Defense Advanced GPS Receiver (DAGR)

Lesson Plan 1 - Perform the DAGR start-up procedure

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			

Task(s) Taught or Supported	Task Number	Task Title			
	113-015	Perform Primary Battery Maintenance			
	113-016	Perform Memory Battery Maintenance			
	113-001	Perform DAGR start-up procedure			

Task(s) Reinforced	Task Number	Task Title			
	None				

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	2:46				
Practical Exercise	0:00				
Test	0:00				
Total Hours	2:46				

Test Lesson Number	Testing		**Hours**	**Lesson No.**	
				113-001	

Prerequisite Lesson(s)	**Lesson Number**		**LESSON TITLE**		
			None		

Security Clearance/Access					

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.				

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References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	OPERATOR'S, MAINTENANCE MANUAL FOR DEFENSE ADVANCED GPS RECEIVER (DAGR)	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	

Student Study Assignments	None	
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna will be required to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.	
Additional Support Personnel Requirements	None	
Equipment Required	DAGR receiver, External Power (AC Adapter), External Power (Fused, 5 Meter) Optional Radiator Antenna or Remote Antenna	
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan one, PowerPoint slides (DAGR_PPT_113_001.ppt).
	Student Materials	DAGR Operator and Maintenance technical manual, lesson one student handout.
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.
	Training Area	Classroom or outdoors.
Ammunition Requirements	None	
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material. Ensure all DAGR are configured the same (ea. Same Waypoints, Routes, Alerts, and Power Saver page set.)	

Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**

Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

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SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 "In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR."	
Terminal Learning Objective	Reference: Slide 3 **ACTION:**	Perform the DAGR start-up procedure.
	CONDITION:	Given a DAGR receiver DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide
	STANDARD:	Performed the DAGR start-up procedure in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	**WARNING:** If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original packaging until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and receiver.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	The outdoor practical evaluation has to be in an environment best suitable to acquire satellites, i.e. objects such as buildings hinder satellite reception and need to be considered when using the equipment in an operational environment. Students will learn what best practices can be performed to acquire satellites if their tactical environment changes. It is unnecessary to damage the environment during this training.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The DAGR is a use full and versatile tool enables the user to navigate, avoid hazards, mark location and much more.	

SECTION III. PRESENTATION

ELO A	Reference: Slide 4 **ACTION:**	Identify basic GPS navigation, DAGR controls, and DAGR displays.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	The student identified basic GPS navigation, DAGR controls, and DAGR displays in accordance with the DAGR Operator and Maintenance Manual.

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Learning Step/Activity 1	Identify basic GPS navigation. Refer students to Page 3-1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	5 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: Paragraph 3.1 through 3.1.2.3 /Page 3-1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 4
		• Introduction
		  – GPS
		  – Unpacking the DAGR
		  – Characteristics
		  – Capabilities and Features
		  – Location and Description

	a. DAGR Purpose	Reference: Slide 5 The Defense Advanced GPS Receiver (DAGR) is a handheld or host platform mounted unit that receives and decodes RF signals from satellites to provide PVT (position, velocity (ground speed), and time) position reporting, and navigation capabilities. The DAGR's primary function is to navigate through terrain using stored waypoint position information. Crypto keys may be loaded into the DAGR for increased PVT accuracy and protection from intentional false or spoofed satellite signals. Mission data can be selectively cleared or zeroized at any time. The DAGR is used in other operations such as waypoint calculations, data transfer, targeting, determining jamming sources, gun laying, and man overboard.
	b. Global Positioning System	Reference: Slide 6 The NAVSTAR Global Positioning System (GPS) is a space-based navigation and timing system. It provides highly accurate, continuous, all weather, 3-dimensional (3D) position, velocity (ground speed), and time (PVT). A constellation of satellites transmit radio frequency (RF) signals for use by navigation sets. Each signal is modulated with a unique code sequence and navigation data message. The code sequence allows the navigation sets to identify each satellite. The navigation data message provides the navigation set information about the operation of each satellite. The navigation sets receive the signals and compute PVT.

	c. NAVSTAR Global Positioning System Structure	Reference: Slide 6
		(1) The GPS structure is made up of multiple satellites, a ground control system, and any number of navigation sets. The satellites orbit the earth while the ground control acts as a monitor and control center for the satellites. The navigation sets are receivers that can be installed in a host platform or carried by personnel.
		(2) Satellites provide navigation data to the navigation set. The satellites are arranged in six rings that orbit the earth twice a day. This arrangement provides worldwide, continuous coverage.
		(3) The Ground Control System tracks the satellites, checks and controls satellite orbits, and updates the satellite navigation data message. The ground control system consists of monitor stations and a control center. Monitor stations are unmanned stations located throughout the world. They use special GPS receivers to track each satellite. The tracking information is sent to the control center where it is used to calculate precise satellite position and satellite clock error for each individual satellite. This data is called ephemeris data. The control center calculates satellite position for all satellites, called almanac data. Once each 24 hours, the control center sends the ephemeris and almanac data to each satellite. This updates the navigation data message broadcast by the satellite.
		(4) The Navigation Set receives and decodes RF signals from the satellites. This decoded information is used to calculate 3D position, 3D speed, and exact time data. The navigation set is able to track satellites that are in open view of the sky from the receiver's antenna position, and measures the time it takes for signals to travel from the tracked satellite to the navigation set. By multiplying travel time by the speed of light, the navigation set determines the exact range to each satellite. By calculating the range to four satellites, an exact 3D position is calculated. The navigation set calculates speed by measuring the rate of change of the RF signals.
Learning Step/Activity 2	Unpacking the DAGR. Refer students to paragraphs 1.2 through 1.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 1.2 through 1.3
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Unpacking	Reference: Slide 7
		Retain empty container for possible return through normal channels. Man-hour requirements and total man-hours required for unpacking the equipment is less than one hour.
		NOTE: The DAGR manuals and a memory battery are overpacked with the DAGR. Primary batteries are not supplied with the DAGR. Install both memory and primary batteries before using DAGR.

	b. Checking Unpacked Equipment	Reference: Slide 7 • Check display surface for scratches. • Check keypad for legible printing of each key label. • Check antenna, power, and data port connectors (J1, J2, J3, J4) for bent or damaged pins. • Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on an SF 361 Transportation Discrepancy Report, DA Form 2404 Equipment Inspection and Maintenance Worksheet, or DA Form 5988E Equipment Inspection and Maintenance Worksheet. • Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., electronic instructions, see DA PAM 738–750). • Check to see whether equipment has been modified. • The DAGR should be returned to the manufacturer for any repair not covered by this manual.
Learning Step/Activity 3	Identify DAGR characteristics. Refer students to paragraph 2.1.1	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs 2.1.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. DAGR Characteristics	Reference: Slide 8 The DAGR collects and processes the GPS satellite Link One (L1) and Link Two (L2) signals to provide position, velocity (ground speed), and time (PVT) information, as well as position reporting and navigation capabilities. The DAGR is primarily a handheld unit with a built-in integral antenna, but can be installed in a host platform (ground facilities, air, sea, and land vehicles) using an external power source and an external antenna. The DAGR used as a handheld unit can also operate with an external L1/L2 antenna and a source of external power.
	b. DAGR Capabilities and Features	Reference: Slide 9 • Signal acquisition using up to 12 channels • All satellites in view are tracked using 11 channels • Navigation using up to 10 channels • L1: Coarse/Acquisition (C/A), Precise (P), and Encrypted P (Y) code capability • L2: Precise (P), and Encrypted P (Y) code capability • Accepts differential GPS signals • One handed operation

		Reference: Slide 10
		    • Backlit display and keypad for night operation
		    • Operates in all weather, day or night
		    • Produces no signals that can reveal your position
		    • Automatically tests itself during power up
		    • Can operate on +9 to +32 volts direct current (V DC) external power
		    • Can perform area navigation functions, storing up to 999 waypoints
		    • Stores up to 15 routes with up to 1000 legs for each route
		Reference: Slide 11
		    • Resists jamming
		    • Resists spoofing when crypto keys are installed
		    • Sealed against dust and water to a depth of 1 meter (3 feet) for 20 minutes
		    • Interconnects with other electronic systems
		    • Uses quick disconnect connectors and fasteners to allow easy unit replacement
		    • Compatible with night vision goggles (NVG) and does not cause blooming
		    Blooming is when a light source is to bright, hotspot, for the night vision goggles to function properly, to get a clear view.
		    • Uses internal compass to compute track and ground speed when moving at or below 0.5 meters per second.

	c. Location of Components	Reference: Slide 12
		The DAGR utilizes four external connectors and other physical features such as:
		    • Integral antenna
		    • Display
		    • J4 provides an external power input
		    • J3 provides an external antenna input
		    • Keypad
		Reference: Slide 13
		    • J1 provides an RS-232 compatible 2-way serial data I/O port (COM Port 3: crypto keyfill, SINCGARS, and pulse per second (PPS))
		    • J2 provides an RS-232 and RS-422 compatible 2-way serial data I/O port (COM Port 1 and COM Port 2: (data transfer), PPS and HAVE QUICK)
		    • Memory battery and cover
		    • Primary battery pack

NOTE:	**Conduct a check on learning.**	Reference: Slide 14
		1. What does the term PVT stand for?
		    (ANS: Position, Velocity, Time.) Paragraph 2.1.1
		2. How many routes can the DAGR store?
		    (ANS: 15.) Paragraph 2.1.2
		3. What is connector J4 used for?
		    (ANS: External Power Input.) Paragraph 2.2

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	Topic Summary	Reference: Slide 15 • GPS • Unpacking the DAGR • Characteristics • Capabilities and Features • Location and Description During this topic you have learned about the GPS System, Unpacking the DAGR, DAGR Characteristics, Capabilities and Feature, and Location and Description of connecters. **Transition Next topic:** Now that we know the DAGR characteristics and features, the next topic will talk about the operation of the features of the keypads and the display.
Learning Step/Activity 4	Identify DAGR controls. Refer students to : Figure 4-3, Table 4-1, Figure 4-4, Table 4-2, Paragraph 4.3 through 4.4/ Page 4-3 through 4-5	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	10 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: Figure 4-3, Table 4-1, Figure 4-4, Table 4-2, Paragraph 4.3 through 4.4/ Page 4-3 through 4-5
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference: Slide 16 • Operations – Keypad Operation • Keypad Controls • Multifunction Keys • Display Indicators – Display Windows • Page Window • Tool Bar Window • Message Window • Pop-up
	Keypad Operation	Reference: Slide 17 The keypad is used to enter data, access and control various displays, modes, and functions. The keypad keys allow direct access to specific functions or groups of functions. Each key contains two labels except for cursor control keys. The lower key label represents the push and release function. The upper key label represents the push and hold function. Accessing push and hold key functions require the operator to push and hold the key for a minimum of two seconds. Function keys F1, F2, and F3 (push and hold) can be customized by the user through changes on the tool bar to access various functions.

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	a. Keypad Controls	Reference: Slide 18
		(1) F1/IN FUNCTIONKEY – Push hold key to acquire the F1 function key action (label is shown in the left side of the tool bar window). Push and release the key to initiate a "Zoom In" on the Situational Awareness page display.
		(2) F2/OUT FUNCTION KEY - Push and hold key to acquire the F2 function key action (label is shown in the center of the tool bar window). Push and release the key to initiate a "Zoom Out" on Situational Awareness page display.
		(3) F3/STATUS FUNCTION KEY - Push and hold key to acquire the F3 function key action (label is shown in the right side of the tool bar window). Push and release the key to display the current DAGR status display.
		Reference: Slide 19
		(4) PWR/QUIT KEY - Push and hold key to turn the DAGR On or off. Push and release the key to cancel an operation, page backwards when using a page set, or return to a previous display in a series of operational displays.
		NOTE: When the DAGR is off, push and release the PWR/QUIT key to turn the DAGR on.
		(5) POS/PAGE KEY Push and hold the POS/PAGE key to access the POS page set and display the Present Position page (with present position coordinates). Push and release the key to scroll to the next page of data.
		(6) BRIGHTNESS/MENU KEY – Push and hold key to toggle the keypad/display lighting on and off. Push and release the key to access display menus. Push and release the key a second time to access main menu. Once a field has been selected, the BRIGHTNESS/MENU key can also be used to edit contents.

		(7) WP/ENTER KEY – WP/ENTER KEY – Push and hold the WP/ENTER key to access different waypoint functions.
		
		        • **GOTO a WP**
		        • **Mark a WP**
		        • **GO TO a WP**
		        • **Create a New WP** (not applicable if no unused waypoints exist)
		        • **List All WPs**
		
		Push and release the WP/ENTER key to select items from pop-up menus, highlight a field when no field is currently highlighted, or make choices while using various editors when a field is currently selected. After a field is highlighted, push and release the WP/ENTER key again to access editing capabilities (if applicable).

		(8) CURSOR CONTROL KEYS – The left, right, up, and down cursor control keys function as follows: Push and release a cursor control key for one scroll (movement) of the cursor from field to field or option to option in the display. Push and hold a cursor control key for an accelerated scroll in the desired direction. Up and Down cursor control keys are used to scroll data vertically within a selected field. Left and right cursor control keys are used to scroll data horizontally.
	b. Multifunction Keys	Reference: Slide 20
		(1) PWR/QUIT KEY and POS/PAGE KEY – Push and release the PWR/QUIT and POS/PAGE keys simultaneously to activate the emergency zeroize display. Confirmation from the user is required before the action is completed.

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		(2) BRIGHTNESS/ MENU KEY and UP or DOWN CURSOR CONTROL KEY – When keypad/display lighting is on, push and hold the BRIGHTNESS/MENU key and push the respective Up or Down cursor control key simultaneously to adjust lighting brightness level.
	c. Display Indicators	Reference: Slide 21 **(1)** LIGHTING STATUS INDICATOR – Located in the upper right corner of the display next to the battery status indicator. The indicator resembles a light bulb when the keypad/ display lighting is on, and the indicator does not appear when the lighting is off. The lighting indicator shows on all display pages, but can be covered when menus or editors are showing on the display. **(2)** PRIMARY BATTERY STATUS INDICATOR – Located in the upper right corner of the display. The indicator resembles a battery and the darkened portion indicates how much primary battery life is remaining. The indicator appears on all display pages, but may be covered when menus or editors are showing on the display. The primary battery status indicator provides an indication of remaining primary battery life hours remaining (full battery capacity is indicated by a completely black battery symbol). When primary battery power is low, the indicator alternates with LOW. The display/keypad lighting on indicator is displayed when display/keypad lighting is turned on. **(3)** FUNCTION KEY LABELS – Each of the three physical function keys of the keypad has an associated function key label shown in the tool bar window of the display. The function key actions are activated by pushing and holding the respective physical key positioned on the keypad directly below the tool bar window.
NOTE:	**Conduct a check on learning.**	Reference: Slide 22 **1.** What is the quickest way to know how much primary battery life is remaining? (ANS: Look at the BATTERY STATUS INDICATOR located in the upper right corner of the display. The indicator resembles a battery and the darkened portion indicates how much primary battery life is remaining), Page 4-3, chapter 4, table 4-1 **2.** What function key is used to display the current DAGR status display? (ANS: The F3/STATUS FUNCTION KEY. Push and release the F3/STATUS key to display the current DAGR status display), Page 4-4, chapter 4, table 4-2 **3.** What keypad controls are used to scroll data vertically within a selected field? (ANS: Up and Down cursor control keys are used to scroll data vertically within a selected field), Page 4-4, chapter 4, table 4-2
Learning Step/Activity 5	Identify DAGR displays. Refer students to Paragraph 4.2 through 4.2.4/ Page 4-1 through 4-2	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	10 Minutes
	Media:	PowerPoint

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	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXXXX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: Figure 4-1, Paragraph 4.2 through 4.2.4/ Page 4-1 through 4-2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Display Windows	Reference: Slide 23 The DAGR display contains three windows (page, tool bar, and message). The display is divided into two regions for two of the windows (page and tool bar) that are always visible. The third window (message) appears as needed for the display of additional messages, including pop-up information. The display windows cannot be individually selected; only fields included in the windows may be selected. The operator is able to request help text or a menu specific to the currently displayed page when no fields are selected. Display windows provide a status area to the right of the display window title containing a primary battery status indicator and display/keypad lighting on indicator.
	a. Page Window	Reference: Slide 24 The page window is where the majority of display interaction occurs. A page may contain several individual fields. The fields may contain read only data or data that can be modified. A page may contain multiple horizontal or vertical views, as denoted by scrollbars at the right side or bottom of the page window. The scrollbars are controlled by the cursor control keys.
	b. Tool Bar Window	Reference: Slide 25 The tool bar window consists of three display regions, and is located at the bottom of the screen. It displays labels for the push and hold keys referred to as function keys (F1, F2, and F3). The function keys are used to change the page being displayed or to perform a single action (e.g., go to the NAV Display page).
	c. Message Window	Reference: Slide 26 When conditions warrant operator notification, message windows are used to attract the operator's attention (e.g., a power down message). Messages are categorized as notes, alerts, cautions, and warnings based on the impact of the message to the operator's mission. The message window is displayed over the page window. The message must be cleared (via operator acknowledgement or self removal) before the page window functionality can be resumed.
	d. Pop-up	Reference: Slide 27 Menu, help, and editor pop-ups are displayed over the page window. The operator initiates a pop-up by pushing the MENU key, or by pushing the ENTER key when a field is selected. The pop-up is cleared by making a selection from the pop-up display, pushing the QUIT key, or using the push and hold function of the POS or WP key. Page window functionality is resumed after removing the pop-up. Pop-ups may have menus, allow editing, and have help text pop-ups associated with the displayed information.
NOTE:	**Conduct a check on learning.**	Reference: Slide 28 **1.** What window is displayed when conditions warrant operator notification? (ANS: Message windows are used to attract the operator's attention (e.g., a power down message)) Page 4-2, paragraph 4.2.3

		2. How is the Pop-Up cleared?
		(ANS: By making a selection from the pop-up display, pushing the QUIT key, or pushing the POS Page key.), Page 4-2, paragraph 4.2.4

	Topic Summary	Reference: Slide 29
		• Keypad Operation
		  – Keypad Controls
		  – Multifunction Keys
		  – Display Indicators
		• Display Windows
		  – Page Window
		  – Tool Bar Window
		  – Message Window
		  – Pop-up
		During this topic you have learned about the features of the keypad and the display.
		
		Transition Next topic: Now that we know the features of the keypad and the display, the next topic will talk about the DAGR Editors.

Learning Step/Activity 6	Identify DAGR editing fields. Refer students to Paragraph 6.2.17 through 6.2.21.6/ Page 6-9 through 6-13	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	10 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: Paragraph 6.2.21 through 6.2.21.6/ Page 6-11 through 6-13
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 30
		• Operations
		  – DAGR Editors
		    • List Editor
		    • Text Editor
		    • Number Editor

	a. DAGR Editors	Reference: Slide 31 The DAGR provides a variety of editors for the operator to change or customize page field content. Editors are accessed via the page or field menu. Actual DAGR editor titles correspond with the field being edited (e.g., when editing a waypoint name field, the text editor title is Name). Field content of a page is edited by selecting choices from an editor. After a field is highlighted, push the ENTER key to display and use the editor or push the MENU key and then use the Edit Field selection to display and use the editor.

	b. List Editors	Reference: Slide 32
		The list editor utilizes key functions the same as the number editor except the PAGE key is used to scroll down larger lists. The list editor is used when editing operator selectable data (i.e., pick from list). List editors are also used for special lists (e.g., including both waypoint number and name) or additional information of the highlighted item in a display footer (e.g., datum information).
	c. Text Editor	Reference: Slide 33
		The text editor is used when editing text and numeric characters. The text editor allows selection of the characters A through Z, 0 through 9, dash (-), slash (/), period (.), and space ( ) to be entered into the text box.
		If the text string being edited is 12 characters long or less, the text editor is displayed with one line of text and a full scroll bar. If the text string being edited is greater than 12 characters long, the text editor is displayed with multiple lines of text (12 characters per line) and a scroll bar (scroll bar is full if only two lines of text are present).
		The text editor is divided into two sections including the text box displaying the text being edited, and the keyboard. The text box is not selectable as a field, only the individual characters. The keyboard displays each character that can be inserted into the text box. Use the up, down, left, and right cursor control keys to move to the desired key. The left and right columns wrap between each other when a scroll key is pushed that would take the selection off the keyboard. The top and bottom rows perform similarly under the same conditions (the text box cannot be selected, and is not considered when wrapping). To select/activate a given key, the ENTER key must be used.
		The four command keys (Clear →, Ins Char, Del Char, and Save) are described as follows.
		• **Clear** — Performs the clear function where the selected character and all characters to the right of the selected character are replaced with the space character.
		• **Ins Char** — (Insert Character) Shifts the selected character and all characters following the selected character to the right by one character, and inserts a space character at the selected location. The new space character becomes the selected character and the character at the end of the text string is deleted (last character of the last line of editable text).
		• **Del Char** — (Delete Character) Shifts all characters following the selected character to the left by one character, thereby overwriting the selected character, and a space character is inserted at the end of the text string (last character of the last line of editable text). The character replacing the selected character becomes the new selected character.
		• **Save** — Saves the changes made to the text string and exits the text editor.
		Instead of using the cursor keys to highlight the SAVE command, the MENU key can be pushed to access a list of options (undo changes, save and exit, exit and no save, reset to default, and editor help). These options provide text editor shortcuts to close the text editor, whether the changes need to be undone, saved, or reset.

	d. Number Editor	Reference: Slide 34
		
		The number editor is used when editing numeric field values (e.g., elevation).
		
		The number editor utilizes key functions as follows:
		
		   • **Up/Down Cursor Control Keys** — Scroll to desired digit or characters.
		   • **PAGE key** — Scroll to the first digit or character value.
		   • **Left/Right Cursor Control keys** — Move the cursor.
		   • **ENTER key** — Save changes and exit.
		   • **QUIT key** — Exit without saving changes.

NOTE:	**Conduct a check on learning.**	Reference: Slide 35 **1.** What are list editors used for? (ANS: When editing operator selectable data (i.e., pick from list).), Page 6-11, paragraph 6.2.21.4 **2.** What are the four command keys for the text editor? (ANS: Clear, Ins Char, Del Char, Save), Page 6-12, paragraph 6.2.21.5.5

	Topic Summary	Reference: Slide 36
		
		• DAGR Editors
		  – List Editor
		  – Text Editor
		  – Number Editor
		
		During this topic you have learned about the DAGR Editors.
		
		Transition Next topic: Now that we know the DAGR Editors, the next topic will talk battery installation.

ELO B	Reference: Slide 37 **ACTION:**	Perform the Primary Battery Installation procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or a pocket guide.
	STANDARD:	Performed primary battery maintenance in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the different types of Batteries. Refer students to paragraph 22.5.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	3 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 22.5.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 1 - Perform the DAGR start-up procedure

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	Topic Overview	Reference: Slide 37
		
		• Operations
		  – Batteries
		    • Types
		    • Install Primary Battery
		Install Memory Battery

	a. Batteries	Reference: Slide 38
		
		(1) The DAGR has two sets of batteries, the primary battery and the memory battery.
		
		The DAGR does not have a battery charger contained in the unit. The DAGR can operate on internal battery power, and can use several types of batteries.
		
		(2) Types of Batteries:
		
		    Lithium AA 1.5 volt; Non-Rechargeable; Primary; Battery type L-91; Battery life 16.5 hours.
		
		    Alkaline AA 1.5 volt: Non-Rechargeable; Primary; W-B-101; Battery life 11.5 hours.
		
		    Alkaline AA 1.5 volt; Rechargeable; Primary; 714-4 or 714-5; Battery Life 7 hours.
		
		    Nickel Metal Hyride AA 1.5 volt; Rechargeable; Primary; NH-15
		
		    Battery Life 10 hours.
		
		    Lithium ½ AA 3.6 volt; Non-Rechargeable; Memory; LS14250; Battery Life 8 months.
		
		(3) The approximate battery life is based on operating the DAGR in continuous mode, at room temperature, and without keypad/display lighting. Several operator selectable DAGR settings are available to extend battery life. No power conservation is required when using external power. Internal batteries are not required when using external power, and need not be removed when connected to external power.
		
		NOTE: Remove all batteries before storing the DAGR below it's -32 °C (-26 °F) minimum operating temperature. This prevents possible memory data corruption, which can degrade DAGR performance. Removing all batteries returns the DAGR to default settings (refer to <u>Table 6-1</u>).

NOTE:	**Conduct a check on learning.**	Reference: Slide 39
		
		1. What are the two battery sets of the DAGR?
		    (ANS: Primary and Memory) Pages 2-2
		
		2. What type of battery do you use for the Memory battery?
		    (ANS: Lithium) Table 22-1

Learning Step/Activity 2	Remove and install Primary Batteries and Memory Battery. Refer students to paragraph 22.6.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 22.6.1

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 1 - Perform the DAGR start-up procedure

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	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Primary Battery Installation	Reference: Slide 40 **NOTE:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **WARNING:** If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original packaging until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and receiver. **CAUTION:** • Do not mix new batteries with old batteries. Do not mix battery types. Do not reverse battery polarity. Use only fresh/new batteries. - If the primary batteries cannot be installed easily, they may be positioned backwards. Check for proper polarity and do not force primary batteries into primary battery pack as this may damage the battery connectors in the battery pack. - If the DAGR is being used for the first time and there are no memory settings to be saved; the memory battery is not important, but still needs to be installed. If the DAGR has memory settings that need to be saved from previous usage, then ensure a good memory battery is installed (check memory battery date on Battery page) or external power applied to unit before installing or replacing the primary batteries to ensure all settings in memory are retained. - If all primary and memory power is lost, memory information is lost and DAGR resets to default settings after power-up. **NOTE**: Polarity markings are shown on the battery pack. Rechargeable batteries may be used, but the DAGR does not have a battery charger contained in the unit. Reference: Slide 41 **a.** Ensure power to the DAGR is off. **b.** Hold unit firmly upside down with the battery pack facing up. **c.** Push or pull latch located on the battery pack to release battery pack. **d.** Lift up on battery pack and remove from unit. Reference: Slide 42 **e.** If batteries are already installed, pull out on the battery removal strap to remove batteries from the battery pack. Dispose of batteries properly. **f.** Position the battery removal strap into the channel of the battery pack before installing new batteries. **g.** Install new batteries and ensure correct polarity installation for each battery (marked on battery pack). **h.** Prior to installing the battery pack, inspect the battery pack gasket for damage or dirt. Lubricate or replace gasket if necessary. Ensure battery removal strap is not protruding from the battery pack. Reference: Slide 43 **i.** To install new battery pack, position tab on battery pack in slot on the DAGR. **j.** Close battery pack against DAGR until battery pack is engaged. **NOTE:** Whenever Primary batteries are replaced, you need to update the Battery Page but we will do this after we power on the DAGR.

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	a. Memory battery Installation	Reference: Slide 44
		Instructional Note: No Student participation.
		CAUTION: • If the DAGR is being used for the first time and there are no memory settings to be saved; the memory battery is not important, but still needs to be installed. If the DAGR has memory settings that need to be saved from previous usage, then ensure good primary batteries are installed (check battery indicator on display) or external power is applied to unit before replacing the memory battery to ensure all settings in memory are retained.
		• If all primary and memory power is lost, memory information is lost and DAGR resets to default settings after power-up.
		NOTE: Use 3.6 volt, 1/2 AA type lithium battery for the memory battery. Refer to Table 22-1 for a list of common battery types and related battery life information.
		Reference: Slide 45
		a. Ensure power to the DAGR is off.
		b. Place unit upside down on non-abrasive surface with the memory battery cover facing up.
		c. Use flat blade screw driver to loosen three captive screws securing memory battery cover, then remove cover from unit.
		d. Remove the memory battery and properly dispose of battery.
		Reference: Slide 46
		e. Prior to installing the memory battery cover, inspect the memory battery cover gasket for damage or dirt. Lubricate or replace gasket if necessary.
		f. Install the memory battery.
		g. Install memory battery cover and tighten three screws.
	Topic Summary	Reference: Slide 47
		• Batteries
		– Types
		– Install Primary Battery
		– Install Memory Battery
		During this topic you have learned about the different battery types how to install the Primary and Memory Batteries.
		Transition Next topic: Now that we know the different battery types how to install the Primary and Memory Batteries, the next topic will talk Powering on the DAGR.
Learning Step/Activity 3	Identify DAGR Power On displays. Refer students to	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	25 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: 5-5 through 5-8, para 5.4; page 5-11 para 5.4.3

Defense Advanced GPS Receiver (DAGR)

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	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 48
		• Operations
		  – Power On DAGR
		    • Power-On Status
		    • SV Sky View
		    • POS Page Set
		      – Elevation Hold
		    • Battery Page
		      – DAGR Menus
		        • Main Menu
		        • Submenu
		          – Power Off DAGR

	a. Power On	Reference: Slide 49
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		WARNING: If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original containers until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and DAGR.
		CAUTION: • Do not mix battery types. Do not mix old batteries with new batteries. Ensure DAGR primary batteries are good (check battery indicator on display) before using unit. The precautions are done to ensure proper battery life and proper unit operation.
		  • If using external power, ensure positive (red) lead of external DC power cable is connected to the positive lead of external power source to prevent possible damage to the unit. Internal batteries may remain installed while using external power. The memory battery should always remain installed.
		  • When position data fields blink between black and gray text, the DAGR is not tracking satellites or has not yet acquired present position. Field data may be inaccurate when the DAGR does not have a position fix. Be sure the DAGR has an open view of the sky to acquire the present position. If the position data fields continue to blink, perform the Manual Initialization procedure.
		  • Prior to a mission, manually enable and orient the internal compass. Failure to do this can result in inaccurate DAGR track data when the DAGR is not moving or is moving below a preset speed value for a specified amount of time.
		Reference: Slide 50
		NOTE: • The DAGR antenna needs a clear field of view to the sky (line of sight) for best satellite visibility. For best reception, the DAGR should be held at a 90 degree angle in relation to the earth's surface.
		  • When first applying power to the DAGR in weather below –20 °C, the receiver will enable a display heater that may take up to twenty minutes to operate display correctly. During this twenty minute period, allow the display heater to function and do not keep turning the DAGR off and then back on. The operator can enable the display heater to operate when the DAGR is powered off This keeps the display heated and allows immediate operation after power-on at temperatures below –20

		°C. DAGR notifies the operator the display heater is enabled prior to powering off. • After power-on, Continuous is the normal operating mode when operating on external power and Fix is the normal operating mode when operating on battery power. After the DAGR obtains a position fix using Fix operating mode, the receiver transitions to Standby mode to conserve battery power. The operator has capability to manually set the power-on operating mode. • In the event a warning or other message is displayed while operating the DAGR, follow display instructions. **WARNING:** DAGR displays a warning to prevent misuse of the present position as a target position that could cause personal injury or death. After power-on and prior to the DAGR automatically displaying the Present Position page, a warning states your position is displayed, NOT the target position if the Fire Support page was used or nonvolatile memory was cleared prior to power-on. Push the PWR key to turn the DAGR on. A display page briefly appears indicating the DAGR software and hardware versions. **NOTE:** To determine the latest DAGR software version, refer to the Replication, Distribution, Installation, and Training (RDIT) website at http://www.sed.monmouth.army.mil/RDIT.
	b. Power-On Status Message	Reference: Slide 51 This display is immediately followed by the power-on status message providing the following information. All messages may not be listed as they are dependent on how the DAGR is configured. When applicable, use the up/down cursor control keys to scroll and view the entire display message. • **Self Test** — Indicates self-test results as pass (no self-test failures found) or fail (self-test failures detected). The power-on self-test performs an automatic self-test of receiver hardware (SAASM module) and does not require any input from the operator. Always displayed. • **Battery Used** — Indicates primary battery capacity used (amount of time DAGR has been operated using primary battery, in hours and minutes). Displayed when using internal primary battery power only. • **Battery Left** — Indicates primary battery capacity remaining (in hours and minutes). Displayed when using internal primary battery power only. • **Power** — Indicates external power being used. Displayed when using external power only. • **Days Remaining** — If CVw or BCVm (black CV monthly) key is loaded, indicates days remaining in mission; and also indicates if enough CV keys are loaded for mission duration. • **Default** — Indicates DAGR's position, time, and date are default values; or if initialization is recommended for the DAGR. The Power-On Status message times out in two seconds and the DAGR is ready to use if the following are true. If the Power-On Status message indicates anything different than the following list, the operator is prompted to push the ENTER key to acknowledge; and the DAGR is ready to use if self-test indicates pass. If self-test fails, the operator is prompted to push the ENTER key to acknowledge; but the DAGR is not ready to use. • Self-test has passed (For self-test failure, refer to paragraph 12.2 for Test Summary page information.) • DAGR does not need initialization (If DAGR requires manual initialization, refer to paragraph 5.4.2.)

		NOTE: Following power-on, if any of the following conditions exist, a message requiring operator acknowledgment appears. • No CV or GUV keys are loaded in DAGR. • No CV key for today is loaded in DAGR. • Not enough CV keys are loaded for mission duration. • SV Code is set to Mixed. • Collecting SV information needed to obtain CV.
	c. Acquire Current Position	Reference: Slide 52 **Instructional Note:** Have student put there DAGRs in Standby Mode. After the Power-On Status display times out or is acknowledged, the DAGR displays the SV (Satellite Vehicle) Sky View page with satellite acquisition status appearing at the top. Initially, status is displayed as Acquiring SVs..., followed by Navigating. After DAGR has acquired current position, the unit automatically switches to the Present Position page of the POS page set and displays position coordinates. During satellite acquisition, the PAGE or QUIT keys can be used to access the Present Position page. **NOTE:** • If the DAGR has been customized and the SV Sky View page is not included in the POS page set, then the DAGR uses the SV Sky View page of the Satellite submenu page set. While the SV Sky View page is displayed, the operator can push and hold the POS key to manually go to the Present Position page. • If the DAGR is not tracking satellites, the display will blink and the Present Position page displays the last position recorded by the receiver before being turned off (provided the DAGR has not experienced a total loss of primary and memory power).

	d. SV Sky View Page	Reference: Slide 53
		The SV Sky View is part of the POS page set containing commonly used pages. The page displays information on visible and tracked satellites. The current operating status is shown at the top of the display. Numbers inside black circles indicate satellites in use to acquire or maintain current DAGR position. The corresponding number at left side of display provides a bar graph indication of satellite signal strength and code status.
		    • **Bar Length** — Indicates received signal strength (from 10 dB Hz to 50 dB Hz). The longer the bar, the greater the signal strength.
		    • **Bar Thickness** — Indicates the type of code in use (thick bar for Y or P code, and thin bar for C/A code).
		    • **No Bar** — Indicates that the satellite is being acquired.
		    • **White (hollow) Bar** — Indicates the satellite is being tracked but has not yet collected ephemeris data for that particular satellite.
		    • **Black (solid) Bar** — Indicates the satellite is being tracked and DAGR has collected ephemeris data for that particular satellite.

	e. Keypad/Display Lighting	Reference: Slide 54 To adjust the DAGR Keypad/Display lighting push and hold the BRIGHTNESS key to toggle the keypad/display lighting on and off. Adjust the lighting brightness by simultaneously pushing and holding the BRIGHTNESS key and the respective or down cursor control key. Keypad/display lighting can also be controlled with one hand using the Light/Contrast page covered later.
	f. Select Operating Mode	Reference: Slide 55 The DAGR mode of operation can be selected from the Present Position page menu, GPS Setup page, SV Sky View Page menu, or Receiver Status display menu. The Status key can also be used to check current mode of operation information. Continuous is the normal operating mode for external

power and Fix is the normal initial operating mode when operating on battery power.

a. From any display, push and hold the POS key until the Present Position page is displayed.

b. If a field is highlighted, push the QUIT key to unhighlight the field.

c. Push the MENU key.

d. Highlight Select Op Mode, then push the ENTER key.

e. Highlight the desired operating mode, then push the ENTER key.

- **Continuous** — At the completion of power-on, the DAGR transitions to Continuous mode if the receiver is connected to external power and is configured to operate as if connected to an unlimited power source (e.g., vehicle power), and no self-test failures have been found. When in Continuous mode, the DAGR tracks satellites to produce a continuous PVT (position, velocity (ground speed), and time) solution. This mode requires more power than Fix or Standby modes.

- **Fix** — At the completion of power-on, the DAGR transitions to Fix mode momentarily when the receiver is operating on battery power, or when connected to external power and configured to operate as if connected to a limited power source, and no self-test failures have been found. When in Fix mode, the DAGR tracks satellites to produce a current PVT solution. The DAGR automatically transitions to Standby mode after a position fix has been obtained. This conserves battery power.

Reference: Slide 56

- **Average**—Average mode is for survey applications where the DAGR is stationary and must not be moved. Satellite signals are continuously received. This mode is also used to improve performance in very low signal environments, such as under dense foliage; but will not improve performance when the satellite signal is lost, such as being in a cave. The DAGR displays a note to the operator upon entering Average mode indicating that the receiver and external antenna (if applicable) must remain stationary (approximately 2 to 4 hours). The DAGR produces more accurate PVT solutions in this stationary position. The DAGR provides an average position and a counter to show the number of position samples used in calculating the position.

- **Time Only** — Time Only mode is for providing time output only (1-PPS, 10-PPS, SINCGARS, or HAVE QUICK). The DAGR acquires and maintains tracking on one or more satellites to provide the current time. The DAGR displays a note to the operator upon entering Time Only mode indicating that the receiver and external antenna (if applicable) must remain stationary.

- **Standby** — At the completion of power-on, the DAGR transitions to Standby mode if self-test failures have been found. When in Standby mode, the DAGR operates at reduced power and does not acquire and track satellites, but performs all functions that do not require satellites. Therefore, when in Standby mode, do not attempt to use functions requiring present DAGR position. This mode is used while entering pre-mission data to help conserve batteries.

- **Rehearsal** — This mode is used for training or mission preparation purposes only. The DAGR uses operator entered waypoints and route to compute position and ground speed data for the simulated

		scenario. The DAGR does not track satellites or perform other functions while in Rehearsal mode. This mode is disabled if the rehearsal route is invalid or does not have legs. • **Test** — The DAGR performs a commanded self-test to determine if the unit is operational. The DAGR does not track satellites, determine position, or provide navigation data while in the Test mode. • **Off** — This mode commands the DAGR to turn off. **f.** Display returns to the Present Position page displaying the selected operating mode below the present position coordinates.
NOTE:	**Conduct a check on learning.**	Reference: Slide 57 **1.** What is the first message that appears on the DAGR display when first turned on? (ANS: DAGR software version.), Page 5-5, paragraph 5.4.1.1 **2.** What is displayed after the Power-On status display times out? (ANS: SV Sky View Page.), Page 5-7, paragraph 5.4.1.3 **3.** What does the Present Position Page display? (ANS: page displays present position coordinates.), Page 5-8, paragraph 5.4.1.3.2

ELO C	**ACTION:**	Select Function Set.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Selected the function set in accordance with DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify select function set. Refer students to paragraphs 12.3 through 12.3.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 12.3 through 12.3.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Select Function Set Operation	Reference: Slide 58 **CAUTION:** The Basic function set contains only one user profile, but the Advanced function set contains ten user profiles. When changing from Basic to Advanced function set, the DAGR defaults to the last used advanced user profile. Ensure the correct user profile is active after switching to the Advanced function set. The mission could be compromised when using the wrong user profile in the advanced function set. Select Function Set is accessed from the System submenu, or by using the Status key and Receiver Status menu. When accessed, an editor appears instead of an actual display page, allowing the operator to choose between the basic and advanced function set. The advanced function set includes all

		basic function set operations plus additional operations.
		Operator confirmation is required before the DAGR changes function sets. Once the operator confirms the selection, the chosen function set is activated. The function set used when the DAGR is powered off is the function set that will be activated when the DAGR is powered back on. The Status key can be used to check current function set and user profile information.
		NOTE: When switching between function sets, settings may be different using the advanced function set as opposed to the basic function set and vice versa. This is because basic function set settings (and any changes made while using the basic function set) apply to the basic function set only, and advanced function set settings (and any changes made while using the advanced function set) apply to the advanced function set only.)
Learning Step/Activity 2	Select the function set. Refer students to paragraph 12.3.2.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 12.3.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Select Function Set	Reference: Slide 59
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) Highlight System from the Main menu, then push the ENTER key.
		(2) Highlight Select Function Set, then push the ENTER key.
		Reference: Slide 60
		(3) The current function set appears inside a box and is highlighted.
		(4) Highlight the desired function set from the list editor, then push the ENTER key.
		Set DAGR to Advanced.
		Reference: Slide 61
		(5) When changing to a different function set, a message is displayed advising the operator that changing profiles may switch user settings. Push the ENTER key to confirm the selection and return to the Present Position page (displaying position coordinates) or push the QUIT key to cancel the selection and return to the prior page displayed.
		NOTE: When using the Advanced function set, the current user profile being used can be checked by accessing the User Profile page from the System submenu. The profile shown in the Current User Profile field is the active profile being used. The Status key can also be used to check current function set and user profile information.
NOTE:	**Conduct a check on learning.**	Reference: Slide 62
		How many user profiles does the advanced function set contain?
		(ANS: Ten user profiles are contained.) Paragraph 12.3.

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Learning Step/Activity 3	Identify DAGR Pos Page Set. Refer students to paragraph 6.29/page 6-5 – 6-6	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	2 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: paragraph 6.2.9/page 6-5 – 6-6
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. POS Page Set	Reference: Slide 63 The POS page set contains the common pages the operator will use. The POS key is used to access the POS page set. After accessing the POS page set, the PAGE or QUIT key can be pushed to view all pages of the POS page set. **NOTE:** The operator can remove the SV Sky View page and Map page from the POS page set. However, the Present Position, Situational Awareness, and NAV Pointer pages cannot be removed from the POS page set. The operator can add up to seven additional display pages to the non-removable pages of the POS page set for a total of up to ten display pages. Reference: Slide 64 • **Present Position** — Displays present position coordinates, coordinate and grid system, datum identifier, current operating mode, estimated horizontal error (EHE), figure of merit (FOM), elevation, elevation reference, ground speed, track, estimated time error, time figure of merit, time and date, MAGVAR, magnetic model year, and operator ID. The operator can scroll the page to view additional field data. Present Position Page is used to set Elevation Hold to Manual or Automatic.
ELO D	**ACTION:**	Select Elevation Hold.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Selected elevation hold in accordance with the DAGR Operator and Maintenance Manual.
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	8 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) DAGR Operator and Maintenance Manual Date: 30/05/2003 Paragraph: 9.5.2.3 through 9.5.2.3.1.1

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Learning Step/Activity 1	**a. Elevation Field and Elevation Hold Mode**	Reference: Slide 65
		
		Elevation is displayed as the vertical range from the surface of the earth as measured from the elevation reference. The elevation reference mean sea level (MSL) or datum (DTM) is displayed in the upper right corner. When elevation hold is activated, the displayed elevation field label alternates with HELD. Field data format is +/- XXXXX, where X represents feet or meters (positive up).
		
		Reference: Slide 66
		
		Elevation hold mode is used to increase accuracy when the DAGR is not tracking enough satellites to determine a three dimensional position solution. Under these conditions, fixing or holding elevation allows the DAGR to provide a 2D-position solution. When elevation hold mode is active, the Elevation field label alternates with Held. Elevation hold mode is turned on and off and configured using the elevation field menu. Two elevation hold modes are as follows:
		
		    • **AUTOMATIC -** The DAGR uses the last computed elevation (user can override) and automatically enables or disables elevation hold. This mode is used where elevation does not vary.
		
		    • **MANUAL -** Elevation hold is not enabled unless the user enters a known elevation. This mode is used where elevation varies. When manual elevation hold mode is in use and the DAGR detects the need for elevation hold, the DAGR prompts the operator to make a choice to use elevation hold. Pushing the ENTER key confirms elevation hold is chosen at the displayed elevation. Pushing the MENU key provides a menu with additional choices.
		
		(**NOTE:** When elevation hold mode is in use, vertical movement should be minimized to enhance accuracy.)
		
		The following scenarios are examples of when the DAGR would enter elevation hold.
		
		    • When available satellites have decreased to three satellites, the PVT solution can be improved by utilizing the present elevation from the position display.
		
		    • When using four or more satellites in conditions of poor satellite geometry, the PVT solution can be improved by utilizing the present elevation from the position display.

NOTE:	**Conduct a check on learning.**	Reference: Slide 67 What are the two elevation hold modes? (ANS: The two elevation hold modes are manual and automatic.) Paragraph 9.5.2.3.1.
Learning Step/Activity 2	**a. Turn Elevation Hold On and Off/Automatic Hold Mode**	**Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Reference: Slide 68 **(1)** With the Present Position page displayed, push the ENTER key to highlight a field. **(2)** Highlight the Elevation field, then push the MENU key.

		Reference: Slide 69
		(3) Highlight Select Hold Mode, then push the ENTER key.
		(4) Highlight Automatic, then push the ENTER key.
		(5) The DAGR uses the last computed elevation (or an operator entered elevation) and automatically turns elevation hold on or off. When elevation hold is on, the Elevation field label alternates with Held.
	b. Turn Elevation Hold on and Off/Manual Hold Mode (When DAGR has no position fix.)	Reference: Slide 70
		(1) With the Present Position page displayed, push the ENTER key to highlight a field.
		(2) Highlight the Elevation field, then push the MENU key.
		(3) Highlight the Select Hold Mode choice, then push the ENTER key.
		Reference: Slide 71
		(4) Highlight Manual, then push the ENTER key.
		(5) Highlight the Elevation field, then push the ENTER key.
		(6) Using the editor, enter a known elevation. Then push the ENTER key.
		(7) Push the QUIT key to unhighlight the Elevation field.
		(8) When the DAGR detects a need for elevation hold, the operator is prompted to select elevation hold.
		The Present Position page allows the operator to view or initialize PVT data when needed (position, time, track, ground speed, and elevation can be initialized). Elevation can be manually entered when in elevation hold mode.
		The next page available in the POS Page set is the Situational Awareness Page. Push the POS Page key to go the Situational Awareness Page.
		Reference: Slide 72
		• **Situational Awareness** — Provides a graphical display of relationships between present position, track, waypoints, routes, and alerts. The Situational Awareness page includes a north reference indicator, speed and track, position error data, and a range scale. Push the POS Page key to go the NAV Pointer Page.
		Reference: Slide 73
		• **NAV Pointer**— **Displays** a pointer directing the operator towards the displayed waypoint. Also displays current navigation method, destination waypoint number and name, azimuth, and range fields. Push the POS Page key to go the Map Page.
		Reference: Slide 74
		• **Map** — **Displays** a graphical map display of relationships between current position, **landmarks**, map objects, and selected waypoints. With a map previously loaded, the Map page automatically displays a map with the DAGR present position shown at the center of the display. The operator uses zoom and pan operations, and waypoint selections to obtain a desired view. When navigating, the Map page provides the operator with a mapped view of surrounding terrain and potential obstructions (e.g., body of water). Push the POS Page key to go the SV Sky View Page.
		Reference: Slide 75
		• **SV Sky View** — Displays status information on tracked satellites (e.g., acquiring satellites). The current operating status is shown at the top of the display. Numbers inside black circles indicate satellites in use to acquire or maintain current DAGR position. The corresponding number

		at left side of display provides a bar graph indication of satellite signal strength and code status. The longer the bar, the greater the signal strength. A black bar indicates ephemeris data is collected. If the DAGR is not able to display satellite information, no bars appear at the far left side of the display.
Learning Step/Activity 3	Identify DAGR Menus. Refer students to Paragraph 6.2.1 through 6.2.6/ Page 6-1 through 6-5	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	20 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: Paragraph 6.2.1 through 6.2.6/ Page 6-1 through 6-5
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. DAGR Menus	Reference: Slide 76 The DAGR uses the following general menu structure to access and/or edit information. There is a menu tree located in the manual on page 6-3, figure 6-2, it illustrates three of the four menu levels. The four menu types are: **1.** Main Menu — Provides submenu choices. **2.** Submenu — Provides page (function) choices. **3.** Page Menu — Provides specific functions or editors associated with the page. **4.** Field Menu — Provides specific functions or editors associated with the field. With a page displayed or a field highlighted, the corresponding menu may be viewed by pushing the MENU key. Pushing the QUIT key allows the user to back out of the menu and return to the previous display. When a menu selection is highlighted that has an arrow symbol to its right, pushing the right cursor control key or the ENTER key causes the submenu to be displayed. Field and page menu items that are not currently available (e.g., Edit Field) are disabled and appear as light gray text. The cursor can be placed on disabled items, but the menu pop-up does not allow selection of disabled items.
	b. Main Menu Access	Reference: Slide 77 The main menu is the DAGR top level menu showing all submenus available and can be accessed using the following methods: • Following DAGR power-up, and from any display (except a pop-up message), access the main menu by pushing the MENU key twice. • With a submenu open, the main menu is accessed by pushing the QUIT key. • With a page menu open, the main menu is accessed by pushing the MENU key. • With a page field menu open, the main menu is accessed by pushing the MENU key.

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	c. Submenu Access	Reference: Slide 78 Submenus are listed within the Main menu and contain individual pages used by DAGR. Access the Main menu, then use the cursor control keys to view the entire list of Submenus.

	d. Page Menu Access	Reference: Slide 79
		
		Page menus are associated with the submenu and are accessed as follows:
		
		NOTE: When a page is displayed, other pages of the submenu page set are accessed by pushing the PAGE or QUIT keys.
		
		   a. Access the main menu.
		
		   b. Highlight the appropriate submenu using the cursor control keys, then push the ENTER key.
		
		   c. Highlight the desired page from a submenu using the cursor control keys, then push the ENTER key.
		
		   d. With page displayed, push the MENU key.

	e. Field Menus	Reference: Slide 80
		
		Field menus are accessed as follows:
		
		   a. Access the desired page.
		
		   b. Select the desired field by pushing the ENTER key and use cursor control keys to highlight the desired field.
		
		   c. Push the MENU key.

	f. Main Menu	Reference: Slide 81 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. The Main Menu allows the user to access the Submenus The Submenus are Navigation, WP/Route/Alerts, Receiver Setup,, Display Setup, Communications, System, Satellite, and Applications. Highlight Navigation and push the ENTER key.
	g. Navigation	Reference: Slide 82 The Navigation Submenu allows the user to select NAV Setup, NAV Pointer, NAV Displays, Present Position, Situation Awareness, and Maps. Highlight NAV Setup and push the Enter Key. Reference: Slide 83 The NAV Setup Page set is now available. You can use the POS Page and PWR QUIT keys to access the different pages in the NAV Setup Page set. At the top of the NAV Setup Page are tabs, each tab is labeled for its Page. At this time the Tab shows NAV Setup. Press the POS Page key to access the next page of the NAV POS Page set which is NAV Display 1. Press the POS Page Key again to cycle through the different pages of NAV Setup Page set. Each time you press the key the tab will change to reflect which page you are on. The Navigation Submenu pages are NAV Setup Page, NAV Display 1, NAV Display 2, NAV Display 3, and NAV Display 4 only in advanced mode. The PWR QUIT key allows seeing the previous page in the set. Press the MENU key twice and highlight WP/Route/Alerts and press the ENTER key.

	h. WP/Route/Alerts	Reference: Slide 84
		The WP/Route/Alerts Submenu allows the user to select Waypoints (WPs), Mark a WP, Range Between WPs, Routes and Alerts.
		Highlight Waypoints (WPs) and press ENTER.
		Reference: Slide 85
		Waypoint page is now available.
		Instructional Note: Cycle through the different pages of the WP/Route/Alerts Setup Submenu using the POS Page and PWR QUIT keys.
		Press the MENU key twice and highlight Receiver Setup and press the ENTER key.
	i. Receiver Setup	Reference: Slide 86
		The Receiver Setup Submenu allows the user to select Crypto Fill, GPS Setup, Power Saver, Battery, Auto-on, and Automark pages.
		Highlight the Crypto Fill and press ENTER.
		Reference: Slide 87
		The Crypto Fill page is available.
		Instructional Note: Cycle through the different pages of the Receiver Setup Submenu using the POS Page and PWR QUIT keys.
		Press the MENU key twice and highlight Display Setup and press the ENTER key.
	j. Display Setup	Reference: Slide 88
		The Display Setup Submenu allows the user to select Units, Internal Compass, Light/Contrast, Customize, User Datum's, and User Grids.
		Highlight the Units and press ENTER.
		Reference: Slide 89
		The Units page is available.
		Instructional Note: Cycle through the different pages of the Display Setup Submenu using the POS Page and PWR QUIT keys.
		Press the MENU key twice and highlight Communications and press the ENTER key.
	k. Communications	Reference: Slide 90
		The Communications Submenu allows the user to select Data Transfer, COM PORT Setup, PPS HQ SINCGARS, Crypto Fill, and Connector Status pages.
		Highlight Data Transfer and press ENTER.
		Reference: Slide 91
		The Data Transfer Page is available.
		Instructional Note: Cycle through the different pages of the Communications Submenu using the POS Page and PWR QUIT keys.
		Press the MENU key twice and highlight System and press the ENTER key.
	l. System	Reference: Slide 92
		The System Submenu allows the user to select Test Summary, Select Function Set, User Profiles, Data Clear Options, and About pages.
		Highlight Test Summary and press ENTER.

		Reference: Slide 93
		The Test Summary Page is available.
		Instructional Note: Cycle through the different pages of the System Submenu using the POS Page and PWR QUIT keys.
		Press the MENU key twice and highlight Satellite and press the ENTER key.
	m. Satellite	Reference: Slide 94
		The Satellite Submenu allows the user to select SV Sky View, Channel Status, SV Message, DOP Calculation, SV Schedule, and SV Select pages.
		Highlight SV Sky View and press ENTER.
		Reference: Slide 95
		The Satellite Sky View page is available.
		Instructional Note: Cycle through the different pages of the Satellite Submenu using the POS Page and PWR QUIT keys.
		Press the MENU key twice and highlight Applications and press the ENTER key.
	n. Applications	Reference: Slide 96
		The Applications Submenu allows the user to select Fire Support, CAS 9-Line Brief, Jammer Finder, and Gun Laying (GLS) pages.
		Highlight Fire Support and press ENTER.
		Reference: Slide 97
		The Fire Support page is available.
		Instructional Note: Cycle through the different pages of the Applications Submenu using the POS Page and PWR QUIT keys.
		Now you should have and understanding of how to navigate and access the Main Menu, Submenus and how to use the POS Page and Quit keys to view different pages in the set.
NOTE:	**Conduct a check on learning.**	Reference: Slide 98
		1. What are the four menu types?
		(ANS; Main Menu, Submenu, Page Menu, and Field Menu. Para 6.2.1)
		2. What allows the operator to back out of a Menu and return to the previous display?
		(ANS; Pushing the QUIT key. Para 6.2.1.1)

ELO E	**ACTION:**	Perform set the Battery page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the battery page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Perform set the Battery page. Refer students to paragraph 7.6.1/Page 7-25	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	20 Minutes

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 1 - Perform the DAGR start-up procedure

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	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 7.6.1/Page 7-25; 7.6.3/Pages 7-27 - 7-28
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Battery Page	Reference: Slide 99 **CAUTION:** Do not mix new batteries with old batteries. Do not mix battery types. Do not reverse battery polarity. Use only fresh/new batteries. These precautions are done to ensure proper battery life and proper unit operation. **(1)** The Battery page is accessed from the Receiver Setup submenu. The Battery page is used to record primary battery information, show type of power source, and estimate remaining primary battery life. The page also contains the date when the memory battery was replaced. Vertical scrolling is used to view all fields of the battery page. Information on battery life during power up and the battery indicator located on the DAGR display is directly related to information on this page. When external power is used for the DAGR, the Power Source field automatically updates, but the External Power Source Type field should be updated by the user (as battery or non-battery). The use of Continuous or Fix modes of operation upon power up and Power Saver page operations (e.g., auto-off) depends on whether or not DAGR is using battery power. **(2)** After replacing primary power or memory batteries, the operator performs the following to maintain accurate DAGR battery information: Primary Battery: Update battery installation date; Update battery type; Update rechargeable fields; Reset the battery user field (using Battery Page Menu) Memory Battery: Update battery installation date.
	b. Updating the Battery Page	Reference: Slide 100 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **a.** Push the MENU key twice to access the Main menu. **b.** Use the cursor control keys to highlight Receiver Setup, then push the ENTER key. The Receiver Setup submenu is displayed. **c.** Use the cursor control keys to highlight Battery, then push the ENTER key. The Battery page is displayed with view one showing on the display. Reference: Slide 101 **d.** Push the ENTER key to highlight a field. **e.** Use the up/down cursor control keys to highlight the Power Batteries Installed field. **f.** Push the ENTER key to access the editor for that field. **Power Batteries Installed Field:** Displays the date the power batteries were installed. This date is input by the operator for information purposes and does not affect battery life calculations. Field data format is DD-MM-YYYY, where D represents day, M represents month, and Y represents year.

Reference: Slide 102

g. Use the up/down/left/right cursor control keys to change the field information to the date of battery replacement, then push the ENTER key. Display returns to the Battery page.

h. Use the up/down cursor control keys to highlight the Battery Type field.

Reference: Slide 103

i. Push the ENTER key to access the editor for that field.

Battery Type Field: Displays the battery type as input by the operator. Selections are Alkaline, Lithium, or None/Other. Battery type affects battery life calculations.

j. Use the cursor control keys to highlight the applicable battery type, then push the ENTER key. Display returns to the Battery page.

Reference: Slide 104

k. Use the up/down cursor control keys to highlight the Rechargeable field.

l. Push the ENTER key to access the editor for that field.

Rechargeable Field: Displays Yes or No as entered by the operator. Yes is entered when rechargeable power batteries are used. The content of this field does not affect battery life calculations.

Reference: Slide 105

m. Use the cursor control keys to highlight the applicable information for the battery type used, then push the ENTER key. Display returns to the Battery page.

n. Push the MENU key to access the page menu.

Reference: Slide 106

o. Use the cursor control keys to highlight Reset Battery Used, then push the ENTER key. Display returns to the Battery page with the Used field reset to zero.

Used Field: Displays the amount of time in hours and minutes the DAGR has been operating on internal power batteries. This field is reset by the operator using the Reset Battery Used function from the page or field menu (after replacement of primary batteries). The operator cannot edit this field, except for resetting the information contained in it. This field is not affected by the DAGR operating mode, battery type, or estimated remaining battery life. Field data format is HHhMMm, where H represents hours and M represents minutes.

p. Use the up/down cursor control keys to highlight the Memory Battery Installed field (shown on view two).

Reference: Slide 107

q. Push the ENTER key to access the editor for that field.

Memory Battery Installed Field: Displays the date the memory battery is installed. This date is input by the operator for information purposes and does not affect battery life calculations. Field data format is DD-MM-YYYY, where D represents day, M represents month, and Y represents year.

Reference: Slide 108

r. Use the up/down/left/right cursor control keys to change the field information to the date of battery replacement, then push the ENTER key. Display returns to the Battery page.

s. Primary and Memory battery installation complete. If desired, push and hold the POS key to access the Present Position page, or push the

		MENU key twice to access the main menu for other DAGR selections. Reference: Slide 109 **Explain rest of Battery Page Fields.** **(1) Power Source Field:** The DAGR automatically determines power source and displays it as Internal (internal primary battery power) or External (external AC or DC power). The operator cannot edit this field. **(2) Power Battery Gauge Field:** Displays the estimated power battery life remaining in hours and minutes. The operator cannot edit this field. This field is directly related to the Power Battery Gauge field bar graph. Estimated remaining battery life changes according to what operating mode and battery type the DAGR is set to. Field data format is HHhMMm, where H represents hours and M represents minutes. **(3) Remaining Field:** Displays the estimated power battery life remaining in hours and minutes. The operator cannot edit this field. This field is directly related to the Power Battery gauge field bar graph. Estimated remaining battery life changes according to what operating mode and battery type the DAGR is set to. Field data format is HHhMMm, where H represents hours and M represents minutes. Reference: Slide 110 **(4) External Power Source Type Field:** The Power Source field must show External for this field to be active. Displays Non-Battery or Battery as the external power source type, and is entered by the operator. Battery must be selected to configure the DAGR to use power saving modes (e.g., auto-off). • **Non-Battery** — Used when connected to an unlimited external power source (e.g., external AC power). Power saving functions are not applicable using this unlimited power source setting. • **Battery**—Used when connected to external battery power, or when connected to an external limited power source. Allows for power saving functions (e.g., auto-off). **(5) Auto Power Transfer Field:** Displays Enabled or Disabled as selected by the operator. When enabled, the DAGR automatically transfers itself to internal (battery) power when external power is removed.
NOTE:	**Conduct a check on learning.**	Reference: Slide 111 **1.** What is the battery page used for? (ANS: record primary battery information, show type of power source, and estimate remaining primary battery life) Page 7-25, paragraph 7.6.1 **2.** When changing a battery set power needs to be what? (ANS: Off.) Page 5-1, paragraph 5.2 **3.** What must you update after changing a battery set? (ANS: Battery Page) Pages 5-1 through 5-2, paragraph 5.2
Learning Step/Activity 2		Turn DAGR Off. Refer students to paragraph 5.4.4/page 5-11
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	5 minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) PRECISE POSITIONING SERVICE (PPS) AN/XXXX NSN XXXX-XX-XXX-XXXX (EIC XXX) Date: XX/XX/XXXX Paragraphs/pages: paragraph 5.4.4.2/page 5-11

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 1 - Perform the DAGR start-up procedure

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	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Power off DAGR	Reference: Slide 112
		
		When in the Off mode, the DAGR maintains crypto keys, waypoints, routes, and setup data providing either primary power, memory power, or external power is available. Perform the following procedure to turn the DAGR off.
		
		    a. Push and hold the PWR key. The 30 second power down warning is displayed.
		
		NOTE: If auto-on, automark, and display heater messages are enabled, their related messages will also appear.
		
		    b. Push the ENTER key to immediately power off the DAGR.

	Topic Summary	Reference: Slide 113
		
		• Operations
		  – Power On DAGR
		    • Power-On Status
		    • SV Sky View
		    • Function Set
		    • POS Page Set
		      – Elevation Hold
		    • Battery Page
		      – DAGR Menus
		        • Main Menu
		        • Submenu
		      – Power Off DAGR
		During this topic you have learned on to Powering on the DAGR.

SECTION IV. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 114 You have now learned to start up the DAGR and perform maintenance on the primary and memory batteries.	
Transition Next Lesson	Now that we know the steps necessary start up the DAGR and perform maintenance on the primary and memory batteries, we will next learn how to perform a DAGR operational checkout.	

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 2 – Perform the DAGR Operational Checkout Procedure
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SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title		
	523-0790484	DAGR Operation		

Task(s) Taught or Supported	Task Number	Task Title		
	113-002	Perform the DAGR Operational Checkout Procedure.		

Task(s) Reinforced	Task Number	Task Title		
	None			

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	0:29				
Practical Exercise	0:00				
Test	0:00				
Total Hours	0:29				

Test Lesson Number	Testing	**Hours**	**Lesson No.**
			113-002

Prerequisite Lesson(s)	**Lesson Number**	**LESSON TITLE**
	113-001	Perform the DAGR Startup Procedure

Security Clearance/Access	None.

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

References	Number	Title	Date	Additional Information
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None.			
Instructor Requirements	PowerPoint slides are available and shall accompany the lesson plan as well as reinforce the student handout.			
Additional Support Personnel Requirements	None.			
Equipment Required	DAGR receiver, External Power (AC Adapter), External Power (Fused, 5 Meter) Optional Radiator Antenna or Remote Antenna			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan two, PowerPoint slides (DAGR_PPT_113_002.ppt).		
	Student Materials	DAGR Operator and Maintenance Manual, lesson two student handouts.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	Indoors or outdoors.		
Ammunition Requirements	None.			
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 2 – Perform the DAGR Operational Checkout Procedure
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SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 This procedure should be performed when acquiring a new DAGR unit, an unfamiliar unit, or a unit you suspect of being damaged.	
Terminal Learning Objective	Reference: Slide 2 **ACTION:**	Perform the DAGR Operational Checkout procedure.
	CONDITION:	Given a DAGR receiver configured for start-up, clear view of the sky, accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Performed the DAGR Operational Checkout procedure in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	**WARNING:** If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original packaging until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and receiver.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	Performing the following operational checkout of the DAGR shows whether the unit is operating correctly or not.	

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SECTION III. PRESENTATION

Learning Step/Activity 1	Identify the operational checkout procedure. Refer students to paragraph 18.1 through 18.3 and 13.2, 13.3, 13.4 13.5, 13.6, 13.7, and 13.8 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	25 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003 Paragraphs: 18.1 through 18.3 and 13.2, 13.3, 13.4 13.5, 13.6, 13.7, and 13.8
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Overview	Reference: Slide 3
		Introduction
		    Operational Checkout Procedure Familiarity
		    Pretest setup
		Operations
		    Perform the DAGR Operational Checkout Procedure
		Reference: Slide 4
		Page Function
		    SV Sky View Page Function
		    Channel Status Page Function
		    SV Status Page Function
		    SV Message Page Function
		    DOP Calculation Page (Advanced) Function
		    SV Schedule Page (Advanced) Function
		    SV Select Page Function

	b. Operational Checkout Procedure Familiarity	Reference: Slide 5 Performing the following operational checkout of the DAGR shows whether the unit is operating correctly or not. If the DAGR passes the operational checkout procedure, the unit is ready to use; if the DAGR does not pass the operational checkout procedure, proceed to the troubleshooting procedures listed in Chapter 19 of the DAGR Operator and Maintenance Manual. The mission operations checks procedure is designed to aid the user in detecting a DAGR malfunction that may be corrected in the field. If the malfunction cannot be corrected, perform the troubleshooting procedure.
	c. Pretest Setup	Reference: Slide 6 **WARNING:** If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original packaging until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and receiver. **CAUTION:** Do not mix battery types. Do not mix old batteries with new batteries. Ensure DAGR primary batteries are good (check battery indicator on display) before using unit. These precautions are done to ensure proper battery life and proper unit operation.

		If using external DC power, ensure positive (red) lead of external DC power cable is connected to the positive lead of external power source to prevent possible damage to the unit. Internal batteries may remain installed while using external power. The memory battery should always remain installed. The DAGR is protected against accidental reverse connection of external power. Reference: Slide 7 **NOTE:** The DAGR antenna needs a clear field of view to the sky (line of sight) for best satellite visibility. For best reception, the DAGR should be held at a 90 degree angle in relation to the earth's surface (not applicable to system installation). If applying power to DAGR in cold weather and the display does not come on, do not keep turning the unit off and then back on for power-up. The DAGR has the capability for the user to enable a display heater, and without the heater enabled, the DAGR could take up to 20 minutes to become operational. To conserve battery power, the DAGR should be kept warm before applying power, then kept warm in between usage such as keeping the DAGR inside a vehicle or inside the user's coat. There are no pretest connections or adjustments required to check out the DAGR as a handheld unit. If the DAGR is used in a host platform system for the checkout procedure, install the DAGR into the host platform mount, then install the external power source and external antenna along with related cables. Additional host plat form mount information is included in brackets within the procedure.

	d. DAGR Operational Checkout Procedure	Reference: Slide 8
		
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		a. Inspect the DAGR [and external cables and equipment] for damage and/or missing parts. (Refer to the parts list for associated parts used.)
		
		b. Push the POWER key to turn the DAGR on, and make sure the DAGR [or DAGR system antenna] has a clear view of the sky.
		
		c. During power up, observe the power-on status display. Make sure that self-test passes and battery indication [batteries not applicable to system installation] shows sufficient battery power left. Do not use the DAGR if a failed self-test is indicated.
		
		Reference: Slide 9
		
		NOTE: A Test Summary page can be accessed from the System submenu for a listing of tests that passed or failed. Do not use the DAGR if the Status field shows FAILED.
		
		d. After the DAGR successfully completes power-on self-test and shows the SV Sky View page or Present Position page, perform the following procedure for an operator induced commanded self-test.
		
		Reference: Slide 10
		
		NOTE: Self-test does not track SVs, determine position, or provide navigation data. Operator confirmation is required to enter this mode. The test requires approximately four minutes to complete, and also requires operator intervention to complete the self-test.
		
		  (1) Activate commanded DAGR self-test.
		
		    (a) If the Present Position page is not already displayed, push and hold the POS key (except when showing a message pop-up, and then push the QUIT key first). The Present Position page is displayed.
		
		    (b) From the Present Position page, push the MENU key.

Reference: Slide 11

(c) Highlight Select Op Mode, then push the ENTER key.

(d) Highlight Test, then push the ENTER key.

(e) The DAGR displays an ENTER TEST MODE message prompting the operator to confirm or cancel entering test mode. Push ENTER key to confirm.

Reference: Slide 12

(2) Test In Progress display appears with specific area of testing listed at bottom and a bar graph denoting progress. The DAGR automatically tests multiple areas.

Reference: Slide 13

NOTE: While performing the following keypad test, push and hold the ENTER key to test the ENTER key. Push and release the ENTER key will advance to the next display.

(3) After the test in progress tests are completed, Keypad Test is displayed. Push each key on the keypad and verify the corresponding key shown on the display toggles between normal and highlighted appearance. Push the ENTER key to continue to the next display.

Reference: Slide 14

(4) Display Light Test display appears with the brightness adjustment cycling between 0% and 100%. The percentage adjustment is reflected in the light bulb of the display. Verify the display lighting by viewing the DAGR display in a dark area. Push ENTER key to continue.

Reference: Slide 15

(5) Contrast Test display appears with the contrast adjustment cycling between 0% and 100%. The percentage adjustment is reflected in the bar graph of the display. Push ENTER key to continue.

Reference: Slide 16

(6) The Display Test Beginning message appears momentarily. After sequencing through white, light gray, dark gray, and black, and the Display Test Completed message appears, followed by the Power-On Status display listing self-test results as Pass or Fail.

Reference: Slide 17

NOTE: A Test Summary page can be accessed from the System submenu for a listing of tests that passed or failed. Do not use the DAGR if the Status field shows FAILED.

(7) If Power-On Status remains displayed and does not time out, push the ENTER key to acknowledge.

(8) The SV (Satellite Vehicle) Sky View page is displayed.

Reference: Slide 18

e. With the SV Sky View page displayed, push the MENU key.

f. Highlight Select Op Mode, then push the ENTER key.

g. Highlight Continuous, then push the ENTER key. This mode enables the DAGR to acquire a current position fix.

h. After satellites are acquired and a current position fix is obtained, the DAGR display stops blinking and Tracking SVs is shown on the SV Sky View page, then automatically switches to the Present Position page.

		Reference: Slide 19
		NOTE: If the DAGR does not acquire satellites, the display blinks between black and gray text and goes into Standby mode (both handheld and host platform operation). If the DAGR display continues to blink, verify a clear view of the sky, then perform the manual initialization procedure.
		    i. Do the following before using the DAGR.
		        • Ensure the correct function set is being used (Basic or Advanced)
		        • Ensure the correct user profile is being used if using the advanced function set.
		        • Set the DAGR to the desired operating mode.

	e. SV Sky View Page Function	Reference: Slide 20
		
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		Guided Practice:
		    1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		    2. Highlight Satellite, then push the ENTER key.
		    3. Highlight SV Sky View, then push the ENTER key. The SV Sky View page is displayed.
		
		Reference: Slide 21
		The SV Sky View page is accessed from the Satellite submenu. Once the SV Sky View page is accessed the operator can scroll between the SV Sky View pages by pressing the POS Page key. The SV Sky View page displays graphical status and signal strength information on visible and tracked satellites (SVs) at left side of display. A graphical representation of satellite positions is also displayed. The current status is shown at the top of the display (e.g., Navigating). The visible (VIS) count indicates the number of SVs visible from the current DAGR position. The good (GOOD) count indicates the number of visible SVs in good health. A satellite in good health is reporting good almanac or ephemeris data. Almanac age (ALM AGE) is the age of the SV data in days, typically one to two days old for recently collected SV data. Almanac data is updated by tracking satellites for at least 12.5 minutes. If a portion of the almanac data is not received within that time period, another 12.5 minutes tracking time is required. Once almanac data is updated, the display changes to 1 day.
		
		Satellite data includes a unique satellite identifier pseudo random number (PRN), received signal strength, and code (C/A, P, or Y). The current operating mode of the DAGR can be set using the SV Sky View page menu, and can also be changed from the Present Position page menu, the GPS Setup page field; or by using the Status key and the Receiver Status menu.

	f. Channel Status Page Function	Reference: Slide 22
		
		The Channel Status page is accessed from the Satellite submenu. Once the Channel Status page is accessed the operator can scroll between the Channel Status pages by pressing the POS Page key. The Channel Status page table provides individual satellite data for active channels. Vertical scrolling is used to view all table rows. If a satellite's information is not available, the table columns display double dashes instead of data. Channel Status page data cannot be edited by the operator. The following information describes the data provided by each table column.
		    • **SV** — Satellite unique, identifying, pseudo random number (PRN) (two digits).
		    • **C/No** — Carrier to noise ratio (dB Hz). Typical value is 37 to 50 (dB

		Hz). • **CODE** — Code type from the satellite (CA, Y, or P). • **FREQ** — Frequency being used (L1 or L2). • **J/I** — Jamming or interference detected (Yes or No).
	g. SV Status Page Function	Reference: Slide 23 The SV Status page is accessed from the Satellite submenu. In addition, the page is automatically displayed after the operator acknowledges a warning message that the DAGR cannot obtain fix or cannot track satellites. The SV Status page table provides status of all currently visible satellites from the present position. Vertical scrolling is used to view all table rows. The SV Status page data cannot be edited by the operator. The following information describes the data provided by each table column. • **SV** — Satellite unique, identifying, pseudo random number (PRN) (two digits). • **AZ** — Azimuth angle (three digits, in degrees) to the SV in reference to the north reference (True, Magnetic, or Grid). • **ELA** — Elevation angle (two digits, in degrees) to the SV. SVs with a higher elevation are located directly above the DAGR. An arrow pointing up indicates rising and an arrow pointing down indicates setting. • **SET** — The time (Zulu (Z) or Local (L)) the SV drops below the horizon mask angle and cannot be tracked. Format is HHMMZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. Displays N/A if time cannot be calculated or is invalid. • **HLTH** — Health status (OK or BAD). When BAD satellite health status is indicated, the satellite is reporting bad almanac or ephemeris data. The DAGR automatically deselects the satellite until the health status returns to OK.
	i. SV Message Page Function	Reference: Slide 24 The SV Message page is accessed from the Satellite submenu using the advanced function set. Once the SV Message page is accessed the operator can scroll between the SV Message pages by pressing the POS Page key. The SV Message page displays the almanac age of the oldest, healthy satellite data and any satellite special messages (satellite page 17, subframe 4 data).
	j. DOP Calculation Page (Advanced) Function	Reference: Slide 25 The DOP (dilution of precision) Calculation page is accessed from the Satellite submenu using the advanced function set. Once the DOP Calculation page is accessed the operator can scroll between the DOP Calculation pages by pressing the POS Page key. The DOP calculation determines the best and worst times for DAGR accuracy at a specified position based upon predicted satellite coverage over a specified time. After required setup data is entered into the fields, the operator initiates the calculation. Up to four mask areas (sectors) simulating obstructions to satellite signal reception (e.g., mountains, buildings, etc.) can be setup by the operator. Each sector is defined horizontally by an entered azimuth range (from azimuth/to azimuth fields). Each sector is defined vertically by an entered mask angle in reference to the horizon. **NOTE:** When the DAGR is turned off, all DOP Calculation page field setup and calculated data is lost. The calculation process is disabled if any changes are made to field setup data while the calculation is running, or if entered field values are invalid.

	k. SV Schedule Page (Advanced) Function	Reference: Slide 26 **NOTE:** When the DAGR is turned off, all SV Schedule page field setup and calculated data is lost. The calculation process is disabled if any changes are made to field setup data while the calculation is running, or if entered field values are invalid. The SV Schedule page is accessed from the Satellite submenu using the advanced function set. Once the SV Schedule page is accessed the operator can scroll between the SV Schedule pages by pressing the POS Page key. The SV Schedule page provides calculations used to determine satellite visibility at a position and time specified by the operator. This calculation is based upon predicted satellite coverage. After setup data (position, elevation, start time, start date, and mask angle) is entered into the fields, the operator initiates the calculation. Vertical scrolling is used to view all fields in the page. Horizontal scrolling is used to view satellite data included in the Rise/Set Data table.
	h. SV Select Page Function	Reference: Slide 27 **CAUTION:** DAGR performance can be degraded when the operator uses the SV Select page to manually deselect satellites or select satellite tracking frequency, code, or acquisition method. When DAGR power is cycled, all operator satellite selections are lost and the DAGR resumes full control of satellite selection. The SV Select page is accessed from the Satellite submenu. Once the SV Select page is accessed the operator can scroll between the SV Select pages by pressing the POS Page key. The SV Select page table allows the operator to individually select specific satellite frequencies, codes, acquisition methods, or deselect satellites. When a satellite is deselected, the DAGR does not acquire or track the satellite. The default (Mode column) setting for all satellites allows the DAGR to determine all satellite selection parameters. Any satellite selection changes made by the operator using this page are removed by cycling DAGR power or by using a page menu Clear All function. Scrolling is used to view all table rows. Satellites are identified by a unique two digit pseudo random number (PRN) in the SV column. Satellite select/deselect information is displayed in the table Mode column.

NOTE:	**Conduct a check on learning.**	Reference: Slide 28
		
		1. The Operational Checkout is designed to do what?
		
		   (ANS: It is designed to show whether the unit is operating correctly or not.) Paragraph 18.1
		
		True or False
		
		2. The DAGR needs a clear view of the sky in order to do a successful operational checkout.
		
		   (ANS: True.) Paragraph 18.3
		
		True or False
		
		3. Do not use the DAGR if a failed self-test is indicated.
		
		   (ANS: True.) Paragraph 18.3
		
		4. Where is the DOP Calculation Page accessed from?
		
		   (ANS: It is accessed from the Satellite submenu.) Paragraph 13.6.1

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 2 – Perform the DAGR Operational Checkout Procedure
9 July 2004

SECTION IV. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction:	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by ---	
	a. Soliciting student questions and explanations.	
	b. Asking questions and getting answers from the students.	
	c. Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 29	
	During this lesson you have learned to perform the DAGR Operational Checkout procedure. This procedure should be performed when acquiring a new DAGR unit, an unfamiliar unit, or a unit you suspect of being damaged.	
Transition Next Lesson	Now that we know the steps necessary to perform the DAGR Operational Checkout Procedure, we will learn how to adjust the default settings to user settings on the DAGR.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title		
	523-0790484	DAGR Operation		

Task(s) Taught or Supported	Task Number	Task Title		
	113-003	Adjust DAGR Receiver Default Settings to User Settings		

Task(s) Reinforced	Task Number	Task Title		
	None			

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	3:44				
Practical Exercise	0:30				
Test	0:00				
Total Hours	4:14				

Test Lesson Number	Testing	Hours	Lesson No.
			113-003

Prerequisite Lesson(s)	Lesson Number	LESSON TITLE
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform the DAGR Operational Checkout Procedure

Security Clearance/Access	

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

9 July 2004

References	Number	Title	Date	Additional Information
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	

Student Study Assignments	None
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna will be required to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.
Additional Support Personnel Requirements	None
Equipment Required	DAGR receiver, External Power (Fused, 5 Meter) or batteries.

Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan three, PowerPoint slides (DAGR_PPT_113_003.ppt).
	Student Materials	DAGR Operator and Maintenance technical manual, lesson three student handout.

Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.
	Training Area	None.

Ammunition Requirements	None
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**

Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

9 July 2004

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	3 Minutes
	Media:	PowerPoint
Motivator	Reference Slide 1 If a soldier acquires a DAGR and wants to change the DAGR to their personal settings.	
Terminal Learning Objective	Reference Slide 2	
	ACTION	Adjust DAGR receiver default settings to user settings.
	CONDITION	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and the DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD	Adjusted DAGR receiver default settings to user settings in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	This lesson includes information necessary to adjust selected DAGR receiver's user settings in accordance with the operator's individual needs or mission requirements.	

SECTION III. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

ELO A	Reference Slide 3	
	ACTION:	Set GPS Setup Page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the GPS Setup page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the GPS Setup page. Refer students to paragraph 7.4.1	
	Method of instruction:	Conference / Discussion

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

9 July 2004

	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 7.4.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference Slide 3
		Introduction
		   – GPS Setup Pages
		   – Page Function
		Operations
		Setup GPS Setup Page.

	Page Function	Reference Slide 4
		
		The GPS Setup page is accessed from the Receiver Setup submenu, or by using the Status key and Receiver Status menu. The GPS Setup page is used to set the operating mode (operating mode is also changed using the Present Position page menu, SV Sky View page menu; or by using the Status key and Receiver Status menu), view status (also viewed by using the Status key and Receiver Status menu), and configure DAGR features for greatest position accuracy.
		
		Page field information includes the following:
		
		  • Operating Mode
		  • Power-On Operating Mode
		  • Frequency
		  • SV Code
		  • Elevation Hold
		  • Receiver Autonomous Integrity Monitor (RAIM) Mode and Status
		  • Rehearsal Route and Ground Speed
		  • Anti-Jam Accessory Mode and Status
		  • Differential Global Position System (DGPS) Mode and Status (Advanced)
		  • Wide Area GPS Enhancements (WAGE) Mode and Status (Advanced)
		  • Mask Mode and Angle (Advanced)
		  • SV Hold (Advanced)
		
		NOTE: When connected to the DAGR, the Anti-Jam Accessory (AJA) is enabled or disabled by the operator using the Anti-Jam Accessory Mode field. When AJA is enabled and jamming is detected by the DAGR, the AJA provides DAGR increased anti-jam capability. AJA status is provided by the Anti-Jam Accessory Status field.

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

9 July 2004

Learning Step/Activity 2	Set the GPS Setup page. Refer students to paragraph 7.4.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	20 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.4.3 and 7.4.2.1 through 7.4.2.18.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Setup the GPS Setup Page	Reference Slide 5

Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.

1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.

2. Highlight Receiver Setup, then push the ENTER key.

3. Highlight GPS Setup, then push the ENTER key. The GPS Setup page is displayed.

1. From the GPS Setup page, push the ENTER key to highlight a field.

2. Use the cursor control keys to highlight the desired field, then perform one of the following:

   (a) To edit field text or numeric content, push the ENTER key. For some fields, field content is chosen from a list and pushing the ENTER key displays the list editor.

Reference Slide 6

(1) Operating Mode Field: This field is only applicable after power has been applied, and displays the current DAGR operating mode. The operating mode can be changed by the user after DAGR has been powered-up. Operating mode selections are as follows:

  • **Continuous** — Tracks satellites to produce a continuous PVT (position, velocity (ground speed), and time) solution.

  • **Fix** — Tracks satellites to produce a single PVT solution.

  • **Average** — Tracks satellites to produce an averaged PVT solution. DAGR must remain stationary.

  • **Time Only** — Tracks satellites to produce a time only solution.

  • **Standby** — Does not track satellites, but performs functions not requiring satellites.

  • **Rehearsal** — Does not track satellites, but uses operator entered information to display a simulated scenario.

  • **Test** — Does not track satellites, but performs internal fault testing.

  • **Off** — Commands the DAGR to turn off.

Reference Slide 7

(2) Power-On Operating Mode Field: This field is only applicable during power-on, and displays how DAGR selects an operating mode during that time. After power has been applied, the operating mode can be changed using the operating mode field. Power-on display selections are as follows: |

- **Default —** The DAGR determines the operating mode based upon the source of DAGR power. When external (unlimited power source) power is used, Continuous operating mode is used. When battery power is used, Fix operating mode is used. Standby operating mode is used if self-test failures occur during power-on.
- **Continuous**
- **Standby**
- **Fix**
- **Average**
- **Time Only**

Reference Slide 8

(3) Frequency Field: Displays one of three frequency selections as follows:

- **L1 Primary —** Tracks satellites on L1. Performs atmospheric corrections on L2. When jammed on L1, uses L2.
- **L2 Primary —** Tracks satellites on L2. Performs atmospheric corrections on L1. When jammed on L2, uses L1.
- **L1 Only —** Only tracks satellites on L1. Used with an L1 only antenna.

Reference Slide 9

(4) SV Code Field: The Status key can be used to check the status of this field. Displays one of two selections as follows:

- **All-Y —** Restricts the DAGR to only use satellites indicating they are transmitting Y code signals. The receiver tracks a Y-code if fully authorized, or tracks C/A if not fully authorized.
- **Mixed —** Allows the DAGR to only use satellites indicating they are transmitting C/A, P, and Y-code signals. Mixed is used when an insufficient Y-code message is received.

NOTE: Mixed SV code is susceptible to spoofing signals. When crypto keys are loaded, All-Y SV code is not susceptible to spoofing signals.

Reference Slide 10

(5) Elevation Hold Field: Elevation hold is used to improve position accuracy when less than four satellites are available or when poor satellite geometry exists. Vertical movement must be avoided when elevation hold is in use. The field displays one of the following selections:

- **Automatic**—Selected to have the DAGR automatically use the last known elevation. DAGR uses this setting unless changed by the operator.
- **Manual** — Selected to prevent automatic elevation hold. DAGR prompts the operator to enter an elevation more accurate than the last known elevation.

Reference Slide 11

(6) RAIM Mode Field: Displays receiver autonomous integrity monitor (RAIM) mode as enabled or disabled. RAIM is enabled for the receiver to detect faulty SV measurements and exclude them from the position solution.

(7) RAIM Status Field:

Caution: When the RAIM Status field displays Faults Found, the position solution may be degraded.

This field cannot be edited by the operator. Displays the status of RAIM as:

- **Unavailable** —RAIM is disabled or has not yet reached full capacity to

detect the presence of faulty satellite signals. Detection of faulty satellite signals requires a DAGR position fix acquired using at least five satellites with good satellite dilution of precision (DOP) geometry (position of satellites in the sky).

- **No Faults** —RAIM detection is enabled, fully available, and no faults are detected. No faults are detected when a position fix is acquired using consistent signals from five or more satellites. While this status is present, the position fix solution will be no further in error than 200 meters.

- **Faults Found** — RAIM has detected a faulty satellite signal used in computing the position fix, but cannot exclude it from the position solution computation. Before a faulty satellite signal can be excluded from the position solution computation, the DAGR must have a position fix acquired using at least six satellites with good satellite DOP geometry. While this field status is present, the position solution may be degraded.

Reference Slide 12

(8) Rehearsal Route Field: Displays the current rehearsal route name. The desired route for a rehearsal scenario is selectable. After the rehearsal route and initial ground speed are selected, the operating mode is changed to Rehearsal to begin the scenario. Field data format is ##-NNNNNNNNNN, where # represents the route number and N represents the route name.

(9) Rehearsal Ground Speed Field: Displays current rehearsal ground speed (in units) indicating how fast the rehearsal scenario is executing. Rehearsal ground speed can be initialized before starting the scenario or changed while running the scenario. Select the appropriate ground speed units before setting rehearsal ground speed. Field data format is XXX, where X represents miles per hour, knots, or kilometers per hour.

Reference Slide 13

(10) Anti-Jam Accessory Mode Field: Displays anti-jam accessory (AJA) mode as Disabled or Enabled. When enabled, the anti-jamming capabilities of the AJA can be used.

(11) Anti-Jam Accessory Status Field: Displays the current status of the AJA as follows:

- **Not Connected**—Displays when the AJA is not functional due to any connection to DAGR, faulty connection, power problem, or DAGR COM Port 3 set to other than standard configuration settings.

- **Off** — Displays when DAGR is set to a non-tracking operating mode.

- **Pass Through (Normal)**—Displays when the AJA is connected but disabled or when the AJA is enabled while operating in a low jamming or non-jamming environment.

- **Nulling** — Displays when AJA is enabled while operating in a jamming environment.

- **Test in Progress** — Displays during an AJA self-test.

- **Self Test Failed** — Displays if the AJA fails self-test.

Reference Slide 14

(12) Mask Mode Field (Advanced): Displays Mask Mode as Enabled or Disabled. When Mask Mode is enabled, the DAGR disregards satellites below the mask angle specified in the Mask Angle field. When Mask Mode is disabled, the DAGR disregards satellites below a 5 degree (default) mask angle.

		(13) Mask Angle Field (Advanced): Displays the selected mask angle specifying the minimum angle for usable satellites, positive up. Field data format is +/- XX, where X represents degrees.
		Reference Slide 15
		(14) DGPS Mode Field (Advanced): Displays the differential global positioning system (DGPS) mode as Enabled or Disabled. DGPS mode is enabled to use DGPS corrections received over the data interface (if available) to improve position accuracy. The data interface must be set up before differential corrections can be used.
		(15) DGPS Status Field (Advanced): Displays a status of whether the DAGR is using differential information in the GPS solution. Status displays are: • **Unavailable** — The DAGR is not receiving DGPS inputs. • **Receiving**— The DAGR is receiving DGPS inputs but is not yet incorporating them into a position solution. • **Using** — The DAGR is receiving and using DGPS inputs in the position solution.
		Reference Slide 16
		(16) WAGE Mode Field (Advanced): Displays the wide area GPS enhancements (WAGE) mode as Enabled or Disabled. WAGE is enabled to use corrections from the SVs to improve position accuracy. WAGE corrections are available only to authorized users. If both WAGE and DGPS are enabled, and DGPS corrections are being used, WAGE data is not used.
		(17) WAGE Status Field (Advanced): Displays the WAGE status as Not Using or Using. When status is displayed as Not Using, WAGE corrections are not included in the position solution. When status is displayed as Using, WAGE corrections have been collected and are included in the position solution.
		Reference Slide 17
		(18) SV Hold (Advanced): Displays satellite hold as Enabled or Disabled. When enabled, the DAGR continues to track only those satellites currently being tracked. **(b)** To access the field menu list, push the MENU key. Scroll to the desired menu item (e.g., Edit Field), then push the ENTER key.
		Reference Slide 18
		3. For list editors, scroll to the desired field content, then push the ENTER key.
		4. Display returns to the GPS Setup page with change made to field content.
NOTE:	**Conduct a check on learning.**	Reference Slide 19
		1. Where is the GPS Setup page accessed from? (ANS: The GPS Setup page is accessed from the Receiver Setup submenu, or by using the Status key and Receiver Status menu.) Paragraph 7.4.1
		2. What does the term RAIM stand for? (ANS: Receiver Autonomous Integrity Monitor.) Paragraph 7.4.2.6
		True or False
		3. The RAIM Status Field cannot be edited by the operator. (Answer: True.) Paragraph 7.4.2.7

	Topic Summary	Reference Slide 20
		•Set the GPS Setup page.
		  –GPS Setup Pages
		  –Page Function
		•Operations
		  –Setup GPS Setup Page.
		During this topic you have learned about the GPS Setup page and how to set it up.
		Transition Next topic: Now that we know the steps necessary to set the GPS Setup page, the next topic will introduce you to the Power Saver page and how to set it.

ELO B	Reference Slide 21 **ACTION:**	Set Power Saver page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and the DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Power Saver page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Power Saver page. Refer students to paragraphs 7.5 through 7.5.2.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	12 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 7.5.1.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference Slide 21
		Power Saver Page
		  – Page Function
		  – Field Descriptions
		Operations
		  – Set Power Saver Page

	Page Function	Reference Slide 22 The Power Saver page is accessed from the Receiver Setup submenu, or by using the Status key and Receiver Status menu. The Power Saver page provides Auto-Off and Auto-Standby modes and timer fields, and an Off Mode Display Heater field. The Power Saver page fields are used to conserve battery power. Auto-Off is used to turn the DAGR off when not being used. Auto-Standby is used to transition the DAGR to Standby operating mode when a GPS solution cannot be found.
Learning Step/Activity 2	Set the Power Saver page. Refer students to paragraph 7.5.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16

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	Time of instruction: (minutes)	10 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.5.3.1 and 7.5.2.1 through 7.5.2.3.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Enable Auto-Off Function	Reference Slide 23
		Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Ensure Auto-off mode is set to Off.
		1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		2. Highlight Receiver Setup, then push the ENTER key.
		3. Highlight Power Saver, then push the ENTER key. The Power Saver page is displayed.
		NOTE: If the Auto-Off Mode field displays On, skip to step (3). If the Auto-Off Mode field displays Off, proceed with step (1).
		(1) From the Power Saver page, highlight the Auto-Off Mode field. Push the ENTER key.
		(a) Auto-Off Mode Field: The Auto-Off mode field is used to enable or disable the auto-off timer by the operator selecting either On or Off.
		Reference Slide 24
		(2) Highlight On, then push the ENTER key. The display returns to the Power Saver page with the Auto-Off Mode field highlighted including changes made.
		(3) From the Power Saver page, highlight the Auto-Off Timer field. Push the ENTER key.
		(a) Auto-Off Timer Field: The Auto-Off Timer field displays a selectable time value within the range of 15 seconds to 30 minutes. The auto-off timer restarts whenever the operator pushes a DAGR key or whenever data is received over a data interface serial port. Auto-Off Timer field data format is MMmSSs, where M represents minutes and S represents seconds.
		When enabled, the auto-off timer starts under the following conditions:
		• Acquisition attempts fail to obtain a PVT solution in any tracking mode
		• After a PVT solution is reached (and satellite tracking data is collected in any tracking mode except FIX)
		• When Standby operating mode is entered
		The auto-off timer is automatically disabled under the following conditions:
		• When the DAGR is operating on external power and the External Power Source Type field of the Battery page displays Non-Battery
		• During an Auto-On cycle
		• During an Automark cycle
		Reference Slide 25
		(4) Enter the desired time value (15 seconds up to 30 minutes), then push the ENTER key. The display returns to the Power Saver page with the Auto-Off Timer field highlighted including changes made.

	b. Enable Auto-Standby Function	Reference Slide 26
		
		NOTE: If the Auto-Standby Mode field displays On, skip to step (3). If the Auto-Standby Mode field displays Off, proceed with step (1).
		
		(**1**) From the Power Saver page, highlight the Auto-Standby Mode field. Push the ENTER key.
		
		  (a) **Auto-Standby Mode Field:** The Auto-Standby Mode field is used to enable or disable the auto-standby timer by the operator selecting either On or Off.
		
		Reference Slide 27
		
		(**2**) Highlight On, then push the ENTER key. The display returns to the Power Saver page with the Auto-Standby Mode field highlighted including changes made.
		
		Reference Slide 28
		
		(**3**) From the Power Saver page, highlight the Auto-Standby Timer field. Push the ENTER key.
		
		  (a) **Auto-Standby Timer Field:** The Auto-Standby Timer field displays a time value within the range of 5 minutes to 9 hours. When auto-standby is enabled and the DAGR is operating on battery power, the DAGR automatically transitions from a tracking mode to Standby mode when a position solution is not acquired within the time duration set for the auto-standby timer. Auto-Standby Timer field data format is HHhMMmSSs, where H represents hours, M represents minutes and S represents seconds.
		
		NOTE: When operating the DAGR on external power, the External Power Source Type field of the Battery page must be set to battery to enable auto-standby.
		
		Reference Slide 29
		
		(**4**) Enter the desired time value (5 minutes up to 9 hours), then push the ENTER key. The display returns to the Power Saver page with the Auto-Standby Timer field highlighted including changes made.

	c. Enable/Disable Off Mode Display Heater	Reference Slide 30
		
		(**1**) From the Power Saver page, highlight the Off Mode Display Heater field. Push the ENTER key.
		
		  (a) **Off Mode Display Heater Field**: The Off Mode Display Heater field is used to enable or disable the display heater while the DAGR is turned off. In cold conditions (below approximately -20 °C) the display heater is used (when enabled) to ensure the display is fully functional when the DAGR is initially powered on. When powering on the DAGR in cold conditions without prior use of the display heater, the DAGR may require up to twenty minutes warming the display for use. The Status key can be used to check the display heater setting.
		
		    • **Enabled -** In cold conditions, the display heater warms the display while the DAGR is powered off, preparing the DAGR display for immediate use.
		
		    • **Disabled -** The display heater does not warm the display while the DAGR is powered off. This setting is used to conserve DAGR battery power.
		
		Reference Slide 31
		
		NOTE: While DAGR is powered on, the display heater is enabled to turn on. The Off Mode Display Heater field has no affect on operation while the DAGR is powered on. With the Off Mode Display Heater field set to

		Enabled, the DAGR requires operator acknowledgement prior to powering down.
		(2) Highlight Enabled or Disabled, then push the ENTER key. The display returns to the Power Saver page with the Off Mode Display Heater field highlighted including changes made.
	Topic Summary	Reference Slide 32
		Power Saver Page
		– Page Function
		– Field Descriptions
		Operations
		–Set Power Saver Page
		During this lesson you have learned about the Power Saver page and how to set it up.
		Transition Next topic: For the next topic, you will learn about the features of the Auto-On page and how to set it up.
ELO C	Reference Slide 32	
	ACTION:	Set Auto-On page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Auto-On page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Auto-On page. Refer students to paragraphs 7.7.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 7.7.1.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference Slide 33
		Auto-On Page
		– Page Function
		– Field Descriptions
		Operations
		– Set Auto-On Page
	a. Page Function	Reference Slide 34
		The Auto-On page is accessed from the Receiver Setup submenu, or by using the Status key and Receiver Status menu The Auto-On page is used to automatically power-on the DAGR and maintain data required for fast acquisition, position, and navigation solutions. The DAGR must be placed where it has visibility to the satellites. The Auto-On page allows the operator to set the auto-on timer and associated fields. The Status key can be used to check the current auto-on setting.

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Learning Step/Activity 2	Set the Auto-On page. Refer students to paragraph 7.7.3.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	20 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.7.3.1 and 7.7.21 through 7.7.2.4.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Disable Auto-On Function	Reference Slide 35
		
		Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Ensure Auto-On mode is set to Off.
		
		1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		
		2. Highlight Receiver Setup, then push the ENTER key.
		
		3. Highlight Auto-On, then push the ENTER key. The Auto-On page is displayed.
		
		NOTE: The DAGR must have a continual open view of the sky for the auto-on function to work properly. If the operator attempts to power down the DAGR while auto-on is active, the operator is prompted to acknowledge auto-on is enabled before power down. After the DAGR is powered down, the DAGR automatically starts the power on sequence according to how the auto-on page is configured.
		
		(1) From the Auto-On page, highlight Mode field, then push the ENTER key.
		
		NOTE: Whenever the Mode field is set to Manual or Automatic, the auto-on function is enabled. The Mode field must first be set to Off before the other fields can be configured.
		
		    (a) Mode Field: Displays the Auto-On mode as follows:
		      • **Off -** Disables auto-on. Must be set to OFF to edit remaining fields.
		      • **On -** Enables Auto-On to power-on and collect satellite information at the specific time interval set by the user in the time interval field. Between the information entered in the start time/date and stop time/date fields, the DAGR powers on and acquires satellite data, then powers down automatically. After reaching an operator entered stop time and date, the Mode field is automatically set to off.
		    Have Students set field to Off.
		
		Reference Slide 36
		
		(2) Highlight Off, then push the ENTER key.
		
		(3) Display returns to the Auto-On page with the Mode field highlighted and changes made.
		
		Instructional NOTE: If you get Auto-On is Enabled Message upon powering down, ensure you disable the Auto-On function to prevent battery drain.

	b. Select Time Zone	Reference Slide 37 **(1)** From the Auto-On page, highlight the Start Time and Date or Stop Time and Date fields. Push the MENU key. **(2)** Highlight Select Time Zone, then push the ENTER key.

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		Reference Slide 38
		(3) Highlight the desired time zone, then push the ENTER key. Returns to the Auto-On page with the time zone reference changed.

	c. Set Start of Auto-On Function	Reference Slide 39
		NOTE: The operator has two options for setting the DAGR to start the Auto-On function. One option is starting as soon as the Mode field is switched from Off; the second option is starting at a specific start time and date.
		1. Start auto-on when mode is switched from Off.
		   (a) From the Auto-On page (with or without a field highlighted), push the MENU key.
		Reference Slide 40
		   (b) Highlight Start When Enable, then push the ENTER key.
		   (c) The Auto-On page displays the Start Time and Date field with Start When Enabled.
		(1) Start Time and Date Field(s): This field is edited to specify when Auto-On function is to start. The two individual start time and start date fields are available only when the single field is edited and a start time and date is entered. Displays one of two configurations:
		   • Displays one field containing Start When Enabled when selected from the page menu, for starting Auto-On function as soon as mode field is switched from Off.
		   • Displays two fields containing Start Time and Start Date when operator entered time and date field values specify when to start the Auto-On function. Start Time field data format is HHhMMmZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. Start Date field data format is DD-MM-YYYY, where D represents day, M represents month, and Y represents year.
		Reference Slide 41
		2. Start Auto-On at specific time and date.
		   (a) From the Auto-On page, highlight the Start Time and Date field, or highlight the Start Time field. Push the ENTER key.
		   (b) Enter desired start time, then push the ENTER key.
		Reference Slide 42
		   (c) Highlight the Start Date field, then push the ENTER key.
		   (d) Enter desired start date, then push the ENTER key.
		   (e) The Auto-On page Start Time and Start Date fields display entered data.

	d. Set Stop of Auto-On Function	Reference Slide 43
		NOTE: The operator has two options for setting the DAGR to stop the Auto-On function. One option is stopping as soon as the Mode field is switched to Off; the second option is stopping at a specific stop time and date.
		   (1) Stop auto-on when mode switched to Off.
		   (a) From the Auto-On page (with or without a field highlighted), push the MENU key.
		Reference Slide 44
		   (b) Highlight Stop When Disable, then push the ENTER key.
		   (c) The Auto-On page displays the Stop Time and Date field with Stop When Disabled.

		(1) **Stop Time and Date Field(s):** This field is edited to specify when Auto-On function is to stop. The two individual stop time and stop date fields are available only when the single field is edited and a stop time and date is entered. Displays one of two configurations:
		
		    • Displays one field containing Stop When Disabled selected from the page menu, or when an entered stop time/date is invalid. Stops the Auto-On function as soon as mode field is switched from Off.
		
		    • Displays two fields containing Stop Time and Stop Date when operator entered time and date field values specify when to stop the Auto-On function. Stops the Auto-On function when the entered time and date are reached. Stop Time field data format is HHhMMmZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. Stop Date field data format is DD-MM-YYYY, where D represents day, M represents month, and Y represents year.
		
		Reference Slide 45
		
		(2) Stop auto-on at specific time and date.
		
		  (a) From the Auto-On page, highlight the Stop Time and Date field, or highlight the Stop Time field. Push the ENTER key.
		
		  (b) Enter desired stop time, then push the ENTER key.
		
		Reference Slide 46
		
		  (c) Highlight the Stop Date field, then push the ENTER key.
		
		  (d) Enter desired stop date, then push the ENTER key.
		
		  (e) The Auto-On page Stop Time and Stop Date fields display entered data.

	e. Set Time Interval Between Auto-On Functions	Reference Slide 47 **(1)** From the Auto-On page, highlight the Time Interval field. Push the ENTER key. **(a) Time Interval Field:** Displays the entered time duration between power-on cycles. Field data format is HHhMMm, where H represents hours and M represents minutes. Reference Slide 48 **(2)** Enter desired time interval, then push the ENTER key. **(3)** The Auto-On page Time Interval field displays entered data.
	f. Enable Auto-On Function	Reference Slide 49 **(1)** From the Auto-On page, highlight the Mode field. Push the ENTER key. **(2)** Highlight On, then push the ENTER key. Reference Slide 50 **(3)** Auto-On function is now enabled and will start and continue operating as previously set up until disabled. After auto-on is enabled, only the Mode field content can be changed.

NOTE:	**Conduct a check on learning.**	Reference Slide 51
		
		1. Which data requirements are maintained using the Auto-On function?
		
		  (ANS: The data requirements are fast acquisition, position and navigation solutions.) Paragraph 7.7.1
		
		2. What does "H" and "M" represent in the Time Interval Field?
		
		  (ANS: "H" represents Hours and "M" represents Minutes.) Paragraph 7.7.2.4)

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	Topic Summary	Reference Slide 52
		
		Auto-On Page
		   – Page Function
		   – Field Descriptions
		Operations
		   –Set Auto-On Page
		
		During this topic you have learned about the Auto-On page and how to set it up.
		
		Transition Next topic: For the next topic, you will learn about the features of the Auto-Mark page and how to set it up.

ELO D	Reference Slide 53 **ACTION**:	Set Automark Page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Automark page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Automark page. Refer students to paragraph 7.8.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 7.8.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference Slide 53
		
		Automark Page
		   – Page Function
		   – Field Descriptions
		Operations
		 Set Automark Page

	a. Page Function	Reference Slide 54 The Automark page is accessed from the Receiver Setup submenu, or by using the Status key and Receiver Status menu. The Automark page allows configuration of the DAGR to automatically store a present position fix as a waypoint at selected time intervals. The DAGR powers itself on, as required, to perform the Automark function. The DAGR must maintain visibility to satellites for this function. The Automark function can be enabled by the operator only when using the advanced function set. Once enabled, either the advanced or basic function set may be used, Automark continues to function as set by the operator and the page is accessible. Automark is disabled either manually by the operator or automatically when an entered stop time and date are reached. Automark is only available when the advanced function set is in use. The Status key can be used to check the current Automark setting.

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Learning Step/Activity 2	Disable the automark function. Refer students to paragraph 7.8.3..1 a and 7.8.2.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1a and 7.8.2.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Disable The Automark Function	Reference Slide 55 **Instructional NOTE:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **1.** From any display (except a message pop-up), push the MENU key twice to display the Main Menu. **2.** Highlight Receiver Setup, then push the ENTER key. **3.** Highlight Automark, then push the ENTER key. The Automark page is displayed. **NOTE:** • The DAGR must have a continual open view of the sky in order for the automark function to work properly. The user must ensure that the total time set to acquire waypoints is coordinated with the range being traveled so the entire path traveled is recorded sufficiently. • If the operator attempts to power down the DAGR while automark is active, the operator is prompted to acknowledge automark is enabled before power down. After the DAGR is powered down, the DAGR automatically starts the power on sequence according to how the Automark page is configured. This allows fields to be setup for automark operation. **(1)** From the Automark page, highlight Mode field, then push the ENTER key. **(a) Mode Field**: (**NOTE:** Whenever the Mode field is set to One Mark or Repeating Marks, the Automark function is enabled. The Mode field must first be set to Off before the other fields can be configured.) Displays the automark mode as: • **Off -** Automark disabled. Must be set to Off to edit remaining fields. • **One Mark -** Store one present position fix as a waypoint at the set start time. • **Repeating Marks -** Store multiple present position fixes as waypoints starting at the preset start time and continuing at specified intervals until the preset stop time. After completing the automark function, the mode field is automatically set to Off. Reference Slide 56 **(2)** Highlight Off, then push the ENTER key. **(3)** Display returns to the Automark page with the Mode field highlighted and changes made.

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Learning Step/Activity 3	Select Time Zone. Refer students to paragraph 7.8.3.1 b	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 b
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Select Time Zone	Reference Slide 57 (**1**) From the Automark page, highlight the Start Time and Date or Stop Time and Date fields. Push the MENU key. (**2**) Highlight Select Time Zone, then push the ENTER key. Reference Slide 58 (**3**) Highlight the desired time zone, then push the ENTER key. Returns to the Automark page with the time zone reference changed.
Learning Step/Activity 4	Set start of the automark function. Refer students to paragraph 7.8.3.1 c and 7.8.2.2.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 c and 7.8.2.2.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Start Automark When Mode Switched From Off	Reference Slide 59 (**1**) From the Automark page (with or without a field highlighted), push the MENU key. (**2**) Highlight Start When Enable, then push the ENTER key. Reference Slide 60 (**3**) The Automark page displays the Start Time and Date field with Start When Enabled.
	b. Start Automark At Specific Time and Date	Reference Slide 61 (**1**) From the Automark page, highlight the Start Time and Date field, or highlight the Start Time field. Push the ENTER key. (**a**) **Start Time and Date Fields**: This field is edited to specify when automark function is to start. The two individual start time and start date fields are available only when the single field is edited and a start time and date is entered. Displays one of two configurations: • Displays one field containing Start When Enabled when selected from the page menu. Starts the automark function as soon as Mode field is switched from Off.

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		• Displays two fields containing Start Time and Start Date fields when time and date field values are entered by the operator. Starts the automark function when the entered time and date are reached. Start Time field data format is HHhMMmZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. Start Date field data format is DD-MM-YYYY, where D represents day, M represents month, and Y represents year.
		Reference Slide 62
		(2) Enter desired start time, then push the ENTER key.
		(3) Highlight the Start Date field, then push the ENTER key.
		Reference Slide 63
		(4) Enter desired start date, then push the ENTER key.
		(5) The Automark page Start Time and Start Date fields display entered data.
Learning Step/Activity 5	Set stop of the automark function. Refer students to paragraph 7.8.3.1 d and 7.8.2.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 d and 7.8.2.3.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Stop Automark When Mode Switched to Off	Reference Slide 64
		NOTE: The operator has two options for setting the DAGR to stop the Automark function. One option is stopping as soon as the Mode field is switched to Off; the second option is stopping at a specific stop time and date.
		(1) From the Automark page (with or without a field highlighted), push the MENU key.
		(2) Highlight Stop When Disable, then push the ENTER key.
		Reference Slide 65
		(3) The Automark page displays the Stop Time and Date field with Stop When Disabled.
	b. Stop Automark at Specific Time and Date	Reference Slide 66
		(1) From the Automark page, highlight the Stop Time and Date field, or highlight the Stop Time field. Push the ENTER key.
		(a) Stop Time and Date Fields: This field is edited to specify when automark function is to stop. The two individual stop time and stop date fields are available only when the single field is edited and a stop time and date is entered. Displays one of two configurations:
		• Displays one field containing Stop When Disabled when selected from the page menu, or when an entered stop time and date is invalid. Stops the automark function as soon as Mode field is set to Off.

		• Displays two fields containing Stop Time and Stop Date fields when time and date field values are entered by the operator. Stops the automark function when the entered time and date are reached. Stop Time field data format is HHhMMmZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. Stop Date field data format is DD-MM-YYYY, where D represents day, M represents month, and Y represents year.
		Reference Slide 67
		(2) Enter desired stop time, then push the ENTER key.
		(3) Highlight the Stop Date field, then push the ENTER key.
		Reference Slide 68
		(4) Enter desired stop date, then push the ENTER key.
		(5) The Automark page Stop Time and Stop Date fields display entered data.
Learning Step/Activity 6	Set time interval between Automark functions. Refer students to paragraph 7.8.3.1 e and 7.8.24.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 e and 7.8.2.4.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Set Time Interval Between Automark Functions (affects Repeating Marks mode only)	Reference Slide 69
		(1) From the Automark page, highlight Time Interval field. Push the ENTER key.
		(a) **Time Interval Field:** Displays and allows editing of the time duration between automarking waypoints. Selection range is one minute to twelve hours. Applies to Repeating Marks mode only. Field data format is HHhMMm, where H represents hours and M represents minutes.
		Reference Slide 70
		(2) Enter desired time interval, then push the ENTER key.
		(3) The Automark page Time Interval field displays entered data.
Learning Step/Activity 7	Set starting waypoint number. Refer students to paragraph 7.8.3.1. f and 7.8.2.5.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 f and 7.8.2.5.

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	Set Starting Waypoint (WP) Number	Reference Slide 71 (**1**) From the Automark page, highlight Starting WP Number field. Push the ENTER key. (**a**) **Starting WP Number Field:** Displays and allows selection of the first waypoint number used for automarking. The page and field menu provide the Reset To Start WP selection to return to the starting waypoint for storage of automark waypoints. Field data format is XXX, where X represents the waypoint number. Reference Slide 72 (**2**) A number editor displays the number of the first unused waypoint. (**3**) Enter desired starting waypoint number, then push the ENTER key. (**4**) The Automark page Starting WP Number field displays entered data.
Learning Step/Activity 8	Set number of waypoints to store. Refer students to paragraph 7.8.3.1 g and 7.8.2.6.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 g and 7.8.2.6.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Set Number of Waypoints to Store	Reference Slide 73 (**1**) From the Automark page, highlight Number of WPs to Store field. Push the ENTER key. (**a**) **Number of WPs To Store Field:** Displays and allows selection of the maximum number of consecutive waypoints stored as automarked waypoints. The operator uses this field value to limit the number of waypoints stored so that other useful waypoints are not overwritten. Field data format is XXX, where X represents the number of consecutive waypoints. Reference Slide 74 (**2**) Enter desired number of waypoints, then push the ENTER key. (**3**) The Automark page Number of WPs to Store field displays entered data.
Learning Step/Activity 9	Set storage mode. Refer students to paragraph 7.8.3.1 h and 7.8.2.7.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 h and 7.8.2.7.

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	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Set Storage Mode	Reference Slide 75
		(1) From the Automark page, highlight Storage Mode field. Push the ENTER key.
		(a) Storage Mode Field: Displays and allows selection of the storage mode as Wrap or No Wrap. Wrap continually overwrites automarked waypoints with new automarked waypoints. No Wrap stores information to all unused automarked waypoints. The page and field menu provide the Clear AMK WPs selection to clear/erase all automark waypoints.
		Reference Slide 76
		(2) Highlight Wrap or No Wrap, then push the ENTER key.
		(3) The Automark page Storage Mode field displays entered data
Learning Step/Activity 10	Enable automark function. Refer students to paragraph 7.8.3. 1 i	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 i
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Enable Automark Function	Reference Slide 77
		(1) From the Automark page, highlight the Mode field. Push the ENTER key.
		(2) Highlight desired mode of operation (One Mark or Repeating Marks), then push the ENTER key.
		Reference Slide 78
		(3) Automark function is now enabled and will start and continue as previously set up until disabled. The Last WP automarked field can be viewed to monitor automark progress. After automark is enabled, only the Mode field content can be changed.
Learning Step/Activity 11	Reset to start waypoint. Refer students to paragraph 7.8.3.1 j	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 j
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Reset to Start Waypoint	Reference Slide 79
		NOTE: Resets automarking to start at the waypoint specified in the Starting WP Number field. The automark function must first be disabled.
		(1) From the Automark page, highlight the Mode field. Push the ENTER key.
		(2) Highlight Off, then push the ENTER key.
		Reference Slide 80
		(3) Push the MENU key.
		(4) Highlight Reset to Start WP, and then push the Enter key. Verify the Last WP automarked field is reset to double dashes.
		(a) Last WP Automarked Field: Displays the last waypoint to be automarked. The operator cannot edit this field. Field data format is XXX-AMKXXX, where X represents the waypoint number and AMK represents automark.
		Reference Slide 81
		(5) When automark function is re-enabled, the Starting WP Number field waypoint is the first to be automarked. If any waypoints were previously automarked within the range set by the starting waypoint and the number of waypoints to store, the operator is prompted to confirm before any waypoints are overwritten.
Learning Step/Activity 12	Clear range of waypoints. Refer students to paragraph 7.8.3.1 k	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.8.3.1 k
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Clear Range of Waypoints	Reference Slide 82
		NOTE: Clears range of waypoints starting with the Starting WP Number field waypoint through the number of waypoints specified in the Number of WPs to Store field. The automark function must first be disabled.
		(1) From the Automark page, highlight the Mode field. Push the ENTER key.
		(2) Highlight Off, then push the ENTER key.
		Reference Slide 83
		(3) Push the MENU key.
		(4) Highlight Clear Range of Waypoints, then push the Enter key. Operator is prompted to confirm before clearing waypoints. Verify Last WP automarked field is reset to double dashes.
		(5) When automark function is re-enabled, the Starting WP Number field waypoint is the first to be automarked.

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NOTE:	**Conduct a check on learning.**	Reference Slide 84
		1. What can automatically be stored as a waypoint from the Automark page?
		(ANS: A present position fix.) Paragraph 7.8.1
		True or False
		2. The DAGR must maintain visibility to satellites for the automark function to work.
		(ANS: True.) Paragraph 7.8.1
		3. What two types of storage modes are displayed in the Storage Mode Field?
		(ANS: The two types are Wrap and No Wrap.) Paragraph 7.8.2.7

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SECTION IV. STUDENT EVALUATION

Testing Requirements	Reference Slide 85
	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings.
	b. Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference Slide 86

Title		Set the GPS Setup page.
Introduction		The student will set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page.
Motivator		"In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR"
TLO	**ACTION:**	Adjust DAGR receiver default settings to user settings.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Adjusted DAGR receiver default settings to user settings in accordance with the DAGR Operator and Maintenance Manual.
ELO A	**ACTION:**	Set GPS Setup Page.
	CONDITION:	Given DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set GPS Setup page in accordance with the DAGR Operator and Maintenance Manual.
	Perform set the GPS Setup page. Refer students to paragraph 7.4.3.1	
ELO B	**ACTION:**	Set Power Saver page.
	CONDITION:	Given the DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Power Saver page in accordance with the DAGR Operator and Maintenance Manual.
	Perform set the Power Saver page. Refer students to paragraph 7.5.3.1	
ELO C	**ACTION:**	Set Auto-On Page.
	CONDITION:	Given the DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Auto-On page in accordance with the DAGR Operator and Maintenance Manual.
	Perform set the Auto-On page. Refer students to paragraph 7.7.3.1	

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ELO D	**ACTION:**	Set Automark Page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR the Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Automark page in accordance with the DAGR Operator and Maintenance Manual.
	Perform set the Automark page. Refer students to paragraph 7.8.3.1	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	This lesson includes information necessary to adjust selected DAGR receiver's user settings in accordance with the operator's individual needs or mission requirements.	
Resource Requirements	DAGR	
Special Instructions	None.	
Procedures	Use this procedure to change the following field settings. After the instructor has verified changes, return the fields to their original settings.	

Task Name: Set GPS Setup Page.	GO	NO GO
Setup the GPS Setup Page : **Field** **Settings** **Operating Mode** **Continues** **Frequency** **L2 Primary** **SV Code** **Mixed** **Elevation** **Manual**	_____	_____
(1) From the GPS Setup page, push the ENTER key to highlight a field.		
(2) Use the cursor control keys to highlight the desired field, then perform one of the following:		
(a) To edit field text or numeric content, push the ENTER key. For some fields, field content is chosen from a list and pushing the ENTER key displays the list editor.		
(b) To access the field menu list, push the MENU key. Scroll to menu item Edit Field, then push the ENTER key.		
(3) For list editors, scroll to the desired field content, then push the ENTER key. For text or numeric editors, follow editing procedures found in paragraphs 6.2.19 and 6.2.20.		
(4) Display returns to the GPS Setup page with change made to field content.		

Task Name: Set Power Saver Page.	**GO**	**NO GO**
Enable Auto-Off Function: **Use seven minutes for timer.** **NOTE:** If the Auto-Off Mode field displays On, skip to step (3). If the Auto-Off Mode field displays Off, proceed with step (1). **(1)** From the Power Saver page, highlight the Auto-Off Mode field. Push the ENTER key. **(2)** Highlight On, then push the ENTER key. The display returns to the Power Saver page with the Auto-Off Mode field highlighted including changes made. **(3)** From the Power Saver page, highlight the Auto-Off Timer field. Push the ENTER key. **(4)** Enter the desired time value (15 seconds up to 30 minutes), then push the ENTER key. The display returns to the Power Saver page with the Auto-Off Timer field highlighted including changes made. **Enable Auto-Standby Function:** **Use 17 minutes for timer.** **NOTE:** If the Auto-Standby Mode field displays On, skip to step (3). If the Auto-Standby Mode field displays Off, proceed with step (1). **(1)** From the Power Saver page, highlight the Auto-Standby Mode field. Push the ENTER key. **(2)** Highlight On, then push the ENTER key. The display returns to the Power Saver page with the Auto-Standby Mode field highlighted including changes made. **(3)** From the Power Saver page, highlight the Auto-Standby Timer field. Push the ENTER key. **(4)** Enter the desired time value (5 minutes up to 9 hours), then push the ENTER key. The display returns to the Power Saver page with the Auto-Standby Timer field highlighted including changes made. **Enable/Disable Off Mode Display Heater:** **Enable the display heater.** **(1)** From the Power Saver page, highlight the Off Mode Display Heater field. Push the ENTER key. **(2)** Highlight Enabled or Disabled, then push the ENTER key. The display returns to the Power Saver page with the Off Mode Display Heater field highlighted including changes made.	____	____

Task Name: Set Auto-On Page.	**GO**	**NO GO**
Disable Auto-On Function: **(1)** From the Auto-On page, highlight Mode field, then push the ENTER key. **(2)** Highlight Off, then push the ENTER key. **(3)** Display returns to the Auto-On page with the Mode field highlighted and changes made.	____	____

Select Time Zone:

Set time to Zulu +0h01m

(**1**) From the Auto-On page, highlight the Start Time and Date or Stop Time and Date fields. Push the MENU key.

(**2**) Highlight Select Time Zone, then push the ENTER key.

(**3**) Highlight the desired time zone, then push the ENTER key. Returns to the Auto-On page with the time zone reference changed.

Set Start of Auto-On Function:

Set time to 10:10.

Set date 30-Sep-2005.

(**NOTE:** The operator has two options for setting the DAGR to start the Auto-On function. One option is starting as soon as the Mode field is switched from Off; the second option is starting at a specific start time and date.

(**1**) Start auto-on when mode is switched from Off.

    (**a**) From the Auto-On page (with or without a field highlighted), push the MENU key.

    (**b**) Highlight Start When Enable, then push the ENTER key.

    (**c**) The Auto-On page displays the Start Time and Date field with Start When Enabled.

(**2**) Start Auto-On at specific time and date.

    (**a**) From the Auto-On page, highlight the Start Time and Date field, or highlight the Start Time field. Push the ENTER key.

    (**b**) Enter desired start time, then push the ENTER key.

    (**c**) Highlight the Start Date field, then push the ENTER key.

    (**d**) Enter desired start date, then push the ENTER key.

    (**e**) **The Auto-On page Start Time and Start Date fields display entered data.**

Set Stop of Auto-On:

Set time to 11:11.

Set date to 30-OCT- 2005.

NOTE: The operator has two options for setting the DAGR to stop the Auto-On function. One option is stopping as soon as the Mode field is switched to Off; the second option is stopping at a specific stop time and date.

(**1**) Stop auto-on when mode switched to Off.

    (**a**) From the Auto-On page (with or without a field highlighted), push the MENU key.

    (**b**) Highlight Stop When Disable, then push the ENTER key.

    (**c**) The Auto-On page displays the Stop Time and Date field with Stop When Disabled.

(**2**) Stop auto-on at specific time and date.

    (**a**) From the Auto-On page, highlight the Stop Time and Date field, or highlight the Stop Time field. Push the ENTER key.

    (**b**) Enter desired stop time, then push the ENTER key.

    (**c**) Highlight the Stop Date field, then push the ENTER key.

    (**d**) Enter desired stop date, then push the ENTER key.

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<table>
<tr><td colspan="4">(e) The Auto-On page Stop Time and Stop Date fields display entered data.

Set Time Interval Between Auto-On Functions (affects Manual mode only):

Time interval 1 hour.

(1) From the Auto-On page, highlight the Time Interval field. Push the ENTER key.

(2) Enter desired time interval, then push the ENTER key.

(3) The Auto-On page Time Interval field displays entered data.

Enable Auto-On Function:

Set to Manual.

(1) From the Auto-On page, highlight the Mode field. Push the ENTER key.

(2) Highlight desired mode of operation (Manual or Automatic), then push the ENTER key.

(3) Auto-On function is now enabled and will start and continue operating as previously set up until disabled. After auto-on is enabled, only the Mode field content can be changed.</td></tr>
</table>

<table>
<tr><td>Task Name: Set Automark Page.</td><td>GO</td><td>NO GO</td></tr>
<tr><td>

Disable The Automark Function:

NOTE: • The DAGR must have a continual open view of the sky in order for the automark function to work properly. The user must ensure that the total time set to acquire waypoints is coordinated with the range being traveled so the entire path traveled is recorded sufficiently.

    • If the operator attempts to power down the DAGR while automark is active, the operator is prompted to acknowledge automark is enabled before power down. After the DAGR is powered down, the DAGR automatically starts the power on sequence according to how the Automark page is configured.

This allows fields to be setup for automark operation.

(1) From the Automark page, highlight Mode field, then push the ENTER key.

(2) Highlight Off, then push the ENTER key.

(3) Display returns to the Automark page with the Mode field highlighted and changes made.

Select Time Zone:

Set to Zulu.

(1) From the Automark page, highlight the Start Time and Date or Stop Time and Date fields. Push the MENU key.

(2) Highlight Select Time Zone, then push the ENTER key.

(3) Highlight the desired time zone, then push the ENTER key. Returns to the Automark page with the time zone reference changed.

</td><td>_____</td><td>_____</td></tr>
</table>

Set Start of Automark Function:

Start time 12:12.

Start date 30-OCT-2005.

(**1**) Start Automark When Mode Switched From Off:

    (**a**) From the Automark page (with or without a field highlighted), push the MENU key.

    (**b**) Highlight Start When Enable, then push the ENTER key.

    (**c**) The Automark page displays the Start Time and Date field with Start When Enabled.

(**2**) Start Automark At Specific Time and Date

    (**a**) From the Automark page, highlight the Start Time and Date field, or highlight the Start Time field. Push the ENTER key.

    (**b**) Enter desired start time, then push the ENTER key.

    (**c**) Highlight the Start Date field, then push the ENTER key.

    (**d**) Enter desired start date, then push the ENTER key.

    (**e**) The Automark page Start Time and Start Date fields display entered data.

Set Stop of the Automark Function:

(**1**) Stop Automark When Mode Switched From Off:

NOTE: The operator has two options for setting the DAGR to stop the Automark function. One option is stopping as soon as the Mode field is switched to Off; the second option is stopping at a specific stop time and date.

    (**a**) From the Automark page (with or without a field highlighted), push the MENU key.

    (**b**) Highlight Stop When Disable, then push the ENTER key.

    (**c**) The Automark page displays the Stop Time and Date field with Stop When Disabled.

Set time to 01:00.

Set date to 30-NOV-2005.

(**2**) Stop Automark at Specific Time and Date:

    (**a**) From the Automark page, highlight the Stop Time and Date field, or highlight the Stop Time field. Push the ENTER key.

    (**b**) Enter desired stop time, then push the ENTER key.

    (**c**) Highlight the Stop Date field, then push the ENTER key.

    (**d**) Enter desired stop date, then push the ENTER key.

    (**e**) The Automark page Stop Time and Stop Date fields display entered data.

Set Time Interval Between Automark Functions (Affects Repeating Marks Mode Only):

Set tome to 2 hours

(**1**) From the Automark page, highlight Time Interval field. Push the ENTER key.

(**2**) Enter desired time interval, then push the ENTER key.

(**3**) The Automark page Time Interval field displays entered data.

Set Starting Waypoint Number:

Set waypoint to 111.

(**1**) From the Automark page, highlight Starting WP Number field. Push the ENTER key.

(**2**) Enter desired waypoint, then push the ENTER key.

(**3**) The Automark page Starting WP Number field displays entered data.

Set Number of Waypoints to Store:

Set Number to 50.

(**1**) From the Automark page, highlight Number of WPs to Store field. Push the ENTER key.

(**2**) Enter desired number of waypoints, then push the ENTER key.

(**3**) The Automark page Number of WPs to Store field displays entered data.

Set Storage Mode:

Set to Wrap.

(**1**) From the Automark page, highlight Storage Mode field. Push the ENTER key.

(**2**) Highlight Wrap or No Wrap, then push the ENTER key.

(**3**) The Automark page Storage Mode field displays entered data.

Enable Automark Function:

Set to Repeating Marks.

(**1**) From the Automark page, highlight the Mode field. Push the ENTER key.

(**2**) Highlight desired mode of operation (One Mark or Repeating Marks), then push the ENTER key.

(**3**) Automark function is now enabled and will start and continue as previously set up until disabled. The Last WP Automarked field can be viewed to monitor Automark progress. After Automark is enabled, only the Mode field content can be changed.

Reset to Start Waypoint:

NOTE: Resets automarking to start at the waypoint specified in the Starting WP Number field. The automark function must first be disabled.

(**1**) From the Automark page, highlight the Mode field. Push the ENTER key.

(**2**) Highlight Off, then push the ENTER key.

(**3**) Push the MENU key.

(**4**) Highlight Reset to Start WP, and then push the key. Verify the Last WP Automarked field is reset to double dashes.

(**5**) When Automark function is re-enabled, the Starting WP Number field waypoint is the first to be Automarked. If any waypoints were previously Automarked within the range set by the starting waypoint and the number of waypoints to store, the operator is prompted to confirm before any waypoints are overwritten.

	Clear Range of Waypoints: **NOTE:** Clears range of waypoints starting with the Starting WP Number field waypoint through the number of waypoints specified in the Number of WPs to Store field. The automark function must first be disabled. **(1)** From the Automark page, highlight the Mode field. Push the ENTER key. **(2)** Highlight Off, then push the ENTER key. **(3)** Push the MENU key. **(4)** Highlight Clear Range of Waypoints, then push the Enter key. Operator is prompted to confirm before clearing waypoints. Verify Last WP Automarked field is reset to double dashes. **(5)** When Automark function is re-enabled, the Starting WP Number field waypoint is the first to be Automarked. Disable Auto-on Function and Auto Standby Function.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

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SECTION V. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	15 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference Slide 86 During this Topic you have learned what the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page is used for, the different field descriptions and how to set these pages.	
Transition Next Lesson	Now that we know the steps necessary to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page, we will learn how to set the Units Page, orient the Internal Compass; adjust the Light/Contrast Page, purpose of the User Datum's page, and the purpose of the User Grids Page.	

SECTION VI. PRESENTION

ELO E	Reference Slide 87 **ACTION:**	Set Units Page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the Units page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Units page. Refer students to paragraph 10.2.1	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 10.2.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Page Function	Reference Slide 88 The Units page is accessed from the Display Setup submenu. The Units page allows the operator to select appropriate units used to format data of other displays. The operator performs display configuration setup of the datum, coordinate and grid system, elevation reference, MAGVAR type (Calculated – WMM, Local, or NAV Waypoint), and units of measure. The operator selects the grid resolution (1, 10, 100, or 1000 units) used by the receiver to display grid coordinates. Grid resolution is not selectable when using a latitude/longitude coordinate grid system.

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Learning Step/Activity 2	Set the Units page. Refer students to paragraph 10.2.3 and 10.2.2.1 through 10.2.2.16.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.2.3.1 and 10.2.2.1 through 10.2.2.16.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Units Page	Reference Slide 89
		Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		2. Highlight Display Setup, then push the ENTER key.
		3. Highlight Units, then push the ENTER key. The Units page is displayed.
		(1) From the Units page, push the ENTER key to highlight a field. Push the ENTER key again for edit capabilities of the field.
		Reference Slide 90
		(a) Coord/Grid Field: Displays the selected coordinate/grid system used when displaying position data. The coordinate system specifies the reference point and units of measure used to define the current position.
		Coordinate/Grid Systems: Coordinate/grid systems are basically an area divided into small sections by a grid. They are used to permit position referencing or computations of azimuth and range between positions inside the grid. They use a standard scale grid square based on a point of origin on a map projection of the earth's surface. DAGR provides multiple coordinate/grid selections. Three selections are described as follows:
		Military Grid Reference System-New (MGRS-New) (DAGR default). A position is described by a series of numbers and letters to describe a grid zone, a 100,000 meter square, and a distance to the east followed by a distance to the north. Both measured from the coordinate origin of the square. This format provides a position resolution of one meter square. Minimum accuracy resolution required for military operational utility is a 100 meter square.
		Latitude/Longitude Degrees (L/L Deg). A coordinate/grid system based upon degrees of latitude and longitude. Latitude is the angular distance measured in degrees north or south from the Equator. Longitude is the angular distance along the Equator east or west from the meridian passing through Greenwich, England.
		British National Grid (BNG). A coordinate/grid system that uses a metric-scale grid square specific to the area around Great Britain. A position is described by a series of numbers and letters to describe a 100 000 meter square and a distance to the east followed by a distance to the north, both measured from the southern most point of the square.

(b) Resolution Field: Displays the level of grid resolution selected when displaying position in grid coordinates. When not using MGRS-New or MGRS-Old coordinate grid system, resolution selections are 1, 10, 100, or 1000 units. When using MGRS-New or MGRS-Old coordinate grid system, resolution selections are 1 (10 digit), 10 (8 digit), 100 (6 digit), or 1000 (4 digit) units. The Resolution field does not apply and is disabled when DAGR is using a latitude/longitude coordinate grid system.

Reference Slide 91

(c) Datum/Ellipsoid Field: Displays the selected datum name reference used when displaying position. The field editor used to edit this field provides the datum's listed in alphabetical order by datum name. The selection of a map datum defines an elevation datum and ellipsoid (spheroid) reference used when displaying position. Older maps use spheroid, newer maps use ellipsoid.

A datum is a representation of the surface of the earth. Some datum's encompass the entire globe, while others are more localized for more precise values. All receiver position data is referenced to the selected datum. Maps have two associated datum's: horizontal and vertical (elevation). For proper orientation, always check the name of the Elevation Datum and Ellipsoid (Spheroid) printed on the map being used.

Datum's: Maps have two associated datum's, horizontal and vertical (altitude). DAGR provides multiple datum selections for defining a horizontal datum and ellipsoid, corresponding to a geographical map. The DAGR horizontal datum and ellipsoid must match those printed on the map in use to ensure DAGR position data compares to the map. The DAGR default datum is WGS-84 (World Geodetic System 1984).

(d) Datum ID Field: Displays the selected datum ID reference used when displaying position. Refer to Table 10-3 for a list of datum ID selections in alphabetical order as they appear in the field editor. The selection of a map datum defines an elevation datum and ellipsoid (spheroid) reference used when displaying position.

Reference Slide 92

To confirm the correct Datum for the mission consult the mission map. Ensure you use the horizontal Datum and not the vertical Datum.

Reference Slide 93

(e) Position Error Field: Displays the selected position error type used when displaying position error. Selection choices are EPE (Estimated Position Error), FOM (Figure of Merit), EHE (Estimated Horizontal Error), and EVE (Estimated Vertical Error). Field data displayed for EPE, EHE, and EVE fields is in miles, nautical miles, or kilometers, and feet, yards, or meters.

(e) Elevation Field: Displays the selected elevation units used when displaying elevation. Selection choices are Meters or Feet.

Reference Slide 94

(f) Reference Field: Displays the selected elevation reference used when displaying elevation. Selection choices are MSL (Mean Sea Level) or DTM (Datum) referencing the operator selected datum.

(g) Range Field: Displays the selected range units used when displaying range. Selection choices are Metric (km, m), English (mi, ft), and

Nautical (nm, yd). Range units include approach horizontal range, and EPE/EHE/EVE/XTE field data.

Reference Slide 95

    (h) Ground Speed Field: Displays the selected speed units used when displaying ground speed. Selection choices are Metric (kph), English (mph), and Nautical (kts).

    (i) Time Zone Field: Time zone is Zulu (Z) or Local (L). Zulu time is offset by the operator for local time zones as referenced in table 10-2. DAGR page fields display time as hours, minutes and seconds, or hours and minutes.

Reference Slide 96

    (j) Angle Field: Displays the selected angular units used when displaying angles (e.g., azimuth, track). Selection choices are Mils, Degrees, and Strecks.

    (k) North Reference Field: Displays the selected north reference used when displaying track or azimuth. Selection choices are True, Magnetic, and Grid.

Reference Slide 97

CAUTION: Do not select NAV Waypoint MAGVAR type. If NAV Waypoint MAGVAR type is selected, track will be incorrect.

(l) MAGVAR Type Field: Displays the selected magnetic variation (MAGVAR) type used when displaying track or azimuth. Selections are Calculated-WMM, Local, and NAV Waypoint (Advanced). At a given position, MAGVAR is the horizontal angle from true north to magnetic north, east or west according to whether magnetic north lies east or west of true north.

The DAGR provides three operator selected choices of MAGVAR type for calculating magnetic angles.

    • **Calculated-WMM -** Uses the world magnetic model (WMM), an algorithm updated every five years to calculate appropriate magnetic angle.

    • **Local—**The operator can enter and use a local MAGVAR value for present position or for any waypoint. This accommodates operation in those parts of the world with unique conditions, such as large underground ore deposits.

    • **NAV Waypoint (Advanced) -**Uses the navigation waypoint MAGVAR value as determined by the navigation waypoints MAGVAR type. This replicates an electronic ground based navigation aid. NAV Waypoint cannot be selected as a MAGVAR type for a waypoint entry.

    (m) MAGVAR Units Field: Displays the selected MAGVAR units used when displaying MAGVAR. Selection choices are Degrees, Degrees-Minutes, Mils, and Strecks.

Reference Slide 98

    (n) MAGVAR Value Field: Displays the entered MAGVAR value used (as determined by the MAGVAR Type field) when displaying azimuth or track. The MAGVAR Type field must be set to Local before a MAGVAR value can be entered and then used by the operator. Before using a value from this field, appropriate units and MAGVAR Type must be selected. Field data format is as follows:

        • **Degrees units selected -** Format is DDD.D E/W, where D represents degrees and E/W represents east or west.

		• **Degrees-Minutes units selected -**Format is DDD°MM' E/W, where D represents degrees, M represents minutes, and E/W represents east or west.
		• **Mils and Strecks units selected -** Format is NNNN E/W, where N represents mils or strecks, and E/W represents east or west.
		(o) Magnetic Model Year Field: Displays the year of the world magnetic model (WMM) used if the MAGVAR type is set to Calculated. This field cannot be edited by the operator.
		Reference Slide 99
		NOTE: All fields are edited using a list editor except the MAGVAR Value field which uses a number editor, and the Magnetic Model Year field which is for information only. Elevation, Ground Speed, and Range fields are units of measure that are also changed in other procedures on various DAGR pages (e.g. Waypoints/Routes/Alerts Chapter 8). The Datum/Ellipsoid and Datum ID fields interact with each other.
		(2) Revise the selected field with appropriate information, then push the ENTER key to save changes to that field.
		(3) Use the cursor control keys and the ENTER key in a similar manner to individually revise all of the remaining fields as required.

NOTE:	**Conduct a check on learning.**	Reference Slide 100
		1. What are the two time zones types displayed in the Time Zone field?
		    (ANS: The two time zones are Zulu (Z) or Local (L).) Paragraph 10.2.2.10
		True or False
		2. Some receiver position data is referenced to the selected datum.
		    (ANS: False, All receiver position data is referenced.) Paragraph 10.2.2.3.1
		3. What does WMM stand for?
		    (ANS: WMM stands for world magnetic model.) Paragraph 10.2.2.16

	Topic Summary	Reference Slide 101
		Introduction
		    – Units Pages
		    – Page Function
		Operations
		    – Setup Units Page.
		During this lesson you have learned about the Units page and its' functionality. You also learned how to setup the Setup Units page.
		Transition Next topic: For the next topic, you will learn about the features of the Internal Compass page and how to enable and orient the internal compass.

ELO F	Reference Slide 102 **ACTION:**	 Enable and orient internal compass.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Enabled and oriented the internal compass in accordance with the DAGR Operator and Maintenance Manual.

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Learning Step/Activity 1	Identify the Internal Compass page. Refer students to paragraphs 10.3.1	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 10.3.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference Slide 102
		
		 Internal Compass Page
		    – Page Function
		    – Field Descriptions
		 Operations
		    – Enable Internal Compass
		    – Orient Internal Compass

	a. Internal Compass Page	Reference Slide 103 **CAUTION:** Prior to a mission, manually enable and orient the internal compass then orient the internal compass as required during a mission. Failure to do this can result in inaccurate DAGR track data when the DAGR is not moving or is moving below a preset speed value for a specified amount of time. **NOTE:** The DAGR cannot compute track and ground speed when moving at or below 0.5 meters per second without using the internal compass. The Internal Compass page is accessed from the Display Setup submenu. The Internal Compass is enabled by the operator to determine track when the receiver is moving slow or when a good position fix is unavailable. The DAGR must be held horizontally level during internal compass operation. The Pointer field of the NAV Pointer, NAV Displays, and Man Overboard pages displays Hold Level, advising the operator the internal compass is active and the DAGR must be kept horizontally level. Avoid large metal objects, strong magnetic fields, or other electromagnetic interference when using the internal compass as it may give erroneous readings. After being enabled by the operator, the internal compass becomes active only when the following conditions are met: • Operating mode set to Continuous, Fix, Standby, Averaging, or Time Only mode. • Ground speed is below the level set by the operator, for the amount of time set by the operator in the page fields.
	b. Orient the Internal Compass	Reference Slide 104 The DAGR must be held horizontally level during internal compass operation. Avoid large metal objects, strong magnetic fields, or other electromagnetic interference when using the internal compass as it may give erroneous readings. Use of an external compass does not affect the DAGR internal compass operation, but using another electronic device within close proximity of the DAGR may affect internal compass operation. DAGR primary batteries have a varying effect on the magnetic field of the

		internal compass operation. It is recommended to orient (calibrate) the internal compass when the following occurs:
		• Approximately 50 percent of primary battery life remaining as shown on primary battery indicator
		• Approximately 25 percent of primary battery life remaining as shown on primary battery indicator
		• After replacing primary batteries
		• As required during a mission
		When navigating from the NAV Pointer Page and the DAGR is tracking satellites while moving too slow to compute track, and the internal compass is disabled, the pointer ring blinks and the last known track is used. If the DAGR is moving too slow to compute track for a specified amount of time, and the internal compass is enabled, the internal compass activates to provide track. Prior to the internal compass activating, the Navigation Pointer field blinks for a specified amount of time. The bottom of the field displays HOLD LEVEL when the internal compass is in use instructing the operator to hold the DAGR horizontally level.
Learning Step/Activity 2	Enable the internal compass. Refer students to paragraph 10.3.3 a and 10.3.2.1 thru 10.3.2.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.3.3 a and 10.3.2.1 thru 10.3.2.3.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Enable Internal Compass	Reference Slide 105
		
		Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		
		2. Highlight Display Setup, then push the ENTER key.
		
		3. Highlight Internal Compass, then push the ENTER key. The Internal Compass page is displayed.
		
		(1) From the Internal Compass page, highlight the Mode field, then set to Enabled.
		
		    (a) Mode Field: The operator selects Enabled to enable activation or Disabled to disable activation of the Internal Compass from this field. The field displays one of the following:
		
		    • **Active**—When the Internal Compass is enabled by the operator and active (in use).
		
		    • **Enabled** — When the Internal Compass is enabled by the operator and inactive.
		
		    • **Disabled** — When the Internal Compass is disabled by the operator or left at default (Disabled) selection.
		
		Reference Slide 106
		
		(2) Set the speed value for the Stop Using Above This Ground Speed field. Select appropriate speed units of measure if required.
		
		    (a) Stop Using Above This Ground Speed Field: Displays the operator selected ground speed value (default is 0.56 meters per second). When

		the DAGR speed (movement) exceeds this value, the Internal Compass is prevented from activating. The Internal Compass activates when the DAGR speed (movement) is under the operator selected ground speed value (set in this field) for the amount of time specified in the Start Using When Below Speed For field, and the operating mode is Continuous, Fix, Standby, Averaging, or Time Only. Appropriate units must be selected before editing this field. Field data format is XXX, where X represents the numeric value of speed in units (kph, mph, or kts).
		Reference Slide 107
		(3) Set the time value for the Start Using When Below Speed For field.
		(a) Start Using When Below Speed For Field: Displays the operator selected value of time from 0 seconds to 999 seconds (default is 5 seconds). Set this field to the desired time delay required before the Internal Compass can activate. The Internal Compass activates when the DAGR speed (movement) is under the operator selected speed value (set by the Stop Using Above This Ground Speed field) for the amount of time specified in this field, and the operating mode is Continuous, Fix, Standby, Averaging, or Time Only. Field data format is XXXs, where X represents seconds.
		(4) The DAGR activates the internal compass as required without further operator action.
		Instructional NOTE: Mode field display **active** when the internal compass is in use.
Learning Step/Activity 3		Orient the internal compass. Refer students to paragraph 10.3.3 b and 10.3.2.4.
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.3.3 b and 10.3.2.4.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Orient Internal Compass	Reference Slide 108
		Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) Place the DAGR, face up, on a flat level surface.
		(2) From the Internal Compass page (with or without fields highlighted), push the MENU key.
		Reference Slide 109
		(3) Highlight Calibrate, then push the ENTER key. The Internal Compass Calibration message is displayed.
		(4) Slowly rotate the DAGR clockwise until the DAGR indicates calibration is complete. The display advises the operator to maintain or alter current rotation speed. Push the QUIT key to cancel the orientation.
		Reference Slide 110
		(5) Upon completion of the orientation, DAGR notifies the operator and requests acknowledgement. Push the ENTER key to acknowledge or allow it to time out and return to the Internal Compass page.

		(a) Last Calibrated Field: Displays the time and date of the last internal compass orientation. If the internal compass has not been oriented, the field displays Never Calibrated. The operator cannot edit this field. Field data format is HHMMZ/LDD-NNN-YYYY, where H represents hours, M represents minutes, Z/L represents Zulu or Local, D represents day, N represents month, and Y represents year.
NOTE:	**Conduct a check on learning.**	Reference Slide 111 **1.** How must the DAGR receiver be held by the operator when the internal compass is in operation? (ANS: The DAGR receiver must be held horizontally level.) Paragraph 10.3.1 **True or False** **2.** You do not need to avoid anything when using the internal compass. (ANS: False, you must avoid metal objects, strong magnetic fields or other electromagnetic interference.) Paragraph 10.3.1.1 **3.** What is displayed in the Last Calibrated Field if the internal compass has not been oriented? (ANS: Never Calibrated is displayed.) Paragraph 10.3.2.4

	Topic Summary	Reference Slide 112
		 Internal Compass Page
		     – Page Function
		     – Field Descriptions
		 Operations
		        – Enable Internal Compass
		        – Orient Internal Compass
		 During this topic you have learned about the Internal Compass page's functionality and how to enable and operate the internal compass.
		 Transition Next topic: For the next topic, you will learn the features of the Keypad Display Lighting page. You will also turn Keypad/Display Lighting On/Off, adjust Keypad/Display Lighting, and adjust Display Contrast level.

ELO G	Reference Slide 113 **ACTION:**	Adjust keypad/display lighting.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Adjusted the keypad/display lighting in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Light/Contrast page. Refer students to paragraph 10.4.1	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	1 Minute
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 10.4.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

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<table>
<tr>
<td></td>
<td>Topic Overview</td>
<td>Reference Slide 113
Keypad Display Lighting Page
   – Page Function
   – Field Descriptions
Operations
   – Turn Keypad/Display Lighting On/Off
   – Adjust Keypad/Display Lighting
 Adjust Display Contrast level</td>
</tr>
<tr>
<td></td>
<td>Page Function</td>
<td>Reference Slide 114

The Light/Contrast page is accessed from the Display Setup submenu. The Light/Contrast page provides control and adjustment of keypad/display lighting and display contrast levels. Both the light level and contrast level adjustments display a percentage value of 0 to 100% and a corresponding graphical slider control.</td>
</tr>
<tr>
<td rowspan="6">Learning Step/Activity 2</td>
<td colspan="2">How To Turn Keypad/Display Lighting On/Off. Refer students to paragraph 10.4.3.1 and 10.4.2.2.</td>
</tr>
<tr>
<td>Method of instruction:</td>
<td>Conference / Discussion</td>
</tr>
<tr>
<td>Instructor to student ratio:</td>
<td>1:16</td>
</tr>
<tr>
<td>Time of instruction: (minutes)</td>
<td>2 Minutes</td>
</tr>
<tr>
<td>Media:</td>
<td>PowerPoint</td>
</tr>
<tr>
<td>References:</td>
<td>Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.4.3.1 and 10.4.2.2.</td>
</tr>
<tr>
<td></td>
<td>Security Classification:</td>
<td>Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials</td>
</tr>
<tr>
<td></td>
<td>a. Turn On Keypad/Display Lighting On/off, Brightness Key Method</td>
<td>Reference Slide 115
Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
(1) From any display, push and hold the BRIGHTNESS key (illuminated bulb icon).
(2) Keypad/display lighting toggles on and off.</td>
</tr>
<tr>
<td></td>
<td>b. Turn On Keypad/Display Lighting On/off, Light/Contrast Page Method</td>
<td>Reference Slide 116
Instructional NOTE: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
2. Highlight Display Setup, then push the ENTER key.
3. Highlight Light/Contrast, then push the ENTER key. The Light/Contrast page is displayed.
(1) From the Light/Contrast page, highlight the Light Mode field, then push the ENTER key.
  (a) Light Mode Field: Displays the keypad/display lighting as On or Off.
Reference Slide 117
(2) Select either On or Off, then push the ENTER key. Display returns to the Light/Contrast page with change made.
Instructional NOTE: Have students set the field to On then Off to see illuminated bulb icon.</td>
</tr>
</table>

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Learning Step/Activity 3	How To Adjust Keypad/Display Lighting Level. Refer students to paragraph 10.4.3.2, 10.4.2.1 and 10.4.3.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.4.3.2, 10.4.2.1 and 10.4.3.3.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Adjust Keypad/Display Lighting Level, Brightness Key Method	Reference Slide 118 **Instructional NOTE:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **(1)** From any display, push and hold the BRIGHTNESS key (illuminated bulb icon) and simultaneously push and hold the respective up or down cursor control key. Reference Slide 119 **(2)** Keypad/display lighting level adjusts up or down depending on which cursor control key is pushed. **(3)** Verify the keypad/display lighting by viewing the DAGR display in a dark area.
	b. Adjust Keypad/Display Lighting Level, Light/Contrast Page Method	Reference Slide 120 **Instructional NOTE:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **(1)** From the Light/Contrast page, and no fields selected, push the respective up or down cursor control key. Reference Slide 121 **(2)** The Display Lighting field percentage value and slider control adjust by one percent for each push of the up or down cursor control key. For larger adjustments, push and hold the up or down cursor control key. **(a) Display Lighting Field:** Displays the keypad/display lighting level as a percentage and is also reflected by the graphical slider control. The higher the percentage, the higher the lighting level. **(3)** Verify the keypad/display lighting by viewing the DAGR display in a dark area. **NOTE:** This adjustment method is also made by highlighting the Display Lighting field, pushing the ENTER key, then using editing techniques to change the display lighting value.
Learning Step/Activity 4	How To Adjust Display Contrast Level. Refer students to paragraph 10.4.3.3 and 10.4.2.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.4.3.2 and 10.4.2.3.

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	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Adjust Display Contrast Level	Reference Slide 122 **Instructional NOTE:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **(1)** From the Light/Contrast page, and no fields selected, push the respective left or right cursor control key. Reference Slide 123 **(2)** The Contrast field percentage value and slider control adjust by one percent for each push of the left or right cursor control key. For larger adjustments, push and hold the left or right cursor control key. **(a) Contrast Field:** Displays the display contrast level as a percentage and is also reflected by the graphical slider control. The higher the percentage, the higher the display contrast level. **NOTE:** This adjustment is also made by selecting the Contrast field, pushing the ENTER key, then using editing techniques to change the contrast value.
NOTE:	**Conduct a check on learning.**	Reference Slide 124 Where is the light/contrast page accessed from? (ANS: It is accessed from the Display Setup submenu.) Paragraph 10.4.1
	Topic Summary	Reference Slide 125 Keypad Display Lighting Page – Page Function – Field Descriptions Operations – Turn Keypad/Display Lighting On/Off – Adjust Keypad/Display Lighting – Adjust Display Contrast level During this topic you have learned about the Keypad Display Lighting page and how to: turn the Keypad/Display Lighting on and off, adjust the Keypad/Display Lighting, and adjust the Display Contrast level. **Transition Next topic:** For the next topic, you shall learn how to customize the POS Page set and Tool Bar Function keys.
ELO H	Reference Slide 126 **ACTION:**	 Customize POS Page Set
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Modified the POS page set in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the POS page set. Refer students to paragraphs 10.5 and 10.5.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	3 Minutes

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	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 10.5 and 10.5.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference Slide 126 Customize Function – Customize Function Operations – Customize the POS Page Set – Customize the Tool Bar Function Keys
	Customize Function (Advanced)	Reference Slide 127 **NOTE:** The operator can remove the SV Sky View page or Map page from the POS page set. However, the Present Position, Situational Awareness, and NAV Pointer pages cannot be removed from the POS page set. The operator can add up to seven additional display pages to the three non-removable pages of the POS page set for a total of up to ten display pages. The Customize function is accessed from the Display Setup submenu. This function provides capability to customize the POS page set or Tool Bar function keys (F1, F2, and F3). Customize is only available when the advanced function set is in use. Pages may be added, removed, or moved in the POS page set. The Tool Bar function key push and hold functions can be customized to provide quick access to DAGR pages regularly used during a mission. When the Customize function is selected, an editor appears with the following choices: • **Add To POS Pages** — Allows the operator to display a page and then add it to the POS page set. • **Clear From POS** — Allows the operator to display a page of the POS page set and then remove it from the page set. • **Move After Next** — Allows the operator to move an existing POS page set page after the next page of the POS page set. • **Move Before Prev**—Allows the operator to move an existing POS page set page before the previous page of the POS page set. • **Tool Bar Keys** — Allows the operator to activate a function key (same as push and hold function) or customize function keys to display desired pages. The DAGR Tool Bar function keys are configured with the following default selections (push and hold operations). • **Mark** — Appears above F1 key. Displays the Mark a Waypoint message. • **Fast Fix**— Appears above F2 key. Enters Fix operating mode. • **Back** — Appears above F3 key. Returns display to the previous page viewed.
Learning Step/Activity 2	Modify the POS page-set. Refer students to paragraph 10.5.2 a and 10.5.2 b.	

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	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.5.2 a and 10.5.2 b.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Customize the POS Page-Set	Reference Slide 128
		
		1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		
		2. Highlight Display Setup, then push the ENTER key.
		
		3. Highlight Customize, then push the ENTER key. The Customize page is displayed.
		
		a. Add a Page to the POS Page Set
		
		  (1) Display the desired submenu page to be added to the POS page set.
		
		  (2) Push the MENU key twice to access the Main Menu.
		
		  (3) Highlight Display Setup, then push the ENTER key.
		
		Reference Slide 129
		
		  (4) Highlight Customize, then push the ENTER key.
		
		  (5) Highlight Add To POS Pages from the list editor, then push the ENTER key.
		
		NOTE: When adding a page to the POS page set, operator acknowledgement is required.
		
		Reference Slide 130
		
		  (6) Push and hold the POS key to view the POS page set.
		
		  (7) Push the PAGE or QUIT key to verify the desired page change was made to the POS page set.
		
		b. Clear or Move a Page of the POS Page Set
		
		Reference Slide 131
		
		  (1) Display the page of the POS page set to be cleared or moved.
		
		  (2) Push the MENU key twice to access the Main Menu.
		
		  (3) Highlight Display Setup, then push the ENTER key.
		
		Reference Slide 132
		
		  (4) Highlight Customize, then push the ENTER key.
		
		  (5) Highlight the desired function (Clear From POS, Move After Next, or Move Before Prev) from the list editor, then push the ENTER key.
		
		NOTE: When clearing a page of the POS page set, operator acknowledgement is required.
		
		Reference Slide 133
		
		  (6) Push and hold the POS key to view the POS page set.
		
		  (7) Push the PAGE or QUIT key to verify the desired page change was made to the POS page set.

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Learning Step/Activity 3	Customize the tool bar function keys. Refer students to paragraph 10.5.2 c.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 10.5.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Customize the Tool Bar Function Keys	Reference Slide 134 **(1)** Push the MENU key twice to access the Main Menu. **(2)** Highlight Display Setup, then push the ENTER key. **(3)** Highlight Customize, then push the ENTER key. Reference Slide 135 **(4)** Highlight Tool Bar Keys, then push ENTER key. Display returns to the last page viewed with one of the tool bar keys highlighted. **(5)** Using the cursor control keys, highlight the desired tool bar function key to customize, then push the ENTER key. Reference Slide 136 **(6)** Highlight Customize Key from the editor, then push the ENTER key. **NOTE:** If Activate is selected from the editor, the page designated by the function key is displayed the same as if the function key was pushed and held. **(7)** From the list editor, highlight the desired page or function for the function key, then push the ENTER key. Reference Slide 137 **(8)** The Tool Bar reappears with the function key changed to the desired selection and highlighted. To customize function keys further, repeat steps (5) through (7). To deselect the function key and move on to other operations, push the QUIT key.
NOTE:	**Conduct a check on learning.**	Reference Slide 138 The Customize Function allows the operator to do what? (ANS: Customize the POS page set or Tool Bar function keys (F1, F2, and F3). Para 10.5.1)

	Topic Summary	Reference Slide 139
		Customize Function
		    – Customize Function
		Operations
		    – Customize the POS Page Set
		    – Customize the Tool Bar Function Keys
		During this lesson you have learned about customizing the POS Page set and the Tool Bar Function keys.
		Transition Next topic: For the next topic, you will learn the purpose of the Datum's page and the Grids page.

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Learning Step/Activity 4	Identify the User Datum's page. Refer students to paragraph 10.6.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	3 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 10.6.1.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference Slide 140 Introduction – User Datum's Page Purpose – User Grids Page Purpose
	a. Page Function	Reference Slide 141 The User Datum's page is accessed from the Display Setup submenu. Some missions may require a customized datum other than the standard datum's loaded into the DAGR. DAGR provides up to six configurable user datum's. The User Datum's page provides capability to input the user datum name, and define the datum parameters. The selection of a map datum defines an elevation datum and ellipsoid reference used when displaying position. Older maps use spheroid, newer maps use ellipsoid. A datum is a representation of the surface of the earth. Some datum's encompass the entire globe, while others are more localized for more precise values. All receiver position data is referenced to the selected datum. Maps have two associated datum's: horizontal and vertical (elevation). For proper orientation, always check the name of the Elevation Datum and Ellipsoid (Spheroid) printed on the map being used.
Learning Step/Activity 5	Identify the User Grids page. Refer students to paragraphs 10.7.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 10.7.1.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Page Function	Reference Slide 142 The User Grids page is accessed from the Display Setup submenu when using the advanced function set. Some missions may require a customized grid other than the standard coordinate/grid systems loaded into the DAGR. These are called User Grids and six are configurable within DAGR. The User Grids page provides capability to view or input the user grids name, and define the grid parameters for a selected map projection. The selection of the map projection determines which associated fields of data are displayed. Table 10-5 provides a listing of map projections.

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SECTION VII. STUDENT EVALUATION

Testing Requirements	Reference Slide 143 The student will demonstrate how to set the Units Page and Customize the POS Page set and Function keys by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 2

Title	Set DAGR Units page.	
Introduction	The student will set the DAGR Units page.	
Motivator	"In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR"	
TLO	**ACTION:**	Adjust DAGR receiver default settings to user settings.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Adjusted DAGR receiver default settings to user settings in accordance with the DAGR Operator and Maintenance Manual.
ELO E	**ACTION:**	Set Units Page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Set the Units page in accordance with the DAGR Operator and Maintenance Manual.
	Perform set the Unite page. Refer students to paragraph 10.2.3.1	
ELO H	**ACTION:**	Customize POS Page Set
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Modified the POS page set in accordance with the DAGR Operator and Maintenance Manual.
	Perform customize POS Page Set. Refer students to paragraph 10.5.2 a and b	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	

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Instructional Lead-in	This lesson includes information necessary to adjust selected DAGR receiver's user settings in accordance with the operator's individual needs or mission requirements.
Resource Requirements	DAGR
Special Instructions	None.
Procedures	Use this procedure to change the following field settings. After the instructor has verified changes, return the fields to their original settings.

Task Name: Set Units Page.	**GO**	**NO GO**

Setup the Units Page :
 	
   Field   **Settings**
   Coordinate/Grid   **UTM/UPS**
   Resolution   **10 units**
   DATUM/Ellipsoid   **WGS-72**
   Position Error   **FOM**
 	
(**1**) From the Units page, push the ENTER key to highlight a field. Push the ENTER key again for edit capabilities of the field.
 	
(**2**) Revise the selected field with appropriate information, then push the ENTER key to save changes to that field.
 	
(**3**) Use the cursor control keys and the ENTER key in a similar manner to individually revise all of the remaining fields as required.
	___	___

Task Name: Modify the POS Page Set.	**GO**	**NO GO**
Customize the POS Page Set: **ADD NAV Setup Page.** **a. Add a Page to the POS Page Set** (**1**) Display the desired submenu page to be added to the POS page set. (**2**) Push the MENU key twice to access the Main Menu. (**3**) Highlight Display Setup, then push the ENTER key. (**4**) Highlight Customize, then push the ENTER key. (**5**) Highlight Add To POS Pages from the list editor, then push the ENTER key. (**NOTE:** When adding a page to the POS page set, operator acknowledgement is required.) (**6**) Push and hold the POS key to view the POS page set. (**7**) Push the PAGE or QUIT key to verify the desired page change was made to the POS page set. **Clear NAV Setup Page** **b. Clear or Move a Page of the POS Page Set** (**1**) Display the page of the POS page set to be cleared or moved. (**2**) Push the MENU key twice to access the Main Menu. (**3**) Highlight Display Setup, then push the ENTER key. (**4**) Highlight Customize, then push the ENTER key.	___	___

(**5**) Highlight the desired function (Clear From POS, Move After Next, or Move Before Prev) from the list editor, then push the ENTER key.

(**NOTE:** When clearing a page of the POS page set, operator acknowledgement is required.)

(**6**) Push and hold the POS key to view the POS page set.

(**7**) Push the PAGE or QUIT key to verify the desired page change was made to the POS page set.

Task Name: Customize the Tool Bar Function Keys.	GO	NO GO
Customize the Tool Bar Function Keys: **Use COM PORT Setup Page for Function Key.** **Highlight FAST FIX to edit.** (**1**) Push the MENU key twice to access the Main Menu. (**2**) Highlight Display Setup, then push the ENTER key. (**3**) Highlight Customize, then push the ENTER key. (**4**) Highlight Tool Bar Keys, then push ENTER key. Display returns to the last page viewed with one of the tool bar keys highlighted. (**5**) Using the cursor control keys, highlight the desired tool bar function key to customize, then push the ENTER key. (**6**) Highlight Customize Key from the editor, then push the ENTER key. **NOTE:** If Activate is selected from the editor, the page designated by the function key is displayed the same as if the function key was pushed and held. (**7**) From the list editor (refer to Table 10-4), highlight the desired page or function for the function key, then push the ENTER key. (**8**) The Tool Bar reappears with the function key changed to the desired selection and highlighted. Push and hold the COM Port (F2) function key to go to the COM Port Setup Page. To customize function keys further, repeat steps (5) through (7). To deselect the function key and move on to other operations, push the QUIT key.	_____	_____

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.

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Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

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SECTION VIII. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes	15 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference Slide 144 During this part of the lesson you have learned what the Units page, Internal Compass Page, Oriented the Compass, Light/Contrast Page, adjusted display lighting, Customized the POS Page set and Function Keys, purpose of the User Datum's page, and the purpose of the User Grids Page, the different field descriptions and how to set these pages.	
Transition Next Lesson	Now that we know the steps necessary to set the Units page, Internal Compass Page, Oriented the Compass, Light/Contrast Page, adjusted display lighting, Customized the POS Page set and Function Keys, purpose of the User Datum's page, and the purpose of the User Grids Page, we will learn how to set the User Profiles Page.	

SECTION IX. PRESENTION

ELO K	**ACTION:**	Set User Profiles page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the user profiles page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the User Profiles page. Refer students to paragraphs 12.4.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 12.4.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference Slide 145
		 Introduction
		    – User Profile Page
		    – Page Function
		    – Page Description
		 Operations
		    – Set User Profile Name

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	a. Page Function	Reference Slide 146 **CAUTION**: Changing DAGR settings modifies the configuration of the current user profile displayed in the Current User Profile field. Changes to a particular profile that is unfamiliar to the user could possibly put the individual or mission in danger. When changing from Basic to Advanced function set, the DAGR defaults to the last used advanced user profile. Ensure the correct user profile is active after switching to the Advanced function set. The User Profiles page is only available when using the advanced function set and is accessed from the System submenu. DAGR can store eleven profiles consisting of one basic function set profile and ten individual advanced function set profiles. User profile number 00 is assigned to the basic function set and user profile numbers 01 through 10 are assigned to the advanced function set. A user profile is used to save a particular DAGR configuration for an individual or for a specific mission phase. User profiles are to be named appropriately to indicate intended use. Switching to a different function set or cycling power on the DAGR does not affect stored user profile receiver settings. The profile used when the DAGR is powered off is the profile that will be activated when the DAGR is powered back on. The Status key can be used to check current user profile and function set information. All user profiles store the user settings plus any changes to these settings. Current settings of the DAGR basic function set can be copied into any user profile or reset to default values.
	b. Page Descriptions	Reference Slide 147 **(1) Current User Profile Field:** Displays the current user profile being used and includes the user profile number and name. The user profile number (not editable) consists of numbers 01 through 10, and user profile name consists of up to ten characters that can be edited by the operator. The user profile name can be edited in this field or while selected in the user profile table. Field data format is XX-NNNNNNNNNN, where X represents the user profile number and N represents the user profile name. **(2) User Profile Table:** Displays the number and name of all user profiles. The user profile number (not editable) consists of numbers 01 through 10, and user profile name consists of up to ten characters that can be edited by the operator. The user profile name can be edited in this table or while selected in the current user profile field. Vertical scrolling is used to view all user profiles.
Learning Step/Activity 2	Set the User Profiles page. Refer students to paragraph 12.4.3.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 12.4.3.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Edit Profile Name	Reference Slide 148 **1.** From any display (except a message pop-up), push the MENU key twice to display the Main Menu. **2.** Highlight System, then push the ENTER key. **3.** Highlight User Profiles, then push the ENTER key. The User Profiles page is displayed. **Edit Profile Name:** **(1)** From the User Profiles page, push the ENTER key. A field is highlighted. **(2)** Scroll to the user profile table, highlight user profile01, then push the ENTER key. Reference Slide 149 **(3)** Edit the name using the text editor to Collins01. **(4)** Highlight save in the text editor, then push the enter key to save name. **(5)** Display returns to the User Profiles page with the user profile name changed.
	b. Clear Basic	Reference Slide 150 **NOTE:** This procedure returns all user profile 00 (basic function set) settings to default values. **(1)** From the User Profiles page, push the MENU key. **(2)** Highlight Clear Basic, then push the ENTER key. The Basic function set user profile 00 is reset to default values. **(3)** Display returns to the User Profiles page.
	c. Clear Profile	Reference Slide 151 **CAUTION:** The Clear Profile procedure deletes user entered information from a selected advanced function set user profile. This procedure should be used only for individual user profiles the operator is familiar with. Clearing a particular profile that is unfamiliar to the user could possibly put the individual or mission in danger. **(1)** From the User Profiles page, push the MENU key. **(2)** Scroll to highlight the desired profile to be used, and then push the MENU key. Reference Slide 152 **(3)** Highlight Clear Profile, then push the ENTER key. **(4)** Display returns to the User Profiles page with the selected profile reset to default values.
	d. Clear All Profiles	Reference Slide 153 **CAUTION:** The Clear All Profiles procedure deletes user entered information in all ten advanced function set user profiles (01 through 10). If the operator does not know the use of all user profiles, this selection should not be used. Instead, the Clear Profile selection should be used only for individual user profiles the operator is familiar with. Clearing a particular profile that is unfamiliar to the user could possibly put the individual or mission in danger. **(1)** From the User Profiles page, push the MENU key. **(2)** Highlight Clear All Profiles, then push the ENTER key.

		Reference Slide 154
		(3) Display returns to the User Profiles page with all profiles reset to the user names and user content.
	e. Select Function Set	Reference Slide 155
		CAUTION: User profile information is directly related to selecting a function set. Ensure the correct user profile is active when switching to the advanced function set. Changes to a particular profile that is unfamiliar to the user could possibly put the individual or mission in danger.
		(1) From the User Profiles page, push the MENU key.
		(2) Choose Select Function Set, then push the ENTER key.
		Reference Slide 156
		(3) The current function set appears inside a box and is highlighted.
		(4) Highlight the desired function set from the list editor, then push the ENTER key.
		Reference Slide 157
		(5) When changing to a different function set, a message is displayed advising the operator that changing profiles may switch user settings. Push the ENTER key to confirm the selection and return to the Present Position page or push the QUIT key to cancel the selection and return to the User Profile page.
		NOTE: When using the Advanced function set, the current user profile being used can be checked from the Current User Profile field of the User Profiles page. The Status key can also be used to check current function set and user profile information.
	f. Set as Current	Reference Slide 158
		NOTE: When using the Advanced function set, the current user profile being used can be checked from the Current User Profile field of the User Profiles page. The Status key can also be used to check current function set and user profile information. This procedure selects the user profile to be used.
		(1) From the User Profiles page, push the ENTER key. A field is highlighted.
		(2) Scroll to highlight the desired user profile to be used, and then push the MENU key.
		Reference Slide 159
		(3) Highlight Set As Current, then push the ENTER key.
		(4) Display returns to the User Profiles page with the selected user profile in the Current User Profile field.
	g. Copy Current Here	Reference Slide 160
		NOTE: This procedure copies the current user profile name and settings to a selected user profile.
		(1) From the User Profiles page, push the ENTER key. A field is highlighted.
		Reference Slide 161
		(2) Scroll to highlight the desired user profile where the current user profile is going to be copied to, then push the MENU key.
		(3) Highlight Copy Current Here, then push the ENTER key.

		Reference Slide 162 **(4)** Display returns to the User Profiles page with the selected profile reset to the current profile's name and settings. The profile number remains the same.
	h. Copy Basic Here	Reference Slide 163 **NOTE:** This procedure copies user profile 00 (basic function set) settings to a selected user profile. **(1)** From the User Profiles page, push the ENTER key. A field is highlighted. Reference Slide 164 **(2)** Scroll to the desired user profile where the Basic function set profile is going to be copied to, then push the MENU key. **(3)** Highlight Copy Basic Here, then push the ENTER key. Reference Slide 165 **(4)** Display returns to the User Profiles page with the selected profile reset to user profile 00 (basic function set) settings. The profile name is changed to BASIC, but the profile number remains unchanged.
NOTE:	**Conduct a check on learning.**	Reference Slide 166 **1.** How many basic function set profiles and individual advanced function set profiles can be stored in the DAGR receiver? (ANS: One basic function set profile and ten individual advanced function set profiles can be stored.) Paragraph 12.4.1 **True or False** **2.** Switching to a different function set or cycling power on the DAGR does not affect stored user profile receiver settings. (ANS: True.) Paragraph 12.4.1

	Topic Summary	Reference Slide 167
		
		Introduction
		  – User Profile Page
		  – Page Function
		  – Page Description
		Operations
		  – Set User Profile Name
		
		During this topic you have learned about the User Profile page, Page function, and Page description. You also learned how to set the User Profile Name.
		
		Transition to Practice Exercise: You will now be able to demonstrate how to adjust the DAGR receiver default settings to user settings.

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SECTION X. STUDENT EVALUATION

Testing Requirements	Reference Slide 168 The student will demonstrate how to Set User Profiles page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 3

Title	Set User Profiles page.	
Introduction	The student will set the User Profiles page.	
Motivator	"In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR"	
TLO	**ACTION:**	Adjust DAGR receiver default settings to user settings.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Adjusted DAGR receiver default settings to user settings in accordance with the DAGR Operator and Maintenance Manual.
ELO K	**ACTION:**	Set User Profiles page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set the User Profiles page in accordance with the DAGR Operator and Maintenance Manual.
	Perform set the User Profile page. Refer students to paragraph 12.4.3.1	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	This lesson includes information necessary to adjust selected DAGR receiver's user settings in accordance with the operator's individual needs or mission requirements.	
Resource Requirements	DAGR	
Special Instructions	None.	

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Procedures

Task Name: Set User Profile Page.	GO	NO GO
Setup the User Profile Page : **Edit Profile Name:** **(1)** From the User Profiles page, push the ENTER key. A field is highlighted. **(2)** Scroll to the user profile table, highlight user profile01, then push the ENTER key. **(3)** Edit the name using the text editor to say Soldier01. **(4)** Highlight save in the text editor, then push the enter key to save name. **(5)** Display returns to the User Profiles page with the user profile name changed. **Set As Current:** **Use User Profile02.** NOTE: When using the Advanced function set, the current user profile being used can be checked from the Current User Profile field of the User Profiles page. The Status key can also be used to check current function set and user profile information. This procedure selects the user profile to be used. **(1)** From the User Profiles page, push the ENTER key. A field is highlighted. **(2)** Scroll to highlight the desired user profile to be used, and then push the MENU key. **(3)** Highlight Set As Current, then push the ENTER key. **(4)** Display returns to the User Profiles page with the selected user profile in the Current User Profile field. **Copy Current Here:** **Use User Profile04.** NOTE: This procedure copies the current user profile name and settings to a selected user profile. **(1)** From the User Profiles page, push the ENTER key. A field is highlighted. **(2)** Scroll to highlight the desired user profile where the current user profile is going to be copied to, then push the MENU key. **(3)** Highlight Copy Current Here, then push the ENTER key. **(4)** Display returns to the User Profiles page with the selected profile reset to the current profile's name and settings. The profile number remains the same. **Copy Basic Here:** **Use user Profile05.** NOTE: This procedure copies user profile 00 (basic function set) settings to a selected user profile. **(1)** From the User Profiles page, push the ENTER key. A field is highlighted. **(2)** Scroll to the desired user profile where the Basic function set	‾‾‾‾	‾‾‾‾

	profile is going to be copied to, then push the MENU key.			
	(3) Highlight Copy Basic Here, then push the ENTER key.			
	(4) Display returns to the User Profiles page with the selected profile reset to user profile 00 (basic function set) settings. The profile name is changed to BASIC, but the profile number remains unchanged.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

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Defense Advanced GPS Receiver (DAGR)

Lesson Plan 3 - Adjust DAGR Receiver Default Settings To User Settings

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SECTION XI. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	15 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference Slide 169 During this the lesson you have learned what the GPS Setup page, Power Saver Page, Auto-On Page, Automark Page, Units page, Internal Compass Page, Oriented the Compass, Light/Contrast Page, adjusted display lighting, Customized the POS Page set and Function Keys, purpose of the User Datum's page, purpose of the User Grids Page, and the User Profiles Page, and the different field descriptions and how to set these pages.	
Transition Next Lesson	Now that we know the steps necessary to set the GPS Setup page, Power Saver Page, Auto-On Page, Automark Page, Units page, Internal Compass Page, Oriented the Compass, Light/Contrast Page, adjusted display lighting, Customized the POS Page set and Function Keys, purpose of the User Datum's page, purpose of the User Grids Page, and the User Profiles Page, we now will learn how to create Waypoints, Routes and Alerts.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			

Task(s) Taught or Supported	Task Number	Task Title			
	113-004	Set Waypoints, Routes, and Alerts			

Task(s) Reinforced	Task Number	Task Title			
	None				

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	2:38				
Practical Exercise	0:15				
Test	0:00				
Total Hours	2:53				

Test Lesson Number	Testing		<u>Hours</u>	<u>Lesson No.</u>
				113-004

Prerequisite Lesson(s)	Lesson Number	**LESSON TITLE**
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform the DAGR Operational Checkout
	113-003	Adjust DAGR Default Settings to User Settings

Security Clearance/Access	

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

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Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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References	Number	Title	Date	Additional Information
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available and shall accompany the lesson plan as well as reinforce the student handout. Instructor must create and select Waypoints, Route, and Alerts before instruction.			
Additional Support Personnel Requirements	None			
Equipment Required	DAGR receiver, External AC power cable or External DC power cable (fused, 5 meter)			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan four, PowerPoint slides (DAGR_PPT_113_004.ppt).		
	Student Materials	DAGR Operator and Maintenance technical manual, lesson four student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	None.		
Ammunition Requirements	None			
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 4 - Set Waypoints, Routes, and Alerts

9 July 2004

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 Using nothing but a DAGR, navigating your way through unknown territory is made easy when the appropriate waypoints and routes are loaded into the DAGR. The soldier can also avoid hazards, travel defined corridors, or be notified a destination's been reached by using the proper alerts.	
Terminal Learning Objective	Reference: Slide 2-4	
	ACTION:	Set Waypoints, Routes, and Alerts.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Set Waypoints, Routes, and Alerts in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	In the event of battle or unfamiliar territory, it is important to understand the territory around you. Creating and downloading waypoints, routes, and alerts will better prepare you for battle while keeping you out of harm's way.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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SECTION III. PRESENTATION

Note: Inform the students of the Enabling Learning Objective requirements.

ELO A	Reference: Slide 5	
	ACTION:	Create a waypoint using the Creating a Waypoint procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Created a waypoint using the Creating a Waypoint procedure in accordance with the DAGR Operator and Maintenance Manual.
ELO B	Reference: Slide 5	
	ACTION:	Set the Waypoints page and Waypoint Editors page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Set the Waypoints page and Waypoint Editors page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Waypoints page. Refer students to paragraphs 8.2 through 8.2.2.2 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 8.2 through 8.2.2.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 5
		 Introduction
		     – Waypoints Page
		       Functions
		       Descriptions
		     – Waypoint Editor Page
		       Functions
		       Descriptions
		     – Operation
		       Create a New Waypoint Using the WP Key
		       Create a New Waypoint From User Input
		       Edit a Waypoint
		       Copy a Waypoint
		       Copy to Range of Waypoints
		       Copy and Paste a Waypoint
		       Edit Units of Waypoints

	a. Waypoints Page Function	Reference: Slide 6
		The Waypoints page is accessed from the WP/Routes/Alerts submenu or by using the WP key. The Waypoints page provides a table that lists all DAGR waypoints. A waypoint is the geographical location of a point used for navigation or other applications. Waypoints are defined by their position coordinates (using a datum and coordinate/grid system) and elevation. A mission typically uses multiple waypoints. Capabilities are provided to create new waypoints, edit waypoints (using Waypoint Editor page), clear waypoints, copy waypoints, or view only desired waypoints (search, sort, and filter). The Waypoint Editor page is accessed from the Waypoints page.

Waypoints Page Functions: Waypoints page menu functions are described in the following list.

- **Edit Waypoint (WP)** — Displays the Waypoint Editor page for editing the selected waypoint.

- **Copy** — Copies a selected waypoint's data. This data can then be pasted into another waypoint or a range of waypoints.

Operator confirmation is required prior to the DAGR overwriting any existing waypoints.

- **Clear** — Clears a waypoint, a range of waypoints, or all waypoints. Operator confirmation is required prior to the DAGR clearing any waypoints.

- **Units** — Provides an editor to select range, angle, north reference, or elevation (Advanced) units.

- **Navigate To Waypoint** — Displays the NAV Pointer page.

- **Search** — Searches and displays waypoints by a name or remark (up to ten characters each).

- **Sort** — Sorts and displays the entire list of waypoints in ascending alphanumeric order by name, number, range from present position, range from selected waypoint, or identity. When the waypoint list is sorted by range from selected waypoint, (WP) appears in the range data table column titles.

- **Filter** — Displays a filtered list of waypoints. Filter choices are All Used WPs, All Unused WPs, Within Range (specified by operator), and Unfilter (display all waypoints). When the waypoint list is filtered, (FILTERED) appears in the page title. If an unused row with double dashes is highlighted and the ENTER key is pushed, the Create/New list editor (previously described) appears.

- **Waypoint Summary** — Displays the waypoint quantities used and unused.

	b. Page Descriptions	Reference: Slide 7
		Vertical and horizontal scrolling is used to view all page information. Field information contained in this page is changed using various editor techniques. The following information describes the various fields contained in this page.
		Waypoint List Table: The waypoint list table includes the following information for each waypoint. The table rows wrap from the last row to the first row (or vice versa) when vertically scrolling through the table.
		• **NUM** — Displays the waypoint number (001 through 999).
		• **Waypoint Name** — Displays the waypoint name of up to ten characters.
		• **Azimuth** — Displays azimuth calculated from present position or selected waypoint. Data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks) in reference to north reference (True, Magnetic, or Grid).
		• **Range** — Displays range calculated from present position or selected waypoint. Data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.
		• **Slant Range (Advanced)** — Displays slant range calculated from present position or selected waypoint. Data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.
		• **Elev Angle (Advanced)** — Displays elevation angle calculated from present position or selected waypoint. Data format is +/- XXX.X (X represents degrees) or XXXX (X represents mils or strecks).
		• **Elev Diff (Advanced)** — Displays elevation difference calculated from present position or selected waypoint. Data format is +/- XXXXX, where X represents feet or meters.
		• **Identity** — Displays identity type selection as Unknown, Friendly, Hostile, or Neutral. Each type has an associated symbol used with the Situational Awareness page.
	c. Waypoints Editors Page Function	Reference: Slide 8
		The Waypoint Editor page is accessed using the Waypoints page or by using the WP key, but is not accessed from a submenu. The Waypoint Editor page is used for viewing and editing waypoint data listed in the Waypoints page.
		When the Waypoint Editor page is accessed, a page field is always highlighted for cursor control key scrolling to the desired field. Select appropriate units for fields, as applicable, before using page field data.
NOTE:	**Conduct a check on learning.**	Reference: Slide 9
		1. How do you access the Waypoints page?
		(ANS: Accessed from the WP/Routes/Alerts submenu or using the WP key.) Paragraph 8.2.1
		2. What does Slant Range display?
		(ANS: Waypoint slant range calculated from present position or selected waypoint.) Paragraph 8.2.2.1
Learning Step/Activity 2		Create a Waypoint and set the Waypoints page and Waypoint Editors page. Refer students to paragraphs 8.2.3.1 and 8.3.2.1 thru 8.3.2.18 in the DAGR Operator and Maintenance Manual.
	Method of	Conference / Discussion

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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	instruction:	
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	45 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 8.2.3.1 and 8.3.2.1 thru 8.3.2.18.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Create a New Waypoint Using the WP Key	Reference: Slide 10
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From any display, push and hold the WP key. Waypoint function choices are displayed.
		(2) Highlight Create New WP, then push the ENTER key.
		    (a) Create/New—Provides a list editor of unused waypoints (numbers). After selecting a new waypoint number, the Waypoint Editor page is used to set up the waypoint. Refer to paragraph for additional information.
		Reference: Slide 11
		(3) The Waypoint Editor page automatically displays the first unused waypoint with current (if tracking satellites) or last position information. Revise information as necessary.
		Reference: Slide 12
		    Waypoint Number and Name Field: Displays the waypoint number and name. Only the waypoint name is editable using up to ten characters. Field data format is XXX-NNNNNNNNNN, where X represents the waypoint number and N represents the name.
		    Position Field: Ensure the appropriate datum coordinate/grid system, and grid resolution are selected before using or editing position coordinates. For moving waypoints, position coordinates are computed using last known position (fix), last fix time, ground speed, and track. Use the following references for additional information.
		        • **Coordinate/grid system** — Appears in the upper left corner.
		        • **Datum ID** — Appears in the upper right corner.
		        • **Position coordinates** — For moving waypoints (advanced function set), the position coordinates are computed using last known position (fix), last fix time, ground speed, and track.
		    Elevation Field: The elevation field provides the waypoint elevation or vertical range from the surface of the earth measured from mean sea level (MSL) or datum (DTM). Field data format is +/- XXXXX, where X represents feet or meters.
		Reference: Slide 13
		    MAGVAR Type Field**:** Displays the selected waypoint MAGVAR (magnetic variation) source as follows.
		        • **Calculated** — MAGVAR value is calculated using the World Magnetic Model (WMM).

• **Local** — An operator entered MAGVAR value is used.

• **None** — No MAGVAR value is available.

MAGVAR Field: Displays the waypoint magnetic variation (MAGVAR) value. The waypoint MAGVAR value (determined by the MAGVAR Type field) is used in calculations between the waypoint being edited and another waypoint or DAGR present position. If the MAGVAR Type field is set to Calculated, the MAGVAR field value is the calculated World Magnetic Model value at the time the waypoint was stored. The MAGVAR Type field must be set to Local before a MAGVAR value can be entered and then used by the operator. If the MAGVAR Type field is set to None, only double dashes appear in the MAGVAR field. Before using a value from this field, appropriate units and MAGVAR Type must be selected.

Ground Speed Field: Displays the ground speed as horizontal speed relative to the earth's surface. Zero (0) is displayed when speed is unknown or when moving too slowly. Field data format is XXX, where X represents miles per hour, knots, or kilometers per hour.

Track Field: The track field provides the ground track or actual path on the earth's surface measured clockwise from the selected north reference (True, Magnetic, or Grid). Select appropriate units, as applicable, before editing track. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks).

Estimated Position Error Field: Displays the estimated position error (EPE) as a ± value. EPE is valid only when the waypoint is created from a position fix. The operator selects units but cannot edit the field value. EPE field data format is N.N, NN, or NNN, where N represents miles, nautical miles, kilometers, feet, yards, or meters. Position data (horizontal and vertical) is estimated to be accurate to within the ± value.

Estimated Horizontal Error Field: Displays the estimated horizontal error (EHE) as a ± value. EHE is valid only when the waypoint is created from a position fix. The operator selects units but cannot edit the field value. EHE field data format is N.N, NN, or NNN, where N represents miles, nautical miles, kilometers, feet, yards, or meters. Position data (horizontal) is estimated to be accurate to within the ± value.

Reference: Slide 14

Identity Field: Displays the identity type of a waypoint as Unknown, Friendly, Hostile, or Neutral. Each identity type has an associated symbol used with the Situational Awareness page and Map Page. The identity symbol is shown at the right side of the field.

Remark Field: Displays information describing the waypoint (up to forty characters for all 999 waypoints).

Reference: Slide 15

Alert Radius Field: Displays the waypoint alert radius value. During navigation, this value defines the range from a waypoint the DAGR must reach to recognize waypoint arrival. The NAV Setup page is used to enable a waypoint alert for waypoint arrival.

Sit (Situational) Awareness Field: Displays Yes or No. When Yes is selected, the waypoint appears on the Situational Awareness page if the page view is configured for operator selected waypoints. When No is selected, the waypoint does not appear on the Situational Awareness page as an operator selected waypoint.

Moving Waypoints Field: (Advanced) Displays Yes or No. When Yes is selected, the waypoint is a moving waypoint. When No is selected, the

		waypoint is not a moving waypoint. The position of a moving waypoint is based upon its last fix position, fix time, ground speed, and track.
		Last Modified Field: Displays the last time and date the waypoint was modified. The operator cannot edit this field. Field time data format is HHMMZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. Field date data format is DD-MMM-YYYY, where D represents days, M represents months, and Y represents years.
		Reference: Slide 16
		(**4**) Push the MENU key.
		(**5**) Multiple options are provided. Highlight the desired option, then push the ENTER key.
		• **Save and Exit** — Briefly displays waypoint stored message. Display returns to the Waypoints page with the new waypoint information saved and highlighted.
		• **Exit and No Save** — Display returns to the Waypoints page without saving the waypoint.
		• **Edit Field**—Displays a field editor for the highlighted field.
		• **Undo Changes** — Clears any changes made and display returns to the Waypoints Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
	b. Create a New Waypoint Using the Waypoints Page	Reference: Slide 17
		(**1**) From the Waypoints page, push the MENU key.
		(**2**) Highlight Create/New, then push the ENTER key. An editor lists all unused waypoints with the first unused waypoint highlighted.
		Reference: Slide 18
		(**3**) Highlight the desired unused waypoint to use, then push the ENTER key.
		(**4**) The Waypoint Editor page displays the chosen waypoint with current (if tracking satellites) or last position information.
		Revise information as necessary.
		(**5**) Push the MENU key.
		Reference: Slide 19
		(**6**) Multiple options are provided. Highlight the desired option, then push the ENTER key.
		• **Save and Exit**—Briefly displays waypoint stored message. Display returns to the Waypoints page with the new waypoint information saved and highlighted.
		• **Exit and No Save** — Display returns to the Waypoints page without saving the waypoint.
		• **Edit Field**—Displays a field editor for the highlighted field.
		• **Undo Changes** — Clears any changes made and display returns to the Waypoints Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
	c. Edit a Waypoint	Reference: Slide 20
		(**1**) From the Waypoints page, highlight the desired waypoint for editing, then push the ENTER key.
		(**2**) The Waypoint Editor page displays the operator selected waypoint.
		Reference: Slide 21

(3) As required, individually highlight each of the page fields and revise with user information according to the following steps.

NOTE: Some fields are for status information only or cannot be edited by the operator.

Reference: Slide 22

(a) Push the ENTER key to revise information other than units of measure. This is done using a text editor, number editor, or choosing items from a list editor.

Reference: Slide 23

(b) Push the MENU key to revise units of measure/reference information of a field, if applicable. For example:

If changing units for the Elevation field, do the following steps.

1 Highlight the Elevation field, and then push the MENU key.

2 Highlight Select Elevation Units, then push the ENTER key.

Reference: Slide 24

3 Highlight the desired elevation units, then push the ENTER key.

4 The page displays the highlighted field with the units of measure changed to the choice made.

5 As applicable, change other units of measure/references for other fields.

NOTE: Multiple fields may have the same or different units of measure choices. Fields with the same units of measure (e.g., two individual fields measured in metric numbers) will both be changed at the same time no matter what field is selected.

Reference: Slide 25

(4) After completing and reviewing all field content changes (with any field highlighted), push the MENU key. Highlight the desired selection from the following list, then push the ENTER key.

• **Save and Exit** — Briefly displays waypoint stored message. Display returns to the Waypoints page with the new waypoint information saved and highlighted.

• **Exit and No Save** — Display returns to the Waypoints page without saving the waypoint.

• **Edit Field** — Displays a field editor for the highlighted field.

• **Undo Changes** — Clears any changes made and display returns to the Waypoints Editor page for editing.

• **Help** — Displays help text for the highlighted field.

	d. Copy a Waypoint	Reference: Slide 26

d. Copy a Waypoint

Reference: Slide 26

(1) From the Waypoints page, highlight the desired waypoint to copy from, then push the MENU key.

(2) Highlight Copy, then push the ENTER key.

(3) Highlight To WP, then push the ENTER key.

Reference: Slide 27

(4) Highlight the desired waypoint position to copy to, then push the ENTER key. If copying to an unused waypoint, a storage confirmation message is briefly displayed. If copying to a used waypoint, the operator is prompted for confirmation to overwrite, and a storage confirmation message is briefly displayed.

(5) The DAGR returns to the Waypoints page, highlighting the waypoint copied from.

		Reference: Slide 28
		(6) Scroll to the copied to waypoint and verify the waypoint name is COPYXXX, where X represents the copied to waypoint number.
		(7) Use the Edit a Waypoint procedure to change waypoint name or other fields if desired.
	e. Copy to Range of Waypoints	Reference: Slide 29
		(1) From the Waypoints page, highlight the desired waypoint to copy from, and then push the MENU key.
		(2) Highlight Copy, then push the ENTER key.
		(3) Highlight To Range of WPs, then push the ENTER key.
		Reference: Slide 30
		(4) Enter the desired waypoint range (from/to) to copy to, then push the ENTER key. If copying to an unused waypoint, a storage confirmation message is briefly displayed. If copying to a used waypoint, the operator is prompted for confirmation to overwrite, and a storage confirmation message is briefly displayed.
		(5) The DAGR returns to the Waypoints page, highlighting the waypoint that was copied from.
		Reference: Slide 31
		(6) Scroll to the copied to range of waypoints and verify the waypoint names are COPYXXX, where X represents the copied to waypoint number.
		(7) Use the Edit a Waypoint procedure (d.) to change waypoint name or other fields if desired.
	f. Copy and Paste a Waypoint	Reference: Slide 32
		(1) From the Waypoints page, highlight the desired waypoint to copy from, and then push the MENU key.
		(2) Highlight Copy, then push the ENTER key.
		Reference: Slide 33
		(3) Highlight Copy WP, then push the ENTER key. The waypoint is now stored in the DAGR clipboard and ready to paste to other waypoints as desired. The display returns to the Waypoints page.
		(4) Scroll to desired waypoint to paste information into.
		(5) Push the MENU key. Highlight Copy, then push the ENTER key.
		(6) Highlight Paste WP, then push the ENTER key.
		Reference: Slide 34
		(7) If pasting to an unused waypoint, a storage confirmation message is briefly displayed. If pasting to a used waypoint, the operator is prompted for confirmation to overwrite, and a storage confirmation message is briefly displayed.
		(8) The DAGR returns to the Waypoints page, highlighting the waypoint pasted to.
		Reference: Slide 35
		(9) Verify the waypoint pasted to name is COPYXXX, where X represents the waypoint number pasted to.
		(10) Use the Edit a Waypoint procedure to change waypoint name or other fields if desired.
		(11) Repeat steps (4) through (10) of this procedure for pasting the copied waypoint to additional waypoints.

	g. Edit Units of Waypoints	Reference: Slide 36 **(1)** From the Waypoints page, push the MENU key. **(2)** Highlight Units, then push the ENTER key. Reference: Slide 37 **(3)** Multiple waypoint data unit options are provided. Perform the desired option as follows: • **Select Range Units**—After highlighting Select Range Units, push the ENTER key. Highlight desired choice, then push the ENTER key. • **Select Angle Units**—After highlighting Select Angle Units, push the ENTER key. Highlight desired choice, then push the ENTER key. • **Select North Ref** — After highlighting Select North Ref, push the ENTER key. Highlight desired choice, then push the ENTER key. • **Select Elev Units** — After highlighting Select Elev Units, push the ENTER key. Highlight desired choice, then push the ENTER key. Reference: Slide 38 **(4)** The DAGR returns to the Waypoints page.
	h. Field Descriptions for Moving Waypoints	Reference: Slide 39 **Last Fix Time Field:** (Advanced) This field is available for moving waypoints only. Displays the time of the last waypoint position fix. This time is automatically updated when the last fix position is modified or can be edited by the operator. This data is used with the last known position fix, ground speed, and track to compute the current moving waypoint position. Field time data format is HHMMZ/L, where H represents hours, M represents minutes, and Z/L represents Zulu or Local. **Last Fix Date Field:** (Advanced) This field is available for moving waypoints only. Displays the date of the last waypoint position fix. This date is automatically updated when the last fix position is modified or can be edited by the operator. This data is used with the last known position fix, ground speed, and track to compute the current moving waypoint position. Field date data format is DD-MMM-YYYY, where D represents days, M represents months, and Y represents years. **Last Known (Fix) Position Field:** (Advanced) This field is available for moving waypoints only. Displays the last known waypoint position fix. This data can be edited by the operator. Last known position fix, fix time, ground speed, and track are used to compute the current moving waypoint position. Ensure the appropriate datum, coordinate/grid system, and grid resolution are selected before using or editing position coordinates. Use the following references for additional information. • **Coordinate/grid system** — Appears in the upper left corner. • **Datum ID** — Appears in the upper right corner. • **Position coordinates.**

NOTE:	**Conduct a check on learning.**	Reference: Slide 40
		
		1. When Creating a Waypoint, what position information is displayed?
		    (ANS: Current (if tracking satellites) or last position information.) Paragraph 8.2.3.1 c(4)
		
		2. What does the Track Field display on the Waypoint Editor Page?
		    (ANS: Displays the waypoint magnetic variation (MAGVAR) value.) Paragraph 8.3.2.7
		
		3. After highlighting the waypoint to copy to, what key is pushed?
		    (ANS: The Enter Key.) Paragraph 8.2.3.1 f(2)

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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	Topic Summary	Reference: Slide 41
		Introduction
		– Page Function
		• Waypoint Editor Page
		– Field Descriptions
		Operation
		– Edited a Waypoint
		– Copied a Waypoint
		– Copied to Range of Waypoints
		– Copied and Paste a Waypoint
		– Edited Units of Waypoints
		Review/Summarize Lesson: During this topic you have learned to set the Waypoints page and Waypoint Editor page.
		Transition Next Lesson: Now that we know the steps necessary to set the Waypoints page and Waypoint Editor page, we will learn how to mark a waypoint using the Marking a Waypoint procedure.

SECTION IV. PRESENTATION

ELO C	Reference: Slide 42	
	ACTION:	Mark a waypoint using the Marking a Waypoint procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Marked a waypoint using the Marking a Waypoint procedure in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Mark a Waypoint procedure. Refer students to paragraph 8.4.1 and 8.4.2 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.4.1 and 8.4.2.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference: Slide 42
		Introduction
		– Mark a Waypoint Function Description
		Operation
		– Mark a Waypoint
		– Mark a Man Overboard Waypoint

	a. Mark a Waypoint Function Description	Reference: Slide 43 **CAUTION:** Ensure the DAGR is tracking satellites and has established position before marking a current position waypoint (display stops blinking or Tracking SVs is displayed on SV (Satellite Vehicle) Sky View page). When display data fields blink between black and gray text, the DAGR is not tracking satellites or has not yet acquired present position. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix. The Mark a WP operation is accessed through the push and hold function of the F1 function key (default Mark on toolbar), the push and hold function of the WP key, or from the WP/Routes/Alerts submenu. The mark a waypoint function stores current position coordinates (or last position if not tracking satellites), elevation, and datum into the waypoint database at the next available or selected waypoint number. These stored position coordinates remain the same unless edited by the operator. This capability is used to rapidly store position coordinates of specific events and locations.
		The Mark a WP function is designed for use while the DAGR is actively tracking satellites, and will store current position data. The Mark a WP function can also be used while not tracking satellites, but will store position data that DAGR collected before satellite tracking capability was lost. The waypoint that the current position is to be stored in can be edited (name, remark or identity) using menu selections. When a waypoint is marked, the waypoint name changes to correspond with the waypoint number (e.g., If WP = 003, is marked, then name = MK003). If operator entered waypoint data is to overwrite or modify a current waypoint, the DAGR prompts the operator for confirmation prior to storing operator entered data. When storing the next available (unused) waypoint, the display shows To Store WP. When overwriting a selected waypoint, the display shows To Overwrite WP. The Man Overboard page is accessed using the mark a waypoint function message.

	b. Mark a Waypoint	Reference: Slide 44
		
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		(1) Access the Mark a Waypoint function using one of the following three methods.
		
		    (a) From any display (except a message pop-up), push and hold the F1 function key (default Mark on toolbar).
		
		    (b) From any display (except a message pop-up), push the WP key. Waypoint function choices are displayed. Highlight MARK a WP, then push the ENTER key.
		
		Reference: Slide 45
		
		    (c) From any display (except a message pop-up), push the MENU key twice to access the Main menu. Highlight WP/Routes/Alerts from the main menu, then push ENTER From the WP/Routes/Alerts submenu, Highlight Mark a WP, then push the ENTER key.
		
		Reference: Slide 46
		
		(2) The Mark Present Position message is displayed with choices to store or cancel the mark operation. Pushing the MENU key while displaying the Mark Present Position message accesses the mark menu for additional operator choices. After being selected, they operate as follows:
		
		    • **Man Overboard** — The present position is stored as a man overboard (MOB) waypoint and the MOB page is displayed. This menu

		selection functions the same as pushing and holding the WP key from the Mark Present Position message.
		• **Select WP** — Displays a list of all waypoints with the first unused waypoint highlighted. Highlight the waypoint to be marked, then push the ENTER key. The Mark Present Position message is displayed.
		• **Edit WP Name** — Displays a waypoint name text editor. After editing the name, highlight Save, then push the ENTER key. The Mark Present Position message is displayed.
		• **Edit WP Remark** — Displays a waypoint remark text editor. After editing the remark, highlight Save, then push the ENTER key. The Mark Present Position message is displayed.
		• **Select Identity** — Displays a waypoint identity list editor. After highlighting the desired identity type, push the ENTER key. The Mark Present Position message is displayed.
		• **Store WP**—Performs mark a waypoint function same as pushing the ENTER key with the Mark Present Position message displayed.
		• **Cancel Mark**—Cancels mark a waypoint function same as pushing the QUIT key with the Mark Present Position message displayed.
		• **Message Help** — Displays help text.
		Reference: Slide 47
		(3) Push the ENTER key to store (or overwrite if applicable) the marked waypoint. The operator is prompted to confirm before any waypoints are overwritten. Push the QUIT key to cancel mark operation.
		(4) After the waypoint is marked, a waypoint stored message is briefly displayed. Display returns to the previously viewed page.
		Reference: Slide 48
		(5) If desired, access the Waypoint Editor page and revise waypoint data (e.g. waypoint name, units of measure, waypoint identity).
		(6) As desired, move to another position and mark another waypoint. Up to 999 waypoints can be stored.
	c. Mark a Man Overboard Waypoint	Reference: Slide 49
		(1) Access the Mark a Waypoint function using one of the following three methods.
		(a) From any display (except a message pop-up), push and hold the F1 function key (default Mark on toolbar).
		(b) From any display (except a message pop-up), push and hold the WP key. Waypoint function choices are displayed. Highlight MARK a WP, then push the ENTER key.
		Reference: Slide 50
		(c) From any display (except a message pop-up), push the MENU key twice to access the Main menu. Highlight WP/Routes/Alerts from the main menu, then push ENTER. From the WP/Routes/Alerts submenu, Highlight Mark a WP, then push the ENTER key.
		Reference: Slide 51
		(2) The Mark Present Position message is displayed.
		(3) Push and hold the WP key. The present position is stored as a man overboard (MOB) waypoint and a waypoint stored message is briefly displayed. The stored waypoint includes the prefix MOB.
		(4) The Man Overboard page is automatically displayed, and provides data for navigation back to the MOB waypoint.

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NOTE:	Conduct a check on learning.	Reference: Slide 52 **1.** What does Mark a Waypoint do? (ANS: Stores a waypoint with current position coordinates or last position if not tracking satellites.) Paragraph 8.4.1 **2.** How many waypoints can be stored in the DAGR? (Answer: 999.) Paragraph 8.4.2
	Topic Summary	Reference: Slide 53 Introduction – Mark a Waypoint Function Description Operation – Marked a Waypoint – Marked a Man Overboard Waypoint During this topic you have learned to mark a waypoint. **Transition Next Lesson:** Now that we know the steps necessary to mark a waypoint, we will learn how to delete a waypoint.

SECTION V. PRESENTATION

ELO D	Reference: Slide 53	
	ACTION:	Delete a waypoint using the Clear function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Deleted a waypoint using the Clear function in accordance with the DAGR Operator and Maintenance Manual.
ELO E	**ACTION:**	Sort waypoints using the Sort function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Sorted waypoints using the Sort function in accordance with the DAGR Operator and Maintenance Manual.
ELO F	**ACTION:**	Search for a waypoint using the Search function.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Searched for a waypoint using the Search function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Delete a waypoint. Refer students to paragraph 8.2.3.1 h in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	2 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.2.3.1 h
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

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	Topic Overview	Reference: Slide 54
		
		Operations
		
		   – Clear Waypoints
		
		   – Sort Waypoints
		
		   – Search Waypoint

	Clearing Waypoints	**Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		Reference: Slide 55
		
		(1) From the Waypoints page, highlight the desired waypoint to clear and push the MENU key. If clearing more than one waypoint, highlighting a waypoint in this step is optional.
		
		(2) Highlight Clear, then push the ENTER key.
		
		Reference: Slide 56
		
		3) Multiple options for clearing waypoints are provided.
		
		Perform the desired option as follows:
		
		    • **Clear WP**—After highlighting Clear WP, push the ENTER key. The operator is prompted for confirmation to clear the waypoint.
		
		    • **Clear Range**—After highlighting Clear Range, push the ENTER key. Then enter the clear waypoint from/to number range. Push the ENTER key. The operator is prompted for confirmation to clear the waypoints.
		
		    • **Clear All** — After highlighting Clear All, push the ENTER key. The operator is prompted for confirmation to clear all waypoints.
		
		Reference: Slide 57
		
		(4) The DAGR returns to the Waypoints page.
		
		(5) View the page to verify cleared waypoints are no longer listed.

Learning Step/Activity 2	Sort waypoints. Refer students to paragraph 8.2.3.1 l in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	3 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.2.3.1 l.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Sort Waypoints	**Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Reference: Slide 58 **(1)** From the Waypoints page, push the MENU key. **(2)** Highlight Sort and push the ENTER key. Reference: Slide 59

		(3) Multiple options for sorting waypoints are provided.
		Perform the desired option as follows:
		• **Name**—After highlighting Name, push the ENTER key. The entire list of waypoints is sorted in alphabetical order by name.
		• **Number** — After highlighting Number, push the ENTER key. The entire list of waypoints is sorted numerically by their number.
		• **Range from POS**—After highlighting Range from POS, push the ENTER key. The entire list of waypoints is sorted in ascending order by range from DAGRs current present position.
		• **Range from WP**—After highlighting Range from WP, push the ENTER key. Highlight the desired reference waypoint, then push the ENTER key. The display briefly advises the DAGR is working. The entire list of waypoints is sorted in ascending order by range from the referenced waypoint, with the referenced waypoint shown at the top of the list. All Waypoints page column titles include (WP).
		• **Identity** — After highlighting Identity, push the ENTER key. The display briefly advises the operator the DAGR is working. The entire list of waypoints is sorted first by waypoint identity (Friendly, Hostile, Neutral, and Unknown) and secondly by waypoint number.
		(4) The DAGR returns to the Waypoints page with waypoints sorted as previously described per method chosen.
Learning Step/Activity 3	Search waypoints. Refer students to paragraph 8.2.3.1 k in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	3 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph 8.2.3.1 k
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Search Waypoints	Reference: Slide 60
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		NOTE: When performing a search, ensure there are no waypoints highlighted in the list before starting. This ensures the search starts at the beginning of the list. When entering a string of characters for a search, ensure they are exact.
		(1) From the Waypoints page, push the MENU key.
		(2) Highlight Search, then push the ENTER key.
		Reference: Slide 61
		(3) Multiple options for searching waypoints are provided. Perform the desired option as follows:
		• **Name** — After highlighting Name, push the ENTER key. Enter a string of characters associated with the Name field of the waypoint, then

		highlight SAVE in the text editor, then push the ENTER key (or use menu shortcut). The display briefly advises the DAGR is working on the search.
		• **Remark**—After highlighting Remark, push the ENTER key. Enter a string of characters associated with the Remark field of the waypoint, then highlight SAVE in the text editor, then push the ENTER key (or use menu shortcut).
		• **Next WP** — Enabled only when a name or remark search option is repeated.
		• **Previous WP** — Enabled only when a name or remark search option is repeated.
		(4) The DAGR returns to the Waypoints page with a highlighted waypoint matching the search string. If no waypoints match the search string, the operator is prompted for confirmation and the DAGR returns to the Waypoints page.
		Reference: Slide 62
		(5) To view the next waypoint matching the search string, repeat steps (1) and (2), highlight Next WP, then push the ENTER key.
		(6) To view the previous waypoint matching the search string, repeat steps (1) and (2), highlight Previous WP, then push the ENTER key.
		Reference: Slide 63
		(7) The DAGR returns to the Waypoints page with a highlighted waypoint matching the search string. If no waypoints match the search string, the operator is prompted for confirmation and the DAGR returns to the Waypoints page.
	Topic Summary	Reference: Slide 64
		Operation
		– Clear waypoints
		– Sort waypoints
		– Search waypoints
		During this topic you have learned about how clear, sort, and search, waypoints.
		Transition Next Lesson: Now that we know the steps necessary clear, sort, and search, waypoints, we will learn select a bullseye waypoint.

SECTION VI. PRESENTATION

ELO G	Reference: Slide 65 **ACTION:**	 Select Bullseye.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Selected bullseye in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the bullseye table. Refer students to paragraph 9.5.2.13 through 9.5.2.13.1 and 9.5.3.1 f.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:30

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	Time of instruction: (minutes)	8 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual Date: 30/05/2003 Paragraph: 9.5.2.13 through 9.5.2.13.1 and 9.5.3.1 f.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 65
		Introduction
		    Select Bullseye
		Operation
		    Bullseye Table

	a. Bullseye Table	Reference: Slide 66
		
		Bullseye waypoints are used for rapid maneuvering operations where the DAGR operator does not have time to reference a map (paper or electronic) to determine an exact DAGR position in relation to a waypoint. The bullseye table provides azimuth and range data referenced from the bullseye waypoint position to the DAGR present position. Example: The DAGR displays an azimuth of 270 degrees with a range of 10 miles for the bullseye waypoint. The DAGR operator radios in data as "Bullseye 270 at 10". The personnel receiving this radio transmission then knows the DAGR is 10 miles due west from the bullseye waypoint. Prior to a mission, a single DAGR bullseye waypoint reference would be selected and set as active in the bullseye table (inside a gray rectangle).
		
		After activating Bullseye On from the page menu, the bullseye table displays up to five selectable bullseye waypoints from the bottom view of the Present Position page. Bullseye waypoints are selected by table row. The active bullseye waypoint row is inside a gray rectangle. The operator scrolls horizontally through the table to view the following bullseye waypoint data:
		
		    • **Bullseye number (01–05)**
		    • **Waypoint number**
		    • **Waypoint name**
		    • **Azimuth**
		    • **Range**
		
		NOTE: Azimuth and range values are from the bullseye waypoint to the present DAGR position. These values appear in decimal or whole number format dependent upon the selected bullseye grid resolution.
		
		  •Whether set as active or inactive, all waypoints listed in the bullseye table display their calculated azimuth and range values with respect to DAGR present position.
		
		  • The DAGR notifies the operator if any datum mismatches exist with the bullseye waypoint.

NOTE:	**Conduct a check on learning.**	Reference: Slide 67 What is the bullseye table used for? (ANS: It is used for rapid maneuvering operations where the operator does not have time to reference a map (paper or electronic) to determine an exact position.) Paragraph 9.5.2.13

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Learning Step/Activity 2	Use the Bullseye Table	Reference: Slide 68
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) With the Present Position page displayed and no fields highlighted, push the MENU key.
		(2) If Bullseye On is displayed, scroll to it and push the ENTER key, then proceed to the next step. If Bullseye Off is displayed, proceed to the next step.
		Reference: Slide 69
		(3) Scroll down the Present Position page to view the bullseye waypoint table.
		(4) If the desired bullseye waypoint is not shown or not highlighted, scroll to the desired bullseye waypoint number (01 to 05). If not already highlighted, push the ENTER key. If the desired bullseye waypoint is shown, but inactive (not inside of a box), proceed to step (7). If the desired bullseye waypoint is active (inside a box), proceed to step (11).
		Reference: Slide 70
		(5) Push the ENTER key, scroll to the desired waypoint needed, then push the ENTER key.
		NOTE: If the desired waypoint needed is not shown in the waypoint list and needs to be added, refer to paragraph 8.2 before proceeding.
		(6) The display returns to the bullseye waypoint table with information using the chosen waypoint inserted in the bullseye table.
		Reference: Slide 71
		(7) With the desired bullseye waypoint highlighted, push the MENU key.
		(8) Highlight Set As Active, then push the ENTER key.
		Reference: Slide 72
		(9) The display returns to the bullseye table.
		(10) Push the QUIT key to exit the bullseye selection function.
		(11) The selected, active bullseye waypoint row/data is inside a box. Use the data to determine azimuth and range from the active bullseye waypoint to the present DAGR position.
		Reference: Slide 73
		(12) Bullseye waypoints and information can be cleared or edited by highlighting the bullseye waypoint (01 through 05), and then pushing the MENU key and selecting the desired edit procedure.

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SECTION VII. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference: Slide 74

Title	Create and edit a waypoint.	
Introduction	The student shall create and edit a waypoint.	
ELO A	**ACTION:**	Create a waypoint using the Creating a Waypoint procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Created a waypoint using the Creating a Waypoint procedure in accordance with the DAGR Operator and Maintenance Manual.
ELO B	**ACTION:**	Set the Waypoints page and Waypoint Editors page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Set the Waypoints page and Waypoint Editors page in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Waypoint page allows the operator to view, edit, and create waypoints.	
Resource Requirements	DAGR receiver, External AC power cable or External DC power cable (fused, 5 meter)	
Special Instructions	None.	
Student assignment	Create and edit a waypoint.	

Procedures	Performance Measures:		

Task Name: Create and edit a waypoint.	GO	NO GO

Create a New Waypoint From User Input:
 	
(1) From the Waypoints page, push the MENU key. Highlight Create/New, then push the ENTER key. An editor lists all unused waypoints with the first unused waypoint highlighted. Highlight the desired unused waypoint, then push the ENTER key.
 	
(2) The Waypoint Editor page displays the operator selected waypoint with current position information (if tracking satellites) or last known position.
 	
(3) As required, individually highlight each of the page fields and revise with user information according to the following steps.
 	
NOTE: Some fields are for status of information only, or cannot be edited by the operator.
 	
    (a) Push the ENTER key to revise information other than units of measure. This is done using a text editor, number editor, or choosing items from a list editor.
 	
    (b) Push the MENU key to revise units of measure/reference information of a field, if applicable. For example:
 	
If changing units for the Elevation field, perform the following steps.
 	
1. Highlight the Elevation field, and then push the MENU key.
 	
2. Highlight Select Elevation Units, then push the ENTER key.
 	
3. Highlight the desired elevation units, then push the ENTER key.
 	
4. The page displays the highlighted field with the units of measure changed to the choice made.
 	
5. As applicable, change other units of measure/references for other fields.
 	
NOTE: Multiple fields may have the same or different units of measure choices. Fields with the same units of measure (e.g., two individual fields measured in metric numbers) will both be changed at the same time no matter what field is selected.
 	
(4) After completing and reviewing all field content changes (with any field highlighted), push the MENU key. Highlight the desired selection from the following list, then push the ENTER key.
 	
    • **Save and Exit** — Briefly displays waypoint stored message. Display returns to the Waypoints page with the new waypoint information saved and highlighted.
 	
    • **Exit and No Save** — Display returns to the Waypoints page without saving the waypoint.
 	
    • **Edit Field**—Displays a field editor for the highlighted field.
 	
    • **Undo Changes** — Clears any changes made and display returns to the Waypoints Editor page for editing.
 	
    • **Help** — Displays help text for the highlighted field.
 	
Edit a Waypoint:
 	
(1) From the Waypoints page, highlight the desired waypoint for editing, then push the ENTER key.
 	
(2) The Waypoint Editor page displays the operator selected waypoint.		

(3) As required, individually highlight each of the page fields and revise with user information according to the following steps.

NOTE: Some fields are for status information only or cannot be edited by the operator.

(a) Push the ENTER key to revise information other than units of measure. This is done using a text editor, number editor, or choosing items from a list editor.

(b) Push the MENU key to revise units of measure/reference information of a field, if applicable. For example:

If changing units for the Elevation field, do the following steps.

1 Highlight the Elevation field, and then push the MENU key.

2 Highlight Select Elevation Units, then push the ENTER key.

3 Highlight the desired elevation units, then push the ENTER key.

4 The page displays the highlighted field with the units of measure changed to the choice made.

5 As applicable, change other units of measure/references for other fields.

NOTE: Multiple fields may have the same or different units of measure choices. Fields with the same units of measure (e.g., two individual fields measured in metric numbers) will both be changed at the same time no matter what field is selected.

(4) After completing and reviewing all field content changes (with any field highlighted), push the MENU key. Highlight the desired selection from the following list, then push the ENTER key.

- **Save and Exit** — Briefly displays waypoint stored message. Display returns to the Waypoints page with the new waypoint information saved and highlighted.

- **Exit and No Save** — Display returns to the Waypoints page without saving the waypoint.

- **Edit Field** — Displays a field editor for the highlighted field.

- **Undo Changes** — Clears any changes made and display returns to the Waypoints Editor page for editing.

- **Help** — Displays help text for the highlighted field.

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.

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SECTION VIII. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 75 During this topic you have learned how use the Bullseye table.	
Transition Next Lesson	Now that we know the steps necessary use the Bullseye table, we will now learn how to create a route.	

SECTION IX. PRESENTATION

ELO G	Reference: Slide 76 **ACTION:**	Create a Route using the Create a New Route using the Route Editor page procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Created a Route using the Create a New Route using the Route Editor page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Route page and the Route Editor page. Refer students 8.7 through 8.7.2, 8.8.2.1 thru 8.8.2.4, and 8.8.3 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	18 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.7 through 8.7.2, 8.8.2.1 thru 8.8.2.4, and 8.8.3.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 76
		
		 Introduction
		
		    –Routes Page Function
		    –Routes Page Description
		    –Route Editor Page Function
		    –Route Editor Page Description

		Operation – Create a New Route – Create a New Route Using a Range of Waypoints, Marked Waypoints, or Automarked Waypoints Reference: Slide 77 – Edit Route – Copy and Paste a Route – Clear Routes – Calculate Route Length

	a. Routes Page Function	Reference: Slide 78
		
		The Routes page is accessed from the WP/Routes/Alerts submenu. The Routes page provides a table that lists all routes stored in DAGR. A route is made up of multiple waypoints, arranged in a specific sequence, used to navigate a desired path. Each waypoint is one route leg of the route. Capabilities are provided to create new routes, edit routes (using Route Editor page) clear routes, copy routes, and calculate route length. The Route Editor page is accessed from the Routes page. Vertical scrolling is used to view all routes. If a route is undefined or invalid, double dashes appear in the route name and legs columns of the table. The table rows wrap from the last row to the first row (or vice versa) when scrolling through the table The route list includes the following information for each route:
		  • **NUM** — Displays the route number (01 through 15).
		  • **Route Name** — Displays the route name of up to ten characters.
		  • **Legs**—Displays the number of route legs (1 to 1000). This quantity matches the number of waypoints in a route.

	b. Routes Menu Page Functions	Reference: Slide 78
		Routes page menu functions are:
		  • **Create** — Provides a list editor with choices for creating a route. A route can be created using the Route Editor page. Routes can also be created from a range of waypoints, all marked waypoints, all automarked waypoints, or all marked and automarked waypoints.
		  • **Edit Route** — Displays the Route Editor page for editing the selected route. Refer to paragraph 8.8 for additional information.
		  • **Copy/Clear** — Provides copy and clear route functions. Copies a route to another route. Clears a route, a range of routes, or all routes. Operator confirmation is required prior to the DAGR overwriting or clearing any existing route.
		  • **Calculate Length** — Calculates the sum length of all route legs.
		  • **Navigate Route** — Displays the NAV Pointer page. Refer to paragraph 9.3 for additional information.
		  • **Help** — Displays help text.

	c. Route Editor Page Function	Reference: Slide 79
		The Route Editor page is accessed using the Routes page and is not accessed from a submenu. The Route Editor page is used in constructing new routes or editing existing routes. When the Route Editor page is initially accessed, the number and name field is highlighted for scrolling to the desired content. Select appropriate units for fields, as applicable, before using page field data. Page fields and route table are described in the following paragraphs. The route table can be minimized or maximized to allow desired viewing of route leg information. When maximized, the Alert Radius and Sit (Situational) Awareness fields do not appear.
	d. Route Editor Page Description	Reference: Slide 79
		Vertical scrolling is used to view all page fields. Field information contained in this page is changed using various editor techniques.
		Route Number and Name Field: Displays the route number and name of up to fifteen routes. Only the route name is editable using up to ten characters. Field data format is XX-NNNNNNNNNN, where X represents the route number (01 to 15) and N represents the route name.
		Alert Radius Field: Displays the route leg end point alert radius value. This value defines the radius around the ending waypoint of a route leg. During navigation, when the DAGR reaches the radius, it recognizes the end of a route leg is near. The NAV Setup page is used to select the route leg advance mode.
		Sit (Situational) Awareness Field: Displays Yes or No. When Yes is selected, the route appears on the Situational Awareness page if the page view is configured for operator selected routes. When No is selected, the route does not appear on the Situational Awareness page as an operator selected route.
		Route Leg Table: Displays individual route leg information for up to 1000 legs. The top row of the Route Leg Table has end waypoint 000–POS (representing present position) and leg – –. View all table data using vertical and horizontal scrolling. Undefined rows have double dashes appearing in place of data. When the route displayed is currently being used for navigation, the current navigation route leg number is displayed inside a box. Table columns provide information as follows:
		• **Leg**— Displays the leg number of 000 up to 999. Consists of the range from the leg starting point (present position or prior end waypoint) to an end waypoint, and defined by the end waypoint.
		• **End Waypoint** — Displays the waypoint number and name ending the route leg. Data format is XXX-NNNNNNNNNN, where X represents the waypoint number, and N represents the waypoint name of up to ten characters.
		• **Azimuth**—Displays the azimuth from the leg starting point to the end waypoint as measured clockwise from the selected north reference (True, Magnetic, or Grid). North is referenced as 360 degrees, 6400 mils, or 6300 strecks. Data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks).
		• **Range** — Displays the range (or length) of the leg. Data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.
	e. Create a New Route Using the Route Editor Page	Reference: Slide 80
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.

		(1) From the Routes page, highlight the desired new route number, or if the highlighted route is not changed, the first unused route number will be automatically used. Push the MENU key.
		(2) Highlight Create, then push the ENTER key.
		(3) Highlight Create/New, then push the ENTER key.
		Reference: Slide 81
		(4) The Route Editor page displays the first unused route if no route number was previously selected or the operator selected route.
		(5) Scroll down the page into the route leg table and highlight the first row containing all double dashes (unused leg). Then push the ENTER key.
		NOTE: The top row of the route leg table always has end waypoint 000–POS representing present position.
		Reference: Slide 82
		(6) Highlight the desired ending waypoint for the leg of the route, then push the ENTER key. The Route Editor displays the route leg with the selected end waypoint.
		(7) Repeat steps (5) and (6) of this procedure, as required, to create all desired route legs.
		(8) After creating all route legs, push the MENU key.
		Reference: Slide 83
		(9) Multiple options are provided. Highlight the desired option, then push the ENTER key.
		• **Save and Exit** — Briefly displays route stored message. Display returns to the Routes page with the new route information saved and highlighted.
		• **Exit and No Save** — Display returns to the Routes page without saving the route.
		• **Maximize/Minimize Table**—Display returns to the Routes page with the route table maximized (displaying five route legs at once) or minimized (displaying three route legs at once).
		• **Insert WP After** — From the Select WP editor, highlight the desired waypoint, then push the ENTER key. The Route Editor page highlights a new leg (inserted after the original highlighted leg) created from the entered waypoint.
		• **Swap With Next**— The Route Editor displays the highlighted route leg swapped with the one that was next (disabled if the highlighted route leg is the last leg).
		• **Remove WP**— The Route Editor page displays with the highlighted leg removed.
		• **Edit Field** — Displays an editor for the highlighted field (leg).
		• **Undo Changes** — Clears any changes made and display returns to the Route Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
	f. Create a New Route Using a Range of Waypoints, Marked Waypoints, or Automarked Waypoints:	Reference: Slide 84
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Routes page, highlight the desired new route number, or if none are highlighted, the first unused route number will be used. Push the MENU key.

		(2) Highlight Create, then push the ENTER key.
		Reference: Slide 85
		(3) Multiple options for creating routes from waypoints are provided. Highlight the desired option, then push the ENTER key, and then perform the selected option as follows.
		• **Create/New** — Not applicable to this procedure. Refer to procedure a.
		• **From Range**—Highlight the first waypoint for the range and push the ENTER key. Highlight the last waypoint for the range and push the ENTER key. Briefly displays a message the DAGR is working.
		• **From All MK WPs** — Briefly displays a message the DAGR is working while creating a route from all marked waypoints. The route is displayed with waypoints shown in ascending order based on the date and time the waypoint was created.
		• **From All AMK WPs** — Briefly displays a message the DAGR is working while creating a route from all automarked waypoints. The route is displayed with waypoints shown in ascending order based on the date and time the waypoint was created.
		• **From MK and AMK** — Briefly displays a message the DAGR is working while creating a route from all marked and automarked waypoints. The route is displayed with waypoints shown in ascending order based on the date and time the waypoint was created.
		Reference: Slide 86
		(4) The Route Editor page displays the new route.
		(5) After the route is created, with any field highlighted, push the MENU key. Highlight the desired selection from the following list, then push the ENTER key.
		• **Save and Exit** — Briefly displays route stored message. Display returns to the Routes page with the new route information highlighted.
		• **Exit and No Save** — Display returns to the Routes page without saving the route.
		• **Maximize/Minimize Table**—Display returns to the Routes page with the route table maximized (displaying five routes at once) or minimized (displaying three routes at once).
		• **Edit Field** — Displays a field editor for the highlighted field.
		• **Undo Changes** — Clears any changes made and display returns to the Route Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
		(6) Repeat procedure, as required, to create multiple routes using the various options.
	g. Edit Route	**Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs **.**
		Reference: Slide 87
		(1) From the Routes page, highlight the desired route for editing. Push the ENTER key.
		(2) The Route Editor page displays the operator selected route.
		Reference: Slide 88
		(3) View the Route Name field, Alert Radius field, and Situational Awareness field to verify correct field content.

Edit if necessary using the following steps.

(a) Highlight the desired field, then push the ENTER key.

(b) Use the displayed editor to edit field content.

(c) If no other changes are to be made to the route information, skip to step (6).

Reference: Slide 89

(4) View the Azimuth and Range columns of the route leg table to determine if changes to units of measure used in the columns are required (metric or decimal, mils or degrees, true or magnetic, etc.). Revise if necessary according to the following steps.

(a) Highlight a route leg of the route leg table. Scroll to view the Azimuth and Range columns, then push the MENU key.

(b) Highlight the desired option for changing a particular set of units of measure, then push the ENTER key.

• Select Range Units

• Select Angle Units

• Select North Ref

Reference: Slide 90

(c) Each option provides a list of choices. Highlight the desired choice, then push the ENTER key.

(d) The Route Editor page displays Azimuth and Range column information with the changes made.

NOTE: If choosing Select Range Units, the choices are Metric, English, or Nautical. This unit selection will also change the information in the Alert Radius field.

(e) If required, repeat the procedure for the remaining two units of measure selections.

Reference: Slide 91

(5) View the Alert Radius field and verify the proper units of measure are in use. Revise if necessary using the following steps.

(a) Highlight the Alert Radius field, and then push the MENU key.

(b) Highlight Select Alert Units, then push the ENTER key.

(c) Highlight the desired choice, then push the ENTER key.

(d) The Route Editor page displays the Alert Radius field highlighted with the changes made.

NOTE: If choosing Select Range Units, the choices are Metric, English, or Nautical. This unit selection will also change the information in the Range column of the route leg table.

Reference: Slide 92

(6) When editing the construction of route legs, multiple options are available. From the Route Editor page, highlight the desired route leg while viewing the End Waypoint column, then push the MENU key. Highlight the desired option to perform, push the ENTER key, and proceed as described.

• **Save and Exit** — Briefly displays route stored message. Display returns to the Routes page with the new route information highlighted.

• **Exit and No Save** — Display returns to the Routes page without saving the route.

		• **Maximize/Minimize Table**—Display returns to the Routes page with the route table maximized (displaying five route legs at once) or minimized (displaying three route legs at once).
		• **Insert WP After** — From the Select WP editor, highlight the desired waypoint, then push the ENTER key. The Route Editor page highlights a new leg (inserted after the original highlighted leg) created from the entered waypoint.
		• **Swap With Next**— The Route Editor displays the highlighted route leg swapped with the one that was next (disabled if the highlighted route leg is the last leg).
		• **Remove WP** — The Route Editor page displays with the highlighted leg removed.
		• **Edit Field** — Displays an editor for the highlighted field (leg).
		• **Undo Changes** — Clears any changes made and display returns to the Route Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
	h. Copy and Paste a Route:	Reference: Slide 93
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Routes page, highlight the desired route to copy from. Push the MENU key.
		(2) Highlight Copy/Clear, then push the ENTER key.
		(3) Highlight Copy Route, then push the ENTER key. The route is now stored in the DAGR clipboard and ready to paste to other routes as desired. The display returns to the Routes page.
		Reference: Slide 94
		(4) Highlight the desired route to paste to.
		(5) Push the MENU key.
		(6) Highlight Copy/Clear, then push the ENTER key.
		(7) Highlight Paste Route, then push the ENTER key.
		Reference: Slide 95
		(8) If pasting to an unused route, a storage confirmation message is briefly displayed. If pasting to a used route, the operator is prompted for confirmation to overwrite and a storage confirmation message is briefly displayed.
		(9) The DAGR returns to the Routes page, highlighting the route pasted to.
		(10) Verify the route pasted to name is RTEXX, where X represents the route number pasted to.
		Reference: Slide 96
		(11) Use the Route Editor page to change the route name or other fields if desired.
		(12) Repeat steps (4) through (11) of this procedure for pasting the copied route to additional routes
	i. Clear Routes	Reference: Slide 97
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Routes page, highlight a desired route to clear if clearing a single route. If clearing a range of routes, highlighting a route is not

		necessary. Push the MENU key.
		(2) Highlight Copy/Clear, then push the ENTER key.
		Reference: Slide 98
		(3) Multiple options for clearing routes are provided. Highlight the desired option, then push the ENTER key, and then perform the selected option as follows.
		• **Clear Route** — The operator is prompted for confirmation to clear the route.
		• **Clear Range** — Enter the route from/to number range, then push the ENTER key. The operator is prompted for confirmation to clear the routes.
		• **Clear All** — The operator is prompted for confirmation to clear all routes.
		(4) The DAGR returns to the Routes page.
		(5) View the page to verify cleared routes are no longer listed.
	j. Calculate Route Length	Reference: Slide 99
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Routes page, highlight a desired route to calculate length. Push the MENU key.
		(2) Highlight Calculate Length, then push the ENTER key.
		(3) The route length is displayed. Push the ENTER key to acknowledge.
		(4) DAGR returns to the Routes page.
NOTE:	**Conduct a check on learning.**	Reference: Slide 100
		1. What is the Route Editor page used for?
		(ANS: The Route Editor page is used in constructing new routes or editing existing routes.) Paragraph 8.8.1
		2. The Route Number and Name Field can display how many routes?
		(ANS: fifteen routes.) Paragraph 8.8.2.1
		3. When creating a new route leg what must you do to enter an ending waypoint?
		(ANS: Highlight the desired ending waypoint for the leg of the route, then push the ENTER key.) Paragraph 8.8.3.1a (6)

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SECTION X. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 2

Reference: Slide 101

Title	Create a new route.	
Introduction	The student shall create a new route.	
ELO G	**ACTION:**	Create a Route using the Create a New Route using the Route Editor page procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Created a Route using the Create a New Route using the Route Editor page procedure in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Route Editor page allows the operator to view, edit, and create routes.	
Resource Requirements	DAGR receiver, External AC power cable or External DC power cable (fused, 5 meter)	
Special Instructions	None.	
Student assignment	Create a new route.	

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Procedures	**Performance Measures:**		

Task Name: Create a New Route:	**GO**	**NO GO**

Create a New Route:
 	
(1) From the Routes page, highlight the desired new route number, or if the highlighted route is not changed, the first unused route number will be automatically used. Push the MENU key.
 	
(2) Highlight Create, then push the ENTER key.
 	
(3) Highlight Create/New, then push the ENTER key.
 	
(4) The Route Editor page displays the first unused route if no route number was previously selected or the operator selected route.
 	
(5) Scroll down the page into the route leg table and highlight the first row containing all double dashes (unused leg). Then push the ENTER key.
 	
NOTE: The top row of the route leg table always has end waypoint 000–POS representing present position.
 	
(6) Highlight the desired ending waypoint for the leg of the route, then push the ENTER key. The Route Editor displays the route leg with the selected end waypoint.
 	
(7) Repeat steps (5) and (6) of this procedure, as required, to create all desired route legs.
 	
(8) After creating all route legs, push the MENU key.
 	
(9) Multiple options are provided. Highlight the desired option, then push the ENTER key.
 	
    • **Save and Exit** — Briefly displays route stored message. Display returns to the Routes page with the new route information saved and highlighted.
 	
    • **Exit and No Save** — Display returns to the Routes page without saving the route.
 	
    • **Maximize/Minimize Table**—Display returns to the Routes page with the route table maximized (displaying five routes at once) or minimized (displaying three routes at once).
 	
    • **Insert WP After** — From the Select WP editor, highlight the desired waypoint, then push the ENTER key. The Route Editor page highlights a new leg (inserted after the original highlighted leg) created from the entered waypoint.
 	
    • **Swap With Next**— The Route Editor displays the highlighted route leg swapped with the one that was next (disabled if the highlighted route leg is the last leg).
 	
    • **Remove WP**— The Route Editor page displays with the highlighted leg removed.
 	
    • **Edit Field** — Displays an editor for the highlighted field (leg).
 	
    • **Undo Changes** — Clears any changes made and display returns to the Route Editor page for editing.
 	
    • **Help** — Displays help text for the highlighted field.
	____	____

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.

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SECTION XI. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 102 During this topic you have learned to create a route using the Route Editor page on your DAGR.	
Transition Next Lesson	Reference: Slide 103 Now that we know how to create a Route using the Route Editor page, we will learn how to set a waypoint alert.	

SECTION XII. PRESENTATION

ELO H	Reference: Slide 104 **ACTION:**	Set a Waypoint Alert using the Create/New Alerts function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Set a Waypoint Alert using the Create/New Alerts function in accordance with the DAGR Operator and Maintenance Manual.
ELO I	**ACTION:**	Edit a Waypoint Alert using the Edit Alert function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Edited a Waypoint Alert using the Edit Alert function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Alerts page. Refer students to paragraphs 8.9.1 through 8.9.1.3 and 8.10.1 through 8.10.2.8 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs 8.9.1 through 8.9.1.3 and 8.10.1 through 8.10.2.8
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

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	Topic Overview	Reference: Slide 104
		Introduction
		– Alerts Page Function
		– Alert Editor Page
		– Alert Types and Page Fields
		Operation
		– Create a New Alert
		•Field Descriptions
		– Copy and Paste an Alert
		– Edit an Alert
	a. Alerts Page Function	Reference: Slide 105
		The Alerts page is accessed from the WP/Routes/Alerts submenu, or by using the Status key and Receiver Status menu. The Alerts page provides a table showing all DAGR alerts. Alerts are set in the DAGR to notify the operator of specific conditions during a mission. Specific conditions include entering or exiting a safe or hazardous position, meeting or exceeding a predefined position error limit, or meeting or exceeding a predefined time and date. Capabilities are provided to create new alerts, edit existing alerts (using Alert Editor page), clear alerts, copy alerts, and enable/disable alerts. The Alert Editor page is accessed from the Alerts page. Vertical and horizontal scrolling is used to view all alerts and table columns. If alert data is undefined or invalid, double dashes appear in the table columns. Use the Status key to view the Receiver Status display and check alert status or access the Alerts page.
		The alert list table includes the following information for each alert. The table rows wrap from the last row to the first row (or vice versa) when vertically scrolling through the table.
		• **NUM** — Displays the alert number (01 through 33).
		• **Name**— Displays the alert name of up to ten characters.
		• **Mode** — Displays the alert mode as Enabled (on) or Disabled (off). Only two area alerts can be enabled at the same time.
		The alert must be properly configured before enabling is possible.
		• **Status** — Displays the alert status as Active, Inactive, or Invalid. An active alert indicates the alert is configured correctly, and the DAGR is currently within the parameters specified by the alert. An inactive alert indicates the alert is configured correctly, but the DAGR is not currently within the parameters specified by the alert. An invalid alert needs additional editing to be properly configured before the alert is usable.
		• **Type**—Displays the alert type as Anchor, Area, Boundary Line, Buffer Zone, Corridor, Hazard, Phase Line, POS Error 1–D (Advanced), POS Error 2–D, POS Error 3–D (Advanced), or Time/Date.
		Reference: Slide 106
		Alerts page menu functions are described in the following list.
		• **Create/New**— Displays the Alert Editor page to set up a new alert.
		• **Edit Alert**— Displays the Alert Editor page to edit the selected alert.
		• **Copy/Clear**—Allows copying a selected alert's data into a storage clipboard. This data can then be pasted into another alert.

		Operator confirmation is required prior to overwriting any existing alerts. Allows clearing (removal) of an alert, a range of alerts, or all alerts. Operator confirmation is required prior to clearing any alerts. • **Enable or Disable Alert**— Individually enables or disables an alert. • **Enable All**— Enables all alerts. • **Disable All**— Disables all alerts.
	b. Triggered Alert	Reference: Slide 107 When an alert is triggered, the DAGR displays an alert message notifying the operator of the type of alert and the alert number and name. The operator can push the ENTER key to acknowledge the displayed alert and take appropriate action, or push the MENU key for further options. When selected, the alert display menu options function as follows: • **Toggle Remark** — Displays opposite view (1 or 2) of time alert message (time alert only). • **View Alert**— Displays Alert Editor page with current alert data. • **Acknowledge** — Same as pushing ENTER key with alert displayed. • **Message Help** — Displays help text.
	c. Alert Editor Page Function	Reference: Slide 108 The Alert Editor page is accessed using the Alerts page and is not accessed from a submenu. The Alert Editor page is used for viewing and editing data Listed in the Alerts page and other alert field data. When the Alert Editor page is accessed, a page field is always highlighted for cursor control key scrolling to the desired field. Select appropriate units for fields, as applicable, before using page field data. When field content is undefined, double dashes appear. Alert types and page fields are described in the following paragraphs.
	d. Alert Types and Page Fields	Reference: Slide 109 **Anchor Alert:** An anchor alert is a circular area defined by an operator entered radial range from a waypoint. Typically used when the operator is to stay near a ship anchor point, within a unit boundary, or within a hover area. The alert activates when outside the defined radius. When outside the radius, the operator uses the azimuth, range, and pointer (arrow points to point of exit) fields to enter the anchor alert area at the point of exit. Reference: Slide 110 **Hazard Alert:** A hazard alert is a circular area defined by an operator entered radial range from a waypoint. Typically used to avoid threats and prevent the operator from entering an area. The alert activates when inside the defined radius. When inside the radius, the operator uses the azimuth, range, and pointer (arrow points to point of entry) fields to exit the hazard alert area at the point of entry. The Alert Editor page display for a hazard alert is the same as for an anchor alert except the hazard alert pointer field refers to the point of entry instead of point of exit. Reference: Slide 111 **Area Alert:** An area alert is a polygon shaped area constructed from three to fifteen operator selected waypoints. Area alerts are used to prevent an operator from entering or exiting an area from any direction. The operator selects either entry to activate the alert or exit to activate the alert.

Reference: Slide 112

Boundary Line Alert / Phase Line Alert: Although boundary line and phase line alerts are set up similarly, they have entirely different purposes. A boundary line should not be crossed, while a phase line is used to indicate completion of a mission phase. A boundary line or phase line alert is a line between two operator selected waypoints. These alerts are used to inform the operator of arrival at a line.

Reference: Slide 113

Buffer Zone Alert: A buffer zone alert is a rectangular area defined by two operator selected waypoints as end points. The operator defines the width of the buffer zone by inputting a range applied to both sides of the line interconnecting the waypoints. These alerts are used to prevent an operator from entering an area (usually from a specific direction), such as a national border, contaminated area, unsafe waters, or Air Defense Identification Zone. When inside the buffer zone, the operator uses the azimuth, range, and pointer (arrow points to point of entry) fields to exit the buffer area at the point of entry. When using the advanced function set, the buffer zone can be calculated using either Rhumb Line (RL) or Great Circle (GC).

Reference: Slide 114

Corridor Alert: A corridor alert is a rectangular area defined by two operator selected waypoints as end points. The operator defines the width of the corridor by inputting a range applied to both sides of the line interconnecting the waypoints. These alerts are used to prevent an operator from exiting a safe area (e.g., a narrow channel, or aircraft positive identification lanes). When outside the corridor, the operator uses the azimuth, range, and pointer (arrow points to point of exit) fields to enter the corridor at the point of exit. The Alert Editor page with a corridor alert is the same as for the buffer zone alert except the pointer points to Direction To Point of Exit (instead of Direction To Point of Entry). When using the advanced function set, the corridor can be calculated using either Rhumb Line (RL) or Great Circle (GC). The Alert Editor page with a corridor alert is the same as for the buffer zone alert except the pointer points to Direction To Point of Exit (instead of Direction To Point of Exit).

Reference: Slide 115

Position Error Alert:

Position alerts do not appear on the situational awareness page only triggered alert message will appear when the threshold is exceeded.

A position error alert can be set up as follows:

- **1-D POS (Advanced)** — One dimensional. Generates an alert when an operator entered estimated vertical error (EVE) threshold is met or exceeded.
- **2-D POS** — Two dimensional. Generates an alert when an operator entered estimated horizontal error (EHE) threshold is met or exceeded.
- **3-D POS (Advanced)** — Three dimensional. Generates an alert when an operator entered estimated position error (EPE) radial range threshold is met or exceeded.

Reference: Slide 116

Time/Date Alert: Allows the operator to enter Date-Time-Group (DTG) alerts including a remark for each alert of up to forty characters. The DTG alert activates when the date and time are reached or exceeded. Time/Date alerts do not appear on the situational awareness page only triggered alert message will appear when the date and time are reached or exceeded.

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NOTE:	**Conduct a check on learning.**	Reference: Slide 117 **1.** What does the Alert List table Type column display? (ANS: Displays the alert type as Anchor, Area, Boundary Line, Buffer Zone, Corridor, Hazard, Phase Line, POS Error 1–D (Advanced), POS Error 2–D, POS Error 3–D (Advanced), or Time/Date.) Paragraph 8.9.1 **2.** When an alert appears to the operator, what action must the operator perform? (ANS: The operator can push the ENTER key to acknowledge the displayed alert and take appropriate action, or push the MENU key for further options.) Paragraph 8.9.1.3 **3.** What is the Hazard Alert used for? (ANS: To avoid threats and prevent the operator from entering an area.) Paragraph 8.10.2.2
Learning Step/Activity 2	Edit a Waypoint Alert. Refer students to paragraph 8.9.2 and 8.10.3.1 through 8.10.3.18 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	20 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.9.2 and 8.10.3.1 through 8.10.3.18.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Create a New Alert	Reference: Slide 118
		
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		(1) From the Alerts page, highlight the desired new alert number, or if the highlighted alert is not changed, the first unused alert number will be automatically be used.
		
		(2) Push the MENU key.
		
		(3) Highlight Create/New, then push the ENTER key.
		
		Reference: Slide 119
		
		(4) The Alert Editor page displays the first unused alert (up to 33 alerts can be created) if no alert was previously selected or the operator selected alert. Revise information as necessary using standard editing techniques.
		
		Number and Name Field: Displays the alert number and name. Only the alert name is editable using up to ten characters. Field data format is XX-NNNNNNNNNN, where X represents the alert number (01 through 33) and N represents the alert name of up to ten characters.
		
		Type Field: Displays one of the alert types listed as follows:
		
		    • **Anchor**
		    • **Area**
		    • **Boundary Line**
		    • **Buffer Zone**

• **Corridor**

• **Hazard**

• **Phase Line**

• **Position Error 1–D** (Advanced)

• **Position Error 2–D**

• **Position Error 3–D** (Advanced)

• **Time/Date**

Mode Field: Displays the alert mode as Enabled or Disabled. In order to function, alerts must be set up with valid data and be enabled.

NOTE: Only two area alerts can be enabled at the same time.

Status Field: Displays one of the following alert statuses. The operator cannot edit this field.

> • **Alert Not Valid** — The alert needs to be configured before it can be enabled.

> • **Inactive** — The conditions specified for the alert have not been met.

> • **Active** — The conditions specified for the alert have been met.

Reference: Slide 120

Radius Field: Displays the radius value from a center waypoint defining an anchor or hazard alert area. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.

Center WP Field: Displays the waypoint defining the center (position) of an anchor or hazard alert area. Field data format is XXX-NNNNNNNNNN, where X represents the waypoint number (001 through 999) and N represents the waypoint name of up to ten characters.

Reference: Slide 121

Pointer Field:

CAUTION: If the DAGR is not tracking satellites nor has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix.

Displays the current ground track and azimuth to the point of alert entry or exit (applicable to anchor, hazard, buffer zone, and corridor alerts). The compass dial rotates so the top of the dial indicates the current ground track. The arrow points in the direction of the entry/exit point (corresponding to labeling at top of field: Direction To Point of Entry or Direction to Point of Exit).

If the DAGR is moving too slow to compute track, the last known track is used and the internal compass is activated (if enabled). The bottom of the field displays HOLD LEVEL when the internal compass is in use.

Azimuth Field: Displays the azimuth to the point of entry/exit of the alert area (applicable to anchor, hazard, buffer zone, and corridor alerts). This field is used to navigate back to the point of entry/exit and cannot be edited by the operator. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks) in reference to north reference (True, Magnetic, or Grid).

Reference: Slide 122

Range Field: Displays the range to the point of entry/exit of the alert area (applicable to anchor, hazard, buffer zone, and corridor alerts). This field is used to navigate back to the point of entry/exit and cannot be edited by the operator. Field data format is XXXX.XX or XXXX.X, where X represents

miles, nautical miles, kilometers, feet, yards, or meters.

Alert When Inside/Outside Field: Displays the selected alert activation parameter as Inside or Outside (applicable to area alerts). When Inside is displayed, the alert activates when the DAGR present position is inside the defined alert area. When Outside is displayed, the alert activates when the DAGR present position is outside the defined alert area.

Waypoint Table: Displays the waypoints defining the perimeter of an area alert. Each area alert must be defined by at least three waypoints, and up to fifteen may be used. The NUM column provides the numbering of area alert waypoints (01 through 15). The Waypoint column provides selected waypoints numbers and names. Waypoint column data format is XXX-NNNNNNNNNN, where X represents a waypoint number (001 to 999), and N represents a waypoint name of up to ten characters.

NOTE: The alert is considered invalid if waypoints are near the north or south poles, or span more than 170° of longitude. Do not create overlapping area alerts.

Range From Center Line Field: Displays the range from the center line (created by WP 1 and WP 2 fields) to the outside border of a buffer zone or corridor alert. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.

WP 1 Field: Displays the first waypoint to be used for an alert (applicable to buffer zone, corridor, boundary line, and phase line alerts). Field data format is XXX-NNNNNNNNNN, where X represents the waypoint number (001 to 999), and N represents the waypoint name of up to ten characters.

WP 2 Field: Displays the second waypoint to be used for an alert (applicable to buffer zone, corridor, boundary line, and phase line alerts). Field data format is XXX-NNNNNNNNNN, where X represents the waypoint number (001 to 999), and N represents the waypoint name of up to ten characters.

Calc Type Field: Displays the method used for calculating the alert condition for buffer or corridor alerts. When using the basic function set, the method is Rhumb Line (RL).When using the advanced function set, the method is either Rhumb Line (RL) or Great Circle (GC). RL allows the alert to be set up along lines of latitude. GC allows the alert to be set up along the shortest path due to the curvature of the earth.

Position Error Limit Field: Displays the maximum range error allowed before triggering a position error alert. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.

Reference: Slide 123

Date-Time-Group Field: Displays the time and date selected for a time alert. Field data format is DDTTTTL/ZMMMYY format, where D represents day; T represents time; L/Z represents local or zulu; M represents month; and Y represents year.

Remark Field**:** Displays a remark providing information about a time alert. Remarks can consist of up to forty characters.

Reference: Slide 124

(5) Push the MENU key.

(6) Multiple options are provided. Highlight the desired option, then push the ENTER key.

  • **Save and Exit**—Briefly displays alert stored message. Display returns to the Alerts page with the new alert information saved and highlighted.

		• **Exit and No Save** — Display returns to the Alerts page without saving the alert.
		• **Edit Field** — Displays a field editor for the highlighted field.
		• **Undo Changes** — Clears any changes made and display returns to the Alert Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
	b. Copy and Paste an Alert	Reference: Slide 125
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Alerts page, highlight the desired alert to copy from, and then push the MENU key.
		(2) Highlight Copy/Clear, then push the ENTER key.
		(3) Highlight Copy Alert, then push the ENTER key.
		Reference: Slide 126
		(4) Highlight the desired alert position to copy **to**, and then push the MENU key.
		(5) Highlight Copy/Clear, then push the ENTER key.
		(6) Highlight Paste Alert, then push the ENTER key. If copying to an unused alert, a storage confirmation message is briefly displayed. If copying to a used alert, the operator is prompted for confirmation to overwrite, and a storage confirmation message is briefly displayed.
		Reference: Slide 127
		(7) The DAGR returns to the Alerts page, highlighting the alert copied to. The alert copied to has the same information as the alert copied from until information is edited.
		(8) Use the Edit an Alert procedure (b.) to change alert name or other field information if desired.
	c. Edit an Alert	Reference: Slide 128
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Alerts page, highlight the desired alert for editing, then push the ENTER key.
		(2) The Alert Editor page displays the operator selected alert.
		(3) As required, individually highlight each of the page fields and revise with user information according to the following steps.
		Reference: Slide 129
		NOTE: Some fields are for status of information only and cannot be edited by the operator.
		(a) Push the ENTER key to revise field information other than units of measure. This is done using either a text editor, number editor, or a list editor.
		Reference: Slide 130
		(b) Push the MENU key to revise units of measure or reference information of a field, if applicable. For example: If changing units for the Range field perform the following steps.
		1 Highlight the Range field, and then push the MENU key.
		2 Highlight Select Range Units, then push the ENTER key.

		3 Highlight the desired range units, then push the ENTER key.
		4 The page displays the highlighted field with the units of measure changed to the choice made.
		5 Revise other field units of measure/references as applicable.
		Reference: Slide 131
		NOTE: Multiple fields may have the same or different units of measure choices. Fields with the same units of measure (e.g., two individual fields measured in metric numbers) will both be changed at the same time no matter what field is selected.
		(4) After completing and reviewing all field content changes (with any field highlighted), push the MENU key.
		Highlight the desired selection from the following list, then push the ENTER key.
		• **Save and Exit**—Briefly displays alert stored message. Display returns to the Alerts page with the new alert information saved and highlighted.
		• **Exit and No Save** — Display returns to the Alerts page without saving the alert.
		• **Edit Field** — Displays a field editor for the highlighted field.
		• **Undo Changes** — Clears any changes made and display returns to the Alert Editor page for editing.
		• **Help** — Displays help text for the highlighted field.
NOTE:	**Conduct a check on learning.**	Reference: Slide 132
		1. When field content is undefined on the Alert Editor page what will appear?
		(ANS: Double dashes will appear.) Paragraph 8.9.1
		2. Remarks can consist of how many characters?
		(ANS: Up to forty characters.) Paragraph 8.9.3.18
	Topic Summary	Reference: Slide 133
		Introduction
		– Alerts Page Function
		– Alert Editor Page
		– Alert Types and Page Fields
		Operation
		– Create a New Alert
		•Field Descriptions
		– Copy and Paste an Alert
		– Edit an Alert
		During this topic you have learned to edit a waypoint alert on your DAGR.
		Transition Next Lesson: Now that we know the steps necessary to edit a waypoint alert, we will learn how to activate a waypoint alert.

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Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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SECTION XIII. PRESENTATION

ELO J	Reference: Slide 134 **ACTION:**	Activate a waypoint alert using the Enable or Disable Alert function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Activated a waypoint alert using the Enable or Disable Alert function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Enable or Disable An Individual Alert. Refer students to paragraph 8.9.2 e and f in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.9.2 e and f.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 134
		Operations
		    – Enable or Disable An Individual Alert
		    – Enable All or Disable All Alerts

	a. Enable or Disable An Individual Alert	Reference: Slide 135 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **NOTE:** Alerts must be defined before they can be enabled. **(1)** From the Alerts page, highlight the desired alert to enable or disable, then push the MENU key. **(2)** Highlight Enable Alert or Disable Alert, then push the ENTER key. **(3)** The DAGR returns to the Alerts page with the individual alert changed accordingly.
	b. Enable All or Disable All Alerts	Reference: Slide 136 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **NOTE:** Alerts must be defined before they can be enabled. **(1)** From the Alerts page, push the MENU key. **(2)** Highlight Enable All or Disable All, then push the ENTER key. **(3)** The DAGR returns to the Alerts page with all applicable alerts changed accordingly.

	Topic Summary	Reference: Slide 137
		•Operations
		  –Enable or Disable An Individual Alert
		  –Enable All or Disable All Alerts
		During this topic you have learned to enable/disable a waypoint alert on your DAGR.
		Transition Next Lesson: Now that we know the steps necessary to enable/disable a waypoint alert, we will learn how to delete a waypoint alert.

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SECTION XIV. PRESENTATION

ELO K	Reference: Slide 138	
	ACTION:	Delete a Waypoint Alert using the Clear Alert function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Deleted a waypoint alert using the Clear Alert function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Delete an Alert. Refer students to paragraph 8.8.2 d in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	3 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 8.8.2 d
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference: Slide 138 Operations – Clear Alerts

	Clear Alerts	Reference: Slide 139
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		(1) From the Alerts page, highlight the desired alert to clear, and then push the MENU key. If clearing more than one alert, highlighting an alert in this step is optional.
		(2) Highlight Copy/Clear, then push the ENTER key.
		Reference: Slide 140
		(3) Multiple options for clearing alerts are provided. Highlight the desired option, then push the ENTER key.
		     • **Clear Alert** — The operator is prompted for confirmation to clear the alert.
		     • **Clear Range**—Enter the clear alert from/to number range. Push the ENTER key. The operator is prompted for confirmation to clear the alerts.
		     • **Clear All** — The operator is prompted for confirmation to clear all 33 alerts.
		Reference: Slide 141
		(4) The DAGR returns to the Alerts page.
		(5) View the page to verify cleared alerts are no longer listed.

	Topic Summary	Reference: Slide 142 Operations – Clear Alerts During this topic you have learned to clear an alert from your DAGR. **Transition Next Lesson:** Now that we know the steps necessary to clear an alert, we now do a practical exercise on creating and editing an alert.

Intentionally left blank.

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SECTION XV. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 3

Reference: Slide 143

Title	Create a new alert.	
Introduction	The student shall create a new alert.	
ELO I	**ACTION:**	Set a Waypoint Alert using the Create/New Alerts function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate a DAGR and a DAGR Operator and Maintenance Manual.
	STANDARD:	Set a Waypoint Alert using the Create/New Alerts function in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Alerts page allows the operator to view, edit, and create alerts.	
Resource Requirements	DAGR receiver, External AC power cable or External DC power cable (fused, 5 meter)	
Special Instructions	None.	
Student assignment	Create a new alert.	

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Procedures	**Performance Measures:**		

Task Name: Create a new alert:	GO	NO GO
Create a New Alert: **(1)** From the Alerts page, highlight the desired new alert number, or if the highlighted alert is not changed, the first unused alert number will be automatically be used. **(2)** Push the MENU key. **(3)** Highlight Create/New, then push the ENTER key. **(4)** The Alert Editor page displays the first unused alert (up to 33 alerts can be created) if no alert was previously selected or the operator selected alert. Revise information as necessary using standard editing techniques. **(5)** Push the MENU key. **(6)** Multiple options are provided. Highlight the desired option, then push the ENTER key. • **Save and Exit**—Briefly displays alert stored message. Display returns to the Alerts page with the new alert information saved and highlighted. • **Exit and No Save** — Display returns to the Alerts page without saving the alert. • **Edit Field** — Displays a field editor for the highlighted field. • **Undo Changes** — Clears any changes made and display returns to the Alert Editor page for editing. • **Help** — Displays help text for the highlighted field.	___	___

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.

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Lesson Plan 4 - Set Waypoints, Routes, and Alerts

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SECTION XVI. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 144-146 During this lesson you have learned to how to create and edit a waypoint, create and edit a route, and create and edit an alert on your DAGR.	
Transition Next Lesson	Now that we know the steps necessary to create a waypoint, route, and alert, we will learn how setup communications.	

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SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			

Task(s) Taught or Supported	Task Number	Task Title			
	113-005	Setup Communications.			

Task(s) Reinforced	Task Number	Task Title			
	None				

Academic Hours — The academic hour(s) required to teach this lesson are as follows:

	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	1:20				
Practical Exercise	0:20				
Test	0:00				
Total Hours	1:40				

Test Lesson Number	Testing	Hours	Lesson No.
			113-007

Prerequisite Lesson(s)	Lesson Number	LESSON TITLE
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform DAGR Self-Test Function
	113-003	Adjust DAGR Receiver Default Settings to User Settings
	113-004	Set Waypoints, Routes, and Alerts.

Security Clearance/Access	None.

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

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References	Number	Title	Date	Additional Information
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna will be required to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used. This lesson assumes all DAGRs are set to "advanced" functions during an earlier lesson.			
Additional Support Personnel Requirements	None			
Equipment Required	DAGR receiver, DAGR to DAGR data cable assembly, crypto keyfill cable, SINCGARS cable Optional: DAGR/AC Power Cable, KYK-13 or AN/CYZ-10.			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan five, PowerPoint slides (DAGR_PPT_113_005.ppt).		
	Student Materials	DAGR Operator and Maintenance technical manual, lesson five student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	None.		
Ammunition Requirements	None.			
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material. The KYK-13 practical exercise may be deleted if a KYK-13 is not available.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

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SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint: DAGR_PPT_113_005.ppt
Motivator	Reference: Slide 1 "In some cases the Department of Defense will deliberately degrade all GPS satellite output, causing all non-encrypted GPS receivers to become inaccurate. In this situation, the only people who will accurately know their location will be those who have the correct crypto variable keys installed. Failure to correctly fill your DAGR may result in your unit getting lost or destroyed by enemy fire."	
Terminal Learning Objective	Reference: Slide 2	
	ACTION:	Setup Communications.
	CONDITION;	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Setup Communications in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	The Communications submenu of the DAGR enables the user to setup individual pages of the DAGR including crypto fill, data transfer, COM port setup, and SINCGARS timing signals.	

SECTION III. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

ELO A	Reference: Slide 3	
	ACTION:	Load CV Keys.
	CONDITION:	Given a DAGR receiver, KYK-13 or AN/CYZ-10, crypto keyfill cable, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Loaded CV Keys in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the Crypto Fill Page. Refer students to paragraph 7.2 through 7.2.2.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	30 Minutes
	Media:	PowerPoint: DAGR_PPT_113_005.ppt
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Paragraph 7.2 through 7.2.3
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 3
		Introduction
		    - Crypto Fill Page
		    - Field Descriptions
		Operations
		    - Load Crypto Variable with a KYK-13
		    - Load Crypto Variable with a AN/CYZ-10

	a. Page Function	Reference: Slide 4 **CAUTION:** Only DAGRs loaded with crypto variable keys should be used for combat operations. Without crypto keys, DAGR cannot compensate for selective availability (SA) errors, cannot read encrypted signals, and has no protection against spoofing. Not having crypto keys loaded could result in mission failure. • When classified waypoints are stored in the DAGR, the DAGR is classified at the same level as the waypoints. **NOTE:** Installing crypto keys does not create a classified DAGR.
		Reference: Slide 5 **(a)** The Crypto Fill page is accessed from the Receiver Setup submenu, or by using the Status key and Receiver Status menu. The Crypto Fill page provides capability to view current status of crypto variable (CV) keys and load new CV keys. CV keys are loaded into the DAGR to provide the best position and time accuracy information, and also increase protection from jamming and spoofing. CV keys are loaded into the DAGR using either the crypto key loading interface or the receiver keypad. Operator entered keys are decimal CV keys (Red) or hexadecimal CV keys (Red and Black). Mission duration is entered for CV types and BCVm (black CV monthly) to let the operator know if enough CVs are loaded to

		complete the mission. Use the Status key to check CV keys that are loaded.
		(b) The Mission Duration and Days Remaining With CVs fields do not appear when loaded with only a group unique variable (GUV) key or not loaded with CVw or BCVm keys. The DAGR notifies the operator and requires operator confirmation when not enough CV keys are loaded for remaining days of mission duration.
		(c) At certain times, the Control Segment of the GPS system causes the satellites to transmit false data to the users called Selective Availability (SA). To compensate for this, the receiver uses crypto keys to correct the false data and provide full accurate performance. Some signals transmitted by the satellites are encrypted to deny certain users the reception of those signals called Anti-Spoofing (A-S). Loading crypto keys allows the DAGR to receive those signals.
	b. Crypto Key Entry using the KYK-13	Reference: Slide 6 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Vertical scrolling is used to view all page fields. Field information contained in this page is changed using various editor techniques. The following information describes the procedure and various fields contained in this page. **1.** From any display (except a message pop-up), push the MENU key twice to display the Main Menu. **2.** Highlight Receiver Setup, then push the ENTER key. **3.** Highlight Crypto Fill, then push the ENTER key. The Crypto Fill page is displayed. **(1)** Connect the KYK-13 to the J1 connector on the DAGR using the crypto keyfill cable. Reference: Slide 7 **(2)** From the Crypto Fill page, highlight the CV Loading Interface field. Push the ENTER key. **(3)** Highlight DS-102, then push the ENTER key. **CV Loading Interface field:** Displays the CV status as follows: • **DS-101** — Provides CV key loading from an AN/CYZ-10 in RS-232D mode. Also used to load key data processor (KDP) initialization parameters. • **DS-102** — Provides CV key loading from a KYK-13, KOI-18, or AN/CYZ-10 in DS-102 mode. Reference: Slide 8 **(4)** Set the KYK-13 selector switch to the position that contains the crypto key. **(5)** Set the KYK-13 mode switch to ON. **NOTE:** As long as the KYK-13 switch is ON, The KYK-13 repeatedly pulses the crypto key into the DAGR. Each time the crypto key is successfully pulsed to the DAGR, the light on the KYK-13 will flash (for red key only).

Reference: Slide 9

(6) Set the KYK-13 mode switch to OFF after at least one KYK-13 flash has been observed (for red key only). Disconnect the KYK-13 and cable from the DAGR.

CV Status Field Displays the CV status as follows:

- **No CV Keys Loaded** — Indicates no CV keys are loaded.
- **Have Today's CV Key** — Indicates the DAGR has a valid CV loaded for present day.
- **No CV Key for Today** — Indicates the DAGR has a valid CV loaded, but not for present day.
- **Waiting for SV Info** —Indicates the DAGR has a group unique variable (GUV) loaded, but has not collected SV (Satellite Vehicle) data. Leave the receiver in a tracking mode, and wait up to 15 minutes to verify the GUV has been collected.

Reference: Slide 10

(7) Acknowledge any DAGR messages and observe the CV Status field on the Crypto Fill page.

NOTE: For each valid and complete red crypto key pulse received from the KYK-13, the DAGR will generate a successful key load message. If the DAGR receives an incomplete pulse, the DAGR generates a warning message (Invalid CV Loaded). Since the KYK-13 repeatedly pulses the crypto key to the DAGR, the user may accidentally interrupt the last crypto key pulse by setting the KYK-13 mode switch to OFF while a key is being sent. In this event, the DAGR will generate a warning message (Invalid CV Loaded) to indicate that a partial key load has been received.

Reference: Slide 11

NOTE: Describe the use of the following fields before proceeding

Mission Duration Field: Displays the quantity of days remaining for the mission (0 to 84 days). This field does not appear when only using a GUV key, or when no CVw or BCVm keys are loaded.

Days Remaining With CVs Field: Displays the quantity of remaining days (within a range of 0 to 84 days) CV keys have been loaded into the DAGR. The first day starts with the present day. This field does not appear when only using a GUV key, or when no CVw or BCVm keys are loaded. If there are not enough CV keys loaded for the duration of the mission, DAGR notifies the operator.

Active Cryptonet Code Field: Displays the cryptonet code currently in use for black key processing. Field data format is XXXX, where X represents a four digit hexadecimal code. During operation, if monthly rollover is about to occur, you must have this month's BCVm and next month's BCVm loaded into the DAGR. If you are a GUV user, you don't need to load any other key into the receiver.

Primary Cryptonet Code Field: Displays the cryptonet code installed when the key data processor (KDP) was loaded. Field data format is XXXX, where X represents a four digit hexadecimal code.

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	Conduct a check on learning.	Reference: Slide 12 **1.** What does the Crypto Fill Page display? (ANS: Current status of crypto variable (CV) keys. Para 7.2.1). **2.** What does CV stand for? (ANS: Crypto variables. Para 7.2.1). **3.** What CV interface code is required for using the KYK-13? (ANS. DS-102 is required when using the KYK13. Para 7.2.3.1.c).

	a. Crypto Key Entry using the AN/CYZ-10	Reference: Slide 13
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		    1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		    2. Highlight Receiver Setup, then push the ENTER key.
		    3. Highlight Crypto Fill, then push the ENTER key. The Crypto Fill page is displayed.
		NOTE: The following procedure applies to red keys only.
		(1) From the Crypto Fill page, highlight the CV Loading Interface field. Push the ENTER key.
		(2) Highlight DS-101, then push the ENTER key.
		(3) Connect the crypto keyfill cable to the J1 connector on the DAGR. Do not connect the crypto keyfill cable to the AN/CYZ–10 until instructed by this procedure.
		Reference: Slide 14
		NOTE: The following steps refer to the AN/CYZ-10 unless specified otherwise.
		(4) Power the AN/CYZ-10 on (if not already powered on). The display shows SOI RADIO SUPERVISOR.
		(5) Select RADIO from the display.
		(6) Display shows SETUP COMSEC TIME. Select COMSEC from the display.
		Reference: Slide 15
		(7) Display shows VG LD RV AK MK VU. Select LD from the display.
		(8) Display shows TEK KEK. Select TEK from the display.
		(9) Push the PgDN or PgUP keys, as required, to view the desired key, then push the ENTR key.
		Reference: Slide 16
		NOTE: While performing the following steps, ignore all display instructions relating to an RT.
		 (10) Display shows QUIT (Key Name/Number) XMT. Select QUIT from the display.
		(11) Display shows CONNECT ANCD TO RT (WAIT) (↓). Push the down arrow key (↓).
		(12) Display shows PRESS (LOAD) ON RT. Connect the crypto keyfill cable to the AN/CYZ-10. The crypto key is automatically loaded into the DAGR.
		Reference: Slide 17
		(13) Acknowledge any DAGR messages and observe the CV Status field on the Crypto Fill page.
		(14) After the key is loaded, disconnect the crypto keyfill cable from the AN/CYZ-10 and the DAGR.

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SECTION IV. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference: Slide 18

Title	Load CV with a KYK-13	
Introduction	The student shall use a KYK-13 provided by the instructor to load CV keys.	
ELO A	**ACTION:**	Load CV Keys.
	CONDITION:	Given a DAGR receiver, KYK-13, crypto keyfill cable, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Loaded CV Keys in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Crypto fill page is used to ensure the DAGR is ready to receive a crypto variable (CV) and to determine the status of loaded CV (s).	
Resource Requirements	DAGR, KYK-13, and crypto keyfill cable	
Special Instructions	Crypto loading devices with CV are classified equipment. Ensure the devices are accounted for at all times. When classified waypoints are stored in the DAGR, the DAGR is classified at the same level as the waypoints.	
Student assignment	Connect and load CV keys into your DAGR receiver.	

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Procedures	**Performance Measures:**		
	Task Name: Load DAGR with CV	**GO**	**NO GO**

	Load CV with KYK-13.
	The student successfully loads a CV, or uses the correct procedure if no CV is available.
	    1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
	    2. Highlight Receiver Setup, then push the ENTER key.
	    3. Highlight Crypto Fill, then push the ENTER key. The Crypto Fill page is displayed.
	c. Crypto Key Entry using the KYK-13
	    (1) Connect the KYK-13 to the J1 connector on the DAGR using the crypto keyfill cable.
	    (2) From the Crypto Fill page, highlight the CV Loading Interface field. Push the ENTER key.
	    (3) Highlight DS-102, then push the ENTER key.
	    (4) Set the KYK-13 selector switch to the position that contains the crypto key.
	    (5) Set the KYK-13 mode switch to ON.
	    (6) Set the KYK-13 mode switch to OFF after at least one KYK-13 flash has been observed (for red key only). Disconnect the KYK-13 and cable from the DAGR **.**
	    (7) Acknowledge any DAGR messages and observe the CV Status field on the Crypto Fill page.
		____	____

	Load CV with AN/CYZ-10. **NOTE:** The following procedure applies to red keys only. **(1)** From the Crypto Fill page, highlight the CV Loading Interface field. Push the ENTER key. **(2)** Highlight DS-101, then push the ENTER key. **(3)** Connect the crypto keyfill cable to the J1 connector on the DAGR. Do not connect the crypto keyfill cable to the AN/CYZ–10 until instructed by this procedure. **NOTE:** The following steps refer to the AN/CYZ-10 unless specified otherwise. **(4)** Power the AN/CYZ-10 on (if not already powered on). The display shows SOI RADIO SUPERVISOR. **(5)** Select RADIO from the display. **(6)** Display shows SETUP COMSEC TIME. Select COMSEC from the display. **(7)** Display shows VG LD RV AK MK VU. Select LD from the display. **(8)** Display shows TEK KEK. Select TEK from the display. **(9)** Push the PgDN or PgUP keys, as required, to view the desired key, then push the ENTR key. **NOTE:** While performing the following steps, ignore all display instructions relating to an RT. **(10)** Display shows QUIT (Key Name/Number) XMT. Select QUIT from the display. **(11)** Display shows CONNECT ANCD TO RT (WAIT) (↓). Push the down arrow key (↓). **(12)** Display shows PRESS (LOAD) ON RT. Connect the crypto keyfill cable to the AN/CYZ-10. The crypto key is automatically loaded into the DAGR.	____	____

	(13) Acknowledge any DAGR messages and observe the CV Status field on the Crypto Fill page. **(14)** After the key is loaded, disconnect the crypto keyfill cable from the AN/CYZ-10 and the DAGR.until instructed by this procedure.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

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SECTION V. SUMMARY

Reference: Slide 19

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	1 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 19 You have learned to load CV keys with the KYK-13 and AN/CYZ-10.	
Transition Next Lesson	Now that you know the steps necessary to load CV Keys into the DAGR receiver, you will learn how to transfer data to/from a DAGR receiver.	

SECTION VI. PRESENTATION

ELO B	Reference: Slide 20	
	ACTION:	Set COM Port Setup page.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Set COM Port Setup page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the COM Port Setup page. Refer students to paragraph 11.3.1 through 11.3.2.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint: DAGR_PPT_113_005.ppt
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Paragraphs: 11.3.1 through 11.3.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference: Slide 20 Introduction – COM Port Setup Page – Field Descriptions Operations – COM Port Setup Page Configuration using advanced function set

	a. Page Function	Reference: Slide 21
		(a) The COM Port Setup page is accessed from the Communications submenu. The COM Port Setup page is used to configure the COM1, COM2, and COM3 data interface ports. COM Port 1 and COM Port 2 are accessed from DAGR connector J2. COM Port 3 is accessed from DAGR connector J1. Configuration can be set for the COM 2 port to operate redundant of the COM 1 port. Using the basic function set, the operator cannot change the COM port settings from the DAGR keypad. The standard configuration is as follows:
		• **Protocol** — ICD-153
		• **In/Out Baud** — 9600
		• **In/Out Parity** — None
		(b) When in the standard configuration, the configuration field displays Standard. It is possible to change the COM port settings over the serial port. When this has occurred, the configuration field displays Custom. The operator can reset the configuration back to Standard from the page menu. The Operator ID is edited to a unique self identifying value.
		(c) When using the advanced function set, all fields are viewed using vertical scrolling. Each COM port protocol, baud rate, and parity can be independently configured. The current COM port being edited is displayed at the top of the second and third page views. Change the COM field to edit a different COM port.
		(d) When configured for National Marine Electronics Association (NMEA), the operator must select which NMEA sentences to output as well as the NMEA Interval (rate the data is output) and the NMEA Node ID (only needed for the STN NMEA sentence). The DAGR supports the following protocols:
		• Input and Output ICD-153
		• Output NMEA (Advanced)
		• Input DGPS Corrections (Advanced)
	b. Field Descriptions	Reference: Slide 22
		Vertical scrolling is used to view all page fields. Field information contained in this page is changed using various editor techniques. The following information describes the various fields contained in this page.
		Configuration Field: Displays Standard when all data interface parameters are set to standard (default) configuration values, otherwise, Custom is displayed. To fully configure data interface parameters requires use of the advanced function set. Table 11-1 provides a listing of Standard configuration values.
		Operator Identifier Field: Displays the operator identifier as a unique ten character self identifying value. Up to eleven operator IDs can be input and stored. Any changes made to the field content or stored operator IDs will also change the Present Position page Operator ID field.
Note:	**Conduct a check on learning.**	Reference: Slide 23
		1. COM Port 1 and COM Port 2 are accessed from what connector?
		(ANS: Connector J2.) Paragraph 11.3.1
		2. What does the Out Protocol Field (Advanced) display?
		(ANS. Displays the protocol as ICD-153 or NMEA, used to output data.) Paragraph 11.3.2.6.

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SECTION VII. SUMMARY

Reference: Slide 24

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 24 You have learned to set the COM Port Setup page.	
Transition Next Lesson	Now that you know the steps necessary to configure the COM Port Setup page, you will learn how to transfer data to/from a DAGR receiver.	

SECTION VIII. PRESENTATION

ELO C	Reference: Slide 25 **ACTION:**	Transfer data.
	CONDITION:	Given a DAGR receiver, DAGR to DAGR data cable assembly, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Transferred data in accordance with the DAGR Operator and Maintenance Manual.
	Motivator:	Some mission will require multiple DAGRs; each programmed with the same mission data. The data transfer procedure allows you to program one DAGR and then transfer all or part of that data to another DAGR.
Learning Step/Activity 1	Identify the Data Transfer page. Refer students to paragraph 11.2.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	17 Minutes
	Media:	PowerPoint: DAGR_PPT_113_005.ppt
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Paragraph 11.2 through 11.2.3.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Summary	Reference: Slide 25 Introduction - Data Transfer Page - Field Descriptions Operations - DAGR to DAGR Information Transfer (Advanced Function Set)

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	a. Capabilities	Reference: Slide 26
		
		Data transfer possibilities include:
		
		   a. DAGR to DAGR Information Transfer (Basic Function Set)
		
		   b. DAGR to DAGR Information Transfer (Advanced Function Set)
		
		   c. DAGR (Basic Function Set) to PLGR Information Transfer
		
		   d. DAGR (Advanced Function Set) to PLGR Information Transfer
		
		   e. PLGR to DAGR (Basic Function Set) Information Transfer
		
		   f. PLGR to DAGR (Advanced Function Set) Information Transfer

	b. Page Function	Reference: Slide 27 **NOTE:** Operator changes to Data Transfer page field content are not saved if the DAGR power is cycled off and on. The Data Transfer page is accessed from the Communications submenu. The Data Transfer page is used to transfer selected data from the DAGR over a selected receiver port. Data set selections for transfer are listed in the Data To Transfer field. The From WP and To WP fields are disabled (appear light gray) when the selected set of data to transfer does not include waypoints.

	c. DAGR to DAGR Data Transfer Procedure (Advanced Functions)	Reference: Slide 28
		
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		(1) Connect both DAGRs together with the DAGR to DAGR data cable assembly using the J2 external connector on both units.
		
		(2) Push the PWR key to set power ON for both DAGRs. Acknowledge power-on status display if required.
		
		Reference: Slide 29
		
		(3) Set both DAGRs to use the Advanced Function Set.
		
		Reference: Slide 30
		
		(4) On both DAGRs, from the main menu, highlight Communications. Push the ENTER key. Highlight COM Port Setup, then push the ENTER key.
		
		(5) On the COM Port Setup page of both DAGRs, set the COM field to COM Port 1.
		
		(6) On the COM Port Setup page of both DAGRs, set the Configuration field to Standard.
		
		Reference: Slide 31
		
		(7) On the sending DAGR, push the PAGE key to access the Data Transfer page.
		
		(8) On the Data Transfer page of the sending DAGR, set the COM Port field to COM Port 1.
		
		   (a) Highlight the COM Port field, then push the ENTER key.
		
		   (b) Highlight COM Port 1, then push the ENTER key.
		
		Reference: Slide 32
		
		(9) On the Data Transfer page of the sending DAGR, set the Mode field to DAGR.
		
		   (a) Highlight the Mode field, then push the ENTER key.

(b) Highlight DAGR, then push the ENTER key.

COM Port Field: Displays the COM port for data transfer. Operator choices are COM Port 1, COM Port 2, or COM Port 3.

Mode Field: Displays type of data format to output. Choices are PLGR and DAGR.

Reference: Slide 33

(10) On the Data Transfer page of the sending DAGR, select the type of data to be sent in the Data To Transfer field.

(a) Highlight the Data To Transfer field, then push the ENTER key.

(b) Highlight the desired selection, then push the ENTER key.

NOTE: If transferring waypoint data, use standard editing practices to set the From WP and To WP fields to the appropriate range of waypoints needed, otherwise all 999 waypoints will be transferred.

Reference: Slide 34

Data To Transfer Field: Displays the data set to output. Choices are as follows:

• **All Data** — All available data (Waypoint (WP)/Mission Data, Satellite (SV)/POS/Time Data, Setup Data, Display Setup, Position Report, User Datum's, and User Grids).

• **WP/Mission Data** — Waypoints, alerts, remarks, routes, and bullseye setup.

• **SV/POS/Time Data** — Satellite data, PVT (position, velocity (ground speed), and time) initialization data, and UTC time.

• **Setup Data** — Units of measure and COM port setup.

• **Display Setup** — Custom navigation pages, custom page sets, and situational awareness setup.

• **Position Report** — Position data.

• **User Datum's**—Datum's.

• **User Grids** (Advanced)—Grids.

• **From WP Field:** Displays the number of the first waypoint to be transferred. Used with the To WP field to establish a waypoint range. Field data format is XXX, where X represents the waypoint number.

• **To WP Field:** Displays the number of the last waypoint to be transferred. Used with the From WP field to establish a waypoint range. Field data format is XXX, where X represents the waypoint number.

Reference: Slide 35

(11) On the Data Transfer page of the sending DAGR, push the MENU key, and then highlight Start Data XFR. Push ENTER key to initiate the data transfer process.

Reference: Slide 36

(12) Messages will show on both DAGR displays indicating the data transfer is starting, in progress, complete, aborted, or failed. Follow instructions on display.

(13) When data transfer is complete, perform one of the following:

(a) Set power to off on both pieces of equipment (push and hold DAGR PWR key). Remove the data cable assembly.

		Reference: Slide 37 (b) Disconnect the data cable assembly and perform other DAGR operations as desired. **NOTE:** To prevent an unintended DAGR power down when disconnecting the data cable, do not allow the cable shield to contact any connector pins. After disconnecting the cable, verify a power down message is not displayed. If a power down message is displayed, push the QUIT key to cancel the power down.

NOTE:	**Conduct a check on learning.**	Reference: Slide 38
		
		1. What is the Data Transfer Page used for?
		   (ANS: To transfer selected data from the DAGR over a selected receiver port.) Paragraph 11.2.1
		2. What does the Mode Field display?
		   (ANS. Displays type of data format to output.) Paragraph 11.2.2.2
		3. What should be set in the Mode Field during DAGR to DAGR transfer?
		   (ANS. Set to PLGR III or DAGR.) Paragraph 11.2.3.1

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SECTION IX. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 2

Reference: Slide 39

Title	Setup Communications.	
Introduction	The student shall setup Communications for the DAGR receiver.	
ELO C	**ACTION:**	Transfer data.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Transferred data in accordance with the DAGR Operator and Maintenance Manual.
	Paragraphs 11.2 through 11.2.3.1	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Performance examination: One practical exercise. Written examination: None.	
Resource Requirements	Two DAGRs, DAGR to DAGR data cable assembly	
Special Instructions	Student will connect two DAGR receivers and perform the data transfer procedure of all data.	

Procedures	**Performance Measures:**		
	Task Name: Transfer data.	**GO**	**NO GO**
	Set DAGR transfer to Setup Data: DAGR to DAGR Information Transfer (Advanced Function Set): **(1)** Connect both DAGRs together with the DAGR to DAGR data cable assembly using the J2 external connector on both units. **(2)** Push the PWR key to set power ON for both DAGRs. Acknowledge power-on status display if required. **(3)** Set both DAGRs to use the Advanced Function Set. **(4)** On both DAGRs, from the main menu, highlight Communications. Push the ENTER key. Highlight COM Port Setup, then push the ENTER key.	‗‗‗	‗‗‗

	(5) On the COM Port Setup page of both DAGRs, set the COM field to COM Port 1.			
	(6) On the COM Port Setup page of both DAGRs, set the Configuration field to Standard.			
	(7) On the sending DAGR, push the PAGE key to access the Data Transfer page.			
	(8) On the Data Transfer page of the sending DAGR, set the COM Port field to COM Port 1.			
	(a) Highlight the COM Port field, then push the ENTER key.			
	(b) Highlight COM Port 1, then push the ENTER key.			
	(9) On the Data Transfer page of the sending DAGR, set the Mode field to PLGR III.			
	(a) Highlight the Mode field, then push the ENTER key.			
	(b) Highlight PLGR-III, then push the ENTER key.			
	(10) On the Data Transfer page of the sending DAGR, select the type of data to be sent in the Data To Transfer field.			
	NOTE: If transferring waypoint data, use standard editing practices to set the From WP and To WP fields to the appropriate range of waypoints needed, otherwise all 999 waypoints will be transferred.)			
	(a) Highlight the Data To Transfer field, then push the ENTER key.			
	(b) Highlight the desired selection, then push the ENTER key.			
	(11) On the Data Transfer page of the sending DAGR, push the MENU key, and then highlight Start Data XFR. Push ENTER key to initiate the data transfer process.			
	(12) Messages will show on both DAGR displays indicating the data transfer is starting, in progress, complete, aborted, or failed. Follow instructions on display.			
	(13) When data transfer is complete, perform one of the following:			
	(a) Set power to off on both pieces of equipment (push and hold DAGR PWR key). Remove the data cable assembly. (b) Disconnect the data cable assembly and perform other DAGR operations as desired. **NOTE:** To prevent an unintended DAGR power down when disconnecting the data cable, do not allow the cable shield to contact any connector pins. After disconnecting the cable, verify a power down message is not displayed. If a power down message is displayed, push the QUIT key to cancel the power down.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

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SECTION X. SUMMARY

Reference: Slide 40

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 40 You have learned how to transfer data to/from the DAGR.	
Transition Next Lesson	Now that we know the steps necessary to set the COM Setup page, we will learn how to set the PPS, HQ SINCGARS page to send a timing signal to a SINCGARS radio.	

SECTION XI. PRESENTATION

ELO D	Reference: Slide 41 **ACTION:**	Send timing signals to a SINCGARS radio.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR and a DAGR Operator Maintenance Manual or pocket guide.
	STANDARD:	Send CINGARS radio timing signals in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the PPS, HQ, SINCGARS page. Refer students to paragraph 11.4.1 through 11.4.2.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint: DAGR_PPT_113_005.ppt
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Paragraph 11.4 through 11.4.3
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 41
		 Introduction
		     – PPS, HQ,SINCGARS Page
		     – Field Descriptions
		 Operations
		     – Synchronize DAGR with another device
		       • Send timing signal to SINCGARS radio

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	a. Page Function	Reference: Slide 42 The PPS (Pulse-Per-Second), HQ (Have Quick), SINCGARS (Single Channel Ground and Airborne Radio System) page is accessed from the Communications submenu. This page provides time outputs from the DAGR used to synchronize radios or other devices. **NOTE:** COM port 1 and COM port 2 are accessed from DAGR connector J2. COM port 3 is accessed from DAGR connector J1.
	b. Page Description	Reference: Slide 43 **COM 1/2 PPS Mode Field:** Displays the type of pulse per second (PPS) mode used for the COM 1 and COM 2 PPS sync selection output. The PPS time pulse output data is associated with COM 1, COM 2, or both COM 1 and COM 2 simultaneously. Selections are: 　• **Off** 　• **1-PPS UTC (time downloaded from satellite)** 　• **1-PPS Time Mark (time from DAGR internal clock)** 　• **10-PPS UTC (time downloaded from satellite)** **COM 1/2 PPS Sync Field:** Displays the port selected for outputting PPS time outputs (of the COM 1 and COM 2 PPS Mode). Selections are: 　• **COM 1** 　• **COM 2** 　• **COM 1and COM 2** **COM 3 PPS Mode Field:** Displays the type of PPS mode used for the COM 3 PPS sync selection output. Selections are: 　• **Off** 　• **1-PPS UTC** 　• **1-PPS Time Mark** 　• **10-PPS UTC** **Have Quick Mode Field:** Displays the Have Quick mode status as On or Off. When Have Quick mode is set to On, the DAGR performs timefill (outputs current time of day). The timefill is output on DAGR J2 connector. Before the timefill output can occur, the time figure of merit (TFOM) field must have a value of 7 or less. **TFOM Field:** Displays the time error as time figure of merit (TFOM) number (1 through 9) where 1 is best. This field is for status only and not editable by the operator. This is a measure of how accurate the DAGR is at that moment.
	c. Synchronize DAGR With Another Device	Reference: Slide 44 **NOTE:** All fields use a list editor for revising field information, except for the TFOM field which is for status information only and is not edited. **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. 　**a.** From the PPS, HQ, SINCGARS page, push the ENTER key to highlight a field. 　**b.** Scroll to highlight the desired field, then push the ENTER key for edit capabilities. Reference: Slide 45 　**c.** Revise the selected field with appropriate information. 　**d.** Use the cursor control keys and the ENTER key in a similar manner to select and individually revise all of the remaining fields as required.

		Reference: Slide 46
		e. When all fields are revised with appropriate information, push the MENU key.
		Reference: Slide 47
		f. Connect DAGR to external equipment and ensure external equipment is powered on before activating the SINCGARS function.
		NOTE: The DAGR is connected to external using the applicable cable as follows:
		• SINCGARS - PLGR/SINCGARS cable adapter connected to DAGR J1.
		• HAVE QUICK - DAGR/HAVE QUICK cable connected to DAGR J2.
		• PPS - DAGR/DAGR/PLGR cable connected to DAGR connector J2.
		g. Highlight Activate SINCGARS, then push the ENTER key and follow display instructions and messages.
NOTE:	**Conduct a check on learning.**	Reference: Slide 48
		1. What does the PPS, HQ, SINCGARS page provide?
		(ANS: Provides time outputs from the DAGR used to synchronize radios or other devices.) Paragraph 11.4.1
		2. What does the COM 1 / 2 PPS Mode Field display?
		(ANS. Displays the port selected for outputting PPS time outputs (of the COM 1 and COM 2 PPS Mode).) Paragraph 11.4.2.2
	Topic Summary	Reference: Slide 49
		• PPS, HQ,SINCGARS Page
		• Field Descriptions
		•Operations
		– Synchronize DAGR with another device
		You have now learned to synchronize the DAGR with another device and send a timing signal to a SINCGARS radio.
		Transition to Practice Exercise: You will now be able to demonstrate how to adjust the synchronize the DAGR with another device.

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SECTION XII. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 3

Reference: Slide 50

Title	Setup Communications.	
Introduction	The student shall send timing signals to a SINCGARS radio.	
ELO D	**ACTION:**	Send timing signals to a SINCGARS radio.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR and a DAGR Operator Maintenance Manual or pocket guide.
	STANDARD:	Send timing signals to a SINCGARS radio in accordance with the DAGR Operator and Maintenance Manual.
	Paragraph 11.4.3.1	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Communications submenu of the DAGR enables the user to setup individual pages of the DAGR including crypto fill, data transfer, COM port setup and PPS, HQ, SINCGARS.	
Resource Requirements	DAGR	
Special Instructions	Have each Student connect the DAGR to a SINCGARS radio and perform the procedure. When a radio is not available, the student will connect the cable to the correct port and follow all procedures until the student gets a message "Can not communicate with radio."	

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Procedures	**Performance Measures:**		
	Task Name: Set PPS, HQ, SINCGARS, page.	**GO**	**NO GO**
	Synchronize DAGR With Another Device: **NOTE:** All fields use a list editor for revising field information, except for the TFOM field which is for status information only and is not edited. 　　**a.** From the PPS, HQ, SINCGARS page, push the ENTER key to highlight a field. 　　**b.** Scroll to highlight the desired field, then push the ENTER key for edit capabilities. 　　**c.** Revise the selected field with appropriate information. 　　**d.** Use the cursor control keys and the ENTER key in a similar manner to select and individually revise all of the remaining fields as required. 　　**e.** When all fields are revised with appropriate information, push the MENU key. 　　**f.** Connect DAGR to external equipment and ensure external equipment is powered on before activating the SINCGARS function. **NOTE:** The DAGR is connected to external using the applicable cable as follows: 　• SINCGARS - PLGR/SINCGARS cable adapter connected to DAGR J1. 　• HAVE QUICK - DAGR/HAVE QUICK cable connected to DAGR J2. 　• PPS - DAGR/DAGR/PLGR cable connected to DAGR connector J2. 　　**g.** Highlight Activate SINCGARS, then push the ENTER key and follow display instructions and messages.	___	___
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.		

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SECTION XIII. LESSON SUMMARY

Reference: Slide 51

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 57 You have now learned how to set up the DAGR with other equipment including crypto fill, data transfer, COM port setup, and sending SINCGARS timing signals.	
Transition Next Lesson	Now that we know the steps necessary to set the DAGR communications, we will learn how to navigate a course during the next lesson.	

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Lesson Plan 6-Navigate A Course

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SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	**Navigate A Course**			
Task(s) Taught or Supported	**Task Number**	**Task Title**			
	113-006	Navigate A Course			
Task(s) Reinforced	**Task Number**	**Task Title**			
	None				

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	0:62				
Practical Exercise	0:45				
Test	0:00				
Total Hours	1:47				

Test Lesson Number	Testing		**Hours**	**Lesson No.**	

Prerequisite Lesson(s)	**Lesson Number**	**LESSON TITLE**
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform DAGR Operational Checkout Procedure
	113-003	Adjust DAGR Receiver Default Settings to User Settings
	113-004	Set Waypoints, Routes, and Alerts.
	113-005	Set Up Communications.

Security Clearance/Access	
Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

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References	Number	Title	Date	Additional Information
	523-xxxxxxx	OPERATOR AND MAINTENANCE MANUAL FOR DEFENSE ADVANCED GPS RECEIVER (DAGR)	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna will be required to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.			
Additional Support Personnel Requirements	None			
Equipment Required	DAGR receiver, External AC power cable or External DC power cable External Power (fused, 5 meter)			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan six, PowerPoint slides (DAGR_PPT_113_006.ppt).		
	Student Materials	DAGR Operator and Maintenance technical manual, lesson six student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	The outdoor training area will have applicable landmarks for navigation exercise. DAGRs will be preloaded as required with waypoints and routes.		
Ammunition Requirements	None			
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 6-Navigate A Course

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SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 "Use the DAGR receiver to perform navigation to avoid the enemy, hazards, and accomplish the mission."	
Terminal Learning Objective	Reference: Slide 2 **ACTION:**	Navigate a Course.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual.
	STANDARD:	Navigate a course in accordance with the DAGR Operations and Maintenance Manual within the time allotted by the instructor.
Safety Requirements	None	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	The outdoor practical evaluation has to be in an environment best suitable to acquire satellites, i.e. objects such as buildings hinder satellite reception and need to be considered when using the equipment in an operational environment. Students will learn what best practices can be performed to acquire satellites if their tactical environment changes. It is unnecessary to damage the environment during this training.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	This lesson includes information necessary to navigate a course in accordance with the operator's individual needs.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 6-Navigate A Course

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SECTION III. PRESENTATION

Note: Inform the students of the Enabling Learning Objective requirements.

ELO A	Reference: Slide 3 **ACTION:**	Navigate a course using Direct To navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Navigated a course using Direct To navigation function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the NAV Setup, NAV Pointer, and NAV Display pages.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	15 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual. Date: 30/05/2003 Paragraph: 9.2 through 9.2.2.13, 9.3 through 9.3.2.4, and 9.4 through 9.4.3.21
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 3
		Navigation
		
		  - Introduction
		    NAV Setup Page
		    NAV Displays
		    NAV Pointer Page
		Operation
		  - Set the Direct To Navigation Function
		    Configure Direct to Navigation
		    Perform Direct to Navigation

	a. NAV Setup Page	Reference: Slide 4 The NAV Setup page is accessed from the Navigation submenu. The NAV Setup page displays and allows selection of the current navigation (NAV) method and associated fields. The chosen navigation method determines which associated fields are displayed. Menu and editor selections are used to select the desired navigation method and configure the items associated with the navigation method. **NOTE:** When using the advanced function set with a navigation method other than None, the following fields are included on the NAV Setup page: • **Calc Type (calculation type)** — Appears on all NAV Setup page views (using vertical scrolling) in the upper right corner of the display. When using the basic function set, calculation type is Rhumb Line (RL). • **MAGVAR Type** — Appears on the last NAV Setup page view (using vertical scrolling). • **Navigation Displays** — Appears on the last NAV Setup page view (using vertical scrolling).

	b. NAV Display Page	Reference: Slides 5
		The NAV (navigation) Displays page is accessed from the Navigation submenu. All DAGR fields used for navigation are accessible from the NAV Displays pages. All DAGR fields used for navigation are accessible from the NAV Displays pages. Up to four display pages of navigation field information are available. When using the advanced function set, the operator can choose between standard or custom NAV Displays pages by using the Navigation Displays field of the NAV Setup page.
		When the Navigation Displays field of the NAV Setup page is set to Standard (using the advanced function set) or the DAGR is using the basic function set, the NAV Displays page displays standard fields for the current navigation method (e.g., Direct To). Each navigation method has its own standard (default) NAV Displays page fields.
		When using the advanced function set and the Navigation Displays field of the NAV Setup page is set to Custom, the fields assigned to the four NAV Displays pages can be customized by the user to meet mission requirements. These customized pages may include some blank fields and/or blank pages. Blank pages can be hidden or shown using the customize process.
		Reference: Slides 6
		A left to right field numbering system is used as a standard convention to reference field locations throughout the following navigation display field figures. There are cases when one large field of a display occupies more than just one field. For example, one field of the display may occupy both fields 1 and 2, or occupy both fields 1 and 3. Actual display field locations and some field sizes can be customized by the operator while using the advanced function set. These larger fields offer advantages during poor visibility conditions (e.g., heavy vibration while riding in a vehicle). Double dashes appear in place of field data when data is invalid or not applicable.
		Reference: Slides 7
		The page number appears in the page title. DATUM appears with the page title when WGS-84 datum is not being used. The DAGR can use one to four pages of display fields. When using the Advanced function set: • Field menu selection Customize Field is used to select fields appearing on pages when the Navigation Displays field of the NAV Setup page is set to Custom. • Up to four NAV Displays pages can be customized. • Larger sized versions of most of the fields are operator selectable. These larger versions require two field spaces. Refer to Table 9-4 for a listing of available larger version fields. • Blank NAV Displays pages can be shown or hidden as selected by the operator. • GC appears with the page title when great circle navigation is being used.
		Appropriate field data units are selected using the page menu. The PAGE and QUIT keys are used to view all page fields by advancing through the NAV Displays pages (including NAV Setup page). Field information contained in this page is changed using various editor techniques. Refer to Chapter 6 for information on the menu tree, page and page sets, menus, submenus, selecting fields, and using editors to change information in fields.

		Reference: Slide 8 **CAUTION:** If the DAGR is not tracking satellites or has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix. Prior to a mission, manually enable and orient the internal compass. Failure to do this can result in inaccurate DAGR track data when the DAGR is not moving or is moving slowly. • A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4. Reference: Slide 9 The NAV (Navigation) Pointer page is accessed from the Navigation submenu, Waypoint GOTO navigation, Waypoints page menu, or Routes page menu or access from the POS page set. The NAV Pointer page provides the most commonly used navigation information. The page fields include the selected navigation method, waypoint (number and name), pointer, azimuth, and range field. These fields also appear on NAV Displays pages. The NAV Pointer page cannot be customized for different fields (as can be done for the NAV Displays page). When using the advanced function set and WGS-84 datum is not being used, DATUM appears with the page title. GC appears with the page title if great circle navigation is being used. If the DAGR is tracking satellites while moving too slow to compute track, and the internal compass is disabled, the pointer ring blinks and the last known track is used. If the DAGR is moving too slow to compute track for a specified amount of time, and the internal compass is enabled, the internal compass activates to provide track. Prior to the internal compass activating, the Navigation Pointer field blinks for a specified amount of time. The bottom of the field displays HOLD LEVEL when the internal compass is in use instructing the operator to hold the DAGR horizontally level.

NOTE:	**Conduct a check on learning.**	Reference: Slide 10
		1. What does RL stand for?
		   (ANS: RL is Rhumb Line.) Page 9.1, Para 9.2
		True or False
		2. The NAV Pointer Page can be customized.
		   (ANS: False.) Page 9.1, Para 9.2
		3. What does the Azimuth field display?
		   (ANS: Provides the azimuth from the DAGR current position to the current navigation waypoint.) page 9.1 par 9.3.2.2

Learning Step/Activity 2	**a. Configure Direct To navigation**	Reference: Slide 11 **1.** From any display (except a message pop-up), push the MENU key twice to display the Main Menu. **2.** Highlight Navigation, then push the ENTER key. **3.** Highlight NAV Setup, then push the ENTER key. The NAV Setup page is displayed. **(1)** From the NAV Setup page, set the Navigation Method field to Direct To. **Navigation Method Field**: Displays the current navigation method being used. **Direct To:** Navigate from present position directly to the selected

		destination waypoint. Waypoint alert mode can be configured on or off.
		Course To: Navigate from present position along the operator entered course (field editable) to the selected destination waypoint. Waypoint alert mode can be configured on or off.
		Course From: Navigate from current location along the operator entered course (field editable) from the selected waypoint.
		  (a) Highlight Navigation Method field, then push the ENTER key.
		  (b) Highlight Direct To, then push the ENTER key.

		Reference: Slide 12
		Calc Type Field (Advanced) Displays the method (Rhumb Line or Great Circle) used for calculating navigation information. The Calc Type field appears on all NAV Setup page displays when using advanced function set.
		    • **Rhumb Line (RL)** — Produces constant compass directions and allows lines of latitude to be used as paths.
		    • **Great Circle (GC)** — Produces the shortest path to the navigation waypoint, but the compass direction of travel changes due to the curvature of the earth.
		(2) Set the Calc Type field (Advanced) to GC for great circle or RL for rhumb line calculation.
		  (a) Highlight Calc Type field, then push the ENTER key.
		  (b) Highlight desired selection, then push the ENTER key.
		Reference: Slide 13
		To WP Field The To Waypoint field displays and configures the number (001 to 999) and name (up to ten characters) of the waypoint being navigated to. The waypoint can be selected while in Direct To or Course To navigation. If using Route navigation, the end (destination) waypoint for the route leg is displayed and cannot be changed. If the waypoint is undefined or invalid, text is replaced with double dashes. Field data format is ###-NNNNNNNNNN, where # represents the waypoint number and N represents the waypoint name.
		(3) Set the ToWP field to the waypoint being navigated to.
		  (a) Highlight To WP field, then push the ENTER key.
		  (b) Highlight desired selection, then push the ENTER key.

		Reference: Slide 14
		WP Alert Mode Field Displays the waypoint alert mode as Off or On. When turned on, an alert occurs when the DAGR enters within a predefined range radius of a waypoint. If using Course To, Route, or Approach navigation, the alert also occurs when passing by the waypoint.
		(4) Set the WP Alert Mode field to On or Off. When on, the DAGR visually alerts the operator upon waypoint arrival. When off, the DAGR does not alert the operator upon waypoint arrival.
		  (a) Highlight WP Alert Mode field, then push the ENTER key.
		  (b) Highlight desired selection, then push the ENTER key.

	b. Perform Direct To navigation	Reference: Slide 15
		
		  (a) Access the NAV Pointer page, then travel the azimuth pointed by the Pointer field arrow. The compass dial rotates so the top of the dial indicates the current ground track.
		
		  (b) If the DAGR internal compass is active, Hold Level appears at the bottom of the Pointer field. The internal compass activates when moving below a preset speed for a preset amount of time.

		Reference: Slide 16 **(c)** While moving towards the destination waypoint, the Range field value steadily decreases and the Azimuth field value changes. **Range Field** The Range field provides the range from the current position to the current navigation waypoint excluding elevation differences. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters. **Azimuth Field** The Azimuth field provides the azimuth from the DAGR current position to the current navigation waypoint as measured clockwise from the selected north reference. North reference selections are True, Grid, or magnetic (Mag-Calc, Mag-WP, or Mag-LCL). A magnetic north reference is based upon the current DAGR MAGVAR type (Calculated, Navigation Waypoint, or Local). North is referenced as 360 degrees, 6400 mils, or 6300 strecks. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks). **(d)** The DAGR recognizes it has reached the waypoint when it reaches a radius from the waypoint (default is 5 meters) set in the Alert Radius field of the Waypoint Editor page. The operator must confirm waypoint arrival only if the WP Alert Mode field of the NAV Setup page was previously set to On.

	Topic Summary	Reference: Slide 17
		
		Navigation
		
		  - Introduction
		      NAV Setup Page
		      NAV Displays
		      NAV Pointer Page
		
		Operation
		  - Set the Direct To Navigation Function
		      Configure Direct to Navigation
		      Perform Direct to Navigation
		
		During this topic you have learned how the NAV Displays page is used in reference to the Direct To navigation function and how to navigate a course using the Direct To navigation function.
		
		Transition Next Lesson: Now that we know the steps necessary to navigate a course using the Direct To navigation function, we will learn how to navigate a course using the route navigation function.

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SECTION IV. PRESENTATION

ELO B	Reference: Slide 18	
	ACTION:	Navigate a course using Route navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Navigated a course using the Route navigation function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Navigate a course using the Route navigation function.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes):	15 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual. Date: 30/05/2003 Paragraph: 9.2.3.1d and 9.3.5.1f(2)
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference: Slide 18 Navigation Operation - Set the Direct To Navigation Function Configure Direct to Navigation Perform Direct to Navigation
	a. Configure Route Navigation	Reference: Slide 19 **(1)** From the NAV Setup page, set the Navigation Method field to Route. **(a)** Highlight Navigation Method field, then push the ENTER key. Reference: Slide 20 **Navigation Route Field**: The Navigation Route field provides the route number, route leg, and route name being used for route navigation. Field data format is ##, LLL, NNNNNNNNNN, where # represents the route number, L represents the leg number and N represents the route name. **(b)** Highlight Route, then push the ENTER key. **(2)** Set the Calc Type field (Advanced) to GC for great circle or RL for rhumb line calculation. **(a)** Highlight Calc Type field, then push the ENTER key. **(b)** Highlight desired selection, then push the ENTER key.

Reference: Slide 21

(**3**) Set the Route field to the desired navigation route number/name.

  (**a**) Highlight Route field, then push the ENTER key.

  (**b**) Highlight desired selection, then push the ENTER key.

Reference: Slide 22

Leg Field Displays the navigation route leg number (000 up to 999). Depending on the route direction, leg number 000 navigates to the first (forward) or last (reverse) waypoint in the route. If the route leg is undefined or invalid, text is replaced with double dashes. Field data format is ###, where # represents the leg number. This field works along with the Route Leg Advance Mode field.

 (**4**) Set the Leg field to the desired starting navigation leg of the route. Entry 000 navigates to the first (forward direction) or last (reverse direction) waypoint in the route. This field is dependent on the Route Leg Advance Mode field setting.

  (**a**) Highlight Leg field, then push the ENTER key.

  (**b**) Enter desired selection, then push the ENTER key.

Reference: Slide 23

Direction Field Displays the direction of route navigation as Forward or Reverse.

(**5**) Set the Direction field to Forward or Reverse for desired direction of navigation through the route legs.

  (**a**) Highlight Direction field, then push the ENTER key.

  (**b**) Highlight desired selection, then push the ENTER key.

Reference: Slide 24

Route Leg Advance Mode Field Displays the selected mode as Off, Automatic, Manual, or WP Alert and is defined as follows. This field works along with the Leg field.

  • **Off** — No alert is displayed when the end of the route leg is reached and no leg advance occurs.

  • **Automatic** — An alert is displayed and the DAGR automatically advances to the next leg with no request for operator confirmation.

  • **Manual** — An alert is displayed and operator confirmation is required before advancing to the next route leg.

  • **WP Alert** — An alert is displayed when a waypoint alert radius is reached.

(**6**) Set the Route Leg Advance Mode field to Off, Automatic, Manual, or WP Alert. The setting of this field governs how the Leg field operates.

  (**a**) Highlight Route Leg Advance Mode field, then push the ENTER key.

  (**b**) Highlight desired selection, then push the ENTER key.

(**7**) The To WP field displays the end waypoint for the route leg and cannot be edited by the operator.

	b. Perform Route Navigation	Reference: Slide 25 **(a)** Access the NAV Pointer page, then travel the azimuth pointed by the Pointer field arrow. **(b)** If the DAGR internal compass is active, Hold Level appears at the bottom of the Pointer field. The internal compass activates when moving below a preset speed for a preset amount of time. **(c)** While traveling towards the leg ending waypoint, the Range field value steadily decreases and the Azimuth field value changes. Reference: Slide 26 **(d)** The DAGR recognizes it has reached the end of a route leg when it reaches a radius from the ending waypoint (default is 5 meters) set in the Alert Radius field of the Route Editor page. The operator is notified and/or must confirm a route leg advance to the next leg depending upon the setting of the Route Leg Advance Mode field of the NAV Setup page. **(e)** Repeat prior steps as required for each leg of the route. **(f)** At any time during route navigation, the operator can reverse the direction of travel on the route by changing the setting of the Direction field of the NAV Setup page. **(g)** When the end of the route is reached, the leg no longer advances.
	Topic Summary	Reference: Slide 27 Navigation Operation - Set Route Navigation Function Configure Route Navigation Perform Route Navigation During this topic you have learned how the NAV Displays page is used in reference to the route navigation function and how to navigate a course using the route navigation function. **Transition to Practice Exercise:** Now that we know the steps necessary to navigate a course using the route navigation function, we will now do a practical exercise. **(Only use if continuing to next lesson) Transition Next Lesson:** Now that we know the steps necessary to navigate a course using the route navigation function, we will now do a practical exercise.

SECTION V. PRESENTATION

ELO C	Reference: Slide 28 **ACTION:**	Navigate a course using Course To navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Navigated a course using the Course To navigation function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Navigate using Course To navigation function.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes):	10 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual Date: 30/05/2003 Paragraph: 9.2.3.1b and 9.4.7.1d(2)
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 28
		– Operation
		  • Set the Course To Function
		    – Configure Course To Navigation
		    – Perform Course To Navigation

	a. Configure Course To Navigation	Reference: Slide 29
		NOTE: The course set for this navigation method may or may not go directly to the selected waypoint. The actual course entered may intersect with the waypoint, or pass by the waypoint without actually reaching it.
		Reference: Slide 30
		(1) From the NAV Setup page, set the Navigation Method field to Course To.
		  (a) Highlight Navigation Method field, then push the ENTER key.
		  (b) Highlight Course To, then push the ENTER key.
		Reference: Slide 31
		(2) Set the Calc Type field (Advanced) to GC for great circle or RL for rhumb line calculation.
		  (a) Highlight Calc Type field, then push the ENTER key.
		  (b) Highlight desired selection, then push the ENTER key.
		Reference: Slide 32
		(3) Set the To WP field to the waypoint being navigated to.
		  (a) Highlight To WP field, then push the ENTER key.

		(b) Highlight desired selection, then push the ENTER key.
		Reference: Slide 33
		(4) Set up units used for the Course field (if required).
		(a) Highlight the Course field, and then push the MENU key.
		(b) Highlight the desired type of units to change (e.g., Select Angle Units), then push the ENTER key.
		Course Field Displays the navigation course to or from a selected waypoint. Appropriate units and north reference must be selected before entering a course. Field data format is XXXX in mils or strecks, or XXX.X in degrees, where # represents the numeric course value.
		Reference: Slide 34
		(c) Highlight the desired selection, then push the ENTER key.
		(d) The page displays all associated field information with the change made.
		Reference: Slide 35
		(5) Set the Course field for the desired course to the waypoint being navigated to:
		(a) Highlight Course field, then push the ENTER key.
		(b) Enter the desired course, then push the ENTER key.
		Reference: Slide 36
		(6) Set the WP Alert Mode field to On or Off. When on, the DAGR visually alerts the operator upon waypoint arrival or passing by the waypoint. When off, the DAGR does not alert the operator upon waypoint arrival or passing by the waypoint.
		Reference: Slide 37
		(a) Highlight WP Alert Mode field, then push the ENTER key.
		(b) Highlight desired selection, then push the ENTER key.
	b. Perform Course To navigation	Reference: Slide 38
		(1) Configure the NAV Setup page.
		(a) Access the NAV Displays page, then point the DAGR so the Track field (NAV Displays page 1) value matches the value entered into the NAV Setup page Course field. The DAGR indicates the track to be navigated.
		Reference: Slide 39
		(b) When the DAGR internal compass is active, the Track field (NAV Displays page 1) label alternates between Track and Hold Level. The internal compass activates when moving below a preset ground speed for a preset amount of time.
		Reference: Slide 40
		NOTE: The Steering 2D (NAV Displays page 2), Steering 3D (NAV Displays page 4), and Azimuth (NAV Displays page 1) fields provide navigation information to the waypoint entered in the NAV Setup page, not the course entered in the NAV Setup page.
		(c) While traveling the course towards the selected waypoint:
		Cross Track Error Field The Cross Track Error (XTE) field provides the range, left or right, of the intended course. L and R designate left and right, respectively, next to the range measurement. When the DAGR is on course, the XTE direction, value and units are replaced with the on course indicator (.....). XTE is not valid when using Direct To navigation because the intended course is not known. Field data format is L (or) R XXXX.XX

or L (or) R XXXX.X, where L represents left, R represents right, and X represents miles, nautical miles, kilometers, feet, yards, or meters.

Track Field The Track field provides the ground track or actual path on the earth's surface measured clockwise from the selected north reference. North reference selections are True, Grid, or magnetic (Mag-Calc, Mag-WP, or Mag-LCL). A magnetic north reference is based upon the current DAGR MAGVAR type (Calculated, NavigationWaypoint, or Local).

The field displays an arrow pointing towards north as shown. If the DAGR ground speed is too slow to compute a current track, the last known track is used or the internal compass is used (when enabled). When the internal compass is active, the displayed track field label alternates with HOLD LEVEL, instructing the operator to hold the DAGR horizontally level. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks).

Steering 2D The Steering 2D field indicates the horizontal steering direction to turn to align track with azimuth to the navigation waypoint. When off course, direction arrows (left and right) and a value (degrees, mils. or strecks) appear. When on course, the on course indicator (.....) appears. The DAGR ground speed must be greater than zero before this data can be computed. Field data format is a direction arrow followed by XXX (X represents degrees) or XXXX (X represents mils or strecks).

Steering 3D (Advanced) The Steering 3D field indicates the vertical steering direction to turn to proceed towards the current navigation waypoint. When off course, direction arrows (up and down) and a value (degrees, mils. or strecks) appear. When on course, the on course indicator (.....) appears. 3D (vertical) steering is valid if the navigation waypoint and its elevation are valid and a greater than zero ground speed or vertical speed can be derived from the PVT solution. Field data format is a direction arrow followed by XX (X represents degrees) or XXXX (X represents mils or strecks).

Reference: Slide 41

- Use the XTE field (NAV Displays page 1) to identify any necessary track corrections required to maintain desired course. For example: If an R shows in this field, move the distance shown in the field in a left direction to get back on course.

Reference: Slide 42

- Verify the Track field (NAV Displays page 1) matches the course entered into the NAV Setup page Course field.
- The value in the Range field (NAV Displays page 1) steadily decreases.

Reference: Slide 43

Note: The Steering 2D (NAV Displays page 1), and Azimuth (NAV Displays page 1) fields provide navigation information to the waypoint entered in the NAV Setup page, not the course entered in the NAV Setup page.

(d) As required, use other NAV Displays page fields during navigation. Other fields useful in Course To navigation are:

Ground Speed Field: The Ground Speed field provides the DAGR current ground speed. If ground speed is unknown or the DAGR is moving too slow, zero (0) is displayed. Field data format is XXX, where X represents miles per hour, knots, or kilometers per hour.

		Time-To-Go 2D Field: The Time-To-Go 2D field displays the estimated time required to reach the navigation waypoint if the same ground speed is maintained directly toward the waypoint, excluding elevation differences. Ground speed must be greater than zero before this data can be computed. Field data format is HHhMMmSSs, HHhMMm, MMmSSs, or SSSs, where H represents hours, M represents minutes, and S represents seconds.
		Minimum Miss Distance 2D Field: The Minimum Miss Distance 2D (MMD 2D) field provides the closest range the DAGR will get to the current navigation waypoint if it has not already been passed and the same track is maintained excluding elevation differences. The DAGR ground speed must be greater than zero before this data can be computed. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.
		Elevation Angle Field: The Elevation Angle field provides the angle from DAGR current position to the navigation waypoint (positive up). Field data format is +/- XXX.X (X represents degrees) or XXXX (X represents mils or strecks).
		Elevation Difference Field: The Elevation Difference field provides the difference between the elevation of the DAGR and the elevation of the navigation waypoint (positive up). The elevation difference is valid if the navigation waypoint and it's elevation are valid. Field data format is +/- XXXXX, where X represents feet or meters.
		Slant Range Field: The Slant Range field provides the range from the current position to the current navigation waypoint including elevation differences. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.
		Estimated Horizontal Error and Figure of Merit Field: This field displays the estimated horizontal error (EHE) as a ± value. EHE field data format is N.N, NN, or NNN, where N represents miles, nautical miles, kilometers, feet, yards, or meters. Horizontal position data is estimated to be accurate to within the ± value. Overall position error is displayed as figure of merit (FOM) numbers 1 though 9, where 1 is the best.
		Reference: Slide 44
		(e) The DAGR recognizes it has reached or passed by the waypoint. The operator must confirm waypoint arrival or passing by the waypoint only if the WP Alert Mode field of the NAV Setup page was previously set to On.
	Topic Summary	Reference: Slide 45
		Navigation
		Operation
		- Set the Course To Navigation Function
		Configure Course to Navigation
		Perform Course to Navigation
		During this topic you have learned how the NAV Displays page is used in reference to the Course To navigation function and how to navigate a course using the Course To navigation function.
		Transition Next Lesson: Now that we know the steps necessary to navigate a course using the Course To navigation function, we will learn how to navigate a course using the Course From navigation function.

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SECTION VI. PRESENTION

ELO D	Reference: Slide 46 **ACTION:**	Navigate a course using the Course From navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance and an operational DAGR.
	STANDARD:	Navigated a course using the Course From navigation function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Navigate using Course From navigation function.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	10 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual Date: 30/05/2003 Paragraph: 9.2.3.1b and 9.4.7.1d(2)
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	Reference: Slide 46 • Navigation • Operation - Set the Course From Navigation Function · Configure Course From Navigation · Perform Course From Navigation
	a. Configure Course From Navigation	Reference: Slide 47 **(1)** From the NAV Setup page, set the Navigation Method field to Course From. **(a)** Highlight Navigation Method field, then push the ENTER key. **From WP Field** The From Waypoint field displays and configures the number (001 to 999) and name (up to ten characters) of the waypoint being navigated from. The waypoint can be selected while in Course From navigation. If the waypoint is undefined or invalid, text is replaced with double dashes. Field data format is ###-NNNNNNNNNN, where # represents the waypoint number and N represents the waypoint name. **(b)** Highlight Course From, then push the ENTER key. Reference: Slide 48 **(2)** Set the Calc Type field (Advanced) to GC for great circle or RL for rhumb line calculation. **(a)** Highlight Calc Type field, then push the ENTER key. **(b)** Highlight desired selection, then push the ENTER key.

		Reference: Slide 49
		(3) Set the From WP field to the waypoint being navigated from.
		(a) Highlight From WP field, then push the ENTER key.
		(b) Highlight desired selection, then push the ENTER key.
		Reference: Slide 50
		(4) Set up units used for the Course field (if required).
		(a) Highlight the Course field, and then push the MENU key.
		(b) Highlight the desired type of units to change (e.g., Select Angle Units), then push the ENTER key.
		Reference: Slide 51
		(c) Highlight the desired selection, then push the ENTER key.
		(d) The page displays all associated field information with the change made.
		Reference: Slide 52
		(5) Set the Course field to the desired course away from the waypoint being navigated from.
		(a) Highlight Course field, then push the ENTER key.
		(b) Enter the desired course, then push the ENTER key.
	b. Perform Course From navigation	Reference: Slide 53
		(a) Access the NAV Displays page, then point the DAGR so the Track field (NAV Displays page 1) value matches the value entered into the NAV Setup page Course field. The DAGR indicates the track to be navigated.
		Reference: Slide 54
		(b) When the DAGR internal compass is active, the Track field (NAV Displays page 1) label alternates between Track and Hold Level. The internal compass activates when moving below a preset ground speed for a preset amount of time.
		Reference: Slide 55
		(c) While traveling the course away from the selected waypoint:
		Reference: Slide 56
		• Use the XTE field (NAV Displays page 2) to identify any necessary track corrections required to maintain desired course. For example: If an R shows in this field, move the distance shown in the field in a left direction to get back on course.
		Reference: Slide 57
		• Verify the Track field (NAV Displays page 1) matches the course entered into the NAV Setup page Course field.
		• The value in the Range field (NAV Displays page 1) steadily increases.
		NOTE: The Steering 2D (NAV Displays page 2), Steering 3D (NAV Displays page 4), and Azimuth (NAV Displays page 1) fields provide navigation information to the waypoint entered in the NAV Setup page, not the course entered in the NAV Setup page.
		Reference: Slide 58
		(d) As required, use other NAV Displays page fields during navigation. Other useful in Course From navigation are:
		• NextWP

		• NAV Method/WP
		• Ground Speed
		• Elevation
		• Elevation Difference
		• SlantRange
		• EHE and FOM

	Topic Summary	Reference: Slide 59
		
		Navigation
		
		  Operation
		
		    - Set the Course From Navigation Function
		
		      Configure Course From Navigation
		
		      Perform Course From Navigation
		
		During this topic you have learned how the NAV Displays page is used in reference to the Course To navigation function and how to navigate a course using the Course To navigation function.
		
		Transition to Practice Exercise: Now that we know the steps necessary to navigate a course using the Course To navigation function, we will conduct a practical exercise.

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SECTION VII. STUDENT EVALUATION

Testing Requirements	The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

Reference: Slide 60

PRACTICAL EXERCISE SHEET NO. 1

Title	Navigate a course using Direct To navigation function.	
Introduction	The student will navigate a course using the Direct To navigation function.	
Motivator	"Use this lesson when the soldier needs to use the DAGR receiver to perform navigation to avoid the enemy, hazards, and accomplish the mission."	
TLO	**ACTION:**	Navigate a Course.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR Operator and Maintenance Manual.
	STANDARD:	Navigate a course in accordance with the DAGR Operator and Maintenance Manual within the time allotted by the instructor.
ELO A	**ACTION:**	Navigate a course using Direct To navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual.
	STANDARD:	Navigated a course using Direct To navigation function in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Perform navigate a course using the Direct To navigation function. Refer students to paragraph 9.2.3.1a and 9.3.5.1c (2).	
Safety Requirements	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	The outdoor practical evaluation has to be in an environment best suitable to acquire satellites, i.e. objects such as buildings hinder satellite reception and need to be considered when using the equipment in an operational environment. Students will learn what best practices can be performed to acquire satellites if their tactical environment changes. It is unnecessary to damage the environment during this training.	
Evaluation	Student learning is reinforced through a performance examination. The student will perform the practical exercise where they will use the DAGR to acquire their position.	
Instructional Lead-in	It is necessary to allow the DAGR to acquire its current position and set certain default settings before using it for navigation.	
Resource Requirements	DAGR	
Special Instructions	If the DAGR is used indoors, an externally mounted antenna will be necessary.	

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Procedures	**Task Name:** Navigated Using Direct To navigation function.	GO	NO GO
	Configured the Direct To navigation. **Access the NAV Setup page.** Set the Navigation Method field to Direct To. Set the Calc Type field (Advanced) to GC for great circle or RL for rhumb line calculation. Set the To WP field to the waypoint being navigated to. Set the WP Alert Mode field to On or Off. When on, the DAGR alerts the operator upon waypoint arrival. When off, the DAGR does not alert the operator upon waypoint arrival.	———	———
	Performed Direct To navigation. Access the NAV Pointer page, then travel the azimuth pointed by the Pointer field arrow. The compass dial rotates so the top of the dial indicates the current ground track. If the DAGR internal compass is active, Hold Level appears at the bottom of the Pointer field. The internal compass activates when moving below a preset speed for a preset amount of time. While moving towards the destination waypoint, the Range field value steadily decreases and the Azimuth field value changes. The DAGR recognizes it has reached the waypoint when it reaches a radius from the waypoint (default is 5 meters) set in the Alert Radius field of the Waypoint Editor page. The operator must confirm waypoint arrival only if the WP Alert Mode field of the NAV Setup page was previously set to On.	———	———
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.		

Defense Advanced GPS Receiver (DAGR)

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SECTION VIII. STUDENT EVALUATION

Testing Requirements	The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

Reference: Slide 60

PRACTICAL EXERCISE SHEET NO. 2

Title	Navigate a course using Route navigation function.	
Introduction	The student will navigate a course using the Route navigation function.	
Motivator	"Use this lesson when the soldier needs to use the DAGR receiver to perform navigation to avoid the enemy, hazards, and accomplish the mission."	
TLO	**ACTION:**	Navigate a Course.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Navigate a course in accordance with the DAGR Operator and Maintenance Manual within the time allotted by the instructor.
ELO B	**ACTION:**	Navigate a course using Route navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Navigated a course using the Route navigation function in accordance with the DAGR Operator and Maintenance Manual. Refer students to paragraph 9.2.3.1d and 9.3.5.1f (2).
Safety Requirements	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	The outdoor practical evaluation has to be in an environment best suitable to acquire satellites, i.e. objects such as buildings hinder satellite reception and need to be considered when using the equipment in an operational environment. Students will learn what best practices can be performed to acquire satellites if their tactical environment changes. It is unnecessary to damage the environment during this training.	
Evaluation	Student learning is reinforced through a performance examination. The student will perform the practical exercise where they will use the DAGR to acquire their position.	
Instructional Lead-in	It is necessary to allow the DAGR to acquire its current position and set certain default settings before using it for navigation.	
Resource Requirements	DAGR	
Special Instructions	If the DAGR is used indoors, an externally mounted antenna will be necessary.	

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Procedures	**Task Name:** Navigated using the Route navigation function.	GO	NO GO	
	Configured the Route navigation function.	___	___	
	Pushed the Menu key twice.			
	Highlighted Navigation by Pushing the ENTER key.			
	Pushed the ENTER key to access Navigation Submenu.			
	Scrolled to Navigation Setup and Push the ENTER key to highlight.			
	Pushed the ENTER key to access the Navigation Setup page.			
	Scrolled to Navigation Method field, then Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Navigation Method field.			
	Scrolled to Route, and then Pushed the ENTER key to acknowledge.			
	Scrolled to the Route field on the Navigation Setup page, then Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Select Route field.			
	Set the Route field to the desired navigation route number/name.			
	Scrolled to the Leg field on the Navigation Setup page, then Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Route Leg field.			
	Set the Leg field to the desired navigation leg of the route. Entry 000 navigates to the first (forward direction)			
	Scrolled to the Direction field on the Navigation Setup page, then Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Direction field.			
	Set the Direction field to Forward or Reverse for desired direction of navigation through the route legs.			
	Scrolled to the Route Leg Advance Mode field on the Navigation Setup page, then Pushed the ENTER key to highlight.			
	Performed Route Navigation.	___	___	
	Pushed the ENTER key to access the Route Leg Advance Mode field.			
	Set Route Leg Advance Mode to Off, Automatic, Manual, or WP Alert.			
	The To WP field displays the end waypoint for the route leg and cannot be edited by the operator.			
	Pushed the POS PAGE key to access the Navigation Displays page, then while moving, uses the Steering 2D field directional arrow and angular value to align track with azimuth for navigation to the leg ending waypoint. When off course, the left and right directional arrows and angular value appear. When on course, the on course indicator (.....) appears, and the Track field and Azimuth field values match.			
	The DAGR recognizes it has reached the end of a route leg when it reaches a radius from the ending waypoint (default is 5 meters) set in the Alert Radius field of the Route Editor page. The operator is notified and/or must confirm a route leg advance to the next leg depending upon the setting of the Route Leg Advance Mode field of the Navigation Setup page.			
	Prior steps (v) through (y) are repeated for each leg of the route.			

	At any time during route navigation, the operator can reverse the direction of travel on the route changing the setting of the Direction field of the Navigation Setup page.		
	As required, use other Navigation Displays page fields during navigation. Other fields useful in Route navigation are:		
	Next WP		
	NAV Method/WP		
	NAV Route		
	Rate of Progress		
	XTE		
	Steering 3D		
	Speed		
	Time-To-Go2D		
	Time-To-Go3D		
	MMD 2D		
	MMD 3D		
	Elevation		
	Elevation Difference		
	Slant Range		
	EHE and FOM		
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.		

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SECTION IX. STUDENT EVALUATION

Testing Requirements	The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

Reference: Slide 61

PRACTICAL EXERCISE SHEET NO. 3

Title	Navigate a course using Course To navigation function.	
Introduction	The student will navigate a course using the Course To navigation function.	
Motivator	"Use this lesson when the soldier needs to use the DAGR receiver to perform navigation to avoid the enemy, hazards, and accomplish the mission."	
TLO	**ACTION:**	Navigate a Course.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and the DAGR Operator and Maintenance Manual.
	STANDARD:	Navigate a course in accordance with the DAGR Operator and Maintenance Manual within the time allotted by the instructor.
ELO C	**ACTION:**	Navigate a course using Course To navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Navigated a course using Course To navigation function in accordance with the DAGR Operator and Maintenance Manual.
	Perform navigate a course using Course To navigation function. Refer students to paragraph 9.2.3.1b and 9.4.7.1d (2).	
Safety Requirements	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	The outdoor practical evaluation has to be in an environment best suitable to acquire satellites, i.e. objects such as buildings hinder satellite reception and need to be considered when using the equipment in an operational environment. Students will learn what best practices can be performed to acquire satellites if their tactical environment changes. It is unnecessary to damage the environment during this training.	
Evaluation	Student learning is reinforced through a performance examination. The student will perform the practical exercise where they will use the DAGR to acquire their position.	
Instructional Lead-in	It is necessary to allow the DAGR to acquire its current position and set certain default settings before using it for navigation.	
Resource Requirements	DAGR	
Special Instructions	If the DAGR is used indoors, an externally mounted antenna will be necessary.	

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Procedures	**Task Name:** Configured Course To navigation function.	GO	NO GO	
	Navigated using Course To navigation function.	___	___	
	Pushed the Menu key twice.			
	Highlighted Navigation by Pushing the ENTER key.			
	Pushed the ENTER key to access Navigation Submenu.			
	Scrolled to Navigation Setup and Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Navigation Setup page.			
	Scrolled to Navigation Method field, then Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Navigation Method field.			
	Scrolled to Course To, then Pushed the ENTER key to acknowledge.			
	Scrolled to To WP, then Pushed the ENTER key to acknowledge.			
	Set the To WP field to the waypoint being navigated to, then Pushed the ENTER key to acknowledge.			
	Scrolled to the Course field, then Pushed the ENTER key to highlight.			
	Set the Course To field to the desired course to the waypoint being navigated to, the Pushed the ENTER key to acknowledge.			
	Scrolled to WP Alert Mode and Pushed the ENTER key to highlight.			
	Set the WP Alert Mode field to On or Off, then Pushed the ENTER key to acknowledge.			
	Pushed the POS PAGE key to access the Navigation Displays page, and then pointed the DAGR so the Track field value matches the value entered into the Navigation Setup page Course field.			
	While traveling the course towards the selected waypoint:			
	Used the XTE field to identify any necessary track corrections required to maintain desired course.			
	Verified the Track field matches the course entered into the Navigation Setup page Course field.			
	Performed Course To navigation.	___	___	
	As required, use other NAV Displays page fields during navigation. Suggested fields useful in Course To navigation are:			
	NextWP			
	NAV Method/WP			
	Speed			
	Time-To-Go2D			
	Time-To-Go3D			
	MMD 2D			
	MMD 3D			
	Elevation			
	Elevation Difference			
	Slant Range			
	EHE and FOM			
	Operator confirmed waypoint arrival or passing by the waypoint only if the WP Alert Mode field of the Navigation Setup page was previously set to ON.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

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SECTION X. STUDENT EVALUATION

Testing Requirements	The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

Reference: Slide 61

PRACTICAL EXERCISE SHEET NO. 4

Title	Navigate a course using the Course From navigation function.	
Introduction	The student will navigate a course using the Course From navigation function.	
Motivator	"Use this lesson when the soldier needs to use the DAGR receiver to perform navigation to avoid the enemy, hazards, and accomplish the mission."	
TLO	**ACTION:**	Navigate a Course.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual.
	STANDARD:	Navigate a course in accordance with the DAGR Operators and Maintenance Manual within the time allotted by the instructor.
ELO D	**ACTION:**	Navigate a course using the Course From navigation function.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	Navigated a course using the Course From navigation function in accordance with the DAGR Operator and Maintenance Manual. Refer students to paragraph 9.2.3.1c and 9.4.7.1e (2).
Safety Requirements	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	The outdoor practical evaluation has to be in an environment best suitable to acquire satellites, i.e. objects such as buildings hinder satellite reception and need to be considered when using the equipment in an operational environment. Students will learn what best practices can be performed to acquire satellites if their tactical environment changes. It is unnecessary to damage the environment during this training.	
Evaluation	Student learning is reinforced through a performance examination. The student will perform the practical exercise where they will use the DAGR to acquire their position.	
Instructional Lead-in	It is necessary to allow the DAGR to acquire its current position and set certain default settings before using it for navigation.	
Resource Requirements	DAGR	
Special Instructions	If the DAGR is used indoors, an externally mounted antenna will be necessary.	

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Procedures	Task Name: Configured using the Course From navigation function.	GO	NO GO	
	Navigated using Course From navigation function.	___	___	
	Pushed the Menu key twice.			
	Highlighted Navigation by Pushing the ENTER key.			
	Pushed the ENTER key to access Navigation Submenu.			
	Scrolled to Navigation Setup and Pushed the ENTER key to highlight.			
	Pushed the ENTER key to accessed the Navigation Setup page.			
	Scrolled to Navigation Method field, then Pushed the ENTER key to highlight.			
	Pushed the ENTER key to access the Navigation Method field.			
	Scrolled to Course From, then Pushed the ENTER key to acknowledge.			
	Scrolled to To WP, then Pushed the ENTER key to acknowledge.			
	Set the To WP field to the waypoint being navigated to, then Pushed the ENTER key to acknowledge.			
	Scrolled to the Course field, then Pushed the ENTER key to highlight.			
	Set the Course field to the desired course to the waypoint being navigated from, then Pushed the ENTER key to acknowledge.			
	Scrolled to WP Alert Mode and Pushed the ENTER key to highlight.			
	Set the WP Alert Mode field to On or Off, then Pushed the ENTER key to acknowledge.			
	Pushed the POS PAGE key to access the Navigation Displays page, then point the DAGR so the Track field value matches the value entered into the Navigation Setup page Course field.			
	While traveling the course away from the selected waypoint:			
	Used the XTE field to identify any necessary track corrections required to maintain desired course.			
	Verified the Track field matches the course entered into the Navigation Setup page Course field.			
	The value in the Range field steadily increases.			
	As required, use other Navigation Displays page fields during navigation. Other fields useful in Course From navigation are:			
	NextWP			
	NAV Method/WP			
	Speed			
	Elevation			
	Elevation Difference			
	SlantRange			
	EHE and FOM			
	Performed Course From Navigation.	___	___	
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 6-Navigate A Course

9 July 2004

SECTION XI. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	10 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 62 During this lesson you have learned how the NAV Displays page is used in reference to the Direct To and Route navigation functions and how to navigate a course using the Direct To and Route functions.	
Transition Next Lesson	Now that we know the steps necessary to use the DAGR for navigation, we will learn how to use the DAGR to maintain situational awareness.	

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 7 – Maintain Situational Awareness

10 January 2005

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			

Task(s) Taught or Supported	Task Number	Task Title			
	113-007	Maintain Situational Awareness			

Task(s) Reinforced	Task Number	Task Title			
	None				

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	2:30				
Practical Exercise	0:23				
Test	0:00				
Total Hours	2:53				

Test Lesson Number	Testing	Hours	Lesson No.
			113-007

Prerequisite Lesson(s)	Lesson Number	LESSON TITLE
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform DAGR Operational Checkout Procedure
	113-003	Adjust DAGR Receiver Default Settings to User Settings
	113-004	Set Waypoints, Routes, and Alerts.
	113-005	Setup Communications
	113-006	Navigate a Course

Security Clearance/Access	
Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 7 – Maintain Situational Awareness

10 January 2005

References	**Number**	**Title**	**Date**	**Additional Information**
	5825-01-516-8038	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	22 December 2005	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	22 December 2005	
Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna will be required to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.			
Additional Support Personnel Requirements	None.			
Equipment Required	DAGR receiver, External AC power cable or External DC power cable (fused, 5 meter)			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan seven, PowerPoint slides (DAGR_PPT_113_007.ppt).		
	Student Materials	DAGR Operator and Maintenance technical manual, lesson seven student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	The outdoor training area will have applicable landmarks for navigation exercise.		
Ammunition Requirements	None			
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material. DAGR must be preloaded with a present position map for this lesson.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 7 – Maintain Situational Awareness

10 January 2005

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 "Situational awareness provides a graphical display of DAGR's current position compared to other waypoints, routes, and alerts shown on the display. Track, ground speed, north indicator, position error, and range scale data all provide additional DAGR present position information. Zoom in or out to acquire the desired view."	
Terminal Learning Objective	**ACTION:**	Reference: Slide 2 Maintain Situational Awareness.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Maintained Situational Awareness in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Situational Awareness page provides a graphical display of relationships between current position, track history, waypoints, alerts, and routes.	

SECTION III. PRESENTATION

ELO A	Reference: Slide 3 **ACTION:**	Determine current position using Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined current position using Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the current position using Situational Awareness page. Refer students to paragraph 9.6 through 9.6.2.4, 9.6.2.5 through 9.6.2.8 and 9.6.3.1 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	30 Minutes
	Media:	PowerPoint

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 7 – Maintain Situational Awareness

10 January 2005

	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.6 through 9.6.2.4, 9.6.2.5 through 9.6.2.8, and 9.6.3.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Topic Overview	Reference: Slide 3
		
		Introduction
		
		    Situational Awareness Page
		
		        Page Function
		
		        Page Symbols and Characteristics
		
		Operations
		
		    Determine Current Position Using Situational Awareness Page

	b. Page Function	Reference: Slide 4 **CAUTION:** If the DAGR is not tracking satellites or has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix. Prior to a mission, manually enable and orient the internal compass. Failure to do this can result in inaccurate DAGR track data when the DAGR is not moving or is moving slowly. A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. The Situational Awareness page may also display FOM in the upper right corner (if so configured). Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4. The Situational Awareness page is accessed from the Navigation submenu or from the POS page set. The Situational Awareness page provides a graphical display of relationships between current position, track history, landmarks or map objects (when using a map), waypoints, alerts, and routes. Before a map can be displayed by the Situational Awareness page, a map including present position must be loaded into the DAGR and must be enabled. The operator can enable or disable maps, select view orientation, select view content (waypoints, routes, and alerts), edit displayed waypoints, measure between selected points, and track history. The operator can hide the toolbar function keys to gain additional display area. Reference: Slide 5 **NOTE:** The Situational Awareness page and Image Viewer page can both display maps, however, they do not display the same maps. The Situational Awareness page displays vector maps and the Image Viewer page displays raster maps. The present position symbol (waypoint 000 inside a circle) is at the center with a track indicator staff, unless the cursor is active and panning is in use. Ground speed and track are displayed in the lower left corner. If the DAGR internal compass is being used, displayed track text alternates with the instruction to HOLD LEVEL. Range scale is displayed in the lower right corner. When a vector map is not loaded in the DAGR, two circles about the center of the display are used to estimate range. North reference indicator is displayed in the upper left corner and always points to True North. Position error (EHE, EPE, EVE, or FOM) is displayed as a ± value in the

		upper right corner (except FOM is displayed as a value of 1 to 9, with 1 being the best). The position error type is selectable and the displayed value is the estimated ± range of accuracy. Depending upon operator selections, time-since-fix or rehearsal mode scenario time may also be displayed. If time-since-fix is displayed, it alternates with the position error data. The operator can set the display view orientation as follows: • **North-Up** — Top of the display is North. • **Track-Up** — Top of the display is current track. • **Course-Up** — Top of the display is current navigation course (if defined, otherwise defaults to current track). • **Operator** Entered — Top of display is operator entered value. Reference: Slide 6 If the DAGR present position is the North or South Pole, the present position symbol is replaced with an N or S, respectively, with arrows around them indicating all directions are opposite the indicated pole. Route legs and alerts within 500 meters of the North or South Pole may not be correctly displayed. Polar regions may cause display or map symbols to move, appear, or disappear. A polar region includes any position above 85 degrees latitude. The operator must acknowledge a DAGR message whenever entering or leaving a polar region. Reference: Slide 7 **Instructional Note:** Hands on. **Select display Orientation:** **(1)** From the Situational Awareness page, push the MENU key. **(2)** Highlight Select Orientation, then push the ENTER key. Reference: Slide 8 **(3)** Highlight the desired orientation selection (listed as follows), then push the ENTER key. • **North Up** — Displays North at the top of the display. • **Track Up** — Displays the current track at the top of the display. • **Course Up**—Displays current navigation course at top of display. If a navigation course is not defined (from the NAV Setup page), displays current track. •**Operator-Entered** — Displays a number editor. Enter a desired azimuth (0.1°to 360.0°) to be at the top of the display. Then push the ENTER key. Reference: Slide 9 **(4)** The Situational Awareness page is displayed using the selected orientation.
	c. Page Symbols and Characteristics	Reference: Slide 10 The Situational Awareness page provides a graphical display (with or without a map) of waypoints, routes, alerts, and track history. Page characteristics include zoom range scale, panning/scrolling, and measuring range between points. **Maps:** Maps displayed by the Situational Awareness page provide a graphical map display of relationships between current position, landmarks, map objects, and selected waypoints or other items used in navigation. The Situational Awareness page automatically displays a map when a map is enabled that includes DAGR present position. The operator can enable or disable maps for viewing. The Situational Awareness page is used without a map when no maps are loaded, no maps include present position, or the maps are disabled by the operator. The operator uses zoom and pan operations, and menu selections to obtain a desired map view. When navigating, a map provides the operator with a view of surrounding terrain

and potential obstructions (e.g., body of water). General map information is as follows:

- The present position symbol (waypoint 000 inside a circle) is at the center of the display (unless the operator is panning the display).
- A scale value (controlled by zoom in/out function) is displayed in the lower right corner of the page.
- Features displayed by a map (e.g., cities, roads, etc.) and their level of detail are determined by the map loaded into the DAGR, a level of detail operator menu selection, and the selected range scale (zoom).
- No map is displayed above 80 degrees latitude.
- Measurements between any two points on the map can be performed by the operator.
- If the operator disables a map, that map will not be displayed.
- A cursor is used for panning and other operations.

Reference: Slide 11

Waypoints: Waypoint numbers are provided in the center of the shape and a direction indicator staff is attached to the symbol, if applicable. Highlighted symbols (shown bottom row) denote selected waypoints. The operator can select which waypoints to display and can create waypoints from page menu selections. Operator selectable waypoint view options are none, navigation, operator-selected, navigation and operator-selected, or all. Waypoints are shown as shapes to denote their identity.

Routes: Routes are shown as dashed lines with arrows indicating route direction waypoint to waypoint (legs of the route). The display of waypoints used to define the route are based upon the selected waypoint view option. The operator can select which routes are displayed. Operator selectable route view options are none, active (in route navigation), operator-selected, active and operator-selected, or all.

Alerts: Waypoints are used to define alerts. Alerts are displayed as selected by the operator (none, enabled, or all) using shapes to denote the alert type. Spikes displayed as part of the alert perimeter represent the dangerous side or area of an alert. Use the Status key and the Receiver Status menu to check alerts and their status.

Zoom/Range Scale: The operator can zoom in or out using the IN or OUT keys on a scale of 50 feet to 800 miles, 50 yards to 800 nautical miles, or 50 meters to 800 kilometers (English, nautical, or metric units). Range scale is shown in the lower right hand corner of the display. When a vector map is not loaded in the DAGR, two circles about the center of the display are used to estimate range. The inner circle is one (1x) scale from the display center. The outer circle is two (2x) scales from the display center.

- **Overzoom —** Overzoom is displayed alternating with range scale when the DAGR ground speed is too fast for the selected range scale. The operator may zoom out until OVERZOOM is no longer displayed. When zooming in or out with the cursor displayed, the display centers upon the cursor. When a waypoint is selected, the display centers upon the waypoint and the cursor moves to the center of the display. When present position cannot be maintained at the center of the display, Working is displayed at the top of the page.

Panning/Cursor: The operator uses the cursor control keys to pan (move) the display in any direction and move the cursor to any point. A cursor appears when panning in any direction or by pushing the ENTER key. All of a map can be viewed through panning. Before panning is performed, the center of the display (with or without a map) is DAGR present position (waypoint 000). After panning to the edge of the display, the present position is no longer at the center of the display and any zoom in or zoom

		out functions reference the cursor, not the present position. Panning is deactivated by pushing the QUIT key or leaving the Situational Awareness page. When panning is deactivated, the cursor is removed, and present position is at the center of the display.
		
		Reference: Slide 12
		
		Measuring Information Box: The operator can perform measurements between any two points on the display including DAGR present position, waypoints, and any other point using the cursor.
		
		When the operator pushes a cursor control key or the ENTER key, the cursor appears at the center of the display along with a measurement information box covering the toolbar function keys at the bottom of the display. The top of the information box is labeled Cursor and it provides azimuth and range measurement data from the DAGR present position to the cursor position on the map. Whenever the cursor is moved, the measurement data is automatically updated. When the cursor is not located at DAGR present position, a dashed measurement line appears between the cursor and present position. The measurement data blinks if the DAGR is not tracking satellites or does not have a current position fix. The cursor and the measurement information box are removed if the QUIT key is pushed, or automatically removed when the operator leaves and returns to the Situational Awareness page.
		
		When the cursor is placed on a waypoint symbol, the waypoint becomes highlighted and is selected. When the waypoint is selected, a second box (next to the waypoint symbol) appears for five seconds showing the waypoint identity, number, and name. The top of the measurement information box shows the selected waypoint identity (unknown, friendly, hostile, or neutral), number, and name. The azimuth and range data from present position to the selected waypoint is also displayed. Elevation angle and slant range data can be added to the box using a menu selection. The operator can set the measurement starting (reference) point to a point other than present position and restart the measurement as many times as desired. Other items used in navigation (in addition to waypoints) can be selected by the cursor and used for measurements. The following is a list of these items and their information that is displayed when they are selected. This data is displayed in the measurement information box (along with measurement data) and in a second box next to the cursor that appears for only five seconds after the item is selected.
		  • **Route**— Displays the route number and name.
		  • **Alert** — Displays the alert type, number, and name.
		  • **Track History Point** — Displays Track History Point.
		  • **North Pole** — Displays North Pole.
		  • **South Pole** — Displays South Pole.
		  • **Polar Region** — Displays Polar Region
		  • **Navigation Line** — Displays Navigation Line.
		  • **Map Feature** — Displays the generic name of the map feature (e.g., road), and the specific name (e.g., Highway 61) if included with the current map.

	d. Example setup for viewing of direct to navigation	Reference: Slide 13 **NOTE:** For viewing waypoints, the Sit (Situational) Awareness field on the Waypoint Editor page must be set to Yes. **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.

		Example setup for viewing of direct to navigation:
		(1) Access the NAV Setup page, then set Direct To as the navigation method and select the navigation waypoint.
		(2) From the Situational Awareness page menu, select View, then select View WPs, then select Navigation.
		Reference: Slide 14
		(3) Display returns to the Situational Awareness page.
		(4) Present position is shown on the display in relationship to the selected waypoint. Zoom in or out if necessary.
		(5) If alerts are needed in addition to the selected waypoint, perform the previous select alerts to view procedure.
	e. Map Setup Information	Reference: Slide 15
		(1) Enable or disable map display capability.
		(a) From the Situational Awareness page, push the MENU key.
		(b) Highlight Maps, then push the ENTER key.
		(c) Highlight Setup, then push the ENTER key.
		Reference: Slide 16
		(d) Enable or disable map(s) using one of the following steps.
		NOTE: Only maps with a check mark displayed to the left of their map name are enabled.
		1. To enable or disable an individual map, highlight the desired map selection, then push the left or right cursor control key to enable or disable the selected map.
		Reference: Slide 17
		2. To enable or disable all maps, push the MENU key. Highlight Select All (to enable all maps) or Deselect All (to disable all maps). Then push the ENTER key. The display returns to the map list showing all maps enabled or disabled.
		(e) Push the ENTER key. The display returns to the Situational Awareness page with the map(s) enabled or disabled.
		Reference: Slide 18
		(2) Select map detail setting.
		(a) From the Situational Awareness page, push the MENU key.
		(b) Highlight Maps, then push the ENTER key.
		(c) Highlight Detail Setting, then push the ENTER key.
		Reference: Slide 19
		(d) Highlight the desired detail selection (listed as follows), then push the ENTER key.
		• **Most** — Provides the most amount of map detail for each range scale setting. • **More** — Provides an intermediate level of map detail including the detail provided by the Some, Less, and Least settings. • **Some**—Provides an intermediate level of map detail including the detail provided by the Less and Least settings. • **Less**— Provides an intermediate level of map detail including the detail provided by the Least setting.

		• **Least** — Provides the least amount of map detail for each range scale setting. **(e)** The display returns to the Situational Awareness page with the selected level of map detail.
		Reference: Slide 20 **(3) Show map information.** **(a)** From the Situational Awareness page, push the MENU key. **(b)** Highlight Maps, then push the ENTER key. **(c)** Highlight Show Information, then push the ENTER key. Reference: Slide 21 **(d)** Select map(s) using one of the following steps. **NOTE:** Only maps with a check mark displayed to the left of their map name are selected to show information. 1. To select an individual map, highlight the desired map, then push the left or right cursor control key. Reference: Slide 22 2. To select all maps, push the MENU key. Highlight Select All, then push the ENTER key. The display returns to the map list showing all maps selected. **(e)** Push the ENTER key. Reference: Slide 23 **(f)** Map information is displayed. Use the cursor control keys to view all information. **(g)** Push the QUIT key to remove the map information display.
	e. Perform Measurement Function	Reference: Slide 24 **(1) Start measurement function.** **(a)** From the Situational Awareness page, use cursor control keys to place the cursor at the desired point to measure range from present position. A dashed line interconnects the measurement points. Reference: Slide 25 **(b)** At the bottom of the page, a measurement information box covers the toolbar. A second box also appears for five seconds next to the selected item with identification information. **NOTE:** The measurement information box provides azimuth, range, elevation angle (ELA) (optional), and slant range (SR) (optional) data referencing present position (starting point) to cursor (selected point). When a navigational item (e.g., waypoint, route, etc.) or map feature is not selected by the cursor, the top line of the measurement box is labeled Cursor. When a navigational item or map feature is selected, the top line of the measurement box provides the item identification information. Reference: Slide 26 **(c)** Perform the following steps to add or remove the optional ELA and SR data. 1. Push the MENU key. 2. Highlight View, then push the ENTER key. 3. Highlight either Show ELA and SR or Hide ELA and SR, then push the ENTER key. 4. The display returns to the Situational Awareness page with ELA and SR measurement box data added or removed, as selected.

		Reference: Slide 27
		
		NOTE: If you return to the measurement function after cycling DAGR power, ELA and SR data is automatically removed from the measurement box.
		  (d) Move the cursor as desired to measure other points from present position. The measurement box automatically updates measurement data.
		
		Reference: Slide 28
		
		  (e) Push the QUIT key to exit the measurement function and remove the measurement box and cursor.
		  (f) After leaving the measurement function, the default range scale is displayed and present position is at the center of the display.
		
		Reference: Slide 29
		
		(2) Restart measurement function.
		
		NOTE: The operator uses this function to restart the measurement using a selected starting point other than present position. The measurement function must already be in process before restarting is possible.
		  (a) With the Situational Awareness page displayed and a measurement function previously started, move the cursor to the desired new starting point (dashed line remains connected to previous starting point), then push the MENU key.
		  (b) Highlight Restart Meas Here, then push the ENTER key.
		
		Reference: Slide 30
		
		  (c) The dashed line is removed. The cursor position is the new starting point, and the information in the measurement box is reset.
		  (d) Move the cursor to the desired point or waypoint to measure range to (dashed line connects from new starting point) and the information in the measurement box updates automatically.
		  (e) Move the cursor as desired to measure other points from the starting point. The measurement box automatically updates measurement data.
		
		Reference: Slide 31
		
		  (f) Repeat this procedure for any amount of starting points needed.
		
		  (g) Push the QUIT key to exit the measurement function and remove the cursor and measurement box.
		
		Reference: Slide 32
		
		  (h) After leaving the measurement function, the default range scale is displayed and present position is at the center of the display.
		
		NOTE: If the operator leaves the measurement function, but does not leave the Situational Awareness page, and then again starts the measurement function, the last used starting point is automatically referenced.

	f. Show or Hide the Toolbar Function Keys	Reference: Slide 33
		
		  (a) From the Situational Awareness page, push the MENU key.
		  (b) Highlight View, then push the ENTER key.
		  (c) Highlight Show Toolbar or Hide Toolbar, as desired, then push the ENTER key.
		NOTE: The Show Toolbar or Hide Toolbar menu choice is disabled when the measurement information box is displayed by the Situational Awareness page.

		Reference: Slide 34
		(d) The display returns to the Situational Awareness page with the toolbar either shown or hidden as previously selected.
		NOTE: The show or hide toolbar selection affects both the Situational Awareness page and the Image Viewer page. The toolbar is shown or hidden, as previously selected, when viewing either of these pages and is not affected by cycling DAGR power.
NOTE:	**Conduct a check on learning.**	Reference: Slide 35
		1. What does the Situational Awareness Page provide?
		(ANS: A graphical display of relationships between current position, track history, landmarks or map objects (when using a map), waypoints, alerts, and routes.) Paragraph 9.6.1.
		2. What does the present position symbol display?
		(ANS: Waypoint 000 inside a circle.) Paragraph 9.6.1.1.
		3. Where is the Range Scale displayed on the Situational Awareness page?
		(ANS: Lower right corner.) Paragraph 9.6.1.1.

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Defense Advanced GPS Receiver (DAGR)
Lesson Plan 7 – Maintain Situational Awareness

10 January 2005

SECTION IV. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference: Slide 36

Title	Perform measurement function.	
Introduction	The student shall perform measurement function.	
ELO A	**ACTION:**	Determine current position using the Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined current position using the Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Situational Awareness page provides a graphical display of relationships between current position, track history, waypoints, alerts, and routes.	
Resource Requirements	DAGR	
Special Instructions	None.	
Student assignment		

Procedures	**Performance Measures:**		

Task Name: Perform measurement function.	GO	NO GO

(1) Start measurement function.
 	
  (a) From the Situational Awareness page, use cursor control keys to place the cursor at the desired point to measure range from present position. A dashed line interconnects the measurement points.
  (b) At the bottom of the page, a measurement information box covers the toolbar. A second box also appears for five seconds next to the selected item with identification information.
NOTE: The measurement information box provides azimuth, range, elevation angle (ELA) (optional), and slant range (SR) (optional) data referencing present position (starting point) to cursor (selected point). When a navigational item (e.g., waypoint, route, etc.) or map feature is not selected by the cursor, the top line of the measurement box is labeled Cursor. When a navigational item or map feature is selected, the top line of the measurement box provides the item identification information.
  (c) Perform the following steps to add or remove the optional ELA and SR data.
    1. Push the MENU key.
    2. Highlight View, then push the ENTER key.
    3. Highlight either Show ELA and SR or Hide ELA and SR, then push the ENTER key.
    4. The display returns to the Situational Awareness page with ELA and SR measurement box data added or removed, as selected.
NOTE: If you return to the measurement function after cycling DAGR power, ELA and SR data is automatically removed from the measurement box.
  (d) Move the cursor as desired to measure other points from present position. The measurement box automatically updates measurement data.
  (e) Push the QUIT key to exit the measurement function and remove the measurement box and cursor.
  (f) After leaving the measurement function, the default range scale is displayed and present position is at the center of the display.
 	
 (2) Restart measurement function.
 	
NOTE: The operator uses this function to restart the measurement using a selected starting point other than present position. The measurement function must already be in process before restarting is possible.
  (a) With the Situational Awareness page displayed and a measurement function previously started, move the cursor to the desired new starting point (dashed line remains connected to previous starting point), then push the MENU key.
  (b) Highlight Restart Meas Here, then push the ENTER key.
  (c) The dashed line is removed. The cursor position is the new starting point, and the information in the measurement box is reset.
  (d) Move the cursor to the desired point or waypoint to measure
	_____	_____

	range to (dashed line connects from new starting point) and the information in the measurement box updates automatically. **(e)** Move the cursor as desired to measure other points from the starting point. The measurement box automatically updates measurement data. **(f)** Repeat this procedure for any amount of starting points needed. **(g)** Push the QUIT key to exit the measurement function and remove the cursor and measurement box. **(h)** After leaving the measurement function, the default range scale is displayed and present position is at the center of the display. **NOTE:** If the operator leaves the measurement function, but does not leave the Situational Awareness page, and then again starts the measurement function, the last used starting point is automatically referenced.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

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SECTION V. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 37 During this topic you have learned to determine current position using the Situational Awareness page.	
Transition Next Lesson	Now that we know the steps necessary to determine current position using the Situational Awareness page, we will learn how to determine position relative to track history using Situational Awareness page.	

SECTION VI. PRESENTATION

ELO B	Reference: Slide 38 **ACTION:**	Determine position relative to track history using Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined position relative to track history using Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify position relative to track history. Refer students to paragraph 9.6.2.5 and 9.6.3.2 g.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 9.6.2.5 and 9.6.3.1 g
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Topic Overview	Reference: Slide 38 Introduction Track History Description Operations Determine Track History

	b. Track History	Reference: Slide 39
		Track history is used to plot previous positions. Up to 250 tracking history points can be saved. Once all 250 points are used, they may be set to wrap (overwrite) themselves, or not. The track history points may be copied to waypoints and used to create a route. Operator confirmation is required prior to overwriting any waypoints. When copying waypoints, the DAGR uses the next unused waypoint, operator selected waypoint(s) or waypoint 001 if all are used. The operator can select the following track history options: • **Recording Mode** — On or off. Start or stop recording track history points. • **Wrap Mode**—Wrap or no wrap. When all track history points are used, begin overwriting (wrap) any existing track history points. • **Interval Type** — Time or range. A track history point is recorded at intervals of time or range. • **Edit Time Interval** — Hours, minutes, and seconds from 1 second to 9 hours when time interval is selected. • **Edit Range Interval** — 10 meters to 99999 meters when range interval is selected. • **Clear Track History** — Clears all recorded track history points.
	c. Track History on the Situational Awareness	Reference: Slide 40 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **(1) Select Wrap Mode:** **(a)** From the Situational Awareness page, push the MENU key. **(b)** Highlight Track History, then push the ENTER key. **(c)** Highlight Select Wrap Mode, then push the ENTER key. Reference: Slide 41 **(d)** Highlight the desired selection (listed as follows), then push the ENTER key. • **No Wrap**—Does not overwrite track history points after all 250 points have been used. • **Wrap** — Begins overwriting track history points after all 250 points have been used. **(e)** The display returns to the Situational Awareness page with changes made. Reference: Slide 42 **(2) Select Interval Type:** **(a)** From the Situational Awareness page, push the MENU key. **(b)** Highlight Track History, then push the ENTER key. **(c)** Highlight Select Interval Type, then push the ENTER key. Reference: Slide 43 **(d)** Highlight the desired selection (listed as follows), then push the ENTER key. • **Time**—Records track history points based upon a set time interval (e.g., one track history point recorded every minute). • **Range** — Records track history points based upon a set range interval (e.g., one track history point recorded every 50 meters).

(e) The display returns to the Situational Awareness page with changes made.

Reference: Slide 44

(3) Edit Interval:

(a) From the Situational Awareness page, push the MENU key.

(b) Highlight Track History, then push the ENTER key.

(c) Highlight Edit Interval, then push the ENTER key.

Reference: Slide 45

(d) Using the editor, enter the desired time or range interval, then push the ENTER key. The selected interval type procedure determines whether a time or range editor appears.

• **Time Interval**—Enter the desired time interval between recording of track history points (1 second up to 9 hours).

• **Range Interval**—Enter the desired range interval between recording of track history points (10 meters up to 99999 meters).

(e) The display returns to the Situational Awareness page with changes applicable to future track history points only. Previously recorded points will not be changed unless overwritten when in wrap mode.

Reference: Slide 46

(4) Select Record Mode:

(a) From the Situational Awareness page, push the MENU key.

(b) Highlight Track History, then push the ENTER key.

(c) Highlight Select Record Mode, then push the ENTER key.

Reference: Slide 47

(d) Highlight the desired selection (listed as follows), then push the ENTER key.

• **Off** — Track history points are not recorded.

• **On** — Track history points are recorded.

Reference: Slide 48

(e) The display returns to the Situational Awareness page with changes made.

Reference: Slide 49

(5) Copy all to WP:

(a) From the Situational Awareness page, push the MENU key.

(b) Highlight Track History, then push the ENTER key.

(c) Highlight Copy All To WP, then push the ENTER key.

(d) A scrollable list displays all waypoints with the first unused waypoint highlighted.

Reference: Slide 50

(e) Highlight the desired waypoint, then push the ENTER key. If an existing waypoint is selected, the operator is prompted to confirm before the waypoint is overwritten. A waypoint stored message briefly displays.

• The waypoint selected in this step is the starting waypoint for storage of multiple track history points and they will be stored in

		consecutive order. The highest waypoint number storing a track history point, contains the last recorded track history point. Reference: Slide 51 • Track history points are stored as COPYXXX waypoints, where COPY is the name prefix and X represents the waypoint number. • The waypoints are displayed on the Situational Awareness page using the cloud shape (identity type unknown). **(f)** The display returns to the Situational Awareness page with changes made. Reference: Slide 52 **(6) Select Track History to View:** **(a)** From the Situational Awareness page, push the MENU key. **(b)** Highlight View, then push the ENTER key. **(c)** Highlight View Track History, then push the ENTER key. Reference: Slide 53 **(d)** Highlight the desired track history view selection (listed as follows), then push the ENTER key. • **None** — Displays no track history. • **All** — Displays track history. Additional track history options are available using the page menu Track History option. **(e)** The Situational Awareness page is displayed with the selected view. Reference: Slide 54 **(7) Clear History:** **(a)** From the Situational Awareness page, push the MENU key. **(b)** Highlight Track History, then push the ENTER key. **(c)** Highlight Clear History, then push the ENTER key. **(d)** The display returns to the Situational Awareness page with all track history points cleared.
NOTE:	**Conduct a check on learning.**	Reference: Slide 55 **1.** How many tracking history points can be saved? (ANS: 250.) Paragraph 9.6.2.5. **2.** What types of Intervals can you select? (ANS: Time and Range.) Paragraph 9.6.2.5.

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SECTION VII. STUDENT EVALUATION

Testing Requirements	The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 2

Reference: Slide 56

Title	Determine position relative to track history.	
Introduction	The student shall use the DAGR to determine the position relative to track history.	
ELO B	**ACTION:**	Determine position relative to track history using Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined position relative to track history using Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Situational Awareness page provides a graphical display of relationships between current position, track history, waypoints, alerts, and routes.	
Resource Requirements	DAGR	
Special Instructions	None.	
Student assignment	Use the DAGR to determine position relative to track history.	
Procedures	**Performance Measures:**	

Performance Measures:

Task Name: Determine position relative to track history	GO	NO GO
Set to No Wrap **Select Wrap Mode:** **(a)** From the Situational Awareness page, push the MENU key.	———	———

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(b) Highlight Track History, then push the ENTER key.

(c) Highlight Select Wrap Mode, then push the ENTER key.

(d) Highlight the desired selection (listed as follows), then push the ENTER key.

• **No Wrap**—Does not overwrite track history points after all 250 points have been used.

• **Wrap** — Begins overwriting track history points after all 250 points have been used.

(e) The display returns to the Situational Awareness page with changes made.

Set to Range

Select Interval Type:

(a) From the Situational Awareness page, push the MENU key.

(b) Highlight Track History, then push the ENTER key.

(c) Highlight Select Interval Type, then push the ENTER key.

(d) Highlight the desired selection (listed as follows), then push the ENTER key.

• **Time**—Records track history points based upon a set time interval (e.g., one track history point recorded every minute).

• **Range** — Records track history points based upon a set range interval (e.g., one track history point recorded every 50 meters).

(e) The display returns to the Situational Awareness page with changes made.

Interval at 10 meters

Edit Interval:

(a) From the Situational Awareness page, push the MENU key.

(b) Highlight Track History, then push the ENTER key.

(c) Highlight Edit Interval, then push the ENTER key.

(d) Using the editor, enter the desired time or range interval, then push the ENTER key. The selected interval type procedure determines whether a time or range editor appears.

• **Time Interval**—Enter the desired time interval between recording of track history points (1 second up to 9 hours).

• **Range Interval**—Enter the desired range interval between recording of track history points (10 meters up to 99999 meters).

(e) The display returns to the Situational Awareness page with changes applicable to future track history points only. Previously recorded points will not be changed unless overwritten when in wrap mode.

Record Mode On

Select Record Mode:

(a) From the Situational Awareness page, push the MENU key.

(b) Highlight Track History, then push the ENTER key.

(c) Highlight Select Record Mode, then push the ENTER key.

(d) Highlight the desired selection (listed as follows), then push the ENTER key.

• **Off** — Track history points are not recorded.

• **On** — Track history points are recorded.

	(e) The display returns to the Situational Awareness page with changes made.		
	Copy all to WP:		
	(a) From the Situational Awareness page, push the MENU key.		
	(b) Highlight Track History, then push the ENTER key.		
	(c) Highlight Copy All To WP, then push the ENTER key.		
	(d) A scrollable list displays all waypoints with the first unused waypoint highlighted.		
	(e) Highlight the desired waypoint, then push the ENTER key. If an existing waypoint is selected, the operator is prompted to confirm before the waypoint is overwritten. A waypoint stored message briefly displays.		
	• The waypoint selected in this step is the starting waypoint for storage of multiple track history points and they will be stored in consecutive order. The highest waypoint number storing a track history point, contains the last recorded track history point.		
	• Track history points are stored as COPYXXX waypoints, where COPY is the name prefix and X represents the waypoint number.		
	• The waypoints are displayed on the Situational Awareness page using the cloud shape (identity type unknown).		
	(f) The display returns to the Situational Awareness page with changes made.		
	Set to All		
	Select Track History to View:		
	(a) From the Situational Awareness page, push the MENU key.		
	(b) Highlight View, then push the ENTER key.		
	(c) Highlight View Track History, then push the ENTER key.		
	(d) Highlight the desired track history view selection (listed as follows), then push the ENTER key.		
	• **None** — Displays no track history.		
	• **All** — Displays track history. Additional track history options are available using the page menu Track History option.		
	(e) The Situational Awareness page is displayed with the selected view.		
	Clear Track History		
	Clear History:		
	(a) From the Situational Awareness page, push the MENU key.		
	(b) Highlight Track History, then push the ENTER key.		
	(c) Highlight Clear History, then push the ENTER key.		
	(d) The display returns to the Situational Awareness page with all track history points cleared.		
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.		

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SECTION VIII. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 57 During this topic you have learned to determine position relative to track history.	
Transition Next Lesson	Now that we know the steps necessary to determine position relative to track history, we will learn how to determine position relative to waypoints on the Situational Awareness page.	

SECTION IX. PRESENTATION

ELO C	Reference: Slide 58 **ACTION:**	Determine position relative to waypoints using Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined position relative to waypoints using Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify position relative to waypoints. Refer students to paragraphs 9.6.2.1, 9.6.3.1 c(1), and 9.6.3.1 d (6).	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.6.2.1, 9.6.3.2 d (1), and 9.6.3.1 e(6).
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Topic Overview	Reference: Slide 58
		 Introduction
		   - Waypoints displayed on the Situational Awareness Page
		     Description
		 Operations
		   - Select Waypoints to View
		   - Create a Waypoint at a Selected Location

	b. Waypoints	Reference: Slide 59

Situational Awareness page display different Waypoint types. Waypoint numbers are provided in the center of the shape and a direction indicator staff is attached to the symbol, if applicable. Highlighted symbols denote selected waypoints. The operator can select which waypoints to display. Operator selectable waypoint view options are none, navigation, operator-selected, navigation and operator-selected, or all. Waypoints are shown as shapes to denote their identity as follows:

    • **Friendly** — Circle
    • **Hostile** — Diamond
    • **Neutral** — Square
    • **Unknown** — Cloud |
| | **c. Waypoints on the Situational Awareness** | Reference: Slide 60

Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.

Select Waypoints to View

  (a) From the Situational Awareness page, push the MENU key.

  (b) Highlight View, then push the ENTER key.

  (c) Highlight View WPs, then push the ENTER key.

Reference: Slide 61

  (d) Highlight the desired waypoint view selection (listed as follows), then push the ENTER key.

    • **None** — Displays no waypoints.

    • **Navigation** — Displays waypoints being used for navigation.

    • **Operator-Selected**—Displays waypoints the operator preselected for viewing on the Situational Awareness page. Individual waypoints are preselected for viewing using the Waypoint Editor page.

    • **NAV and Selected** — Displays both waypoints being used for navigation and operator selected waypoints.

    • **All** — Displays all waypoints.

Reference: Slide 62

NOTE: For viewing operator-selected waypoints, the Situational Awareness field on the Waypoint Editor page must be set to Yes.

  (e) The Situational Awareness page is displayed with the selected view.

Reference: Slide 63

Create a Waypoint at a Selected Location

  (a) With the Situational Awareness page displayed, move the cursor (using cursor control keys) to a location desired to create a waypoint.

  (b) Push the MENU key.

  (c) Highlight Show/Edit, then push the ENTER key.

Reference: Slide 64

  (d) Highlight Create WP Here, then push the ENTER key.

  (e) A scrollable list displays all waypoints with the first unused waypoint highlighted. |

		Reference: Slide 65
		(f) Highlight the desired waypoint, then push the ENTER key. If an existing waypoint is selected, the operator is prompted to confirm before the waypoint is overwritten. A waypoint stored message briefly displays.
		(g) The display returns to the Situational Awareness page with the new waypoint highlighted.
		NOTE: The Situational Awareness page view must be set to view all waypoints (refer to select waypoints to view procedure).
NOTE:	**Conduct a check on learning.**	Reference: Slide 66 How is the selected waypoint noted? (ANS: By being highlighted.) Paragraph 9.6.3.2 e(6).
	e. Topic Summary	Reference: Slide 67 Introduction Waypoints displayed on the Situational Awareness Page Description Operations Selected Waypoints to View Created a Waypoint at a Selected Location During this lesson you have learned to determine position relative to waypoints. **Transition Next Lesson:** Now that we know the steps necessary to determine position relative to waypoints, we will learn how to determine position relative to alerts.

SECTION X. PRESENTATION

ELO D	Reference: Slide 68	
	ACTION:	Determine position relative to alerts using Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined position relative to alerts using Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify position relative to alerts. Refer students to paragraphs 9.6.2.4 and 9.6.3.2 d(2).	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	3 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.6.2.4 and 9.6.3.2 d(2)
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

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	a. Topic Overview	Reference: Slide 68
		
		Introduction
		
		    Alerts displayed on the Situational Awareness Page
		
		    Description
		
		Operations
		
		    Select Alerts to View

	b. Alerts	Reference: Slide 69
		
		Waypoints are used to define alerts. Alerts are displayed as selected by the operator (none, enabled, or all) using shapes to denote the alert type. Spikes displayed as part of the alert perimeter represent the dangerous side or area of an alert. Use the Status key and the Receiver Status menu to check alerts and their status. The alerts that will be displayed are:
		
		    • Hazard Alert
		
		    • Anchor Alert
		
		    • Buffer Zone Alert
		
		    • Corridor Alert
		
		    • Boundary Line or Phase Line Alert
		
		    • Area Alert

	c. Select Alerts to View	Reference: Slide 70
		
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		Select Alerts to View
		
		  (a) From the Situational Awareness page, push the MENU key.
		
		  (b) Highlight View, then push the ENTER key.
		
		  (c) Highlight View Alerts, then push the ENTER key.
		
		Reference: Slide 71
		
		  (d) Highlight the desired alert view selection (listed as follows), then push the ENTER key.
		
		    • **None** — Displays no alerts.
		
		    • **Enabled**—Displays enabled alerts. Alerts are enabled using the Alerts page.
		
		    • **All** — Displays all alerts (enabled or disabled).
		
		  (e) The Situational Awareness page is displayed with the selected view.

NOTE:	**Conduct a check on learning.**	Reference: Slide 72 What do spikes represent on alert perimeters? (ANS: The dangerous side of area.) Paragraph 9.6.2.4.

	e. Topic Summary	Reference: Slide 73
		
		Introduction
		
		    Alerts
		
		Operations
		
		    Selected Alerts to View
		
		During this lesson you have learned to position relative to alerts.
		
		    Transition Next Lesson: Now that we know the steps necessary to position relative to alerts, we will learn how to position relative to routes.

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SECTION XI. PRESENTATION

ELO E	Reference: Slide 74	
	ACTION:	Determine position relative to routes using Situational Awareness page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined position relative to routes using Situational Awareness page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify position relative to routes. Refer students to paragraphs 9.6.2.3 and 9.6.3.2 d(3).	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.6.2.3 and 9.6.3.1 d(3)
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Topic Overview	Reference: Slide 74 Introduction Routes Operations Select Routes to View
	b. Routes	Reference: Slide 75 Routes are shown as dashed lines with arrows indicating route direction waypoint to waypoint (legs of the route). The operator can select which routes are displayed. Operator selectable route view options are none, active (in route navigation), operator-selected, active and operator-selected, or all.

	c. Select Routes to View	Reference: Slide 76
		
		Instruction Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		
		(a) From the Situational Awareness page, push the MENU key.
		
		(b) Highlight View, then push the ENTER key.
		
		(c) Highlight View Routes, then push the ENTER key.
		
		Reference: Slide 77
		
		(d) Highlight the desired route view selection (listed as follows), then push the ENTER key.
		
		    • **None** — Displays no routes.
		
		    • **Active** — Displays active routes being used for navigation.
		
		    • **Operator-Selected**—Displays routes the operator preselected for viewing on the Situational Awareness page. Individual routes are preselected for viewing using the Route Editor page.
		
		    • **Active & Selected** — Displays both routes being used for navigation and operator selected routes.
		
		    • **All** — Displays all routes.

		Reference: Slide 78
		NOTE: For viewing operator-selected routes, the Situational Awareness field on the Route Editor page must be set to Yes.
		(e) The Situational Awareness page is displayed with the selected view.
NOTE:	**Conduct a check on learning.**	Reference: Slide 79
		Routes are shown as what?
		(ANS: Dashed lines.) Paragraph 9.6.2.3
	e. Topic Summary	Reference: Slide 80
		Introduction
		Routes
		Operations
		Selected Routes to View
		During this lesson you have learned to determine position relative to routes.
		Transition Next Lesson: Now that we know the steps necessary to determine position relative to routes, we will learn how to determine current position using the Map page.

SECTION XII. PRESENTATION

ELO F	Reference: Slide 81	
	ACTION:	Determine current position using Image Viewer page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Determined current position using Image Viewer page in accordance with the DAGR Operator and Maintenance Manual.
ELO G	**ACTION:**	Demonstrate how to show or hide the toolbar function keys.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Demonstrated how to show or hide the toolbar function keys in accordance with the DAGR Operator and Maintenance Manual.
ELO H	**ACTION:**	Select a map from the Image Viewer page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Selected a map from the Image Viewer page in accordance with the DAGR Operator and Maintenance Manual.
ELO I	**ACTION:**	Show map information from the Image Viewer page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Showed map information from the Image Viewer page in accordance with the DAGR Operator and Maintenance Manual.

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Learning Step/Activity 1	Identify the Image Viewer page. Refer students to paragraph 9.7.1 through 9.7.3.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	20 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 9.7.1, 9.7.3.2.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Topic Overview	Reference: Slide 81
		
		Introduction
		
		    Image Viewer Page Function
		
		    Page Symbols and Characteristics
		
		    Image Viewer Page Panning/Cursor
		
		    Image Viewer Selection, Clearing and Information
		
		Operations
		
		    Show or Hide the Toolbar Window Function Keys
		
		    Select Map
		
		    Select Waypoints to View
		
		    Perform Measurement Function
		
		    Restart Measurement Function
		
		    Show Map Information
		
		    Select Image
		
		    Show Image Information
		
		    Enable or Disable Map Capability to Automatically Display Present Position
		
		    Clear Maps and Images

	b. Image Viewer Page Function	Reference: Slide 82 **CAUTION:** If the DAGR is not tracking satellites or has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix. Prior to a mission, manually enable and orient the internal compass. Failure to do this can result in inaccurate DAGR track data when the DAGR is not moving or is moving slowly. A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4. The Image Viewer page is accessed from the Navigation submenu or from the POS page set. The Image Viewer page provides map displays, image displays, and functions described in the following paragraphs.

		After maps or images are loaded into the DAGR, they can be displayed as selected by the operator. When displaying maps or images, the page title includes (Map) or (Image), respectively. The operator can hide the toolbar window function keys to gain additional map or image display area.
		Reference: Slide 83
		Maps displayed on the Image Viewer page provide a graphical map display of relationships between current position, landmarks, map objects, and selected waypoints. When first accessed, the Image Viewer page automatically displays a map with the DAGR present position shown at the center of the display. If no loaded maps include present position or the maps have been disabled by the operator, the Image Viewer page automatically displays No Map Loaded/Enabled For This Position. The operator uses zoom and pan operations, and waypoint selections to obtain a desired view. When navigating, the Image Viewer page can provide the operator with a mapped view of surrounding terrain and potential obstructions (e.g., body of water). General map information is as follows: • Maps are always oriented with the top of the map appearing at the top of the display. • When displayed, the present position symbol (waypoint 000 inside a circle) is at the center of the display (unless the operator is panning the display). • A selectable scale value (dependent upon the map in use) is displayed in the lower right corner of the Maps page. • If no Image Viewer page maps are loaded into the DAGR, the page displays a No Maps Are Loaded. • When a map is displayed that does not cover present position, the center of the map is automatically displayed at the center of the display. • No map is displayed above 80 degrees latitude. • If the DAGR hardware version does not support maps, the Image Viewer page displays This Version Of The Hardware Does Not Support Maps. • Measurements between points on the map can be performed by the operator. • If the operator disables a map, that map cannot be used to display present position. • A cursor is used for panning and other operations.
		Reference: slide 84
		Map Page functions the same way as Situational Pages do. Waypoint types displayed on Map Page are the same as in Situational Awareness. Images provide a display of photographs or other non-map images. When an image is selected for viewing, the center of the image automatically appears at the center of the display. The operator uses zoom and pan functions to obtain the desired view. Unlike maps, a present position fix cannot be viewed from an image. General image information is as follows: • The image is always oriented with the top of the image appearing at the top of the display. • A selectable scale value is displayed in the lower right corner of the page. • A cursor is used for panning.
	c. Page Symbols and	Reference: Slide 85
		The Image Viewer page provides a graphical display of waypoints, map

| | **Characteristics** | objects, or images. Page characteristics include zoom scale, panning, and map and image functions. |

Waypoints: Waypoint numbers are provided in the center of the shape and a direction indicator staff is attached to the symbol, if applicable. Highlighted symbols (shown bottom row) denote selected waypoints. The operator can select which waypoints to display and can create waypoints from page menu selections. Operator selectable waypoint view options are none, navigation, operator-selected, navigation and operator-selected, or all. Refer to paragraph 8.2 for additional waypoint information. Waypoints are shown as shapes to denote their as follows:

- **Friendly** — Circle
- **Hostile** — Diamond
- **Neutral** — Square
- **Unknown** — Cloud

Present position is always displayed as waypoint 000. The operator can select which waypoints to display from the Image Viewer page menu. Operator selectable waypoint view options are:

- **None** — Only present position is displayed.
- **Navigation**—Displays waypoints being used for navigation inside the map coverage area as determined by the NAV Setup page From WP or To WP fields.
- **Operator-Selected**—Displays waypoints inside the map coverage area that have been selected by the operator for viewing. Waypoints desired for viewing must have the Sit (Situational) Awareness field of the Waypoint Editor page set to Yes.
- **Navigation and Selected**—Displays both navigation and operator-selected waypoints (as previously described).
- **All** — Displays all waypoints inside the map coverage area.

Reference: Slide 86

Zoom/Range Scale: The operator can zoom in or zoom out using the IN or OUT key to display the map or image with a desired range scale. Scale is adjusted through push and release of the IN or OUT keys. The center of the display is one of the following: present position (map only), center of the map or image (map with no present position), a cursor (map or image), or a selected waypoint (map only). Prior to the operator using zoom in or zoom out functions, the map or image is displayed with a default (x 1) scale. If the operator leaves the Image Viewer page and then returns, the scale automatically returns to the default scale. The zoom in and out functions operate as follows:

- **IN key** — When pushed, the display is changed to a lower scale (three levels of zoom in function) (i.e. images get larger).
- **OUT key** — When pushed, the display is changed to a greater scale (four levels of zoom out function) (i.e. images get smaller).
- **Overzoom** — Overzoom can occur when zooming in and the DAGR present position cannot be kept centered on the display. Overzoom also occurs when ground speed is too high for the selected scale. When this happens, the scale in the lower right corner alternates with Overzoom until the operator zooms out or pans the display until the present position can be centered. As the display is zoomed in or out, a scale value in the lower right corner of the display is updated to the new scale value. When present position cannot be maintained at the center of the display (due to zooming, not panning), or DAGR is

		preparing to display a new map, Working is displayed at the top of the page.
	d. Image Viewer Page Panning/Cursor	Reference: Slide 87
		The operator uses the cursor control keys to pan (move) the display in any direction to any point of the map or image. A cursor appears when panning in any direction or by pushing the ENTER key. The entire map or image can be viewed through panning. Before panning is performed, the center of the display is either DAGR present position (waypoint 000) on a map or the center of an image or map (without present position). After panning to the edge of the display, the present position (when applicable) is no longer at the center of the display and any zoom in or zoom out functions reference the cursor, not the present position. Panning is deactivated by pushing the QUIT key or leaving the Image Viewer page. When panning is deactivated, the cursor is removed, and the display returns to the display shown prior to panning. If panning or movement of the DAGR to a new position causes the display to reach the boundary of map coverage, one of the following occurs: • The DAGR automatically displays another map (if loaded) starting where the original map ends. If required, the scale automatically adjusts to display the other map with a different scale, and the DAGR displays Map Scale Changed. • If no bordering map is loaded, the DAGR displays No Map Loaded/Enabled For This Position. Panning can also be performed by selecting a specific map using the Image Viewer page menu.
	e. Map Measurement Information Box	Reference: Slide 88 The operator can perform measurements between any two points on a map including DAGR present position, waypoints, and any other point using the cursor.
		When a map is displayed and the operator pushes a cursor control key or the ENTER key, the cursor appears at the center of the display along with a measurement information box covering the toolbar function keys at the bottom of the display. The top of the information box is labeled Cursor and it provides azimuth and range measurement data from the DAGR present position to the cursor position on the map. Whenever the cursor is moved,
		the measurement data is automatically updated. When the cursor is not located at DAGR present position, a dashed measurement line appears between the cursor and present position. The measurement data blinks if the DAGR is not tracking satellites or does not have a current position fix. The cursor and the measurement information box are automatically removed if the operator leaves and returns to the Image Viewer page.
		When the cursor is placed on a waypoint symbol, the waypoint becomes highlighted and is selected. When the waypoint is selected, a second box (next to the waypoint symbol) appears for five seconds showing the waypoint identity, number, and name. The top of the measurement information box shows the selected waypoint identity (unknown, friendly, hostile, or neutral), number, and name. The azimuth and range data from present position to the selected waypoint is also displayed. Elevation angle and slant range data can be added to the box using a menu selection. The operator can set the measurement starting (reference) point to a point other than present position and restart the measurement as many times as desired.
	f. Map Selection, Clearing and Information	Reference: Slide 89 The Image Viewer page menu provides the selections listed as follows to select a specific map, clear maps, or view map information. • **Center on Position**— Displays a map (if loaded) with DAGR present

		position at the center of the display. • **Maps** • **Select Map** — Provides a listing of all loaded map names that the operator can select to view. When a map is selected that includes present position, the present position appears at the center of the display. If the selected map does not include present position, the center of the map appears at the center of the display. • **Show Information** — Provides a listing of all loaded map names. When the operator selects a map (or maps) from the listing, the map information (loaded with the map) is displayed. This information includes map name, identification, date, ellipsoid, horizontal datum, vertical datum, MAGVAR, MAGVAR date, and MAGVAR angular rate of change. • **Setup** — Provides a listing of all loaded map names. The operator can disable or enable any listed map. Only enabled maps are automatically displayed. Reference: Slide 90 • **Images** • **Select Image**—Provides a listing of all loaded image names that the operator can select to view. When an image is selected, the center of the image appears at the center of the display. • **Show Information** — Provides a listing of all loaded image names. When the operator selects an image (or images) from the image listing, the image information (loaded with the image) is displayed. • **View** — Provides operator selections for viewing waypoints, selecting range and angle units of measure, selecting north reference, hiding or showing the toolbar, and hiding or showing elevation angle and slant range measurement data. • **Show/Edit** — Provides operator selections to edit waypoint position, name, remark, identity, access the Waypoint Editor page, or create a waypoint. • **Restart Measurement Here** — Provides operator capability to perform measurements between any two points on the map with or without using present position. • **Help** — Provides operator help text. **Instructional Note**: Loading a Map will be discussed in another lesson.
NOTE:	**Conduct a check on learning.**	Reference: Slide 91 **1.** What submenu is Map page accessed from? (ANS: Navigation submenu.) Paragraph 9.7.1. **2.** How is Panning deactivated? (ANS: Pushing the Quit key.) Paragraph 9.7.2.4. **3.** What does Select Map menu selection list? (ANS: Names for all currently loaded maps.) Paragraph 9.7.2.5.
Learning Step/Activity 2		Show or Hide Toolbar. Refer students to paragraphs 9.7.3.2 i.
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 7 – Maintain Situational Awareness

10 January 2005

	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.7.3.2 (i)
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Show or Hide the Toolbar Window Function Keys	Reference: Slide 92 Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **Show or Hide Toolbar** **(1)** From the Image Viewer page, push the MENU key. **(2)** Highlight View, then push the ENTER key. Reference: Slide 93 **(3)** Highlight Show Toolbar or Hide Toolbar, as desired, then push the ENTER key. **NOTE:** The Show Toolbar or Hide Toolbar menu choice is disabled when the measurement information box is displayed by the Image Viewer page. Reference: Slide 94 **(4)** The display returns to the Image Viewer page with the toolbar either shown or hidden as previously selected. **NOTE:** The show or hide toolbar selection affects both the Situational Awareness page and the Image Viewer page. The toolbar is shown or hidden, as previously selected, when viewing either of these pages and is not affected by cycling DAGR power.
Learning Step/Activity 3	Identify position relative to Image Viewer map. Refer students to paragraphs 9.7.3.2 b, c., h, and k.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.7.3.2 b, c, h, and k
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Select Map	Reference: Slide 95 Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **Select Map** **(1)** From the Image Viewer page, push the MENU key. **(2)** Highlight Maps, then push the ENTER key. **(3)** Highlight Select Map, then push the ENTER key. Reference: Slide 96 **(4)** Highlight the desired map selection, then push the ENTER key. **(5)** The Image Viewer page displays the selected map.
	b. Select Waypoints to View	Reference: Slide 97 Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **Select Waypoints to View** (1) From the Image Viewer page, with the desired map displayed, push the MENU key.

		(2) Highlight View, then push the ENTER key.
		Reference: Slide 98
		(3) Highlight View WPs, then push the ENTER key.
		(4) Highlight the desired view waypoint selection (listed as follows), then push the ENTER key.
		• None — Displays no waypoints.
		• Navigation — Displays waypoints being used for navigation.
		• Operator-Selected—Displays waypoints the operator preselected for viewing on the Image Viewer page. Individual waypoints are preselected for viewing using the Waypoint Editor page.
		• NAV and Selected — Displays both waypoints being used for navigation and operator selected waypoints.
		• All — Displays all waypoints.
		(5) The display returns to the Image Viewer page with the selected waypoint view.
	c. Perform Measurement Function	Reference: Slide 99
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		Start measurement function
		(a) From the Image Viewer page with a map displayed, use cursor control keys to place the cursor at the desired point or waypoint to measure range from present position. A dashed line interconnects the measurement points.
		Reference: Slide 100
		(b) At the bottom of the page, a measurement box covers the toolbar. A second box also appears for five seconds next to the selected point with identification information.
		NOTE: The measurement box provides azimuth, range, elevation angle (ELA) (optional), and slant range (SR) (optional) data referencing present position (starting point) to cursor (selected point). When a waypoint is not selected by the cursor, the top line of the measurement box is labeled Cursor. When a waypoint is selected, the top line of the measurement box provides the waypoint identity type, number, and name.
		Reference: Slide 101
		(c) Perform the following steps to add or remove the optional ELA and SR data.
		1. Push the MENU key.
		2. Highlight View, then push the ENTER key.
		3. Highlight either Show ELA and SR or Hide ELA and SR, then push the ENTER key.
		Reference: Slide 102
		4. The display returns to the Image Viewer page with ELA and SR measurement box data added or removed, as selected.
		Reference: Slide 103
		NOTE: If you return to the measurement function after cycling DAGR power, ELA and SR data is automatically removed from the measurement box.
		(d) Move the cursor as desired to measure other points from present position. The measurement box automatically updates measurement data.
		Reference: Slide 104
		(e) Push the QUIT key to exit the measurement function and remove the measurement box and cursor.
		(f) After leaving the measurement function, the default scale is displayed

		on the map.

	d. Restart Measurement Function	Reference: Slide 105
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		Restart measurement function
		NOTE: The operator uses this function to restart the measurement using a selected starting point other than present position. The measurement function must already be in process before restarting is possible.
		Reference: Slide 106
		  (a) With the Image Viewer page displayed and a measurement function previously started, move the cursor to the desired new starting point (dashed line remains connected to previous starting point), then push the MENU key.
		  (b) Highlight Restart Meas Here, then push the ENTER key.
		Reference: Slide 107
		  (c) The dashed line is removed. The cursor position is the new starting point, and the information in the measurement box is reset.
		  (d) Move the cursor to the desired point or waypoint to measure range to (dashed line connects from new starting point) and the information in the measurement box updates automatically.
		Reference: Slide 108
		  (e) Move the cursor as desired to measure other points from the starting point. The measurement box automatically updates measurement data.
		  (f) Repeat this procedure for any amount of starting points needed.
		Reference: Slide 109
		  (g) Push the QUIT key to exit the measurement function and remove the cursor and measurement box.
		  (h) After leaving the measurement function, the default scale is displayed on the map.

	f. Display Map with Present Position at Center of Display	Reference: Slide 110
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		Display map with present position at center of display.
		(1) From the Image Viewer page, push the MENU key.
		(2) Highlight Center On POS, the push the ENTER key.
		Reference: Slide 111
		(3) The Image View page displays one of the following:
		  (a) Present position at center of display.
		  (b) No Map Loaded/Enabled For This Position if the DAGR does not have a map loaded and enabled that includes present position.

Learning Step/Activity 4	Show map information. Refer students to paragraphs 9.7.3.2 e.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.7.3.2 e
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Show Map	Reference: Slide 112 Instructional Note: The following procedure should be performed as a

	Information	guided practice. Have students follow along with their DAGRs.
		Show Map Information
		(1) From the Image Viewer page, push the MENU key.
		(2) Highlight Maps, then push the ENTER key.
		(3) Highlight Show Information, then push the ENTER key.
		Reference: Slide 113
		(4) Select map(s) using one of the following steps.
		NOTE: Only maps with a check mark displayed to the left of their map name are selected to show information.
		(a) To select an individual map, highlight the desired map, then push the left or right cursor control key.
		(b) To select all maps, push the MENU key. Highlight Select All, then push the ENTER key. The display returns to the map list showing all maps selected.
		Reference: Slide 114
		(5) Push the ENTER key.
		(6) Map information is displayed. Use the cursor control keys to view all information.
		(7) Push the QUIT key to remove the map information display.
NOTE:	**Conduct a check on learning.**	Reference: Slide 115
		1. Where does the present position appear when a map is selected?
		(ANS: Center of the display.) Paragraph 9.7.2.6
		2. Only maps with what sort of mark are selected to show information?
		(ANS: Check mark. Paragraph 9.7.3.2
		3. Which key removes the map information display?
		(ANS: QUIT key.) Paragraph 9.7.2.6

SECTION XIII. PRESENTATION

ELO J	Reference: Slide 81 **ACTION:**	Select an image from the Image Viewer page
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Selected an image from the Image Viewer page in accordance with the DAGR Operator and Maintenance Manual.
ELO K	**ACTION:**	Show image information from the Image Viewer page.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Showed image information from the Image Viewer page in accordance with the DAGR Operator and Maintenance Manual.
ELO L	**ACTION:**	Enable or disable map capability to automatically display present position.
	CONDITION:	Given a DAGR receiver, DAGR accessories to operate the DAGR, DAGR Operator and Maintenance Manual or pocket guide and a map.
	STANDARD:	Enabled or disabled map capability to automatically display present position in accordance with the DAGR Operator and Maintenance Manual.

10 January 2005

Learning Step/Activity 1	Select an image from the Image Viewer page. Refer students to paragraphs 9.7.3.2 d.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.7.3.2 d
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Select Image	Reference: Slide 116 Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **(1)** From the Image Viewer page, push the MENU key. **(2)** Highlight Images, then push the ENTER key. Reference: Slide 117 **(3)** Highlight Select Image, then push the ENTER key. **(4)** Highlight the desired image selection, then push the ENTER key. **(5)** The Image Viewer page displays the selected map.
Learning Step/Activity 2	Show image information. Refer students to paragraphs 9.7.3.2 f.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.7.3.2 f
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Show Image Information	Reference: Slide 118 Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **Show image information** **(1)** From the Image Viewer page, push the MENU key. **(2)** Highlight Images, then push the ENTER key. **(3)** Highlight Show Information, then push the ENTER key. Reference: Slide 119 **(4)** Select image(s) using one of the following steps. **NOTE:** Only images with a check mark displayed to the left of their image name are selected to show information. **(a)** To select an individual image, highlight the desired map, then push the left or right cursor control key. **(b)** To select all images, push the MENU key. Highlight Select All,

		then push the ENTER key. The display returns to the image list showing all maps selected.
		Reference: Slide 120
		(5) Push the ENTER key.
		(6) Image information is displayed. Use the cursor control keys to view all information.
		(7) Push the QUIT key to remove the image information display.
Learning Step/Activity 3	Enable or disable map capability to automatically display present position. Refer students to paragraphs 9.7.3.2 g and i.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 9.7.3.2 g and i
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Enable or Disable Map Capability to Automatically Display Present Position	Reference: Slide 121
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.
		Enable or disable map capability to automatically display present position.
		(1) From the Image Viewer page, push the MENU key.
		(2) Highlight Maps, then push the ENTER key.
		(3) Highlight Setup, then push the ENTER key.
		Reference: Slide 122
		(4) Enable or disable map(s) using one of the following steps.
		NOTE: Only maps with a check mark displayed to the left of their map name are enabled.
		  (a) To enable or disable an individual map, highlight the desired map selection, then push the left or right cursor control key to enable or disable the selected map.
		  (b) To enable or disable all maps, push the MENU key. Highlight Select All (to enable all maps) or Deselect All (to disable all maps). Then push the ENTER key. The display returns to the map list showing all maps enabled or disabled.
		Reference: Slide 123
		(5) Push the ENTER key. The display returns to the Image Viewer page with the map(s) enabled or disabled.

	b. Clear Maps and Images	Reference: Slide 124 Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **Clear Maps and Images** **CAUTION:** When the clear maps and images procedure is performed, all maps and images loaded into the DAGR are removed. DAGR support of a particular mission can become seriously impaired without the required maps or images.

		(1) From any display (except a message pop-up), push the MENU key twice to display the Main Menu. Reference: Slide 125 **(2)** Highlight System, then push the ENTER key. **(3)** Highlight Data Clear Options, then push the ENTER key. **(4)** From the clear data message display, use the cursor control keys to scroll to Maps/Images. **(5)** Push the ENTER key to confirm and perform the clear data function. Reference: Slide 126 **NOTE:** • If the QUIT key is pushed to cancel the clear data function, the display returns to the last page viewed. • After the maps/images clear data function has started, DAGR displays an in progress message that states no DAGR functions are available until the clear data function has been completed. **(6)** Push the ENTER key to acknowledge the clear data passed message. The display returns to the POS page set.

NOTE:	**Conduct a check on learning.**	Reference: Slide 127
		
		1. Selecting Select Image provides which sort of listing?
		
		   (ANS: Loaded image names.) Paragraph 9.7.2.6
		
		2. What key enables you to select a desired image?
		
		   (ANS: ENTER key.) Paragraph 9.7.2.6
		
		Reference: Slide 128
		
		3. When the operator selects an image from the image listing, what is displayed?
		
		   (ANS: Image information. Paragraph 9.7.2.6)
		
		4. Which control key allows the user to enable or disable the selected map?
		
		   (ANS: Cursor control key. Paragraph 9.7.3.2)

	Topic Summary	Reference: Slide 129
		
		Introduction
		
		   Image Viewer Page Function
		
		   Page Symbols and Characteristics
		
		   Image Viewer Page Panning/Cursor
		
		   Image Viewer Selection, Clearing and Information
		
		Operations
		
		   Show or Hide the Toolbar Window Function Keys
		
		   Select Map
		
		   Select Waypoints to View
		
		   Perform Measurement Function
		
		   Restart Measurement Function
		
		   Show Map Information
		
		   Select Image
		
		   Show Image Information
		
		   Enable or Disable Map Capability to Automatically Display Present Position

		Clear Maps and Images
		During this topic you have learned to determine current position using Image Viewer page.

SECTION XIV. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 83 During this lesson you have learned to determine current position using situational awareness page and Map page.	
Transition Next Lesson	Now that we know the steps necessary to determine current position using the Situational Awareness page and Map page, we will now learn how to determine azimuth of a jamming source.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			

Task(s) Taught or Supported	Task Number	Task Title			
	113-008	Determine Azimuth of a Jamming Source using the How To Use The Jammer Finder Page procedure.			

Task(s) Reinforced	Task Number	Task Title			
	None				

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	0:35				
Practical Exercise	0:15				
Test	0:00				
Total Hours	0:45				

Test Lesson Number	Testing	**Hours**	**Lesson No.**
			113-008

Prerequisite Lesson(s)	**Lesson Number**	**LESSON TITLE**
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform DAGR Self-Test Function
	113-003	Adjust DAGR Receiver Default Settings to User Settings
	113-004	Set Waypoints, Routes, and Alerts.
	113-005	Setup Communications
	113-006	Navigate a Course
	113-007	Maintain Situational Awareness

Security Clearance/Access	None.

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.			
References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna is optional to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.			
Additional Support Personnel Requirements	None			
Equipment Required	DAGR receiver and External Power (Fused, 5 Meter), Optional handheld compass			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan eight, PowerPoint slides (DAGR_PPT_113_008.ppt).		
	Student Materials	DAGR Operator and Maintenance technical manual, lesson eight student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	None.		
Ammunition Requirements	None.			
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	
Motivator	Reference: Slide 1 "The DAGR and an external compass are used to determine and store the azimuth of a jamming signal source as a waypoint. Multiple waypoints are stored and used to determine the position of the jamming source."	
Terminal Learning Objective	Reference: Slide 2 **ACTION:**	The student shall determine the azimuth of a jamming source.
	CONDITION:	Given a DAGR receiver configured from start-up, accessories necessary to operate the DAGR, and a DAGR Operator Maintenance Manual.
	STANDARD:	The student determined the azimuth of a jamming source in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	Determining the azimuth of an L1 and L2 frequency jamming (signal noise) source allows the DAGR operator to block out unwanted signal noise.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

SECTION III. PRESENTATION

	ACTION:	Determine the azimuth of a jamming source using the How To Use The Jammer Finder Page procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR and a DAGR Operator Maintenance Manual or pocket guide.
	STANDARD:	Determined the azimuth of a jamming source using the How To Use The Jammer Finder Page procedure in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify the azimuth of a jamming source. Refer students to paragraph 14.4.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	10 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual, Date: 30/05/2003 Paragraph: 14.4.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Overview	Reference: Slide 3 Introduction: 　Jammer Finder Page Operations: 　Determine Azimuth of a Jamming Source
	a. Determine Azimuth of Jamming Source Familiarization	Reference: Slide 4 **CAUTION:** A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4. The Jammer Finder page is accessed from the Applications submenu. The Jammer Finder page provides capability to determine the azimuth of an L1 and L2 frequency jamming (signal noise) source. After the DAGR determines the direction of the jamming signal, a compass is used to determine the azimuth (track) of the jamming source in relation to present position. The operator then enters the azimuth into the Entered Azimuth field and stores it along with the DAGR present position as an electronic warfare (EW) waypoint. Multiple EW waypoints are used to calculate the position of the jamming source.
	b. Jammer Finder Page Field Descriptions	Reference: Slide 5 Vertical scrolling is used to view all page fields. Field information contained in this page is changed using various editor techniques. The following information describes the various fields contained in this page. **L1 and L2 Fields:** Displays signal noise strength as a numeric value and bar graphs for the L1 and L2 frequencies. Signal noise strength is used to determine the direction jamming signals are coming from. The bar graph consists of a black bar and a gray bar. The black bar represents the numeric value thousands and hundreds digits. The gray bar represents the numeric value tens and ones digits. The greater the signal noise strength, the greater the values displayed by the fields. Field values for the same

		level of jamming can vary between DAGRs. This field data is to be used only with the Jammer Finder page.
		Reference: Slide 6
		Entered Azimuth Field: Displays the entered azimuth value. The operator acquires this value from a compass while viewing the maximum signal noise strength of the L1 and L2 fields. The azimuth is the angle measured clockwise in reference to north reference (True, Magnetic, or Grid). If a value is not entered, the field displays double dashes. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks).
		Stored As WP Field: Displays the waypoint number and name used to store the DAGR present position and entered azimuth value. The next unused waypoint will automatically be used or WP 001 is used if all waypoints are used. Another waypoint may be selected for use by the operator. Prior to overwriting existing waypoints, the DAGR prompts the operator for confirmation. Unless edited, the waypoint name is preceded by EW (electronic warfare). The DAGRMAGVAR and MAGVAR Type values determine those values stored with the waypoint. If a value is not entered, the field displays double dashes. Field data format is XXX-EWNNN, where X represents the waypoint number and N represents the waypoint name (displayed as waypoint number unless edited).
NOTE:	**Conduct a check on learning.**	Reference: Slide 7 **1.** The black bar graph on the L1 and L2 fields represents what sort of numeric value? (ANS: The black bar represents the numeric value thousands and hundreds digits.) Paragraph 14.4.2.1 **2.** Which DAGR submenu page provides capability to determine the azimuth of an L1 and L2 frequency jamming source in relation to present position? (ANS: Jammer Finder page accessed from the Applications submenu.) Paragraph 14.4.1
Learning Step/Activity 2	Determine the azimuth of a jamming source. Refer students to paragraph 14.4.3.1	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual, Date: 30/05/2003 Paragraph: 14.4.3.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Determine Azimuth of a Jamming Source	Reference: Slide 8 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **1.** From any display (except a message pop-up), push the MENU key twice to display the Main Menu. **2.** Highlight Applications, then push the ENTER key. **3.** Highlight Jammer Finder, then push the ENTER key. The Jammer Finder page is displayed. **NOTE:** The following procedure requires that the operator use an external compass with the DAGR.

		(1) Block signal noise from behind by holding the DAGR level, in front of and close to the midsection of your body.
		(2) From the Jammer Finder page, view the L1 and L2 page fields for signal noise strength.
		(3) Slowly turn in a circle. Watch the L1 and L2 fields closely to determine the starting and stopping point (not a single point) where the greatest signal noise strength occurs (this could be a 45° to 150° angle where the highest signal noise strength begins and ends).
		Reference: Slide 9
		(4) Point the DAGR at the middle of the angle between the starting and stopping point where signal noise strength is greatest. The DAGR now points the most likely direction of the signal jamming source.
		(5) Use a compass to determine the azimuth of the direction pointed by the DAGR.
		(6) Highlight the Entered Azimuth field, push the ENTER key. Enter the azimuth value, then push the ENTER key.
		NOTE: An alternate method of entering azimuth (not requiring a compass) is to use the Entered Azimuth field menu selection Use Current Track while pointing the DAGR at the most likely direction of the signal jamming source.
		Reference: Slide 10
		(7) Store present position and entered azimuth as a waypoint.
		    (a) Highlight the Store As Waypoint field, and then push the MENU key.
		    (b) Highlight Store As WP, then push the ENTER key.
		    (c) The first unused waypoint is highlighted. Highlight the desired waypoint, then push the ENTER key. DAGR requires confirmation before overwriting an existing waypoint.
		    (d) Present position and azimuth are stored as an electronic warfare (EW) waypoint. The display returns to the Jammer Finder page Stored As WP field. The stored waypoint is displayed as XXX-EWXXX, where X represents the waypoint number. The waypoint name, remark, and identity type can be edited using field menu selections.
		Reference: Slide 11
		WARNING: The calculated jammer signal source area is not to be used as an accurate GPS position (e.g., Fire Support).
		    (8) Gather an additional EW waypoint from another position, as required, for use in calculating (triangulating) the Jammer signal source area. The calculation requires at least two EW waypoints and the use of a map to plot EW waypoint positions and azimuths to the jammer signal source.
		NOTE: Stored EW waypoints azimuth values can be viewed from the Waypoint Editor page Track field.

NOTE:	**Conduct a check on learning.**	Reference: Slide 12
		1. Which field on the Jammer Finder page may you find signal noise strength?
		    (ANS: L1 and L2 field.) Paragraph 14.4.2.1
		2. What sort of bodily motion can you do in order to determine the greatest signal noise strength?
		    (ANS: Slowly turn about in a circle. Point the DAGR at the middle of the angle between the starting and stopping point, or stop turning when the greatest noise is indicated.) Paragraph 14.4.3.1 b(3)

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

SECTION IV. STUDENT EVALUATION

Testing Requirements	The student will determine the azimuth of a jamming source by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference: Slide 13

Title	Determine the Azimuth of a Jamming Source.	
Introduction	The student shall determine the azimuth of a jamming source.	
Motivator	"In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR".	
TLO	**ACTION:**	Determine the azimuth of a jamming source using the How To Use The Jammer Finder page procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Determined the azimuth of a jamming source using the How To Use The Jammer Finder page procedure in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	Determining the azimuth of an L1 and L2 frequency jamming (signal noise) source allows the DAGR operator to block out unwanted signal noise.	
Resource Requirements	DAGR	
Special Instructions	None.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

Procedures		

Task Name: Determine Signal Jamming Source Azimuth.	GO	NO GO
Determine Signal Jamming Source Azimuth: **NOTE:** The following procedure requires that the operator use an external compass with the DAGR. **(1)** Block signal noise from behind by holding the DAGR level, in front of and close to the midsection of your body. **(2)** From the Jammer Finder page, view the L1 and L2 fields for signal noise strength (refer to paragraph 14.4.2.1 for field descriptions). **(3)** Slowly turn in a circle. Watch the L1 and L2 fields closely to determine the starting and stopping point (not a single point) where the greatest signal noise strength occurs (this could be a 45° to 150° angle where the highest signal noise strength begins and ends). **(4)** Point the DAGR at the middle of the angle between the starting and stopping point where signal noise strength is greatest. The DAGR now points the most likely direction of the signal jamming source. **(5)** Use a compass to determine the azimuth of the direction pointed by the DAGR (refer to paragraph 14.4.2.2 for field description). **(6)** Highlight the Entered Azimuth field, push the ENTER key. Enter the azimuth value, then push the ENTER key. **NOTE:** An alternate method of entering azimuth (not requiring a compass) is to use the Entered Azimuth field menu selection Use Current Track while pointing the DAGR at the most likely direction of the signal jamming source. **(7)** Store present position and entered azimuth as a waypoint. 　**(a)** Highlight the Store As Waypoint field, and then push the MENU key. 　**(b)** Highlight Store As WP, then push the ENTER key. 　**(c)** The first unused waypoint is highlighted. Highlight the desired waypoint, then push the ENTER key. DAGR requires confirmation before overwriting an existing waypoint. 　**(d)** Present position and azimuth are stored as an electronic warfare (EW) waypoint. The display returns to the Jammer Finder page Stored As WP field. The stored waypoint is displayed as XXX-EWXXX, where X represents the waypoint number. The waypoint name, remark, and identity type can be edited using field menu selections. Refer to paragraph 8.3 for additional waypoint information as required. **WARNING:** The calculated jammer signal source area is not to be used as an accurate GPS position (e.g., Fire Support). Reference: Slide 11 　**(8)** Gather an additional EW waypoint from another position, as required, for use in calculating (triangulating) the Jammer signal source area. The calculation requires at least two EW waypoints and the use of a map to plot EW waypoint positions and azimuths to the jammer signal source. **NOTE:** Stored EW waypoints azimuth values can be viewed from the Waypoint Editor page Track field. Refer to paragraph 8.3.	―――	―――

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 8 – Determine the Azimuth of a Jamming Source

9 July 2004

SECTION V. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 14 During this lesson you have learned to determine the azimuth of a jamming source on your DAGR.	
Transition Next Lesson	Now that we know the steps necessary to determine the azimuth of a jamming source, we will learn how to determine target position the DAGR receiver.	

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 9 – Target Position Using DAGR

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title	
	523-0790484	DAGR Operation	
Task(s) Taught or Supported	**Task Number**	**Task Title**	
	113-009	Determine Target Position Using DAGR	
Task(s) Reinforced	**Task Number**	**Task Title**	
	None		

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	1:25				
Practical Exercise	0:30				
Test	0:00				
Total Hours	1:55				

Test Lesson Number	Testing	**Hours**	**Lesson No.**
			113-009
Prerequisite Lesson(s)	**Lesson Number**	**LESSON TITLE**	
	113-001	Perform the DAGR Startup Procedure	
	113-002	Perform DAGR Self-Test Function	
	113-003	Adjust DAGR Receiver Default Settings to User Settings	
	113-004	Set Waypoints, Routes, and Alerts.	
	113-005	Setup Communications	
	113-006	Navigate a Course	
	113-007	Maintain Situational Awareness	
	113-008	Determine Azimuth of Jamming Source	
Security Clearance/Access			

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 9 – Target Position Using DAGR

9 July 2004

References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	

Student Study Assignments	None
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna is optional to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used. Instructor needs to supply coordinates for target and Initial Point.
Additional Support Personnel Requirements	None
Equipment Required	DAGR receiver, and External Power (Fused, 5 Meter), Laser Range Finder, and cable to connect laser range finder to DAGR

Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan nine, PowerPoint slides (DAGR_PPT_113_009.ppt).
	Student Materials	DAGR Operator and Maintenance technical manual, lesson nine student handout.

Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.
	Training Area	None.

Ammunition Requirements	None
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material. Instructor needs to create waypoints for targets.

Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**

Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 9 – Target Position Using DAGR

9 July 2004

SECTION II. INTRODUCTION

<table>
<tr><td rowspan="4"></td><td align="right">Method of Instruction:</td><td colspan="2">Lecture/Conference/Discussion</td></tr>
<tr><td align="right">Instructor to Student Ratio:</td><td colspan="2">1:16</td></tr>
<tr><td align="right">Time of Instruction: (minutes)</td><td colspan="2">5 Minutes</td></tr>
<tr><td align="right">Media:</td><td colspan="2">PowerPoint</td></tr>
<tr><td>Motivator</td><td colspan="3">Reference: Slide 1

 "DAGR aids in accurately determine the location of targets for artillery fire or close air support missions."</td></tr>
<tr><td rowspan="4">Terminal Learning Objective</td><td colspan="2">Reference: Slide 2
ACTION:</td><td>Determine target position.</td></tr>
<tr><td colspan="2">CONDITION:</td><td>Given a DAGR receiver DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide</td></tr>
<tr><td colspan="2">STANDARD:</td><td>Determined target position using DAGR in accordance with the DAGR Operator and Maintenance Manual within the time allotted by the instructor.</td></tr>
<tr><td colspan="2"></td><td></td></tr>
<tr><td>Safety Requirements</td><td colspan="3">None.</td></tr>
<tr><td>Risk Assessment Level</td><td colspan="3">The Risk Assessment for this lesson is low.</td></tr>
<tr><td>Environmental Considerations</td><td colspan="3">None.</td></tr>
<tr><td>Evaluation</td><td colspan="3">Student learning is reinforced through a check on learning questioning technique throughout the lesson.

Performance examination: One practical exercise.

Written examination: None.</td></tr>
<tr><td>Instructional Lead-in</td><td colspan="3">The Fire Support page is used to calculate the three dimensional position coordinates of a target location from any waypoint or present DAGR position.</td></tr>
</table>

SECTION III. PRESENTATION

NOTE:	Inform the students of the Enabling Learning Objective requirements.	

ELO A	**ACTION:**	Determine target location for artillery using the Fire Support Page.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	The student determined target location for artillery using the Fire Support page in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify target location for artillery using the Fire Support page. Refer students to paragraphs 14.2 through 14.2.2.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	5 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 14.2 through 14.2.2.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Topic Overview	Reference: Slide 3
		Introduction:
		    Fire Support Page
		Operations:
		    Determine Target Position
		    How to Use Laser Range Finder

	b. Page Function	Reference: Slide 4 **WARNING:** • If DAGR power is cycled while using the Fire Support page, calculated position coordinates and elevation of a target are lost unless stored as a waypoint. When the Power-On sequence is complete, the Present Position Page is displayed and NOT the Fire Support Page. You must recalculate the target position coordinates after the Power-On sequence is completed. Prior to communicating or using any calculated target position coordinates, always verify page title FIRE SUPPORT appears at the top of the display and position coordinates field title is Calculated Target Position. • DAGR displays a warning to prevent misuse of the present position as a target position that could cause personal injury or death. After power-on and prior to the DAGR automatically displaying the Present Position page, a warning states your position is displayed, NOT the target position if the Fire Support page was used or nonvolatile memory was cleared prior to power-on. • Before using or communicating a Fire Support page target position, take appropriate action according to any warning or danger message that is displayed. Then check all data in the Safety Check fields to ensure your present position is a safe distance from the target position relative to the ordinance being used. Failure to do so could result in injury or death. **CAUTION:** • When DAGR present position (000–PRES POS) is used in the From WP field for the calculation and fields are blinking between black and gray text (From WP field, POS To Target Slant Range, Calculated Target Position and Calculated Target Elevation fields), the DAGR was not tracking satellites or had not yet acquired a current position fix before the calculation. Calculated field data referencing present position may be inaccurate when the DAGR does not use a current position fix for the calculation.

		• The operator must use the Stored As WP field to store the target position and elevation as a fire support (FS) waypoint or laser range finder (LRF) waypoint, or the target position will be lost when the DAGR is turned off.
		• Verify appropriate units of measure, elevation reference, coordinate/grid system, grid resolution, and datum are selected before entering field data for calculation. Verification of this data ensures accurate target data.
		• A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4.
		Reference: Slide 5
		The Fire Support page is accessed from the Applications submenu using the advanced function set. The Fire Support page is used to calculate the three dimensional position coordinates of a target location from any waypoint or present DAGR position. This calculation is automatically performed once the operator inputs the following information:
		    • Source waypoint or present position (From WP field)
		    • Slant range or horizontal range to target (whichever is available).
		    • Azimuth to target
		    • Target elevation or elevation angle (whichever is available).
		Line of sight is used to calculate the new position. When target data is manually entered in view one of the Fire Support page, the calculated position can be stored as a fire support (FS) waypoint. When target data is electronically entered using a laser range finder, the calculated position can be stored as a laser range finder (LRF) waypoint. FS and LRF waypoints are stored with a MAGVAR value calculated from their target position and their MAGVAR type is stored as Calculated. FS and LRF waypoints are also used by the CAS 9–Line Brief page for close air support (CAS) applications.
		Check all data in the Safety Check fields (view two of the Fire Support page) prior to using or communicating a Fire Support page target position.

NOTE:	**Conduct a check on learning**	Reference: Slide 6
		1. How do you access the Fire Support page?
		   (ANS: From the Applications submenu using the advanced function set. Paragraph 14.2.1)
		2. What must entered before the DAGR can automatically calculate the three dimensional position of the target?
		   (ANS: source waypoint, slant range or horizontal range to target, azimuth to target, and target elevation or elevation angle. Paragraph 14.2.1)

Learning Step/Activity 2		Determine target location for artillery using the Fire Support page. Refer students to paragraph 14.2.3.1 and 14.2.4.
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	30 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 14.2.3.1 and 14.2.4
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Calculate Target Position and Elevation	Reference: Slide 7

Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.

(1) From the Fire Support page, individually highlight each field, then push the ENTER key to edit field content described as follows:

(a) From WP field — Select the source waypoint as desired, or leave it set to present position (000–PRESPOS).

From WP Field: Displays the starting point (source) waypoint number and name selected by the operator for use in the calculation. After required data is entered and the calculation is performed, this field title changes from From WP to From WP At Time Of Calculation. Field data format is XXX-NNNNNNNNNN, where X represents the waypoint number and N represents the waypoint name. This field also indicates the following:
• This field does not blink when a waypoint is used instead of present position (000–PRES POS).
• This field does not blink when present position (000–PRES POS) is used and the DAGR has a present position fix before the calculation is performed.
• This field blinks when present position (000–PRES POS) is used and the DAGR does not have a present position fix before the calculation is performed.
• After the calculation is performed using present position (000–PRES POS), this field blinks to indicate the DAGR did not have a current position fix when the calculation was performed.

Reference: Slide 8

(b) Azimuth field — Input the azimuth (from the source waypoint to the target position).

NOTE: If entering the azimuth from present position to the target position, an alternative method is to Point the DAGR at the target. Highlight the Azimuth field, and then push the MENU key. Highlight Use Current Track, then push the ENTER key.

Azimuth Field: Displays the azimuth from the source waypoint to the new (calculated) position. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks) in reference to north reference (True, Magnetic, or Grid).

Reference: Slide 9

(c) Range Type field and Elevation Type field — Determine, and then input the range type and elevation type into their corresponding fields. This field corresponds with the Range/Slant Range field and Target Elevation/Elevation Angle field.

Range Type Field: Operator selects Range when only horizontal range data is being used in the calculation. Operator selects Slant when both horizontal and vertical range data is being used in the calculation. The operator selection determines whether the Slant Range or Range field is displayed.

Reference: Slide 10

(d) Range or Slant Range field — Input the range or slant range field value (from the source waypoint to the target position). This field is dependent on the type of range set in the Range Type field.

Slant Range Field: This field is displayed when Range Type field is set to Slant. Displays the slant range entered from the source waypoint to the new (calculated) position. Field data format is XXXX.XX or

XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.

Range Field: This field is displayed when Range Type field is set to Range. Displays the range entered from the source waypoint to the new (calculated) position. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.

Reference: Slide 11

(e) Target Elevation or Elevation Angle field—Input the target elevation or elevation angle (from the source waypoint to the target position) field value. This field is dependent on the type of elevation set in the Elevation Type field. If data is not entered, the calculation is performed using default values (Target Elevation 0.0 meters DTM, or Elevation Angle 0.0°).

Target Elevation Field: This field is displayed when Elevation Type field is set to Elevation. Displays the entered elevation of the new (calculated) position. The field provides the elevation or vertical range from the surface of the earth from either mean sea level (MSL) or datum (DTM) elevation reference. Field data format is +/- XXXXX, where X represents feet or meters (positive up).

Elevation Angle Field: This field is displayed when Elevation Type field is set to Angle. Displays the entered elevation angle from the source waypoint to the new (calculated) position. Field data format is +/- XXX.X (X represents degrees) or XXXX (X represents mils or strecks) (positive up).

Elevation Type Field: Operator selects Elevation when elevation feet or meters are being used in the calculation. Operator selects Angle when an elevation angle is being used in the calculation. This operator selection determines whether the Target Elevation or Elevation Angle field is displayed.

Reference: Slide 12

WARNING: • If any fields on the Fire Support page are blinking, the DAGR did not have a current position fix when the calculation was performed. Calculated field data may be inaccurate and result in injury or death.

• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than the value shown in the User Entered Minimum Safe Slant Range field (but greater than 100 meters), the DAGR displays a warning message and displays the slant range from DAGR present position to target position. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.

• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than 100 meters, the DAGR displays a danger message that present position and target position are the same. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.

(2) Calculated Target Position and Calculated Target Elevation fields automatically display their calculated values. The From WP field title changes to From WP At Time of Calculation.

Calculated Target Position Field: Displays the calculated target position, datum, and coordinate system. Whenever the source waypoint, range, elevation, or azimuth data is changed, the calculation is automatically performed. Displays No solution Possible when field data required for the calculation has not yet been entered. Field data

blinks if the source waypoint is 000-PRES POS and the DAGR did not have current position fix when the calculation was performed.

Calculated Target Elevation Field: Displays the calculated target elevation. Whenever the source waypoint, range, elevation, or azimuth data is changed, the calculation is automatically performed. Field data blinks if the source waypoint is 000-PRES POS and the DAGR did not have current position fix when the calculation was performed.

Reference: Slide 13

(3) Scroll to the Safety Checks view two of the Fire Support page, then review all safety check field information.

(a) POS to Target Slant Range Field - Verify a safe range between present position and target position.

(b) EPE/EHE field - Verify acceptable position accuracy to meet mission requirements.

Reference: Slide 14

(c) FOM Field - Verify acceptable position accuracy to meet mission requirements.

(d) User Entered Minimum Safe Slant Range Field - Verify a safe user entered minimum slant range value between present position and target position.

Warning: Always verify this field data as a safety check prior to using or communicating a Fire Support page target position. Always maintain a safe slant range between present position and target position to ensure safety of operator and other personnel.

POS To Target Slant Range Field: Displays the slant range from the DAGR position fix at time of calculation to the calculated target position. This field cannot be edited by the operator. Units of measure can be selected using the Range or Slant Range field menu. Field data blinks if the DAGR did not have a current position fix when the calculation was performed. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.

Warning: Always verify this field data as a safety check prior to using or communicating a Fire Support page target position. A high level of position error may place the safety of personnel at risk.

EPE/EHE Field: Displays either the estimated position error (EPE) or the estimated horizontal error (EHE). The operator can use the field menu to select either EPE or EHE. Error is displayed as a ± value. Calculated target position data is accurate to within the ± value. This field data cannot be edited by the operator. Units of measure can be selected using the Range or Slant Range field menu. Field data format is N.N, NN, or NNN, where N represents miles, nautical miles, kilometers, feet, yards, or meters.

Warning: Always verify this field data as a safety check prior to using or communicating a Fire Support page target position. A high level of position error may place the safety of personnel at risk.

FOM Field: Displays the figure of merit (FOM) for the calculated position. FOM ranges from 1 to 9, with a value of 1 being the best. This field cannot be edited by the operator.

Warning: Always verify this field data as a safety check prior to using or communicating a Fire Support page target position. Always maintain a safe slant range between present position and target position to ensure safety of operator and other personnel.

User Entered Minimum Safe Slant Range Field: Displays the minimum safe slant range between present position of the DAGR and

the calculated target position. A warning is displayed when the slant range between DAGR present position and the target position is less than the displayed value. The operator can edit the value, but the field returns to the default value (1,000 meters) when DAGR power is cycled. Units of measure can be selected using the Range or Slant Range field menu.

Reference: Slide 15

Warning: A high level of position error may place the safety of personnel and the mission at risk. Before storing calculation values as a waypoint, verify the current the FOM field and EPE or EHE field indicate acceptable position accuracy to meet mission requirements.

(4) Store the calculation values as a waypoint.

  (a) Highlight the Stored As WP field, and then push the MENU key.

  (b) Highlight Store As WP, then push the ENTER key.

   Stored As WP Field: Displays the waypoint number and name of the waypoint used to store the calculated position and elevation. The waypoint name begins with FS for fire support waypoints (manual entry), or LRF for laser range finder waypoints (electronic entry). The operator is prompted for confirmation before any waypoint is overwritten. If the calculated position is not stored as a waypoint, the field displays double dashes. Field data format is XXX-TTTNNNNNN, where X represents waypoint number and T represents FS or LRF and N represents waypoint name (displays waypoint number until edited). The operator stores the calculated position and elevation as a waypoint according to one of the following:

   • The first unused waypoint starting with waypoint 999 and counting down (e.g., 998, 997, etc.)

   • Any waypoint number selected by the operator.

   • Waypoint 001 if all waypoints are used.

Reference: Slide 16

  (c) DAGR displays and highlights the first unused waypoint staring with 999 and counting down (e.g., 998, 997, etc.). Highlight the desired waypoint, then push the ENTER key.

  (d) DAGR briefly displays the waypoint stored message, and then returns to the Fire Support page with the Stored As WP field displaying XXX-FSXXX, where X represents the stored waypoint number.

Reference: Slide 17

  (5) Edit the Stored as WP field waypoint (name, remark, or identity type) as desired using the field menu selections.

| | **(b) How to Use a Laser Range Finder** | Reference: Slide 18
Warning: • A high level of position error may place the safety of personnel and the mission at risk. Before storing laser range finder (LRF) values as a waypoint, verify the current DAGR figure of merit (FOM) indicates acceptable position accuracy to meet mission requirements. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM.
• Prior to using a laser range finder with DAGR, ensure present position is current and accurate. When used with a laser range finder, the DAGR must be set to Continuous mode, OR if set to Standby mode, the present position fix must be current and accurate. DO NOT set the DAGR to auto transition to Standby mode. When DAGR ceases tracking satellites (e.g., placed in Standby mode) and is moved to another location, the last present position fix is no longer current or accurate.
• Before using or communicating an LRF waypoint target position, take appropriate action according to any warning or danger message that is displayed. Then check all data in the Safety Check fields to ensure your |

present position is a safe distance from the target position relative to the ordinance being used. If the operator edits field data of Fire Support page view one after LRF data is displayed, a target calculation is automatically performed and the Safety Check fields must again be checked. Failure to do so could result in injury or death.

Note: At close range (100 meters or less), the LRF waypoint azimuth value may have a small amount of error. To ensure accurate targeting, the azimuth should be crosschecked using a map and compass prior to use.

Caution: Do not connect the LRF to the DAGR while the DAGR is powered on. This can cause spurious signals resulting in the DAGR rejecting the first LRF shot data.

    a. With the DAGR powered off, attach the laser range finder interface cable (supplied with the LRF) to the LRF and the RS-232 connector to the DAGR J2 connector.

Reference: Slide 19

    b. Power-on the DAGR, then access the Communications submenu, COM Port Setup page.

    c. Set the COM Port field to COM Port 1 (advanced function set only).

    d. Set the Configuration field to Standard (advanced function set only).

Reference: Slide 20

    e. Set the Laser Range Finder (LRF) Type field to Mark VII if using the Mark VII LRF (advanced function set only).

    f. Set the Laser Range Finder (LRF) Type field to Other if using a LRF other than the Mark VII (advanced function set only).

    g. Ensure the DAGR is not set for auto transition to Standby mode.

Reference: Slide 21

    h. Prior to using the LRF, use the Present Position page position error field (EPE/EHE/EVE) to ensure present position is current and accurate.

    i. Using LRF procedures (initiated from the LRF), determine the range of the desired point in the field of view, and then transfer the data through the interface cable to the DAGR.

Reference: Slide 22

    j. Verify accuracy of the LRF shot data.

        (1) The DAGR automatically displays the LRF Shot Received message.

Note: If multiple LRF shots are taken, only the data of the last shot taken is displayed in the LRF Shot Received message. All prior LRF shot data is overwritten.

Reference: Slide 23

        (2) Check the accuracy of the displayed azimuth, slant range, and elevation angle of the LRF shot data. Then perform one of the following:

          (a) To accept the data and store an LRF waypoint, push the ENTER key. Then proceed to step k.

          (b) To replace the data with a new LRF shot, return to step i.

          (c) To discard the data and remove the LRF Shot Received message, push the QUIT key. The DAGR returns to the page displayed prior to the LRF Shot Received message.

Reference: Slide 24

    k. Store the LRF waypoint.

        (1) The DAGR automatically displays the Fire Support page with the LRF shot data.

Warning: • If any fields on the Fire Support page are blinking, the DAGR did not have a current position fix when the calculation was performed. Calculated field data may be inaccurate and result in injury or death.

• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than the value shown in the User Entered Minimum Safe Slant Range field (but greater than 100 meters), the DAGR displays a warning message and displays the slant range from DAGR present position to target position. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.

• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than 100 meters, the DAGR displays a danger message that present position and target position are the same. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.

> (2) Calculated Target Position and Calculated Target Elevation fields automatically display their calculated values.

Reference: Slide 25

> (3) Scroll to the Safety Checks view two of the Fire Support page, then review all safety check field information.
>> (a) POS to Target Slant Range field — Verify a safe range between present position and target position.
>> (b) EPE/EHE field — Verify acceptable position accuracy to meet mission requirements.

Reference: Slide 26

>> (c) FOM field — Verify acceptable position accuracy to meet mission requirements.
>> (d) User Entered Minimum Safe Slant Range field — Verify a safe user entered minimum slant range value between present position and target position.

Reference: Slide 27

Warning: A high level of position error may place the safety of personnel and the mission at risk. Before storing LRF shot values as a waypoint, verify the FOM field and EPE or EHE field indicate acceptable position accuracy to meet mission requirements.

> (4) Store the LRF shot data as a waypoint.
>> (a) Highlight the Stored As WP field, then push the MENU key.
>> (b) Highlight Store As WP, then push the ENTER key.

Reference: Slide 28

>> (c) DAGR displays and highlights the first unused waypoint starting with waypoint 999 and counting down (e.g., 998, 997, etc.). Highlight the desired waypoint, then push the ENTER key.

Reference: Slide 29

>> (d) DAGR briefly displays the waypoint stored message, then returns to the Fire Support page with the Stored As WP field displaying XXX-LRFXXX, where X represents the stored waypoint number.

Reference: Slide 30

> (5) Edit the Stored as WP field waypoint (name, remark, or identity type) as desired using the field menu selections.

Note: If the operator edits field data of the Fire Support page view one, the waypoint name prefix changes from LRF to FS.

l. Verify the LRF waypoint is stored using the Waypoints page.

Reference: Slide 31

m. Use the Waypoints page and Waypoint Editor page to check LRF waypoint data (e.g., position, elevation, azimuth, slant range, EPE, etc.).

		Note: The sort function of the Waypoints page provides capability to sort and display the stored LRF waypoints by name for quick access.

NOTE	**Conduct a check on learning**	Reference: Slide 32
		
		1. What field do you enter the target's elevation?
		
		    (ANS: Target Elevation Field.) Paragraph 14.2.3.1 b(1)(e)
		
		2. What connector, on the DAGR, do you connect the LRF cable to?
		
		    (ANS: J2.) Paragraph 14.2.4

Defense Advanced GPS Receiver (DAGR)
Lesson Plan 9 – Target Position Using DAGR

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SECTION IV. STUDENT EVALUATION

Testing Requirements	Reference Slide 85 The student will demonstrate how to set the GPS Setup page, Power Saver Page, Auto-On Page, and Automark Page by using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference: Slide 33

Title	Determine target location for artillery using the Fire Support page.	
Introduction	The student will determine target location for artillery using the Fire Support page.	
Motivator	"In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR"	
TLO	**ACTION:**	Determine target position.
	CONDITION:	Given a DAGR receiver DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide
	STANDARD:	Determined target position using DAGR in accordance with the DAGR Operator and Maintenance Manual within the time allotted by the instructor.
ELO A	**ACTION:**	Determine target location for artillery using the Fire Support Page.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	The student determined target location for artillery using the Fire Support page in accordance with the DAGR Operator and Maintenance Manual.
	Determine target location using fire support page. Refer students to paragraph 14.2.3.1 b	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The Fire Support page is used to calculate the three dimensional position coordinates of a target location from any waypoint or present DAGR position	
Resource	DAGR	

Defense Advanced GPS Receiver (DAGR)
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Requirements	
Special Instructions	None.
Procedures	Use this procedure to change the following field settings. After the instructor has verified changes, return the fields to their original settings.

Task Name: Set Target for Fire support Page.	GO	NO GO

Setup the Fire Support Page :
 	
b. Calculate Target Position and Elevation
 	
   (1) From the Fire Support page, individually highlight each field, then push the ENTER key to edit field content described as follows:
 	
     (a) From WP field — Select the source waypoint as desired, or leave it set to present position (000–PRES POS).
 	
     (b) Azimuth field — Input the azimuth (from the source waypoint to the target position).
 	
     (c) Range Type field and Elevation Type field — Determine, and then input the range type and elevation type into their corresponding fields. This field corresponds with the Range/Slant Range field and Target Elevation/Elevation Angle field.
 	
     (d) Range or Slant Range field — Input the range or slant range field value (from the source waypoint to the target position). This field is dependent on the type of range set in the Range Type field.
 	
     (e) Target Elevation or Elevation Angle field—Input the target elevation or elevation angle (from the source waypoint to the target position) field value. This field is dependent on the type of elevation set in the Elevation Type field. If data is not entered, the calculation is performed using default values (Target Elevation 0.0 meters DTM, or Elevation Angle 0.0°).
 	
WARNING: • If any fields on the Fire Support page are blinking, the DAGR did not have a current position fix when the calculation was performed. Calculated field data may be inaccurate and result in injury or death.
• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than the value shown in the User Entered Minimum Safe Slant Range field (but greater than 100 meters), the DAGR displays a warning message and displays the slant range from DAGR present position to target position. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.
• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than 100 meters, the DAGR displays a danger message that present position and target position are the same. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.
 	
   (2) Calculated Target Position and Calculated Target Elevation fields automatically display their calculated values. The From WP field title changes to From WP At Time of Calculation.
 	
   (3) Scroll to the Safety Checks view two of the Fire Support page, then review all safety check field information.
 	
     (a) POS to Target Slant Range Field - Verify a safe range between present position and target position.
	_____	_____

<table>
<tr><td>

(b) EPE/EHE field - Verify acceptable position accuracy to meet mission requirments.

(c) FOM Field - Verify acceptable position accuracy to meet mission requirments.

(d) User Entered Minimum Safe Slant Range Field - Verify a safe user entered minimum slant range value between present position and target position.

WARNING: A high level of position error may place the safety of personnel and the mission at risk. Before storing calculation values as a waypoint, verify the current the FOM field and EPE or EHE field indicate acceptable position accuracy to meet mission requirements.

(4) Store the calculation values as a waypoint.

(a) Highlight the Stored As WP field, and then push the MENU key.

(b) Highlight Store As WP, then push the ENTER key.

(c) DAGR displays and highlights the first unused waypoint staring with 999 and counting down (e.g., 998, 997, etc.). Highlight the desired waypoint, then push the ENTER key.

(d) DAGR briefly displays the waypoint stored message, and then returns to the Fire Support page with the Stored As WP field displaying XXX-FSXXX, where X represents the stored waypoint number.

(5) Edit the Stored as WP field waypoint (name, remark, or identity type) as desired using the field menu selections.

</td></tr>
</table>

Task Name: Determine Target with laser Range Finder.	**GO**	**NO GO**
Determine Target with A Laser Range Finder With DAGR: **Warning:** • A high level of position error may place the safety of personnel and the mission at risk. Before storing laser range finder (LRF) values as a waypoint, verify the current DAGR figure of merit (FOM) indicates acceptable position accuracy to meet mission requirements. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. • Prior to using a laser range finder with DAGR, ensure present position is current and accurate. When used with a laser range finder, the DAGR must be set to Continuous mode, OR if set to Standby mode, the present position fix must be current and accurate. DO NOT set the DAGR to auto transition to Standby mode. When DAGR ceases tracking satellites (e.g., placed in Standby mode) and is moved to another location, the last present position fix is no longer current or accurate. • Before using or communicating an LRF waypoint target position, take appropriate action according to any warning or danger message that is displayed. Then check all data in the Safety Check fields to ensure your present position is a safe distance from the target position relative to the ordinance being used. If the operator edits field data of Fire Support page view one after LRF data is displayed, a target calculation is automatically performed and the Safety Check fields must again be checked. Failure to do so could result in injury or death. **Note:** At close range (100 meters or less), the LRF waypoint azimuth value may have a small amount of error. To ensure accurate targeting, the azimuth should be crosschecked using a map and compass prior to use.	_____	_____

Caution: Do not connect the LRF to the DAGR while the DAGR is powered on. This can cause spurious signals resulting in the DAGR rejecting the first LRF shot data.

  a. With the DAGR powered off, attach the laser range finder interface cable (supplied with the LRF) to the LRF and the RS-232 connector to the DAGR J2 connector.

  b. Power-on the DAGR, then access the Communications submenu, COM Port Setup page.

  c. Set the COM Port field to COM Port 1 (advanced function set only).

  d. Set the Configuration field to Standard (advanced function set only).

Reference: Slide 17

  e. Set the Laser Range Finder (LRF) Type field to Mark VII if using the Mark VII LRF (advanced function set only).

  f. Set the Laser Range Finder (LRF) Type field to Other if using a LRF other than the Mark VII (advanced function set only).

  g. Ensure the DAGR is not set for auto transition to Standby mode.

  h. Prior to using the LRF, use the Present Position page position error field (EPE/EHE/EVE) to ensure present position is current and accurate.

  i. Using LRF procedures (initiated from the LRF), determine the range of the desired point in the field of view, and then transfer the data through the interface cable to the DAGR.

  j. Verify accuracy of the LRF shot data.

    (1) The DAGR automatically displays the LRF Shot Received message.

Note: If multiple LRF shots are taken, only the data of the last shot taken is displayed in the LRF Shot Received message. All prior LRF shot data is overwritten.

    (2) Check the accuracy of the displayed azimuth, slant range, and elevation angle of the LRF shot data. Then perform one of the following:

      (a) To accept the data and store an LRF waypoint, push the ENTER key. Then proceed to step k.

      (b) To replace the data with a new LRF shot, return to step i.

      (c) To discard the data and remove the LRF Shot Received message, push the QUIT key. The DAGR returns to the page displayed prior to the LRF Shot Received message.

  k. Store the LRF waypoint.

    (1) The DAGR automatically displays the Fire Support page with the LRF shot data.

Warning: • If any fields on the Fire Support page are blinking, the DAGR did not have a current position fix when the calculation was performed. Calculated field data may be inaccurate and result in injury or death.

• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than the value shown in the User Entered Minimum Safe Slant Range field (but greater than 100 meters), the DAGR displays a warning message and displays the slant range from DAGR present position to target position. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.

• When the calculation is performed and the slant range between DAGR present position and the target position is equal to or less than 100 meters, the DAGR displays a danger message that present position and

target position are the same. When this message is displayed, take immediate action, obtain a safe slant range to prevent injury or death.

(2) Calculated Target Position and Calculated Target Elevation fields

automatically display their calculated values.

(3) Scroll to the Safety Checks view two of the Fire Support page, then review all safety check field information.

(a) POS to Target Slant Range field — Verify a safe range between present position and target position.

(b) EPE/EHE field — Verify acceptable position accuracy to meet mission requirements.

(c) FOM field — Verify acceptable position accuracy to meet mission requirements.

(d) User Entered Minimum Safe Slant Range field — Verify a safe user entered minimum slant range value between present position and target position.

Warning: A high level of position error may place the safety of personnel and the mission at risk. Before storing LRF shot values as a waypoint, verify the FOM field and EPE or EHE field indicate acceptable position accuracy
to meet mission requirements.

(4) Store the LRF shot data as a waypoint.

(a) Highlight the Stored As WP field, then push the MENU key.

(b) Highlight Store As WP, then push the ENTER key.

(c) DAGR displays and highlights the first unused waypoint starting with waypoint 999 and counting down (e.g., 998, 997, etc.). Highlight the desired waypoint, then push the ENTER key.

(d) DAGR briefly displays the waypoint stored message, then returns to the Fire Support page with the Stored As WP field displaying XXX-LRFXXX, where X represents the stored waypoint number.

(5) Edit the Stored as WP field waypoint (name, remark, or identity type) as desired using the field menu selections.

Note: If the operator edits field data of the Fire Support page view one, the waypoint name prefix changes from LRF to FS.

Reference: Slide 18

l. Verify the LRF waypoint is stored using the Waypoints page.

Reference: Slide 19

j. Use the Waypoints page and Waypoint Editor page to check LRF waypoint data (e.g., position, elevation, azimuth, slant range, EPE, etc.).

Note: The sort function of the Waypoints page provides capability to sort and display the stored LRF waypoints by name for quick access.

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.

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Defense Advanced GPS Receiver (DAGR)
Lesson Plan 9 – Target Position Using DAGR

9 July 2004

SECTION V. TOPIC SUMMARY

<table>
<tr><td></td><td>Method of Instruction:</td><td>Lecture/Conference/Discussion</td></tr>
<tr><td></td><td>Instructor to Student Ratio:</td><td>1:16</td></tr>
<tr><td></td><td>Time of Instruction: (minutes)</td><td>5 Minutes</td></tr>
<tr><td></td><td>Media:</td><td>PowerPoint</td></tr>
<tr><td>Check on Learning</td><td colspan="2">Determine if students have learned the material presented by ---

a. Soliciting student questions and explanations.

b. Asking questions and getting answers from the students.

c. Providing immediate feedback in context to the material presented and correcting student misunderstandings.</td></tr>
<tr><td>Review/Summarize Lesson</td><td colspan="2">Reference: Slide 34

During this lesson you have learned to determine target location for artillery using the Fire Support page.</td></tr>
<tr><td>Transition Next Lesson</td><td colspan="2">Now that we know the steps necessary to target location for artillery using the Fire Support page, we will learn how to identify the CAS 9-Line Brief page.</td></tr>
</table>

SECTION VI. PRESENTATION

 NOTE: Inform the students of the Enabling Learning Objective requirements.

<table>
<tr><td>ELO B</td><td>ACTION:</td><td>Determine target location for Close Air Support using the CAS 9–Line Brief Page.</td></tr>
<tr><td></td><td>CONDITION:</td><td>In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR</td></tr>
<tr><td></td><td>STANDARD:</td><td>The student determined target location for Close Air Support using the CAS 9-Line Brief page in accordance with the DAGR Operator and Maintenance Manual.</td></tr>
<tr><td>Learning Step/Activity 1</td><td colspan="2">Identify the CAS 9-Line brief page. Refer students to paragraph 14.3.</td></tr>
<tr><td></td><td>Method of instruction:</td><td>Conference / Discussion</td></tr>
<tr><td></td><td>Instructor to student ratio:</td><td>1:16</td></tr>
<tr><td></td><td>Time of instruction: (minutes):</td><td>5 Minutes</td></tr>
<tr><td></td><td>Media:</td><td>PowerPoint</td></tr>
<tr><td></td><td>References:</td><td>Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 14.3</td></tr>
<tr><td></td><td>Security Classification:</td><td>Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials</td></tr>
<tr><td></td><td>Topic Overview</td><td>Reference: Slide 35
Introduction:
   CAS 9-Line Brief Page
Operations:
How to Use CAS 9-Line Brief Page</td></tr>
</table>

	Page Function	Reference: Slide 36
		WARNING: Check all data appearing in the Safety Check fields prior to calling for close air support to ensure safety of operator and other personnel.
		CAUTION: A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4.
		The CAS 9-Line Brief page is accessed from the Applications submenu using the advanced function set. Data from this page is used and called in by the operator to acquire close air support (CAS). The DAGR displays computed CAS data after the following is entered by the operator:
		• Initial point position used by inbound aircraft to orient target acquisition.
		• Target position typically acquired from a fire support waypoint.
		Reference: Slide 37
		The CAS 9-Line Brief page can use fire support waypoints (waypoints stored using the Fire Support page) or other waypoints to provide target and initial point (IP) position data. Certain page fields are numbered one through nine, corresponding to the CAS 9-Line Brief form. The two bottom views of the page have safety check fields that must be checked prior to calling for support. The operator is prompted by the DAGR to view and acknowledge the safety check fields under the following conditions:
		• When initial point (IP) and target position are entered or changed.
		• When datum, unit selection, or reference (other than coordinate/grid) are changed.
		• When present position changes more than 50 meters.
NOTE:	**Conduct a check on learning.**	Reference: Slide 38
		What must be checked before calling in air support?
		(ANS: CAS 9 Line brief safety check fields have been checked.) Paragraph 14.3.1.1
Learning Step/Activity 2	Determine close air support position coordinates data. Refer students to paragraphs 14.3.3.1.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	30 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date 30/05/03, Paragraphs: 14.3.3.1.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Set Up Units/References	Reference: Slide 39 **NOTE:** All CAS 9–Line Brief page units of measure and references are standard. If other units or references are used, specify these in the page Remarks field. Any changes made to units or references on the CAS 9–Line Brief page do not affect other pages units of measure or references. **(1)** Prior to using display data, view the page to determine if changes to units of measure or references used in the display are required (metric or decimal, mils or degrees, true or magnetic, etc.). Reference: Slide 40 **(2)** When unit or reference changes are required, highlight the field, then push the MENU key. **(3)** Highlight the desired type of units or reference selection (e.g., Select Range Units), then push the ENTER key. **(4)** Highlight the desired selection, then push the ENTER key. Reference: Slide 41 **(5)** The page displays all associated information with the change made. **(6)** If required, repeat the procedure for the remaining selections.

	b. Entering and Using CAS 9–Line Brief Data	Reference: Slide 42
		
		NOTE: At any time during the following procedure, the operator can select Clear All from the page menu or any field menu to clear all data for the CAS 9–Line page and start over. The Clear All menu selection is used at the beginning of the procedure to make sure no old computed or manually entered field data is retained.
		
		   (1) From the CAS 9–Line Brief page, push the MENU key.
		
		Reference: Slide 43
		
		   (2) Highlight Clear All, then push the ENTER key.
		
		Reference: Slide 44
		
		   (3) Manually enter data as applicable for the following fields:
		     • Coordinate Source field
		     • 5) Target Description field
		     • 7) Type of Mark field
		     • Code/Color
		     • 8) Location of Friendlies
		     • 9) Egress (Relative to Target)
		     • Remarks
		     • Time on Target (TOT)
		     • Time to Target (TTT) Standby
		     • Time to Target (TTT) plus (Seconds)
		
		Reference: Slide 45
		
		   (4) Scroll the page views and highlight the 1) Initial Point (IP) field, then push the MENU key.
		
		   (5) Highlight Use WP Position, then push the ENTER key.
		
		Reference: Slide 46
		
		   (6) Highlight the waypoint desired for the initial point (position used by inbound aircraft to orient target acquisition), then push the ENTER key. The display returns to the CAS 9–Line Brief page displaying the 1) Initial Point (IP) field highlighted with the initial point waypoint position data.
		
		NOTE: The Initial Point (IP) Datum/Ellipsoid field automatically displays the waypoint datum.
		
		1) Initial Point (IP) Field: Displays the initial point (IP) position data for use by inbound aircraft to orient target acquisition. A waypoint is

selected to provide IP position, datum, and elevation data. Ensure the appropriate datum, coordinate/grid system and grid resolution are selected before editing horizontal coordinates. With the field highlighted, the left and right cursor control keys can be used to rapidly change the coordinate/grid system as required for inbound aircraft. The field displays Required Entry until an entry is made.

Reference: Slide 47

(7) As required use the left and right cursor control keys to select the grid/coordinate system used by the inbound aircraft (part of the 1) Initial Point (IP) field).

(8) Highlight the 6) Target Location field, then push the MENU key.

Reference: Slide 48

(9) Highlight Use WP Position, then push the ENTER key.

(10) Highlight the waypoint desired for the target location, then push the ENTER key. The operator is prompted to review and acknowledge safety checks.

Reference: Slide 49

(11) The display returns to the CAS 9–Line Brief page displaying the 6) Target Location field highlighted with target waypoint position data.

NOTE: The Target Datum/Ellipsoid field automatically displays the waypoint datum.

Target Location Field: Displays the target position data same as the 6) Target Location field. Any changes made to this field also changes the 6) Target Location field. A waypoint is selected to provide target position, datum, and elevation data. Ensure the appropriate datum and coordinate/grid system is selected before editing horizontal coordinates. The field displays Required Entry until an entry is made.

Reference: Slide 50

(12) As required, use the left and right cursor control keys to select the grid/coordinate system used by the inbound aircraft Target Location field.

Reference: Slide 51

(13) After the target location field is populated, the DAGR automatically computes and displays data for the following fields:
  • **2)** Heading (IP to Target) field. The word (computed) is displayed following the data.
  • **3)** Distance (IP to Target) field. The word (computed) is displayed following the data.
  • **4)** Target Elevation field

Reference: Slide 52

2) Heading (IP to Target) Field: Displays the initial point to target course (azimuth), normally acquired using a paper map. The course can be entered by the operator or computed by the DAGR. The field menu provides a Compute Value selection for the DAGR to compute the course. The words Manual Entry or Computed appear after the course value to indicate how the course was provided. Double dashes appear if the course has not been entered or cannot be computed. Field data format is XXX.X (X represents degrees) or XXXX (X represents mils or strecks).

Offset (Left/Right) Field: Displays the selected course offset, if applicable. Selections are:
  • **– – (none)**
  • **Right**

		• **Left** **3) Distance (IP to Target) Field:** Displays the initial point to target horizontal range. The range can be entered by the operator or computed by the DAGR. The field menu provides a Compute Value selection for the DAGR to compute the range. The words Manual Entry or Computed appear after the range value to indicate how the range was provided. Double dashes appear if the range has not been entered or cannot be computed. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters. **4) Target Elevation Field:** Displays the elevation of the target. When a waypoint position is used in the Target Position field, the waypoint elevation is automatically displayed in the Target Elevation field. Displays double dashes if elevation has not been entered. Field data format is +/- XXXXX, where X represents feet or meters.
		Reference: Slide 53 **NOTE:** The 2) Heading (IP to Target) field and 3) Distance (IP to Target) field can be revised manually and will show the words (manual entry) following the data. When this is displayed, the 1) Initial Point (IP) and 6) Target Location field position data is not used by DAGR to compute IP to target heading (course) or distance (range). The manual entry data can be changed back to computed data by using the MENU key and selecting Compute Value (see procedure c). **Coordinate Source Field:** Displays the coordinate source used by the operator for gathering data. Selections are: • **– – (none)** • **Paper Map** • **Electronic Map** • **GPS** • **Other** Reference: Slide 54 **5) Target Description Field:** Displays information entered about the target. The description can consist of up to 36 characters. **6) Target Location Field:** Displays the target position data same as the Target Position field. Any changes made to this field also change the Target Position field. A waypoint is selected to provide target position, datum, and elevation data. Ensure the appropriate datum and coordinate/grid system is selected before editing horizontal coordinates. With the field highlighted containing position data, the left and right cursor control keys can be used to rapidly change the coordinate/grid system as required for inbound aircraft. The field displays Required Entry until an entry is made. Required Entry until an entry is made. Reference: Slide 55 **7) Type of Mark Field:** Displays information entered about the type of mark used. The information can consist of up to 18 characters. **Code/Color Field:** Displays entered code/color to add mark information. The information can consist of up to 18 characters. **8) Location of Friendlies Field:** Displays information entered about the location of friendlies. The information can consist of up to 54 characters.

Reference: Slide 56

9) Egress (Relative to Target) Field: Displays information entered about the egress. The information can consist of up to 36 characters.

Remarks Field: Displays entered remarks. Remarks can consist of up to 72 characters.

Reference: Slide 57

Time on Target (TOT) Field: Displays the time on target using the HHMM L/Z format, where H represents hours, M represents minutes, L represents local, and Z represents zulu. Displays double dashes when field data has not been entered.

Time to Target (TTT) Standby Field: Displays the time to target in minutes (0 up to 99). Displays double dashes when field data has not been entered.

Time to Target (TTT) Plus (Seconds) Field: Displays the time to target in seconds (0 up to 59), additional to minutes. Displays double dashes when field data has not been entered.

Reference: Slide 58

(14) Scroll to the Safety Checks view of the CAS 9–Line Brief page, and review all safety check field information. If the DAGR is not tracking satellites nor has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix.

CAUTION: If the DAGR is not tracking satellites or has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix.

Reference: Slide 59

(a) **Current Time and Date (Time Hack) field** — Verify accuracy of current time and date information.

Current Time and Date (Time Hack) Field: (**Warning:** Always verify this field data as a safety check prior to calling for close air support. Verify accuracy of current time and date information to ensure safety of operator and other personnel.) Displays the current time and date. This field cannot be edited by the operator. However, the time zone can be edited using the Time on Target (TOT) field menu.

(b) **Time Zone field** - Verify accuracy of current time zone information.

Time Zone Field: (**Warning:** Always verify this field data as a safety check prior to calling for close air support. Verify accuracy of time zone information to ensure safety of operator and other personnel.) Displays the current time zone. This field cannot be edited by the operator. However, the time zone can be edited using the Time on Target (TOT) field menu.

Reference: Slide 60

(c) **Present Position to Target Range field** — Verify a safe range between present position, target position, and initial point position.

Present Position to Target Range Field: (**Warning:** Always verify this field data as a safety check prior to calling for close air support. Always maintain a safe range between present position, target position, and initial point position to ensure safety of operator and other personnel.) Displays the horizontal range from present position to the target position. This field cannot be edited by the operator. Displays double dashes if the target position has not been entered. Range units can be changed using the 3) Distance (IP to Target)

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		Reference: Slide 61
		(d) IP to Target — Azimuth field and Range field — Verify a safe range between present position, target position, and initial point position. Avoid having inbound aircraft overfly your present position. When the IP to Target Azimuth field and IP to Present Position Azimuth field overfly bars are positioned in the same direction, inbound aircraft could overfly your present position.
		IP to Target Range: Displays the horizontal range from the IP to the target position. This field cannot be edited by the operator. Displays double dashes if the IP or target position has not been entered. Range units can be changed using the 3) Distance (IP to Target) field menu.
		IP to Azimuth Field: Displays the azimuth from the IP to the target position. Also displays an inbound aircraft overfly bar positioned relative to the azimuth value. This field cannot be edited by the operator. Displays double dashes (and no overfly bar) if the IP or target position has not been entered. Angle units can be changed using the 2) Heading (IP to Target) field menu.
		Reference: Slide 62
		(e) IP to Present Position—Azimuth field and Range field— Verify a safe range between present position, target position, and initial point position. Avoid having inbound aircraft overfly your present position. When the IP to Target Azimuth field and IP to Present Position Azimuth field overfly bars are positioned in the same direction, inbound aircraft could overfly your present position.
		IP to Present Position Azimuth Field: Warning: Always verify this field data as a safety check prior to calling for close air support. Avoid having inbound aircraft overfly your present position to ensure safety of operator and other personnel. When the IP to Target Azimuth field and IP to Present Position Azimuth field overfly bars are positioned in the same direction, inbound aircraft could overfly your present position.
		Displays the azimuth from the IP to the present position. Also displays an inbound aircraft overfly bar positioned relative to the azimuth value. This field cannot be edited by the operator. Displays double dashes (and no overfly bar) if the IP or present position has not been entered. Angle units can be changed using the 2) Heading (IP to Target) field menu.
		Reference: Slide 63
		WARNING: Check all data appearing in the Safety Check fields prior to calling for close air support to ensure safety of operator and other personnel.
		(15) After verifying all safety check information indicates it is safe to proceed, communicate data as required for close air support.
	c. Revise Heading or Distance field information from manual entry to computed data.	Reference: Slide 64
		NOTE: When data in the 2) Heading (IP To Target) field and the 3) Distance (IP To Target) field is revised manually; the DAGR does not automatically compute or update these fields after entering IP or Target (waypoint) position data. When data is manually entered, the field has (manual entry) displayed after their data. Use the following procedure to command the DAGR to compute or update these fields based upon IP and target position data.

		(1) From the CAS 9–Line Brief page, highlight the 2) Heading (IP To Target) field.
		Reference: Slide 65
		(2) Push the MENU key.
		(3) Highlight Compute Value, then push the ENTER key.
		Reference: Slide 66
		(4) The DAGR performs computation according to the data shown in the Initial Point and Target Location fields. Display returns to the CAS 9–Line Brief page with the field highlighted and the word (computed) displayed following the data.
		(5) Repeat steps (1) through (4) of this procedure for the 3) Distance (IP To Target) field.
NOTE:	**Conduct a check on learning.**	Reference: Slide 67
		1. What does 1) Initial Point (IP) field display?
		(ANS: Position data for use by inbound aircraft to orient target acquisition.) Paragraph 14.3.2.5
		2. What does the IP to Target Azimuth Field display?
		(ANS: Displays the azimuth from the IP to the target position.) Paragraph 14.3.2.23
	Topic Summary	Reference: Slide 68
		• Introduction
		– CAS 9-Line Brief Page
		• Operations
		How to Use CAS 9-Line Brief Page

SECTION VII. STUDENT EVALUATION

Testing Requirements	The student will determine close air support position coordinates data using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 2

Reference: Slide 69

Title	Determine target location for Close Air Support page.	
Introduction	The student will determine target location for Close Air Support page.	
Motivator	"Use this lesson when the soldier needs to accurately determine the location of targets for artillery fire or close air support missions."	
TLO	**ACTION:**	Determine target position.
	CONDITION:	Given a DAGR receiver DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual or pocket guide
	STANDARD:	Determined target position using DAGR in accordance with the DAGR Operator and Maintenance Manual within the time allotted by the instructor.
ELO B	**ACTION:**	Determine target location for Close Air Support using the CAS 9–Line Brief Page.
	CONDITION:	In a classroom environment, given a DAGR Operator and Maintenance Manual and an operational DAGR
	STANDARD:	The student Determine target location for Close Air Support using the CAS 9–Line Brief page in accordance with the DAGR Operator and Maintenance Manual.
	Paragraphs 14.3.3.1	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	The CAS 9-Line page is used to provide target position data for close air support.	

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Resource Requirements	DAGR		
Special Instructions	None.		
Procedures	**Task Name:** Determine target location for Close Air Support using the CAS 9–Line Brief Page.	**GO**	**NO GO**

Determine target location for Close Air Support using the CAS 9–Line Brief Page.

NOTE: At any time during the following procedure, the operator can select Clear All from the page menu or any field menu to clear all data for the CAS 9–Line page and start over. The Clear All menu selection is used at the beginning of the procedure to make sure no old computed or manually entered field data is retained.

(1) From the CAS 9–Line Brief page, push the MENU key.

(2) Highlight Clear All, then push the ENTER key.

(3) Manually enter data as applicable for the following fields:

- Coordinate Source field
- 5) Target Description field
- 7) Type of Mark field
- Code/Color
- 8) Location of Friendlies
- 9) Egress (Relative to Target)
- Remarks
- Time on Target (TOT)
- Time to Target (TTT) Standby
- Time to Target (TTT) Plus (Seconds)

(4) Scroll the page views and highlight the 1) Initial Point (IP) field, then push the MENU key.

(5) Highlight Use WP Position, then push the ENTER key.

(6) Highlight the waypoint desired for the initial point (position used by inbound aircraft to orient target acquisition), then push the ENTER key. The display returns to the CAS 9–Line Brief page displaying the 1) Initial Point (IP) field highlighted with the initial point waypoint position data.

NOTE: The Initial Point (IP) Datum/Ellipsoid field automatically displays the waypoint datum.

(7) As required use the left and right cursor control keys to select the grid/coordinate system used by the inbound aircraft (part of the 1) Initial Point (IP) field).

(8) Highlight the 6) Target Location field, then push the MENU key.

(9) Highlight Use WP Position, then push the ENTER key.

(10) Highlight the waypoint desired for the target location, then push the ENTER key. The operator is prompted to review and acknowledge safety checks.

(11) The display returns to the CAS 9–Line Brief page displaying the 6) Target Location field highlighted with target waypoint position data.

NOTE: The Target Datum/Ellipsoid field automatically displays the waypoint datum.

	(12) As required, use the left and right cursor control keys to select the grid/coordinate system used by the inbound aircraft (part of the 6) Target Location field).		

(13) After the target location field is populated, the DAGR automatically computes and displays data for the following fields:

• **2)** Heading (IP to Target) field. The word (computed) is displayed following the data.

• **3)** Distance (IP to Target) field. The word (computed) is displayed following the data.

• **4)** Target Elevation field

NOTE: The 2) Heading (IP to Target) field and 3) Distance (IP to Target) field can be revised manually and will show the words (manual entry) following the data. When this is displayed, the 1) Initial Point (IP) and 6) Target Location field position data is not used by DAGR to compute IP to target heading (course) or distance (range). The manual entry data can be changed back to computed data by using the MENU key and selecting Compute Value (see procedure in step c).

(14) Scroll to the Safety Checks view of the CAS 9–Line Brief page, and review all safety check field information.

Caution: If the DAGR is not tracking satellites nor has no position fix, the displayed position data blinks between gray and black to notify the operator. Field data may be inaccurate and/or unavailable when the DAGR does not have a position fix.

(a) Current Time and Date (Time Hack) field — Verify accuracy of current time and date information.

(b) Time Zone field — Verify accuracy of current time zone information.

(c) Present Position to Target Range field — Verify a safe range between present position, target position, and initial point position.

(d) IP to Target — Azimuth field and Range field — Verify a safe range between present position, target position, and initial point position. Avoid having inbound aircraft overfly your present position. When the IP to Target Azimuth field and IP to Present Position Azimuth field overfly bars are positioned in the same direction, inbound aircraft could overfly your present position.

(e) IP to Present Position— Azimuth field and Range field—Verify a safe range between present position, target position, and initial point position. Avoid having inbound aircraft overfly your present position. When the IP to Target Azimuth field and IP to Present Position Azimuth field overfly bars are positioned in the same direction, inbound aircraft could overfly your present position. Check all data appearing in the Safety Check fields prior to calling for close air support to ensure safety of operator and other personnel.

(15) After verifying all safety check information indicates it is safe to proceed, communicate data as required for close air support.

Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.		

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SECTION VIII. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	5 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 70 During this lesson you have learned to determine close air support position coordinates data.	
Transition Next Lesson	Now that we know the steps necessary to determine close air support position coordinates data, we will learn how to lay gun position using the DAGR.	

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Lesson Plan 10 – Gun Laying Position

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SECTION I. ADMINISTRATIVE DATA

<table>
<tr><td rowspan="2">All Courses Including This Lesson</td><td>Course Number</td><td colspan="4">Course Title</td></tr>
<tr><td>523-0790484</td><td colspan="4">DAGR Operation</td></tr>
<tr><td rowspan="3">Task(s) Taught or Supported</td><td>Task Number</td><td colspan="4">Task Title</td></tr>
<tr><td>113-010</td><td colspan="4">Gun Laying Position Using DAGR Receiver</td></tr>
<tr><td></td><td colspan="4"></td></tr>
<tr><td rowspan="2">Task(s) Reinforced</td><td>Task Number</td><td colspan="4">Task Title</td></tr>
<tr><td>None</td><td colspan="4"></td></tr>
<tr><td rowspan="6">Academic Hours</td><td colspan="5">The academic hour(s) required to teach this lesson are as follows:</td></tr>
<tr><td colspan="4" align="center">PEACETIME</td><td align="center">MOB</td></tr>
<tr><td align="center">AC</td><td align="center">TASS TRAINING</td><td colspan="2" align="center">AC/RC
Non-res DL</td><td></td></tr>
<tr><td align="center">Resident
Hrs:
Min/MOI</td><td align="center">AT/ADT
Hrs: Min/MOI</td><td align="center">IDT
Hrs:
Min/MOI</td><td align="center">Hrs:
Min/MOI</td><td align="center">Hrs: Min/MOI</td></tr>
<tr><td align="right">Conference/
Discussion</td><td>0:47</td><td></td><td></td><td></td><td></td></tr>
<tr><td align="right">Practical
Exercise</td><td>0:45</td><td></td><td></td><td></td><td></td></tr>
</table>

<table>
<tr><td></td><td align="right">Test</td><td>0:00</td><td></td><td></td><td></td></tr>
<tr><td></td><td align="right">Total Hours</td><td>1:32</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Test Lesson Number</td><td colspan="2" rowspan="2" align="center">Testing</td><td align="center">Hours</td><td colspan="2" align="center">Lesson No.</td></tr>
<tr><td></td><td colspan="2" align="center">113-010</td></tr>
<tr><td>Prerequisite Lesson(s)</td><td colspan="2" align="center">Lesson Number</td><td colspan="3" align="center">LESSON TITLE</td></tr>
<tr><td></td><td colspan="2" align="center">113-001</td><td colspan="3" align="center">Perform the DAGR Startup Procedure</td></tr>
<tr><td></td><td colspan="2" align="center">113-002</td><td colspan="3" align="center">Perform the DAGR Operational Checkout Procedure</td></tr>
<tr><td></td><td colspan="2" align="center">113-003</td><td colspan="3" align="center">Adjust DAGR Receiver Default Settings to User Settings</td></tr>
<tr><td></td><td colspan="2" align="center">113-004</td><td colspan="3" align="center">Set Waypoints, Routes, and Alerts.</td></tr>
<tr><td></td><td colspan="2" align="center">113-005</td><td colspan="3" align="center">Setup Communications</td></tr>
<tr><td></td><td colspan="2" align="center">113-006</td><td colspan="3" align="center">Navigate a Course</td></tr>
<tr><td></td><td colspan="2" align="center">113-007</td><td colspan="3" align="center">Maintain Situational Awareness</td></tr>
<tr><td></td><td colspan="2" align="center">113-008</td><td colspan="3" align="center">Determine the Azimuth of a Jamming Source</td></tr>
<tr><td></td><td colspan="2" align="center">113-009</td><td colspan="3" align="center">Determine Target Position Using the DAGR Receiver</td></tr>
<tr><td>Security Clearance/Access</td><td colspan="5">None.</td></tr>
<tr><td>Foreign Disclosure</td><td colspan="5">WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export</td></tr>
</table>

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Lesson Plan 10 – Gun Laying Position

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References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	

Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available and shall accompany the lesson plan as well as reinforce the student handout.			
Additional Support Personnel Requirements	None			
Equipment Required	DAGR receiver 1 -, DAGR to DAGR connector, External Power, RA-1 antenna, and helmet antenna cable and mounting pole kit. Dual DAGR receiver - RA-1 Antenna, antenna adapter, Helmet antenna cable, installation mount, antenna mounting pole, mounting pole adapter, dual antenna mount, antenna pole receptacle, To point 1 tripod, DAGR to DAGR data cable, antenna pole receptacle, and To point 2 tripod.			

Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan ten, PowerPoint slides (DAGR_PPT_113_010.ppt)..
	Student Materials	DAGR Operator and Maintenance technical manual, lesson ten student handout.

Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.
	Training Area	None.

Ammunition Requirements	None.			
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material. Pick a site outside with no power lines in the area.			

Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**

Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

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SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction:	2 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 "The Gun Laying System (GLS) page procedures are typically used by artillery personnel to acquire an accurate azimuth between two points. A single DAGR or dual DAGRs may be used; however, the dual DAGR (Sub-Mil) procedure provides increased accuracy."	
Terminal Learning Objective	Reference: Slide 2	
	ACTION:	Gun Laying Position using DAGR receiver.
	CONDITION:	Given a DAGR receiver, accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Laid gun position in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	Gun laying position is used to calculate an accurate azimuth between two points using the advanced function set.	

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SECTION III. PRESENTATION

ELO A	Reference: Slide 3	
	ACTION:	Gun laying position using the single DAGR receiver method.
	CONDITION:	Given a DAGR receiver, accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Gun laying positioned using the single DAGR receiver method in accordance with the DAGR Operations Maintenance Manual.
Learning Step/Activity 1	Identify the Gun Laying System page. Refer students to paragraph 14.5.1 through 14.5.2 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 14.5.1 through 14.5.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	Topic Overview	Reference: Slide 3
		  • Introduction
		    - Gun Laying Page Function
		      Single Receiver Method
		      Dual Receiver Method
		      Field Descriptions
		      Gun Laying System Page Functions
		  • Operations
		    - Gun Laying Position Single DAGR Receiver

	a. Page Function (Advanced)	Reference: Slide 4 **CAUTION:** A high level of position error may place a mission at risk. Verify the figure of merit (FOM) level is sufficient to accomplish the mission. Refer to the position error field (EPE/EHE/EVE) of either the Present Position page or NAV Displays page to view the current FOM. Refer to Table 9-1 to convert FOM into a position error range (in meters). If the FOM is too high, refer to paragraph 18.4. The Gun Laying System (GLS) page is accessed from the Applications submenu using the advanced function set. This page is used to calculate an accurate azimuth between two points. When a field is disabled or contains no data, double dashes appear. Fields may require units' setup prior to performing a calculation. There are two methods used for the GLS azimuth calculation: • **Single receiver method**—Using one DAGR (with a remote antenna), the operator activates the GLS calculation and walks the receiver from the first point to the second point. Walking in a straight line between points is not required; however, the DAGR must maintain a clear view of the sky to track satellites. After reaching the second point, the GLS calculation is completed. The single receiver method offers simplicity and speed of setup.

		Reference: Slide 5 • **Dual receiver method** — The operator configures two DAGRs (each using a remote **antenna**) with matching port settings and interconnects both DAGRs using a DAGR to DAGR cable. One of the DAGRs is designated the master and one is the slave. The operator activates the GLS calculation from the master receiver. The slave receiver must not be moved during the calculation. When interconnected, the DAGR detects the opposite receiver and automatically selects dual receiver GLS operation. After activation, the operator disconnects the master receiver from the slave receiver and walks the master receiver to the second point and remains there until the preset walk time has expired. Walking in a straight line between points is not required; however, the DAGR must maintain a clear view of the sky to track satellites. After the walk time is expired, the operator returns the master receiver to the slave receiver and reconnects them to allow completion of the GLS calculation. The dual receiver method offers increased accuracy over the single receiver method.
	b. Field Descriptions	Reference: Slide 6 Vertical scrolling is used to view all page fields. Field information contained in this page is changed using various editor techniques. The following information describes the various fields contained in this page. **Walk Time Field:** Displays the estimated amount of time (1 to 180 seconds) required to walk from Point 1 to Point 2. For improved accuracy, enter the seconds required to walk a minimum of 50 meters (164 feet). Less distance results in less accuracy. Field data format is XXXs, where X represents seconds. This field applies to dual receiver method only. **COA/GT Field:** Displays the center of arc (COA)/gun target (GT) mode as Enabled or Disabled. When enabled, the Angle Offset and Measurement fields become enabled. **Angle Offset Field:** Displays the offset angle (0.00° to 359.99°) to be applied to the calculated azimuth. This field is enabled only when the COA/GT field is enabled. Field data format is XXX.XX (X represents degrees) or XXXX.XX (X represents mils or strecks). **Measurement Field:** Displays Forward to calculate the azimuth from Point 1 to Point 2. Displays Reverse to calculate the azimuth from Point 2 to Point 1. This field is enabled only when the COA/GT field is enabled or after a GLS calculation has been successfully completed. Reference: Slide 7 **Status Field:** Displays the current status of the Gun Laying (GLS) page as follows: • Use the Menu to Start the GLS Calculation • Initializing GLS. • Starting Standard GLS (applies to single receiver method only) • Slave Receiver Detected (2 second delay) (applies to dual receiver method only) • Tracking: XX of YY Need 4 SVs to Start (XX is the number of SVs being searched/tracked. YY is the total number of SVs available.) • Tracking: XX of YY Use <MENU> to Continue (XX is the number of SVs being searched/tracked. YY is the total number of SVs available.) • Waiting to Latch Data

- Time Duration: ###s Use <MENU> Upon Reaching Point 2 (Applies to single receiver GLS only. ### is the number of seconds elapsed, counting up, while walking path. Maximum time is specified in the Walk Time field.)

- Time Remaining: ###s Do Not Move the Receiver (Applies to dual receiver GLS only. ### is the number of seconds remaining to walk path, counting down from the value specified in the Walk Time field.)

- Time Remaining: ###s Use <MENU> Upon Reaching Point 2 (Applies to dual receiver GLS only. ### is the number of seconds remaining to walk path, counting down from the value specified in the Walk Time field.)

Reference: Slide 8

- Time Remaining: ###s Waiting to Latch Data (Applies to dual receiver GLS only. ### is the number of seconds remaining to walk path, counting down from the value specified in the Walk Time field.)

- Processing: ##s Do Not Move the Receiver (Applies to single receiver GLS only. ## is half of the actual time (rounded up), counted down, taken to walk from Point 1 to Point 2.

- Maximum Time Exceeded, Try Again (applies to single receiver method only)

- Time Exceeded, Extend Walk Time and Try Again (applies to dual receiver method only)

- Reconnect Receivers to Complete Calculation (Applies to dual receiver GLS only.)

- No Solution-Poor SV (Satellite Vehicle) Visibility, Try Again

- Calculation Complete Degraded Solution, Check EAZ (Estimated Azimuth Error field)

- Calculation Complete Good Solution

- Recalled Solution Computed at: (The time and date when the last valid GLS calculation was completed.)

- GLS in Progress Do Not Move the Receiver (applies to dual receiver method only)

- Waiting for Response Use <MENU> to Continue or Stop Calculation (applies to dual receiver method only)

- Errors Occurred: (Two lines display errors that occurred during the GLS calculation.)

Reference: Slide 9

Calculation Type Field: The DAGR automatically determines if a second receiver is connected and displays the type of GLS calculation being performed as follows. The operator cannot edit this field.

- **Single Receiver** — Only one DAGR used for the GLS calculation.

- **Dual Receiver** — Two DAGRs interconnected via serial ports for the GLS calculation.

Azimuth Field: Displays the calculated azimuth angle from Point 1 to Point 2 when the Measurement field is set to Forward. Displays the calculated azimuth angle from Point 2 to Point 1 when the Measurement field is set to Reverse. The operator cannot edit the Azimuth field. Field data format is XXX.XX (X represents degrees) or XXXX.XX (X represents mils or strecks) in reference to north reference (True, Magnetic, or Grid).

		Estimated Azimuth Error Field: Displays the estimated error (EAZ) for the calculated azimuth. The operator cannot edit this field. Field data format is +/- XXX.XX (where X represents degrees, positive up) or XXXX.XX (where X represents mils or strecks).
		Range Field: Displays the range between the two points. The operator cannot edit this field. Field data format is XXXX.XX or XXXX.X, where X represents miles, nautical miles, kilometers, feet, yards, or meters.
		SV Count Field: Displays the number of satellites used in the GLS calculation. The operator cannot edit this field.
		Reference: Slide 10
		Point 1 and Point 2 Fields: The Point 1 field displays the position of the DAGR when the walk time is started.
		The Point 2 field displays the position of the DAGR when the walk time is stopped. The operator cannot edit these fields.
	c. Gun laying System Page Functions	Reference: Slide 11
		Gun Laying (GLS) page menu functions are described in the following list.
		• **Start/Stop Calculation** — Start Calc selection starts the DAGR GLS calculation. Stop Calc stops an ongoing GLS calculation.
		• **Recall Solution** — If the DAGR is not performing a GLS calculation, this selection displays the previous GLS calculated solution.
		• **Clear All Data** — Sets configurable Gun Laying (GLS) page fields to their default values.
		• **Continue** — Selected by the operator to continue operation when prompted by the Status field.
		• **Point Reached** — Selected by the operator to continue operation when prompted by the Status field.
NOTE:	**Conduct a check on learning.**	Reference: Slide 12
		1. Which selection starts the DAGR GLS calculation?
		(ANS: Start Calc selection.) Paragraph 14.5.3,
		2. Which field displays the position of the DAGR when the walk time is started?
		(ANS: Point 1.) Paragraph 14.5.2.11,
		True or False.
		3. Two interconnected DAGRs provide better accuracy than a single DAGR receiver.
		(ANS: True. The Sub-Mil GLS dual receiver method offers increased accuracy over the single receiver method.) Paragraph 14.5.1,
Learning Step/Activity 2	Gun Laying Position using single DAGR receiver method. Refer students to paragraph 14.5.4.2 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 14.5.4.2.

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	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	GLS Single Receiver	**Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Task to be completed outside with DAGR. When performing GLS single receiver procedures, use of a remote antenna is required. Procedures associated with the GLS single receiver include assembling the antenna mounting pole, performing GLS single receiver calculation, and performing the recall calculation solution. 　　　　**a. Antenna Mounting Pole Assembly** **NOTE:** • The RA-1 antenna and helmet antenna cable are not supplied in the antenna mounting pole kit, but are described for assembly purposes. 　　• The antenna adapter, bubble level, and foam grip are pre-assembled to the upper antenna mounting pole. The steel point is pre-assembled to the lower antenna mounting pole. **(1)** Screw the antenna onto the antenna adapter. **(2)** Connect plain end of the helmet antenna cable to the antenna (spinner end connects to DAGR when installed). **(3)** Connect the upper and lower antenna mounting poles together. **(4)** The steel point end of the antenna mounting pole assembly rests on the ground and held still by the operator (watching the bubble level) while in use. The DAGR is also held separately by the operator. 　　　　**b. GLS Single DAGR Receiver Calculation** **NOTE:** At any time during the following procedure, the operator can select Clear All Data from the page menu or any field menu to clear all data for the Gun Laying System page and start over. The Clear All Data menu selection is used at the beginning of the procedure to ensure no previous field data is retained. **(1)** From the Gun Laying System page, push the MENU key. **(2)** Highlight Clear All Data, then push the ENTER key. **(3)** From the Gun Laying System page, configure the fields: 　　• **COA/GT** — Set to Enabled or Disabled to enable or disable the Angle Offset and Measurement fields. 　　• **Measurement**—This field is applicable only when the COA/GT field is enabled. Set to Forward to calculate azimuth from point 1 to point 2. Set to Reverse to calculate azimuth from point 2 to point 1. 　　• **Angle Offset**—This field is applicable only when the COA/GT field is enabled. Set the desired angle offset (0.00° to 359.99°) to be applied to the calculated azimuth. **(4)** Position the DAGR at point 1. **(5)** Connect the helmet antenna cable of the antenna mounting pole assembly to DAGR connector J3. **(6)** While observing the bubble level, hold the antenna mounting pole assembly level and completely still. **(7)** With the Gun Laying System page displayed and the Status field in view, push the MENU key. **(8)** Highlight Start Calc, then push the ENTER key. The Status field displays Initializing GLS followed by satellite tracking status information. **NOTE:** If the satellite count drops below four during the procedure, the Status field advises the need to acquire satellites to start, or No Solution—Poor SV Visibility, Try Again. The Status field also displays any errors occurring during the procedure.

		(9) When the Status field prompts the operator to use the menu to continue, push the MENU key. Highlight Continue, then push the ENTER key. **(10)** Prior to DAGR storing point 1 data, the Status field momentarily displays Waiting to Latch Data. (This status may display too quickly to be observed.) **(11)** The Status field displays time duration information and begins counting up to 180 seconds (maximum). **(12)** Walk the DAGR and antenna mounting pole assembly to point 2. Walking in a straight line is not required. Maintaining satellite visibility is required. For improved accuracy, walk a minimum of 50 meters (164 feet). Less distance results in less accuracy. **(13)** When point 2 is reached, push the MENU key. **(14)** Highlight Point Reached, then push the ENTER key. **(15)** While observing the bubble level, hold the antenna mounting pole assembly level and completely still. The DAGR stores point 2 data. **(16)** The Status field displays Processing: XXs, Do Not Move the Receiver. XX represents a count down timer with half the actual seconds used to reach point 2. **(17)** Do not move the DAGR or antenna pole assembly until the Status field displays Calculation Complete Good Solution. **NOTE:** If the Status field displays Calculation Complete Degraded Solution, verify the estimated azimuth error (EAZ) field data before using the calculated GLS solution. **(18)** The calculated Gun Laying System page data is ready for use. **a. Recall Calculation Solution** **NOTE:** When the GLS calculation is not in progress, the operator can view the last computed GLS solution. **(1)** From the Gun Laying System page, push the MENU key. **(2)** Highlight Recall Solution, then push the ENTER key. **(3)** The status field displays Recalled Solution Computed at: (time and date of last GLS solution). The other fields display data of the last GLS solution.
NOTE:	**Conduct a check on learning.**	Which field displays Initializing GLS followed by satellite tracking status information? (ANS: The Status field.) Paragraph 14.5.2.5.

	Topic Summary	• Gun Laying Page Function
		  – Single Receiver Method
		  – Dual Receiver Method
		  – Field Descriptions
		  – Gun Laying System Page Functions
		• Operations
		  – Gun Laying Position Single DAGR Receiver
		During this topic you have learned to the gun laying position using a single DAGR receiver.
		Transition Next Lesson: Now that we know the steps necessary for gun laying position using a single DAGR receiver, the next topic will introduce you to the dual DAGR receiver gun laying position.

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SECTION IV. PRESENTATION

ELO B	**ACTION:**	Gun Laying Position using the dual DAGR receiver method.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Laid gun position using the dual DAGR receiver method in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Gun Laying Position using the dual DAGR receiver method. Refer students to paragraph 14.5.4.3 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003 Paragraphs: 14.5.4.3.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	Topic Overview	– Gun Laying Position Dual DAGR Receiver • Antenna Mounting Pole Assembly • Sub-Mil GLS Dual DAGR Receiver Calculation • Recall Calculation Solution
	Sub-MIL GLS Dual Receivers	**Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Task to be completed outdoors. When performing Sub-Mil GLS dual receiver procedures, use of remote antennas are required. Procedures associated with the Sub-Mil GLS dual receiver include assembling the antenna mounting poles, performing Sub-Mil GLS dual receiver calculations, and performing the recall calculation solution. **a. Antenna Mounting Pole Assembly** **NOTE:** The RA-1 antennas and RA-1 antenna cables are not supplied in the antenna mounting pole kit, but are described here for assembly purposes. • The RA-1 antenna cable can be any one of the cables used for the RA-1 antenna (DAGR to helmet cable, 5–meter cable, or 10–meter cable). **(1)** With the installation mounts facing you, use the two holes on their right side to connect the installation mounts to the antenna mounting poles. **(2)** Screw the antennas onto the top of the antenna adapters. **(3)** Connect the antenna adapters to the antenna mounting poles. **(4)** Connect plain end of the antenna cables to the antennas (spinner end connects to DAGR when installed). **(5)** Screw the mounting pole adapter onto the bottom of the antenna mounting pole (one antenna mounting pole only). **(6)** The antenna mounting pole assembly (with mounting pole adapter) slides onto the antenna pole receptacle of the dual antenna mount.

(7) The antenna mounting pole assembly (without mounting pole adapter) screws onto the external threads of the dual antenna mount.

(8) The dual antenna mount is connected to the tripod (or other source of stationary mount) using the antenna pole receptacle that is located in the dual antenna mount.

(9) The DAGR to DAGR cable is used in the Sub-Mil Dual DAGR Procedure to connect both DAGRs together.

(10) Mount the remaining antenna pole receptacle to the second tripod (or other source of stationary mount).

b. Sub-Mil GLS Dual DAGR Receiver Calculation

NOTE: • Both DAGR receivers must have the same crypto key status (ie., both DAGRs loaded or not loaded with crypto keys).

• At any time during the following procedure, the operator can select Clear All Data from the page menu or any field menu to clear all data for the Gun Laying System page and start over. The Clear All Data menu selection is used at the beginning of the procedure to ensure no previous field data is retained.

(1) Two separate measurement positions (point 1 and point 2) are required in this calculation. Set up a stationary mount (e.g., tripod) at each position prior to performing the procedure. For improved accuracy, set a distance between points of not less than 50 meters (164 feet). Less distance results in less accuracy.

(2) Configure both master and slave DAGR receivers.

(a) From the Gun Laying System page, push the MENU key.

(b) Highlight Clear All Data, then push the ENTER key.

(c) Set COM Port 1 to Standard configuration.

1 Access the COM Port Setup page from the Communications submenu, then set the Configuration field to Standard.

2 Scroll down and set the page to Com Port 1.

(3) Designate one of the DAGRs as the master DAGR, then configure the master DAGR receiver Gun Laying System page fields:

• **Walk Time** — Set the estimated walk time from point 1 to point 2 (up to 180 seconds). If walk time is exceeded during the procedure, the procedure must be started over. For improved accuracy, set the field for enough seconds to walk a minimum of 50 meters (164 feet). Less distance results in less accuracy.

• **COA/GT**— Set to Enabled or Disabled to enable or disable the Angle Offset and Measurement fields.

• **Measurement** — Set to Forward to calculate azimuth from point 1 to point 2. Set to Reverse to calculate azimuth from point 2 to point 1.

• **Angle Offset** — Set the desired angle offset (0.00° to 359.99°) to be applied to the calculated azimuth.

(4) Position master and slave DAGRs at point 1. The slave DAGR must not be moved until the procedure has been completed.

(5) Mount each DAGR to an installation mount of an antenna mounting pole assembly, and then connect the remote antennas to each DAGR connector J3.

(6) If not previously done, secure both antenna mounting pole assemblies (with DAGRs installed) to a stationary mount (e.g., tripod). The master DAGR antenna mounting pole assembly slides onto the center of the

stationary mount for easy removal. The slave DAGR antenna mounting pole assembly screws onto the offset position of the stationary mount.

(7) Interconnect the J2 connectors of the master DAGR and slave DAGR using a DAGR to DAGR cable.

NOTE: The following steps are performed on the master DAGR, unless specified otherwise. During the procedure, the slave DAGR Status field states the slave DAGR is not to be moved.

(8) With the Gun Laying System page displayed and the Status field in view, push the MENU key.

(9) Highlight Start Calc, then push the ENTER key. The Status field displays Initializing GLS followed by satellite tracking status information.

NOTE: • If the satellite count drops below four during the procedure, the Status field advises the need to acquire satellites to start, or No Solution—Poor SV Visibility, Try Again. The Status field also displays any errors occurring during the procedure.

   • After starting the calculation, the slave DAGR automatically displays the Gun Laying System page.

(10) The Status field displays Slave Receiver Detected and satellite tracking status information.

(11) When the Status field prompts the operator to use the menu to continue, push the MENU key. Highlight Continue, then push the ENTER key.

(12) The Status field displays Waiting to Latch Data, then the DAGR stores point 1 data.

(13) The Status field begins counting down from the time entered in the Walk Time field.

(14) Disconnect the DAGR to DAGR cable from the J2 connector of the master DAGR.

(15) Remove the master DAGR antenna mounting pole assembly (with DAGR installed) from the stationary mount (e.g., tripod).

(16) Walk the master DAGR antenna mounting pole assembly (with DAGR installed) to point 2 before all walk time elapses. Walking in a straight line is not required. Maintaining satellite visibility is required; keep the antenna held above your head. For improved accuracy, walk a minimum of 50 meters (164 feet). Less distance results in less accuracy.

(17) When point 2 is reached, secure the antenna mounting pole assembly (with DAGR installed) to a stationary mount (e.g., tripod).

(18) Push the MENU key.

(19) Highlight Point Reached, then push the ENTER key. Do not move from point 2 position.

NOTE: If all walk time elapses before point 2 data is entered, the Status field displays Time Exceeded, Extend Walk Time and Try Again.

(20) The Status field displays time remaining to stay at point 2 position and latch data (store point 2 position).

(21) After Status field displays Reconnect Receivers to Complete Calculation, return the master DAGR antenna mounting pole assembly (with DAGR installed) to the point 1 position.

NOTE: If the Status field displays Waiting For Response Use Menu to Continue or Stop Calculation, push the MENU key. Highlight Continue, then push the ENTER key.

		(22) After returning to point 1, secure the master DAGR antenna mounting pole assembly (with DAGR installed) to the stationary mount (e.g., tripod).
		(23) Reconnect the J2 connectors of the master DAGR and the slave DAGR using the DAGR to DAGR cable. The GLS calculation is automatically performed. Do not move the DAGRs.
		(24) The master DAGR Status field displays Calculation Complete Good Solution. The slave DAGR Status field displays Use Menu to Start GLS Calculation.
		NOTE: If the master DAGR Status field displays Calculation Complete Degraded Solution, verify the estimated azimuth error (EAZ) field data before using the calculated GLS solution.
		(25) The calculated Gun Laying System page data is ready for use.
		c. Recall Calculation Solution
		NOTE: When the GLS calculation is not in progress, the operator can view the last computed GLS solution.
		(1) From the Gun Laying System page, push the MENU key.
		(2) Highlight Recall Solution, then push the ENTER key.
		(3) The status field displays Recalled Solution Computed at: (time and date of last GLS solution). The other fields display data of the last GLS solution.
NOTE:	**Conduct a check on learning.**	**1.** You can set the estimated walk time up to how many seconds? (ANS: 180 seconds.) Paragraph 14.5.4.3 b(3). **2.** Which field displays Slave Receiver Detected and satellite tracking status information? (ANS: Status field.) Paragraph 14.5.2.5.

	Topic Summary	•Laid Gun Position Using a Dual DAGR Receiver
		   –Antenna Mounting Pole Assembly
		   –Sub-Mil GLS Dual DAGR Receiver Calculation
		   –Recall Calculation Solution
		Now you know how to use the dual DAGR receiver gun laying procedure.
		Now will perform the practical exercise for both the single and dual DAGR procedures.

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SECTION V. STUDENT EVALUATION

Testing Requirements	The student will determine close air support position coordinates data using the DAGR receiver, DAGR accessories necessary to operate the DAGR, and DAGR Operator and Maintenance Manual. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference Slide 42

Title	Gun Laying Position using the DAGR receiver.	
Introduction	The student shall lay the gun position using the DAGR receiver.	
ELO A	**ACTION:**	Lay the gun position using the single DAGR receiver method.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Laid gun position using the dual DAGR receiver method in accordance with the DAGR Operator and Maintenance Manual.
	Paragraphs 14.5.4.2	
ELO B	**ACTION:**	Lay the gun position using the dual DAGR receiver method.
	CONDITION:	Given a DAGR receiver, accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual.
	STANDARD:	Laid the gun position using the single DAGR receiver method in accordance with the DAGR Operator and Maintenance Manual.
	Paragraph 14.5.4.3	
Safety Requirements	None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Performance examination: One practical exercise. Written examination: None.	
Instructional Lead-in	Laying the gun position is used to calculate an accurate azimuth between two points using the advanced function set.	
Resource Requirements	DAGR	
Special Instructions		

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Procedures	**Performance Measures:**		
	Task Name: Lay the gun position using the single DAGR receiver method.	**GO**	**NO GO**
	NOTE: Task to be completed outside with DAGR.		
	NOTE: At any time during the following procedure, the operator can select Clear All Data from the page menu or any field menu to clear all data for the Gun Laying System page and start over. The Clear All Data menu selection is used at the beginning of the procedure to ensure no previous field data is retained.		
	When performing GLS single receiver procedures, use of a remote antenna is required. Procedures associated with the GLS single receiver include assembling the antenna mounting pole, performing GLS single receiver calculation, and performing the recall calculation solution.		
	a. Antenna Mounting Pole Assembly		
	NOTE:		
	• The RA-1 antenna and helmet antenna cable are not supplied in the antenna mounting pole kit, but are described for assembly purposes.	___	___
	• The antenna adapter, bubble level, and foam grip are pre-assembled to the upper antenna mounting pole. The steel point is pre-assembled to the lower antenna mounting pole.		
	(1) Screw the antenna onto the antenna adapter.		
	(2) Connect plain end of the helmet antenna cable to the antenna (spinner end connects to DAGR when installed).		
	(3) Connect the upper and lower antenna mounting poles together.		
	(4) The steel point end of the antenna mounting pole assembly rests on the ground and held still by the operator (watching the bubble level) while in use. The DAGR is also held separately by the operator.		
	b. GLS Single DAGR Receiver Calculation		
	NOTE: At any time during the following procedure, the operator can select Clear All Data from the page menu or any field menu to clear all data for the Gun Laying System page and start over. The Clear All Data menu selection is used at the beginning of the procedure to ensure no previous field data is retained.		
	(1) From the Gun Laying System page, push the MENU key.		
	(2) Highlight Clear All Data, then push the ENTER key.		
	(3) From the Gun Laying System page, configure the fields:		
	• **COA/GT** — Set to Enabled or Disabled to enable or disable the Angle Offset and Measurement fields.		
	• **Measurement**—This field is applicable only when the COA/GT field is enabled. Set to Forward to calculate azimuth from point 1 to point 2. Set to Reverse to calculate azimuth from point 2 to point 1.		
	• **Angle Offset**—This field is applicable only when the COA/GT field is enabled. Set the desired angle offset (0.00° to 359.99°) to be applied to the calculated azimuth.		
	(4) Position the DAGR at point 1.		
	(5) Connect the helmet antenna cable of the antenna mounting pole assembly to DAGR connector J3.		
	(6) While observing the bubble level, hold the antenna mounting pole assembly level and completely still.		

	(7) With the Gun Laying System page displayed and the Status field in view, push the MENU key.		
	(8) Highlight Start Calc, then push the ENTER key. The Status field displays Initializing GLS followed by satellite tracking status information.		
	NOTE: If the satellite count drops below four during the procedure, the Status field advises the need to acquire satellites to start, or No Solution—Poor SV Visibility, Try Again. The Status field also displays any errors occurring during the procedure.		
	(9) When the Status field prompts the operator to use the menu to continue, push the MENU key. Highlight Continue, then push the ENTER key.		
	(10) Prior to DAGR storing point 1 data, the Status field momentarily displays Waiting to Latch Data. (This status may display too quickly to be observed.)		
	(11) The Status field displays time duration information and begins counting up to 180 seconds (maximum).		
	(12) Walk the DAGR and antenna mounting pole assembly to point 2. Walking in a straight line is not required. Maintaining satellite visibility is required. For improved accuracy, walk a minimum of 50 meters (164 feet). Less distance results in less accuracy.		
	(13) When point 2 is reached, push the MENU key.		
	(14) Highlight Point Reached, then push the ENTER key.		
	(15) While observing the bubble level, hold the antenna mounting pole assembly level and completely still. The DAGR stores point 2 data.		
	(16) The Status field displays Processing: XXs, Do Not Move the Receiver. XX represents a count down timer with half the actual seconds used to reach point 2.		
	(17) Do not move the DAGR or antenna pole assembly until the Status field displays Calculation Complete Good Solution.		
	NOTE: If the Status field displays Calculation Complete Degraded Solution, verify the estimated azimuth error (EAZ) field data before using the calculated GLS solution.		
	(18) The calculated Gun Laying System page data is ready for use.		
	c. Recall Calculation Solution		
	NOTE: When the GLS calculation is not in progress, the operator can view the last computed GLS solution.		
	(1) From the Gun Laying System page, push the MENU key.		
	(2) Highlight Recall Solution, then push the ENTER key.		
	(3) The status field displays Recalled Solution Computed at: (time and date of last GLS solution). The other fields display data of the last GLS solution.		

Performance Measures:

Task Name: Lay the gun position using the dual DAGR receiver method.	GO	NO GO
NOTE: Task to be completed outdoors.		
a. Antenna Mounting Pole Assembly		
NOTE: The RA-1 antennas and RA-1 antenna cables are not supplied in the antenna mounting pole kit, but are described here for assembly		

purposes.

• The RA-1 antenna cable can be any one of the cables used for the RA-1 antenna (DAGR to helmet cable, 5–meter cable, or 10–meter cable).

(1) With the installation mounts facing you, use the two holes on their right side to connect the installation mounts to the antenna mounting poles.

(2) Screw the antennas onto the top of the antenna adapters.

(3) Connect the antenna adapters to the antenna mounting poles.

(4) Connect plain end of the antenna cables to the antennas (spinner end connects to DAGR when installed).

(5) Screw the mounting pole adapter onto the bottom of the antenna mounting pole (one antenna mounting pole only).

(6) The antenna mounting pole assembly (with mounting pole adapter) slides onto the antenna pole receptacle of the dual antenna mount.

(7) The antenna mounting pole assembly (without mounting pole adapter) screws onto the external threads of the dual antenna mount.

(8) The dual antenna mount is connected to the tripod (or other source of stationary mount) using the antenna pole receptacle that is located in the dual antenna mount.

(9) The DAGR to DAGR cable is used in the Sub-Mil Dual DAGR Procedure to connect both DAGRs together.

(10) Mount the remaining antenna pole receptacle to the second tripod (or other source of stationary mount).

b. Sub-Mil GLS Dual DAGR Receiver Calculation

NOTE: Both DAGR receivers must have the same crypto key status (ie., both DAGRs loaded or not loaded with crypto keys).

• At any time during the following procedure, the operator can select Clear All Data from the page menu or any field menu to clear all data for the Gun Laying System page and start over. The Clear All Data menu selection is used at the beginning of the procedure to ensure no previous field data is retained.

(1) Two separate measurement positions (point 1 and point 2) are required in this calculation. Set up a stationary mount (e.g., tripod) at each position prior to performing the procedure. For improved accuracy, set a distance between points of not less than 50 meters (164 feet). Less distance results in less accuracy.

(2) Configure both master and slave DAGR receivers.

(a) From the Gun Laying System page, push the MENU key.

(b) Highlight Clear All Data, then push the ENTER key.

(c) Set COM Port 1 to Standard configuration.

1 Access the COM Port Setup page from the Communications submenu, then set the Configuration field to Standard.

2 Scroll down and set the page to Com Port 1.

(3) Designate one of the DAGRs as the master DAGR, then configure the master DAGR receiver Gun Laying System page fields:

• **Walk Time** — Set the estimated walk time from point 1 to point 2 (up to 180 seconds). If walk time is exceeded during the procedure, the procedure must be started over. For improved accuracy, set the field for enough seconds to walk a minimum of 50 meters (164 feet). Less distance results in less accuracy.

- **COA/GT**— Set to Enabled or Disabled to enable or disable the Angle Offset and Measurement fields.
- **Measurement** — Set to Forward to calculate azimuth from point 1 to point 2. Set to Reverse to calculate azimuth from point 2 to point 1.
- **Angle Offset** — Set the desired angle offset (0.00° to 359.99°) to be applied to the calculated azimuth.

(4) Position master and slave DAGRs at point 1. The slave DAGR must not be moved until the procedure has been completed.

(5) Mount each DAGR to an installation mount of an antenna mounting pole assembly, and then connect the remote antennas to each DAGR connector J3.

(6) If not previously done, secure both antenna mounting pole assemblies (with DAGRs installed) to a stationary mount (e.g., tripod). The master DAGR antenna mounting pole assembly slides onto the center of the stationary mount for easy removal. The slave DAGR antenna mounting pole assembly screws onto the offset position of the stationary mount.

(7) Interconnect the J2 connectors of the master DAGR and slave DAGR using a DAGR to DAGR cable.

NOTE: The following steps are performed on the master DAGR, unless specified otherwise. During the procedure, the slave DAGR Status field states the slave DAGR is not to be moved.

(8) With the Gun Laying System page displayed and the Status field in view, push the MENU key.

(9) Highlight Start Calc, then push the ENTER key. The Status field displays Initializing GLS followed by satellite tracking status information.

NOTE: If the satellite count drops below four during the procedure, the Status field advises the need to acquire satellites to start, or No Solution—Poor SV Visibility, Try Again. The Status field also displays any errors occurring during the procedure.

- After starting the calculation, the slave DAGR automatically displays the Gun Laying System page.

(10) The Status field displays Slave Receiver Detected and satellite tracking status information.

(11) When the Status field prompts the operator to use the menu to continue, push the MENU key. Highlight Continue, then push the ENTER key.

(12) The Status field displays Waiting to Latch Data, then the DAGR stores point 1 data.

(13) The Status field begins counting down from the time entered in the Walk Time field.

(14) Disconnect the DAGR to DAGR cable from the J2 connector of the master DAGR.

(15) Remove the master DAGR antenna mounting pole assembly (with DAGR installed) from the stationary mount (e.g., tripod).

(16) Walk the master DAGR antenna mounting pole assembly (with DAGR installed) to point 2 before all walk time elapses. Walking in a straight line is not required. Maintaining satellite visibility is required; keep the antenna held above your head. For improved accuracy, walk a

	minimum of 50 meters (164 feet). Less distance results in less accuracy.			
	(17) When point 2 is reached, secure the antenna mounting pole assembly (with DAGR installed) to a stationary mount (e.g., tripod).			
	(18) Push the MENU key.			
	(19) Highlight Point Reached, then push the ENTER key. Do not move from point 2 position.			
	NOTE: If all walk time elapses before point 2 data is entered, the Status field displays Time Exceeded, Extend Walk Time and Try Again.			
	(20) The Status field displays time remaining to stay at point 2 position and latch data (store point 2 position).			
	(21) After Status field displays Reconnect Receivers to Complete Calculation, return the master DAGR antenna mounting pole assembly (with DAGR installed) to the point 1 position.			
	NOTE: If the Status field displays Waiting For Response Use Menu to Continue or Stop Calculation, push the MENU key. Highlight Continue, then push the ENTER key.			
	(22) After returning to point 1, secure the master DAGR antenna mounting pole assembly (with DAGR installed) to the stationary mount (e.g., tripod).			
	(23) Reconnect the J2 connectors of the master DAGR and the slave DAGR using the DAGR to DAGR cable. The GLS calculation is automatically performed. Do not move the DAGRs.			
	(24) The master DAGR Status field displays Calculation Complete Good Solution. The slave DAGR Status field displays Use Menu to Start GLS Calculation.			
	NOTE: If the master DAGR Status field displays Calculation Complete Degraded Solution, verify the estimated azimuth error (EAZ) field data before using the calculated GLS solution.			
	(25) The calculated Gun Laying System page data is ready for use.			
	c. Recall Calculation Solution			
	NOTE: When the GLS calculation is not in progress, the operator can view the last computed GLS solution.			
	(1) From the Gun Laying System page, push the MENU key.			
	(2) Highlight Recall Solution, then push the ENTER key.			
	(3) The status field displays Recalled Solution Computed at: (time and date of last GLS solution). The other fields display data of the last GLS solution.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 10 – Gun Laying Position

9 July 2004

SECTION VI. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction:	5 minutes
	Media:	PowerPoint
Check on Learning	Reference: Slide 43 Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	During this lesson you have learned to lay the gun position using both single and dual DAGR receiver methods.	
Transition Next Lesson	Next you will learn how to perform the troubleshooting procedure.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 11 – Perform the DAGR Troubleshooting Procedure

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			
Task(s) Taught or Supported	**Task Number**	**Task Title**			
	113-011	Perform the DAGR Troubleshooting Procedure			
Task(s) Reinforced	**Task Number**	**Task Title**			
	None				
Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	0:50				
Practical Exercise	0:00				
Test	0:00				
Total Hours	0:50				
Test Lesson Number	**Testing**	**Hours**		**Lesson No.**	
				113-012	
Prerequisite Lesson(s)	**Lesson Number**	**LESSON TITLE**			
	113-001	Perform the DAGR Startup Procedure			
	113-002	Perform DAGR Operational Checkout Procedure			
	113-003	Adjust DAGR Receiver Default Settings to User Settings			
	113-004	Set Waypoints, Routes, and Alerts.			
	113-005	Setup Communications			
	113-006	Navigate a Course			
	113-007	Maintain Situational Awareness			
	113-008	Determine the Azimuth of a Jamming Source			
	113-009	Determine Target Position Using the DAGR Receiver			
	113-010	Gun Laying Position Using the DAGR Receiver			
Security Clearance/Access	None.				

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 11 – Perform the DAGR Troubleshooting Procedure

9 July 2004

Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.

References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	

Student Study Assignments	None.
Instructor Requirements	PowerPoint slides are available and shall accompany the lesson plan as well as reinforce the student handout.
Additional Support Personnel Requirements	None.
Equipment Required	DAGR receiver and External Power (Fused, 5 Meter)

Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan eleven, PowerPoint slides (DAGR_PPT_113_0011.ppt).
	Student Materials	DAGR Operator and Maintenance technical manual, lesson eleven student handout.

Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.
	Training Area	None.

Ammunition Requirements	None.
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material.

Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**

Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 11 – Perform the DAGR Troubleshooting Procedure

9 July 2004

SECTION II. INTRODUCTION

<table>
<tr><td rowspan="4"></td><td>Method of Instruction:</td><td>Lecture/Conference/Discussion</td></tr>
<tr><td>Instructor to Student Ratio:</td><td>1:16</td></tr>
<tr><td>Time of Instruction: (minutes)</td><td>5 Minutes</td></tr>
<tr><td>Media:</td><td>PowerPoint</td></tr>
<tr><td>Motivator</td><td colspan="2">Reference: Slide 1

"Other than physical damage, the soldier may need to return the DAGR to the manufacturer when a malfunction occurs. Performing troubleshooting on the DAGR is a means of finding out whether the DAGR is working or not working properly."</td></tr>
<tr><td rowspan="4">Terminal Learning Objective</td><td>Reference: Slide 2
ACTION:</td><td>Perform the DAGR troubleshooting procedure.</td></tr>
<tr><td>CONDITION:</td><td>Given a DAGR receiver, accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.</td></tr>
<tr><td>STANDARD:</td><td>Performed the DAGR troubleshooting procedure in accordance with the DAGR Operator and Maintenance Manual.</td></tr>
<tr><td>Safety Requirements and Alerts</td><td colspan="2">WARNING: If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original packaging until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and receiver.

CAUTION: Do not mix battery types. Do not mix old batteries with new batteries. Ensure DAGR primary batteries are good (check battery indicator on display) before using unit.

These precautions are done to ensure proper battery life and proper unit operation. If using external DC power, ensure positive lead of external DC power cable is connected to the positive lead of external power source to prevent possible damage to the unit. Internal batteries may remain installed while using external power. The memory battery should always remain installed. The DAGR is protected against accidental reverse connection of external power.

NOTE: The DAGR antenna needs a clear field of view to the sky (line of sight) for best satellite visibility. For best reception, the DAGR should be held at a 90 degree angle in relation to the earth's surface.

If applying power to DAGR in cold weather and the display does not come on, do not keep turning the unit off and then back on for power-up. The DAGR has the capability for the user to enable a display heater, and without the heater enabled, the DAGR could take up to 20 minutes to become operational. To conserve battery power, the DAGR should be kept warm before applying power, and then kept warm in between usage such as keeping the DAGR inside a vehicle or inside the user's coat.</td></tr>
<tr><td>Risk Assessment Level</td><td colspan="2">The Risk Assessment for this lesson is low.</td></tr>
<tr><td>Environmental Considerations</td><td colspan="2">The DAGR antenna needs a clear field of view to the sky (line of sight) for best satellite visibility. For best reception, the DAGR should be held at a 90 degree angle in relation to the earth's surface.</td></tr>
<tr><td>Evaluation</td><td colspan="2">Student learning is reinforced through a check on learning questioning technique throughout the lesson.

Performance examination: practical exercise.

Written examination: DAGR test package at the end of the DAGR course.</td></tr>
<tr><td>Instructional Lead-in</td><td colspan="2">The troubleshooting procedure is designed to detect and isolate DAGR failures and malfunctions. The troubleshooting procedure directly relates to the operational checkout</td></tr>
</table>

	procedure.	

SECTION III. PRESENTATION

ELO	**ACTION:**	Perform the DAGR troubleshooting procedure.
	CONDITION:	Given a DAGR receiver, accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Performed the DAGR troubleshooting procedure in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify and perform the troubleshooting procedure. Refer students to paragraph 19.1 through 19.3 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual Date: 30/05/2003 Paragraphs: 19.1 through 19.3
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Overview	Reference: Slide 3
		
		Introduction
		
		    Troubleshooting Familiarity
		
		    Pretest Setup
		
		Operations
		
		Troubleshooting Procedure

	b. DAGR Troubleshooting Familiarity	Reference: Slide 4 The troubleshooting procedure is designed to detect and isolate DAGR failures and malfunctions. The troubleshooting procedure directly relates to the operational checkout procedure. After a DAGR failure has been found and corrected, perform the operational checkout procedure (lesson plan 2) to make sure the DAGR is operating properly. If troubleshooting confirms a DAGR failure, and repair is beyond what is covered in DAGR Operator and Maintenance Manual, return the DAGR unit to the manufacturer.
	c. Pretest Setup	Reference: Slide 5 **WARNING:** If abused, lithium batteries can explode causing severe injury. Be sure to store batteries in original packaging until ready to use and observe polarity during installation. Reverse polarity can cause damage to the battery and receiver. **CAUTION:** • Do not mix battery types. Do not mix old batteries with new batteries. Ensure DAGR primary batteries are good (check battery indicator on display) before using unit. These precautions are done to ensure proper battery life and proper unit operation. • If using external DC power, ensure positive (red) lead of external DC power cable is connected to the positive lead of external power source to prevent possible damage to the unit. Internal batteries may remain

		installed while using external power. The memory battery should always remain installed. The DAGR is protected against accidental reverse connection of external power.
		Reference: Slide 6
		NOTE: •The DAGR antenna needs a clear field of view to the sky (line of sight) for best satellite visibility. For best reception, the DAGR should be held at a 90 degree angle in relation to the earth's surface (not applicable to system installation).
		• If applying power to DAGR in cold weather and the display does not come on, do not keep turning the unit off and then back on for power-up. The DAGR has the capability for the user to enable a display heater, and without the heater enabled, the DAGR could take up to 20 minutes to become operational. To conserve battery power, the DAGR should be kept warm before applying power, and then kept warm in between usage such as keeping the DAGR inside a vehicle or inside the users' coat.)
		There are no pretest connections or adjustments required to troubleshoot the DAGR as a handheld unit. If the DAGR is used in a host platform system for the troubleshooting procedure, install the DAGR into the host platform, then install the external power source and external antenna along with related cables. Additional host platform information is included in brackets within the procedure.
	d. Troubleshooting Procedure	Reference: Slide 7
		Instructional Note: The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. Make sure DAGRs are set to continuous mode.
		(1) Inspect the DAGR [and external cables and equipment] for damage and/or missing parts.
		(2) If DAGR is damaged, return DAGR to manufacturer.
		(3) Push the PWR key to turn the DAGR on, and ensure the DAGR (or DAGR system antenna) has a clear view of the sky.
		(4) If DAGR display does not come on after power is applied, check primary battery and primary battery pack [external connections to power source]. If battery connections [or external connections] are good, return DAGR to manufacturer.
		Reference: Slide 8
		(5) If operating in cold conditions, allow additional time for display to appear.
		(6) Observe the power up self-test results.
		(7) If a failure occurs, check all external connections, if applicable and rerun self-test.
		(8) Follow instructions on display and/or return DAGR to manufacturer.
		(9) After power-up and using primary power batteries, does primary battery life indicator show sufficient battery life?
		Reference: Slide 9
		(10) If battery life is insufficient, replace primary batteries and update battery information on the Battery page.
		(11) After power up, ensure a low memory battery message does not show.
		(12) Access the Battery page and observe date shown in the Memory Battery Installed field.
		(13) The memory battery date is updated by the user at time of battery replacement.

		(14) If the DAGR shows a date approximately six months old, then replace memory battery and update memory battery information on the Battery page.
		Reference: Slide 10
		(15) After power up, perform an operator induced commanded self test (operator intervention required).
		(16) If DAGR fails self-test, check all external connections if applicable, and rerun self-test.
		(17) Follow instructions on display and/or return DAGR to manufacturer.
		Reference: Slide 11
		(18) After power up, if the DAGR passes self-test and display blinks between black and grey text, do the following:
		• Move DAGR [or external antenna] to open view of the sky.
		• Check all external connections.
		• Hold DAGR 90˚ to horizon.
		• Ensure satellite acquisition time was at least two minutes.
		• Ensure DAGR is in a satellite tracking mode of operation.
		• Perform the manual initialization procedure.
		Reference: Slide 12
		(19) If display does not stop blinking, return DAGR to manufacturer.
		(20) If display stops blinking, troubleshooting is complete.
	Display Test Summary Page	Reference: Slide 13
		1. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.
		2. Highlight System, then push the ENTER key.
		3. Highlight Test Summary, then push the ENTER key. The Test Summary page is displayed.
		The Results Table displays five columns of information described as follows. If no faults or information messages exist, the individual table fields display "- -".
		• F/I — Displays information as FAIL or INFO.
		• DEVICE DESCRIPTION — Displays a brief device description.
		• INDEX — Displays an index value of three digits corresponding to the device description.
		• CURRENT— Displays the current device value consisting of four digits.
		• ACCUM — Displays an accumulated device value consisting of four digits.
NOTE:	**Conduct a check on learning.**	Reference: Slide 14
		1. The troubleshooting procedure is designed to detect and isolate what?
		(ANS: DAGR failures and malfunctions.) Paragraph 19.1.
		True or False.
		2. If DAGR is damaged, return to the manufacturer.
		(ANS: True.) Paragraph 19.3,
		3. When is the memory battery date updated by the user?
		(ANS: At the time of memory battery replacement.) Paragraph 19.3.

SECTION IV. SUMMARY

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 11 – Perform the DAGR Troubleshooting Procedure

9 July 2004

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	30 Minutes
	Media:	PowerPoint
Check on Learning	Reference: Slide 15 Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	During this lesson you have learned to perform the DAGR troubleshooting procedure.	
Transition Next Lesson	Now that we know the steps necessary to perform the DAGR troubleshooting procedure, we will learn how to reprogram the DAGR and load maps into the DAGR.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 12 – Reprogram the DAGR and Maps Installation

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title		
	523-0790484	DAGR Operation		

Task(s) Taught or Supported	Task Number	Task Title		
	113-012	Reprogram the DAGR and Maps Installation.		

Task(s) Reinforced	Task Number	Task Title		
	None			

Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	1:45				
Practical Exercise	0:00				
Test	0:00				
Total Hours	1:45				

Test Lesson Number	Testing	Hours	Lesson No.
			113-012

Prerequisite Lesson(s)	Lesson Number	LESSON TITLE
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform the DAGR Operational Checkout Procedure
	113-003	Adjust DAGR Receiver Default Settings to User Settings
	113-004	Set Waypoints, Routes, and Alerts.
	113-005	Setup Communications
	113-006	Navigate a Course
	113-007	Maintain Situational Awareness
	113-008	Determine the Azimuth of a Jamming Source
	113-009	Determine Target Position Using the DAGR Receiver
	113 -010	Gun Laying Position Using DAGR Receiver
	113-011	Perform the DAGR Troubleshooting Procedure

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Security Clearance/Access	None.			
Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.			
References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None			
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna is optional to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.			
Additional Support Personnel Requirements	None			
Equipment Required	• PC reprogramming software Refer to RDIT website http://www.sed.monmouth.army.mil/RDIT • DAGR software Refer to RDIT website http://www.sed.monmouth.army.mil/RDIT • External AC power cable NSN 6130-01-521-3157 • DAGR to PC data cable NSN 5995-01-521-3198 • IBM compatible personal computer with minimum specifications as follows: Pentium II with 166-MHz processor, 5.5-Mb RAM for 1 port, up to 65-Mb RAM 16 ports, Hard drive with 7-Mb free space, Microsoft windows 95, 98, NT, 2000, or XP (The personal computer should meet or exceed the minimum specifications of the installed version of Microsoft Windows.) and RS-232 serial port (with up to 16 Comports) (9-pin version) (Additional ports may be added to the personal computer at any time after the multiple receiver programming software is installed.) * On some computers, the only available communication port may be used for a serial mouse. In this case, the mouse must be disabled.			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan twelve, PowerPoint slides (DAGR_PPT_113_012.ppt).		
	Student Materials	DAGR Operator and Maintenance technical manual, twelve seven student handout.		

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Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.
	Training Area	None.
Ammunition Requirements	None.	
Instructional Guidance	Before presenting this less, instructors must thoroughly prepare by studying this lesson and identified reference material.	

Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**

Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	40 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1	
	"Reprogramming the DAGR with the latest software keeps DAGR operation fully functional and up-to-date with the latest technology."	
Terminal Learning Objective	Reference: Slide 2 **ACTION**	Reprogram the DAGR and Maps Installation.
	CONDITION	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD	Reprogrammed the DAGR and installed a map into the DAGR in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: None.	
Instructional Lead-in	Reprogramming of the DAGR erases all user and satellite date (except Crypto keys) stored in the DAGR and reprograms the software residing in the DAGR.	

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SECTION III. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

ELO A	**ACTION:**	Reprogram the DAGR
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR and a DAGR Operator Maintenance Manual or pocket guide.
	STANDARD:	Reprogrammed the DAGR in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify reprogramming the DAGR. Refer students to paragraph 17.2.1 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	10 Minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual, Date: 30/05/2003 Paragraph: 17.2.1
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Overview	Reference: Slide 3 • Introduction Purpose Required Equipment • Operations Reprogram DAGR
	b. Purpose	Reference: Slide 4 Reprogramming instructions are used to reprogram software residing in the DAGR. All user and satellite data stored in the DAGR is erased during the reprogramming process. This includes any waypoints and routes, satellite almanac data, and user setup information. Be sure to save any critical data prior to reprogramming (transfer data to another DAGR). Crypto keys are not erased during reprogramming.
	c. Required Equipment	Reference: Slide 5 The following equipment is needed for reprogramming the DAGR: • PC reprogramming software Refer to RDIT website http://www.sed.monmouth.army.mil/RDIT • DAGR software Refer to RDIT website http://www.sed.monmouth.army.mil/RDIT • External AC power cable NSN 6130-01-521-3157 • DAGR to PC data cable NSN 5995-01-521-3198 • IBM compatible personal computer with minimum specifications as follows: Pentium II with 166-MHz processor, 5.5-Mb RAM for 1 port, up to 65-Mb Ram for 16 ports,

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		Hard drive with 7-Mb free space,
		Microsoft windows 95, 98, NT, 2000 or XP (The personal computer should meet or exceed the minimum specifications of the installed version of Microsoft Windows.)
		RS-232 serial port (with up to 16 Comports) (9-pin version). Additional ports may be added to the personal computer at anytime after the multiple receiver programming software is installed.
		• On some computers, the only available communication port may be used for a serial mouse. In this case, the mouse must be disabled.

NOTE:	**Conduct a check on learning.**	Reference: Slide 6
		1. While reprogramming the DAGR what is erased?
		   (ANS: All user and satellite data stored in the DAGR.) Paragraph 17.2.1
		2. What is the minimum free hard drive space on the computer?
		   (ANS: 7-Mb.) Paragraph 17.2.2.1.

Learning Step/Activity 2		Reprogram the DAGR. Refer students to RDIT website, http://www.sed.monmouth.army.mil/RDIT, instructions are provided by a DAGR Time Compliance Technical Order (TCTO) and/or Modification Work Order (MWO).
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	10 Minutes
	Media:	PowerPoint
	References:	RDIT website, http://www.sed.monmouth.army.mil/RDIT
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

	a. Installing Reprogramming Software	Reference: Slide 7
		The following must be done to each computer that is used for reprogramming.
		NOTE: Disable the screen saver program active in Windows to guard against possible unexpected errors in reprogramming. For example, open Display Properties either by right clicking on your desktop and then selecting PROPERTIES; or by going through the control panel and when the Display Properties window is displayed, select NONE for the screen saver.
		Perform a DAGR commanded self-test to ensure the unit is fully operable prior to reprogramming. Any DAGR failing self-test must be returned to Rockwell Collins for warranty repair.
		   a. Insert the disk containing the reprogramming software into the drive of the PC.
		   b. Copy the Multi_RPG.zip file to C:\, and then extract all files directly to C:\.
		Reference: Slide 8
		   c. A folder named Multi_RPG was loaded from the zip file into the C: drive. Verify the folder contains two files named SHELLAPP.EXE and RPG.EXE. The only file remaining to interact with is SHELLAPP.EXE.
		   d. Insert the disk containing DAGR software into the drive of the PC.
		Reference: Slide 9
		   e. Copy the following files from the disk into C:\Multi_RPG:

		• 31_multi_rpg.cfg • load.abs • yellow_main.abs • red_main.abs **f.** The reprogramming software is now installed.

NOTE:	**b. Equipment Connections**	Reference: Slide 10
		NOTE: If external power is being used as primary power for the DAGR, perform steps a and b of this procedure. If internal primary batteries are being used, perform step b only.
		    a. Connect one end of the external AC power cable to J4 power connector of the DAGR, and the other end to any 110 VAC outlet.
		    b. Connect the DAGR to PC data cable between J2 data interface connector of the DAGR and the serial port of the PC.

	c. Reprogramming the DAGR	Reference: Slide 11
		Reprogramming includes loading software and verifying the software part number was correctly loaded. Also, a commanded self-test is recommended after reprogramming and verification is complete.
		NOTE: Do not remove power to the DAGR while reprogramming is in progress or reprogramming must be started over.
		    a. Prior to proceeding, ensure reprogramming software is installed in the personal computer and equipment connections have been performed.
		    b. Power the DAGR on.
		    c. Click the START button on the task bar of the monitor, and then select RUN.
		Reference: Slide 12
		    d. Type C:\Multi_RPG\SHELLAPP at the prompt. Push the Enter key.
		    e. On the SHELLAPP application select browse, then open the desired configuration (.cfg) file from the Multi_RPG folder needed to reprogram the DAGR.
		Reference: Slide 13
		    f. Select the comport to be used for reprogramming by clicking on the desired comport check box. Up to sixteen comports can be utilized for reprogramming up to sixteen DAGR receivers. All comports can be selected or deselected by clicking on Select All or Clear All, respectively. Refer to your personal computer manual to configure additional ports.
		Reference: Slide 14
		    g. Select the appropriate comport baud rate (not to exceed 115200) from the drop down list.
		    h. Click on the Start All Selected button at the bottom of the screen. The screen momentarily displays an additional window.
		Reference: Slide 15
		    i. The status window for the selected comport displays "Power Cycle The Unit".
		    j. Power cycle the DAGR (power the DAGR off, then on). Reprogramming is started, the DAGR display remains blank, for approximately 20 seconds, and the status window on the personal

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		computer changes color. Reference: Slide 16 　**k.** When the status window is yellow, user action is required. Follow instructions of the status window. **Note:** Additional yellow status window may appear and require repeating this step. Reference 17 　**l.** Wait for the reprogramming process to be completed. This process normally requires three to six minutes. The comport status field is green indicating reprogramming in process for the comport link type displayed. 　**m.** When reprogramming is completed, the comport status window is blue in color and displays Finished. 　**n.** Power the DAGR off and disconnect all external cables.
NOTE	**Conduct a check on learning.**	Reference: Slide 18 **1.** What connector do you use on the DAGR to connect it to the PC? 　(ANS: J2.) Paragraph 17.2.3.2 **2.** What do you type in the RUN Prompt on your PC? 　(ANS: C:\Multi_RPG\SHELLAPP.) Paragraph 17.2.4.1
	d. Verification	Reference: Slide 19 This verifies the correct software part number was loaded into the DAGR. 　**a.** Power the DAGR on. 　**b.** Observe the software part number shown in the start-up display message. Verify the software part number shown matches the software part number that was loaded from the loading software procedure, step a, of this lesson step activity. **NOTE:** If needed, repeat the power-on procedure to view the software part number. The software part number can also be accessed from the About page of the DAGR (from the main menu, highlight System, push ENTER, highlight About, then push ENTER). Compare software version displayed to software version printed on the reprogramming disk loaded in step a of the loading software procedure in this lesson step activity.
	e. Self-test	Reference: Slide 20 The commanded self-test is done to ensure the DAGR is ready for use. Any unit that fails the self-test should be returned to Rockwell Collins for repair. Perform the commanded self-test (push and hold POS key, push MENU key, highlight Select Op Mode, push ENTER, highlight TEST, push ENTER).
	f. Remove and Reset Hardware	Reference: Slide 21 　**a.** Close the MULTI RPG window to shut down the reprogramming software. 　**b.** Re-enable screen saver on the PC. 　**c.** Re-enable the mouse if it was used for the reprogramming COM port on the PC. 　**d.** Disconnect reprogramming cable from PC. If applicable, disconnect power cable used for the DAGR.
	g. Remove Reprogramming Software From PC	Reference: Slide 22 　**a.** Click the START button on the task bar, and then select RUN. 　**b.** Type EXPLORER at the prompt. 　**c.** Go to C:\Multi_RPG, or wherever you stored the program.

		d. Highlight the C:\Multi_RPG folder by right clicking on it, then click Delete.
		e. A prompt asks for confirmation prior to deleting, click Yes.
	Topic Summary	Reference: Slide 23
		–Purpose
		– Required Equipment
		– Reprogram DAGR
		During this lesson you have learned to reprogram the DAGR and verify the software was installed correctly. Also, the DAGR must successfully pass a self-test before using in the field.
		Transition Next Lesson: Now that we know the steps necessary to perform reprogramming of the DAGR, we will learn how to load maps into the DAGR in the next learning step activity.

SECTION IV. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

ELO B	Reference: Slide 24	
	ACTION:	Load a Map into the DAGR.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Loaded a Map into the DAGR in accordance with the DAGR Operator and Maintenance Manual.
Learning Step/Activity 1	Identify Map installation. Refer students to paragraph 17.3. through 17.3.2 in the DAGR Operator and Maintenance Manual.	
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	10 minutes
	Media:	PowerPoint
	References:	DEFENSE ADVANCED GPS RECEIVER (DAGR) Operator and Maintenance Manual, Date: 30/05/2003 Paragraph: 17.3 through 17.3.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Overview	Reference: Slide 24
		• Introduction
		Purpose
		Required Equipment
		• Operations
		Installed Maps
	b. Purpose	Reference: Slide 25
		These instructions are used to install maps residing in the DAGR. All user and satellite data stored in the DAGR is erased during the maps installation process. This includes any waypoints and routes, satellite almanac data, and user setup information. Be sure to save any critical data prior to maps installation. Crypto keys are not erased during maps installation.

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	c. Required Equipment	Reference: Slide 26
		The following equipment is needed for DAGR maps installation:
		• PC Maps installation software P/N 984–2517–XXX
		• Maps Data File Varies with map
		• External AC power cable NSN 6130-01-521-3157
		• DAGR to PC data cable NSN 5995-01-521-3198
		• IBM compatible personal computer with minimum specifications as follows:
		Pentium II with 166-MHz processor,
		5-Mb RAM,
		Hard drive with 33-Mb free space for map installation software and map data files,
		Microsoft windows 98, NT, 2000, or XP. (The personal computer should meet or exceed the minimum specifications of the installed version of Microsoft Windows.)
		RS-232 serial port (COM1 to COM4) (9-pin version). On some computers, the only available communication port may be used for a serial mouse. In this case, the mouse must be disabled.
NOTE:	**Conduct a check on learning.**	Reference: Slide 27
		1. While installing MAPS what is erased?
		(ANS: All user and satellite data stored in the DAGR.) Paragraph 17.3.1
		2. What is the minimum free hard dive space?
		(ANS: 33-Mb.) Paragraph 17.3.2.1
Learning Step/Activity 2		Install Maps into DAGR. Refer students to paragraph 17.3.3.1 through 17.3.5.2 in the DAGR Operator and Maintenance Manual.
	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction (minutes):	10 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 17.3.3.1 through 17.3.5.2
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials
	a. Installing Maps Installation Software	Reference: Slide 28
		Caution: Ensure you have write access to a personal computer drive (e.g., desktop or drive C) before starting the installation of Maps installation software into the personal computer. If necessary, contact your system administrator to obtain write access.
		Note: Disable the screen saver program active in Windows to guard against possible unexpected errors during maps installation. To accomplish, open Display Properties either by right clicking on your desktop and then selecting PROPERTIES; or by going through the control panel and when the Display Properties window comes up, select NONE for the screen saver.
		a. Insert the disk containing the Maps installation software into the PC CD-ROM drive.

		b. Right click on the Start task bar, move the mouse pointer over Explore on the list, then left click.
		Reference: Slide 29
		c. Locate the CD-ROM drive in the Explore window, move the mouse pointer over it, then left click. **d.** Move the mouse pointer over the MAPSRPG.exe file, then right click. **e.** Scroll down to the Copy tab, then left click. **f.** Move the mouse pointer from the window to the desktop, then right click.
		Reference: Slide 30
		g. Move the mouse pointer over Paste, then left click. **h**. Verify the MAPSRPG.exe file has been copied to your desktop. If it has been copied, remove the Maps installation software CD from the CD-ROM drive. If it has not been copied, repeat steps a through h.
	b. Equipment Connections	Reference: Slide 31
		NOTE: If external power is being used as primary power for the DAGR, perform steps a and b of this procedure. If internal primary batteries are being used, perform step b only.
		a. Connect one end of the external AC power cable to J4 power connector of the DAGR, and the other end to any 110 VAC outlet.
		b. Connect the DAGR to PC data cable between J2 data interface connector of the DAGR and the serial port of the PC.
	c. Loading Maps	Reference: Slide 32
		Maps installation includes loading maps and also verification the maps were correctly loaded.
		NOTE: • Do not remove power to the DAGR while maps installation is in progress or maps installation must be started over.
		• During the following procedure, if the File Not Found prompt appears, select Cancel to ignore it. **a.** Ensure DAGR power is off. **b.** Ensure the Maps installation software is installed in the personal computer and equipment connections have been performed. **c.** Insert the applicable disk containing the DAGR maps data file into the PC CD-ROM drive.
		Reference: Slide 33
		d. START the Maps installation software by double clicking on MAPSRPG.exe located on the desktop.
		NOTE: While performing the following step, if a no disk message appears, select Cancel to ignore it. **e.** On the Maps installation screen, double left click inside the Program file text (located next to Program). A window appears to aid the user in finding the file to load. Left click on the drop down menu, then select the CD-ROM drive.
		Reference: Slide 34
		f. Select the desired ".abs" file on the CD, then left click the Open tab. The file is now inserted into the program file text box (e.g., D:\CedarRapidslg.abs).
		g. Power the DAGR on by pushing the PWR key once. On the PC, a red indicator periodically blinks next to "Rx" in the communications box of the MAPSRPG screen.
		NOTE: • The blinking red indicator (blinking approximately every six

		seconds) indicates the maps installation setup is working. If the red indicator is not blinking, select a different COM port from the COM port drop down menu.
		• If a working COM port on the PC cannot be found, try using another PC or another DAGR. The MAPSRPG will verify the existence of the DAGR maps files.)
		Reference: Slide 35
		h. Power off the DAGR by pushing and holding the PWR key.
		i. Select the Setup pull down menu from the Maps installation screen, then left click on Communication Card/No Baud Mult/Divsor.
		j. From the Setup pull down menu, left click on Bootstrap Baud/19.2K (odd parity).
		k. From the Setup pull down menu, left click on Transfer Baud/115.2K (odd parity).
		l. Left click on the GO button of the Maps installation screen.
		Reference: Slide 36
		m. Turn the DAGR on when prompted pushing the PWR key.
		NOTE: After the DAGR is powered on, it is normal for the DAGR display to remain blank during Maps installation. Observe the PC Maps installation screen, not the DAGR during the Maps installation.
		n. During Maps installation, the labeled process indicators turn red to indicate that the process is active and turn another color (typically blue or green) when the process is complete.
		o. Maps installation takes approximately 1-30 minutes to complete (depending upon size of the map file).
		Reference: Slide 37
		p. When Maps installation is complete and prompted by the program.
		q. When prompted, power off the DAGR by pushing and holding the PWR key.
		r. To load another map into the DAGR, repeat steps a through q.
		s. Disconnect the DAGR to PC cable from the DAGR J2 connector.
NOTE	**Conduct a check on learning.**	Reference: Slide 38
		1. What connector do you use on the DAGR to connect it to the PC?
		(ANS: J2.) Paragraph 17.3.3.2
		2. What do you type in the RUN Prompt on your PC?
		(ANS: C:/MAPSRPG/MAPSRPG.EXE.) Paragraph 17.3.4.1 d
	d. Verification	Reference: Slide 39
		Perform this procedure on the DAGR to verify the maps were loaded into the DAGR.
		a. Power the DAGR on by pushing the PWR key.
		b. Clear all popup messages using the ENTER key.
		c. When the SV Sky View page is displayed, push and release the PAGE or QUIT key until the MAP page is displayed.
		d. Push the MENU key to display the MAP page menu.
		e. Push the up or down cursor control keys to highlight Select Map.
		Reference: Slide 40
		f. Push the ENTER key to select a map.
		g. Highlight desired map name to view, then push the ENTER key.

		h. The selected map is displayed on the DAGR.
		i. Repeat steps d. through h. to view other individual maps loaded.
	e. Remove and Reset Hardware	Reference: Slide 41 **a.** Remove the disk containing Maps data file from the CD-ROM drive. **b.** On the PC, select File/Exit to shut down the Maps installation software. **c.** Re-enable screen saver on the PC. **d.** Re-enable the mouse if it was previously disabled for the Maps installation COM port on the PC. Reference: Slide 42 **e.** Disconnect the DAGR to PC data cable from PC. **f.** If applicable, disconnect AC power cable used for the DAGR.
	f. Remove Maps Installation Software From PC	Reference: Slide 43 **a.** On the PC desktop, place the mouse pointer over MAPSRPG.exe, then right click. **b.** Move the mouse pointer over Delete, then left click. **c.** Confirm file deletion by placing the mouse pointer over Yes, then left click. **d.** Verify MAPSRPG.exe is removed from the desktop. Reference: Slide 44 **e.** On the PC desktop, place the mouse pointer over RPG.ini, then right click. **f.** Move the mouse pointer over Delete, then left click. **g.** Confirm file deletion by placing the mouse pointer over Yes, then left click. **h.** Verify RPG.ini is removed from the desktop.
	Topic Summary	Reference: Slide 45 – Purpose – Required Equipment – Installed Maps During this topic, you learned how to reprogram and install maps into the DAGR unit. **Transition Next Lesson:** Now that we know the steps necessary to reprogram and install maps into the DAGR unit, we will conduct a practical exercise.

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SECTION V. STUDENT EVALUATION

Testing Requirements	The student will demonstrate Maps Installation for the DAGR receiver. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 1

Reference: Slide 46

Title	Reprogrammed the DAGR.	
Introduction	The student shall determine that the reprogramming instructions are used to reprogram software residing in the DAGR. All user and satellite data stored in the DAGR is erased during the reprogramming process	
Motivator	"Reprogramming the DAGR with the latest software keeps DAGR operation fully functional and up-to-date with the latest technology".	
TLO	**ACTION**	Reprogram the DAGR.
	CONDITION	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD	Reprogrammed the DAGR in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	Reprogramming of the DAGR erases all user and satellite date (except Crypto keys) stored in the DAGR and reprograms the software residing in the DAGR.	

Resource Requirements	The following equipment is needed for reprogramming the DAGR:
	 • PC reprogramming software Refer to RDIT website http://www.sed.monmouth.army.mil/RDIT
	 • DAGR software Refer to RDIT website http://www.sed.monmouth.army.mil/RDIT
	 • External AC power cable NSN 6130-01-521-3157
	 • DAGR to PC data cable NSN 5995-01-521-3198
	 • IBM compatible personal computer with minimum specifications as follows:
	   Pentium II with 166-MHz processor,
	   5.5-Mb RAM for 1 port, up to 65-Mb RAM for 16 ports,
	   Hard drive with 7-Mb free space,
	   Microsoft windows 95, 98, NT, 2000, or XP (The personal computer should meet or exceed the minimum specifications of the installed version of Microsoft Windows.)	

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	RS-232 serial port (with up to 16 Comports) (9-pin version). Additional ports may be added to the personal computer at anytime after the multiple receiver programming software is installed. • On some computers, the only available communication port may be used for a serial mouse. In this case, the mouse must be disabled.
Special Instructions	None.

Procedures	**Task Name:** Reprogrammed the DAGR.	**GO**	**NO GO**	
	Installing Reprograming Software:	▬	▬	
	NOTE: Disable the screen saver program active in Windows to guard against possible unexpected errors in reprogramming. For example, open Display Properties either by right clicking on your desktop and then selecting PROPERTIES; or by going through the control panel and when the Display Properties window is displayed, select NONE for the screen saver.			
	Perform a DAGR commanded self-test to ensure the unit is fully operable prior to reprogramming. Any DAGR failing self-test must be returned to Rockwell Collins for warranty repair.			
	a. Insert the disk containing the reprograming software into the drive of the PC (Refer to the DAGR Operator and Maintenance Manual for Software Number).			
	b. Copy the Multi_RPG.zip file to C:\, then extract all files directly to C:\.			
	c. A folder named Multi_RPG was loaded from the zip file into the C: drive. Verify the folder contains two files named SHELLAPP.EXE and RPG.EXE. The only file remaining to interact with is SHELLAPP.EXE.			
	d. Insert the disk containing the DAGR software into the drive of the PC (Refer to the DAGR Operator and Maintenance Manual for Software Number).			
	e. Copy the following files from the disk into C:\Multi_RPG:			
	• **31_multi_rpg.cfg**			
	• **load.abs**			
	• **yellow_main.abs**			
	• **red_main.abs**			
	f. The reprograming software is now installed.	▬	▬	
	Equipment Connections:			
	NOTE: If external power is being used as primary power for the DAGR, perform steps a and b of this procedure. If internal primary batteries are being used, perform step b only.			
	a. Connect one end of the external AC power cable to J4 power connector of the DAGR, and the other end to any 110 VAC outlet.			
	b. Connect the DAGR to PC data cable between J2 data interface connector of the DAGR and the serial port of the PC.	▬	▬	
	Reprogramming the DAGR:			
	Reprogramming includes loading software and also verification that the software part number was correctly loaded. Also, a commanded self-test is recommended after reprogramming and verification is complete.			
	NOTE: Do not remove power to the DAGR while reprogramming is in progress or reprogramming must be started over.			
	a. Prior to proceeding, ensure the reprograming software is installed in the personal computer and equipment connections have been performed.			

b. Power the DAGR on.

c. Click the START button on the task bar of the monitor, and then select RUN.

d. Type C:\Multi_RPG\SHELLAPP at the prompt. Push the Enter key.

e. On the SHELLAPP application select browse, then open the desired configuration (.cfg) file from the Multi_RPG folder needed to reprogram the DAGR.

f. Select the comport to be used for reprogramming by clicking on the desired comport check box. Up to sixteen comports can be utilized for reprogramming up to sixteen DAGR receivers. All comports can be selected or deselected by clicking on Select All or Clear All, respectively. Refer to your personal computer manual to configure additional ports.

g. Select the appropriate comport baud rate (not to exceed 115200) from the drop down list.

h. Click on the Start All Selected button at the bottom of the screen. The screen momentarily displays an additional window.

i. The status window for the selected comport displays Power Cycle The Unit.

j. Power cycle the DAGR (power the DAGR off, then on). Reprogramming is started, the DAGR display remains blank for approximately 20 seconds, and the status window on the personal computer changes color.

k. When the status window is yellow, user action is required. Follow instructions of the status window.

Note: An additional yellow status window may appear and required repeating this step.

l. Wait for the reprogramming process to be completed. This process normally requires three to six minutes. The comport status field is green indicating reprogramming in process for the comport link type displayed.

m. When reprogramming is completed, the comport status window is blue in color and displays Finished.

n. Power the DAGR off and disconnect all external cables.

Verification:

This verifies the correct software part number was loaded into the DAGR.

a. Power the DAGR on.

b. Observe the software part number shown in the start-up display message. Verify the software part number shown matches the software part number that was loaded from the loading software procedure, step a, of this lesson step activity.

NOTE: If needed, repeat the power-on procedure to view the software part number. The software part number can also be accessed from the About page of the DAGR (from the main menu, highlight System, push ENTER, highlight About, push ENTER). Compare software version displayed to software version printed on the reprogramming disk loaded in step a of the loading software procedure in this lesson step activity.

Self-Test:

The commanded self-test is done to ensure the DAGR is ready for use. Any unit that fails the self-test should be returned to Rockwell Collins for repair. Perform the commanded self-test (push and hold POS key, push MENU key, highlight Select Op Mode, push ENTER, highlight

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 12 – Reprogram the DAGR and Maps Installation

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	Remove and Reset Hardware:			
	a. Close the MULTI RPG window to shut down the reprogramming software.			
	b. Re-enable screen saver on the PC.			
	c. Re-enable the mouse if it was used for the reprogramming COM port on the PC.	___		
	d. Disconnect reprogramming cable from PC. If applicable, disconnect power cable used for the DAGR.		___	
	Remove Reprogramming Software from PC:			
	a. Click the START button on the task bar, and then select RUN.			
	b. Type EXPLORER at the prompt.			
	c. Go to C:\Multi_RPG, or wherever you stored the program.			
	d. Highlight the C:\Multi_RPG folder by right clicking on it, then click Delete.			
	e. A prompt asks for confirmation prior to deleting, click Yes.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

Defense Advanced GPS Receiver (DAGR)

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SECTION VI. STUDENT EVALUATION

Testing Requirements	The student will demonstrate Maps Installation for the DAGR receiver. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.

PRACTICAL EXERCISE SHEET NO. 2

Reference: Slide 46

Title	Load a Map into the DAGR.	
Introduction	Identify Map installation. Refer students to paragraph 17.3. through 17.3.2 in the DAGR Operator and Maintenance Manual.	
Motivator	Installing Maps of any given Region increasing chances of accuracy and success in any given task.	
TLO	**ACTION**	Load a Map into the DAGR.
	CONDITION	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD	Loaded a Map into the DAGR in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements	An initial introduction to the safety requirements associated with handling lithium batteries and basic warnings and cautions identified in DAGR manuals will be addressed so personnel know proper use, handling and storage requirements for the DAGR.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	Inform the students of the Enabling Learning Objective requirements.	

Resource Requirements	The following equipment is needed for reprogramming the DAGR:
	• PC Maps installation software PN 984-2517-XXX
	• Maps Data File Varies with map
	• External AC power cable NSN 6130-01-521-3157
	• DAGR to PC data cable NSN 5995-01-521-3198
	• IBM compatible personal computer with minimum specifications as follows:
	    Pentium II with 166-MHz processor,
	    5-Mb RAM,
	    Hard drive with 33-Mb free space,	

Defense Advanced GPS Receiver (DAGR)

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	Microsoft windows 98, NT, 2000, or XP (The personal computer should meet or exceed the minimum specifications of the installed version of Microsoft Windows.) RS-232 serial port (COM1 to COM4) (9-pin version). On some computers the only available communication port may be used for a serial mouse. In this case, the mouse must be disabled.
Special Instructions	None.

Procedures	

Task Name: Installed Maps Into the DAGR.	**GO**	**NO GO**

Installing Maps Installation Software:
 	
Caution: Ensure you have write access to a personal computer drive (e.g., desktop or drive C) before starting the installation of Maps installation software into the personal computer. If necessary, contact your system administrator to obtain write access
 	
NOTE: Disable the screen saver program active in Windows to guard against possible unexpected errors during maps installation. To accomplish, open Display Properties either by right clicking on your desktop and then selecting PROPERTIES; or by going through the control panel and when the Display Properties window comes up, select NONE for the screen saver.
 	
    a. Insert the disk containing the Maps installation software into the PC CD-ROM drive.
 	
    b. Right click on the Start task bar, move the mouse pointer over Explore on the list, then left click.
    c. Locate the CD-ROM drive in the Explore window, move the mouse pointer over it, then left click.
    d. Move the mouse pointer over the MAPSRPG.exe file, then right click.
    e. Scroll down to the Copy tab, then left click.
    f. Move the mouse pointer from the window to the desktop, then right click.
    g. Move the mouse pointer over Paste, then left click.
    h. Verify the MAPSRPG.exe file has been copied to your desktop. If it has been copied, remove the Maps installation software CD from the CD-ROM drive. If it has not been copied, repeat steps a through h.
	___
	
	___
	
	___
		_____
		
		_____
		
		_____

Equipment Connections:
 	
NOTE: If external power is being used as primary power for the DAGR, perform steps a and b of this procedure. If internal primary batteries are being used, perform step b only.
 	
    a. Connect one end of the external AC power cable to J4 power connector of the DAGR, and the other end to any 110 VAC outlet.
 	
    b. Connect the DAGR to PC data cable between J2 data interface connector of the DAGR and the serial port of the PC.		

Loading Maps:
 	
Maps installation includes loading maps and also verification the maps were correctly loaded.
 	
NOTE: • Do not remove power to the DAGR while maps installation is in progress or maps installation must be started over.
 	
    • During the following procedure, if the File Not Found prompt appears, select Cancel to ignore it.
    a. Ensure DAGR power is off.
    b. Ensure the Maps installation software is installed in the personal		

computer and equipment connections have been performed.

c. Insert the applicable disk containing the DAGR maps data file into the PC CD-ROM drive.

d. START the Maps installation software by double clicking on MAPSRPG.exe located on the desktop.

NOTE: While performing the following step, if a no disk message appears, select Cancel to ignore it.

e. On the Maps installation screen, double left click inside the Program file text (located next to Program). A window appears to aid the user in finding the file to load. Left click on the drop down menu, then select the CD-ROM drive.

f. Select the desired ".abs" file on the CD, then left click the Open tab. The file is now inserted into the program file text box (e.g., D:\CedarRapidslg.abs).

g. Power the DAGR on by pushing the PWR key once. On the PC, a red indicator periodically blinks next to "Rx" in the communications box of the MAPSRPG screen.

NOTE: • The blinking red indicator (blinking approximately every six seconds) indicates the maps installation setup is working. If the red indicator is not blinking, select a different COM port from the COM port drop down menu.

• If a working COM port on the PC cannot be found, try using another PC or another DAGR. The MAPSRPG will verify the existence of the DAGR maps files.)

h. Power off the DAGR by pushing and holding the PWR key.

i. Select the Setup pull down menu from the Maps installation screen, then left click on Communication Card/No Baud Mult/Divsor.

j. From the Setup pull down menu, left click on Bootstrap Baud/19.2K (odd parity).

k. From the Setup pull down menu, left click on Transfer Baud/115.2K (odd parity).

l. Left click on the GO button of the Maps installation screen.

m. Turn the DAGR on when prompted pushing the PWR key.

NOTE: After the DAGR is powered on, it is normal for the DAGR display to remain blank during Maps installation. Observe the PC Maps installation screen, not the DAGR during the Maps installation.

n. During Maps installation, the labeled process indicators turn red to indicate that the process is active and turn another color (typically blue or green) when the process is complete.

o. Maps installation takes approximately 1-30 minutes to complete (depending upon size of the map file).

p. When Maps installation is complete and prompted by the program.

q. When prompted, power off the DAGR by pushing and holding the PWR key.

r. To load another map into the DAGR, repeat steps a through q.

s. Disconnect the DAGR to PC cable from the DAGR J2 connector.

Verification:

This procedure is performed on the DAGR to verify the maps were loaded into the DAGR.

Perform this procedure on the DAGR to verify the maps were loaded into the DAGR.

	a. Power the DAGR on by pushing the PWR key.			
	b. Clear all popup messages using the ENTER key.			
	c. When the SV Sky View page is displayed, push and release the PAGE or QUIT key until the MAP page is displayed.			
	d. Push the MENU key to display the MAP page menu.			
	e. Push the up or down cursor control keys to highlight Select Map.			
	f. Push the ENTER key to select a map.			
	g. Highlight desired map name to view, then push the ENTER key.			
	h. The selected map is displayed on the DAGR.			
	i. Repeat steps d. through h. to view other individual maps loaded.			
	Remove and Reset Hardware:			
	a. On the PC desktop, place the mouse pointer over MAPSRPG.exe, then right click.			
	b. Move the mouse pointer over Delete, then left click.			
	c. Confirm file deletion by placing the mouse pointer over Yes, then left click.			
	d. Verify MAPSRPG.exe is removed from the desktop.			
	e. On the PC desktop, place the mouse pointer over RPG.ini, then right click.			
	f. Move the mouse pointer over Delete, then left click.			
	g. Confirm file deletion by placing the mouse pointer over Yes, then left click.			
	h. Verify RPG.ini is removed from the desktop			
	Remove Maps Installation Software from PC:			
	a. On the PC desktop, place the mouse pointer over MAPSRPG.exe, then right click.			
	b. Move the mouse pointer over Delete, then left click.			
	c. Confirm file deletion by placing the mouse pointer over Yes, then left click.			
	d. Verify MAPSRPG.exe is removed from the desktop.			
	e. On the PC desktop, place the mouse pointer over RPG.ini, then right click.			
	f. Move the mouse pointer over Delete, then left click.			
	g. Confirm file deletion by placing the mouse pointer over Yes, then left click.			
	h. Verify RPG.ini is removed from the desktop.			
Feedback Requirements	If the student fails to perform the procedure, the instructor will provide remedial guidance to the student at the completion of the procedure if necessary and the student will attempt the procedure again.			

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 12 – Reprogram the DAGR and Maps Installation

9 July 2004

SECTION VII. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	10 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Review/Summarize Lesson	Reference: Slide 47 During this lesson you have learned to install software and maps into the DAGR, and verify the software and maps were installed correctly.	
Transition Next Lesson	Now that we know the steps necessary to perform Maps Installation, we will learn how to clear the DAGR.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 13 – Clear the DAGR Receiver

9 July 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title			
	523-0790484	DAGR Operation			
Task(s) Taught or Supported	**Task Number**	**Task Title**			
	113-013	Clear the DAGR Receiver.			
Task(s) Reinforced	**Task Number**	**Task Title**			
	None				
Academic Hours	The academic hour(s) required to teach this lesson are as follows:				
	PEACETIME				MOB
	AC	TASS TRAINING	AC/RC Non-res DL		
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	0:19				
Practical Exercise	0:00				
Test	0:00				
Total Hours	0:19				

Test Lesson Number	Testing	Hours	Lesson No.
			113-013

Prerequisite Lesson(s)	Lesson Number	LESSON TITLE
	113-001	Perform the DAGR Startup Procedure
	113-002	Perform the DAGR Operational Checkout Procedure
	113-003	Adjust DAGR Receiver to User Settings
	113-004	Set Waypoints, Routes, and Alerts.
	113-005	Setup Communications
	113-006	Navigate a Course
	113-007	Maintain Situational Awareness
	113-008	Determine the Azimuth of a Jamming Source
	113-009	Determine Target Position Using the DAGR Receiver
	113-010	Gun Laying Position Using the DAGR Receiver
	113-011	Perform the DAGR Troubleshooting Procedure
	113-012	Reprogramming the DAGR Receiver
Security Clearance/Access	None.	
Foreign Disclosure	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 13 – Clear the DAGR Receiver

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Restrictions	Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.			
References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None.			
Instructor Requirements	PowerPoint slides are available, but are not required to be used.			
Additional Support Personnel Requirements	None.			
Equipment Required	DAGR receiver, Optional: DAGR/AC Power Cable.			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan thirteen, PowerPoint slides (DAGR_PPT_113_013.ppt).		
	Student Materials	DAGR Operator and Maintenance Manual, lesson thirteen student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	None.		
Ammunition Requirements	None.			
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 13 – Clear the DAGR Receiver

9 July 2004

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 "While preparing for a mission, specific types of DAGR data can be cleared in a non-emergency situation without affecting loaded CV keys."	
Terminal Learning Objective	Reference: Slide 2	
	ACTION:	Clear the DAGR receiver using the Data Clear procedure.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Cleared the DAGR receiver using the Data Clear Procedure in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	**NOTE:** None.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: None. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	The data clear function is used to provide a quick way to delete mission critical data and protect sensitive information.	

SECTION III. PRESENTATION

	Perform the Data Clear Procedure. Refer students to DAGR Operator and Maintenance Manual, paragraphs 12.5, 12.5.1, and 12.5.2.	
Learning Step/Activity 1	Method of instruction:	Conference / Discussion
	Instructor to student ratio:	1:16
	Time of instruction: (minutes)	15 Minutes
	Media:	PowerPoint
	References:	Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraphs: 12.5, 12.5.1, and 12.5.2.
	Security Classification:	Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 13 – Clear the DAGR Receiver

9 July 2004

	Overview	Reference: Slide 3
		• Introduction
		  – Data Clear Options
		• Operations
		  – Data Clear Procedure

	a. Data Clear Procedure Familiarity	Reference: Slide 4 **(1)** Data Clear Options can destroy mission critical data. DAGR operation can become seriously impaired for a particular mission without this data. Data Clear Options are accessed from the System submenu. Data Clear Options provides capability to destroy data entered into the DAGR. **(2)** After selecting the clear data options function, a warning message appears. The operator selects the data type and then provides confirmation before the function is performed. Pushing the ENTER key clears the chosen data. Pushing the QUIT key cancels the clear data operation. **(3)** Choices of data types are: • **Mission Data** — Clears all waypoints, routes, and alerts. • **User-Entered** — Clears all user selected and entered settings. • **Basic Set (Advanced)** — Clears all user selected and entered settings in the basic function set (User Profile 00). This choice appears only when using the advanced function set. • **Advanced Set (Advanced)** — Clears all user selected and entered settings in the advanced function set for all defined user profiles (User Profiles 01 through 10). This choice appears only when using the advanced function set. **(4)** The data clear function is used to provide a quick way to delete mission critical data and protect sensitive information. Refer to the keystroke map when doing the following procedure. Pushing the MENU key while viewing the data clear message provides additional selections which duplicate key functions. The menu also provides message help text access.

NOTE:	**Conduct a check on learning.**	Reference: Slide 5
		
		1. Clear options are available from which submenu?
		  (ANS: System submenu.) See paragraphs 12.5.1 in the DAGR Operator and Maintenance Manual.
		
		2. What are the four data types that may be cleared on the DAGR receiver?
		  (ANS: Mission Data, User-Entered, Basic Set (Advanced), Advanced Set (Advanced).) See paragraphs 12.5.1 in the DAGR Operator and Maintenance Manual.
		
		True or False
		
		3. Clearing the DAGR must be confirmed by pressing the ENTER key.
		  (ANS: True. Pressing the ENTER key allows you to perform the clear data function.) See paragraph 12.5.1 in the DAGR Operator and Maintenance Manual.

	b. **Data Clear Procedure**	Reference: Slide 6 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs.

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a. From any display (except a message pop-up), push the MENU key twice to display the Main Menu.

b. Highlight System from the Main Menu, then push the ENTER key.

c. Highlight Data Clear Options from the System submenu, then push the ENTER key.

Reference: Slide 7

d. From the clear data message display, scroll to the desired data selection to be cleared using the cursor control keys.

Reference: Slide 8

e. Push the ENTER key to confirm and perform the clear data function. Push the ENTER key again to acknowledge the clear data passed message. The display returns to the POS page set.

NOTE: If the QUIT key is pushed to cancel the clear data function, the display returns to the last page viewed.

</td></tr>
<tr><td>

NOTE:

</td><td>

Conduct a check on learning.

</td><td>

Reference: Slide 9

True or False

Upon pushing the ENTER key to confirm the clear data function, the DAGR receiver will take the operator to the POS page set.

(ANS: False. The operator must push the ENTER key a second time to acknowledge the clear data passed message before returning to the POS page set.). See Page 12.5.2 in the DAGR Operator and Maintenance Manual.

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</table>

SECTION IV. SUMMARY

<table>
<tr><td></td><td>Method of Instruction:</td><td>Lecture/Conference/Discussion</td></tr>
<tr><td></td><td>Instructor to Student Ratio:</td><td>1:16</td></tr>
<tr><td></td><td>Time of Instruction: (minutes)</td><td>2 Minutes</td></tr>
<tr><td></td><td>Media:</td><td>PowerPoint</td></tr>
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Check on Learning

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Determine if students have learned the material presented by ---

a. Soliciting student questions and explanations.

b. Asking questions and getting answers from the students.

c. Providing immediate feedback in context to the material presented and correcting student misunderstandings.

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Review/Summarize Lesson

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Reference: Slide 10

During this lesson you have learned to clear the DAGR receiver.

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Transition Next Lesson

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Now that we know the steps necessary to clear the DAGR receiver, we will learn how to zeroize the DAGR receiver.

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Defense Advanced GPS Receiver (DAGR)

Lesson Plan 14 – Zeroize the DAGR Receiver

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SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson	Course Number	Course Title		
	523-0790484	DAGR Operation		
Task(s) Taught or Supported	**Task Number**	**Task Title**		
	113-014	Zeroize the DAGR Receiver.		
Task(s) Reinforced	**Task Number**	**Task Title**		
	None			
Academic Hours	The academic hour(s) required to teach this lesson are as follows:			
	PEACETIME			MOB
	AC	TASS TRAINING	AC/RC Non-res DL	
	Resident Hrs: Min/MOI	AT/ADT Hrs: Min/MOI	IDT Hrs: Min/MOI	Hrs: Min/MOI	Hrs: Min/MOI
Conference/ Discussion	0:19				
Practical Exercise	0:00				
Test	0:00				
Total Hours	0:19				
Test Lesson Number	Testing	**Hours**	**Lesson No.**		
			113-014		
Prerequisite Lesson(s)	**Lesson Number**	**LESSON TITLE**		
	113-001	Perform the DAGR Startup Procedure		
	113-002	Perform the DAGR Operational Checkout Procedure		
	113-003	Adjust DAGR Receiver to User Settings		
	113-004	Set Waypoints, Routes, and Alerts.		
	113-005	Setup Communications		
	113-006	Navigate a Course		
	113-007	Maintain Situational Awareness		
	113-008	Determine the Azimuth of a Jamming Source		
	113-009	Determine Target Position Using the DAGR Receiver		
	113-010	Gun Laying Position Using the DAGR Receiver		
	113-011	Perform the DAGR Troubleshooting Procedure		
	113-012	Reprogramming the DAGR Receiver		
	113-013	Clear the DAGR Receiver		
Security Clearance/Access	None.			

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 14 – Zeroize the DAGR Receiver

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Foreign Disclosure Restrictions	WARNING: INFORMATION SUBJECT TO EXPORT CONTROL LAWS This document may contain information subject to the International Traffic in Arms Regulation (ITAR) or the Export Administration Regulation (EAR) of 1979 which may not be exported, released, or disclosed to foreign nationals inside or outside of the United States without first obtaining an export license. A violation of the ITAR or EAR may be subject to a penalty of up to 10 years imprisonment and a fine of up to $1,000,000 under 22 U.S.C.2778 of the Arms Export Control Act of 1976 or section 2410 of the Export Administration Act of 1979. Include this notice with any reproduced portion of this document.			
References	**Number**	**Title**	**Date**	**Additional Information**
	523-xxxxxxx	DEFENSE ADVANCED GPS RECEIVER (DAGR) OPERATOR AND MAINTENANCE MANUAL	9 January 2004	
	523-xxxxxxx	DAGR OPERATOR'S POCKET GUIDE	9 January 2004	
Student Study Assignments	None.			
Instructor Requirements	PowerPoint slides are available, but are not required to be used. An external antenna will be required to acquire the current position unless the check on learning is conducted outside or PowerPoint slides are used.			
Additional Support Personnel Requirements	None.			
Equipment Required	DAGR receiver, Optional: DAGR/AC Power Cable.			
Materials Required	Instructor Materials	DAGR program of instruction (POI), lesson plan fourteen, PowerPoint slides (DAGR_PPT_113_014.ppt).		
	Student Materials	DAGR Operator and Maintenance Manual, lesson fourteen student handout.		
Classroom, Training Area, and Range Requirements	Classroom	The classroom will be equipped with a white board and markers. Overhead projectors and digital projectors may also be used.		
	Training Area	None.		
Ammunition Requirements	None.			
Instructional Guidance	Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.			
Branch Safety Manager Approval	**Name**	**Rank**	**Position**	**Date**
Proponent Lesson Plan Approvals	**Name**	**Rank**	**Position**	**Date**

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 14 – Zeroize the DAGR Receiver

9 July 2004

SECTION II. INTRODUCTION

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Motivator	Reference: Slide 1 "In an operational and potentially hostile or foreign environment, what can better assist and support the tactical skills of a highly-trained soldier? – the answer: A state-of-the-Art, technologically superior Defense Advanced Global Positioning hand-held Receiver that we call DAGR."	
Terminal Learning Objective	Reference: Slide 2	
	ACTION:	Clear the DAGR receiver using the Zeroize function.
	CONDITION:	Given a DAGR receiver, DAGR accessories necessary to operate the DAGR, and a DAGR Operator and Maintenance Manual or pocket guide.
	STANDARD:	Cleared the DAGR receiver using the Zeroize function in accordance with the DAGR Operator and Maintenance Manual.
Safety Requirements and Alerts	**CAUTION:** The emergency zeroize function is used in emergencies to protect mission sensitive data. Emergency zeroize destroys mission critical data and CV keys entered into or collected by the DAGR. Failure to emergency zeroize could compromise a mission. **CAUTION:** CV key zeroize destroys CV key data entered into the DAGR. Failure to CV key zeroize could compromise a mission.	
Risk Assessment Level	The Risk Assessment for this lesson is low.	
Environmental Considerations	None.	
Evaluation	Student learning is reinforced through a check on learning questioning technique throughout the lesson. Performance examination: practical exercise. Written examination: DAGR test package at the end of the DAGR course.	
Instructional Lead-in	The CV key zeroize function is used under more normal conditions to revise CV key information. The emergency zeroize function is used in, but not limited to, emergency situations. Emergency zeroize provides a quick way to delete mission critical data and protect sensitive information. Refer to the keystroke map when doing the following procedure.	

Defense Advanced GPS Receiver (DAGR)

Lesson Plan 14 – Zeroize the DAGR Receiver

9 July 2004

SECTION III. PRESENTATION

<table>
<tr>
<td colspan="3">Perform the CV Key Zeroize and Emergency Zeroize Procedures. Refer students paragraphs 7.3 thru 7.3.3 in the DAGR Operator and Maintenance Manual.</td>
</tr>
<tr>
<td rowspan="6">Learning Step/Activity 1</td>
<td>Method of instruction:</td>
<td>Conference / Discussion</td>
</tr>
<tr>
<td>Instructor to student ratio:</td>
<td>1:16</td>
</tr>
<tr>
<td>Time of instruction: (minutes)</td>
<td>15 Minutes</td>
</tr>
<tr>
<td>Media:</td>
<td>PowerPoint</td>
</tr>
<tr>
<td>References:</td>
<td>Defense Advanced GPS Receiver (DAGR) Operator and Maintenance Manual, Date: 30/05/2003, Paragraph: 7.3 - 7.3.3</td>
</tr>
<tr>
<td>Security Classification:</td>
<td>Foreign Disclosure (FD) Restriction Statements, and Copyright/Proprietary Materials</td>
</tr>
<tr>
<td></td>
<td>Overview</td>
<td>Reference: Slide 3
Introduction
   CV Key Zeroize Familiarity
   Emergency Zeroize Familiarity
Operations
   CV Key Zeroize
   Emergency Zeroize</td>
</tr>
<tr>
<td></td>
<td>a. CV Key Zeroize Familiarity</td>
<td>Reference: Slide 4
(1) There are two types of zeroize functions: Crypto Variable (CV) Key Zeroize and Emergency Zeroize.
CAUTION: The emergency zeroize function is used in emergencies to protect mission sensitive data. Emergency zeroize destroys mission critical data and CV keys entered into or collected by the DAGR. Failure to emergency zeroize could compromise a mission.
(2) CV key zeroize is used to clear CV keys only.
CAUTION: CV key zeroize destroys CV key data entered into the DAGR. Failure to CV key zeroize could compromise a mission.
The CV key zeroize function is associated with the Crypto Fill page. The CV key zeroize function is initiated by pushing the MENU key while accessing the Crypto Fill page. CV key zeroize clears only CV keys and mission duration that have been entered into or collected by the DAGR; and keeps other mission critical data (e.g. waypoints). After initiating the CV key zeroize function, the activate CV zeroize message appears. The operator provides confirmation before the CV key zeroize function is performed. Pushing the ENTER key destroys CV keys. Pushing the QUIT key cancels the CV key zeroize operation.</td>
</tr>
<tr>
<td>NOTE:</td>
<td>Conduct a check on learning.</td>
<td>Reference: Slide 5
1. What types of information are deleted by emergency zeroizing the DAGR receiver?
   (ANS: The emergency zeroize function destroys mission critical data and CV keys entered into or collected by the DAGR.) See para 7.3.1 in the DAGR Operator and Maintenance technical manual.
2. What two keys must be pushed simultaneously to initialize the zeroize function?
   (ANS: The emergency zeroize function is initiated by simultaneously pushing the QUIT and PAGE keys.) See para 7.3.1 in the DAGR Operator and Maintenance technical manual.</td>
</tr>
</table>

		3. What information is destroyed by CV Key zeroizing? (ANS: The CV Key zeroize function destroys CV keys data.) See para 7.3.2.
	b. CV Key Zeroize the DAGR Receiver	Reference: Slide 6 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **a. CV Key Zeroize:** **(1)** From any display, push and hold the POS key, the Present Position page is displayed. Reference: Slide 7 **(2)** Push the MENU key twice to access the main menu. **(3)** Highlight Receiver Setup, then push the ENTER key. **(4)** Highlight Crypto Fill, then push the ENTER key. **(5)** From the Crypto Fill page, with or without a field highlighted, push the MENU key. Reference: Slide 8 **(6)** Highlight Zeroize CV Keys, then push the ENTER key. **(7)** The Activate CV Zeroize message is displayed. Reference: Slide 9 **(8)** Push the ENTER key to confirm and perform the CV key zeroize function. **NOTE**: If the QUIT key is pushed to cancel the CV key zeroize function, the display returns Crypto Fill page. **(9)** Push the ENTER key to acknowledge the CV key zeroize passed message. The display returns to the Crypto Fill page.
	c. Emergency Zeroize Familiarity:	Reference: Slide 10 Emergency zeroize is used to clear data and CV keys. **CAUTION:** The emergency zeroize function is used in emergencies to protect mission sensitive data. Emergency zeroize destroys mission critical data and CV keys entered into or collected by the DAGR. Failure to emergency zeroize could compromise a mission. The emergency zeroize function is not accessed from a submenu, and is not directly associated with a submenu or display page. The emergency zeroize function is initiated by simultaneously pushing the QUIT and PAGE keys. Emergency zeroize clears data and CV keys that have been entered into or collected by the DAGR, and defaults to the basic function set with the values defined in Table 6-1. After initiating the emergency zeroize function, the activate emergency zeroize message appears. The operator provides confirmation before the emergency zeroize function is performed. Pushing the ENTER key destroys all entered or collected data and CV keys. Pushing the QUIT key cancels the emergency zeroize operation.
	d. Emergency Zeroize:	Reference: Slide 11 **Instructional Note:** The following procedure should be performed as a guided practice. Have students follow along with their DAGRs. **(1)** From any display, push the QUIT and PAGE keys simultaneously. **(2)** The Activate Emergency Zeroize message is displayed. **(3)** Push the ENTER key to confirm and perform the emergency zeroize function.

		Reference: Slide 12
		NOTE: If the QUIT key is pushed to cancel the emergency zeroize function, the display returns to the last page viewed.
		(4) Push the ENTER key to acknowledge the emergency zeroize passed message. The SV (Satellite Vehicle) Sky View page is displayed.

SECTION IV. SUMMARY

	Method of Instruction:	Lecture/Conference/Discussion
	Instructor to Student Ratio:	1:16
	Time of Instruction: (minutes)	2 Minutes
	Media:	PowerPoint
Check on Learning	Determine if students have learned the material presented by --- **a.** Soliciting student questions and explanations. **b.** Asking questions and getting answers from the students. **c.** Providing immediate feedback in context to the material presented and correcting student misunderstandings.	
Testing Requirements	Reference: Slide 13 The student will zeroize the DAGR receiver. The student will successfully complete the steps identified in the Student Evaluation Plan in the time allotted by the instructor.	
Feedback Requirement	**a.** Schedule and provide feedback in context to the material presented; correct student misunderstandings. **b.** Provide remedial training, as needed.	