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AN/PRC-117G
MULTIBAND MANPACK
RADIO

FIELD REFERENCE
GUIDE



HARRIS

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AN/PRC-117G

FIELD REFERENCE GUIDE

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This manual is based on Firmware Version 4.4.0

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AN/PRC-117G FIELD REFERENCE

SAFETY GUIDELINES

SAFETY GUIDELINES








	WARNING - Do not crush, disassemble, reverse polarity, incinerate, or mutilate the lithium-ion battery. Do not expose to fire or temperatures above 160 °F (71 °C). The battery can vent, rupture, or explode, releasing toxic material which may cause injury or death to personnel. In case material is released or spilled, evacuate and allow vapors to dissipate. Increase ventilation and DO NOT inhale vapors. Notify safety personnel of release or spills.
	CAUTION - ACID CONTAMINATES LITHIUM-ION BATTERIES. Every effort must be made to keep lithium-ion batteries isolated from lead-acid batteries because lead-acid batteries contain sulfuric acid. DO NOT use the same tools and materials for both types of batteries. Any trace of acid or acid fumes will permanently damage lithium-ion batteries on contact.
	WARNING - A damaged lithium-ion battery that is exposed to water could cause a fire or explosion, causing personal injury. Never expose batteries to any amount of water at any time. Replace batteries with cracked or damaged cases immediately.
	WARNING - A partially discharged or damaged lithium battery is considered to be hazardous waste that can cause personal injury. Do not dispose of lithium-ion batteries in uncontrolled trash.
	WARNING - Use only battery chargers approved by Harris. Never attempt to modify the battery or charger. Doing so may result in damage to the battery, the radio, or cause personal injury to the user. Do not attempt to recharge a disposable AA battery.
	WARNING - RF shock could occur from coming into contact with the antenna while radio is transmitting. The radio could be transmitting with or without activating the keyline via Push-To-Talk (PTT).
	WARNING - Operating RF transmitting devices such as radios and cellular phones in or around fuel, weapons, or ordinance could cause serious injury or death. Follow all local directives and established safety procedures when operating any RF transmitting devices in these circumstances.

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INTRODUCTION

This reference guide is intended to support basic field user operations on the RT-1949 Manpack Receiver/Transmitter (R/T), referred to by its common name, AN/PRC-117G. The following assumptions are made about the field user:

- The operator has been trained on the radio and is familiar with its basic features.
- The radio has been Type-1 Initialized and contains appropriate Mission Plans.

The AN/PRC-117G frequency range is continuous from 30.0000 MHz to 1999.9950 MHz. The radio supports AM, FM, and various data waveforms. Refer to AN/PRC-117G Operation Manual (10515-0319-4200) for detailed information. This manual supports:

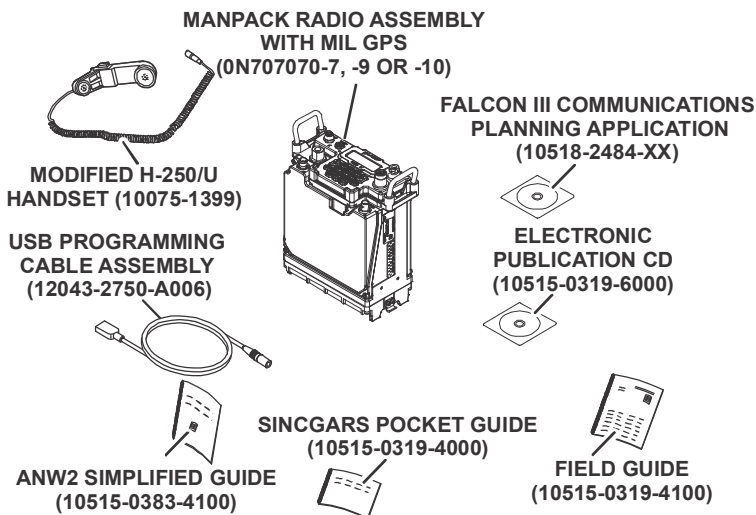
- VHF/UHF Line-of-Sight (VULOS) Fixed Frequency FM/AM
- UHF Dedicated Channel Satellite Communications (SATCOM)
- Single Channel Ground and Airborne Radio System (SINCGARS) Frequency Hopping (FH) and Single Channel (SC)
- HAVEQUICK frequency hopping in the UHF AM band
- SATURN frequency hopping in the UHF FM band
- High Performance Waveform (HPW) for secure data transmission using KG-84C (data only)
- Adaptive Networking Wideband Waveform (ANW2 / ANW2C)
- Project 25 (P25)
- Integrated Waveform (IW)

AN/PRC-117G FIELD REFERENCE ITEMS INCLUDED

- Demand Assigned Multiple Access (DAMA) Satellite Communications

ITEMS INCLUDED

The items shown below are included with the AN/PRC-117G. Additional attaching items required for specific waveform operation such as ANW2 networking are described in [System Setup](#).



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SYSTEM SETUP

Set up your radio for basic communications and operations.

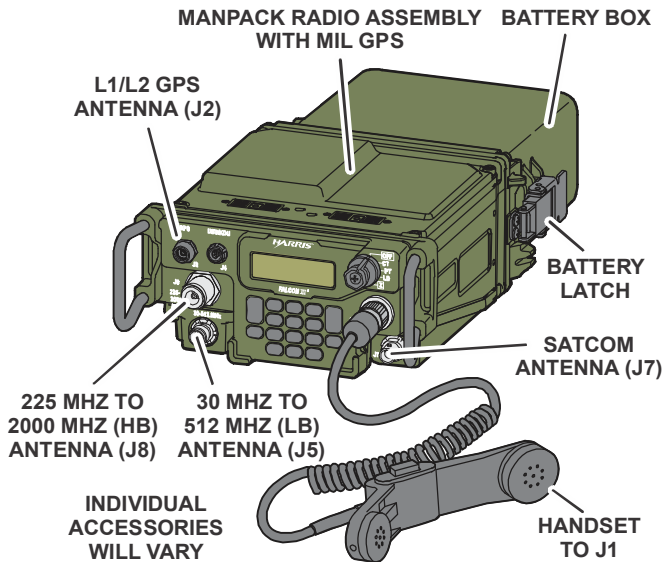
- a. Attach a charged battery. The AN/PRC-117G can use one of the following:

NOTE: Use of batteries other than those listed may result in equipment malfunction.

- BB-390B/U Nickel-Metal Hydride (Ni-MH)
 - BB-590/U Nickel-Cadmium (Ni-Cd)
 - BB-2590/U Lithium-Ion (Li-ION)
 - BA/BB-5590/U Lithium Sulfur Dioxide (Li-SO₂)
 - BA-5390/U Lithium Manganese Dioxide (Li-MnO₂)
- b. Screw the antenna(s) to the antenna connector(s). If operating in SATCOM mode, connect the optional SATCOM antenna cable to the radio, and deploy the SATCOM antenna according to the separate instructions provided with the antenna.
 - J8 HB ANT - N-Connector, High-Band (HB) Antenna (ANT) Port (0.5 to 5 watts), 225.0000 MHz - 1999.9950 MHz
 - J5 LB ANT - TNC Connector, Low-Band (LB) Port (1 to 10 watts), 30.0000 MHz - 511.9950 MHz
 - J7 SATCOM - BNC Connector, SATCOM (2 to 20 watts), only activated with SATCOM channel selection (243.0000 MHz - 270.0000 MHz RX and 291.0000 MHz - 318.0000 MHz TX)
 - c. Plug the Global Positioning System (GPS) antenna into the GPS connector, J2.
 - d. Connect a handset or headset to J1 connector.

AN/PRC-117G FIELD REFERENCE SYSTEM SETUP

- e. Connect data and auxiliary cables (typical examples).
- Black Data Connector (Top Left, J6) - 10/100BaseT Ethernet, High Assurance Internet Protocol Encryptor (HA/PE).
 - Red Data Connector (Top Right, J3) - 10/100BaseT Ethernet, RS-422, RS-232 RS, and fixed audio.
 - Universal Serial Bus (USB) Connector (J4) - Red USB, Ethernet, Point-To-Point Protocol (PPP), Synchronous/Asynchronous.
 - AUDIO (J1) - Used for DS-101/DS-102 Fill Device.
- f. Place rubber boots over unused front panel connectors.



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SYSTEM TEARDOWN

Perform the following procedure to tear down the AN/PRC-117G:

- a. Zeroize the radio to erase all communications information. Refer to [Zeroize Functions](#).
- b. Turn cipher switch to the OFF position.
- c. For GPS models, the GPS antenna may remain on the radio because of its small size.
- d. Disconnect the handset, headset, or any cabling, if used, from the transceiver.
- e. Disconnect the antenna from the antenna connector.

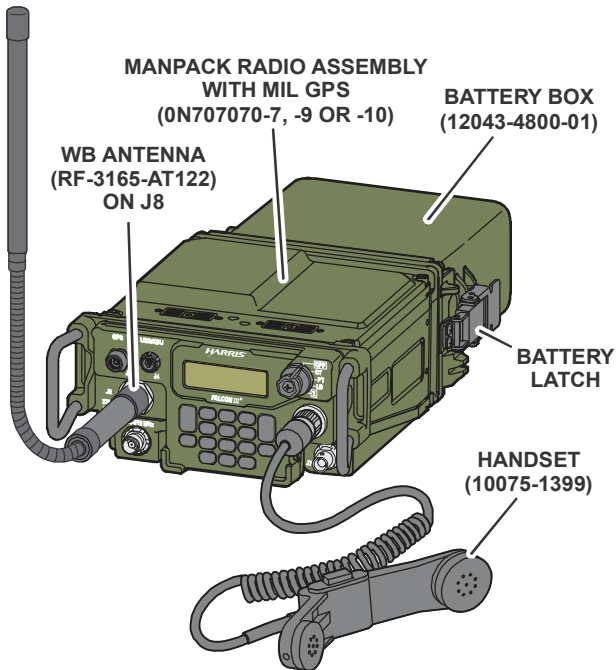
TYPICAL CONFIGURATIONS

The following configurations show typical combinations of antenna, cable, and connecting items used with AN/PRC-117G.

AN/PRC-117G FIELD REFERENCE TYPICAL CONFIGURATIONS

ANW2 for AN/PRC-117G

Use this combination for simultaneous voice and high-speed data capabilities using a Wide-Band (WB) antenna. This radio can be networked with other ANW2 combinations.

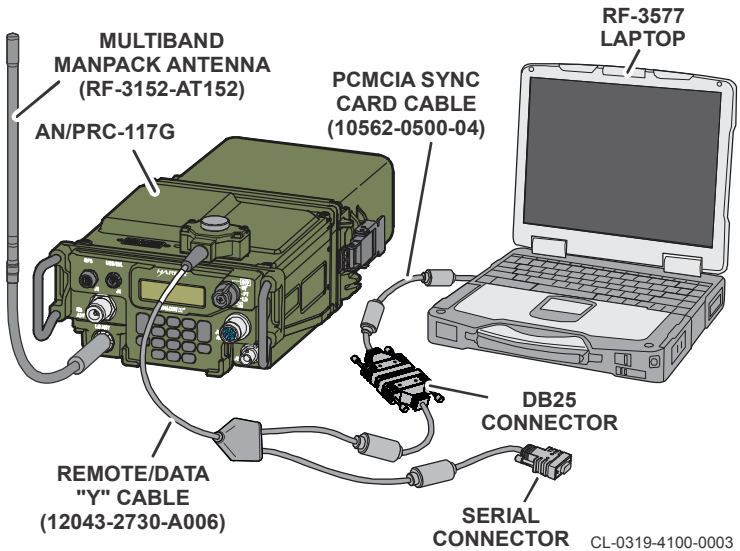


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AN/PRC-117G FIELD REFERENCE TYPICAL CONFIGURATIONS

WMT for AN/PRC-117G

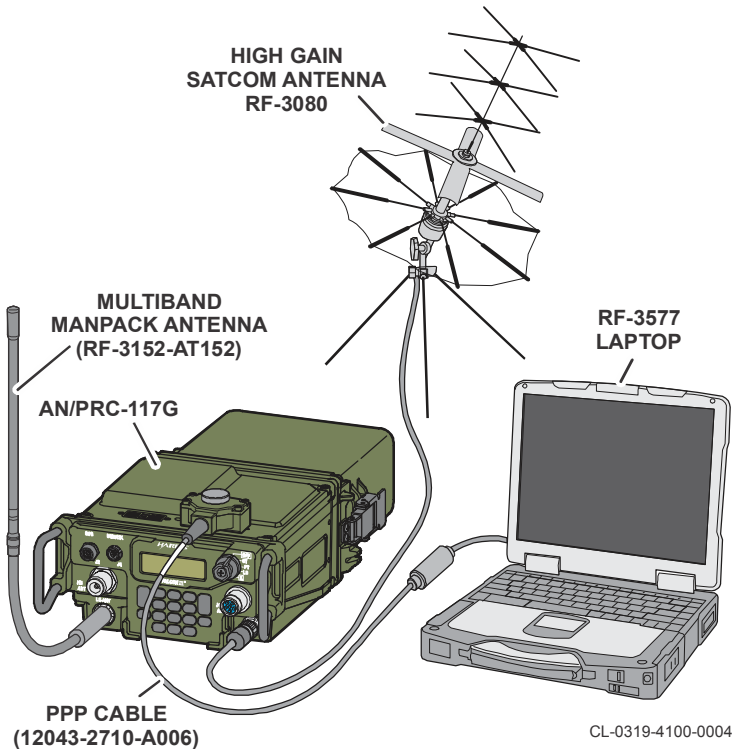
Use this combination for synchronous data, RF-6760 Wireless Messaging Terminal (WMT) using VULOS AM/FM, HAVEQUICK II, SINCGARS, or Line-of-Sight (LOS) HPW.



AN/PRC-117G FIELD REFERENCE TYPICAL CONFIGURATIONS

SATCOM for VULOS, HPW, DAMA, IW

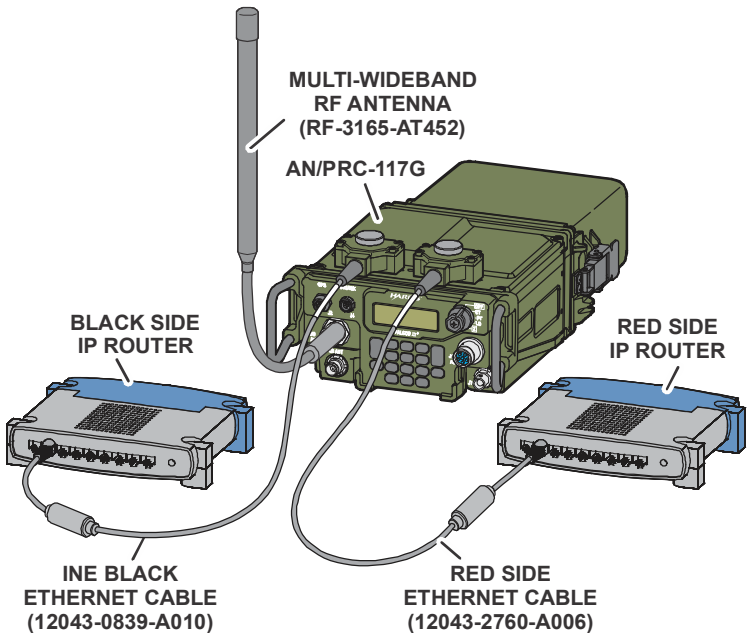
VULOS operation provides fixed frequency communications over the VHF, UHF and over dedicated UHF SATCOM channels. HPW supports SATCOM, LOS, and Internet Protocol (IP) through the radio's PPP port.



AN/PRC-117G FIELD REFERENCE TYPICAL CONFIGURATIONS

In-line Network Encryptor (INE) Mode

INE is supported within the ANW2 network. The black side router connects to a black Wide Area Network (WAN) or black Local Area Network (LAN). The red side router connects to a private red network. ANW2 broadband networking is provided through the antenna (RF-3165-AT452).



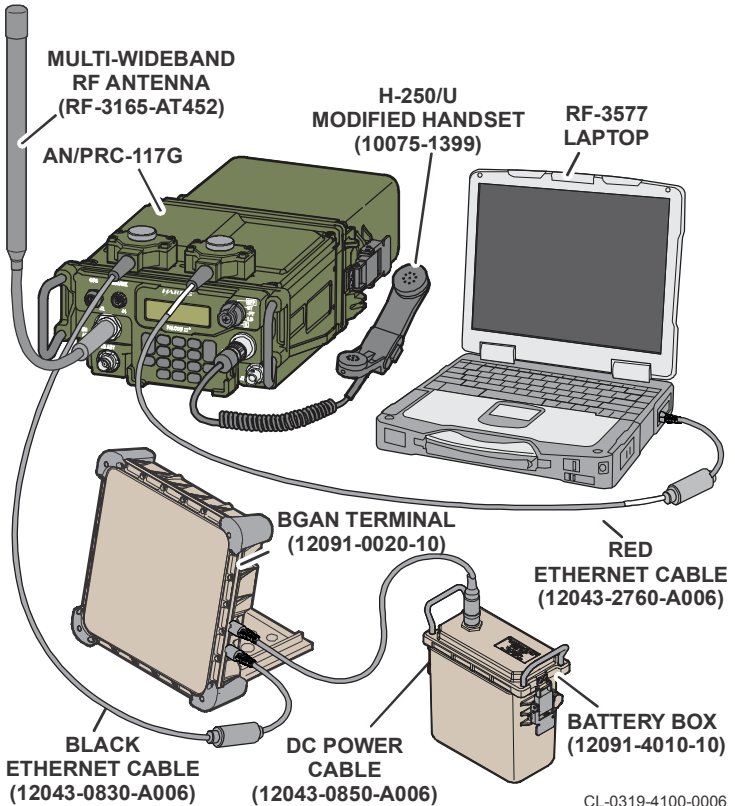
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AN/PRC-117G FIELD REFERENCE

TYPICAL CONFIGURATIONS

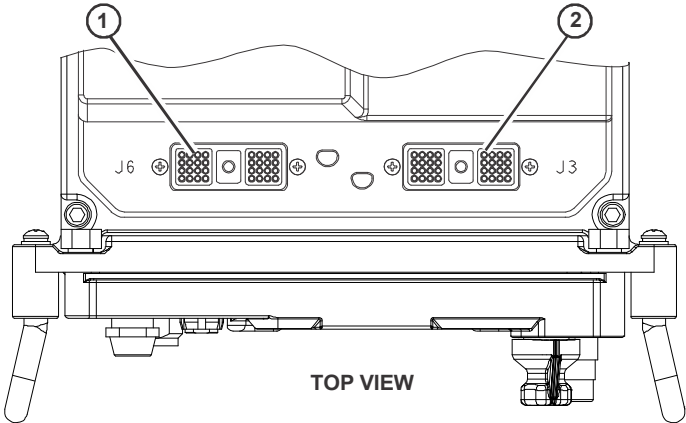
ANW2 and BGAN INE Ethernet Networking

Broadband Global Area Network (BGAN) is supported within the ANW2 network.

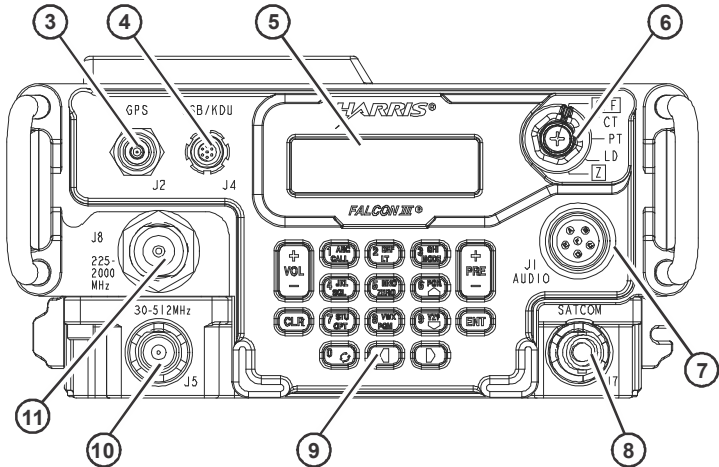


AN/PRC-117G FIELD REFERENCE CONTROLS AND INDICATORS

CONTROLS AND INDICATORS



TOP VIEW



FRONT VIEW















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AN/PRC-117G FIELD REFERENCE

CONTROLS AND INDICATORS



Key	Control/Indicator	Function
1	Black Side Top Connector (J6)	Provides interface for various black data devices.
2	Red Side Top Connector (J3)	Provides interface for various red data devices.
3	GPS Antenna Connector (J2)	Connector for GPS antenna.
4	USB/KDU Connector (J4)	Connector for red USB and external Keypad Display Unit (KDU).
5	Display	Displays operational and programming screens.
6	Cipher Switch	
	OFF	A pull-to-turn action is required to enter or leave this position. Turns radio off.
	[CT]	Places the radio in the cipher text encryption mode. The radio will display INVALID CRYPTO MODE if COMSEC mode and TEK are not programmed. Set TEK.
	[PT]	Places the radio in plain text non-encrypted mode.
	[LD]	Places the radio off-line for security or installation. In fill mode, the radio is able to load encryption keys. In install mode, the radio is able to load software and mission plans.
	[Z]	A pull-to-turn action is required. This zeroizes all programmed variables, including encryption variables.
7	6-Pin AUDIO/Fill Connector (J1)	Provides a connection for an H-250 handset or crypto fill device that uses a 6-pin connector.
8	SATCOM Antenna Connector (J7)	Provides a 50-ohm SATCOM antenna port via BNC.

AN/PRC-117G FIELD REFERENCE CONTROLS AND INDICATORS

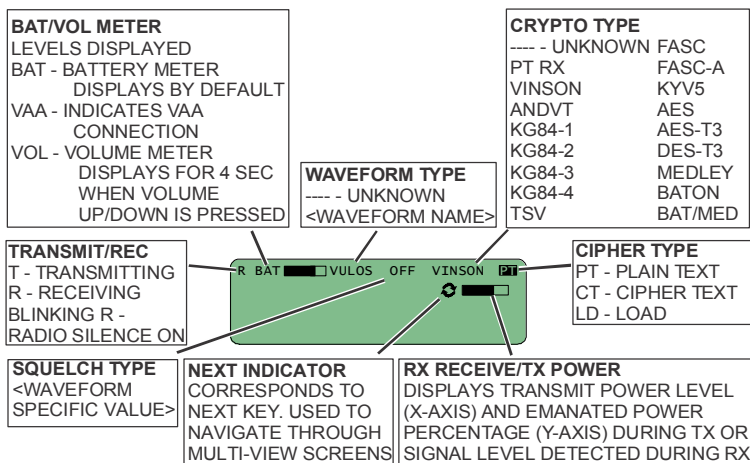
Key	Control/Indicator	Function
9	Keypad	
	 [NEXT]	Switches the display to alternate screens for additional information.
	 [CALL]	Displays a Call Menu from the current waveform. Typically used to hail all radios or directing traffic to a radio or set of radios, based on the operation of the waveform.
	 [LT]	Accesses the Keypad/Display backlight control menu.
	 [MODE]	Perform/set-up waveform specific features for Over-The-Air Rekeying (OTAR), Beacon, Clone, or Scan.
	 [SQL]	Select a squelch type and squelch level, if applicable, for the currently active waveform (depends on waveform).
	 [ZERO]	Accesses the zeroize menus.
	 [OPT]	Accesses the radio and waveform options menus.
	 [PGM]	Accesses the radio's programming menus.
	 [CLR]	Returns a field to its previous value, activates the previous menu or screen, terminate an active Voice over Internet Protocol (VoIP) call.
	 [ENT]	Enter - Selects scroll field choices or locks in entry field data.
	 [PRE +/-]	Scrolls through the programmed nets. Up (+) scrolls up through the presets, down (-) scrolls down through the presets.
	 [VOL +/-]	Up (+) increases volume, down (-) decreases volume. (Not lockable.)
	  [Left Arrow] [Right Arrow]	Move the cursor to the left (◀) or right (▶), or to select a new menu field.

AN/PRC-117G FIELD REFERENCE

CONTROLS AND INDICATORS

Key	Control/Indicator	Function
	 [Up Arrow]  [Down Arrow]	Step through a scroll field list up (▲) or down (▼).
10	Low-Band Antenna Connector (J5)	50-ohm antenna port TNC Connector for 30.0000 - 511.9950 MHz. Used for VULOS, SINCARS, LOS HPW, HAVEQUICK, P25, and narrowband and SATCOM Vehicular Amplifier Adapter (VAA).
11	High-Band Antenna Connector (J8)	50-ohm antenna port N-Connector for 225.0000 MHz to 1999.9950 MHz. Used for ANW2 and ANW2C and for Wideband VAA.

Front Panel Display



CL-0319-4100-0008A

LOADING COMSEC FILLS

Operating the radio in any of the embedded Communications Security (COMSEC) modes requires loading of COMSEC fill data. Key loading operations and key types can be different for each waveform. Use the following as basic examples.

Loading COMSEC TEK/KEK using DS-101

- a. Move cipher switch to **[LD]**.
- b. Select **FILL** and press **[ENT]**.
- c. Select the correct waveform, HAIPE, GPS, etc.
- d. Select **DTD (CYZ-10)/KIK-20, SKL (PYQ-10)**, or other device from FILL DEVICE screen, and press **[ENT]**.
- e. For Data Transfer Device (DTD)/KIK-20 or Simple Key Loader (SKL), select **DS-101** from FILL PORT TYPE screen and press **[ENT]**.
- f. The radio displays **INITIATE FILL AT FILL DEVICE**. Connect fill device to AUDIO/FILL connector. Use Harris fill cable 10012-0714 or equivalent FL51242-5.
- g. If using AN/CYZ-10 DTD:
 1. Use DTD FILL to initiate loading of required key.
 2. Ensure DTD FILL is set to D101 (DS-101) protocol before beginning. Always select **ISSUE** as transmit mode in the DTD loading process.
 3. Select **XMIT** on the DTD.
 4. Select **ISSUE**.
 5. Select one key (page up and down to display keys). Do not send multiple keys. Press **[ENTR]**.

AN/PRC-117G FIELD REFERENCE

LOADING COMSEC FILLS

6. Press **SEND**.
 7. Select **SEND TO: DIRECT**. Press **[ENTR]**.
 8. At **CONNECT TO STATION**, select **SEND**, or press **[ENTR]** if highlighted.
- h. At fill devices other than the AN/CYZ-10, prepare to transmit key information. Do not send multiple keys. Use **DS-101** and select **Issue** as transmit mode. Initiate the fill at fill device.
- i. Select the desired **CRYPTO MODE**, and press **[ENT]**.
- VINSON
 - ANDVT
 - KG84 (KG-84)
 - AES
 - FASCINATOR
 - TSV - no selection required, load KEK before TEK
- j. Select the **KEY TYPE**, then select the key compartment position number (**01 - 25**) and press **[ENT]**. If a Key Encryption Key (KEK) is selected to be loaded, no key position is shown as only one can be loaded per waveform.
- k. Note that the classification level is temporarily displayed (DS-101 includes this additional tagging and no input is required).
- l. At prompt **LOAD ANOTHER KEY**, select **YES** to enter more fill data. When all fill data is entered, select **NO** when the **LOAD ANOTHER KEY** prompt displays.
- m. Disconnect fill device from the **AUDIO/Fill** connector. Follow screen prompts to close session and log out.
- n. Rotate cipher switch from **[LD]** to **[CT]**.

AN/PRC-117G FIELD REFERENCE

LOADING COMSEC FILLS

- o. Perform a secure communications check using loaded Traffic Encryption Key (TEKs) and Transmission Security Keys (TSKs) to ensure correct fills have been loaded. Keys can also be checked by going to **[OPT] > VIEW KEY INFO**.

Loading COMSEC TEK/KEK using DS-102

- a. Move cipher switch to **[LD]**.
- b. Select **FILL** and press **[ENT]**.
- c. Select the correct waveform (not used with GPS, ANW2, ANW2C, HAIPE).
- d. Select **DTD (CYZ-10)/KIK-20, SKL (PYQ-10), KYK-13, KYX-15, KOI-18, or MX-18290** from FILL DEVICE screen, and press **[ENT]**.
- e. Select **DS-102** from FILL PORT TYPE screen and press **[ENT]**.
- f. The radio displays **PRESS ENT TO INITIATE FILL**. Do not press anything until fill device is set up.
- g. Connect fill device to AUDIO/FILL connector and send the key. Use fill cable 10012-0714 or FL51242-5.
- h. At the radio, with **PRESS ENT TO INITIATE** still displayed, press **[ENT]**.
- i. Select Crypto mode. Press **[ENT]**.
- j. Select slot number for KEK or TEK. Press **[ENT]**.
- k. Select **CLASSIFICATION**. Press **[ENT]**. If this is not completed, the key does not store.
- l. At prompt **LOAD ANOTHER KEY**, select **YES** to enter more fill data. When all fill data is entered, select **NO** when the **LOAD ANOTHER KEY** prompt displays.

AN/PRC-117G FIELD REFERENCE

BASIC OPERATIONS

- m. Disconnect fill device from the AUDIO/Fill connector. Follow screen prompts to close session and log out.
- n. Rotate cipher switch from **[LD]** to **[CT]**.
- o. Perform a secure communications check using loaded TEKs to ensure correct fills have been loaded. Keys can also be checked by going to **[OPT] > VIEW KEY INFO**.

BASIC OPERATIONS

Starting Up the Radio

- a. Rotate the cipher switch to **[CT]** or **[PT]**. This turns the radio on and begins initialization.
- b. Wait about 30 seconds for the radio to initialize. A radio preset screen should display.
- c. Select a preset **[PRE +/-]**. Presets 1 - 99 are possible. You can also cursor to the preset number on the screen, type in the Preset number from the keypad and press **[ENT]**.

Locking the Keypad

- a. Press **[OPT]**.
- b. Use **[Up Arrow]** or **[Down Arrow]** to select **LOCK** and then select **KEYPAD**, and press **[ENT]**.

Locking the keypad does not disable **[NEXT]**. This allows viewing of main screens.

Unlocking the Keypad

When a button press displays that the “Keypad is Locked”, press button sequence **[1], [3], [7], [9]** to unlock the keypad. If there is more than a five second delay between button presses, the sequence will time out and you must start over.

Beacon Operation

- a. Press **[MODE]**.
- b. Select **BEACON**.
- c. Press **[ENT]** to start transmitting.
- d. Press **[CLR]** to stop transmitting.

Clone Mode Operation

(VULOS Only) To copy Mission Plan files by wireless transmission from one radio to another:

- a. Put both sending and receiving radios in CT mode (TEK must be installed).
- b. Receiving radio:
 1. Press **[MODE]**.
 2. Go to **CLONE MODE** and set clone frequency and VULOS key.
 3. Go to **CLONE TYPE** and select **RECEIVE CLONE**.
- c. Sending radio:
 1. Press **[MODE]**.
 2. Go to **CLONE MODE** and set clone frequency and VULOS key.
 3. Go to **CLONE TYPE** and select **TRANSMIT CLONE**.
 4. Select Mission Plan file to transmit and press **[ENT]**.

AN/PRC-117G FIELD REFERENCE

BASIC OPERATIONS

OTAR Operation

To receive and transmit Over-The-Air Rekeying (OTAR), both the receiving AN/PRC-117G and the Net Controller Device must have the same VINSON KEK. The KEK must be previously loaded into the receiving AN/PRC-117G by an external fill device.

The AN/PRC-117G can transmit Manual Keying (MK) OTARs by uploading a TEK to temporary memory prior to transmitting the OTAR. The radio cannot be turned off or the TEK will be lost. If the radio will be used for transmitting keying data (TX OTAR), perform the following procedure.

- a. Move the cipher switch to **[LD]** and select **LOAD OTAR TEK** to load OTAR information from another device. Press **[ENT]** to continue.
- b. Initiate the MK Transmit procedure on the Net Controller Device.
- c. On the radio, select the classification of the TEK being loaded: **CONFIDENTIAL**, **SECRET**, **TOP SECRET**, or **UNCLASSIFIED**. Press **[ENT]** to continue.
- d. When loaded, a screen will display the number of TEKs and KEKs loaded from the OTAR fill. The SWITCH TO CT screen is displayed after the OTAR fill procedure has been completed successfully.

OTAR Transmit Operation

- a. After loading OTAR TEK, rotate cipher switch to **[CT]**.
- b. Press **[MODE]**. The radio must not be actively transmitting.
- c. Select **OTAR TRANSMIT** and press **[ENT]** or **[CLR]** to return to the main screen.

- d. Select **YES** or **NO** under TRANSMIT OTAR MK and press **[ENT]**. OTAR In Progress screen will appear.
- e. Press **[CLR]** to abort OTAR operations. Once the OTAR operation is complete, the OTAR transmit successful screen will be displayed.

OTAR Receive Operation

- a. Rotate cipher switch to **[CT]**.
- b. Press **[MODE]**. The radio must not be actively transmitting.
- c. Select **OTAR RECEIVE** and press **[ENT]** or **[CLR]** to return to the main screen.
- d. Choose between **RECEIVE AK** or **RECEIVE MK** and press **[ENT]**. The corresponding OTAR In Progress screens will appear. Receive MK must be selected if receiving from another AN/PRC-117G.
- e. Press **[CLR]** to abort OTAR operations. Once the OTAR operation is complete, the OTAR Received screen will be displayed.
- f. Once the key has been received, press **[ENT]** to display the OTAR waveform screen.
- g. Select **SINGARS** or **VULOS**, and press **[ENT]**. The crypto mode screen appears.
- h. Select TEK slot: **01** through **25**. The help text on the bottom of the screen will indicate whether or not the slot is already filled. When the slot choice is selected, press **[ENT]**. Status will display. If an Automatic Keying (AK) OTAR was successfully received, the updated KEK count will be displayed.

AN/PRC-117G FIELD REFERENCE

BASIC OPERATIONS

Zeroize Functions

Press [ZERO].

- **Zeroize All** - Erases all Radio and Crypto configuration. Digital Signal Standard (DSS) Public Key and Type 1 Initialization are not affected. The operator can choose to configure the radio so that Mission Plan files are erased during zeroization. If this option is not selected, the current mission plan file is deactivated, however, all loaded mission plans remain in the radio memory.
- **Deactivate Mission Plan** - Deactivates current plan.
- **Selective Zeroize** - Deletes individual COMSEC Fill items. This operation requires a maintenance password.
- **Erase Mission Plans** - Removes all loaded Mission Plans from the radio.

Panic Zeroize

Rotate the cipher switch to [Z].

- All crypto fill information (TEKs, KEK, HOPSET, Word of Day [WOD], etc.) is deleted from the radio.
- All radio presets are reset to factory defaults. Mission plans are not erased.

Activating a Mission Plan

- a. Press [OPT].
- b. Scroll to **MISSION PLAN**. Press [ENT].
- c. Scroll to **ACTIVATE MISSION PLAN**. Press [ENT].
- d. Select the appropriate **PLAN FILE**, (for example, ANW2.MSFF). Press [ENT]. Also select Station for .MSFF. Press [ENT].

- e. Select **YES** to ACTIVATE PLAN. Press **[ENT]**.
- f. Radio will display PLAN IN PROGRESS while radio's settings are reconfigured.
- g. Radio will display PLAN COMPLETE when finished. Press **[ENT]**.
- h. Radio is ready for operation.

Display Light Menu

- a. Press **[LT]**.
- b. Select **LIGHT MODE** and set for **MOMENTARY** or **NONE**. Press **[ENT]**.
- c. Select **LIGHT INTENSITY** and adjust brightness. Press **[ENT]**.
- d. Select **SCREEN CONTRAST** and adjust display for best viewing. Press **[ENT]**.

Options Menu

Use the Options menu to view and set radio options and make programming changes to the currently used net preset. While in the Options menu, the radio remains online and able to function in operating nets. Press **[OPT]** to access the following menus:

- **DATA MODE** - Sets Autoswitch status. Assign red data port as SYNC/ASYNC, or PPP.
- **GPS OPTIONS** - View GPS STATUS and GPS KEY INFO.
- **LOCK > KEYPAD** - Use to lock keypad.
- **LOCK > DIVE MODE** - Turn off electrical interfaces and lock keypad (applies to 0N707070-9, and -10 radio part numbers only).

AN/PRC-117G FIELD REFERENCE

BASIC OPERATIONS

- **MISSION PLAN** - Activates Mission Plan and show currently loaded plan history.
- **NETWORK OPTIONS** - SEND PING, INTERFACES, HAIPE KEYCHAIN VERIFICATION, VOIP CONFIG, NAT STATUS.
- **RADIO INFORMATION** - Shows SYSTEM CLOCK, BATTERY INFORMATION, NETWORK STATUS.
- **RADIO OPTIONS** - Sets RADIO SILENCE, PRESET AUTOSAVE, RF FAULTS PERSIST, PA FAILSAFE OVER, REMOTE KDU.
- **SA OPTIONS** - Enables/Disables Situational Awareness (SA) Transmit data if SA is enabled in radio through the Communications Planning Application (CPA).
- **SYSTEM INFORMATION** - Displays VERSIONS, SERIAL NUMBER, PART NUMBER, installed software (SW) OPTIONS, ELAPSED TIME, Temperature Compensated Crystal Oscillator (TCXO) TUNING. Part number displays if radio is 0N707070-7, 0N707070-9, or 0N707070-10.
- **TEST OPTIONS** - Runs Self Test and other optional tests.
- **TX POWER OPTIONS** - Sets Transmit Power Level.
- **VIEW KEY INFO** - Displays information about installed COMSEC keys.
- **[Waveform name] OPTIONS** - Refer to the waveform.

SATCOM Ping Test

The SATCOM ping function reports Receive Satellite Signal Strength in the range between 0 and 100. A Ping Rx Strength of zero means no signal is detected from the satellite. A Ping Rx Strength of 100 represents the maximum expected signal level on a narrowband UHF satellite channel under ideal conditions. In practice, the maximum achievable score in true operating

conditions will be less than 100. To use the SATCOM ping function:

- a. Select a VULOS SAT, HPW, DAMA or IW channel.
- b. Point the antenna in the approximate direction of the satellite. Ensure that the antenna has a clear line of sight to the sky. Refer to UHF TACSAT Satellite Antenna Pointing Guide, 10515-0109-4910. For antenna setup, follow instructions provided with the antenna.
- c. Press **[CALL]** while in a SATCOM preset, select PING, and press **[ENT]**.
- d. Select a ping test duration (SINGLE TEST, 60 SECONDS, 30 SECONDS, 15 SECONDS) and press **[ENT]**.
- e. The Ping RX Strength indicates the measured strength of the signal received from the satellite.
- f. Note the reported Ping Rx Strength and then rotate the antenna in azimuth (horizontally) about 10 degrees.
- g. If the reported Ping Rx Strength is higher, rotate the antenna again by 10 degrees in the same direction. If the signal is lower, rotate the antenna in the opposite direction by 10 degrees.
- h. Repeat the above steps to find a maximum Ping Rx Strength. This value will most likely be less than 100.
- i. Once the azimuth position has been determined, repeat the process, this time adjusting the antenna position in elevation (vertically).

AN/PRC-117G FIELD REFERENCE

BASIC OPERATIONS

Retransmission

Use RETRANSMIT CONFIG to configure red analog audio and red or black digital data or digital voice retransmission for a repeater or a bridge configuration. Separate retransmission antennas by a minimum of 50 feet. Place retransmit cable on the ground.

- a. Press **[PGM] > RADIO CONFIG > GENERAL CONFIG > RETRANSMIT CONFIG**. Access RXMT ANALOG AUDIO.
- b. Select ON to enable red analog audio retransmission. A Red Audio Retransmit cable (12023-1360-A002) is required (J1 to J1 connector between any radio that supports red retransmit).
- c. Press **[ENT]** to continue with RXMT DIGITAL DATA.
- d. Select ON to enable synchronous digital data retransmission. A Data Terminal Equipment (DTE) retransmit cable (12043-2740-A003, -A006, or -A050) is required (J3 to J3 connector of AN/PRC-117G radios). Supports synchronous data modes only (all radios).
- e. Press **[ENT]** to return to RETRANSMIT CONFIG.


NOTE: Refer to the Operation Manual (10515-0319-4200) for waveform specific use.

VULOS WAVEFORM

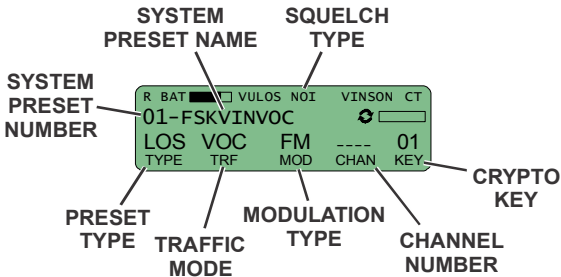
VULOS operation provides fixed frequency communications for VHF, UHF, and dedicated UHF SATCOM channels. Refer to [SATCOM Ping Test](#) for satellite ping testing.

- VHF Low Band – 30.0000 MHz to 89.9999 MHz
- VHF High Band – 90.0000 MHz to 224.9999 MHz
- UHF Band – 225.0000 MHz to 511.9950 MHz
- SATCOM Band receive 243.0000 MHz - 270.0000 MHz and transmit 291.0000 MHz - 318.3000 MHz.

Output power is one (1) watt to 10 watts for VHF/UHF and two (2) watts to 20 watts for SATCOM.

Use **[NEXT]** () to move through the set of main screens with the last being the large font screen. Press **[NEXT]** again to return to the first main screen.

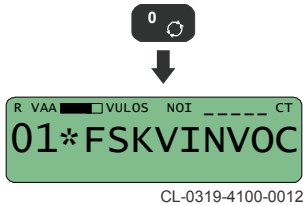
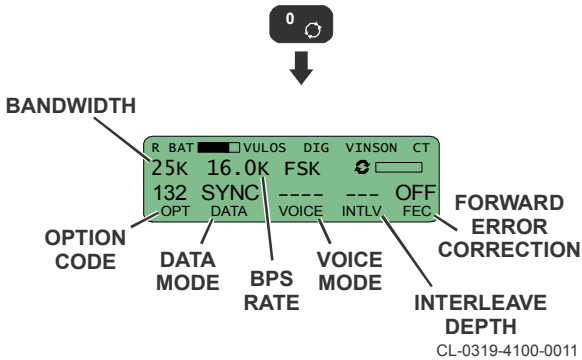
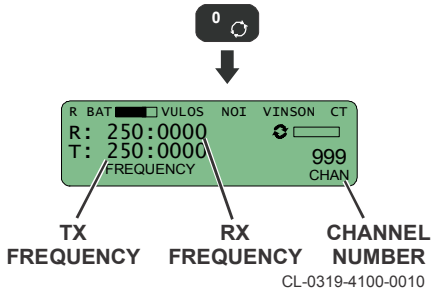
VULOS Main Screens



CL-0319-4100-0009

AN/PRC-117G FIELD REFERENCE

VULOS WAVEFORM



CT VULOS Operation

- a. Make sure that COMSEC keys have been loaded to the proper storage position.
- b. Set cipher switch to **[CT]**. This enables the programmed COMSEC mode and TEK (the radio will display INVALID CRYPTO MODE if not programmed).
- c. After the radio initializes, select desired LOS fixed frequency system preset by pressing **[PRE +/-]**. Check display for proper COMSEC mode and TEK number. KEY -- indicates the system preset is programmed for a TEK that has not been loaded.
- d. Adjust **[VOLUME UP/DOWN]** for adequate listening level.
- e. Begin radio operations.
- f. A PT override warning tone is heard when receiving or transmitting in PT. Used with option code 132 voice traffic.
- g. When KG-84 is the selected COMSEC mode, radio can only be keyed by a properly interfaced DTE device connected to the 32-pin connector.

PT VULOS Operation

- a. Make sure that the radio has been set up and ready to operate.
- b. Rotate the cipher switch to **[PT]**.
- c. After the radio initializes, select desired VULOS fixed frequency system preset by pressing **[PRE + / -]**.
- d. Adjust **[VOLUME UP/DOWN]** for adequate listening level.
- e. Begin radio operations.

AN/PRC-117G FIELD REFERENCE

VULOS WAVEFORM

- f. Press **[NEXT]** to monitor status of the selected system preset.
- g. Access menus under **[OPT]** to make minor operation changes.

Operational Overrides - VULOS

With the main system preset screen displayed, press **[Right Arrow]** to find items that can be modified. Modifiable items will be indicated by a dark background. Use the arrow buttons to change value of the selected item. The display indicates the status:

- Dash (-) indicates the system preset is unchanged.
- Asterisk (*) indicates the system preset is temporarily changed (only shown if the Preset Autosave feature is Off).

VULOS Options

The VULOS Option menus allow the operator to quickly make a change to the COMSEC or Squelch parameters of a VULOS preset without accessing the Programming menus.

Press **[OPT]** and select VULOS CONFIG to access this menu. Selections are COMSEC, SQUELCH, VINSON COMPATIBILITY, SA MODE.

VULOS Scan Mode

- Select **[MODE] > SCAN** to enter Scan Mode. If there are no presets in the scan list, the screen will display a message indicating that scan is disabled.
- The text SCAN will be displayed flashing on the top line of the screen to indicate that the radio is in automatic scan mode.
- Press **[CLR]** to switch the radio into manual scan mode.

SINGGARS WAVEFORM

Single Channel Ground and Airborne Radio System (SINGGARS) Frequency Hopping consists of two operating modes: Frequency Hopping (FH) and Single Channel (SC). Frequency range is 30.000 MHz to 87.975 MHz

A SINGGARS FH net typically uses a MASTER SINGGARS radio as the Net Control Station (NCS) to maintain Global Time-of-Day (GTOD) synchronization and control SINGGARS net operational procedures. All other radios in the net are normally Member stations.

A SINGGARS SC net can be used for Analog FM voice operations in Plain Text (PT), and Continuously Variable Slope Delta (CVSD) voice operations in Cipher Text (CT). A Single Channel net can also be used for performing data operations.

A radio designated as MASTER is responsible for maintaining accurate SINGGARS Global Time-of-Day and operational control of the Frequency Hopping net.

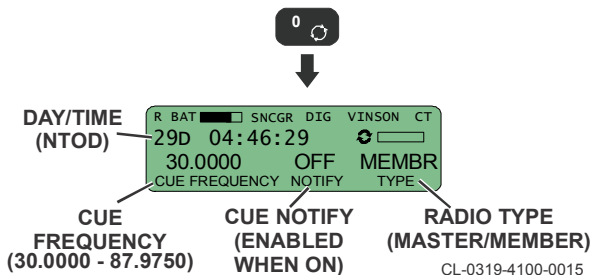
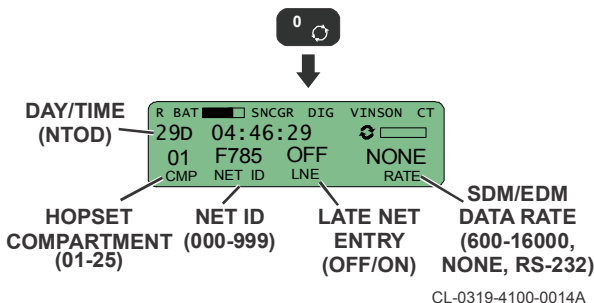
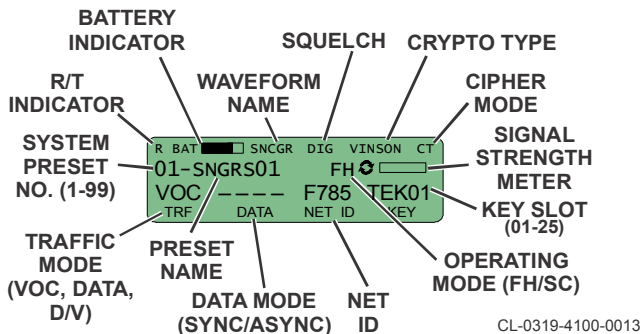
Master Station Operation - Requires operator to set ZULU Universal Time Coordinated as close as possible and use proper Julian date.

Member Station Operation - Operator should set time to \pm four (4) seconds for a hot start capability or to \pm one (1) minute for Late Net Entry. Cueing procedures must be used if accurate time cannot be obtained.

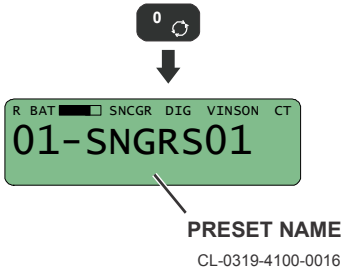
AN/PRC-117G FIELD REFERENCE

SINGARS WAVEFORM

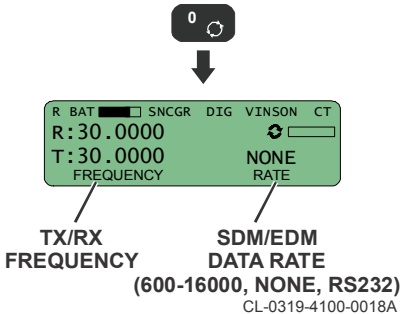
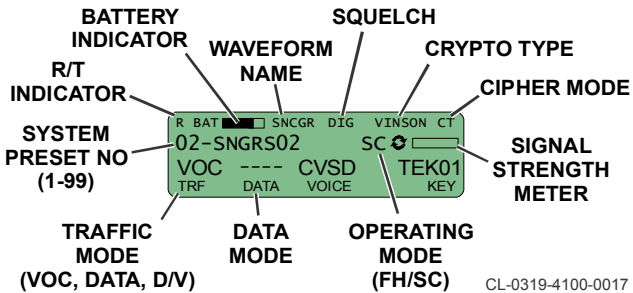
Frequency Hopping Main Screens



AN/PRC-117G FIELD REFERENCE SINGARS WAVEFORM



Single Channel Main Screens



AN/PRC-117G FIELD REFERENCE

SINGGARS WAVEFORM

SINGGARS Loadset

- Traffic Encryption Keys (TEKs), TEK01 through TEK06, are loaded into VINSON slots one (01) through six (06) respectively. TEK 06 will also be stored as a VINSON KEK for AK OTAR operations.
- Hopsets are stored in compartment locations 01 through 06. Hopset Copy function can be used to populate 07 - 25 and change the Net Identification (ID) numbers.
- The Cold Start portion of the loadset is stored in compartment 19 as TSK19.

When using a fill device with the Revised Battlefield Electronic Communications-Electronics Operating Instructions System DTD Software (RDS) for Mode 2/3 fill, perform the following procedure to load SINGGARS FH Fill Data:

- a. Move cipher switch to **[LD]**.
- b. Select **FILL** on the radio. Press **[ENT]**.
- c. Select **WAVEFORM** on the radio. Press **[ENT]**.
- d. Select WAVEFORM FOR KEY: **SINGGARS**. Press **[ENT]**.
- e. Select fill device **DTD (CYZ-10/KIK-20)**, or **SKL (PYQ-10)**, from FILL DEVICE. Press **[ENT]**.
- f. Select **MODE 2/3 (LOADSET)** from FILL PORT TYPE. Press **[ENT]**.
- g. When screen displays INITIATE FILL AT FILL DEVICE, connect fill device to radio and send keys.

SINGGARS Options

Press **[OPT] > SINGGARS OPTIONS** to access the menus for SINGGARS Time Of Day and Retransmit Role. The radio must be in a SINGGARS FH System Preset to see all options (Single Channel will not display GTOD).

Load Time of Day

- a. Press **[OPT]**.
- a. Scroll to **SINGGARS OPTIONS**. Press **[ENT]**.
- b. Scroll to **SINGGARS GTOD**. Press **[ENT]**.
- c. Scroll to **USER ENTRY**. Press **[ENT]**. The current Global Time of Day will be highlighted. Press **[ENT]**.
- d. Set Julian Day-Hours-Minutes-Seconds (standard is ZULU time). Must be \pm four (4) seconds of the master station in the SINGGARS net. Press **[ENT]**. If radio is GPS equipped, select GPS SYNCHRONIZATION to set GTOD.
- e. Press **[OPT]** to return to the main screen.

SINGGARS Master / Member

- a. Change by pressing **[NEXT]** to the third front panel screen.
- b. Use **[Left/Right Arrows]** to highlight **TYPE** and then use **[Up/Down Arrows]** to select **MASTER** or **MEMBER**.
- c. Press **[ENT]**.

Set CUE Frequency

- a. Change by pressing **[NEXT]** to the third front panel screen.
- b. Use **[Left/Right Arrows]** to highlight Cue Frequency and then use the keypad to enter a new frequency.
- c. Press **[ENT]**.

AN/PRC-117G FIELD REFERENCE

SINGARS WAVEFORM

Set Net ID

- Use **[NEXT]** to scroll to any screen that displays the NET ID. NET ID will appear in the bottom line of the display.
- Use **[Right/Left Arrows]** to highlight the NET ID.
- Use keypad to enter the NET ID. Press **[ENT]**.

Passive Late Net Entry (LNE)

- From the SINGARS main screen, press **[NEXT]** to view the LNE status. It is normally OFF. Highlight the **LNE** field and select **ON**. Press **[ENT]**.
- Do not attempt to transmit. Wait for communications from any station on the SINGARS FH net. When the radio re-establishes time with the net, the LNE display switches to **OFF**. Note that a Master station cannot turn on LNE.
- Press **[CLR]** to return to the main screen. Attempt a communications check with any station in the net. If still no communications, conduct CUE operations to contact the Master station.

Sending a CUE Call

- Rotate the cipher switch to **[PT]**.
- Press **[CALL]**.
- Select **CUE**. Press **[ENT]**. View CUE Frequency to make sure correct.
- Press **[PTT]** for five (5) seconds, then rotate the cipher switch to **[CT]**.
- If no response from any net member after 20-30 seconds, try again.

Receiving a CUE Call

- a. Upon hearing or seeing CUE call on receiving radio, press **[CALL]**.
- b. Select **CUE**. Press **[ENT]**.
- c. Respond to station transmitting CUE call in **[CT]**.
- d. If CUEing station comes back in PT (Plain Text beeps are heard), go to **[PT]** to establish communications. Move back to **[CT]** as soon as possible.

COLD START ERF - Master Station

- a. Set SINGGARS GTOD. If necessary, use CUE Channel to coordinate actions with all Member radios.
- b. Set radio to designated SINGGARS preset as **MASTER**.
- c. Press **[CALL]**, select **COLD START ERF**. Press **[ENT]**.
- d. Select **TRANSMIT**. Press **[ENT]**.
- e. Enter the Cold Start Electronic Remote Fill (ERF) frequency (Manual Channel frequency). Press **[ENT]**.
- f. At **SELECT SET** prompt, select the desired Hopset or Lockout to be transmitted. Press **[ENT]**. Transmission will begin.
- g. When all required FH data has been sent, press **[CLR]** on the **SELECT SET** prompt to exit Cold Start ERF and return to the CALL menu.

COLD START ERF - Member Station

- a. Set radio to the same SINGGARS preset as the Transmit Station.
- b. Press **[CALL]**, select **COLD START ERF**. Press **[ENT]**.

AN/PRC-117G FIELD REFERENCE

SINGGARS WAVEFORM

- c. Enter the same Cold Start ERF frequency as the Transmit Station. Press **[ENT]**.
- d. Observe radio display for reception of the Cold Start ERF. Monitor audio in case the Cold Start ERF is not received. Do not transmit unless contacted by Master.
- e. If a Hopset is received, select a Compartment (**01 - 25**), press **[ENT]** to store. Note that compartment 19 is used to store Cold Start TSK).
- f. At the prompt **ASSIGN TO PRESET**, select **YES** and assign the received Hopset to a SINGGARS FH preset. Press **[ENT]**.
- g. If a Lockout is received, **LOCKOUT RX OK, ENT TO SAVE - CLR TO EXIT** is displayed. Press **[ENT]** to store the Lockout.
- h. When all required FH data has been received, press **[CLR]** on the **COLD START ERF AWAITING RECEPTION** prompt to exit Cold Start ERF.

Normal ERF Fill Updates

SINGGARS fill data may be updated during normal FH operation. This procedure requires the Master station to modify the presently used loadset with a new hopset, inform Member stations of an ERF update over the SINGGARS FH preset, and then transmit the fill data to Member radios.

NORMAL ERF - MASTER Station

- a. Contact Member radios over the current SINGGARS FH preset. Instruct members to stand by for FH Fill data update, where to store the update data and when to use it.
- b. Press **[CALL]**, select **NORMAL ERF**. Press **[ENT]**.

- c. At **NORMAL ERF** prompt, select **TRANSMIT**. Press **[ENT]**.
- d. At **SELECT SET** prompt, select new Hopset or Lockout, and press **[ENT]**.
- e. When the transmission is complete, **TRANSMIT COMPLETE** is displayed. Press **[CLR]** or **[ENT]** to continue to the **SELECT SET** prompt. If another set of data is to be transmitted, repeat the above procedure. When all required FH data has been sent, press **[CLR]** on the **SELECT SET** prompt to exit **NORMAL ERF**.
- f. If update is effective immediately, switch radio to **SINGGARS FH** preset that uses the new **SINGGARS FH** data and conduct communications check with net members. Return to the old **SINGGARS FH** net preset for any stations that do not respond. Resend the update **ERF** to any stations as needed.

NORMAL ERF - MEMBER Stations

- a. Upon instructions from the Master station to prepare for updated **ERF**, press **[CALL]**, select **NORMAL ERF**, and press **[ENT]**. **AWAITING RECEPTION** is shown.
- b. If a Hopset is received, **HOPSET RX OK, STORE IN: ##** is displayed. Select a compartment number (**01 - 25**). Press **[ENT]** to store the hopset.
- c. At the prompt **ASSIGN TO PRESET**, select **YES** to assign the Hopset to a **SINGGARS FH** preset. Press **[ENT]**. Select a **SINGGARS** preset. Press **[ENT]**.
- d. If a Lockout is received, **LOCKOUT RX OK, ENT TO SAVE - CLR TO EXIT** is displayed. Press **[ENT]** to store the Lockout.
- e. When required **FH** data has been received, press **[CLR]**.

AN/PRC-117G FIELD REFERENCE

SINGGARS WAVEFORM

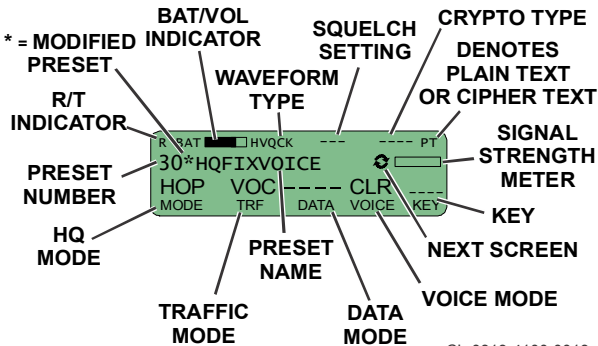
SINGLE CHANNEL Preset

- a. Press **[PGM]**, select **SYSTEM PRESETS**. Press **[ENT]**.
- b. Select **SYSTEM PRESET CONFIG**. Press **[ENT]**.
- c. At PRESET NUMBER, use keypad to enter the Preset number (for example: 01) or accept default selection. Press **[ENT]**.
- d. Enter a text description or name for the new system preset. Press **[ENT]**.
- e. Choose **SINGGARS** as the waveform type. Press **[ENT]**.
- f. At OPMODE, select **SINGLE CHANNEL**. Press **[ENT]**.
- g. At PRESET NAME, use the keypad to enter any name. Press **[ENT]**.
- h. At CRYPTO KEY, select the TEK position that corresponds to the HOPSET location (for example, select TEK01 for Hopset compartment 01). Press **[ENT]**.
- i. At TX POWER LEVEL, select **HIGH** (5 watts). Press **[ENT]**.
- j. At TRAFFIC MODE, select **VOICE**. Press **[ENT]**.
- k. At HOPSET COMPARTMENT, select the user's NET-ID (for example, 01 is SINGGARS Channel 1). Press **[ENT]**.
- l. At SC FREQUENCY, enter the TX/RX frequency (**30.000 - 87.975** MHz). Press **[ENT]**.
- m. At SC SQUELCH TYPE, select **TONE**. Press **[ENT]**.
- n. Press **[PGM]** to exit Program Mode.

HAVEQUICK WAVEFORM

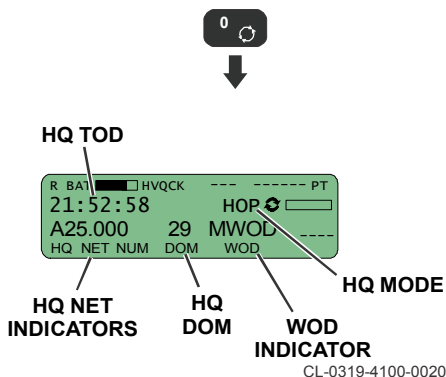
HAVEQUICK (HQ) operations require Time of Day (TOD) and Word of Day (WOD) configuration. HQ frequencies (225.000 MHz to 399.975 MHz) are automatically determined from internal frequency tables. The HQ Net Number is used to determine which frequency table is indexed.

TOD and WOD information must be programmed for all HQ operations. HQ TOD synchronization must be set every time the radio is powered up. The radio can send or receive HQ TOD while in Initial (INIT) mode on any AM HQ frequency and also perform time synchronization in HOP mode.



AN/PRC-117G FIELD REFERENCE

HAVEQUICK WAVEFORM



HAVEQUICK Operation

- Rotate the cipher switch to **[PT]** or **[CT]** position.
- After radio initializes, press **[PRE +/-]** to scroll to the desired HQ net preset.
- Begin HQ operation.
 - TOD should be re-acquired to get back into the HQ net.
 - GPS synchronization (with multiple satellite acquisition) ensures good communications.
 - Without continual sync updates, the radio needs to reacquire TOD about every four hours or sooner. Degraded communications may indicate TOD should be updated.
 - Troubleshoot problems by checking for common TEK if in CT mode, TOD synchronization, same HQ net preset parameters, and for WOD loading errors.

- Degradation of channel quality is an indication to re-synchronize TOD. TOD syncs can be sent and received over the HQ net using **[CALL]**.

Receiving HQ TOD Sync in Initial (INI) HQ Mode

- a. Press **[CALL]** from the home screen and select TOD RECEIVE.
- b. Wait while the radio is attempting to receive a TOD sync (AWAITING RECEPTION displayed).
- c. The radio will display HQ time and date upon a successful reception of a HQ TOD.

Transmitting HQ TOD Sync (from INI)

- a. Press **[CALL]** from the home screen and select TOD TRANSMIT.
- b. Wait for the IN PROGRESS message while the radio is attempting to transmit a TOD sync.
- c. The radio will display a "SUCCESSFUL" message upon correct transmission of a HQ TOD.

HAVEQUICK Options

Press **[OPT] > HAVEQUICK OPTIONS** to access the menus for VIEW HQ TOD, CONFIGURE HQ TOD, and SQUELCH LEVEL. Viewing or configuring HQ TOD parameters is necessary for successfully operating a HQ system preset. The Squelch Level screen will only be displayed when the Analog Squelch Type is set to NOISE and the Modulation is set to AM.

AN/PRC-117G FIELD REFERENCE

SATURN WAVEFORM

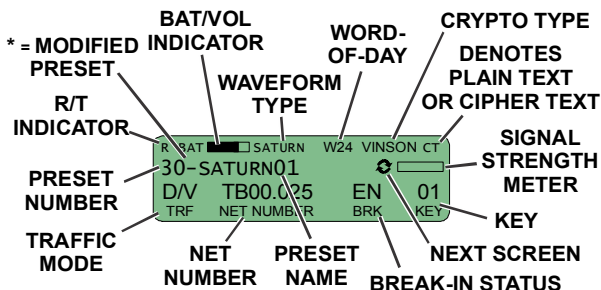
SATURN WAVEFORM

SATURN extends HAVEQUICK by providing only hopping nets above and beyond what the existing HAVEQUICK waveform provides. SATURN is a 25 kHz bandwidth Fast Frequency Hopping net with a digital waveform and Minimum Shift Keying modulation. SATURN employs advanced ECCM which allows it to operate effectively in jammed environments. SATURN also allows the user to break in and replace an established call at the receiver whether or not he is tracking that call.

SATURN utilizes the same time format, Word of Day, and net number configuration parameters as HAVEQUICK. The actual over-the-air format is different and SATURN is FM based.

SATURN supports full-band (25 kHz) hopping nets for voice and data and sub-band (6.25 kHz) hopping nets for co-site applications. Operation is in the 225.000 MHz - 399.975 MHz frequency band (UHF/FM) using Frequency Hopping for anti-jam capability.

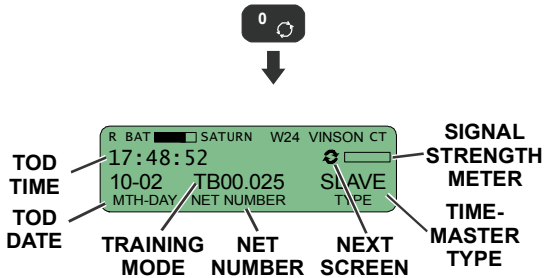
SATURN TOD is established using fixed-frequency TOD transfer from the CALL menu, manual entry or automatic synchronization from GPS.



CL-0319-4100-0056

AN/PRC-117G FIELD REFERENCE

SATURN WAVEFORM



CL-0319-4100-0057

SATURN Operation

- Rotate the cipher switch to **[PT]** or **[CT]** position.
- After radio initializes, press **[PRE +/-]** to scroll to the desired SATURN net preset.
- Begin SATURN operation.
 - TOD should be re-acquired to get back into the SATURN net.
 - GPS synchronization (with multiple satellite acquisition) ensures good communications.
 - Without continual sync updates, the radio needs to reacquire TOD about every four hours or sooner. Degraded communications may indicate TOD should be updated.
 - Troubleshoot problems by checking for common TEK if in CT mode, TOD synchronization, same SATURN net preset parameters, and for WOD loading errors.
 - Degradation of channel quality is an indication to re-synchronize TOD. TOD syncs can be sent and received over the SATURN net using **[CALL]**.

AN/PRC-117G FIELD REFERENCE

SATURN WAVEFORM

Receiving/Transmitting SATURN TOD Sync

- a. Press **[CALL]** from the home screen.
- b. Select FIXED-FREQ TOD SYNC either synchronize all SATURN radios with your transmitted TOD, or receive TOD. The sending radio must know to send TOD via some agreement or other form of communication.
- c. View or modify the frequency used for fixed-frequency synchronization. Enter a frequency from 225.0000 MHz to 399.9750 MHz. Frequency must be in 25 kHz increments.
- d. Select the TOD transfer direction: TOD RECEIVE, or TOD TRANSMIT.
 - While the radio is attempting to receive a TOD sync, AWAITING is displayed. SATURN time and date is displayed upon a successful reception of a SATURN TOD.
 - Wait for the IN PROGRESS message while the radio is attempting to transmit a TOD sync. SUCCESSFUL is displayed upon correct transmission of a TOD.

SATURN Options

Press **[OPT] > SATURN OPTIONS** to access the menus for VIEW SATURN TOD and CONFIGURE SATURN TOD. Viewing or configuring TOD parameters is necessary for successfully operating a SATURN preset.

SATURN Break-in

When a radio receives a synchronous break-in transmission, three tones will be heard at the beginning and SY (for synchronous break-in) will flash in the break-in status field. At the end of the break-in, two tones will be heard and the break-in status will return to normal (EN). If PTT is activated prior to the end of message termination signal, then some receivers may establish a break-in condition while others may not.

HPW WAVEFORM

HPW is supported in SATCOM and LOS operation from 243.0000 MHz - 270.0000 MHz and 291.0000 MHz - 318.0000 MHz. It is designed to provide fast, reliable data messaging and file transfer between two or more computers via a radio network. A separate TSK is used, and TOD synchronization (within ± 30 seconds) is also required for HPW operation. HPW uses KG-84C encryption in Redundant Mode 1 synchronization for improved data rates over UHF satellite links. TSV is also supported.

HPW only supports data communications, and is used with WMT software RF-6760W-HPW or other applications using IP through the radio's PPP port. AN/PRC-117G is also interoperable with the AN/PRC-117F, AN/PRC-152, and AN/PRC-152A in HPW mode.

HPW offers two main modes of data operation:

- With WMT, messages are sent and received through a personal computer loaded with a standard email client. In addition to radio configuration described in this manual, WMT operation requires that the user has configured the client to work with Harris Wireless Message Terminal software. Refer to the Harris RF-6760W-HPW Users Manual (10515-0320-4200) for configuration of email client software packages.
- If the radio is equipped with the optional HPW IP feature, the user is allowed to interface with any IP-based application. In IP mode, the IP address of the Peer PC (PC connected to the radio) must be configured. This is to distinguish it on the network from other PCs connected to other radios. Do the following to set the data port:

[PGM] > RADIO CONFIG > GENERAL CONFIG > DATA PORT CONFIG > PPP CONFIG > NET CONFIG.

AN/PRC-117G FIELD REFERENCE

HPW WAVEFORM

- IP Address - The IP of the radio (leave as default, for example: 10.0.0.1). Note that the IP address of the radio can stay the same on all radios because this is the PPP address. Since the radios are physically connected to the serial port of the PC, a unique IP address is not necessary for each radio.
- Peer IP Address - Enter IP of Host PC (for example: 10.0.0.2)
- Subnet Mask - Leave as default (for example: 255.255.000.000]
- Gateway Address - Leave as default (for example: 000.000.000.000)

Refer to [SATCOM Ping Test](#) for satellite ping testing.

HPW Setup

- Configure the HPW settings.** Proceed through the setup menus that are described in this section to configure all HPW radio parameters as desired.
- Set the radio's data port to PPP.** Make sure that the connector data port is configured for PPP operation.
- Load a Traffic Encryption Key.** Confirm that the keys have loaded properly. TSV requires a DS-101 load with a KEK loaded before TEK.
- Load a Transmission Security Key.** Confirm that the keys have loaded properly.
- Select the HPW mode based on satellite type and communication conditions.** Select the HPW channel rate: Narrowband, Wideband, and UHF Follow On (UFO). HPW can make use of either a narrowband (5 kHz) or a wideband (25 kHz) channel. HPW has an auto-baud capability built-in that will attempt to send data as quickly

as possible within each of the three rates. These speed settings will be displayed as low, medium and high on the console.

- f. **Synchronize HPW Time of Day.** Ensure that all radios in the net have HPW Time Of Day set to within ± 30 seconds of each other. If using GPS, configure the System Clock parameters and program HPW to use the System Clock **[OPT] > HPW TOD > CONFIGURE HPW TOD**. ZULU Universal Time Coordinated (UTC) GPS time should be used.

If not using GPS, then all net users must synchronize HPW time to be within ± 30 seconds of each other. Radios that have mismatched HPW TODs will not be able to communicate. This will appear to the user as message traffic that is directed to random addresses that are not correct for the HPW net in use.

HPW Compatibility

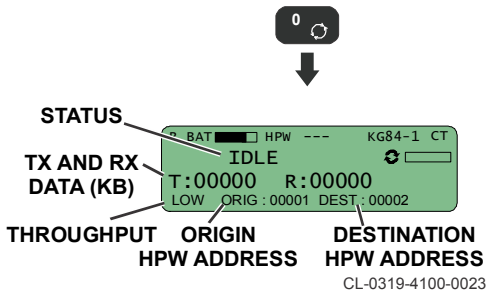
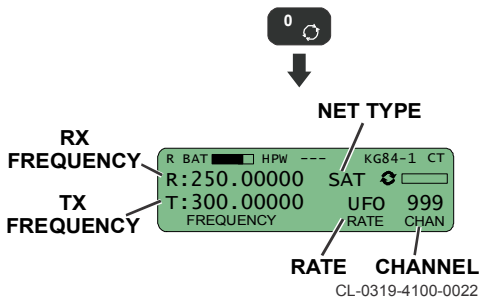
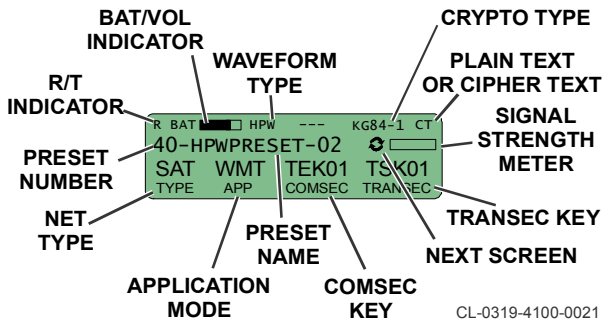
To allow the AN/PRC-117G, AN/PRC-117F, AN/PRC-152, and AN/PRC-152A to be interoperable in HPW mode, follow these configuration guidelines:

- On the AN/PRC-117F radio, make sure MODULATION MODE (in the Data/Voice menu) is configured to be HPW and not Trellis Code Modulation (TCM), and NET TYPE is configured for LOS FIX FREQUENCY.
- On the AN/PRC-117G (or AN/PRC-152 and AN/PRC-152A) radios, make sure NETWORK TYPE is configured to be LOS, and HPW BAUD RATE is configured for WB.
- Operating frequency must be in the 225.0000 - 511.9875 MHz range.

AN/PRC-117G FIELD REFERENCE

HPW WAVEFORM

HPW Main Screens



ANW2/ANW2C WAVEFORMS

ANW2, ANW2C operate in the 225.0000 MHz to 1999.9950 MHz frequency range at five (5) watts average. ANW2 extends an IP network from a tactical network point-of-presence to mounted and dismounted operators on the move while still providing standard push-to-talk voice capability. Refer to ANW2 Simplified Guide, 10515-0383-4100. The following is required for ANW2 deployment:

CPA Mission Fill

- ANW2 network INE requires a Communications Planning Application (CPA) Mission Plan.
- Transmission Security (TRANSEC) keys are loaded by the CPA.

Encryption Keys

- Voice Key(s)
- Pre-Placed Key (PPK)
- Vector(s) for use with Internet Key Exchange (IKE)
- TRANSEC Key (from CPA)

ANW2 Date/Time

- IP Security date/time
- TRANSEC date/time

TRANSEC requires all radios in the wireless network to have accurate ANW2 time-of-day configuration. Time on all radios must be synchronized within five minutes or less.

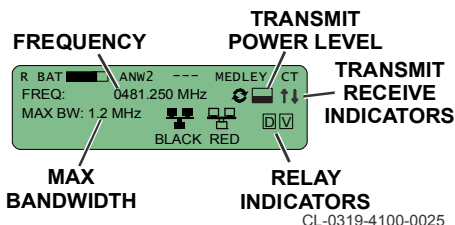
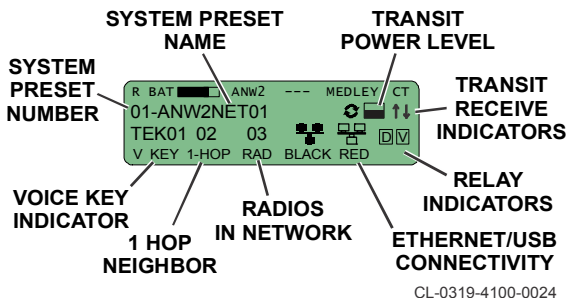
HAIPE encrypted traffic requires all radios to have an accurate system time. System time on all radios must be within 55 minutes of each other, and 55 minutes from Greenwich Mean Time (GMT) in order to communicate with other fielded HAIPE devices.

AN/PRC-117G FIELD REFERENCE

ANW2/ANW2C WAVEFORMS

ANW2/ANW2C Main Screens

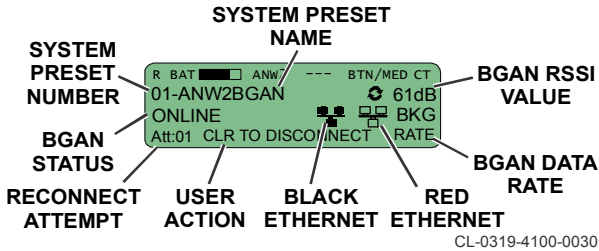
If you have a number above 1-HOP in your screen, you are part of the network.



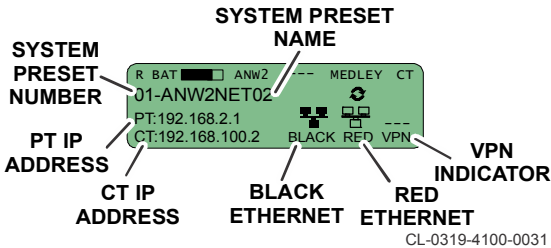
AN/PRC-117G FIELD REFERENCE

ANW2/ANW2C WAVEFORMS

BGAN Top Level Screen

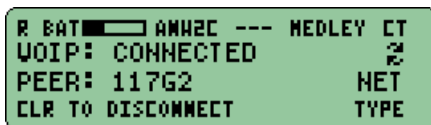


INE Top Level Screen



VoIP Operation

VoIP calls can be made between AN/PRC-117G radios that exist within an ANW2C net or that have a network link such as BGAN. VoIP Network (NET) calls are also supported to allow VoIP traffic between radios in different networks. The main VoIP screen displays VoIP status and the station name of the peer.



AN/PRC-117G FIELD REFERENCE

ANW2/ANW2C WAVEFORMS

- a. To place a VoIP call, press **[CALL]**. If no call is in progress, select either the PHONEBOOK or IP ADDRESS option for making a call. If a call is in progress, the terminate call screen is displayed. If VoIP is disabled, nothing will happen.
- b. Select a contact from the phonebook list or enter a contact by IP address.
- c. Select YES to initiate a VoIP call. Call process begins by dialing the selected contact. Waveform generated tones are muted while VoIP tones play. A ringback tone is heard at the caller handset.
- d. Selected contact gets an incoming call (ringtone is played). The name of the incoming call peer is displayed. Select to ACCEPT or DENY the call.
- e. Press **[CLR]** to disconnect from a VoIP session.

ANW2 Voice Operation

ANW2 voice operations is similar to any half-duplex digital voice, except that data operations can be occurring simultaneously.

The radio must be already programmed for the ANW2 operation, COMSEC keys loaded, and an antenna installed.

- a. Rotate cipher switch to **[CT]**. This enables the programmed COMSEC mode and TEK (the radio will display INVALID CRYPTO MODE if not programmed).
- b. After the radio initializes, select desired ANW2 system preset by pressing **[PRE +/-]**. Check display for proper COMSEC TEK number. **KEY --** indicates the system preset is programmed for a TEK that has not been loaded.
- c. Adjust **[VOLUME UP/DOWN]** for adequate listening level and begin radio operations.

- d. Key your handset and conduct a radio check with all other stations. This will verify that you have working handsets and you have the correct key loaded.

ANW2 Data Operation

The radio must be already programmed for ANW2 operations, COMSEC keys (pre-placed TEKs and for unicast or multicast traffic, TSKs, and Vectors for unicast traffic) loaded, and an antenna installed. If there are no data TEKs or vectors loaded for ANW2, voice operation is still possible.

- a. Use the correct cabling for the data application.
- b. Rotate cipher switch to **[CT]**. The radio will display INVALID CRYPTO MODE if not programmed.
- c. After the radio initializes, select desired ANW2 system preset by pressing **[PRE +/-]**.
- d. The TEK number on the main screen refers to the voice TEK. For data operation, there can be multiple TEKs.

Conduct an IP PING test to confirm IP connectivity. Refer to [Test Your Network - Data](#).

AN/PRC-117G FIELD REFERENCE

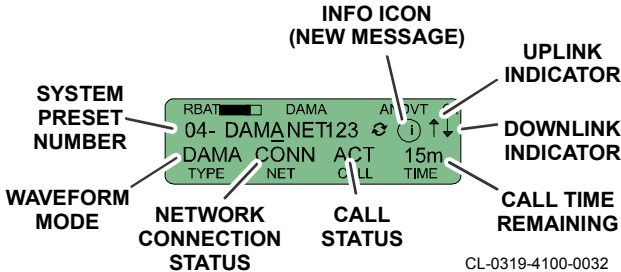
DAMA WAVEFORM

DAMA WAVEFORM

DAMA supports:

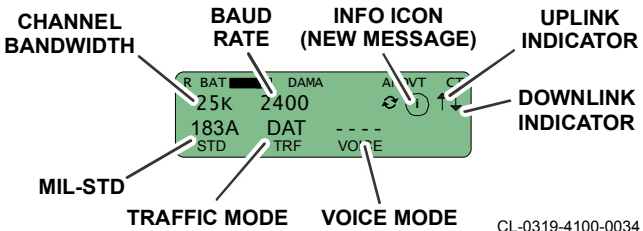
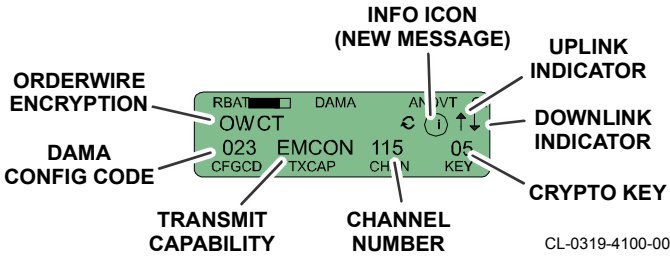
- UHF SATCOM dedicated channel operation MIL-STD-181B for 5 kHz and 25 kHz channels.
- UHF DAMA SATCOM: MIL-STD-188-182A for 5 kHz channels.
- UHF DAMA SATCOM: MIL-STD-188-183A for 25 kHz channels.
- 99 DAMA net presets to allow operation in multiple DAMA networks with different terminal base addresses.
- Auto select between incoming Mixed-Excitation Linear Predictive vocoder (MELP) and Linear Predictive Coding 10 (LPC-10) traffic and transmits back in same mode.

183A Wideband DAMA Main Screens



AN/PRC-117G FIELD REFERENCE

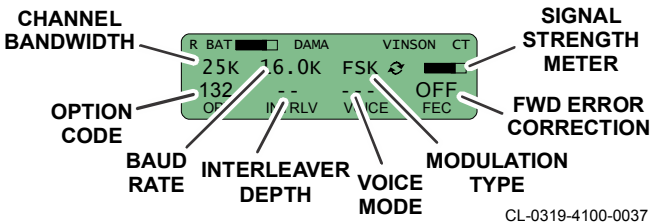
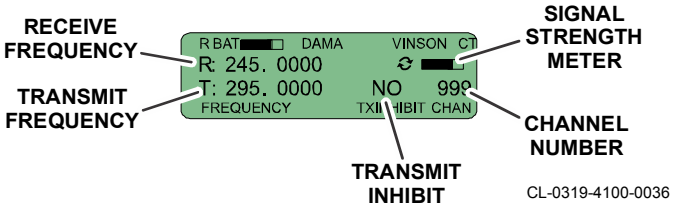
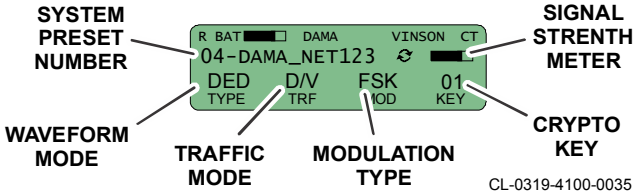
DAMA WAVEFORM



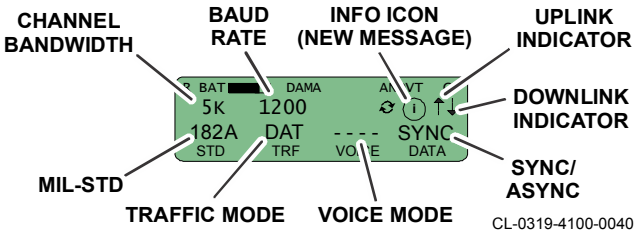
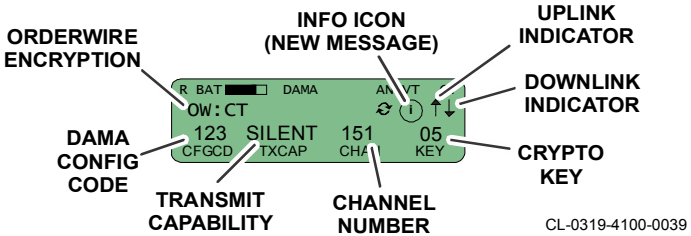
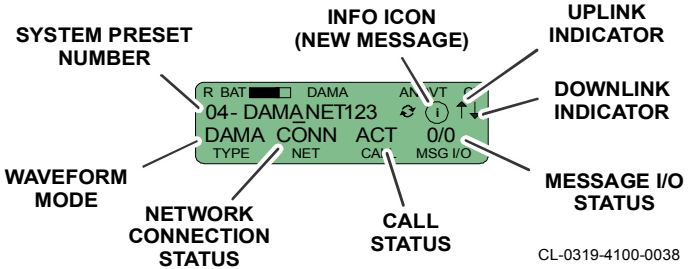
AN/PRC-117G FIELD REFERENCE

DAMA WAVEFORM

181B Dedicated SATCOM Main Screens



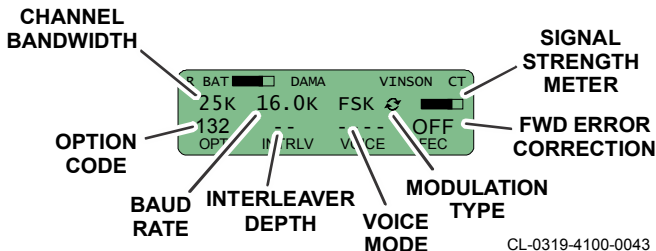
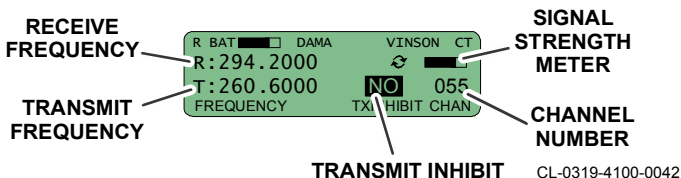
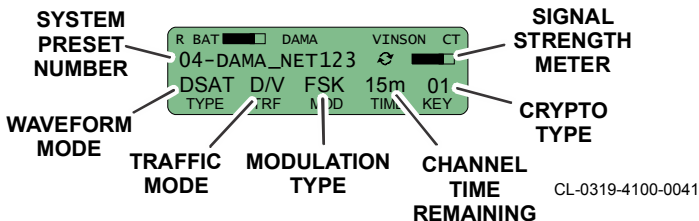
182A Narrowband DAMA Main Screens



AN/PRC-117G FIELD REFERENCE

DAMA WAVEFORM

DASA Main Screens



View DAMA Message Log

- a. From main screen, use up/down arrow keys to view last 100 messages (not 181B dedicated SATCOM or Demand Assigned Single Access [DASA]).
- b. Press **[ENT]** or **[CLR]** to return to the main screen.

DAMA Call Capabilities

181B Dedicated SATCOM Call

Refer to [SATCOM Ping Test](#) for satellite ping testing. Current preset is configured with a Shaped Binary Phase Shift Keying (SBPSK) modulation.

182A Call (Not Logged In)

- a. Press **[CALL]**.
- b. Select **LOGIN** or **DOWNLOAD MESSAGE** and press **[ENT]**. Other menu options such as TERMINATE SERVICE are available after login.

183A Call (Place Call)

- a. Press **[CALL]**.
- b. Select **PLACE CALL** and press **[ENT]**.
- c. Enter 01 as the DESTINATION INDEX and press **[ENT]**.
- d. Enter a DESTINATION NAME and press **[ENT]**.
- e. Enter guard address at ADD ADDRESS and press **[ENT]**.
- f. Select **EXIT** and press **[ENT]**.
- g. Enter 00 SEC for indefinite DURATION and press **[ENT]**.
- h. Select **ROUTINE** as the PRECEDENCE and press **[ENT]**.
- i. Main screen shows INIT for CALL while radio is waiting for a reply. CONN is displayed when call is successful.

AN/PRC-117G FIELD REFERENCE

IW WAVEFORM

IW WAVEFORM

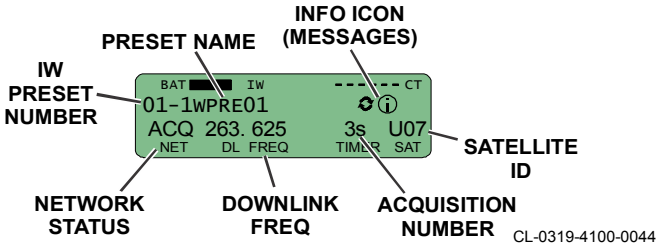
IW is a UHF satellite waveform that provides several important improvements over DAMA for tactical operations on both 25 kHz and 5 kHz satellite channels. IW employs a more flexible Time Division Multiple Access (TDMA) protocol that provides improved access and allows several stations to share the same satellite channel. Refer to [SATCOM Ping Test](#) for satellite ping testing.

IW supports:

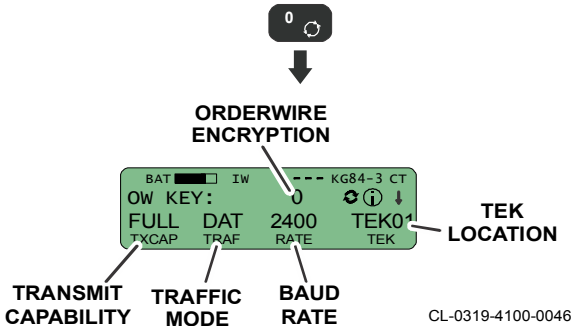
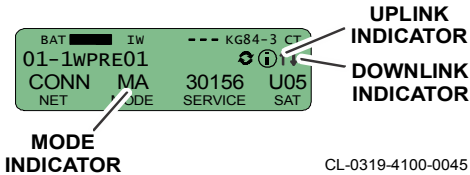
- Use of 5 kHz or 25 kHz satellite channels, as defined by MIL-STD-188-181C and 188-183B.
- Use of Harris external 50 W Power Amplifier (PA) or other Joint Interoperability Test Command (JITC) tested PAs.
- Monitoring of the IW channel controller signal from the satellite, automatically acquiring the satellite, and then automatically connecting to the voice or data Service defined in the Satellite Assignment Authorization (SAA) message.
- Inter-operates with DAMA by the IW controller synchronizing IW signals to that of the DAMA service slot.
- Use of Advanced Narrowband Digital Voice Terminal (ANDVT), VINSON, or KG-84 encryption.
- MELP improves voice quality using ANDVT encryption.
- Increased data throughput with CPM modems using KG-84 encryption.
- When used in Single Access Service mode, IW can support MIL-STD 188-181C protocols.

IW Multiple Access Main Screens

Acquiring State:



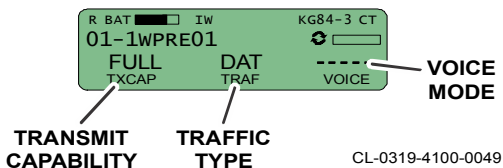
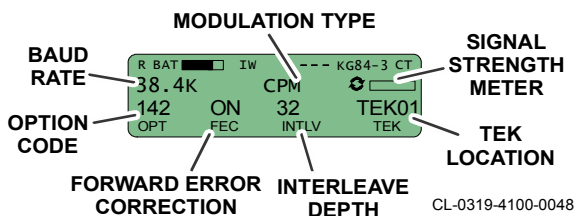
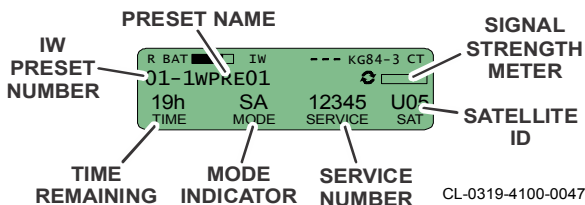
Connected State:



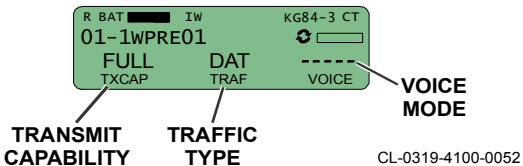
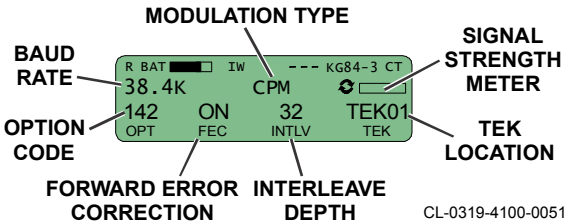
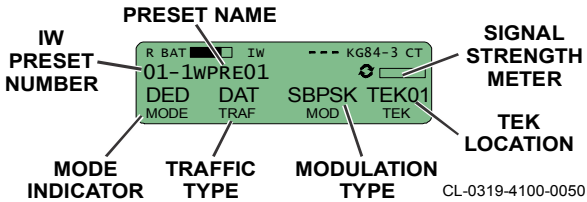
AN/PRC-117G FIELD REFERENCE

IW WAVEFORM

IW Single Access Main Screens

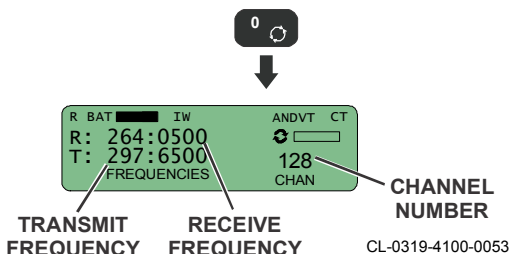


IW Dedicated Channel Main Screens



AN/PRC-117G FIELD REFERENCE

IW WAVEFORM



Change to Another IW Service (Manual Connection)

- Press [**CALL**].
- Select **CONNECT**. Use the up/down arrow buttons to view the **SERVICES** that are available for use. Only those **SERVICES** programmed and announced by the IW Controller will be displayed.
- Select the desired **SERVICE** and press [**ENT**].

Add IW Service

- Press [**OPT**].
- Select **IW CONFIG** and press [**ENT**].
- Select the desired **SERVICES** and press [**ENT**].
- Under **LOCATION TO EDIT**, scroll to an empty location.
- Type in a new Service Number (or select a service to change).
- Select a Service which will be automatically connected upon acquisition, or **NONE** and press [**ENT**].
- Press [**ENT**] to save and [**CLR**] to exit.

Change IW Transmit Setting

- a. Press **[OPT]**.
- b. Select **IW CONFIG** and press **[ENT]**.
- c. Select **TX OPTIONS** and press **[ENT]**.
- d. Under **TRANSMIT CAPABILITY**, use the up/down arrow buttons to select FULL for transmit, or Emission Control (EMCON) for receive only. Press **[ENT]**.
- e. Press **[CLR]** to exit.

View IW Message Log

- a. From the main screen, use the up/down arrow keys to display newer or older messages, respectively. The Message Log allows the user to view the last 100 messages.
- b. Press **[ENT]** or **[CLR]** to return to the main screen.

View IW Options

- a. Press **[OPT]**.
- b. Select **IW CONFIG** and press **[ENT]**.
- c. Select **TERM ADDR** to view IW Terminal Address.
- d. Select **FREQUENCY** to view Downlink and Service frequencies.
- e. Select **KEY LOCATION** to view the TSK Key Location, which identifies the Orderwire key position currently being used by the IW Controller.
- f. Press **[CLR]** to return to the main screen.

AN/PRC-117G FIELD REFERENCE

P25 WAVEFORM

P25 WAVEFORM

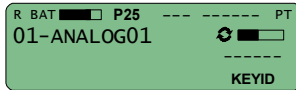
Project 25 (P25) supports Digital Encryption Standard Output Feedback (DES-OFB) and Advanced Encryption Standard 256 bit (AES-256) modes. Type-3 encryption keys are loaded via a Motorola KVL 3000+ Key Variable Loader (KVL) device, or by using the CPA.

AN/PRC-117G can select from up to five separate P25 scan lists. P25 operates only in PT mode, and may be used in either Digital Mode (with or without Type-3 encryption), or Analog (without encryption). P25 Scan Lists are completely independent from VULOS Scan Lists.

AN/PRC-117G supports a frequency range of 30.0000 MHz to 511.9950 MHz.

P25 Main Screens

ANALOG PT PRESET:

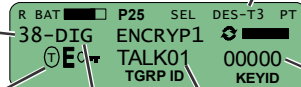


CL-0319-4100-0026

DIGITAL TYPE-3 PRESET:

TX/RX CRYPTO STATUS

SYSTEM
PRESET
NUMBER



KEY ID

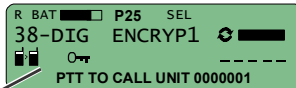
CALL
MODES

SYSTEM
PRESET
NAME

TALKGROUP
ID

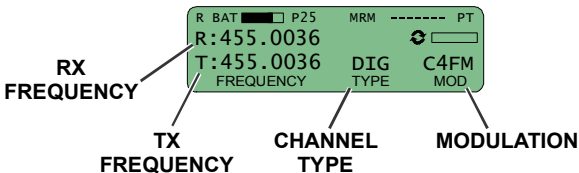
CL-0319-4100-0027

UNIT TO UNIT CALL:



CALL MODE

CL-0319-4100-0055



CL-0319-4100-0028

AN/PRC-117G FIELD REFERENCE

P25 WAVEFORM



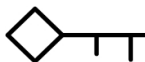
UNIT TO UNIT
CALL MODE



TALKAROUND
MODE



EMERGENCY
MODE (FLASHES WHEN
EMERGENCY MODE IS ENABLED.)



TYPE-3
ENCRYPTION
MODE



OVER-THE-AIR
REKEY MODE



DUAL CHANNEL
MODE

CL-0319-4100-0029

TALKGROUP ID - Displayed when the radio sends or receives a talkgroup call.

TX/RX CRYPTO STATUS -

- DES-T3 - Transmit or Receive DES encrypted traffic.
- AES-T3 - Transmit or Receive AES encrypted traffic.
- ERR! - Cannot decrypt incoming encrypted traffic.

KEY ID - Current Type-3 key number used by the P25 preset.

RX FREQUENCY - Receive (R) frequency for the preset.

TX FREQUENCY - Transmit Frequency for the preset.

CHANNEL TYPE - Channel type for the preset.

- ANA - for Analog (ANA) channels
- DIG - for Digital (DIG) channels

MODULATION - Modulation (MOD) type for the preset.

- FM - for analog channels
- C4FM - for digital channels

UNIT ID - Indicates either the receiving or transmitting unit for the call.

SLN ID - When transmitting, Storage Location Number (SLN) ID represents the name of the user selected as Transmit Global SLN, or the automatically determined talkback SLN when responding to encrypted communications. When receiving, the SLN displayed is determined based on the incoming voice transmission's Type-3 encryption key.

Dual Channel Receiving

The Dual Channel Receive feature indicates the radio will also listen to analog signals with the same frequencies as the digital preset. Note that the user does not have the ability to transmit analog while on a P25 digital preset.

P25 Encryption Key Loading

The KVL is attached to the AN/PRC-117G via the 32-pin J6 Black Data connector using cable part number (12053-6400-04). Radio should be turned on and in P25 Type-3 Key Fill mode prior to connecting the KVL cable. Remove the KVL3000+ cable from the radio prior to exiting P25 Type-3 Key Fill mode. **Regardless of operating mode, P25 always operates with the cipher switch in PT position.**

Loading Type-3 Encryption Keys

Make sure that valid keys have been created and stored in the KVL 3000+ before continuing with the loading procedure.

- a. Turn on the radio.
- b. Select a P25 system preset.
- c. Turn on the KVL 3000+.

AN/PRC-117G FIELD REFERENCE

P25 WAVEFORM

- d. Attach KVL 3000+ to radio using cable part number (12053-6400-04).
- e. Press **[OPT]** on the radio.
- f. Select **P25 CONFIG** and press **[ENT]**.
- g. Select **TYPE 3 KEY MANAGEMENT** and press **[ENT]**.
- h. Select **ENTER FILL MODE** and press **[ENT]**.
- i. Select a keyset and press **[ENT]**.
- j. Select **TARGET** on the KVL 3000+.
- k. Select **LOAD** on the KVL 3000+.
- l. Select **KEY** on the KVL 3000+.
- m. Using the left and right arrow buttons on the KVL 3000+, select the DES-OFB or AES-256 key with the desired Common Key Reference (CKR) value. The key type must be the same type as selected in [Step i](#). Press **LOAD**.
- n. Verify that the KVL 3000+ screen displays LOADED SUCCESSFULLY OK.
- o. Select **OK** on the KVL 3000+.
- p. Repeat [Step i](#) through [Step o](#) to load any additional keys.
- q. Remove the KVL 3000+ cable from the radio.
- r. At radio, press **[CLR]**.
- s. Press **[OPT]** on the radio.
- t. Verify that the radio returns to normal RX mode on the current P25 preset.

Loading a Type-3 Keygroup

Make sure that valid keys have been created and stored in the KVL 3000+ before continuing with the loading procedure.

- a. Turn on the radio and rotate the cipher switch to **PT**.
- b. Select a P25 system preset.
- c. Turn on the KVL 3000+.
- d. Attach KVL 3000+ to radio using cable part number (12053-6400-04).
- e. Press **[OPT]** on the radio.
- f. Select **P25 CONFIG** and press **[ENT]**.
- g. Select **TYPE 3 KEY MANAGEMENT** and press **[ENT]**.
- h. Select **ENTER FILL MODE** and press **[ENT]**.
- i. Select a keyset and press **[ENT]**. The default active keyset is indicated by a checkmark on the display. Use the up/down arrow buttons to move the checkmark to the desired keyset.
- j. Select **TARGET** on the KVL 3000+.
- k. Select **LOAD** on the KVL 3000+.
- l. Select **GROUP** on the KVL 3000+.
- m. Using the left and right arrow buttons on the KVL 3000+, select the keygroup with the desired label. The key type must be the same type as selected in [Step i](#). Press **LOAD**.
- n. Verify that the KVL 3000+ screen displays **LOADED SUCCESSFULLY OK**.
- o. Select **OK** on the KVL 3000+.
- p. Remove the KVL 3000+ cable from the radio.

AN/PRC-117G FIELD REFERENCE

P25 WAVEFORM

- q. At radio, press **[CLR]**.
- r. Press **[OPT]** on the radio.
- s. Verify that the radio returns to normal RX mode on the current P25 preset.

Zeroizing P25 Encryption Keys

P25 Type-3 encryption keys can be zeroized by either the “Panic Zeroize” procedure described in [Zeroize Functions](#), or by manually zeroizing keys as follows.

- To zeroize a single P25 key, follow the steps to load a key in [Loading Type-3 Encryption Keys](#), except replace **LOAD** with **ZERO** in [Step k](#) and [Step m](#).
- To zeroize a group of P25 keys, follow the steps to load a key in [Loading a Type-3 Keygroup](#), except replace **LOAD** with **ZERO** in [Step k](#) and [Step m](#).

Unit to Unit Calling

- a. Press **[CALL]** while in a P25 preset. Highlight UNIT TO UNIT and press **[ENT]** to continue.
- b. Select the Unit to Unit call destination. Use the **[UP/DOWN ARROW]** buttons to scroll through the unit list by name (if available) or Unit ID.
- c. To enter a Unit ID, select UNIT ENTRY and press **[ENT]** to continue. The Unit ID number may be entered. If a Unit ID is entered that is not preprogrammed, an error will appear.
- d. Press **[ENT]** to set the Unit ID and navigate to the main screen. The radio is now ready to make a Unit to Unit call.

Emergency Calling

- a. Press **[CALL]** while in a P25 preset.
- b. Highlight EMERGENCY MODE ENABLE and press **[ENT]** to continue. The radio is now ready to make emergency calls by pressing PTT.
- c. If the radio is currently in Emergency Mode, the menu choice will read EMERGENCY MODE DISABLE. To disable this mode, highlight EMERGENCY MODE DISABLE and press **[ENT]**.

Scan Mode

- a. Select **[MODE] > SCAN** and press **[ENT]** to enter Scan Mode so that the radio is actively scanning presets in the scan list. The text "SCAN" displayed on the top line of the screen will flash to indicate that the radio is in scan mode. If a signal is detected on a certain preset, the Scan Mode preset screen will be displayed for that preset. Pressing PTT will navigate to the Scan Mode home preset screen.
- b. If any preset in the scan list is configured with a transmit frequency that lies within an exclusion band, the preset will be modified to make it valid for scanning. A message is displayed indicating that presets have been corrected.

OTAR Rekey Operation

Over The Air Rekeying is an option with the AN/PRC-117G. Refer to the Operation Manual (10515-0319-4200) for complete information.

CHECK RADIO

Start your radios as described in [Basic Operations](#) and check radios as described below. Your mission plan should be loaded into the radios.

AN/PRC-117G FIELD REFERENCE

CHECK RADIO

Test Your Network - Voice

Key your handset and conduct a radio check with all other stations.

- Verifies that you have working handsets.
- Verifies you have the correct key loaded.

NOTE: If you cannot receive or transmit voice, refer to [Troubleshooting](#).

Test Your Network - Data

Conduct an IP PING test to confirm IP connectivity.

From radio:

- a. Press **[OPT]**.
- b. Select **NETWORK OPTIONS** and press **[ENT]**.
- c. Select **SEND PING** and press **[ENT]**.
- d. Enter the Host name or IP Address of one of the other radios in your network and press **[ENT]**.
- e. If your radios are passing data, you will get a response.

From a PC:

- a. **Start Programs > Command Prompt.**
- b. Type PING xxx.xxx.xxx.xxx (IP address of a radio).
- c. If your radios are passing data, you will get a response.

RADIO PROGRAMMING

This section provides limited information on front panel programming. Complete programming structures and descriptions are explained in the AN/PRC-117G Operation Manual (10515-0319-4200).

Configuring Presets

Press **[ENT]** after each step.

- a. Press **[PGM]**, and select SYSTEM PRESETS.
- b. Select SYSTEM PRESET CONFIG.
- c. At SYSTEM PRESET NUMBER, use keypad to enter a number **01 - 99**.
- d. At PRESET DESCRIPTION, enter a description that defines the preset.
- e. At PRESET WAVEFORM, select the waveform type.
- f. Continue working through the programming tree to enter items such as PRESET NAME, CRYPTO KEY, TX POWER LEVEL, TRAFFIC MODE, and so forth.
- g. Press **[PGM]** to exit Program Mode and go to main screen.

General Configuration

[PGM] > RADIO CONFIG > GENERAL CONFIG >

- **AUDIO CONFIG** - Set sidetone, voice key-up timeout.
- **BATTERY CONFIG** - Set battery model.
- **CT OVERRIDE CONFIG** - Set automatic PT to CT when switching to CT preset.
- **GPS CONFIG** - Set GPS options.

AN/PRC-117G FIELD REFERENCE

PREVENTIVE MAINTENANCE

- **RETRANSMIT CONFIG** - Set red analog audio, and red or black digital data or digital voice retransmission.
- **SA CONFIG** - SA allows VULOS or ANW2/ANW2C to transmit the current radio GPS position over the air to one or more receiving radios every time the radio is keyed for voice.

System Clock

[PGM] > RADIO CONFIG > SYSTEM CLOCK - Change the radio date and time as well as configure the clock display parameters. Not used for SINGARS GTOD or ANW2 TOD.

PREVENTIVE MAINTENANCE

[OPT] > TEST OPTIONS > SELF TEST - Daily check of general system Built-In Test (BIT). While in CT, have a VINSON, ANDVT, or KG-84 key loaded.

Antenna, connectors, protective caps - check weekly for damage.

Batteries

- Use rechargeable Lithium-Ion battery.
- Main battery should operate for approximately 8 hours.
- Store the radio with a charged main battery attached. When a charged main battery is connected, memory is held up through it, and the Hold-Up Battery (HUB) is automatically disconnected to extend its life.
- Do not replace the HUB unless the main battery is attached.
- After exposure to water, detach battery from the radio. Clean battery with fresh, clean soft cloth and thoroughly dry with another soft cloth. Do not use heat to dry the battery. Clean corrosion using a nylon mesh abrasive pad.

AN/PRC-117G FIELD REFERENCE TROUBLESHOOTING

TROUBLESHOOTING

Observation	Action
Radio does not power-up; completely dead.	Replace battery with a known good one. Clean battery connector. If radio still does not power-up, Level III Maintenance is required.
No Receive/Transmit audio.	Check volume level. Check squelch level. If using a handset, clean connectors or replace handset.
Intermittent RX audio.	Check antenna connections. Check squelch level. If using a handset, clean connectors or replace handset.
Radio stays at HARRIS logo before going to a power up failed screen.	Level III Maintenance required.
Radio stuck in ALARM at power-up.	Level III Maintenance required.
Passive Zeroization message after power-up when zeroize was not initiated by operator.	Replace HUB battery. Remove main battery for five minutes. Reattach main battery and power-up radio. If Passive Zeroization message is displayed again, Level III Maintenance is required.
Crypto Fill interface failures	Verify operation of Fill Device and Fill Interface Cable.
GPS Failure	Inspect condition of GPS antenna and connection. If GPS antenna is being used, ensure upright orientation. Verify clear path to satellite. Verify GPS Internal/Pass Through is on.
32-pin Connector ports not operational	Clean connections. Replace cable. Verify data port configuration is set properly. If problem still occurs, Level III Maintenance is required.

AN/PRC-117G FIELD REFERENCE **REFERENCE TABLES AND FIGURES**

REFERENCE TABLES AND FIGURES

This paragraph consists of reference tables and figures of information that may be useful for programming and operating the radio. All frequencies shown are in MHz unless noted.

- SINGGARS Julian Date Calendars for non-leap years
- SINGGARS Julian Date Calendars for leap years
- SATCOM Option Codes for 5 kHz Channels
- SATCOM Option Codes for 25 kHz Channels
- SATCOM Channel Frequency Code List
- Maritime Mobile Service Frequencies and Channels
This radio can be used on Maritime channels if a VULOS PT preset is programmed. The list of maritime channels and frequencies is based on <http://www.navcen.uscg.gov/>.
- National Oceanic and Atmospheric Administration (NOAA) Weather Radio Channels
- Continental United States (CONUS) SATCOM Footprint
- Atlantic SATCOM Footprint
- Indian Ocean SATCOM Footprint
- Pacific SATCOM Footprint
- CTCSS Frequencies and Designator Codes
- CDCSS Codes

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

SINGARS Julian Date Calendar, Non-Leap Years

MON DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	01	32	60	91	21	52	82	13	44	74	05	35
2	02	33	61	92	22	53	83	14	45	75	06	36
3	03	34	62	93	23	54	84	15	46	76	07	37
4	04	35	63	94	24	55	85	16	47	77	08	38
5	05	36	64	95	25	56	86	17	48	78	09	39
6	06	37	65	96	26	57	87	18	49	79	10	40
7	07	38	66	97	27	58	88	19	50	80	11	41
8	08	39	67	98	28	59	89	20	51	81	12	42
9	09	40	68	99	29	60	90	21	52	82	13	43
10	10	41	69	00	30	61	91	22	53	83	14	44
11	11	42	70	01	31	62	92	23	54	84	15	45
12	12	43	71	02	32	63	93	24	55	85	16	46
13	13	44	72	03	33	64	94	25	56	86	17	47
14	14	45	73	04	34	65	95	26	57	87	18	48
15	15	46	74	05	35	66	96	27	58	88	19	49
16	16	47	75	06	36	67	97	28	59	89	20	50
17	17	48	76	07	37	68	98	29	60	90	21	51
18	18	49	77	08	38	69	99	30	61	91	22	52
19	19	50	78	09	39	70	00	31	62	92	23	53
20	20	51	79	10	40	71	01	32	63	93	24	54
21	21	52	80	11	41	72	02	33	64	94	25	55
22	22	53	81	12	42	73	03	34	65	95	26	56
23	23	54	82	13	43	74	04	35	66	96	27	57
24	24	55	83	14	44	75	05	36	67	97	28	58
25	25	56	84	15	45	76	06	37	68	98	29	59
26	26	57	85	16	46	77	07	38	69	99	30	60
27	27	58	86	17	47	78	08	39	70	00	31	61
28	28	59	87	18	48	79	09	40	71	01	32	62
29	29		88	19	49	80	10	41	72	02	33	63
30	30		89	20	50	81	11	42	73	03	34	64
31	31		90		51		12	43		04		65

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

SINGARS Julian Date Calendar, Leap Years: 2012, 2016, 2020

MON DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	01	32	61	92	22	53	83	14	45	75	06	36
2	02	33	62	93	23	54	84	15	46	76	07	37
3	03	34	63	94	24	55	85	16	47	77	08	38
4	04	35	64	95	25	56	86	17	48	78	09	39
5	05	36	65	96	26	57	87	18	49	79	10	40
6	06	37	66	97	27	58	88	19	50	80	11	41
7	07	38	67	98	28	59	89	20	51	81	12	42
8	08	39	68	99	29	60	90	21	52	82	13	43
9	09	40	69	00	30	61	91	22	53	83	14	44
10	10	41	70	01	31	62	92	23	54	84	15	45
11	11	42	71	02	32	63	93	24	55	85	16	46
12	12	43	72	03	33	64	94	25	56	86	17	47
13	13	44	73	04	34	65	95	26	57	87	18	48
14	14	45	74	05	35	66	96	27	58	88	19	49
15	15	46	75	06	36	67	97	28	59	89	20	50
16	16	47	76	07	37	68	98	29	60	90	21	51
17	17	48	77	08	38	69	99	30	61	91	22	52
18	18	49	78	09	39	70	00	31	62	92	23	53
19	19	50	79	10	40	71	01	32	63	93	24	54
20	20	51	80	11	41	72	02	33	64	94	25	55
21	21	52	81	12	42	73	03	34	65	95	26	56
22	22	53	82	13	43	74	04	35	66	96	27	57
23	23	54	83	14	44	75	05	36	67	97	28	58
24	24	55	84	15	45	76	06	37	68	98	29	59
25	25	56	85	16	46	77	07	38	69	99	30	60
26	26	57	86	17	47	78	08	39	70	00	31	61
27	27	58	87	18	48	79	09	40	71	01	32	62
28	28	59	88	19	49	80	10	41	72	02	33	63
29	29	60	89	20	50	81	11	42	73	03	34	64
30	30		90	21	51	82	12	43	74	04	35	65
31	31		91		52		13	44		05		66

5 kHz MIL-STD-188-181B Data Rate Options

Option Code	I/O Data Rate	Modulation Type	Applicable COMSEC	Forward Error Correction
008	1200	SBPSK	KG-84, TSV, ANDVT	OFF
010	2400	SBPSK	KG-84, TSV, ANDVT	OFF

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

5 kHz MIL-STD-188-181B Data Rate Options (Continued)

Option Code	I/O Data Rate	Modulation Type	Applicable COMSEC	Forward Error Correction
013	4800	CPM	KG-84, TSV	OFF
014	4800	CPM	KG-84, TSV	ON
015	6000	CPM	KG-84, TSV	ON
016	6000	CPM	KG-84, TSV	OFF
017	7200	CPM	KG-84, TSV	ON
018	7200	CPM	KG-84, TSV	OFF
019	8000	CPM	KG-84, TSV	ON
020	8000	CPM	KG-84, TSV	OFF
021	9600	CPM	KG-84, TSV	OFF

25 kHz MIL-STD-188-181B Data Rate Options

Option Code	I/O Data Rate	Modulation Type	Applicable COMSEC	Forward Error Correction
131	9600	CPM	KG-84, TSV	OFF
132	16 k	FSK	KG-84, TSV, VINSON	OFF
137	19.2 k	CPM	KG-84, TSV	OFF
138	28.8 K	CPM	KG-84, TSV	ON
139	28.8 k	CPM	KG-84, TSV	OFF
140	32 k	CPM	KG-84, TSV	ON
141	32 k	CPM	KG-84, TSV	OFF
142	38.4 k	CPM	KG-84, TSV	ON
143	38.4 k	CPM	KG-84, TSV	OFF

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

25 kHz MIL-STD-188-181B Data Rate Options (Continued)

Option Code	I/O Data Rate	Modulation Type	Applicable COMSEC	Forward Error Correction
144	48 k	CPM	KG-84, TSV	OFF
145	56 k	CPM	KG-84, TSV	OFF
200*	128 k	AM	KG-84	OFF
200*	25 k	AM (CLR)	FASCINATOR	OFF
201*	128 k	FM	KG-84	OFF
201*	25 k	FM (CLR)	FASCINATOR	OFF
202*	16 k	ASK	KG-84, VINSON	OFF
202*	25 k	AM (CVSD)	FASCINATOR	OFF
206*	12.5 k	AM (CLR)	FASCINATOR	OFF
207*	8.33 k	AM (CLR)	FASCINATOR	OFF
F12*	12.0 k	FM, FSK	FASCINATOR	OFF

*These special option codes are selectable from top level screens when in LOS. F12 is displayed in preset programming for FASCINATOR traffic.

Satellite Channel Frequency Code List

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
1	SHF	250.350	W1	N1	N/A
2	SHF	250.400		N'1	N/A
3	SHF	250.450	A1	O1	N/A
4	SHF	250.500		O'1	N/A

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
5	SHF	250.550	B1	P1	N/A
6	SHF	250.600		P'1	N/A
7	SHF	250.650	C1	Q1	N/A
8	SHF	250.700		Q'1	N/A
9	292.850	251.850	W3	N2	25 kHz
10	292.950	251.950	A2	O2	25 kHz
11	293.050	252.050	B2	P2	25 kHz
12	293.150	252.150	C2	Q2	25 kHz
13	294.550	253.550	W4	N3	25 kHz
14	294.650	253.650	A3	O3	25 kHz
15	294.750	253.750	B3	P3	25 kHz
16	294.850	253.850	C3	Q3	25 kHz
17	296.250	255.250	W5	N4	25 kHz
18	296.350	255.350	A4	O4	25 kHz
19	296.450	255.450	B4	P4	25 kHz
20	296.550	255.550	C4	Q4	25 kHz
21	297.850	256.850	W6	N5	25 kHz
22	297.950	256.950	A5	O5	25 kHz
23	298.050	257.050	B5	P5	25 kHz
24	298.150	257.150	C5	Q5	25 kHz
25	299.350	258.350	W7	N6	25 kHz
26	299.450	258.450	A6	O6	25 kHz
27	299.550	258.550	B6	P6	25 kHz
28	299.650	258.650	C6	Q6	25 kHz

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
29	306.250	265.250	W8	N7	25 kHz
30	306.350	265.350	A7	O7	25 kHz
31	306.450	265.450	B7	P7	25 kHz
32	306.550	265.550	C7	Q7	25 kHz
33	307.750	266.750		N8	25 kHz
34	307.850	266.850	A8	O8	25 kHz
35	307.950	266.950	B8	P8	25 kHz
36	308.050	267.050	C8	Q8	25 kHz
37	309.150	268.150		N9	25 kHz
38	309.250	268.250	A9	O9	25 kHz
39	309.350	268.350	B9	P9	25 kHz
40	309.450	268.450	C9	Q9	25 kHz
41	310.650	269.650		N10	25 kHz
42	310.750	269.750	A10	O10	25 kHz
43	310.850	269.850	B10	P10	25 kHz
44	310.950	269.950	C10	Q10	25 kHz
45	293.950	260.350	A23-1		25 kHz
46	293.975	260.375	A23-2	N11	25 kHz
47	294.000	260.400	A23-3		25 kHz
48	294.025	260.425	A23-4	P11	25 kHz
49	294.050	260.450	A23-5		25 kHz
50	294.075	260.475	A23-6	N12	25 kHz
51	294.100	260.500	A23-7		25 kHz
52	294.125	260.525	A23-8	P12	25 kHz

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
53	294.150	260.550	A23-9		25 kHz
54	294.175	260.575	A23-10	O11	25 kHz
55	294.200	260.600	A23-11		25 kHz
56	294.225	260.625	A23-12	Q11	25 kHz
57	294.250	260.650	A23-13		25 kHz
58	294.275	260.675	A23-14	O12	25 kHz
59	294.300	260.700	A23-15		25 kHz
60	294.325	260.725	A23-16	Q12	25 kHz
61	294.350	260.750	A23-17		25 kHz
62	294.375	260.775	A23-18		25 kHz
63	294.400	260.800	A23-19		25 kHz
64	294.425	260.825	A23-20		25 kHz
65	294.450	260.850	A23-21		25 kHz
66	295.050	261.450	B23-1		25 kHz
67	295.075	261.475	B23-2		25 kHz
68	295.100	261.500	B23-3		25 kHz
69	295.125	261.525	B23-4		25 kHz
70	295.150	261.550	B23-5		25 kHz
71	295.175	261.575	B23-6	N13	25 kHz
72	295.200	261.600	B23-7		25 kHz
73	295.225	261.625	B23-8	P13	25 kHz
74	295.250	261.650	B23-9		25 kHz
75	295.275	261.675	B23-10	N14	25 kHz
76	295.300	261.700	B23-11		25 kHz

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
77	295.325	261.725	B23-12	P14	25 kHz
78	295.350	261.750	B23-13		25 kHz
79	295.375	261.775	B23-14	N15	25 kHz
80	295.400	261.800	B23-15		25 kHz
81	295.425	261.825	B23-16	P15	25 kHz
82	295.450	261.850	B23-17		25 kHz
83	295.475	261.875	B23-18	N16	25 kHz
84	295.500	261.900	B23-19		25 kHz
85	295.525	261.925	B23-20	P16	25 kHz
86	295.550	261.950	B23-21		25 kHz
87	295.650	262.050	C23-1		25 kHz
88	295.675	262.075	C23-2	O13	25 kHz
89	295.700	262.100	C23-3		25 kHz
90	295.725	262.125	C23-4	Q13	25 kHz
91	295.750	262.150	C23-5		25 kHz
92	295.775	262.175	C23-6	O14	25 kHz
93	295.800	262.200	C23-7		25 kHz
94	295.825	262.225	C23-8	Q14	25 kHz
95	295.850	262.250	C23-9		25 kHz
96	295.875	262.275	C23-10	O15	25 kHz
97	295.900	262.300	C23-11		25 kHz
98	295.925	262.325	C23-12	Q15	25 kHz
99	295.950	262.350	C23-13		25 kHz
100	295.975	262.375	C23-14	O16	25 kHz

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
101	296.000	262.400	C23-15		25 kHz
102	296.025	262.425	C23-16	Q16	25 kHz
103	296.050	262.450	C23-17		25 kHz
104	296.075	262.475	C23-18		25 kHz
105	296.100	262.500	C23-19		25 kHz
106	296.125	262.525	C23-20		25 kHz
107	296.150	262.550	C23-21		25 kHz
108	297.150	263.550	W2-1		25 kHz
109	297.175	263.575	W2-2	N17	25 kHz
110	297.200	263.600	W2-3		25 kHz
111	297.225	263.625	W2-4	P17	25 kHz
112	297.250	263.650	W2-5		25 kHz
113	297.275	263.675	W2-6	N18	25 kHz
114	297.300	263.700	W2-7		25 kHz
115	297.325	263.725	W2-8	P18	25 kHz
116	297.350	263.750	W2-9		25 kHz
117	297.375	263.775	W2-10	O17	25 kHz
118	297.400	263.800	W2-11		25 kHz
119	297.425	263.825	W2-12	Q17	25 kHz
120	297.450	263.850	W2-13		25 kHz
121	297.475	263.875	W2-14	O18	25 kHz
122	297.500	263.900	W2-15		25 kHz
123	297.525	263.925	W2-16	Q18	25 kHz
124	297.550	263.950	W2-17		25 kHz

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
125	297.575	263.975	W2-18		25 kHz
126	297.600	264.000	W2-19		25 kHz
127	297.625	264.025	W2-20		25 kHz
128	297.650	264.050	W2-21		25 kHz
129	302.445	248.845		N27	5 kHz
130	302.450	248.850	G1		5 kHz
131	302.455	248.855		N28	5 kHz
132	302.465	248.865		N29	5 kHz
133	302.475	248.875	G2	N30	5 kHz
134	302.485	248.885		N31	5 kHz
135	302.495	248.895		N32	5 kHz
136	302.500	248.900	G3		5 kHz
137	302.505	248.905		N33	5 kHz
138	302.515	248.915		N34	5 kHz
139	302.525	248.925	G4	N35	5 kHz
140	302.535	248.935		N36	5 kHz
141	302.545	248.945	N37		5 kHz
142	302.550	248.950	G5		5 kHz
143	302.555	248.955	N38		5 kHz
144	302.565	248.965	N39		5 kHz
145	302.575	248.975	G6	O27	5 kHz
146	302.585	248.985		O28	5 kHz
147	302.595	248.995		O29	5 kHz
148	302.600	249.000	G7		5 kHz

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
149	302.605	249.005		O30	5 kHz
150	302.615	249.015		O31	5 kHz
151	302.625	249.025	G8	O32	5 kHz
152	302.635	249.035		O33	5 kHz
153	302.645	249.045		O34	5 kHz
154	302.650	249.050	G9		5 kHz
155	302.655	249.055		O35	5 kHz
156	302.665	249.065		O36	5 kHz
157	302.675	249.075	G10	O37	5 kHz
158	302.685	249.085		O38	5 kHz
159	302.695	249.095		O39	5 kHz
160	302.700	249.100	G11		5 kHz
161	302.705	249.105		P27	5 kHz
162	302.715	249.115		P28	5 kHz
163	302.725	249.125	G12	P29	5 kHz
164	302.735	249.135		P30	5 kHz
165	302.745	249.145		P31	5 kHz
166	302.750	249.150	G13		5 kHz
167	302.755	249.155		P32	5 kHz
168	302.765	249.165		P33	5 kHz
169	302.775	249.175	G14	P34	5 kHz
170	302.785	249.185		P35	5 kHz
171	302.795	249.195		P36	5 kHz
172	302.800	249.200	G15	5	5 kHz

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
173	302.805	249.205		P37	5 kHz
174	302.815	249.215		P38	5 kHz
175	302.825	249.225	G16	P39	5 kHz
176	302.835	249.235		Q27	5 kHz
177	302.845	249.245		Q28	5 kHz
178	302.850	249.250	G17	5	5 kHz
179	302.855	249.255		Q29	5 kHz
180	302.865	249.265		Q30	5 kHz
181	302.875	249.275	G18	Q31	5 kHz
182	302.885	249.285		Q32	5 kHz
183	302.895	249.295		Q33	5 kHz
184	302.900	249.300	G19	5	5 kHz
185	302.905	249.305		Q34	5 kHz
186	302.915	249.315		Q35	5 kHz
187	302.925	249.325	G20	Q36	5 kHz
188	302.935	249.335		Q37	5 kHz
189	302.945	249.345		Q38	5 kHz
190	302.950	249.350			5 kHz
191	302.955	249.355		Q39	5 kHz
192	307.750	254.150	GA		25 kHz
193	311.150	257.550	GB		25 kHz
194	316.955	243.855	W9		5 kHz
195	316.960	243.860	W10		5 kHz
196	316.975	243.875	W11		5 kHz

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
197	317.000	243.900	W12		5 kHz
198	317.010	243.910	W13		5 kHz
199	317.015	243.915		N19	5 kHz
200	317.025	243.925		N20	5 kHz
201	317.035	243.935		N21	5 kHz
202	317.045	243.945	A11	N22	5 kHz
203	317.055	243.955	A12	N23	5 kHz
204	317.065	243.965	A14	N24	5 kHz
205	317.075	243.975	A16	N25	5 kHz
206	317.085	243.985	A18	N26	5 kHz
207	317.090	243.990	A19		5 kHz
208	317.095	243.995	A20	O19	5 kHz
209	317.100	244.000	A21		5 kHz
210	317.105	244.005		O20	5 kHz
211	317.110	244.010	A22		5 kHz
212	317.115	244.015		O21	5 kHz
213	317.125	244.025		O22	5 kHz
214	317.135	244.035		O23	5 kHz
215	317.145	244.045	B11	O24	5 kHz
216	317.155	244.055	B12	O25	5 kHz
217	317.165	244.065	B14	O26	5 kHz
218	317.175	244.075	B16	P19	5 kHz
219	317.185	244.085	B18	P20	5 kHz
220	317.190	244.090	B19		5 kHz

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
221	317.195	244.095	B20	P21	5 kHz
222	317.200	244.100	B21		5 kHz
223	317.205	244.105		P22	5 kHz
224	317.210	244.110	B22		5 kHz
225	317.215	244.115		P23	5 kHz
226	317.225	244.125		P24	5 kHz
227	317.235	244.135		P25	5 kHz
228	317.245	244.145	C11	P26	5 kHz
229	317.255	244.155	C12	Q19	5 kHz
230	317.265	244.165	C14	Q20	5 kHz
231	317.275	244.175	C16	Q21	5 kHz
232	317.285	244.185	C18	Q22	5 kHz
233	317.290	244.190	C19		5 kHz
234	317.295	244.195	C20	Q23	5 kHz
235	317.300	244.200	C21		5 kHz
236	317.305	244.205		Q24	5 kHz
237	317.310	244.210	C22		5 kHz
238	317.315	244.215		Q25	5 kHz
239	317.325	244.225		Q26	5 kHz
240	307.550	253.950		North Atlantic Treaty Organization (NATO) IVB / SKYNET 4A	25 kHz / 25 kHz (United Kingdom [UK])

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Satellite Channel Frequency Code List (Continued)

Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
241	307.700	254.100		North Atlantic Treaty Organization (NATO) IVA	25 kHz
242	311.050	257.450		NATO IVB / SKYNET 4A	25 kHz / 25 kHz (UK)
243	311.200	257.600		NATO IVA	25 kHz
244	307.750	254.150		SKYNET 4B	25 kHz (UK)
245	311.250	257.650		SKYNET 4B	25 kHz (UK)
246	307.650	254.050		SKYNET 4C	25 kHz (UK)
247	311.150	257.550		SKYNET 4C	25 kHz (UK)
248	294.800 to 314.800	253.650 to 254.350		SKYNET 4D	25 kHz (UK)
249	298.300 to 313.300	257.150 to 257.850		SKYNET 4D	25 kHz (UK)
999	User Input 291.000 to 318.3000	User Input 243.000 to 270.0000			5 / 25 kHz

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Maritime Channels, USA

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
1A	Transmit/ Receive (T/R): 156.05	T/R: 156.05	Port Operations and Commercial, Vessel Traffic Service (VTS). New Orleans/Lower Mississippi area.
5A	T/R: 156.25	T/R: 156.25	Port Operations or VTS in Houston, New Orleans and Seattle areas.
6	T/R: 156.30	-	Intership Safety
7A	T/R: 156.35	T/R: 156.35	Commercial
8	T/R: 156.40	-	Commercial (Intership only)
9	T/R: 156.45	T/R: 156.45	Boater Calling. Commercial and Non-Commercial.
10	T/R: 156.50	T/R: 156.50	Commercial
11	T/R: 156.55	T/R: 156.55	Commercial. VTS in selected areas.
12	T/R: 156.60	T/R: 156.60	Port Operations. VTS in selected areas.
13	T/R: 156.65	-	Intership Navigation Safety (Bridge-to-bridge). Ships >20m length maintain a listening watch on this channel in United States (US) waters.
14	T/R: 156.70	T/R: 156.70	Port Operations. VTS in selected areas.

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Maritime Channels, USA (Continued)

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
15	R: 156.75	T: 156.75	Environmental (Receive only). Used by Class C Emergency Position-Indicating Radio Beacons (EPIRBs).
16	T/R: 156.80	T/R: 156.80	International Distress, Safety and Calling. Ships required to carry radio, United States Coast Guard (USCG), and most coast stations maintain a listening watch on this channel.
17	T/R: 156.85	T/R: 156.85	State Control
18A	T/R: 156.90	T/R: 156.90	Commercial
19A	T/R: 156.95	T/R: 156.95	Commercial
20	T: 157.00 R: 161.60	T: 161.60 R: 157.00	Port Operations (duplex)
20A	T/R: 157.00	T/R: 157.00	Port Operations
21A	T/R: 157.05	T/R: 157.05	US Coast Guard only
22A	T/R: 157.10	T/R: 157.10	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.
23A	T/R: 157.15	T/R: 157.15	US Coast Guard only
24	T: 157.20 R: 161.80	T: 161.80 R: 157.20	Public Correspondence (Marine Operator)
25	T: 157.25 R: 161.85	T: 161.85 R: 157.25	Public Correspondence (Marine Operator)
26	T: 157.30 R: 161.90	T: 161.90 R: 157.30	Public Correspondence (Marine Operator)

AN/PRC-117G FIELD REFERENCE

REFERENCE TABLES AND FIGURES

Maritime Channels, USA (Continued)

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
27	T: 157.35 R: 161.95	T: 161.95 R: 157.35	Public Correspondence (Marine Operator)
28	T: 157.40 R: 162.00	T: 162.00 R: 157.40	Public Correspondence (Marine Operator)
63A	T/R: 156.175	T/R: 156.175	Port Operations and Commercial, VTS. New Orleans/Lower Mississippi area.
65A	T/R: 156.275	T/R: 156.275	Port Operations
66A	T/R: 156.325	T/R: 156.325	Port Operations
67	T/R: 156.375	-	Commercial. Used for Bridge-to-bridge communications in lower Miss. River. Intership only.
68	T/R: 156.425	T/R: 156.425	Non-Commercial
69	T/R: 156.475	T/R: 156.475	Non-Commercial
70	T/R: 156.525	T/R: 156.525	Digital Selective Calling (voice communications not allowed)
71	T/R: 156.575	T/R: 156.575	Non-Commercial
72	T/R: 156.625	-	Non-Commercial (Intership only)
73	T/R: 156.675	T/R: 156.675	Port Operations
74	T/R: 156.725	T/R: 156.725	Port Operations
77	T/R: 156.875	-	Port Operations (Intership only)
78A	T/R: 156.925	T/R: 156.925	Non-Commercial
79A	T/R: 156.975	T/R: 156.975	Commercial. Non-Commercial in Great Lakes only

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

Maritime Channels, USA (Continued)

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
80A	T/R: 157.025	T/R: 157.025	Commercial. Non-Commercial in Great Lakes only
81A	T/R: 157.075	T/R: 157.075	US Government only - Environmental protection operations
82A	T/R: 157.125	T/R: 157.125	US Government only
83A	T/R: 157.175	T/R: 157.175	US Coast Guard only
84	T: 157.225 R: 161.825	T: 161.825 R: 157.225	Public Correspondence (Marine Operator)
85	T: 157.275 R: 161.875	T: 161.875 R: 157.275	Public Correspondence (Marine Operator)
86	T: 157.325 R: 161.925	T: 161.925 R: 157.325	Public Correspondence (Marine Operator)
87	T/R: 157.375	T/R: 157.375	Public Correspondence (Marine Operator)
88A	T/R: 157.425	-	Commercial, Intership only.
AIS 1	T/R:161.975	T/R:161.975	Automatic Identification System (AIS)
AIS 2	T/R:161.025	T/R:161.025	AIS

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

International Maritime Channels

An asterisk (*) indicates that the frequency is not allowed within US territorial waters.

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
1	T: 156.05 R: 160.65	T: 160.65* R: 156.05	Public Correspondence, Port Operations
2*	T: 156.10* R: 160.70*	T: 160.70* R: 156.10*	Public Correspondence, Port Operations
3*	T: 156.15* R: 160.75*	T: 160.75* R: 156.15*	Public Correspondence, Port Operations
4*	T: 156.20* R: 160.80*	T: 160.80* R: 156.20*	Public Correspondence, Port Operations
5	T: 156.25 R: 160.85*	T: 160.85* R: 156.25	Public Correspondence, Port Operations
6	T/R: 156.30	-	Intership
7	T: 156.35 R: 160.95*	T: 160.95* R: 156.35	Public Correspondence, Port Operations
8	T/R: 156.40	-	Intership
9	T/R: 156.45	T/R: 156.45	Intership, Port Operations
10	T/R: 156.50	T/R: 156.50	Intership, Port Operations
11	T/R: 156.55	T/R: 156.55	Port Operations
12	T/R: 156.60	T/R: 156.60	Port Operations
13	T/R: 156.65	T/R: 156.65	Intership, Port Operations
14	T/R: 156.70	T/R: 156.70	Port Operations

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

International Maritime Channels (Continued)

An asterisk (*) indicates that the frequency is not allowed within US territorial waters.

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
15	T/R: 156.75*	T/R: 156.75*	Intership, Port Operations
16	T/R: 156.80	T/R: 156.80	DISTRESS, SAFETY and CALLING
17	T/R: 156.85	T/R: 156.85	Intership, Port Operations
18	T: 156.90 R: 161.50*	T: 161.50* R: 156.90	Public Correspondence, Port Operations
19	T: 156.95 R: 161.55*	T: 161.55* R: 156.95	Public Correspondence, Port Operations
20	T: 157.00 R: 161.60	T: 161.60 R: 157.00	Public Correspondence, Port Operations
21	T: 157.05 R: 161.65*	T: 161.65* R: 157.05	Public Correspondence, Port Operations
22	T: 157.10 R: 161.70*	T: 161.70* R: 157.10	Public Correspondence, Port Operations
23	T: 157.15 R: 161.75*	T: 161.75* R: 157.15	Public Correspondence, Port Operations
24	T: 157.20 R: 161.80	T: 161.80 R: 157.20	Public Correspondence, Port Operations
25	T: 157.25 R: 161.85	T: 161.85 R: 157.25	Public Correspondence, Port Operations
26	T: 157.30 R: 161.90	T: 161.90 R: 157.30	Public Correspondence, Port Operations

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

International Maritime Channels (Continued)

An asterisk (*) indicates that the frequency is not allowed within US territorial waters.

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
27	T: 157.35 R: 161.95	T: 161.95 R: 157.35	Public Correspondence, Port Operations
28	T: 157.40 R: 162.00	T: 162.00 R: 157.40	Public Correspondence, Port Operations
60*	T: 156.025* R: 160.625*	T: 160.625* R: 156.025*	Public Correspondence, Port Operations
61*	T: 156.075* R: 160.675*	T: 160.675* R: 156.075*	Public Correspondence, Port Operations
62*	T: 156.125* R: 160.725*	T: 160.725* R: 156.125*	Public Correspondence, Port Operations
63	T: 156.175 R: 160.775*	T: 160.775* R: 156.175	Public Correspondence, Port Operations
64*	T: 156.225* R: 160.825*	T: 160.825* R: 156.225*	Public Correspondence, Port Operations
65	T: 156.275 R: 160.875*	T: 160.875* R: 156.225	Public Correspondence, Port Operations
66	T: 156.325 R: 160.925*	T: 160.925* R: 156.325	Public Correspondence, Port Operations
67	T/R: 156.375	T/R: 156.375	Intership, Port Operations
68	T/R: 156.425	T/R: 156.425	Port Operations
69	T/R: 156.475	T/R: 156.475	Intership, Port Operations

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

International Maritime Channels (Continued)

An asterisk (*) indicates that the frequency is not allowed within US territorial waters.

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
70	T/R: 156.525	T/R: 156.525	Digital selective calling for distress, safety and calling
71	T/R: 156.575	T/R: 156.575	Port Operations
72	T/R: 156.625	-	Intership
73	T/R: 156.675	T/R: 156.675	Intership, Port Operations
74	T/R: 156.725	T/R: 156.725	Port Operations
75*	T/R: 156.775*	T/R: 156.775*	Port Operations
76*	T/R: 156.825*	T/R: 156.825*	Port Operations
77	T/R: 156.875	-	Intership
78	T: 156.925 R: 161.525*	T: 161.525* R: 156.925	Public Correspondence, Port Operations
79	T: 156.975 R: 161.575*	T: 161.575* R: 156.975	Public Correspondence, Port Operations
80	T: 157.025 R: 161.625*	T: 161.625* R: 157.025	Public Correspondence, Port Operations

AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

International Maritime Channels (Continued)

An asterisk (*) indicates that the frequency is not allowed within US territorial waters.

Channel	Ship Station MHz	Shore Station MHz	Channel Usage
81	T: 157.075 R: 161.675*	T: 161.675* R: 157.075	Public Correspondence, Port Operations
82	T: 157.125 R: 161.725*	T: 161.725* R: 157.125	Public Correspondence, Port Operations
83	T: 157.175 R: 161.775*	T: 161.775* R: 157.175	Public Correspondence, Port Operations
84	T: 157.225 R: 161.825	T: 161.825 R: 157.225	Public Correspondence, Port Operations
85	T: 157.275 R: 161.875	T: 161.875 R: 157.275	Public Correspondence, Port Operations
86	T: 157.325 R: 161.925	T: 161.925 R: 157.325	Public Correspondence, Port Operations
87	T/R: 157.375*	T/R: 157.375*	Port Operations
88	T/R:157.425	T/R:157.425	Port Operations
89	T/R:161.975	T/R:161.975	AIS
90	T/R:161.025	T/R:161.025	AIS

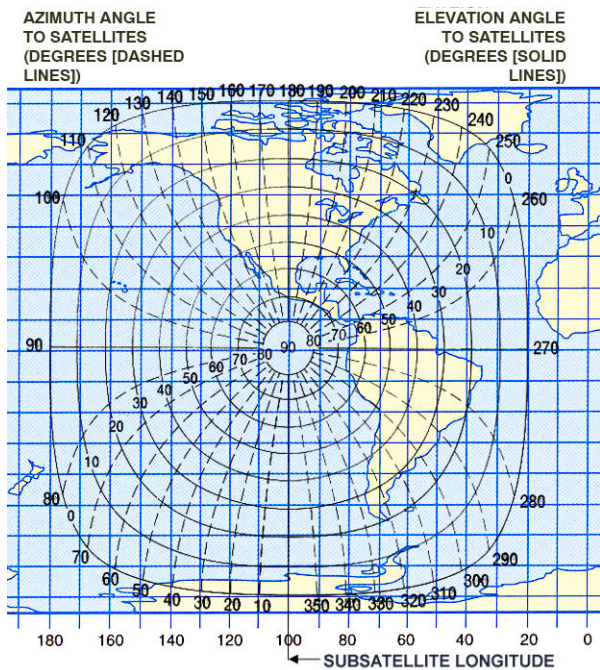
AN/PRC-117G FIELD REFERENCE REFERENCE TABLES AND FIGURES

NOAA Weather Radio Channels

Channel	Frequency
WX1	162.550
WX2	162.400
WX3	162.475
WX4	162.425
WX5	162.450
WX6	162.500
WX7	162.525

AN/PRC-117G FIELD REFERENCE CONUS SATCOM FOOTPRINT

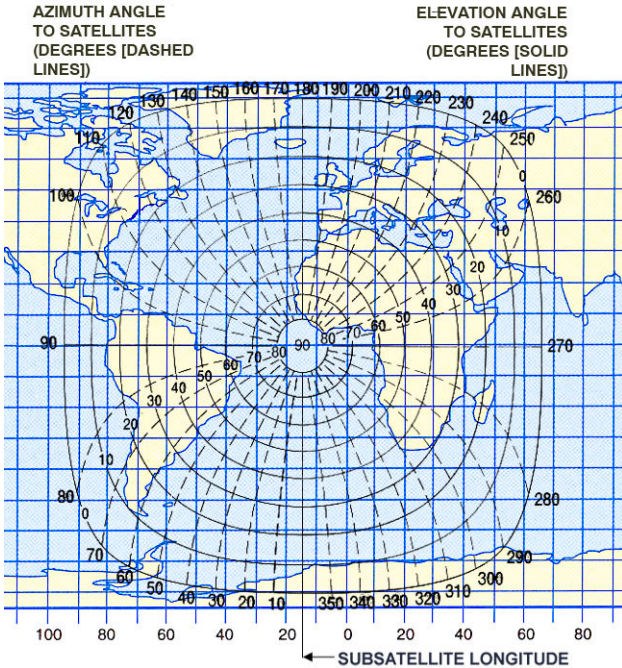
CONUS SATCOM FOOTPRINT



CONUS 100 deg W, 105 deg W

AN/PRC-117G FIELD REFERENCE ATLANTIC SATCOM FOOTPRINT

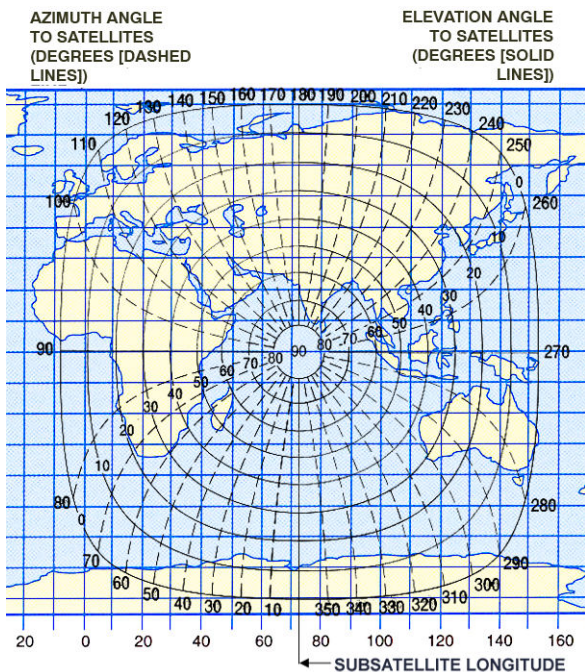
ATLANTIC SATCOM FOOTPRINT



LANT 15 deg W, 23 deg W

AN/PRC-117G FIELD REFERENCE INDIAN OCEAN SATCOM FOOTPRINT

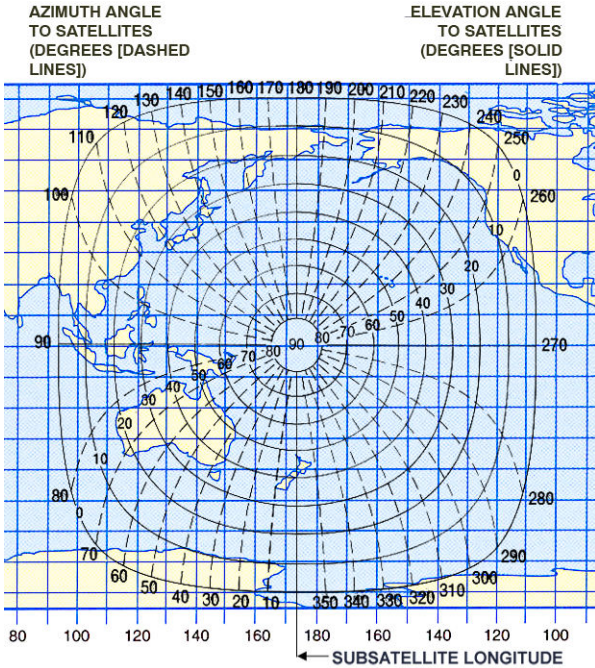
INDIAN OCEAN SATCOM FOOTPRINT



IO 72 deg E, 72.5 deg W

AN/PRC-117G FIELD REFERENCE PACIFIC SATCOM FOOTPRINT

PACIFIC SATCOM FOOTPRINT



PAC 172 deg E, 177 deg E

AN/PRC-117G FIELD REFERENCE

PACIFIC SATCOM FOOTPRINT

CTCSS Frequencies and Designator Codes

FREQ (Hz)	Designator			FREQ (Hz)	Designator		
	EIA	Motorola	HAM		EIA	Motorola	HAM
67.0	L1	XZ	01	136.5	4Z		21
69.3		WZ	N/A	141.3	4A		22
71.9	L2	XB	02	146.2	4B		23
74.4		WA	03	151.4	5Z		24
77.0	L3	XB	04	156.7	5A		25
79.7		SP	05	162.2	5B		26
82.5	L4	YZ	06	167.9	6Z		27
85.4		YA	07	173.8	6A		28
88.5	L4A	YB	08	179.9	6B		29
91.5		ZZ	09	186.2	7Z		30
94.8	L5	ZA	10	192.8	7A		31
97.4		ZB	11	203.5	M1		32
100.0		1Z	12	206.5	8Z		N/A
103.5		1A	13	210.7	M2		33
107.2		1B	14	218.1	M3		34
110.9		2Z	15	225.7	M4		35
114.8		2A	16	229.1	9Z		N/A
118.8		2B	17	233.6	M5		36
123.0		3Z	18	241.8	M6		37
127.3		3A	19	250.3	M7		38
131.8		3B	20	254.1	OZ		N/A

AN/PRC-117G FIELD REFERENCE

PACIFIC SATCOM FOOTPRINT

CDCSS Codes

EIA Codes

023	025	026	031	032	043	047	051	054	065
071	072	073	074	114	115	116	125	131	132
134	143	152	155	156	162	165	172	174	205
223	226	243	244	245	251	261	263	265	271
306	311	315	331	343	346	351	364	365	371
411	412	413	423	431	432	445	464	465	466
503	506	516	532	546	565	606	612	624	627
631	632	654	662	664	703	712	723	731	732
734	743	754							

AN/PRC-117G FIELD REFERENCE

GLOSSARY

GLOSSARY

-A-

AES	Advanced Encryption Standard
AIS	Automatic Identification System
AK	Automatic Key
AM	Amplitude Modulation
ANA	Analog
ANDVT	Advanced Narrowband Digital Voice Terminal
ANT	Antenna
ANW2	Adaptive Networking Wideband Waveform
ASYNC	Asynchronous
AUX	Auxiliary

-B-

BAT	Battery
BGAN	Broadband Global Area Network
BIT	Built-In Test
BNC	Bayonet Neill-Concelman
BPS	Bits per second

-C-

C	Celsius
CD	Compact Disc
CKR	Common Key Reference
COMSEC	Communications Security
CPA	Communications Planning Application
CT	Cipher Text, encrypted voice or data
CVSD	Continuously Variable Slope Delta

-D-

D/V	Data/Voice
DAMA	Demand Assigned Multiple Access
DASA	Demand Assigned Single Access
DC	Direct Current
DES-OFB	Digital Encryption Standard Output Feedback
DIG	Digital
DOM	Day of Month
DSS	Digital Signature Standard
DTD	Data Transfer Device
DTE	Data Terminal Equipment

AN/PRC-117G FIELD REFERENCE GLOSSARY

-E-

ECCM	Electronic Counter-Countermeasures
EDM	Enhanced Data Mode
EMCON	Emission Control
ERF	Electronic Remote Fill

-F-

F	Fahrenheit
FEC	Forward Error Correction
FH	Frequency Hopping
FM	Frequency Modulation

-G-

GMT	Greenwich Mean Time
GPS	Global Positioning System
GTOD	Global Time-Of-Day

-H-

HAIPe	High Assurance Internet Protocol Encryptor
HB	High Band
HPW	High Performance Waveform
HQ	HAVEQUICK
HUB	Hold-Up Battery

-I-

ID	Identification
IKE	Internet Key Exchange
INE	Inline Network Encryptor
INI, INIT	Initial
IP	Internet Protocol
IW	Integrated Waveform

-J-

JITC	Joint Interoperability Test Command
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-K-

KB	Kilobyte
KDU	Keypad Display Unit
KEK	Key Encryption Key
KHz	Kilohertz
KVL	Key Variable Loader

-L-

LAN	Local Area Network
LB	Low Band

AN/PRC-117G FIELD REFERENCE

GLOSSARY

LD	Load
Li-ION	Lithium-Ion rechargeable battery
Li-MnO ₂	Lithium Manganese Dioxide non-rechargeable
Li-SO ₂	Lithium Sulfur Dioxide non-rechargeable battery
LNE	Late Net Entry
LPC	Linear Predictive Coding
LOS	Line-of-Sight
-M-	
MELP	Mixed-Excitation Linear Predictive
MHz	Abbreviation for megahertz
MK	Manual Key
MOD	Modulation
-N-	
NATO	North Atlantic Treaty Organization
NCS	Net Control Station
Ni-Cd	Nickel-Cadmium battery
Ni-MH	Nickel-Metal Hydride battery
NTOD	Network Time-Of-Day
-O-	
OTAR	Over The Air Rekey
-P-	
P25	Project 25 waveform
PA	Power Amplifier
PC	Personal Computer
PPK	Pre-Placed Keys
PPP	Point-To-Point Protocol
PT	Plain Text
PTT	Push-To-Talk
-R-	
R	Receive (Indicator)
R/T	Receiver-Transmitter
RDS	Revised Battlefield Electronic Communications-Electronics Operating Instructions System Data Transfer Device (DTD) Software
RF	Radio Frequency
RSSI	Received Signal Strength Indication
RX	Receive

-S-

SA	Situational Awareness
SAA	Satellite Assignment Authorization
SATCOM	Satellite Communications
SATURN	Second generation Anti-jam Tactical UHF Radio for NATO
SBPSK	Shaped Binary Phase Shift Keying
SC	Single Channel
SDM	SINGARS Data Mode
SINGARS	Single Channel Ground and Airborne Radio System
SKL	Simple Key Loader
SLN	Storage Location Number
SW	Software
SYNC	Synchronous

-T-

T	Transmit (Indicator)
TACSAT	Tactical Satellite
TCM	Trellis Code Modulation
TCXO	Temperature Compensated Crystal Oscillator
TDMA	Time Division Multiple Access
TEK	Traffic Encryption Key
TNC	Threaded Neill-Concelman
TOD	Time-of-Day
TRANSEC	Transmission Security
TSK	Transmission Security Key
TSV	Tactical Secure Voice
TX	Transmit

-U-

UFO	UHF Follow On Satellite
UHF	Ultra High Frequency
USB	Universal Serial Bus
UTC	Universal Time Coordinated

-V-

VAA	Vehicular Amplifier Adapter
VHF	Very High Frequency
VOC	Voice
VoIP	Voice over Internet Protocol
VOL	Volume
VPN	Virtual Private Network
VULOS	VHF/UHF Line-of-Sight

AN/PRC-117G FIELD REFERENCE

GLOSSARY

-W-

WAN	Wide Area Network
WB	Wideband, or 25 kHz satellite
WMT	Wireless Message Terminal
WOD	Word of Day

