



PUBLICATION NUMBER: 10515-0109-4000
SEPTEMBER 2004
Rev. D

AN/PRC-117F QUICK REFERENCE POCKET GUIDE

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AN/PRC-117F DESCRIPTION AND FEATURES

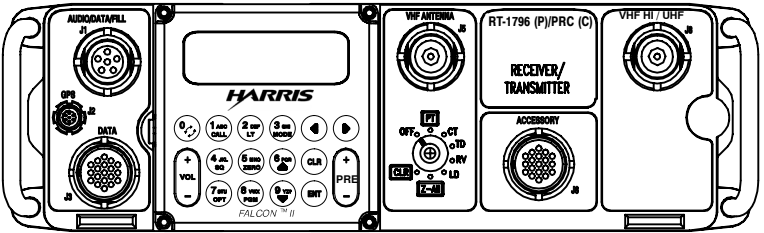


Figure 1. AN/PRC-117F Radio Set

1. PURPOSE OF THIS MANUAL

This Pocket Guide is intended to give the user a quick reference to support operation, training, and planning in remote locations using the AN/PRC-117F Radio Set shown in Figure 1. Refer to the AN/PRC-117F Operation Manual (10515-0109-4100) for detailed operating instructions.

2. CAPABILITIES OF THE AN/PRC-117F RADIO SET

Tables 1 through 4 list the capabilities of the AN/PRC-117F.

Table 1. Frequency Ranges

Band or Mode	Modulation	Frequency Range
VHF-Low	FM / TCM	30 MHz – 89.99999 MHz
VHF-High	AM / FM / TCM	90 MHz – 224.99999 MHz
UHF	AM / FM / TCM	225 MHz – 511.99999 MHz
SINGARS FH	FM Frequency Hopping	30 MHz – 87.975 MHz
SINGARS CUE	FM	30 MHz – 87.975 MHz
SINGARS COLD START	FM	30 MHz – 87.975 MHz
HAVEQUICK FH I/II, FMT	AM Frequency Hopping	225 MHz – 399.975 MHz
HAVEQUICK GRD RCVR	LOS-AM	90 MHz – 511.99999 MHz
Dedicated UHF SATCOM	Mil-Std -188-181B / HPW 5 kHz NB, 25 kHz WB	CHAN 001 – 239, 999 Rx 243 MHz – 270 MHz Tx 291 MHz – 318 MHz
DAMA UHF SATCOM	MIL-STD-188-182, 5 kHz MIL-STD-188-183, 25 kHz	CHAN 001 – 239 Rx 243 MHz – 270 MHz Tx 291 MHz – 318 MHz
BEACON	AM / FM	90 MHz – 511.99999 MHz

Table 2. Power Output

Frequency Range or Mode	Power Output
VHF-Low, 30 MHz – 89.99999 MHz	1 – 10 watts
VHF-High, 90 MHz – 224.99999 MHz	FM / TCM – 1 – 20 watts AM – 1 – 10 watts
UHF, 225 MHz – 399.99999 MHz	FM / TCM – 1 – 20 watts AM – 1 – 10 watts
UHF 400 MHz – 511.99999 MHz	1 – 10 watts
SINGARS FH	1 – 10 watts
Dedicated SATCOM, NB / WB	2 – 20 watts
DAMA UHF SATCOM NB / WB	1 – 20 watts
HAVEQUICK FH I/II	1 – 10 watts
BEACON	90 – 399.99999 MHz, 1 – 20 watts 400 – 511.99999 MHz, 1 – 10 watts
AM (400 – 511.99999 MHz)	1 – 10 watts PEP 1 – 4 watts average
With optional VRC-103(V)1 Vehicular Adapter Unit	FM / TCM / SATCOM – 5 – 50 watts AM modes – 5 – 20 watts

Table 3. COMSEC Capabilities

COMSEC Type	Modulation or Mode	Operational Frequency Range	Remarks
VINSON, KY-57 compatible	AM / FM LOS SINGARS FH HAVEQUICK FH WB UHF SATCOM	30 MHz – 511.99999 MHz	Voice and Data at 16 kbps
FASCINATOR	FM LOS only	90 MHz – 511.99999 MHz	Voice only, 12 kbps data rate only indication of operation
KG-84C	AM / FM / TCM LOS WB/NB SATCOM DAMA SATCOM	30 MHz – 511.99999 MHz	Data only, supports 64K TCM LOS and HPW SATCOM
ANDVT KY-99/99A compatible	Dedicated and DAMA UHF SATCOM only		Voice at 2400 Data, 300, 600, 1200, 2400 bps
KYV-5	FM LOS, SINGARS	30 MHz – 87.975 MHz	1.2N, 2.4N, 4.8N, 9.6N, RS232, Packet

Table 4. HPW SATCOM Data Rates

Channel Type	HPW using UFO Satellite	HPW using NON-UFO Satellite
25 kHz Wideband	56 kbps 37 kbps 18 kbps	42 kbps 21 kbps
5 kHz Narrowband	8.5 kbps 4.2 kbps	

3. INITIAL OPERATION AND COMMON TASKS

3.1 Components and Assembly

See Figure 2. The AN/PRC-117F consists of the following:

- R/T 1796(P)/PRC(C) Transceiver
- VHF Blade Antenna (30.00000 MHz – 89.99999 MHz)
- VHF/UHF Flex Antenna (90.00000 MHz – 511.99999 MHz)
- Antenna Carrying Bag
- H-250/U Handset, Modified
- Battery Box, Wide
- KDU Remote Control Cable
- Flexible Adapter for VHF Blade Antenna
- Operator Manual and Quick Reference Guide
- Remote Data “Y” Cable
- HPW package with RF-6710W-HPW software and PPP cable

Several other optional items may be provided, depending on the specific sales order.

The VHF Blade Antenna is 39.4 inches (1 meter) when fully extended, and is operational over the 30.00000 MHz to 89.99999 MHz frequency range of the radio.

The VHF/UHF Flex Antenna is 13.25 inches (33.65 cm) and is operational over the 90.00000 MHz to 511.99999 MHz frequency range of the radio.

A SATCOM antenna (optional) is required for satellite communications.

The AN/PRC-117F is supplied with Battery Box (10512-4800-02). Use either two BA-5590 lithium non-rechargeable batteries, two BB-590/U Ni-Cd rechargeable batteries, two BB-390A/U Ni-MH rechargeable batteries, or two BB-2590/U Li-ION rechargeable lithium batteries.



Do not recharge a BA-5590/U Lithium Battery. Battery may explode, causing injury or death to personnel.



For batteries containing Lithium, do not crush, puncture, disassemble, mutilate, short circuit, incinerate, immerse in water, or expose to temperatures above 130 °F (54 °C). The battery may vent or rupture, releasing toxic material which may cause injury or death to personnel.

Perform the following procedure to set up the AN/PRC-117F:

- a. Attach batteries and battery box to AN/PRC-117F. Use batteries of the same type.
- b. Connect H-250/U handset to the radio J1 Audio/Data/Fill connector.



Check the handset volume before using the handset or injury to personnel may result.

- c. To operate in the 30.00000 MHz – 89.99999 MHz frequency range, connect flexible adapter to the J5 VHF-LOW antenna connector. Connect the VHF Blade Antenna to the flexible adapter.



To prevent electrical shock and RF burns, avoid contact with RF power output connections and antenna during transmit mode.

- d. To operate between 90.00000 MHz – 511.99999 MHz, connect the VHF/UHF Flex Antenna to the radio J8 VHF-HI/UHF antenna connector.

- e. To operate with an external PLGR or PLGR-II GPS receiver, connect the GPS interface cable connector to the J2 GPS connector. Harris cable part number (12005-0730-A006) is required. Set the PLGR to STD interface, 1 PPS to UTC, and HAVEQUICK to OFF in PLGR setup menu.
- f. To operate with a NMEA-0183 commercial GPS receiver, connect the GPS receiver to the manufacturer-supplied "PC" cable. Attach the DB-9 connector of the PC cable to Harris adapter cable (12005-0740-A006), and attach the other end of the Harris cable to J2 GPS connector.
- g. If operating in SATCOM mode, connect the SATCOM antenna using a cable with BNC connector to the radio J8 VHF-HI / UHF antenna connector.
- h. Perform the following procedure to remote the KDU from the AN/PRC-117F chassis:
 - 1. Slide KDU lock to the left.
 - 2. Remove KDU from AN/PRC-117F chassis.
 - 3. Connect KDU remote cable to the male connector on the left side of the KDU and to the AN/PRC-117F chassis KDU cradle male connector.
 - 4. Power the AN/PRC-117F to the ON position of PT, CT, or TD depending on the desired mode of operation.

The chief factors in determining battery life is transmission output power and duty cycle. To maximize battery life, keep radio off when not needed, minimize transmissions, and use the lowest transmit power level required to successfully communicate.

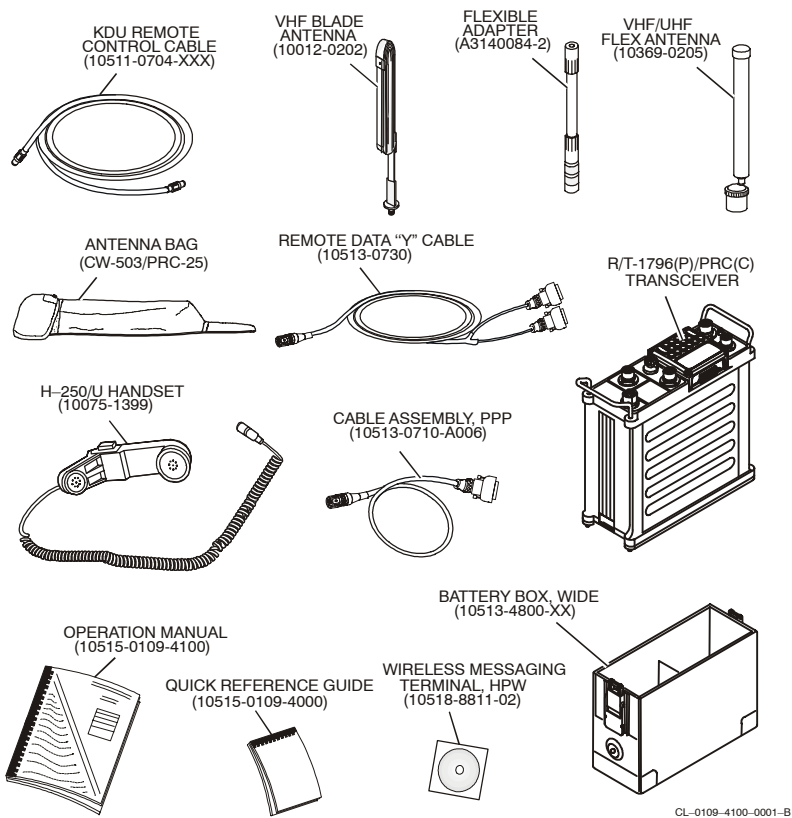


Figure 2. AN/PRC-117F Radio Set Components

3.2 Controls and Indicators

Refer to Table 5 and see Figure 3 for the description and purpose of AN/PRC-117F Radio Set controls and indicators.

Table 5. Controls, Indicators, Connectors


Control/Indicator/Connector	Function
KDU	Keypad Display Unit – Provides the LCD and the following buttons:
	Circular Arrow Button – toggles operational displays.
CALL	Call – Initiates the following in each mode of operation: LOS AM – TOD sync HAVEQUICK – TOD sync and Guard Receiver access SINCGARS – CUE, ERF, and COLDSTART functions UHF Dedicated SATCOM – SATCOM RSSI test UHF DAMA SATCOM – Network service setup menus
LT	Light – Accesses the KDU backlight control menus.
MODE	Mode – Changes the radio's operating MODE.
SQ	Squelch – Accesses the squelch menus.
ZERO	Zeroize – Accesses the radio's zeroize menus.
OPT	Options – Accesses the radio's options menus.
PGM	Program – Accesses to the radio's programming menus.
CLR	Clear – Returns a field to its previous value, and activates the previous menu.
ENT	Enter – Selects scroll field choices or locks in entry field data.
VOL+/-	Volume – Increases/decreases handset volume.
NET +/- or PRE +/-	Presets – Scrolls through the normal mode net presets. Stops at the top and bottom of net preset list. Also labeled as NET on some AN/PRC-117F radios.

Table 5. Controls, Indicators, Connectors – Continued

Control/Indicator/ Connector	Function
Function Switch	
OFF	Off – Turns radio off.
PT	Plain Text – Places the radio in PT mode.
CT	Cipher Text – Places the radio in CT mode, enables COMSEC.
TD	Time Delay – increases CT sync time to 800 ms. TD is used in SATCOM, Retransmit, or SCAN operation to overcome delay factors by increasing VINSON CT sync time.
RV	Receive Variable – transmit and receive crypto variables OTAR or OTAT.
LD	Load – Loads crypto variables and SINCGARS FH data.
Z-ALL	Zeroize all – Used to delete all crypto variables and FH TRANSEC keys. Zeroizes RED data and leaves net preset programming.
CLR	Clear – Electrically disconnects the HUB. Clears all preset parameters and COMSEC from the radio. During extended storage, place the function switch to CLR.
AUDIO/DATA/FILL (J1)	Used to connect external audio equipment, data terminals, or fill devices. Also referred to as the “ADF” connector on the display and in radio programming menus.
GPS (J2)	Used to connect external AN/PSN-11, PLGR-II, or commercial NMEA GPS receiver.
DATA (J3)	Used to connect data, remote control devices, and retransmit cable.
VHF ANTENNA (J5)	Used to connect VHF-LOW Blade Antenna. 30.00000 MHz to 89.99999 MHz.
ACCESSORY (J6)	Used to connect cable for cloning operations, remote control, and firmware upgrades.
VHF HI/UHF ANTENNA (J8)	Used to connect VHF/UHF FLEX antenna or the SATCOM antenna. 90.00000 MHz to 511.99999 MHz.
ACCESSORY (J9)	Rear panel connector, used to connect control cable for remote operations, cloning, or control interface to VAU (Not shown on figure.)
BATTERY 1 (J10)	Battery 1 connector on rear panel (Not shown on Figure 3.)
BATTERY 2 (J11)	Battery 2 connector on rear panel (Not shown on Figure 3.)

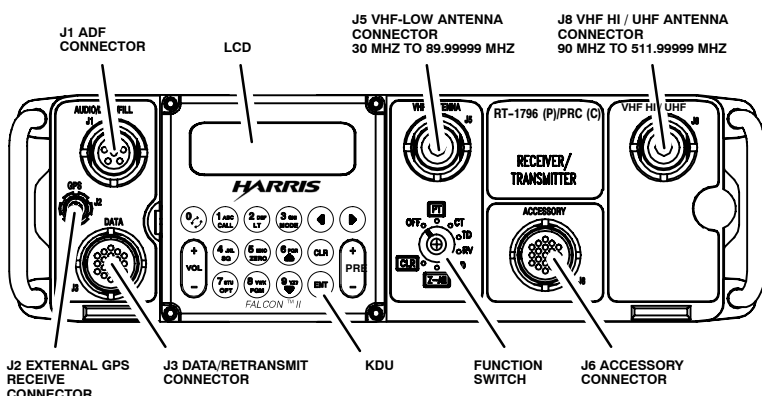


Figure 3. AN/PRC-117F Front Panel

3.3 Common Tasks

3.3.1 Power Up Self-Test

Pull out the function switch and turn it to the **PT** position. This initializes the radio and performs a POST test. The battery voltage is displayed to show the charge status of the batteries. The AN/PRC-117F will start on the last selected operating mode.

Any AN/PRC-117F being powered up after being cleared (**CLR** position of the function switch), initially indicates **WARNING BLACK DATA RESET** (or **NVRAM FAILURE** on Firmware versions before 3.6). This is a normal indication. Press any key to continue.

NOTE

Switching the radio to **CLR** clears COMSEC and returns the radio to default settings.

3.3.2 Setting the Battery Type

The AN/PRC-117F provides a battery voltage level indicator on the KDU display to monitor battery status. Since each battery type provides a slightly different operating voltage range, the radio should be set for the particular type in use. This optimizes the KDU battery display and provides a more accurate indication of battery status. By pressing the up/down arrow keys, the battery type can be changed as shown in Figure 4. Refer to Table 6 for an explanation of each setting.

NOTE

The Battery Type setting is only a status indicator and has no effect on radio operation.

Table 6. Battery Type Settings

Setting	Function	Monitor Range
BAT	Generic battery range, also use with VAU or remote power supply	22 – 32 Volts
NKL	Ni-Cd (BB-590), or Ni-MH (BB-390)	22 – 27 Volts
LIT	Lithium non-rechargeable (BA-5590)	26 – 28 Volts
LII	Lithium-Ion rechargeable (BB-2590)	28 – 32 Volts

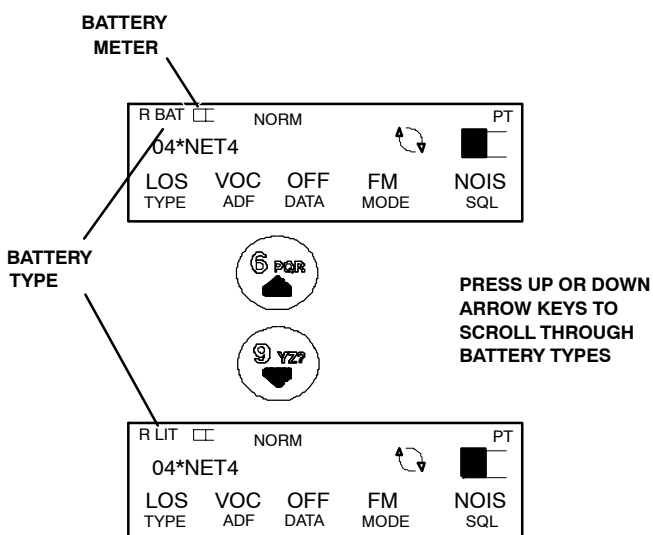


Figure 4. Setting Battery Type

3.3.3 Adjust Light and Squelch

See Figures 5 and 6. Perform the following procedure to configure the KDU backlighting intensity and contrast:

- a. Press the **LT** button.
- b. For momentary backlighting, select **MOMENTARY**. For continuous backlighting, select **ON** (only available if enabled under configuration). To disable backlighting, select **OFF**.
- c. Use the left/right arrow keys to adjust the backlight intensity and contrast, then press **ENT**.

3.3.4 Configure Squelch

The AN/PRC-117F provides digital, analog tone, and analog noise squelch. In addition, Continuous Tone Coded Squelch System (CTCSS), and Continuous Digital Coded Squelch System (CDCSS) are available squelch choices.

3.3.4.1 Digital Squelch

Digital squelch only functions in Cipher Text (CT) or Time Delay (TD) voice modes. Digital squelch can be set to either ON or OFF. Using digital squelch inhibits the PT override feature of VINSON and FASCINATOR COMSEC. Therefore, digital squelch must be turned OFF to handle traffic from stations operating in PT that have a lost or incorrect COMSEC TEK.

3.3.4.2 Analog Squelch

If digital squelch is set to OFF, then analog squelch programming options become available. The analog squelch can be set to either OFF or ON. If analog squelch is set to ON, the user can select TONE or NOISE. AM channels have the additional parameter for analog squelch level of LOW, MEDIUM, or HIGH (squelch bar) when using noise squelch. Use the lowest setting possible to ensure weak signals do not become blocked. If CTCSS has been previously programmed to ON, standard 150 Hz TONE squelch will be unavailable.

TONE squelch is a normal selection for most FM LOS radios operating below 90 MHz. Use of TONE squelch above 90 MHz in radio nets with radios other than AN/PRC-117F is not recommended. Use NOISE squelch if questions of squelch compatibility exist. All radios on a net must be set for the same squelch type to ensure successful communications.

3.3.4.3 CTCSS Squelch

Transmit and receive support for Continuous Tone Coded Squelch System (CTCSS) can be programmed by selecting ANALOG SQUELCH TYPE from the SQUELCH menu (in PT operation). The Electronic Industries Alliance (EIA) designation for the CTCSS tone is then selected from the menu. Refer to Table 7 for the selectable designator codes and their associated squelch tone frequencies. CTCSS allows for user entry of a 67.0 Hz to 254.1 Hz tone. The AN/PRC-117F will transmit/receive the selected tone as part of its overall signal to break the squelch in equipment using CTCSS type squelch. Standard 150 Hz tone squelch becomes unavailable when CTCSS is ON.

Table 7. CTCSS Codes

FREQ	Designator			FREQ	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

3.3.4.4 CDCSS Squelch

Transmit and receive support for Continuous Digital Coded Squelch System (CDCSS) can be programmed by selecting ANALOG SQUELCH TYPE from the SQUELCH menu (in PT operation). The EIA code for the squelch data is then selected from the menu. The radio will transmit/receive the programmed code as part of its overall signal to break squelch in other equipment using CDCSS type squelch. Standard 150 Hz tone squelch becomes unavailable when CDCSS is ON. Refer to Table 8 for the list of CDCSS codes used with the AN/PRC-117F.

Different squelch frequencies or codes can be used for transmit and receive, if desired. However, the squelch type must be the same for all stations in a net to be able to communicate.

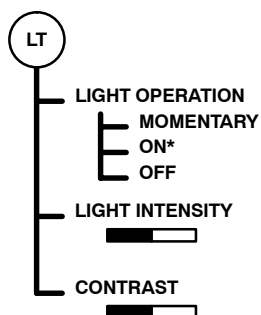
With normal CTCSS/CDCSS operation, the AN/PRC-117F will not transmit if the channel is busy, and the main KDU display shows BSY in the squelch field. Setting CTCSS/CDCSS Priority to TX will allow transmit even when the channel is busy. Set the priority to RX for normal operation (cannot transmit when channel is busy).

NOTE

It is recommended that AM tone squelch, CTCSS, and CDCSS be used only in nets with the same squelch type. Use of incompatible types of squelch will result in the R/T not being able to hear radio calls.

Table 8. CDCSS Codes

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							



***NOTE: ONLY IF ENABLED UNDER CONFIGURATION**

Figure 5. KDU Light Menu Tree

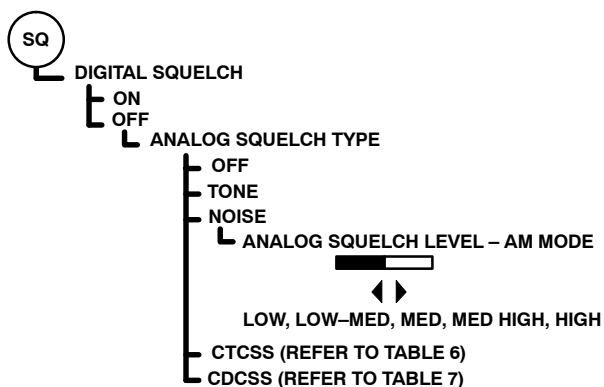


Figure 6. SQUELCH Programming Menu Tree

3.3.5 AN/PRC-117F Audio Tones

During AN/PRC-117F operations, certain audio tones are generated to alert the user of operating conditions. Some audio tones acknowledge a particular action is complete, others indicate an expected action did not occur. Table 9 lists the audio tones and their functions.

Table 9. Audio Tones

Condition	Tone	Description
CipherT X Ready	Single Beep	Occurs after keydown in cipher transmission MODE to indicate transmission can occur.
Cipher TX Preamble Processing	Continuous Tone	Occurs during beginning of initial keydown in cipher transmission to prevent operator from talking during preamble processing. Immediately followed by the cipher TX ready single beep.
Low Battery	Single Beep Continuous Beeps Continuous Tone	Occurs every five seconds, if the battery voltage is less than 22 V. Beeps once per second in receive, if the battery voltage is less than 21.5 V. Occurs when AN/PRC-117F is keyed and the battery voltage is less than 21.5 V (cutback condition).
BIT – off-line	Single Beep	Indication for any off-line BIT Failure.
BIT – on-line/ Critical Message	Single Beep	Indication for any on-line BIT failure or critical messages for the user.
INFOSEC Initiate	Continuous Beeps	Occurs until INFOSEC board is initialized.
PT Receive/CT Receive EOM	Single Beep	At EOM, AN/PRC-117F receiving message generates a beep.
Receiving Plain Text Override	Continuous Beeps	Occurs when a PT signal is received in CT or TD. A beep is heard approximately every second while the signal is being received. This will not occur if using digital squelch.
INFOSEC Alarm	Continuous Tone	Indicates an INFOSEC alarm that occurs on either of the following two conditions: – An internal INFOSEC alarm. – No valid crypto variable is present when keyed. To clear, change to a net with a valid crypto variable.
INFOSEC Zeroize	Continuous Beeps	Occurs any time the front panel switch is turned to the Z-ALL position.
Net Change	Single Beep	Occurs if the operator changes nets.
Top/Bottom Net List	Double Beep	Occurs if the operator reaches the top or bottom of the net list.

Table 9. Audio Tones – Continued

Condition	Tone	Description
SINGARS Cue RX	Double Beep	Indicates tone squelch has been broken on the SINGARS FH cue channel.
No SINGARS Fill	Continuous Tone	Occurs when an empty HOPSET compartment is assigned to a SINGARS FH channel.
SARK, OTAR, and OTAT	4 Short Beeps 1 Short Beep, 1 Long Beep	Indicates a successful receive rekey. Indicates a failed receive rekey.
Retrieving a key	Continuous Beeps	Indicates a key requires unwrapping during Key Retrieval from Key Management.
HAVEQUICK MWOD missing	Continuous Tone	Occurs when a HAVEQUICK net is initially activated or when midnight is reached on an active HAVEQUICK net, and a MWOD is not programmed for the next DOM.
HAVEQUICK TOD uninitialized	Continuous Tone	Occurs when a HAVEQUICK net is activated after power-up, but the TOD has not been initialized.
HAVEQUICK GUARD RX	Double Beep	Indicates a call on the programmed HAVEQUICK guard receiver frequency setting. Press CALL from HQ net preset to access guard receiver preset.
DAMA Call Connected	4 Short Beeps	Occurs when a DAMA/DASA call is connected.
5 kHz MSG Service New Message Received	4 Short Beeps	Occurs in 5 kHz MSG Service when a new message is received and being held in the buffer.
DAMA Call Terminated	1 Long Beep	Occurs when a DAMA/DASA call terminates.
DAMA Error	2 Short Beeps	Occurs when the AN/PRC-117F enters an error state while in DAMA. This usually means there is a problem with DAMA EOW TSK being used for the current net.
DAMA Call Pending	Continuous Beeps	Occurs when a DAMA call is pending, queued, or preempted.

3.3.6 BIT Test

BIT faults occur following an operator-executed self-test.

When the radio displays a fault message, record all fault code information displayed on the KDU, then report the fault to a Level III maintainer.

Press **MODE** to select TEST MODE. Use the up/down arrow keys to select **TEST** and press **ENT**. Perform the following procedure:

- a. To initiate BIT, select **TEST** and press **ENT**. If the radio displays a fault code, send radio to maintenance.
- b. For an indication of the battery's charge level, select **BATTERY** and press **ENT**.
- c. To determine the radio's hardware and firmware version, installed options, and radio serial number, select **VERSIONS** and press **ENT**.
- d. To determine total elapsed power-on time and transmit time, select **ETI** and press **ENT**.

3.3.7 Operational Overrides

Changes can be made while operating in Normal and DAMA modes without reprogramming the radio. Press the right arrow key on the KDU while operating on a current Net Preset display to find display items that can be modified. Modifiable items will begin to flash. Press the up/down arrow keys to change value of the flashing item.

NOTE

The radio can be configured to automatically save overrides. If AUTO SAVE function is set to OFF, the operator can temporarily override programmed nets. An asterisk (*) appears to the left of the net name on the LCD, indicating the net parameter was temporarily changed (If security is ON and the net is locked, the indicator will be a plus (+) sign). These changes are valid until the operator selects another programmed net. When the net is changed, the temporary changes are lost. To permanently save the changes as programmed values, select the **SAVE** command from the **OPT** menu. For programming instructions for the AUTO SAVE function, refer to Paragraph 15.

3.3.8 Radio Options

While operating in Normal modes or DAMA UHF SATCOM, Press the **OPT** key on the KDU to access the Options Menu. Additional changes can be made to the current net preset here. Using the OPT key to make changes keeps the radio online, whereas, programming mode takes the radio completely offline until exiting from programming mode. Most OPT Menu items are exactly as found in the programming mode. COMSEC options are only accessible when the radio is in CT mode.

3.3.9 Zeroize Presets (Black Data)

Black Data consisting of radio programming parameters of all net presets and other configuration programming can be quickly zeroized by pressing the **ZERO** key on the KDU.

Zeroizing is used to return the radio to default settings. THIS DOES NOT CLEAR COMSEC and FH DATA. See Figure 7.

Perform the following procedure to zeroize the radio of BLACK DATA:

- a. Press **ZERO**.
- b. Select **YES**.
- c. Press **ENT**.
- d. Place the radio function switch to **OFF**.

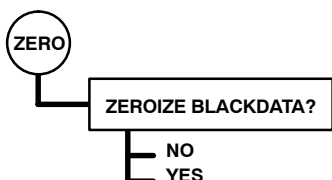


Figure 7. ZERO Menu

3.3.10 Clearing the AN/PRC-117F

The AN/PRC-117F can be cleared of all programming and electronic fill data by placing the function switch to the **CLR** position. This disconnects the HUB from the radio and the nonvolatile memory is cleared. Use this position for long term storage of the radio. The function switch position of **Z-ALL** clears only the electronic COMSEC fills (RED DATA) in the radio. The function switch must be pulled out to reach the **Z-All** and **CLR** position to protect from inadvertent loss of data. The KDU **ZERO** key can be pressed to clear only radio programming (BLACK DATA).

3.3.11 Hold-Up Battery (HUB)

Replace the HUB (B41-0010-003, NSN 6135-01-461-5322, SAFT # LS 14250) annually, or sooner if mission importance dictates the need to have a fresh battery.

Perform the following procedure to replace the HUB battery to retain radio programming and configuration information:

- a. Remove the battery box and leave one battery connected to the right rear panel BATTERY connector J10.
- b. Power the radio ON at **PT** position.
- c. Without turning the radio OFF, remove and replace the HUB battery.
- d. Turn the radio off. Install the second battery and battery box.
- e. Perform radio self-test to determine if the HUB battery is installed correctly. The BIT will detect incorrectly installed HUB.

NOTE

Ensure HUB battery is correctly oriented with the battery polarity aligned with the polarity markings on the radio.

4. ELECTRONIC FILL LOADING

To access menus to load electronic fill data into the AN/PRC-117F, the function switch is placed in the **LD** position. Table 10 and Table 11 contain electronic fill characteristics and types.

Table 10. Fill Device Characteristics

Device Type	Model	Fill Types	Remarks
Common Fill Devices (CFD) DS-102	KYK-13	TEK, KEK DAMA EOW TSK, HPW TSK	Only holds 6 fills.
	KYX-15	TEK, KEK DAMA EOW TSK, HPW TSK	Net Controller Device, able to perform VG, VU, and OTAR/OTAT operations in addition to handling fills.
	KOI-18	Tape Reader	Converts paper tape COMSEC to electronic form.
	MX-18290 ECCM Fill Device	TEK, KEK DAMA EOW TSK, HPW TSK SINGGARS FH TSK	Dual use. Holds COMSEC fills and SINGGARS fills.
Data Transfer Device (DTD) or Automated Net Controllers Device (ANCD)	AN/CYZ-10	TEK, KEK, TRKEK DAMA EOW TSK, HPW TSK SINGGARS FH TSK	FILL application used for TEK, KEK, and TSKs. RDS application used in SINGGARS FH operation. Net Controller Device, able to perform VG, VU, and OTAR/OTAT operations.

NOTE

Do not connect COMSEC fill devices to ADF connector **J1** until the AN/PRC-117F function switch is placed in the **LD** position. After finishing electronic fill loading, disconnect the fill device BEFORE switching from the **LD** position. Failure to do so causes the AN/PRC-117F to transmit in certain modes.

Table 11. Electronic Fill Types

Fill Type	Quantity	Purpose	Fill Device
VINSON TEK or FASCINATOR (shared) or KYV-5 (shared)	25	Traffic Encryption	CFD or DTD
VINSON KEK	1	AK OTAR/OTAT	CFD or DTD
VINSON TRKEK	1	Black key unwrapping	AN/CYZ-10 only
ANDVT TEK	25	Traffic Encryption	CFD or DTD
ANDVT KEK	1	AK OTAR/OTAT	CFD or DTD
ANDVT TRKEK	1	Black key unwrapping	AN/CYZ-10 DTD only
KG-84 TEK	25	Traffic Encryption	CFD or DTD
KG-84 KEK	1	AK OTAR/OTAT	CFD or DTD
KG-84 TRKEK	1	Black key unwrapping	AN/CYZ-10 DTD only
SATCOM-DAMA EOW TSK or HPW TSK (shared)	25	Encryption of non-communications control signals	CFD or DTD
HAVEQUICK WOD (SWOD)	1	HAVEQUICK I FH	Manually enterable with KDU
HAVEQUICK WOD (MWOD)	31	HAVEQUICK II FH	
FMT_FREQS	16	HAVEQUICK training	
SINGGARS FH TSK	25	SINGGARS FH	MX-18290 or AN/CYZ-10 DTD using RDS
SINGGARS LOUT	As required	SINGGARS FH locked out frequencies.	

4.1 COMSEC Data Loading with Common Fill Devices

Perform the following procedure to load COMSEC Fill data with common fill devices (KOI-18, KYK-13, KYX-15, and MX-18290):

- Rotate function switch to **LD**.
- Select appropriate fill device and press **ENT**.
- Ensure the fill device is off.
- Connect fill device to **J1 AUDIO/DATA/FILL** connector.
- Select the desired **CRYPTO TYPE** and press **ENT**.
- Select the appropriate **KEY TYPE**. If **TEK** is selected, select the key position number (01 – 25).

- g. Turn fill device on and select key position on fill device. (If using KOI-18, have key tape ready to pull.)
- h. **PRESS ENTER TO INITIATE** displays; press **ENT**.
- i. **FILL IN PROGRESS** displays. Pull tape now, if using KOI-18.
- j. When **FILL DONE** displays, press any key.
- k. At prompt **MORE FILL DATA**, select **YES** to enter more fill data. Repeat Steps f through j.
- l. When all fill data is entered, select **NO** when the **MORE FILL DATA** prompt displays.
- m. Turn off fill device and disconnect it from **J1 AUDIO/DATA/FILL** connector.
- n. Rotate function switch from **LD** to desired operating position of **PT**, **CT** or **TD**.

4.1.1 Load COMSEC using AN/CYZ-10 DTD with UAS Fill

Using the AN/CYZ-10 DTD varies due to differences in application software. Some DTDs use the radio portion of RDS application program, COMSEC menu, LD. This program operates like procedures for common fill devices outlined above except to select KYK-13 instead of AN/CYZ-10 on the AN/PRC-117F load menus. AN/CYZ-10's using DTD FILL program should be set to DS-101 protocol and perform the following procedure:

- a. Rotate function switch to **LD**.
- b. Connect fill device to **J1 AUDIO/DATA/FILL** connector.
- c. Select appropriate fill device of **AN/CYZ-10 DS-101**; press **ENT**.
- d. Select the desired **CRYPTO TYPE**; press **ENT**.
- e. Select the **KEY TYPE**, then select the key compartment position number (**01 – 25**). Press **ENT**.
- f. **INITIATE FILL AT FILL DEVICE** displays.
- g. Turn AN/CYZ-10 DTD fill device on. Use DTD FILL program to initiate loading of required key. Use **ISSUE** command instead of FILL or load will fail.
- h. Press **SEND** on the DTD. The radio displays **FILL IN PROGRESS**.
- i. When **FILL DONE** displays, press any key on KDU.
- j. At prompt **MORE FILL DATA**, select **YES** to enter more fill data. Repeat Steps e through i. Use DTD NEW menu item to back up for new key selection.
- k. When all fill data is entered, select **NO** when the **MORE FILL DATA** prompt displays.
- l. Turn off DTD and disconnect it from the **J1 AUDIO/DATA/FILL** connector.
- m. Rotate function switch from **LD** to desired operating position of **PT**, **CT**, or **TD**.

4.2 Loading SINCGARS FH Fill Data

A TRANSEC fill device of either an AN/CYZ-10 DTD or MX-18290 is required to load the FH data into the AN/PRC-117F. The AN/CYZ-10 requires user application software RDS for SINCGARS FH fill data.

4.2.1 Parts of a SINCGARS Loadset

A loadset (ESET) consists of sections in the following order:

- One to five channel Vinson TEKs.
- Manual preset (cold start portion of the ESET).
- Remaining one to six channels of ESET.
- Time of Day information (mode 3 only)
- Frequency lockout sets which may or may not be used.

The AN/PRC-117F supports modes 1, 2, and 3 using Integrated COMSEC (ICOM). When using mode 1 fill, an AN/CYZ-10 running RDS is used to load each section of the loadset manually via the RDS Airborne mode. When using mode 2 fill, an AN/CYZ-10 RDS ICOM mode is used to load all the sections of the loadset automatically. Mode 3 is similar, except the user can load an additional frame containing TOD information which is located between the ESET and the frequency lockouts. Mode 3 fill can also load information identical to mode 2 if both TOD and single channel information are not to be loaded.

4.2.2 Load SINCGARS FH Data with MX-18290 ECCM Fill Device

Perform the following procedure to load SINCGARS FH data with the MX-18290 ECCM Fill Device:

- a. Turn fill device off.
- b. Rotate function switch to **LD**.
- c. Select MX-18290 as the appropriate **FILL DEVICE** from the KDU display; press **ENT**.
- d. Connect fill device to **J1 AUDIO/DATA/FILL** connector.
- e. Select the desired **CRYPTO TYPE** as **SINCGARS**; press **ENT**.
- f. Select **TSK** as the **KEY TYPE**, then select the key compartment position number (**01 – 25**). Press **ENT**.
- g. Turn fill device on.
- h. **PRESS ENTER TO INITIATE** displays; press **ENT**.
- i. **FILL IN PROGRESS** displays.
- j. When **FILL DONE, PRESS ANY KEY** displays; press any key.

- k. At the prompt **MORE FILL DATA**, select **YES** to enter more fill data. Repeat Steps f through j and select a different key position number.
- l. When all fill data has been entered, select **NO** at prompt **MORE FILL DATA**.
- m. Turn off fill device power and disconnect from the **J1 AUDIO/DATA/FILL** connector.
- n. Rotate function switch from **LD** to desired operating position of **PT**, **CT**, or **TD**.

4.2.3 Loading SINCGARS FH Fill Data Using AN/CYZ-10 DTD (Mode 1)

By using the RDS procedure to fill an airborne radio (AN/PRC-117F) with a KY-58, the ESETs can be separately loaded from the associated TEKs as required by the AN/PRC-117F in mode 1. Be sure to also load the required Vinson TEKs associated with the SINCGARS loadset. When using an AN/CYZ-10 with RDS, select MX-18290 instead of AN/CYZ-10 DS-101 on the AN/PRC-117F load menus.

Perform the following procedure to load SINCGARS FH Fill Data using AN/CYZ-10 DTD:

- a. Rotate function switch on AN/PRC-117F to **LD**. See Figure 8.
- b. Connect fill device to **J1 AUDIO/DATA/FILL** connector.
- c. Select appropriate fill device of **MX-18290** instead of **AN/CYZ-10 DS-101** on the AN/PRC-117F; press **ENT**.
- d. Select the desired **CRYPTO TYPE** as **SINCGARS**; press **ENT**.
- e. Select **TSK** as the **KEY TYPE**, then select the key compartment position number (**01 – 25**). Press **ENT**.
- f. **PRESS ENTER TO INITIATE** displays. Hold at this point, do not press **ENTER** until the DTD is ready to send data.
- g. Turn AN/CYZ-10 DTD fill device on.
- h. Start RDS application on the AN/CYZ-10, select **RADIO** and then **SEND**. If RDS or RADIO is not initially seen on AN/CYZ-10, press the **MAIN** key or select **APPL** to access all installed user application software. Select **RDS**.
- i. On DTD, select **RADIO** again and then **ABN** for device type.
- j. Select **NO** to KY-58 question and **YES** to ABN radio fill. These selections prepare the ANCD to send only the ESETs in the loadset and not the associated VINSON TEKs. They will be loaded later.
- k. Continue in DTD menus following screen prompts until DTD displays **Press [LOAD] on R/T**.
- l. Press **ENT** key on KDU; **FILL IN PROGRESS** displays.

- m. When **FILL DONE** displays, press any key on KDU.
- n. At the **MORE FILL DATA** prompt, select **YES** to enter more fill data. Repeat Steps e through m to load all the ESETs in the loadset. RDS will loop through **LOADING 'ESET NAME'** and **TRANSFER IN PROGRESS** screens. No operator intervention is required on the DTD and radio during these cycles. Select a different TSK compartment number before loading the next ESET. If any lockout sets are contained in the loadset, change **KEY TYPE** to **LOCKOUT** after all ESETs are loaded. Observe the DTD to see if it contains a LOCKOUT after the last ESET (usually ESET #6). If LOCKOUT Set is not loaded, communications with other SINCGARS compatible radios may not be possible. ESETs in a loadset will be numbered from 1 to 6, but can be loaded by the operator to any of the 25 compartments in the AN/PRC-117F. Ensure not to overwrite any previously loaded ESETs. If loading process times out due to operator lag, the DTD will indicate a data error. Press a down arrow on DTD and answer **YES** to continue. The DTD will continue where it left off in the ESET loading process.
- o. When all fill data is entered, the DTD will indicate **ICOM TRANSFER SUCCESSFUL**. Follow screen prompts and/or press **ABORT** to return to main menu in RDS Radio Menu. VINSON keys will now be loaded.
- p. When the **MORE FILL DATA** prompt displays, select **YES** and press **ENT**.
- q. Select the desired **CRYPTO TYPE** of **VINSON** and the key storage position of 01–25; press **ENT**.
- r. **PRESS ENTER TO INITIATE** displays, hold here on AN/PRC-117F until the DTD is ready to send data.
- s. Use RDS menu for COMSEC and LD to select VINSON TEK associated with the loadset. Prompt DTD until it displays to **Press [LOAD] on R/T**.
- t. Press **ENT** key on KDU; **FILL IN PROGRESS** displays.
- u. When **FILL DONE** displays, press any key on KDU.
- v. When the **MORE FILL DATA** prompt displays, select **NO** and press **ENT**.
- w. Turn off DTD and disconnect it from **J1 AUDIO/DATA/FILL** connector.
- x. Rotate function switch from **LD** to desired operating position of either **PT**, **CT**, or **TD**.
- y. Check all SINCGARS FH net presets for programming with proper HOPSET Compartment, Net ID, and VINSON TEK.

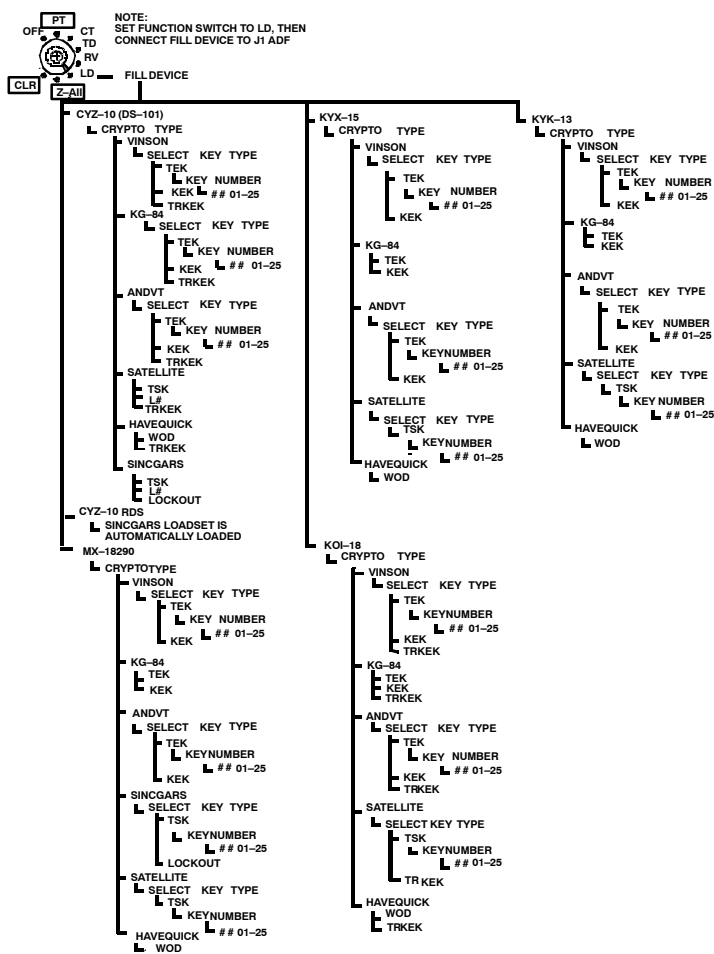


Figure 8. AN/PRC-117F COMSEC LOAD Menus

4.2.4 Loading SINCGARS FH Fill Data using AN/CYZ-10 DTD (Mode 2 and Mode 3)

When using modes 2 and 3, the user must be aware of the COMSEC slots used by the AN/PRC-117F during this automated process. Due to the fact that SINCGARS fill uses Vinson, modes 2 and 3 COMSEC data, TEKs one through five, are loaded into Vinson slots 21 through 25 on the AN/PRC-117F. The sixth COMSEC data is the Vinson KEK. Hopsets are stored in TSK locations 20 through 25 and the coldstart ESET is loaded in location 19. Also, it is assumed that the user did not load ESET into a slot lower than 19. If ESET was manually loaded into a slot lower than 19, coldstart would use the ESET in the lowest numbered slot. This is not a problem as long as all radios are loaded in the same manner and the manually loaded ESET was meant to be used.

When using an AN/CYZ-10 with RDS, select AN/CYZ-10 RDS instead of AN/CYZ-10 DS-101 on the AN/PRC-117F load menus.

Perform the following procedure to load SINCGARS FH Fill Data Using AN/CYZ-10 DTD:

- a. Rotate function switch on AN/PRC-117F to **LD**.
- b. Connect DTD to J1 AUDIO/DATA/FILL connector.
- c. At the AN/PRC-117F, select appropriate fill device of **AN/CYZ-10 RDS** instead of **AN/CYZ-10 DS-101** on the AN/PRC-117F; press **ENT**. AN/PRC-117F displays **PRESS ENTER TO INITIATE**.
- d. Press **ENT**, and the AN/PRC-117F displays **FILL IN PROGRESS**.
- e. Turn **AN/CYZ-10 DTD** fill device on.
- f. Start RDS application on the AN/CYZ-10; select **RADIO** and then **SEND**. If **RDS** or **RADIO** is not initially seen on AN/CYZ-10, press the **MAIN** key or select **APPL** to access all installed user application software, then select **RADIO**.
- g. On DTD, select **RADIO** again and then **ICOM** for device type. AN/CYZ-10 displays **CONNECT TO RT AUD/FILL CONN** ↓.
- h. On DTD, press **ENT**. AN/CYZ-10 displays **SET FCTN SWITCH TO LD ON RT** ↓.
- i. On DTD, press **ENT**. AN/CYZ-10 displays **DO YOU WANT TO INCLUDE TIME? Y/N**. This is the TOD information.
- j. On DTD, select **Y** or **N**. DTD displays **PRESS LOAD ON RT**. At this point, do not press **ENT** or touch any key on the AN/PRC-117F.
- k. Observe that the AN/PRC-117F will display various key store messages and the DTD will display the portions of the hopset being loaded ending with **ICOM TRANSFER SUCCESSFUL**. At this point, do not touch any key on the AN/PRC-117F.
- l. After the DTD has finished, the AN/PRC-117F will continue displaying **KEY STORE IN PROGRESS**.
- m. When **FILL DONE – PRESS ANY KEY** is displayed at the AN/PRC-117F, press any key. The loadset fill has been completed. Turn off DTD and disconnect it from **J1 AUDIO/DATA/FILL** connector. Rotate function switch to desired operating position of either **PT**, **CT**, or **TD**.

5. AN/PRC-117F DATA OPERATION

Data devices can be connected to the radio through the J1 ADF connector or the J3 DATA connector. Data devices with standard KY-57/99 interface cable can be easily used on the J1 ADF connector. Consider data device interface cabling in these areas:

- Voice only
- Combination of Voice and DATA, voice contact first and then data message next.
 - Both on J1 ADF connector.
 - Voice on J1 ADF connector with handset, data operation using cable to J3 DATA connector.
- DATA only
 - J1 ADF connector
 - J3 DATA connector

Data operation of the AN/PRC-117F varies depending on the COMSEC mode being used and to which of these two connectors the data device is connected. Each connector has the ability to sense the connection of a data device and operate according to definite rules determined by the COMSEC mode being used.

5.1 COMSEC – NONE (Plain Text DATA Operation)

For deliberate data operation for plain text data or connection of other crypto devices to the AN/PRC-117F, select COMSEC – NONE in COMSEC programming and place the function switch to the **PT** position. When there are no data devices on either port, the radio configures both J1 ADF connector and J3 DATA connector for voice. The J1 ADF connector takes priority over the J3 DATA connector when a data device is attached to it. If a data device is connected to both jacks, the J1 ADF connector takes priority and makes J3 DATA connector inoperable. With VPOD (Voice Priority Over Data) enabled, the radio can operate with a handset attached to J1 ADF connector for voice and a data device to J3 DATA connector for data operation. Each can key the radio when required but not at the same time.

5.2 VINSON DATA Operation

Under VINSON COMSEC operation, the radio must be programmed for the connector that will be used for data operation. The default in programming is **AUTO ON ADF PORT**, meaning the J1 ADF connector will be configured for DATA operation and the J3 DATA connector will be turned off when a data cable is connected to J1.

Operations requiring switching between voice and data in the same contact period will require connection and disconnection of devices from the J1 ADF connector if only a J1 data interface cable is available. The net preset for this type of operation will use **AUTO ON ADF PORT**.

If using a handset on J1 ADF connector and a data device on the J3 DATA connector, it will require a net preset specifically for voice operation set to **AUTO ON ADF PORT** and another net preset for data operation on the J3 DATA connector set to **AUTO ON DATA PORT**. The operation then can leave the handset and data device connected to the AN/PRC-117F. Operation in voice or data is accomplished by switching between the two adjacent net presets. If VPOD is enabled, this paragraph does not apply.

5.3 KG-84 DATA Operation

KG-84 is a data only COMSEC mode and connection of a handset to J1 ADF connector will be ignored by the radio when it is keyed. Depending on which connector the data device is initially attached, the radio will configure that port for data operation and shut off the other connector. SATCOM HPW operation can only be done using the J3 DATA connector.

5.4 ANDVT DATA Operation

ANDVT COMSEC is used only in UHF SATCOM operations. When there are no data devices connected to either port, the radio configures the J1 ADF connector and J3 DATA connector for voice. The radio can be simply operated from one preset for voice or data on either connector. Upon connection of a data device to either connector, it takes priority and configures the connector for data operation. When a data device is attached to J3 DATA connector and a handset is connected to the J1 ADF connector, either device can key the radio, but not simultaneously. When one port is being keyed, a key on the other port will be ignored.

5.5 FASCINATOR Operation

FASCINATOR encryption does not support digital data operation. The J1 ADF connector and the J3 DATA connector will be configured for voice operation.

5.6 KYV-5 Operation

KYV-5 COMSEC allows selection of EDM data rates.

6. NORMAL MODE NET PRESET PROGRAMMING

Radios must be programmed before communicating in a radio net. Net presets have the following characteristics:

- Up to 100 normal mode net presets, 10 DAMA net presets, and one beacon mode preset can be programmed into each radio.
- Scan mode requires normal mode LOS and SATCOM net presets to be programmed before scan operation can be configured.
- Net names consist of up to 12 user defined alphanumeric characters.

NOTE

Spaces are not allowed. The default name for each normal mode net is **NET##**, where **##** represents a number from 0 to 99. Default DAMA net name is **DAMANET#**, where **#** represents a number 0 to 9.

- Each net may be enabled or disabled during programming at the **ACTIVATE IN LIST?** prompt. This allows for net presets to be programmed and set aside for later use and not seen. Nets not activated, can be called up by entering the net preset number for them.
- In program mode, pressing **NET/PRE +** or **NET/PRE –** returns the radio to the last use operational mode display. The **NET/PRE +** or **NET/PRE –** key is not active in DAMA mode.
- Net presets for asynchronous data operation requires data port configuration programming to properly interface an asynchronous data device. HPW SATCOM data and RETRANS mode operation automatically configures the radio J3 DATA connector.

7. NORMAL MODE

See Figure 9. Perform the following procedure to program normal mode nets:

- a. Press **PGM**.
- b. Select **NORM**.
- c. Select **NET**. The KDU displays **SELECT NET TO MODIFY (00 – 99)**. Use the number keys on the KDU to select desired net. Press **ENT** to continue.

If **ACTIVATE IN LIST?** is set to **YES**, that net is accessible using the **NET/PRE +** or **NET/PRE –** key in normal operation. If **ACTIVATE IN LIST?** is set to **NO**, then the net can only be called up by entering the nets' channel number. Nets can be programmed and held in reserve until needed.

- a. Select type of net preset:
 - LOS FIX FREQUENCY – Paragraph 7.1
 - UHF SATCOM – Paragraph 7.2
 - FREQUENCY HOPPING – Including:
 - SINGARS FH – Paragraph 7.4
 - HAVEQUICK – Paragraph 7.5



To avoid damage to hearing, check the handset volume before using the handset.



To prevent electrical shock and Radio Frequency (RF) burns, avoid making RF power output connections or touching antenna while in transmit mode.

At this point the radio will be at the programming submenu for the type of channel to be programmed. Do not leave the programming submenu until all elements are properly programmed. Refer to the tables in each referenced paragraph for information on making the proper programming selections. A capabilities table precedes the programming section for each normal mode.

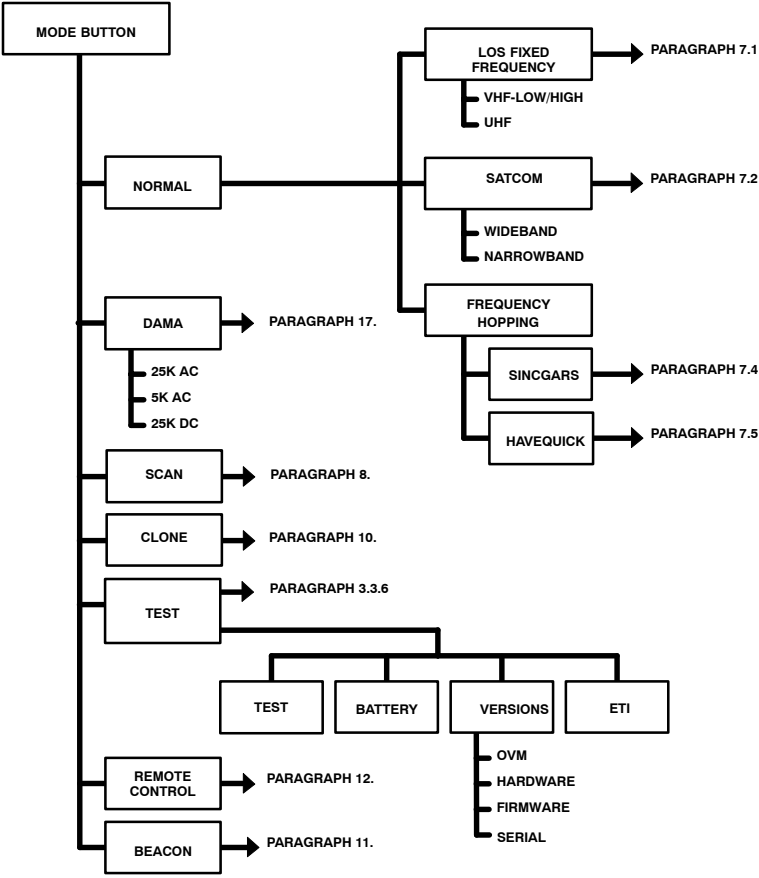


Figure 9. AN/PRC-117F Operating Modes

7.1 LOS Fixed Frequency Operation

The AN/PRC-117F can be set up according to the capabilities listed in Table 12.

Table 12. LOS Fix Frequency Capabilities

Band of Operation	MOD	COMSEC	DATA VOICE	Data Rates SYNC / ASYNC
VHF-LOW 30 – 89.99999 MHz <u>10 watts</u> Maximum	FM	PT-NONE	VOICE	SDM, EDM, 16kbps
	FM	PT-NONE	DATA	12 kbps, 16 kbps
	TCM	PT-NONE	DATA	48 kbps, 64 kbps
	FM	VINSON	VOICE	16 kbps, SDM rates
	FM	VINSON	DATA	16 kbps, SDM rates
	FM	KYV-5	DATA	16 kbps, EDM rates
	FM	KG-84C	DATA only	16 kbps
	TCM	KG-84C	DATA only	48 kbps, 64 kbps
	HPW	KG-84C	DATA only	1600, 2666, 8000, 16 k, 21.3 k, 42.6 k 64 kbps
VHF-HIGH 90 – 224.99999 MHz <u>20 watts</u> FM / TCM <u>10 watts</u> AM	AM/FM	PT-NONE	VOICE	N/A
	AM/FM	PT-NONE	DATA	12 k, 16 k
	TCM	PT-NONE	DATA only	48 kbps, 64 kbps
	AM/FM	VINSON	VOICE	16 kbps
	AM/FM	VINSON	DATA	16 kbps
	FM only	FASCINATOR	VOICE only	12 kbps
	AM/FM	KG-84C	DATA only	16 kbps
	TCM	KG-84C	DATA only	48 k, 64 k
	HPW	KG-84C	DATA only	1600, 2666, 8000, 16 k, 21.3 k, 42.6 k 64 kbps

Table 12. LOS Fix Frequency Capabilities – Continued

Band of Operation	MOD	COMSEC	DATA VOICE	Data Rates SYNC / ASYNC
UHF 225 – 511.99999 MHz <u>20 watts</u> FM / TCM 225 – 399.99999 MHz <u>10 watts</u> AM / FM / TCM 400 – 511.99999 MHz	AM/FM	PT-NONE	VOICE	N/A
	AM/FM	PT-NONE	DATA	12 kbps, 16 kbps
	TCM	PT-NONE	DATA only	48 kbps, 64 kbps
	AM/FM	VINSON	VOICE	16 kbps
	AM/FM	VINSON	DATA	16 kbps
	FM only	FASCINATOR	VOICE only	12 kbps
	AM/FM	KG-84C	DATA only	16 kbps
	TCM	KG-84C	DATA only	48 k, 64 k
	HPW	KG-84C	DATA only	1600, 2666, 8000, 16 k, 21.3 k, 42.6 k 64 kbps

7.1.1 LOS Fix Frequency Programing Checklist Table

Table 13 contains the programming parameters that can be accessed from the programming sub-menu. See Figures 10 and 11 for the LOS Fix Frequency Programming sub menu and tree.

Table 13. LOS Net Preset Programming Parameters

FREQUENCY		
Menu Item	Options	Remarks
RECEIVE FREQUENCY 30 MHz – 512 MHz	30.00000 – 89.99999 MHz 90.00000 – 224.99999 MHz 225.00000 – 511.99999 MHz	For Half Duplex operation, transmit and receive frequencies can be different, consider antenna systems.
TRANSMIT FREQUENCY 30 MHz – 512 MHz	30.00000 – 89.99999 MHz 90.00000 MHz – 224.99999 MHz 225.00000 – 511.99999 MHz	For Half Duplex operation, transmit and receive frequencies can be different, consider antenna systems.
RECEIVE ONLY	YES NO	YES sets radio to EMCON, no transmit capability.
COMSEC		
Menu Item	Options	Remarks
CRYPTO MODE	NONE	Function switch used in PT.
	VINSON	Voice and Data 16 kbps.
	FASCINATOR	FM and Voice Only, indi- cated in use by 12 kbps data rate.
	KG-84	Data Only, needed for TCM 64 K data and HPW.
	KYV-5	KYV-5 – Required for En- hanced Data Mode (EDM) data rates. Allows VINSON compatible voice (30.000 MHz to 87.985 MHz only).
ANALOG DATA	YES	Turns off crypto resyncs for using external data devices with own MODEM.
	NO	RS-232 Digital Interface.

Table 13. LOS Net Preset Programming Parameters – Continued

COMSEC		
Menu Item	Options	Remarks
KG-84 SYNCHRONIZA- TION	REDUNDANT MODE 1 REDUNDANT MODE 2 NON-REDUNDANT MODE 3 NON-REDUNDANT MODE 4	Match mode used in net. All must be the same.
DATA/VOC		
Menu Item	Options	Remarks
DATA/VOICE	VOICE	When FASCINATOR is selected
	DATA	When KG-84 is selected
	AUTO ON ADF PORT	When VINSON COMSEC is selected. Select port needed to receive data on. Select VINSON for SDM data rates. Select KYV-5 for EDM data rates.
	AUTO ON DATA PORT	
	DATA OR VOICE	When PT and COMSEC NONE is selected.
MODULATION	AM	90.0 – 511.99999 MHz only.
	FM	30.0 – 511.99999 MHz.
	TCM	Requires using KG-84
	HPW	Requires using KG-84
AM CHANNEL SPACING	25 kHz	Normal AM bandwidth
	8.33 kHz 12.5 kHz	Narrowband AM selections
SYNC/ASYNCT SELECT	SYNC ASYNCT	ASYNCT requires port configuration under CFIG programming.
FM DEVIATION	5 kHz 6.5 kHz 8 kHz	8 kHz most common tactical setting.
BAUD RATE	PT 12 kbps (FM) 16 kbps (AM/FM)	Select desired data rate. Hi-speed data requires using KG-84 COMSEC.
	TCM 48 kbps 64 kbps	

Table 13. LOS Net Preset Programming Parameters – Continued

DATA/VOC		
Menu Item	Options	Remarks
VOICE MODE	CLEAR	PT Voice only.
	MODEM	PT Data only – COMSEC-NONE.
ENCRYPTION KEY	TEK 01 – 25	Each COMSEC mode has up to twenty five keys, except FASCINATOR and KYV-5 share with VINSON.
SQUELCH		
Menu Item	Options	Remarks
DIGITAL SQUELCH	ON OFF	Digital Squelch ON prevents PT override.
ANALOG SQUELCH	OFF TONE NOISE	Tone Squelch is unavailable if CTCSS or CDCSS is ON. Do not use TONE unless all radios in the net support it.
ANALOG SQUELCH LEVEL	LOW MED-LOW MED MED-HIGH HIGH	AM Noise Squelch only. Do not set too high and lose ability to receive weaker signals.
CTCSS (PT mode only)	OFF ON	If ON, TONE squelch is not available.
CDCSS (PT mode only)	OFF ON	If ON, TONE squelch is not available.
POWER		
Menu Item	Options	Remarks
TX POWER LEVEL	1 – 10 watts (20 watts PEP, 10 avg AM)	30 – 89.9999 MHz and 400 – 511.99999 MHz 10 watts for FM,TCM 90 – 511.99999 MHz – AM
TX POWER LEVEL	1 – 20 watts	90 – 399.99999 MHz – FM/TCM
TX POWER LEVEL	1 – 10 watts PEP (4 watts average)	400 – 511.99999 MHz – AM

Table 13. LOS Net Preset Programming Parameters – Continued

NAME		
Menu Item	Options	Remarks
CHANGE NET NAME	NET00 – 99	12 characters alphanumeric, no spaces or repeated names.

FREQ	COMSEC	DATA/VOC
SQUELCH	POWER	NAME
USE < > TO SELECT ITEM		

Figure 10. LOS Fixed Frequency Programming Sub Menu

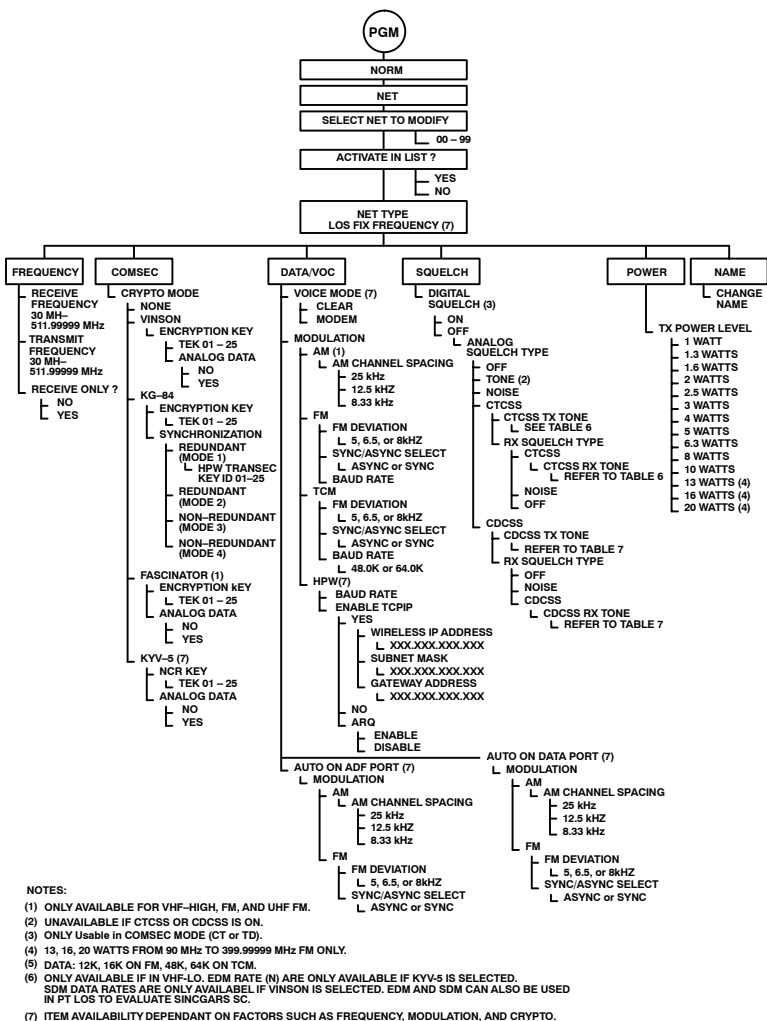


Figure 11. LOS Fixed Frequency Programming Tree

7.1.2 LOS Fixed Frequency Operational Steps

Ensure antenna is installed for proper band or mode of operation. Refer to Table 14. See Figures 12 and 13 for receive and transmit displays.

Table 14. Operational Mode and Output Jacks

Frequency Band or Mode	Output Jack
30.00000 MHz – 89.99999 MHz VHF-Low	VHF-LOW J5
90.00000 MHz – 224.99999 MHz VHF-High	VHF-HI / UHF J8
225.00000 MHz – 511.99999 MHz UHF	VHF-HI / UHF J8
SINCGARS FH (30.000 – 87.975 MHz)	VHF-LOW J5
HAVEQUICK FH (225.000 – 399.975 MHz)	VHF-HI / UHF J8
Dedicated or DAMA UHF SATCOM	VHF-HI / UHF J8
BEACON (90.00000 – 511.99999 MHz)	VHF-HI / UHF J8
SCAN (LOS and SATCOM only)	Dependent on preset channels scanned

7.1.2.1 PT Operation

Perform the following procedure to operate the radio in LOS fixed frequency PT MODE:

- a. Rotate function switch to **PT**.
- b. After the radio initializes, press **MODE**, select **NORMAL**. If radio does not start in Normal mode, press **ENT**.
- c. Select desired LOS fixed frequency net by pressing the **NET/PRE** + or – switch.
- d. Adjust **VOL** + or – switch for adequate listening level.
- e. Begin radio operations.
 - Monitor handset closely for any received transmissions.
 - Press handset PTT when required to transmit.
 - Press KDU circular arrow key to monitor status displays for net preset.
 - Access menus under OPT key to make minor operations changes.
 - Do not press PRG key as this places radio offline while in programming mode. No communications will be possible until returned to normal mode.

7.1.2.2 CT Operation

Perform the following procedure to operate the radio in LOS fixed frequency CT MODE:

- a. Rotate function switch to **CT** or **TD**.
- b. After the radio initializes, press **MODE**.
- c. At the **OPERATIONAL MODE** prompt, select **NORMAL** and press **ENT**.
- d. Select desired LOS fixed frequency net preset by pressing the **NET/PRE +** or **-** switch. Check display for proper COMSEC mode and TEK number. **NO KEY** indicates that a net has been programmed for a TEK that has not been loaded.
- e. Adjust VOL +/- key for adequate listening level.
- f. Begin radio operations.
 - Radio will default to VINSON and TEK 01 if no COMSEC mode has been programmed for a net preset capable of Vinson operation.
 - Communications to other station with different keys is impossible. If this is suspected, go to PT and attempt communications with other station. Indicate PT in your transmission to facilitate the other station to go to PT in troubleshooting the key mismatch.
 - Radio will not allow any transmissions if no COMSEC key is programmed for a net preset and loaded to the programmed storage position. Handset Push-To-Talk (PTT) action produces display of **WARNING NO TEK LOADED**.
 - Fascinator COMSEC mode is only indicated by a KDU data rate display of 12 kbps. Keys from Vinson are used, and COMSEC mode will still display as Vinson.
 - KYV-5 COMSEC mode also uses keys from Vinson and allows EDM data rates to be selected. (EDM data rates are displayed with an N next to the data rates.)
 - Data SINCGARS Improvement Program/Enhanced SINCGARS Improvement Program (SIP/ESIP) data rates can be used.
 - When KG-84 is the selected COMSEC mode, radio can only be keyed by properly interfaced Data Terminal Equipment (DTE) on J1 ADF or J3 DATA connectors. Pressing handset PTT produces display of **KEYLINE IGNORED**.
 - Use TD position when communicating to a scanning AN/PRC-117F or retransmission system. (TD only affects Vinson operation.)

7.1.2.3 LOS HPW Operation

LOS HPW is a data-only mode for communications over traditional LOS channels with greatly increased data throughput. It combines features of both MIL-STD-188-181B and MIL-STD-188-184 to permit error free data communications at high Over-The-Air (OTA) burst data rates. HPW also supports Internet Protocol (IP) data.

Refer to Harris Wireless Messaging Terminal Software RF-6710W-HPW Manual, (10515-0093-4220), concerning operation of the AN/PRC-117F using HPW LOS. This paragraph assumes the network database has been programmed and the MS Outlook personal address book is setup with stations being used in the network database.

Perform the following steps to operate in HPW LOS mode:

- a. Connect Personal Computer (PC) with properly configured RF-6710W-HPW Wireless Messaging Terminal from its ASYNC COMM port jack to the AN/PRC-117F J3 DATA connector with HPW-PPP data cable (10513-0710).

NOTE

Do not confuse the HPW-PPP cable with a standard RS-232 ASYNC data cable or remote control cable that may physically look identical. These cable types do not function with the radio when it is in the HPW LOS mode.

- b. See Figure 12. Turn on the radio and set the function switch to **CT** and select a net preset that has been configured for HPW LOS. It should contain the following programmed parameters:
 - KG-84 COMSEC using **REDUNDANT MODE 1** synchronization
 - KG-84 TEK loaded and programmed to HPW LOS net preset
 - HPW TRANSEC key loaded to and programmed to HPW net preset. It is recommended to use the KG-84 TEK here if prescribed and coordinated by higher authority. Check local Standard Operating Procedures (SOPs).
 - HPW modulation selected and HPW baud rate set.
 - HPW TOD set to +/- 30 seconds of Universal Coordinated Time (UTC). This is manually set by the operator, or set using GPS.
- c. Turn on PC and allow operating system to fully boot. Start MS Outlook using Wireless Messaging Terminal (WMT) Profile. Observe that the Dial-Up Networking icon and Radio System icon appear in the system tray of the desktop. If no Dial-Up Networking (DUN) icon appears, or a yellow asterisk is seen on the Radio System icon, there is a problem with either the DUN setup, the cable connection, or the HPW net settings. Click on event log icon in Outlook and look for status of IDLE in both the event log and floating protocol status window. Windows NT systems do not display DUN icon but do display the radio system icon.

- d. Assigned local address in the HPW data network is located at the top of the Outlook program window. If incorrect, shutdown Outlook. Go to WMT settings and change to correct address. Apply settings and reboot the computer to make the changes go into effect. Restart Outlook as described in Step c.
- e. Send a message by clicking on Outlook **New Mail Message** Toolbar icon or selecting **New Mail Message** from file menu. Compose the message, select address of recipients, and select any attachment to be included.
- f. Use RF Properties on the File menu to set HPW Send Options for the message.
- Transmission Mode: ARQ – This selection is the default normal operation mode and allows for the starting code rate to be selected, if desired. Once transmission begins, the code rate varies according to channel conditions as determined by how well the receiving station gets the data. The default starting code rate will be medium.
 - Transmission Mode: Non-ARQ – Locks sending terminal into sending message at low code rate to help ensure message reception under poor channel conditions. Code rate selection is not available if Non-ARQ is selected. Used mainly to transmit messages to outstations operating under signal security restrictions that do not want to transmit from their location.
 - Code Rate – Selected for ARQ operation:
 - Low, 4-ary Phase Shift Keying (PSK)
 - Medium, 8-ary PSK, Default starting code rate
 - High, 16-ary PSK
 - Highest Priority – Channel Access – Places the message to be sent next, ahead of all others in the Outbox and attempts to immediately access the channel if no other users have selected this priority.
 - Compress Message – Message and attachment are compressed if selected. No additional compression occurs on non-compressible attachments such as JPGs or ZIP files. Compression greatly improves throughput on message files that can be compressed.
- Messages can also be sent using the Harris Enhanced Text Form. This form contains all the options pertaining to the sending of messages in one place for ease of operation. Be sure to press **SEND** button instead of **EXIT** or messages composed and ready to send will be lost.
- g. Received messages are indicated of their incoming status by the HPW protocol status window. Upon successful reception, go to the Inbox to read the received message. View and save attachments. Reply or forward the message as necessary.
- h. While messages are being transmitted or received, view detailed message status in applicable radio outbox or radio inbox. Monitor Event Log to all system status messages.

- i. Consult the RF-6710W-HPW Manual (10515-0093-4220) to assist in isolating problems.

7.1.2.4 Operational Overrides

Changes can be made while operating in a LOS fixed frequency net preset without reprogramming the AN/PRC-117F. This includes operating frequency, squelch, transmitter power levels, COMSEC parameters, and type of net. Press the right arrow key on the KDU, on a current operating net preset display, to find items that can be modified. Modifiable items begin to flash. Press the up/down arrow keys or numeral keys to change value of the flashing item. When changing frequency or net number, use the numeral keys to enter the desired number. Other items can be overridden by pressing the **OPT** button on the KDU. Changes to squelch can be directly accessed by pressing the **SQ** button on the KDU. Using display overrides and the options menu allows continued operation on the currently selected net preset. During ongoing communications, entering back into programming mode takes the AN/PRC-117F off line. No communications is possible until AN/PRC-117F is returned to normal mode.

The AN/PRC-117F can be configured to automatically save overrides. If **AUTO SAVE** function is set to **OFF**, the operator can temporarily override programmed net parameters. An asterisk (*) appears to the left of the net name on the LCD, indicating the net preset parameter was temporarily changed. If security is ON and the net is locked, the indicator will be a plus (+) sign. These changes are valid until the operator selects another programmed net preset. When the net is changed, the temporary changes are lost. To permanently save the changes as programmed values, select the **SAVE** command from the **OPT** menu and save the net preset as a new preset. If **AUTO SAVE** function is set to **ON**, all changes are saved automatically and the **SAVE** command is absent from **OPT** menu.

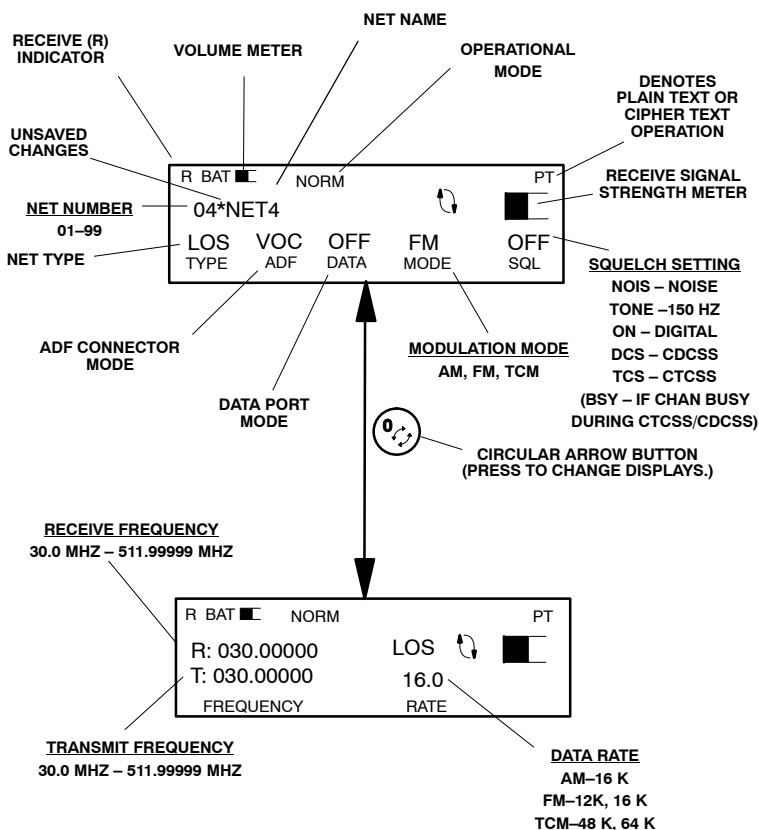


Figure 12. LOS Fix Frequency Operational Displays, Receive

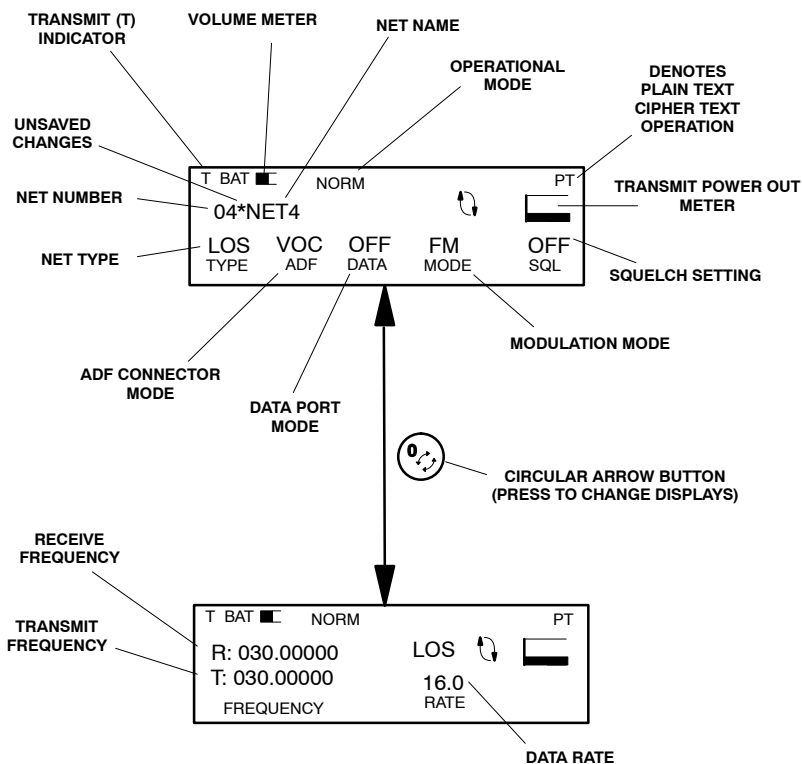


Figure 13. LOS Fix Frequency Operational Displays, Transmit

7.2 Dedicated UHF SATCOM Operation

The AN/PRC-117F operates in UHF SATCOM mode using MIL-STD-188-181B modulation and HPW data operation. It supports encrypted voice and data communications in wideband 25 kHz and narrowband 5 kHz channels.

The AN/PRC-117F in SATCOM mode is compatible with VINSON KY-57 (wideband 25 kHz), ANDVT KY-99/99A, and KG-84C cryptographic equipment. Refer to Tables 15 through 17 for capabilities.

Table 15. Dedicated UHF SATCOM Capabilities

Band of Operation	MOD	COMSEC	DATA VOC	DATA RATES SYNC or ASYNC
Dedicated SATCOM 5 kHz Narrowband Channel 20 watts max	MS181	PT-NONE	DATA only	1200, 2400
	MS181	ANDVT	VOICE	2400
	MS181	ANDVT	DATA	300, 600, 1200, 2400
	MS181	KG-84C	DATA only	1200, 2400 using SBPSK
	MS181	KG-84C	DATA only	4800, 6000, 7200, 8000, 9600 using CPM
	HPW	KG-84C	DATA only	4 – 8.5 kbps – ARQ
Dedicated SATCOM 25 kHz Wideband Channel 20 watts max	MS181	PT-NONE	DATA only	1200, 2400, 9600 2kbps, 16 kbps
	MS181	VINSON	VOICE	16 kbps
	MS181	VINSON	DATA	16 kbps
	MS181	KG-84C	DATA only	1.2 k, 2.4 k, 9600, 16 k
	MS181	KG-84C	DATA only	19.2, 28.8, 32, 38.4, 48, 56 kbps using CPM
	MS181	ANDVT	DATA	300, 600, 1200, 2400
	MS181	FASC	VOICE	Special Retrans Systems
	HPW	KG-84C	DATA only	18 – 56 kbps – ARQ

Table 16. 5 kHz MIL-STD-188-181B Data Rate Options

OPTION	I/O DATA RATE	MODULATION TYPE	APPLICABLE COMSEC	VOICE or DATA	REMARKS
008	1200	SBPSK	KG-84	DATA	181A
010	2400	SBPSK	KG-84	D/V	181A NB Voice
010	2400	SBPSK	ANDVT	D/V	181A NB Voice
A10	1200	SBPSK	ANDVT	DATA	
B10	600	SBPSK	ANDVT	DATA	
C10	300	SBPSK	ANDVT	DATA	
013	4800	CPM	KG-84	DATA	
016	6000	CPM	KG-84	DATA	

Table 16. 5 kHz MIL-STD-188-181B Data Rate Options – Continued

OPTION	I/O DATA RATE	MODULATION TYPE	APPLICABLE COMSEC	VOICE or DATA	REMARKS
018	7200	CPM	KG-84	DATA	
020	8000	CPM	KG-84	DATA	
021	9600	CPM	KG-84	DATA	

Table 17. 25 kHz MIL-STD-188-181B Data Rate Options

OPTION	I/O DATA RATE	MODULATION TYPE	APPLICABLE COMSEC	VOICE or DATA	REMARKS
130	9600	SBPSK	KG-84	DATA	181A
131	9600	CPM	KG-84	DATA	
132	16k	FSK	VINSON	D/V	181A WB Voice
F12	12k	FSK	FASCINATOR	VOICE	
137	19.2k	CPM	KG-84	DATA	
139	28.8k	CPM	KG-84	DATA	
141	32k	CPM	KG-84	DATA	
143	38.4k	CPM	KG-84	DATA	
144	48k	CPM	KG-84	DATA	
145	56k	CPM	KG-84	DATA	

7.2.1 UHF Dedicated SATCOM Programming Checklist

Table 18 outlines programming parameters necessary for Dedicated UHF SATCOM net presets. See Figures 14 and 15 for the sub menu and programming tree. Refer to Paragraph 7.2.2 to access this menu.

Table 18. UHF SATCOM Programming Parameters

FREQ		
Menu Item	Options	Remarks
FREQUENCY CODE	Channel Number 001 – 249, or 999	Refer to Table 45 for list of FREQ codes.

Table 18. UHF SATCOM Programming Parameters – Continued

FREQ		
Menu Item	Options	Remarks
RECEIVE FREQUENCY	999	Use 999 to manually enter non-standard uplink and downlink frequencies. 225.00000 – 511.99999 MHz
TRANSMIT FREQUENCY		
RECEIVE ONLY	NO YES	YES for EMCON, no transmit.
COMSEC		
Menu Item	Options	Remarks
CRYPTO MODE	NONE	Function switch in PT, mode defaults to DATA only.
	VINSON	Not available on NB channels.
	ANDVT	2400 Max data rate. LPC/MELP
	KG-84	2400 Max data rate. LPC/MELP
	FASCINATOR	Not available on NB channels. Available for SATCOM to LOS BLACK RETRANS.
ENCRYPTION KEY	TEK 01 – 25	Load TEKs first.
ANALOG DATA	YES NO	External devices with own modem, eliminates crypto resynchs that interfere. (KL-43C/F).
KG-84 SYNCHRONIZATION	REDUNDANT MODE 1 REDUNDANT MODE 2 NON-REDUNDANT MODE 3 NON-REDUNDANT MODE 4	Match mode used in net. HPW operation requires MODE 1.
HPW TRANSEC KEY ID	TSK 01 – 25	TSK loaded in SATELLITE Storage position.
TRAINING FRAMES	6, 9, 12, 15, 30, or 60	Sets length of Training Frames Sequence, 9 is default.
DATA/VOC		
Menu Item	Options	Remarks
DATA/VOICE	DATA	Only option w/KG-84 selected.
	AUTO ON ADF PORT	With VINSON, select port wanted to receive DATA.
	AUTO ON DATA PORT	
	DATA OR VOICE	w/ ANDVT COMSEC

Table 18. UHF SATCOM Programming Parameters – Continued

DATA/VOC		
Menu Item	Options	Remarks
MODULATION	MS181	Regular SATCOM
	HPW	Requires using KG-84 encryption in mode 1.
SYNC/ASYNCELECT	ASYNCE	ASYNCE requires port programming.
	SYNCE	Synchronous data systems
BAUD RATE	(HPW) UFO (25 kHz) WB (25 kHz) NB (5 kHz)	Select type of Satellite used, NB only on NB channel when using FREQ Code 999. Refer to Table 45.
OPTION	DATA OPTION CODES	Refer to Tables 16 and 17 for listing of selectable codes. Available options dependent on FREQ code and COMSEC previously selected.
SQUELCH		
Menu Item	Options	Remarks
DIGITAL SQUELCH	ON OFF	Digital Squelch ON prevents PT override from occurring.
POWER		
Menu Item	Options	Remarks
TX POWER LEVEL	2 – 20 watts	Steps in 1 dBm increments.
NAME		
Menu Item	Options	Remarks
CHANGE NET NAME	NET00 – 99	12 characters alphanumeric, no spaces.

FREQ	COMSEC	DATA/VOC
SQUELCH	POWER	NAME
USE < > TO SELECT ITEM		

Figure 14. UHF SATCOM Programming Sub Menu

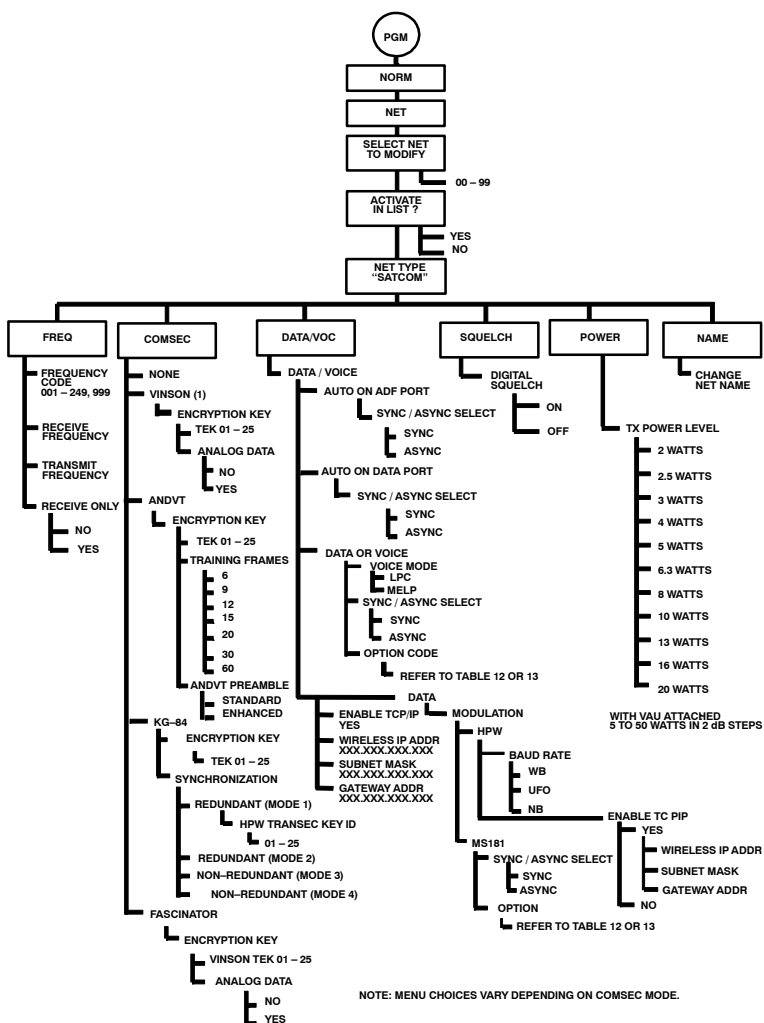


Figure 15. SATCOM Programming Menu

7.2.3 Dedicated UHF SATCOM Operational Steps

To operate in Dedicated UHF SATCOM mode, connect a medium or high gain SATCOM antenna to VHF-HI/UHF J8 antenna connector with a coax cable.

Analyze terrain in planned areas of operation for satellite look angle access. Verify the SATCOM antenna is correctly oriented using a compass to point the antenna on the proper horizontal azimuth to the satellite. Make an approximate antenna vertical elevation adjustment. Pointing graphs and look angle calculation software are available to assist in this task. Refer to Paragraph 30. Azimuths from these graphs are not adjusted for local magnetic declination. Table 19 contains UHF satellite positions.

Perform the following procedure to check SATCOM antenna pointing, using the SATCOM Receive Signal Strength Indicator (RSSI) Test:

NOTE

The SATCOM RSSI Test can only be conducted using data operating parameters of 1200 or 2400 bps. Preselect data operation using KG-84 or ANDVT at one of these rates prior to initiating the test.

- a. After placing the AN/PRC-117F into normal mode Dedicated SATCOM operation, press the **CALL** button on the KDU.
- b. Press **ENT** to initiate the SATCOM RSSI Test.
- c. Watch display for test completion. A relative signal strength score will be displayed with a value from 000 to 100. Repeat test and adjust pointing of the SATCOM antenna to obtain a better than 80 score.
- d. Press **CLR** to exit SATCOM RSSI Test. Return to net preset for Vinson 16 kbps operation if using a WB channel.

Perform the following procedure for Dedicated UHF SATCOM operation:

- a. Rotate function switch to **CT** or **TD**. The AN/PRC-117F does not allow PT non-secure voice operation in SATCOM to operate in a non-secure SATCOM mode. The radio defaults to DATA only operation when **PT** is selected.
- b. After the radio initializes, press **MODE**.
- c. At the **OPERATIONAL MODE** prompt, select **NORMAL**; press **ENT**.
- d. Select the desired **SATCOM** net preset by pressing the **PRE +** or **-** switch (NET +/- switch on some versions).
- e. Begin radio operation. See Figure 16 for SATCOM operational displays.

Table 19. UHF Satellite Positions

Footprint Name	Satellite Position
CONUS	100 and 105 deg W Longitude
LANT	15 and 23 deg W Longitude
IO	72 and 72.5 deg E Longitude
PAC	172 and 177 deg E Longitude

7.2.4 SATCOM 181B Data Operation using KG-84 COMSEC and CPM

When using a SATCOM net preset using KG-84 COMSEC and Continuous Phase Modulation (CPM), the sender transmitting station decides which CPM Data Option to conduct the transmission in. The receiving end must also be using a CPM data code of the same channel type, either the 5 K group or the 25 K group.

Perform the following procedure to change the data option code for the currently selected SATCOM net preset:

- Press circular arrow key to view the data option page of the SATCOM net preset. See Figure 16 for SATCOM displays.
- Use left/right arrow keys to scroll over to data option field. With the up/down arrow key, select the required code. Only the data option codes relating to the presently selected COMSEC mode and or satellite channel type can be selected.
- Refer to Tables 16 and 17. If COMSEC mode needs to be changed to achieve required data option, use the COMSEC menu under OPT key.
- Pay attention to the data rate while in receive. The data rate may change to a slower data rate if transmitting party is unsuccessful. (User may want to select a new data rate for transmitting if this happens.)

Perform the following procedure to send SATCOM DATA with CPM data option:

- Ensure net communications plan is for all outstations to use a CPM data option from the table for the same channel type of 5 kHz or 25 kHz. A synchronous data transmission application is best.
- Sending station selects the desired CPM data option to transmit the data message with. Upon transmitting the message, the receiving radio will automatically match speed of the sending station.
- If transmission is unsuccessful, in that the receiving end does not acknowledge good reception, it may be necessary to reduce the CPM data rate and re-attempt the data transmission. If transmissions continue to be unsuccessful, troubleshoot the communications software setup to help determine the communications failure.

7.2.5 Operational Overrides

Changes can be made while operating in Dedicated UHF SATCOM without reprogramming the AN/PRC-117F, including channel number, frequency, squelch, power levels, COMSEC parameters, and type of net. Press the right arrow key on the KDU while operating on a current net preset display to find items that can be modified. Modifiable items begin to flash. Press the up/down arrow keys or numeral keys to change value of the flashing item. Other items can be overridden by pressing the **OPT** key on the KDU. Changes to squelch can be directly accessed by pressing the **SQ** key on the KDU. Using display overrides and the options menu allows continued operation on the presently selected net preset. During ongoing communications, entering back into programming mode takes the AN/PRC-117F off line. No communications are possible until the AN/PRC-117F is returned to normal mode.

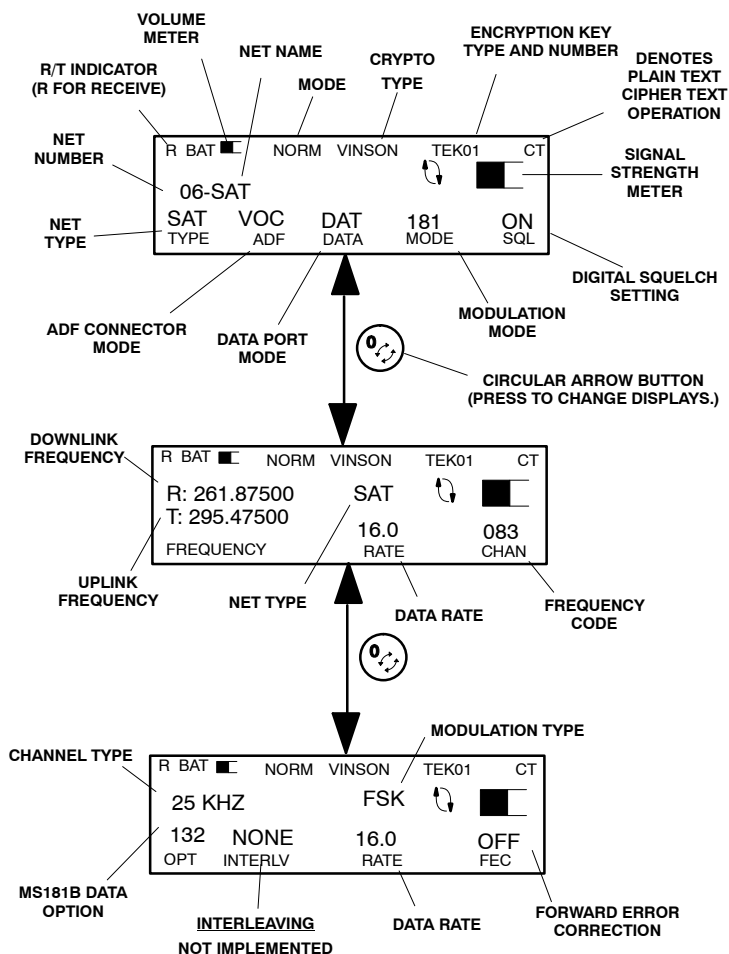


Figure 16. Dedicated UHF SATCOM Displays

7.2.6 Dedicated UHF SATCOM Operation using High Performance Waveform (HPW)

HPW is a dedicated SATCOM modulation selection that uses KG-84 encryption in synchronization redundant mode 1 for increased data rates over UHF satellite channels. Refer to Table 4 for HPW data rates. A separate TSK is used in HPW mode. Accurate TOD synchronization to + / – thirty (30) seconds between terminals using HPW is also required. HPW only supports data communications and is used in conjunction with Microsoft Outlook based Harris Windows Messaging Terminal software RF-6710W-HPW.

Table 20 lists all the necessary parameters required to program the AN/PRC-117F radio for HPW Dedicated UHF SATCOM operation. Refer to Table 18 for all other UHF SATCOM programming parameters.

Table 20. HPW SATCOM Net Preset

Menu Item	Parameter	Value
117F Mode	NORMAL Mode	SATCOM
FREQ	FREQUENCY CODE	001 – 239 999
COMSEC	CRYPTO MODE	KG-84 must be selected first in programming.
	ENCRYPTION KEY	TEK 01 – 25
	HPW TRANSEC KEY ID	SATCOM TSK 01 – 25
	KG-84 SYNCHRONIZATION MODE	REDUNDANT MODE 1 required.
DATA / VOC	DATA/VOICE Mode DATA	DATA, default by selecting KG-84 COMSEC.
	MODULATION HPW	HPW will not be available if KG-84 and mode 1 not programmed.
	BAUD RATE UFO WB NB	UFO when using a UFO satellite. WB is for FLTSATCOM. NB CHAN is set to NB.
WMT DTE to Radio Connection	Cable # (10513-0710-A006)	J-3 Data connector only.
PORTS	Port configuration for HPW is automatically set by selecting HPW modulation in DATA/VOC.	
HPW TOD	ZULU Time (UTC)	+ / – 30 seconds, User manual entry or GPS synchronization in OPT menu.
Terminal Software	MS Windows 95/98/NT MS Outlook 97/98 Harris RF-6710W-HPW	RF-6710W-HPW V2.6 software adds WMT extension to MS Outlook giving it AN/PRC-117F HPW capabilities.

See Figure 17 for sample screen. HPW SATCOM is a data only mode for communication over SATCOM channels with greatly increased data throughput. It combines features of both MIL-STD-188-181B and Mil-STD-188-184 to permit error free data communications at high Over-The-Air (OTA) burst data rates. HPW also supports Internet Protocol (IP) data.

Refer to Harris Wireless Messaging Terminal Software RF-6710W-HPW Manual, (10515-0093-4220), concerning operation of the AN/PRC-117F using HPW SATCOM. This paragraph assumes the network database has been programmed and the MS Outlook personal address book is setup with stations being used in the network database.

Perform the following procedure to operate in HPW SATCOM mode:

- a. Connect Personal Computer (PC) with properly configured RF-6710W-HPW Wireless Messaging Terminal from its ASYNC COMM port jack to the AN/PRC-117F J3 DATA connector with HPW-PPP data cable (10513-0710).

NOTE

Do not confuse a standard RS-232 ASYNC data cable or remote control cable that may physically look identical. These cable types do not function with the radio when it is in the HPW SATCOM mode.

- b. Turn on the radio and set the function switch to **CT** and select net preset for HPW SATCOM. It should contain the following programmed parameters:
 1. KG-84 COMSEC using synchronization REDUNDANT mode 1.
 2. KG-84 TEK loaded and programmed to HPW dedicated SATCOM net preset.
 3. HPW TRANSEC loaded to Satellite Storage position and programmed to HPW net preset. It is recommended to use the KG-84 TEK here if prescribed and coordinated by higher authority. Check local Standard Operating Procedures (SOPs).
 4. HPW modulation selected and HPW baud rate set for type of Satellite and channel being used.
 - (a.) UFO – 25 kHz channel on UFO type satellite.
 - (b.) WideBand (WB) – 25 kHz channel on FLTSAT satellite.
 - (c.) NarrowBand (NB) – 5 kHz channel on either type of satellite, UFO or FLTSAT.
 5. HPW TOD set to +/- 30 seconds of Universal Coordinated Time (UTC). This is manually set by the operator, and time counts can be received over voice radio channels while setting time in Options. GPS can also be used.

- c. Turn on PC and allow operating system to fully boot. Start MS Outlook using Wireless Messaging Terminal Profile. Observe for DUN icon and Radio System icon in the system tray of the desktop. No dial-up networking icon and/or a yellow asterisk on the radio system icon indicates a problem with either the DUN setup, cable connection, or HPW net preset. Click on **Event Log** icon in Outlook and look for status of IDLE in both the event log and floating protocol status window. Windows NT systems do not display DUN icon but will display the radio system icon.
- d. Assigned local address in the HPW data network is located at the top of the Outlook program window. If incorrect, shutdown Outlook. Go to Wireless Messaging Terminal settings and change to correct address. Apply settings and reboot the computer to make the changes go into effect. Restart Outlook as described in Step c.
- e. Send a message by clicking on Outlook **New Mail Message** Toolbar icon or selecting New Mail Message from the file menu. Compose the message, select address of recipients, and select any attachment to be included.
- f. Use RF Properties on the File menu to set HPW Send Options for the message.
 1. Transmission Mode
 - (a.) ARQ – This selection is the default normal operation mode and allows for the starting code rate to be selected, if desired. Once transmission begins, the code rate varies according to channel conditions as determined by how well the receiving station gets the data. The default starting code rate will be medium.
 - (b.) Non-ARQ – This selection locks sending terminal into sending message at low code rate to help ensure message reception under poor channel conditions. Code rate selection is not available if Non-ARQ is selected. Used mainly to transmit messages to outstations operating under signal security restrictions that do not want to transmit from their location.
 2. Code Rate – Selected for ARQ operation
 - (a.) Low, 4-ary PSK
 - (b.) Medium – 8-ary PSK, Default starting code rate
 - (c.) High, 16-ary PSK
 3. Highest Priority – Channel Access – Places the message to be sent next, ahead of all others in the Outbox and attempts to immediately access the channel if no other users have selected this priority.
 4. Compress Message – Message and attachment are compressed if selected. No additional compression occurs on non-compressible attachments such as JPGs or ZIP files. Compression greatly improves throughput on message files that can be compressed.

Messages can also be sent using the Harris Enhanced Text Form. This form contains all the options pertaining to the sending of messages in one place for ease of operation. Be sure to press **SEND** button instead of **EXIT** or any message composed and ready to send will be lost.

- a. Received messages are indicated of their incoming status by the HPW protocol status window. Upon successful reception, go to the Inbox to read the received message. View and save attachments. Reply or forward the message as necessary.
- b. While messages are being transmitted or received, view detailed message status in applicable radio outbox or radio inbox. Monitor Event Log to all system status messages.
- c. Consult the RF-6710W-HPW Manual (10515-0093-4220) to assist in isolating problems.

7.3 Setting HPW TOD

Perform the following procedure to enter TOD for HPW operation on dedicated UHF SATCOM:

NOTE

HPW operation requires all stations to be within one minute of each other. Use ZULU time with accuracy of +/- 30 seconds.

- a. Press **OPT**.
- b. Select **TIME**, then select **HPW**, and press **ENT**.
- c. Enter ZULU calendar date and time from an accurate time source such as a PLGR. HPW TOD can be synced using a NMEA compatible GPS. Time counts can also be received over voice net presets. Use a left or right arrow key to move between the time units. Set minute figure to next upcoming whole minute value, and press **ENT** when time source reaches this point. The second count commences after **ENT** is pressed. All stations in a HPW network must be using a TOD within one minute of each other to operate properly. Indications of inaccurate HPW TOD are varying probe addresses of five digits that do not exist in the HPW network database. Check HPW TOD and HPW TSK if this problem exists.

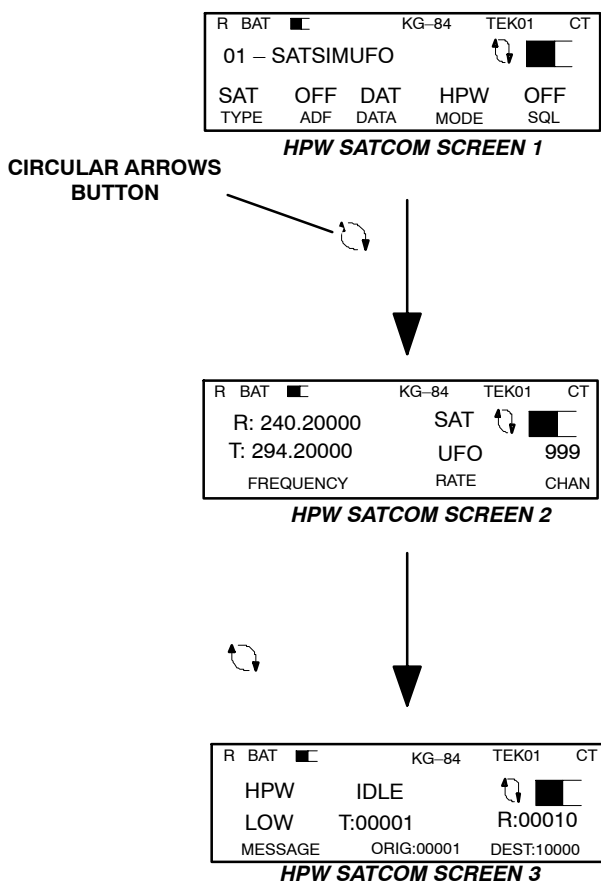


Figure 17. HPW SATCOM Operational Displays

7.4 SINGARS FH

The AN/PRC-117F can operate in SINGARS frequency hopping mode from 30.000 MHz to 87.975 MHz. Refer to Table 21 and see Figure 18 and Figure 19.

SINGARS frequency hopping provides ECCM of antijam and LPD/LPI protection. SINGARS frequency hopping also operates in VINSON COMSEC mode using a TEK.

The following are AN/PRC-117F SINGARS frequency hopping operating capabilities and limitations:

- **Net Master/Member** – The AN/PRC-117F can be placed in either a net master or net member mode. A SINGARS master station is responsible for establishing and maintaining a net of member stations. The master station normally is the NCS. A SINGARS NET has only 1 master and remaining stations are members.
- **TSK** – A key used in SINGARS operations to establish the pseudo-random hopping pattern of frequency hopping of the SINGARS net.
- **Hopset** – The set of frequencies on which a SINGARS radio net hops.
- **Lockout Set** – A set of frequencies that are excluded during frequency hopping operations.
- **Frequency Hopping Sync Time** – The GTOD used by SINGARS to synchronize SINGARS frequency hopping communications. This is usually ZULU UTC from a GPS receiver, DTD by manual user entry.
- **Two-Digit Date** – SINGARS GTOD uses the last two digits of the Julian date as part of the sync time. Refer to Tables 43 and 44.
- **ERF** – The procedure necessary to load hopset and lockout set information by transmitting OTA. When the master radio sends an ERF, the following information is also transmitted:
 - Frequency hopping sync time
 - Hopset ID
- **Cold Start Net Opening** – Method used by the master radio to initially open a net of member radios by transmitting OTA, hopset, and TOD data. A separate LOS fixed frequency is required to coordinate actions and to transmit the data.

- **Hot Start Net Opening** – Passive method of entering a SINCGARS FH net by loading all necessary FH data by local fill and accurate GTOD from a GPS source or DTD. Call NCS for a communications check.
- **Late Net Entry Mode** – A receive function which permits a radio to enter a SINCGARS net when its TOD clock has drifted away from the net TOD by +/- 4 seconds or when a radio must join an existing net. The entering transceiver must be loaded with the proper TEK (not necessary in PT mode) and TSK variable, hopset, and lockout set. The time must be no more than +/- one minute from the Net Master TOD setting.
- **Cue Channel** – A pre-designated LOS fixed frequency in the SINCGARS operational frequency range of 30.000 MHz to 87.975 MHz that enables a radio not in a FH net to contact the NCS of a FH net. This mode can be enabled or disabled by the user.

Table 21. SINCGARS FH Capabilities

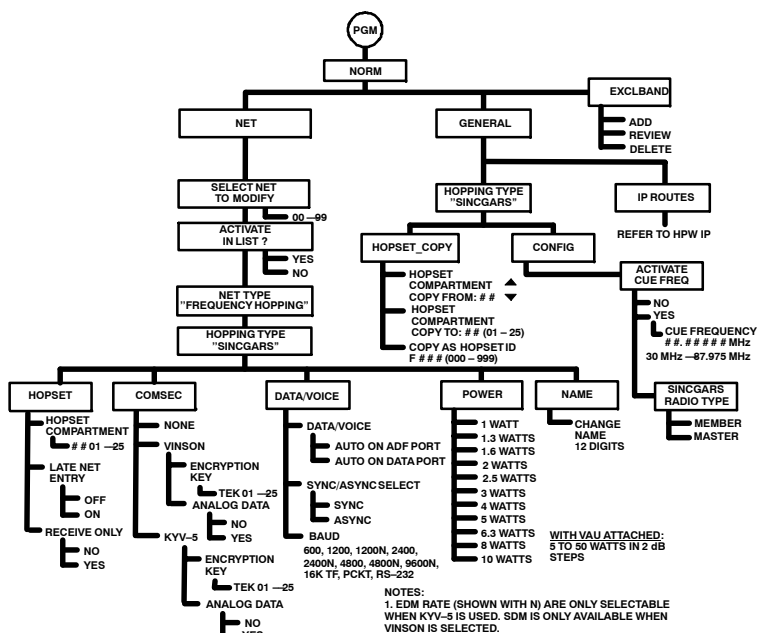
FH Mode	Modulation	COMSEC	DATA VOC	DATA Rates
SINCGARS FH 30 – 87.975 MHz 1 – 10 watts	FH FM	VINSON	VOICE	16 kbps
	FH FM	VINSON	DATA	16 kbps
	FH FM	KYV-5	DATA	16 kbps, EDM rates

HOPSET
COMSEC

DATA/VOC
POWER
NAME

USE < > TO SELECT ITEM

Figure 18. SINCGARS FH Programming Sub Menu



117F-116

Figure 19. SINCARS Programming Menu Tree

7.4.1 SINGARS FH Programming Checklist

Refer to Table 22 for the programming menu items for a SINGARS FH net preset and refer to Paragraph 7. to access the sub-menu.

Table 22. SINGARS FH Programming Parameters

HOPSET		
Menu Item	Options	Remarks
HOPSET COMPART-MENT	01 – 25	Observe NET ID (F###) for already loaded compartments.
LATE NET ENTRY	OFF/ON	Turn ON if using hot start procedures or if time has drifted over four (4) sec but not more than one (1) min.
RECEIVE ONLY	NO YES	Yes sets radio to EMCON, will not transmit.
COMSEC		
Menu Item	Options	Remarks
CRYPTO MODE	NONE	Function switch used in PT.
	VINSON	Voice and Data 16 kbps.
ANALOG DATA	YES	Turns off crypto resynchs for using external data de-vices with own MODEM.
	NO	Normal RS-232 Interface.
ENCRYPTION KEY	TEK 01 – 25	Load TEKs first.
DATA/VOC		
Menu Item	Options	Remarks
DATA/VOICE	AUTO ON ADF PORT	With VINSON, select port wanted to receive on.
	AUTO ON DATA PORT	
SYNC/ASYNCS SELECT	SYNC ASYNCS	ASYNCS requires port pro-gramming.

Table 22. SINGARS FH Programming Parameters – Continued

POWER		
Menu Item	Options	Remarks
TX POWER LEVEL	1 – 10 watts	30 – 87.975 MHz
NAME		
Menu Item	Options	Remarks
CHANGE NET NAME	NET00 – 99	12 characters alphanumeric, no spaces.

7.4.2 SINGARS FH Global Time-of-Day Programming

If programming for operation as the Master Station of a SINGARS net, the GTOD must be set manually. The last two digits of the Julian date must be determined and used for the day component of the time entry. Refer to Tables 43 and 44 for SINGARS FH Julian Date Calendars. Use GPS or other accurate source to set to ZULU UTC.

7.4.3 SINGARS FH General Programming

GENERAL programming data establishes common defaults that apply to any net programmed for frequency hopping operation. NET programming data applies only to a specific net and does not affect any other net. Refer to Table 23.

Table 23. SINGARS FH General Programming Parameters

SINGARS FH General Programming		
HOPSET COPY		
Menu Item	Options	Remarks
HOPSET COPY FROM	01 – 25	Select HOPSET already loaded to radio.
HOPSET COPY TO	01 – 25	Select an empty compartment or overwrite.
COPY AS HOPSET ID	F # # #	Only last two digits are modifiable 00 – 99 on some RTs. Newer units allow 000 – 999.

Table 23. SINCGARS FH General Programming Parameters – Continued

CONFIG		
Menu Item	Options	Remarks
ACTIVATE CUE FREQ	NO YES	YES allows radio to be signalled by cueing stations.
CUE FREQUENCY	30.000 – 87.975 MHz	Enter designated CUE frequency from SOI.
SINCGARS RADIO TYPE	MASTER MEMBER	Only one Master Station per SINCGARS net, all others set to member.

7.4.4 Operational Steps

A SINCGARS FH net uses a MASTER radio as the NCS to maintain TOD synchronization and control SINCGARS FH net procedures. See Figure 20 for operational displays.

NOTE

Development of good unit standard operating procedures and practicing them prior to missions, will ensure smooth operation of SINCGARS FH nets.

7.4.4.1 MASTER/MEMBER Selection

Every radio in a net must be designated as either a MASTER or MEMBER radio. There should be only **one** MASTER radio controlling a net. However, any radio originally configured as a MEMBER can be reconfigured as a MASTER radio. A MASTER radio can also be reconfigured to be a MEMBER radio. Transmitting ERFs and COLDSTARTs can only be done with a radio programmed as a MASTER radio.

7.4.4.2 Start-Up Net Setup

A LOS fixed frequency net (or manual channel frequency) should be programmed on each radio as a start-up net. The start-up net is used to initiate a cold start by the MASTER radio. All MEMBER radios should be set to this net and follow directions from the Master Station. This start-up net frequency can be used to transmit the Cold Start ERF to member radios.

7.4.4.3 Hot Start Net Opening

A Hot Start requires setting the time of opening and ensuring that all net members receive the loadset to be used and correct sync time. The operator's participating in a Hot Start net opening set radio time manually from the **OPT > TIME** menu to within +/- 4 seconds of each other. At the prescribed time for net opening, each net operator enters the secure FH net. The Hot Start net opening procedure is completed once all members have entered the net.

If all stations have TRANSEC fill devices (either MX-18290 or AN/CYZ-10) and ZULU GPS time, Hotstart procedures can be used to establish SINCGARS FH nets and enter them without assistance from Master station.

Perform the following procedure to Hotstart:

- a. Load complete SINCGARS FH data and COMSEC TEK fill to all net radios.
- b. Press **OPT > TIME > GTOD**, and press **ENT**.
- c. Enter the GTOD in Julian days, ZULU hours, minutes and seconds format. Use the left or right arrow keys to move between the time units. Set minute figure to next upcoming whole minute value. Press **ENT** when time source reaches this point. All net radios must be within +/- four seconds of each other.
- d. Attempt communications using SINCGARS FH net preset to Master station or Member stations.
- e. If no communications are heard or established, use passive LNE function to gain GTOD synchronization with the net.
- f. If Hotstart and LNE procedures fail, conduct CUE procedures to contact Master station.

7.4.4.4 Cold Start Net Opening

A Cold Start is required to open a net. To initiate a cold start, the MASTER places a call on the start-up net. The start-up net is a separate LOS Fixed Frequency Net used to establish communication if all net members cannot be gathered to a central area. All radios must be loaded with the same TSK, lockout, and COMSEC TEK fill data. The MASTER radio performs a Cold Start ERF. This transmits the HOPSET data and GTOD to the member radios. A LOS fixed frequency in the SINCGARS FH operational range is used to transmit the Cold Start ERF. This is known as the manual channel frequency.

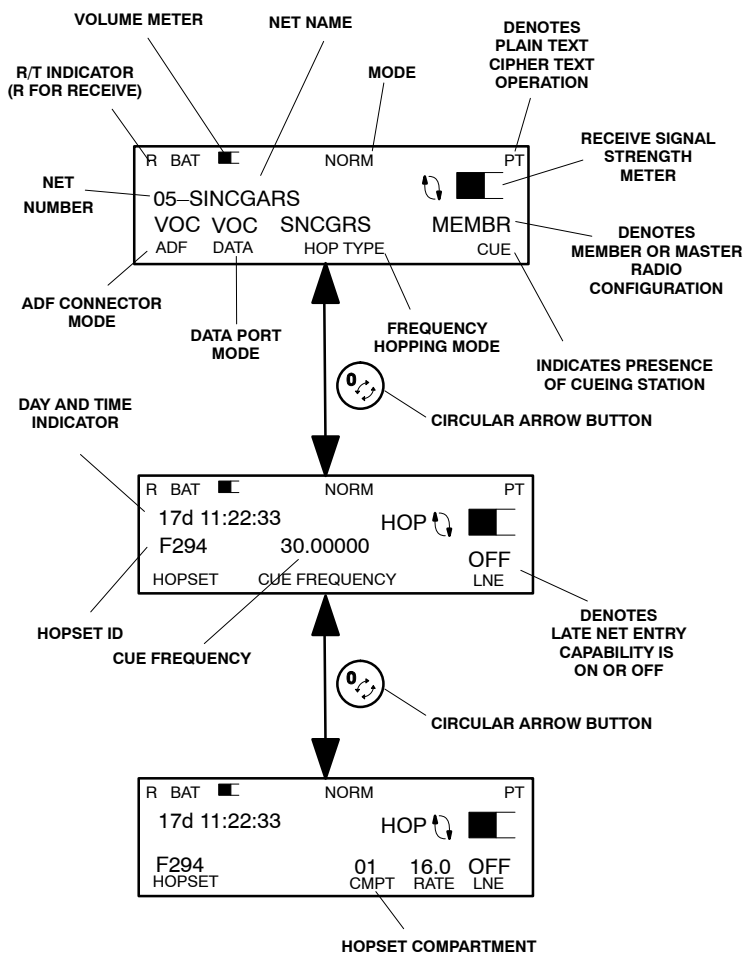


Figure 20. SINCARS FH Displays

7.4.5 MASTER Radio (Net Opening) Operation

A cold start net opening is best performed with all net radios assembled together in a local area. If this cannot be accomplished, procedures for coordinating actions over the start-up net should be developed to permit smooth operation under direction of the Net Master Station.

Perform the following procedure to **Cold Start** as a MASTER radio:

- a. Manually set the SINCGARS GTOD in the MASTER radio to ZULU time from an accurate time source such as a GPS that has a current fix with the satellite system.
- b. Set the MASTER radio to the start-up net. Coordinate time and place to be on the start-up net for all member radios.
- c. Press **PTT** switch on the handset. Instruct the net members to prepare for a Cold Start Net Opening by going to designated SINCGARS FH net preset and waiting for the ERF transmission. Ensure net members know the frequency for the Cold Start ERF and not to transmit again until the Master Station contacts them for a communications check on the SINCGARS FH net preset.
- d. Select the designated SINCGARS net. Press **CALL**, select **COLD_START** and press **ENT**.
- e. At the **COLD START ERF** prompt, select **TRANSMIT**, and press **ENT**.
- f. Enter the frequency given to the net MEMBER radios on which the Cold Start ERF will be transmitted. The MASTER and the MEMBER radios must all be tuned to the same LOS fixed frequency. Press **ENT** to set the (manual channel) ERF frequency. Two way communications is possible on this frequency as a LOS fixed frequency assignment using **PT** or **CT**.
- g. At **SELECT SET** prompt, select the desired **HOPSET** or **LOCKSET** number. Press **ENT**.
- h. The prompt **TRANSMITTING** is displayed, indicating the FH data is being transmitted to the net members. When the transmission is complete, **TRANSMITTED** is displayed, then the **SELECT SET** prompt displays. If another set of data is to be transmitted, repeat Steps f through h.
- i. When all data has been sent, press **CLR** until the main screen is displayed.
- j. Allow a short time period for net members to store received SINCGARS FH DATA, and conduct a communications check on the SINCGARS FH net preset. For any stations not responding, return to start-up net to conduct the Cold Start ERF process again.

7.4.6 MEMBER Radio (Net Opening) Operation

Perform the following procedure to **Cold Start** as a MEMBER radio:

- a. Select designated start-up LOS fixed frequency net. Wait for call from Net Control Station (NCS) with instructions to go to SINCGARS FH net preset.
- b. Press **CALL**, select **COLD_START**, and press **ENT**.

- c. At the **ENTER FREQUENCY** prompt, enter the frequency given by Net Control Station (NCS) or predetermined into the MEMBER radio when prompted. MEMBER radios must be tuned to the appropriate **LOS FIXED** frequency on which the Master will transmit the Cold Start ERF.
- d. Press **ENT** to accept the frequency entry. The prompt **WAITING FOR RECEPTION** displays. Wait at this point and observe the radio display for reception of the Cold Start ERF.
- e. If a HOPSET is received:
 1. **HOPSET RX OK STORE AS HOPSET ##** displays.
 2. Enter desired HOPSET number and press **ENT** to store the data.
 3. **HOPSET STORE OK PRESS ANY KEY** displays. Press **ENT** to continue.
 4. At the prompt **ASSIGN HOPSET TO NET**, enter desired net preset that you will be operating on. Only SINCGARS FH net presets can be selected. Press **ENT**.
 5. The prompt **WAITING FOR RECEPTION** displays again. If another HOPSET is sent by the MASTER radio, repeat Step e. If another LOCKSET is sent by the MASTER radio, proceed to Step f.
- f. If a LOCKSET is received:
 1. **LOCKSET RX OK PRESS ANY KEY TO STORE** displays. Press any key to store the data.
 2. The prompt **WAITING FOR RECEPTION** displays again. If another LOCKSET is sent by the MASTER radio, repeat Step f. If another HOPSET is sent by the MASTER radio, repeat Step e.
- g. If FH data is not received, wait for communications check from the Master station. Notify the Master station that data was not received. Repeat Steps e and h.
- h. When all data is received, press **CLR** until the main operating menu displays. Check SINCGARS operational displays for GTOD sync time and Net ID.

7.4.7 Updating SINCGARS FH Fill Data using ERF

To update the FH data during operation, the MASTER Station loads the new FH fill data, informs the MEMBER radios of the ERF update over the SINCGARS FH net preset, then transmits the fill data to net MEMBER radios. It should be determined beforehand when the update is to become effective to allow operators to reprogram radios with the updated FH data. If the update is to become immediately effective, the Net Master will need to program a second SINCGARS net preset that is using the updated FH fill data to use immediately for communications checks after the updated ERF. In the member radios, they have the option to immediately assign the received updated FH data to the net they are presently using, or to any other of their programmed SINCGARS nets.

7.4.7.1 MASTER Radio Operation for Updating SINCGARS FH Fill Data

Perform the following procedure to update SINCGARS FH fill data:

- a. Contact the net MEMBER radios over the presently used SINCGARS FH net preset. Instruct members to standby for FH Fill data update. Tell them where to store the data and when to use it.
- b. Press **CALL**, select **ERF**, and press **ENT**.
- c. At **NORMAL ERF** prompt, select **TRANSMIT**, and press **ENT**.
- d. At **SELECT SET** prompt, select desired **HOPSET** or **LOCKSET**, and press **ENT**.
- e. While the data is being transmitted, the **TRANSMITTING . . .** prompt displays.
- f. When the transmission is complete, the prompt **TRANSMITTED** displays momentarily, then **SELECT SET** displays again. If more data is to be sent, repeat Steps d and e until finished.
- g. When the last data has been sent, press **CLR** until the main operating menu is displayed.
- h. If update is effective immediately, switch radio to SINCGARS FH preset using the new SINCGARS FH data and conduct communications check with net members. Return to the old SINCGARS FH net preset for any stations that do not respond. Resend the update ERF to any stations still needing the update.

7.4.7.2 MEMBER Radio Operation for Receive Updated SINCGARS FH DATA OTA by ERF

Perform the following procedure to update SINCGARS FH data OTA by ERF:

- a. Upon instructions from the NCS to get ready to receive update ERF, press **CALL**, select **ERF**, and press **ENT**.
- b. At the **NORMAL ERF** prompt, select **RECEIVE**, and press **ENT**. The prompt **WAITING FOR RECEPTION . . .** displays.
- c. If a HOPSET is received:
 1. **HOPSET RX OK STORE AS HOPSET ##** displays.
 2. Enter desired HOPSET number 01-25, then press **ENT** to store the data. Choose a vacant HOPSET compartment if update is not immediately effective for operation.
 3. **HOPSET STORE OK PRESS ANY KEY** displays. Press **ENT** to continue.
 4. At prompt **ASSIGN HOPSET TO NET**, select the desired net with the up/down arrow keys. Only SINCGARS FH net presets can be selected. Press **ENT**. Do not store to the presently used net preset unless the Net Master Station has directed you to do so. Press **CLR** if you do not desire to assign the received FH data to a net at this time.

5. **WAITING FOR RECEPTION . . .** displays again. If another HOPSET is received, repeat Step c. If another LOCKSET is received, proceed to Step d.
- d. If a LOCKSET is received:
 1. **LOCKSET RX OK PRESS ANY KEY TO STORE** displays. Press any key to store data.
 2. **WAITING FOR RECEPTION . . .** displays again. If another LOCKSET is received, repeat Step d. If another HOPSET is received, repeat Step c.
- e. When the last HOPSET or LOCKSET is received and stored, press **CLR** until the operating menu displays.
- f. Wait for further instructions from the NCS.

7.4.8 Change NET ID in Master or Member Station

With a common hopset, TSK, and GTOD, changing nets is done by changing the NET ID. Refer to Paragraph 7.4.3 on programming a NET ID change using HOPSET COPY function in General Programming. Some older radios cannot change all three digits of the Net ID, contact Harris if this option is desired.

7.4.9 CUE Channel Setup

The CUE channel is a LOS fixed frequency assignment in the 30.000 MHz to 87.975 MHz frequency range that allows the user to signal the NCS to establish the radio as a member of a SINCGARS FH net. Access to CUE channel is through the **CALL** button. Radios must have the cue frequency activated and entered to use CUE. Only the Master Station can respond to cueing station and transmit a cold start ERF and add them to the already established SINCGARS FH net.

7.4.9.1 Adding a MEMBER Station to the Net

The following paragraphs describe procedures to add a late net entry member. This station still needs to have the proper TSK and COMSEC TEK loaded to gain access to the SINCGARS FH net.

7.4.9.2 Non-Net MEMBER Operation for Cueing a SINCGARS FH Net

Perform the following procedure to join a net:

- a. At the non-net MEMBER radio, press **CALL**, select **CUE**, and press **ENT**. The radio switches to the net programmed for CUE operations.
- b. Rotate the function switch to **PT** and key the handset for four to five seconds. Do this every 15 seconds until NCS responds. Return to **CT** after each attempt as the Master station will respond in **CT** on CUE channel.
- c. Wait for instructions from the net MASTER radio.
- d. When the net MASTER indicates to do so, switch to the appropriate SINCGARS FH net and perform a Cold Start Net Opening. Refer to Paragraph 7.4.4.4.

7.4.9.3 MASTER Operation to Respond to a Cueing Station

Perform the following procedure to add a MEMBER to an existing net:

- a. In SINCGARS FH mode, a **CUE** prompt displays at the lower right corner of the LCD, and an audio tone is heard. This indicates a transmission has been made from a radio that is not a member of the SINCGARS FH net.
- b. Inform the existing net MEMBERS that you are departing the net.
- c. Press **CALL**, select **CUE**, then press **ENT**. The radio switches to the cue channel net. Call for the station that initiated the CUE. It may take going to PT to make contact with this station.
- d. Direct the requesting operator to the appropriate SINCGARS FH net and to get ready to perform the procedure for a COLD START, then press **CLR** to leave CUE channel. Press **CALL** and select **COLD START**. Initiate a Cold Start Net opening procedure. Refer to Paragraph 7.4.4.4.
- e. Allow time for receiving station to store FH data, then conduct communications check of that station on SINCGARS net preset.

7.4.10 Hotstart Net Opening and Late Net Entry

If all stations have TRANSEC fill devices (either MX-18290 or AN/CYZ-10) and ZULU GPS time, Hotstart procedures can be used to establish SINCGARS FH nets and to enter them without assistance from NCS.

Perform the following procedure to Hotstart:

- a. Load complete SINCGARS FH data and COMSEC TEK fill to radio.
- b. Set GTOD in radio to within + / – four (4) seconds UTC from an accurate time source.
- c. Attempt communications using SINCGARS FH net preset to NCS or member stations already in the net. If no contact is made and nothing is heard, move to a more optimum transmission position and use passive late net entry as described in Paragraph 7.4.10.1.

7.4.10.1 Passive Late Net Entry

If no communications on the SINCGARS FH net is heard, it is possible that GTOD in the radio has slipped passed the +/- four (4) seconds needed to remain in sync. If it still is within +/- one (1) minute, the Late Net Entry function can resync the member GTOD with the master station. This can also be used in conjunction with Hot Start procedures if an accurate time setting within +/- four seconds cannot be obtained.

Perform the following procedure for passive late net entry:

- a. From the SINCGARS net preset operational display, press the circular arrow button to view the status of the **LNE** function. Normally it will be OFF. Use the left/right arrows to select the LNE field. Press the up/down arrows to select **ON** and press **ENT**.
- b. Do not transmit and wait for the reception of communications from any station on the SINCGARS FH net. When the radio reestablishes time with the net, the LNE display indicator will switch to **OFF** automatically.
- c. Attempt communications check with any station that will respond.

7.4.11 Updating Time Errors

If a master station started a net by using a coldstart with a significant time error, the net can not be contacted by any station outside the net. To correct the time error, the master must have everyone in the net prepare a new coldstart by reinitializing their time manually, then performing a coldstart. This type of situation can be avoided by using hotstarts.

7.4.12 SINCGARS Data

The AN/PRC-117F supports SIP and ESIP data features as described in the following paragraphs.

7.4.12.1 SINCGARS Data Mode (SDM) and Enhanced Data Mode (EDM)

Both EDM and SDM are 16 kbps OTA regardless of the data rate chosen. On the AN/PRC-117F, EDM is shown with a **N** next to the data rates. These data modes can also be used in LOS fixed frequency operation in the 30.00000 – 89.97500 MHz frequency range.

EDM uses Reed Solomon encoded Forward Error Correction (FEC) to add extra codes for transmission of the data rates that are lower than 16 kbps. At the EDM rates of 1200N, 2400N, 4800N, or 9600N, or using RS232, the data is sent out of the data port at the chosen baud rate. EDM can be used in PT. KYV-5 must be selected in order to use EDM data rates.

SDM repeats the data bits on data rates that are less than 16 kbps. SDM uses redundant encoding for FEC. Vinson must be selected in order to use SDM data rates. PT uses SDM as well.

SDM and EDM data rates can also be used in LOS fixed frequency operation in the 30 MHz – 89.975 MHz frequency range to emulate SINCGARS SC operation.

7.4.12.2 Tactical Fire Direction System (Tacfire)

For Tacfire, use standard devices such as the AN/PSC-2 on J1. The KDU menu must be set **TACFIRE**.

7.4.12.3 RS-232

In this mode, the radio connects to a PC terminal using Xmodem, 1K-Xmodem, Ymodem, or Kermit at 1200, 2400, 4800, and 9600 baud. Once a cable (such as Harris 10513-0730 Remote/Data Cable) is connected between the PC Com port and radio connector J3, a carriage return will cause the radio to autobaud itself to the data rate of the terminal. RS-232 is an EDM mode and therefore uses FEC and KYV-5 encryption.

7.4.12.4 Packet

Packet is an X.21 data mode for use with the PCIDM router cards. The Harris part number for the cable that is used with these cards is 10513-0780-A1. For more information on these cards, visit: www.pcidm.com.

The AN/PRC-117F is also compatible with the ITT INC. For application support of this configuration, please contact Harris.

7.4.12.5 Selecting Data During Operations

The EDM and SDM data types and rates, including Tacfire and RS232, can be selected from the menu **OPTIONS > COMSEC > DATA**. This can also be changed from the main status screen.

7.4.13 Operational Overrides

Changes can be made while operating in SINCGARS FH mode without reprogramming the AN/PRC-117F, including power levels, COMSEC setup, LNE function, and type of net. Press the right arrow key on the KDU, on a current operating net preset display, to find items that can be modified. Modifiable items begin to flash. Press the up/down arrow keys to change value of the flashing item. Press ENT to set selection. Other items can be overridden by pressing the OPT key on the KDU to access the options menu items. Using display overrides and the options menu allows continued operation on the presently selected net preset. During ongoing communications, entering back into programming mode takes the AN/PRC-117F off line. No communications are possible until the AN/PRC-117F is returned to normal operation and important communications could be missed.

The AN/PRC-117F can be configured to automatically save overrides. If AUTO SAVE function is set to OFF, the operator can temporarily override programmed net parameters. An asterisk (*) appears to the left of the net name on the LCD, indicating the net preset parameter was temporarily changed. These changes are valid until the operator selects another programmed net preset. When the net is changed, the temporary changes are lost. To permanently save the changes as programmed values, select the SAVE command from the OPT menu and save the net preset as a new preset. If AUTO SAVE function is set to ON, all changes are saved automatically and SAVE command is absent from OPT menu.

7.5 HAVEQUICK Frequency Hopping

The AN/PRC-117F is capable of HAVEQUICK frequency hopping operation in the UHF AM band of 225.000 MHz to 399.975 MHz. Refer to Table 24 for HAVEQUICK capabilities and see Figure 21 for the HAVEQUICK programming tree.

The following are AN/PRC-117F HAVEQUICK frequency hopping operating capabilities and limitations:

- **TOD** – Allows for synchronization of all radios in a HAVEQUICK net.
- **SWOD** – Configures the frequency hopping pattern and rate. WOD elements may vary in length from one to six segments.

- **MWOD** – The MWOD elements are entered into memory locations 1 – 6. The MWOD also contains the operational date of the MWOD. The MWOD is only valid on the date assigned to it.
- **Operational Date** – The TOD message includes the operational date. This information allows the radio to select the MWOD assigned to the current date.
- **SWOD Mode** – HAVEQUICK I frequency hopping mode that allows radios with identical TOD, WOD, and net number to synchronize and communicate.
- **MWOD Mode** – HAVEQUICK II frequency hopping mode that has the identical capabilities as the SWOD mode, and provides for automatic multiple day operation. Up to 31 MWODs can be loaded electronically or by manual input. Electronic loading is accomplished by distinguishing the MWOD date.
- **FMT** – HAVEQUICK training mode of operation that allows operation on user entered set of 16 training frequencies. FMT mode still requires a SWOD or MWOD, a HAVEQUICK Net Number, and TOD.
- **Net Numbers** – A five digit code that programs the entry point in the WOD frequency hopping pattern allowing for multiple radio net operations using a common WOD and TOD.

Table 24. HAVEQUICK Capabilities

FH Type	Modulation	COMSEC	DATA VOC	DATA Rates
HAVEQUICK 225 – 400 MHz 1 – 10 watts	FH AM	VINSON	VOICE	16 kbps
	FH AM	VINSON	DATA	16 kbps

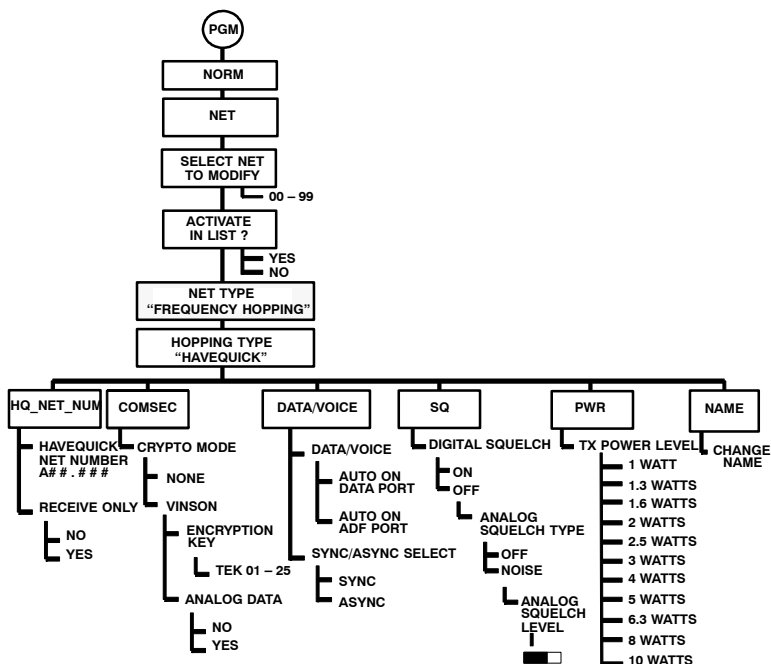


Figure 21. HAVEQUICK Net Preset Programming Tree

7.5.1 HAVEQUICK Net Preset Programing Checklist

Refer to Table 25 for the setup net presets as a guide for the correct parameters and see Figure 22 for accessing the programming sub menu.

Table 25. HAVEQUICK Net Preset Programming

HAVEQUICK NET NUMBER		
Menu Item	Options	Remarks
HAVEQUICK NET NUMBER	A## . # # #	Enter the authorized HAVEQUICK Net Number.
Receive Only	NO YES	YES sets radio to EMCON.
COMSEC		
Menu Item	Options	Remarks
CRYPTO MODE	NONE	Function switch used in PT.
	VINSON	Voice and Data 16 kbps.
ANALOG DATA	YES	Ext. devices with own MODEM.
	NO	Normal Digital Data Interface.
DATA/VOC		
Menu Item	Options	Remarks
DATA/VOICE	DATA	With KG-84 COMSEC selected.
	AUTO ON ADF PORT	With VINSON COMSEC selected.
	AUTO ON DATA PORT	
	DATA OR VOICE	With PT and COMSEC NONE selected.
SYNC/ASYNCR SELECT	SYNC ASYNCR	ASYNCR requires port programming.
BAUD RATE	16 K	VINSON

Table 25. HAVEQUICK Net Preset Programming – Continued

SQUELCH		
Menu Item	Options	Remarks
DIGITAL SQUELCH	ON OFF	Digital Squelch ON prevents VINSON PT override from occurring.
ANALOG SQUELCH	OFF NOISE	Digital Squelch is set to OFF to use ANALOG.
ANALOG SQUELCH LEVEL	LOW MED LOW MED MED High HIGH	AM Noise Squelch only.
POWER		
Menu Item	Options	Remarks
TX POWER LEVEL	1 – 10 watts	10 watts max for AM modes.
NAME		
Menu Item	Options	Remarks
CHANGE NET NAME	NET00 – 99	12 characters alphanumeric, no spaces.

HQ_NET_NUM	COMSEC
DATA/VOC	SQ PWR NAME
USE < > TO SELECT ITEM	

Figure 22. HAVEQUICK Programming Sub Menu

7.5.2 HAVEQUICK General Programming

HAVEQUICK general parameters involve the manual loading operations of a SWOD, MWODs, and FMT frequencies. The status of electronically loaded SWOD or MWODs can be checked here. Refer to Table 26 for HAVEQUICK general parameters and see Figure 23 for the programming tree.

Table 26. HAVEQUICK General Parameters

SWOD		
Menu Item	Options	Remarks
DEFINE	Segment 1 (20) – Segment 6 (15)	Enter segments as listed. Use read back procedure with 2nd operator to ensure correct entry.
ERASE	ARE YOU SURE – YES/NO	Deletes the programmed SWOD.
STATUS	Indicates if a SWOD is loaded	Go here to check status of electronic MWOD fills.
MWOD		
Menu Item	Options	Remarks
DEFINE	MWOD Day of the month 01 – 31	Program to day of the month MWOD is to be used for. Matches calendar ZULU day.
	Segment 1 (20) – Segment 6 (15)	Once entered, cannot be viewed.
ERASE	MWOD Day of the month 01 – 31	Select day MWOD is to be erased.
	ARE YOU SURE – YES/NO	Deletes the programmed MWOD.
STATUS	MWOD Day of the Month	Select day to be checked, shows if filled. Go here to check status of electronic MWOD fills.

Table 26. HAVEQUICK General Parameters – Continued

FMT_FREQS		
Menu Item	Options	Remarks
DEFINE	Frequency 1 (20) to Frequency 16 (05)	Enter 16 UHF-AM frequency assignments in range of 225 – 399.975 MHz. All 16 must be entered and in same order for all radios in net. Still requires a SWOD or MWOD and correct time.
ERASE	Deletes all FMT frequencies.	CLR or Z-ALL does not delete them.
STATUS	Checks if FMT frequencies are loaded.	
GRDRCVR		
Menu Item	Options	Remarks
ACTIVATE GUARD RECEIVER	NO YES	Turns on the HAVEQUICK Guard Receiver.
GUARD FREQUENCY	90.00000 MHz – 511.99999	243.000 MHz is the default.
SQUELCH LEVEL	LOW – HIGH	Set squelch level for guard receiver.

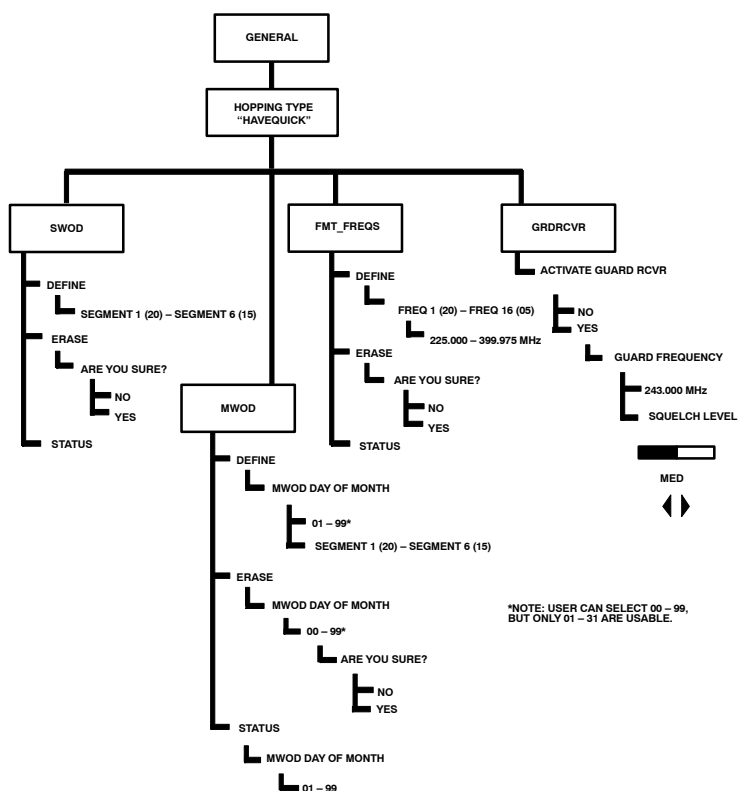


Figure 23. HAVEQUICK General Programming Tree

7.5.3 HAVEQUICK Operational Steps

Operation on a HAVEQUICK net requires a WOD and a TOD. A separate LOS fixed frequency LOS AM channel in the frequency range of 225.000 MHz to 399.975 MHz is needed to transmit and receive TOD sync requests. A GPS interface to the AN/PRC-117F can also be used to provide accurate TOD. The radio will lose its TOD sync whenever it is powered off. Refer to Table 27.

Perform the following procedure to operate in HAVEQUICK mode:

- Rotate the function switch to **PT**, **CT**, or **TD** position.
- After initializing, press **MODE**.
- At the **OPERATIONAL MODE** prompt, select **NORMAL** and press **ENT**.
- Press the **NET/PRE +** or **-** button to scroll to the desired **HAVEQUICK** net.

Table 27. HAVEQUICK and TOD

Mode	WOD Type	Date Used	Time Used
HAVEQUICK I	SWOD	00/00/80	ZULU
HAVEQUICK II	MWOD	Actual ZULU	ZULU
FMT	SWOD or MWOD	00/00/80 or ZULU	ZULU

7.5.4 Frequency Hopping (HAVEQUICK) TOD Programming Procedures

A station that has obtained HAVEQUICK TOD from an accurate source such as a GPS, TSS or another station can transmit it's TOD on to another station that needs the time. HAVEQUICK TOD can be transmitted and received over a UHF-AM LOS Fixed Frequency net preset in the frequency range of 225.000 – 399.975 MHz. See Figure 24 for Call Menu.

NOTE

The AN/PRC-117F does not use an inactive non-hopping state on its HAVEQUICK preset.

Perform the following procedure to send the TOD to another station:

- From a Fixed Frequency UHF-AM Net Preset in the operating range of 225.000 MHz to 399.975 MHz, and communicating with the station needing the TOD sync, press **CALL**.
- At the **HAVEQUICK TOD INIT** prompt, select **TRANSMIT**.
- Press **ENT**.

Perform the following procedure to receive a TOD from another AN/PRC-117F, other HAVEQUICK radio, or TSS:

- From a Fixed Frequency UHF-AM Net Preset in the operating range of 225.000 to 399.9999 MHz, press **CALL**.
- Select **TOD**.
- At the **HAVEQUICK TOD INIT** prompt, select **RECEIVE**.
- Press **ENT**. Wait for the transmitting station to send TOD sync. The radio accepts and loads the *first* TOD it receives.

- e. Press the **NET/PRE** + or – button to scroll to the desired **HAVEQUICK** net. Begin radio operations. See Figure 25 for operational displays.

NOTE

Once HAVEQUICK operation is established, the TOD must be re-synced at least every four hours. TOD syncs can be sent and received over the HAVEQUICK net using the Call button as described in Paragraph 7.5.4 to keep the TOD in sync.

7.5.5 HAVEQUICK Guard Receiver Procedures

While operating on any HAVEQUICK net preset, transmissions on the preprogrammed HAVEQUICK guard frequency can be detected while frequency hopping. A double beep signal will be heard in the handset and a KDU visual display will be seen to denote the presence of any communications on the guard frequency. The user can access the HAVEQUICK guard receiver through the **CALL** key. See Figure 24. The guard frequency could be used as a method of gaining TOD synchronization with stations already in HAVEQUICK frequency hopping operation.

Perform the following steps to access the HAVEQUICK Guard Receiver:

- a. Upon indication of HAVEQUICK guard receiver operation, press the **CALL** key on the KDU.
- b. Use left or right arrow key to select **GRDFRQ** and press **ENT**.
- c. The guard receiver channel display will become active. Listen or place a call on the guard frequency to make contact with any station using the guard frequency.
- d. If the station using the guard frequency needs a TOD sync transmission, press **CALL** to re-access TOD menu to transmit the HAVEQUICK TOD to that station. Press **CLR** to back out of this menu when complete.
- e. Press **CLR** key once at the guard receiver display to return back to HAVEQUICK net preset.

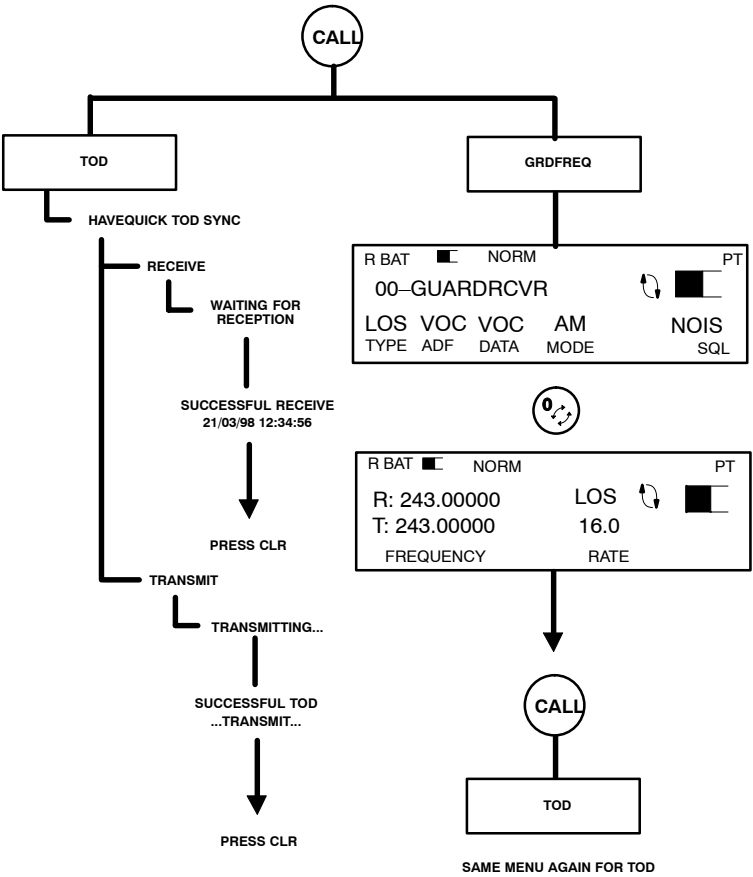


Figure 24. HAVEQUICK TOD CALL Menu

Perform the following procedure to manually enter TOD for HAVEQUICK:

- a. Press **OPT**.
- b. Select **TIME**, select **HAVEQUICK**, and press **ENT**.
- c. Use **USER ENTRY** to enter the DATE and TOD. Enter ZULU calendar date and time from an accurate time source for HAVEQUICK II with MWODs. For HAVEQUICK I using a SWOD, set date as 00/00/80 but still use ZULU hours, minutes, and seconds. Use left or right arrow key to move between the time units. Set minute figure to next upcoming whole minute value, press **ENT** when time source reaches this point.

NOTE

To enable SWOD HAVEQUICK I operating mode, select 00/00/80 as the TOD date. For MWOD HAVEQUICK II use the current ZULU date and time. Refer to Table 27. These rules are only specific to the AN/PRC-117F and are not the only factors determining operation in either HAVEQUICK mode. Rules concerning SWOD and MWOD segments concerning the HAVEQUICK modes still apply. All HAVEQUICK radios will be loaded with same HAVEQUICK Net Number and WOD segments, but the AN/PRC-117F will follow these TOD rules.

- d. If a GPS is connected and operating with a 2D or 3D position fix, select **GPS_SYNC** to have the HAVEQUICK TOD automatically sync with the GPS. A TFOM of four (4) or less is required on the PLGR. Using the GPS for setting TOD will only allow for HAVEQUICK II operation using loaded MWODs. Set the PLGR to STD interface, 1PPS to UTC, and HAVEQUICK to OFF in PLGR setup menu.

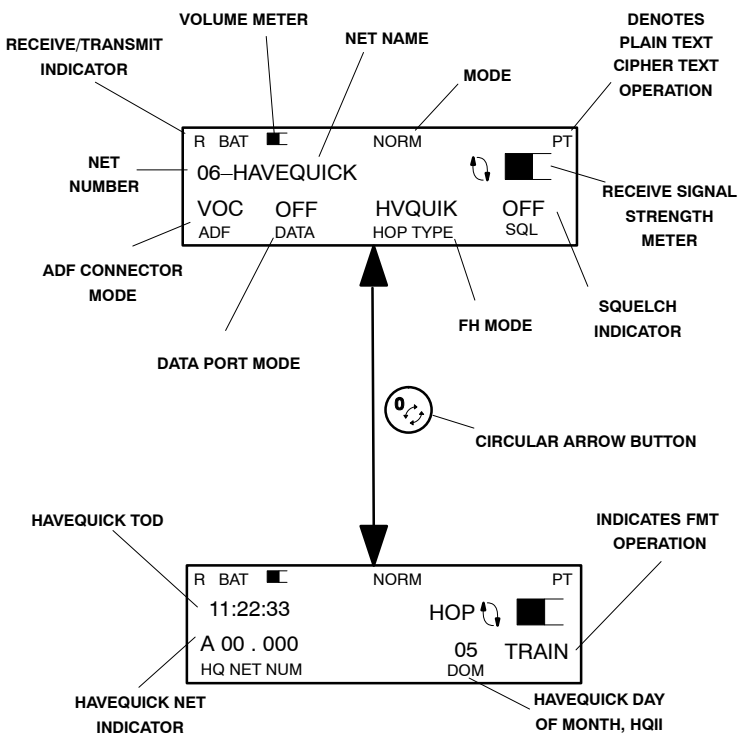


Figure 25. HAVEQUICK Displays

8. SCAN OPERATIONS

See Figure 26 for SCAN mode operation.

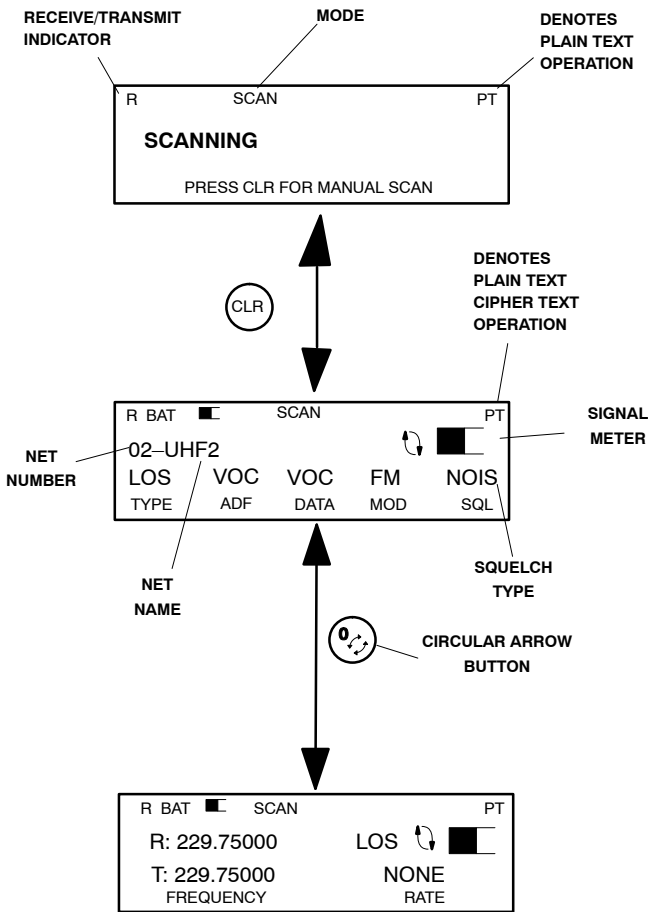


Figure 26. SCAN Mode Displays

8.1 SCAN Mode Capability

The AN/PRC-117F cannot scan HAVEQUICK, SINCGARS, or DAMA UHF SATCOM nets. Digital squelch cannot be used in LOS nets. Scanning combinations of CT and PT net is allowed by PT override feature of the VINSON CT mode. (Set function switch to **PT** position to communicate with the PT station.)

When the AN/PRC-117F is keyed in scan mode, it transmits on one of the following nets:

- The net currently paused on (if actively receiving traffic or still in the return-to-scan hang time).
- The priority transmit net, if the radio is actively scanning.
- The net currently being scanned if a priority transmit net is not selected.

The following are AN/PRC-117F scan operating capabilities and limitations:

- **Priority Transmit Channel** – The net on which the radio transmits if the PTT button is pressed when the radio is actively scanning.
- **Hold Time** – The length of time the radio dwells on a net before returning to scan, even with a signal present. Useful for monitoring multiple active nets by using a value long enough to determine if a call is for you and letting it continue scanning automatically.
- **Hang Time** – The length of time the radio dwells on a net after a signal ends before returning to scan. Helpful if occupied with other tasks while monitoring the radio.
- **Priority Receive Channel** – The AN/PRC-117F can scan a designated priority receive net. It samples the priority receive net every other net. For example:
 - Ch. 4 = Priority receive net
 - 0, 1, 2, 3, ..., 9 = radio nets selected for scanning
 - Scan sequence: 0 4 1 4 2 4 3 4 4 4 5 4 6 4 7 4 8 4 9 4 0 4 1 4.....

8.2 SCAN Mode Setup

Perform the following procedure to program the radio scan function:

- a. Press **PGM**.
- b. Select **SCAN**.
- c. Use the left/right arrow keys to select **LIST**, **PRIORITY**, or **CONFIG**. See Figure 27.

NOTE

SCAN Programming requires that normal mode LOS Fixed Frequency and Dedicated SATCOM Nets be properly programmed and operating satisfactorily prior to use in scan operation. SCAN mode should not be entered until these channels exist and the scan mode has been programmed.

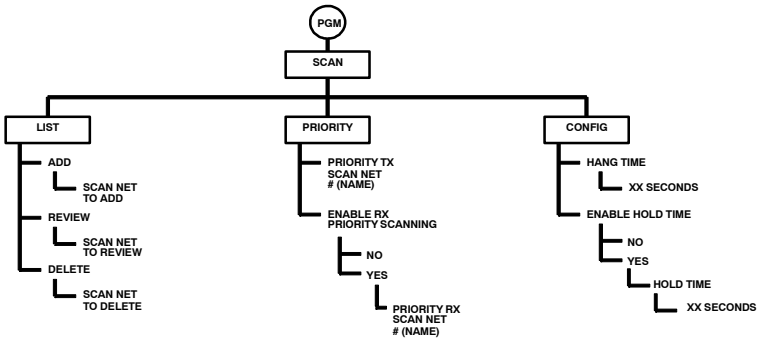


Figure 27. SCAN Mode Programming Menu Tree

8.2.1 LIST

See Figure 27. Select **LIST** to **ADD**, **REVIEW**, or **DELETE** nets from the scan list.

8.2.2 PRIORITY

Refer to Paragraph 8.2.1. Priority transmit and receive nets can be selected. The radio transmits using the priority transmit net, if the PTT key is pressed during scanning. The priority receive net is the net that the radio checks most frequently for a signal.

Perform the following procedure to configure a transmit and receive priority net:

- a. Press **PGM**.
- b. Select **SCAN**.
- c. Select **PRIORITY**.
- d. Choose the **PRIORITY TRANSMIT** net name, and press **ENT**.
- e. Select **YES** for **ENABLE RX PRIORITY SCANNING?**, and press **ENT**.
- f. Select the **PRIORITY RECEIVE** net name, and press **ENT**.

8.2.3 SCAN CONFIGURATION (CONFIG)

Scan CONFIG programming allows the operator to configure the radio's hang time and hold time.

Perform the following procedure to configure hang time and hold time:

- a. Press **PGM**.
- b. Select **SCAN, CONFIG**.
- c. Enter the desired hang time in seconds. Press **ENT** to set value.
- d. Set **ENABLE HOLD TIME?** to **YES**, then enter the desired hold time duration in seconds. Press **ENT** to return back to scan programming menu.

8.3 SCAN Operation

In SCAN mode, the radio searches up to ten (10) nets for a signal. The user can program and edit the list of nets scanned. All LOS fixed frequency and dedicated SATCOM nets voice operation can be scanned. Data, FH, and DAMA nets cannot be scanned.

SCAN functions in PT, CT, or TD. When a signal is detected, the radio stops scanning, unsquelches (in voice mode), and dwells on the net for the duration of the programmed hang time. The default hang time is three seconds after the signal is lost. The radio continues automatic scan to the next net. Refer to Paragraph 8.2.3.

For better performance for scanning reception of stations operating in CT mode, have these outstations use TD cipher mode setting and initiate calls with slightly longer first call transmissions.

Pushing the PTT key while the radio is scanning causes the radio to transmit on the priority transmit net. Pushing the PTT key while the radio is stopped on a net causes the radio to transmit on that net. Refer to Paragraph 8.2.2.

Perform the following procedure to enter automatic scan mode:

- a. Rotate function switch to **PT** or **CT**.
- b. Press **MODE**.
- c. Use the up/down arrow keys to select **SCAN**.
- d. Press **ENT** to initiate automatic scan mode.

- e. If the radio is keyed when a signal is received within the three-second hang time, the radio transmits on the receiving net. After the transmission, the radio remains in receive for three seconds.
- f. Press **CLR** to enter manual scanning. Select the desired channel with the **NET/PRE +** or **-** button on KDU. Only channels in the scan list are available. Manual scanning can be used to temporarily leaving automatic scanning to conduct operations with an outstation without concern to signals on any other scan list channel.
- g. Press **CLR** again to return to automatic scanning.

NOTE

Pressing the circular arrow key toggles between the operational displays.

9. RETRANSMIT OPERATIONS

The AN/PRC-117F provides retransmit operations in simplex and half-duplex modes from 30 MHz to 511.99999 MHz, including cross-band and cross-mode retransmissions. It provides three types of retransmissions: red analog retransmit, red data retransmit, and black data retransmit.



To prevent electrical shock and RF burns, avoid contact with antennas in retransmit mode operation as each AN/PRC-117F in the system transmits automatically in response to incoming calls on the opposite AN/PRC-117F.



Damage to equipment may result if the retransmit cable is connected or disconnected from an operating AN/PRC-117F. Ensure that AN/PRC-117Fs on each end of retransmission cable are off.

9.1 Capability

The following are AN/PRC-117F retransmit modes:

- **Red Retransmit** – Radios A and D are the outstations. Radios B and C are the retransmit radios. A and D pass traffic in cipher text through radios B and C which are in CT mode. One retransmit radio (B or C) receives traffic, decrypts it, and sends it along the cable to the other retransmit radio, which re-encrypts it and transmits it to the other outstation. Red retransmit systems can overcome differences in COMSEC keys, COMSEC types, and/or data rates.

NOTE

In Red retransmissions, the retransmit radios have COMSEC variables. The radios must be physically secured.

- **Black Retransmit** – This mode is used for retransmissions in end-to-end encryption. The outstation radios (A and D) operate in CT mode and the retransmit radios are in PT mode. When traffic is received by one of the retransmitting radios, it is not decrypted. It is demodulated, then passed to the transmit radio (still encrypted) for retransmission.

9.2 Retransmit Setup and Operation

Determine whether simplex or half-duplex communication is required.

Perform the following procedure to configure the port settings:

- Program the retransmit radios with the NET information. Ensure radios are in normal mode.
- Press **CLR**, as necessary, to return to the operational display.
- Press **OPT** key on KDU, select **RETRANS** from the **OPT** menu, and press **ENT**.
- Select **ON** and press **ENT** to configure radio for retrans operation.

NOTE

Power off both radios before connecting or disconnecting the Retransmit cable to J3 connector ports.

- Attach the retransmit cable to the J3 DATA connector on both radios.
- Begin retransmission operations. If one radio locks into continuous transmit, check for presence of interfering signals on the receiving radio and/or check squelch settings to determine if squelch falsing condition exists.

10. CLONE MODE

Clone mode allows for quick setup of additional radios by transferring the programming parameters of one radio to another by a data cable connection. Cloning reduces errors in programming large numbers of AN/PRC-117Fs with many net presets. Cloning does not transfer COMSEC fills, FH data, DAMA TBAs, SINCGARS GTOD, or HAVEQUICK TOD. The first radio in the process (source) is set to transmit programming parameters and the second radio (target) is set to receive them.

Two cloning settings are available: **SYSTEM** and **DAMA**. The **SYSTEM** setting will clone all possible parameters including DAMA. The **DAMA** setting will clone only DAMA parameters.

NOTE

When cloning from an AN/PRC-117F with firmware version 4.1 to an AN/PRC-117F with version 4.0 or earlier, the **SYSTEM** setting will not clone DAMA parameters.

Perform the following procedure to clone a radio. Do not connect the cloning cable to radios until instructed to do so.

NOTE

Cloning between different AN/PRC-117F firmware versions is not possible below version 2.3.1.7. Also, if a net parameter in the source radio is not available in an older version target radio, that parameter will not be cloned. It is recommended to use the same version firmware for all radios in a net. Contact Harris for software upgrade information.

- a. Make sure source radio has been programmed with all necessary net presets. Zeroize the target radio.
- b. Place each radio's function switch to **PT** position.
- c. Press **MODE** key and select **CLONE** mode on each radio.
- d. Select **RECEIVE** on the target radio to be cloned. Display indicates **INITIATE CLONE AT SOURCE**.
- e. Connect both radios with cloning cable (12013-0720-Axxx) using the **J6 ACCESSORY** connectors.
- f. Select **TRANSMIT** on the programmed source radio, and press **ENT**.
- g. Use the up/down arrow keys to select either **SYSTEM** cloning or **DAMA** cloning.
- h. Press **ENT** on the source radio to send black parameters to the target radio. The source radio indicates **TRANSMITTING**.
- i. Upon successful cloning operation, turn off each radio. Disconnect the clone cable.
- j. Power on the newly cloned radio. Load any COMSEC or FH data necessary and perform communications check. If using DAMA mode, change Terminal Base Addresses on the cloned radio to its own in all DAMA net presets. If using SINCGARS Nets, ensure Member/Master relationship is maintained.

11. BEACON MODE

Beacon mode is used to support radio direction-finding efforts for recovery operations. The beacon mode transmitting parameters can be preset in the **PGM>CFIG>BEACON** menu. Output signal is modulated by an audio tone swept from 300 Hz to 3300 Hz. The beacon can be operated on any frequency from 90.00000 MHz to 511.99999 MHz in either FM or AM modulation. The frequency and modulation settings are also screen overridable after entering BEACON mode; power level is not screen overridable. Be sure all users are aware of the programmed beacon frequency to avoid inadvertent operation on normal operating frequencies.

Perform the following to operate in Beacon mode:

- a. Rotate function switch to **PT**.
- b. After the radio initializes, press **MODE**.
- c. At **OPERATIONAL MODE** prompt, select **BEACON** and press **ENT**.
- d. At **ENTER BEACON MODE** display, select **YES** to enter Beacon mode. Selecting **NO** brings radio back to operational mode menu. The Beacon will start transmitting.
- e. To override the preset Beacon settings, set the desired frequency in the range of **90.00000 MHz to 511.99999 MHz** and modulation type of **AM** or **FM** by using the right or left arrow keys on the KDU. Press **ENT** to set new values.
- f. To leave **BEACON** mode, press **MODE** and select **NORMAL** mode or turn radio off. Upon next power up, the radio starts in normal mode.


12. REMOTE CONTROL OPERATIONS

The AN/PRC-117F can be controlled by an optional remote control device such as a PC. The remote port of either J3 DATA, J6 ACCESSORY, or J9 ACCESSORY must be configured to communicate with the remote control device. Communications programs capable of programming an asynchronous interface can be used.

Perform the following procedure to enable remote control mode:

- a. Press **MODE**.
- b. Use the up/down arrow keys to select **REMOTE CONTROL**.
- c. Press **ENT**.

During remote control operation, the following operations are allowed from the KDU:

- Volume control.
- Deactivation of the remote control mode.
- KDU backlight control via the **LT** key.
- Display alternate operational displays using  key.

Perform the following procedure to deactivate remote control operation:

- a. Press **MODE**.
- b. Scroll to **REMOTE CONTROL**.
- c. Scroll to **OFF** and press **ENT**.

13. COMSEC OTAR/OTAT AND OTHER NCD OPERATIONS

The AN/PRC-117F is capable of OTAR and OTAT. The AN/PRC-117F supports cooperative and uncooperative receive rekey, transmit MK, or AK rekey, VG, and VU from the menus available in the function switch position of **RV**. The AN/PRC-117F supports noncooperative receive rekey (OTAR) in the **CT** and **TD** positions.

To receive a TEK using AK, both the receiving and the NCD or DTD transmitting the OTAR must have the same KEK. The KEK must be loaded into the AN/PRC-117F by an external fill device. MK does not require using the KEK. Refer to Table 28.

The following are AN/PRC-117F OTAR operating capabilities and limitations:

- **KEK** – Encryption key used in certain OTAR operations.
- **Receive Variable** – The AN/PRC-117F is capable of implementing receive variable operation of manual keying or automatic keying using a KYX-15 NCD or AN/CYZ-10 DTD.
- **Variable Generate** – The AN/PRC-117F can generate COMSEC key variables using a KYX-15 NCD or AN/CYZ-10 DTD.
- **Cooperative Receive Rekey** – Receiving radio requires operator action to enable reception.
- **Noncooperative Receive Rekey** – The received key overwrites the current key on the channel automatically without operator action. The radio must have KEK loaded for AK operation.
- **OTAT** – An additional process of OTAR where a COMSEC key can be downloaded to a fill device after reception in the AN/PRC-117F.

OTAR and OTAT allow COMSEC variables to be transmitted by the NCS and received by any net member radio. The AN/PRC-117F supports full OTAR operations, SARK, as well as other NCD controlled operations. These operations require the KYX-15 NCD or AN/CYZ-10 DTD in KYX-15 mode. Table 29 shows the process of either a AK or MK.

Table 28. AN/PRC-117F OTAR/OTAT Capabilities

RV Process	OTAR	OTAT		KEK Required
	Radio Only	Fill Device Only	Both Fill Device and Radio	
VINSON AK	X	NO	NO	YES
VINSON MK	X	X	X	NO
ANDVT AK	X	X	NO	YES
ANDVT MK	X	X	NO	NO
KG-84 AK	X	X	X	YES
KG-84 MK	X	X	X	YES
FASCINATOR	Does not support OTAR / OTAT operations.			

Table 29. OTAR Process

Step	AK or MK Sending Station	AK or MK Receiving Station
1.	Call all stations and tell them to prepare for OTAR.	If using cooperative, users switch to RV. If using noncooperative, users do nothing.
2.	Switch to RV .	Do not transmit until process is completed.
3.	Connect NCD and use to send either an AK or MK.	If using cooperative, AN/PRC-117F will ask user where to store the new key. If using noncooperative, new key overwrites current selected key.
4.	Perform variable update, load new key into sending radio, and make sure communications is possible with all stations with new key.	

13.1 Transmit MK OTAR

Perform the following procedure for TX MK mode:

- a. Determine TEK that is to be transmitted by MK OTAR. Load this TEK to the AN/PRC-117F to have available for communications checks with receiving stations of the OTAR.
- b. Notify receiving stations to prepare for MK OTAR. Direct them to use cooperative or noncooperative method, Additionally instruct them not to transmit again until they hear a communications check.
- c. Rotate the function switch to **RV**.
- d. Select **TRANSMIT MK** mode and press **ENT**.
- e. **WAIT – CONFIGURING FOR TX MK** displays.
- f. If in VINSON or ANDVT mode, **CONNECT NCD AND INITIATE MK** displays.
- g. If in KG-84 mode, **START TX CONNECT NCD AND INITIATE MK** displays. Transmit data traffic.
- h. Connect the KYX-15 (NCD) or AN/CYZ-10 DTD fill device now. The AN/CYZ-10 should use COMSEC menu of RDS or FILL using CFD emulation of KYX-15.
- i. On the fill device, select **MK** mode and the necessary keys.
- j. Initiate the MK from the fill device.
- k. **TX MK IN PROGRESS** displays, followed by **TX MK DONE PRESS ANY KEY**.
- l. Press any key to return to the rekey/NCD operations menu.
- m. Disconnect Fill device.
- n. Return to **CT** operation and conduct a communications check using the new TEK.

13.2 Transmit AK OTAR

AK rekeying operations require the receiving radio to be loaded with the same KEK as used in the NCD used to send the OTAR. The KEK must be distributed and loaded prior to using AK operations. After each AK OTAR operation the KEK loaded in the receiving radios is automatically updated. Sending operator must then update KEK in DTD or NCD accordingly after each successful AK OTAR operation.

Perform the following procedure for TX AK mode:

- a. Determine TEK that is to be transmitted by AK OTAR. Load this TEK to the AN/PRC-117F to have available for communications checks with receiving stations of the OTAR.
- b. Notify receiving stations to prepare for AK OTAR. Direct them to use cooperative or noncooperative method. Additionally, instruct them not to transmit again until they hear a communications check.
- c. Rotate the function switch to **RV**.
- d. Select **TRANSMIT AK** mode; press **ENT**.
- e. **WAIT – CONFIGURING FOR TX AK** displays.
- f. If in VINSON or ANDVT mode, **CONNECT NCD AND INITIATE AK** displays.
- g. If in KG-84 mode, **START TX CONNECT NCD AND INITIATE AK** displays. Transmit data traffic.
- h. Connect KYX-15 (NCD) or AN/CYZ-10 (DTD) fill device now. The AN/CYZ-10 should use COMSEC menu of RDS or FILL using CFD emulation of KYX-15.
- i. On the fill device, select **AK** mode and the necessary keys.
- j. Initiate the AK from the fill device.
- k. **TX AK IN PROGRESS** displays, followed by **TX AK DONE PRESS ANY KEY**.
- l. Press any key to return to the rekey/NCD operations menu.
- m. Disconnect Fill device.
- n. Return to **CT** operation and conduct a communications check using the new TEK.
- o. If OTAR was successful, update KEK in NCD using procedure described in Paragraph 13.6.

13.3 Receive AK OTAR Cooperative

NOTE

It is not recommended to use noncooperative OTAR as a method to update COMSEC in a multiple station net as the possibility of not all stations receiving the update results in the net being mixed with stations using two different keys. Use of noncooperative OTAR methods should be limited to stations with untrained operators and as a means of corrective action for stations not able to change keys at end of schedule crypto periods.

Perform the following procedure for cooperative RX AK OTAR and/or OTAT mode:

- a. Upon receiving notification that NCS will transmit an AK OTAR, acknowledge instructions and do not transmit again until procedure has completed and the NCS makes another communications check.
- b. Rotate function switch to **RV**.
- c. Select **RECEIVE AK** mode; press **ENT**.
- d. **WAIT – CONFIGURING FOR RX AK** displays, followed by **WAIT TO RECEIVE MK**.
- e. Select desired **KEY STORAGE DEVICE**. Refer to Table 28 for OTAR and OTAT capabilities.
- f. Wait for sending station to transmit AK OTAR.
- g. **RX MK IN PROGRESS** displays, followed by **RX AK OK**.
- h. Select the desired TEK location (01 – 25), if key storage device is the radio.
- i. If external key fill device is key storage device, display will show **INITIATE TRANSFER AT FILL DEVICE**. Load key to fill device using the procedure appropriate to your specific fill device.
- j. **KEY STORE IN PROGRESS** displays, followed by **KEY STORE OK** if successful. If unsuccessful, coordinate with sending station to repeat process. If OTAR had been successfully accomplished (Step f), use that key to fill radio instead of having the OTAR retransmitted.
- k. Press any key to return to the rekey/NCD operations menu.
- l. Turn off DTD or NCD and disconnect it from **J1 AUDIO/DATA/FILL** connector.
- m. Return to CT operation. Wait for communications check from NCS. Acknowledge to NCS if process was successful and if KEK update was indicated.

13.4 Receive MK OTAR Cooperative

Perform the following procedure for cooperative RX MK OTAR and/or OTAT mode:

NOTE

A more fail-safe method is to use OTAT where the key can also be stored in the fill device. If one of the receiving radios does not receive the key, or a failure occurs in the key store, a backup will exist in the fill device to load into the radio that does not have the key.

- a. Upon receiving notification that NCS will transmit an MK OTAR, acknowledge instructions and do not transmit again until procedure has completed and the NCS makes another communications check.
- b. Rotate function switch to **RV**.
- c. Select **RECEIVE MK** mode; press **ENT**.
- d. Select desired **KEY STORAGE DEVICE**. Refer to Table 28 for OTAR and OTAT capabilities.
- e. **WAIT – CONFIGURING FOR RX MK** displays, followed by **WAIT TO RECEIVE MK**.
- f. Wait for sending station to transmit MK OTAR.
- g. **RX MK IN PROGRESS** displays, followed by **RX MK OK**.
- h. Select the desired TEK location (01 – 25), if key storage device is the radio. It's best not to choose the current used TEK location unless directed to.
- i. If external key fill device is key storage device, display will show **INITIATE TRANSFER AT FILL DEVICE**. Load key to fill device using the procedure appropriate to your specific fill device. The AN/CYZ-10 must be using RDS or FILL set to a CFD protocol.
- j. **KEY STORE IN PROGRESS** displays, followed by **KEY STORE OK** if successful. If unsuccessful, coordinate with sending station to repeat process. If OTAR had been successfully accomplished (Step f), use that key to fill radio instead of having the OTAR retransmitted.
- k. Press any key to return to the rekey/NCD operations menu.
- l. Turn off fill device and disconnect it from **J1 AUDIO/DATA/FILL** connector.
- m. Return to **CT** operation. Wait for communications check from NCS. Acknowledge to NCS if process was successful.

13.5 Receive RX OTAR (MK or AK) Noncooperative

The AN/PRC-117F supports both a cooperative and non-cooperative RX MK mode in ANDVT and KG-84 COMSEC modes. VINSON does not support noncooperative RX MK OTAR. KG-84 still requires use of a KEK. Perform the following procedure for noncooperative RX AK mode:

- a. Upon receiving notification from NCS that a AK OTAR is to be transmitted, acknowledge instructions. Do not transmit again until the process is complete and the NCS makes a communications check.
- b. Wait to receive the AK. Monitor the upper right corner of the KDU to observe the status of the RX AK.
- c. If the radio is in ANDVT or VINSON mode, beeps in the handset provide status of the RX AK. Four short beeps indicate a successful AK. One short beep, then one long beep indicates a failed AK operation.
- d. If the AK is received successfully, the new key overwrites the currently selected TEK.
- e. If the KEK is updated during the RX AK, the KEK update count is indicated.
- f. Wait for communications check from the sending station. The sending station will make the first check on the new TEK. If the OTAR process was unsuccessful, the communications check will be made on the old key and the process will need to be attempted again.

13.6 Variable Update

After AK OTAR operation has been verified at the receiving AN/PRC-117F, the KEK used by the net controller must be updated in fill device to continue operations in AK OTAR.

Perform the following procedure for variable update mode:

- a. Rotate function switch to **RV**.
- b. Select **VARIABLE UPDATE**; press **ENT**.
- c. **WAIT – CONFIGURING FOR VU** displays, followed by **INITIATE VU – PRESS ANY KEY WHEN DONE**.
- d. Connect the KYX-15 (NCD) or AN/CYZ-10 (DTD) fill device.
- e. On the fill device, select **VU** mode and the key storage location of the desired key variable. AN/CYZ-10 must be set to KYX-15 protocol to use the VU mode under the Fill program. On AN/CYZ-10s using RDS, go to the Radio Program COMSEC menu and follow menu instructions for VU.
- f. Initiate the VU from the fill device. Monitor the fill device for the status of the variable update operation.
- g. Press any key to return to the rekey/NCD operations menu.
- h. Turn off DTD or NCD and disconnect it from **J1 AUDIO/DATA/FILL** connector.
- i. Return to CT operation.

13.7 Variable Generate

Perform the following procedure for variable generate mode:

- a. Rotate function switch to **RV**.
- b. Select **VARIABLE GENERATE** mode; press **ENT**.
- c. **WAIT – CONFIGURING FOR VG** displays, followed by **INITIATE VG – PRESS ANY KEY WHEN DONE**.
- d. Connect the KYX-15 (NCD) or AN/CYZ-10 (DTD) fill device.
- e. On the fill device, select **VG** mode and the key storage location of the desired key variable. AN/CYZ-10 must be set to KYX-15 protocol to use the VG mode under the Fill program. On AN/CYZ-10s using RDS, go to the Radio Program COMSEC menu and follow menu instructions for VG.
- f. Initiate the VG from the fill device. Monitor the fill device for the status of the variable generate operation.
- g. Press any key to return to the rekey/NCD operations menu.
- h. Turn off DTD or NCD and disconnect it from **J1 AUDIO/DATA/FILL** connector.
- i. Return to CT operation.

14. SECURITY AND NET LOCKOUT PROGRAMMING

Security settings are used in the AN/PRC-117F to prevent unauthorized changes to radio parameters. See Figure 28 for the programming menu tree that shows the security and network lockout menus.

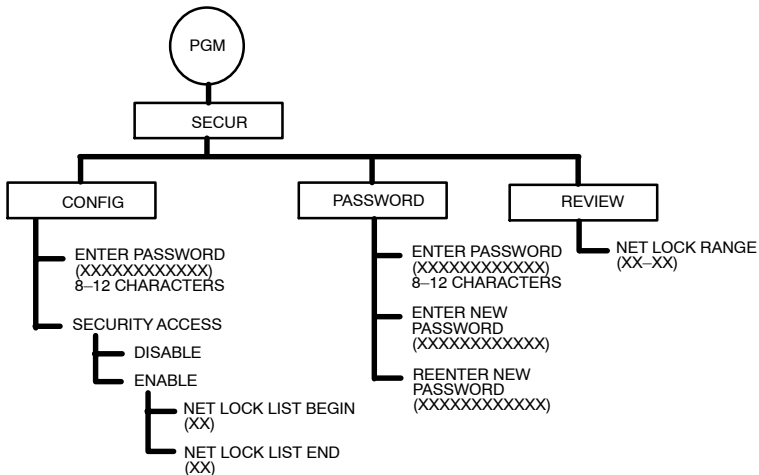


Figure 28. Secur Menu Programming Tree

14.1 Creating or Changing a Password

To create a new security password or change an existing password:

- Press **PGM** key on the KDU. Use left/right arrow keys to select **SECUR** to access security programming, and press **ENT**.
- Use left/right arrow keys to select **PASSWORD**, and press **ENT**.
- To change a password, enter the existing password, and press **ENT**. If a password does not exist, skip this step and proceed to Step e.
- Enter the new password, and press **ENT**. Password must be 8 to 12 alphanumeric characters.
- Re-enter the new password to confirm it, and press **ENT**.
- Press **CLR** to exit out of menus. Password is now active.

14.2 Enabling a Net Lock List

To protect a range of radio nets with a password, perform the following procedure:

NOTE

A password must be set before the Net Lock List can be created.

- a. Press the **PGM** key on the KDU. Use the left/right arrow keys to select **SECUR** to access security programming, and press **ENT**.
- b. Use the left/right arrow keys to select **CONFIG**, and press **ENT**.
- c. Enter the password, and press **ENT**.
- d. Under SECURITY ACCESS, select **ENABLE** and press **ENT**.
- e. Enter the net number of the first net in the range that is to be secured, and press **ENT**.
- f. Enter the net number of the last net in the range that is to be secured, and press **ENT**.
- g. Press **CLR** to exit out of menus. The specified range of nets now requires the deactivation of security to permit changes.

14.3 Disabling a Net Lock List

To turn off password protection for a range of radio nets, perform the following procedure.

- a. Press the **PGM** key on the KDU. Use the left/right arrow keys to select **SECUR** to access security programming, and press **ENT**.
- b. Use the left/right arrow keys to select **CONFIG**, and press **ENT**.
- c. Enter the security password, and press **ENT**.
- d. Under SECURITY ACCESS, select **DISABLE**, and press **ENT**.
- e. Press **CLR** to exit out of menus. All nets are now accessible.

14.4 Viewing a Net Lock List

To determine the range of nets that are password protected, perform the following procedure.

- a. Press the **PGM** key on the KDU. Use the left/right arrow keys to select **SECUR** to access security programming, and press **ENT**.
- b. Use the left/right arrow keys to select **REVIEW**, and press **ENT**.
- c. The Net Lock Range will be displayed. Press **CLR** to exit out of menus.

14.5 Copying a Net

To copy an existing net preset to another net location, perform the following procedure.

- a. Use the **PRE +/-** keys on the KDU and go to the net that is to be copied.
- b. Press the **OPT** key on the KDU. Use the left/right arrow keys to select **SAVE**, and press **ENT**.

- c. Under **SAVE AS NET ID:**, enter the two-digit net number where the parameters are to be saved, and press **ENT**.

NOTE

If the Net Locking feature is enabled and the selected number is within the locked net range, then ***LOCKED*** will appear on the screen. To continue, either assign a different (unlocked) net number, or disable the net lock.

- d. Enter a net name for the new net or keep the default name, and press **ENT**.
- e. When asked "SAVE NET?", use the up/down arrow keys to select **YES**, and press **ENT**. The new net will be saved with the same preset parameters as the copied net.
- f. Press **CLR** to exit out of menus.

15. CONFIGURATION PROGRAMMING

The **CFIG** menus enable various radio programming. See Figure 29 for the programming menu tree. Perform the following procedure to select any of these programming options:

- a. Press **PGM**.
- b. Use the left/right arrow keys to select **CFIG**.
- c. Press **ENT** to access the **CFIG** menus.

15.1 GENERAL Configuration

EXTERNAL TACSAT LNA POWER – When this is set to **ON**, a Direct Current (DC) voltage of 20 VDC is supplied to the VHF-HI/UHF antenna connector for use with a Low Noise Amplifier (LNA) during DAMA or SATCOM receive operations. Be sure to turn LNA power to **OFF** when not using an external LNA.

FM TRANSMIT TONE – When this is set to **ON**, the AN/PRC-117F transmits a 150 Hz squelch tone whenever the PTT key is pressed in a LOS fixed frequency net preset using FM modulation. Ensure FM transmit tone is set to **ON** when operating with other types of FM radios requiring tone squelch, or if CTCSS/CDCSS is being used.

AM TRANSMIT TONE – When set to **ON**, allows for the transmission of the 150 Hz squelch tone when using AM. Ensure this is set to **ON** when communicating with other radio systems requiring this type of receive squelch. Set to **OFF** when not using tone squelch, or if CTCSS/CDCSS is being used.

SILENCE ERROR BEEPS? – When set to **YES**, the AN/PRC-117F will not beep when operator errors occur.

AUTO SAVE OVERRIDES – When set to **YES**, all operator overrides are immediately saved. Set this to **NO** if all overrides are to be temporary. When set to **NO**, the **SAVE** command in the Option menu must be used to keep any overrides.

CONST LIGHT OPTION – If Constant Light Operation is desired in the manpack operation, set this to **ON**. This makes the item selectable from the KDU LT button. Otherwise the KDU LT button will only allow choice of **OFF** or **Momentary**. This feature is used to conserve battery power for the manpack configured radio.

ANDVT Fade Priority – ANDVT fade occurs when voice is being received and the modem drops sync without receiving an active End Of Message flag. The fade period is approximately four seconds. In order for the crypto to maintain sync through the fade, the modem must think the channel is busy, which would normally not allow the user to key the radio. This menu permits the user to choose whether or not to allow radio keying during a fade. If **TX** is selected, the user may key the radio during the fade period. If **RX** is selected, the display will show "Keyline Ignored", and the operator cannot key during the fade period.

CTCSS/CDCSS Priority – With normal CTCSS/CDCSS operation, the AN/PRC-117F will not transmit if the channel is busy, and the main KDU display shows "BSY" in the squelch field. Set CTCSS/CDCSS Priority to **TX** to allow transmit even when the channel is busy. Set the priority to **RX** for normal operation (cannot transmit when channel is busy).

PA FAILSAFE OVR – PA Failsafe is a radio feature that provides automatic power cutback should the Power Amplifier overheat. **ENABLE** the PA FAILSAFE OVR (Override) setting to command the PA to continue at full power, even in overtemperature conditions. **DISABLE** the Override setting to allow automatic power cutback feature. The override function should be enabled only when necessary, since damage to the PA could result.

VOICE PRIORITY – When Voice Priority Over Data (VPOD) is set to **ENABLE**, it allows the operator to key the handset while the radio is transmitting data and immediately (less than 2 seconds) switch to voice mode. Keying the handset drops the data transmission immediately. After the handset unkeys, data transmission may or may not resume, depending upon the type of data, mode of operation, and connected data device. The net DATA/VOICE setting must be **AUTO ON DATA** (for nets set to AUTO ON ADF, VPOD will be ignored).

SIMUL Rx VOC/DAT – When Simultaneous Receive Voice and Data is set to **ENABLE**, the radio will output received data to both the handset and J3 Data connector. This ensures the operator can hear voice while the radio is still receiving data. This feature can be used on any VINSON net, or SATCOM Wideband in CT mode (no NB, DAMA, or ANDVT).

15.2 EXT_DEV (EXTERNAL DEVICES)

The AN/PRC-117F receiver-transmitter can be installed and operated in the Vehicular Adapter Unit (VAU) as part of the AN/VRC-103(V)1 Radio Set. For more information on the VAU, refer to AN/VRC-103(V)1 Vehicular Radio Communications System Manual (10515-0110-4200).



Using an R/T with firmware older than version 3.4.0.4 will not work and may damage the VAU.

15.2.1 VAU Configuration

If the AN/PRC-117F is to be used with the 50 watt power amplifier contained in the VAU, set **EXTERNAL 50W PA MODE** to **ON**. Select **BYPASS** for manpack operation of the AN/PRC-117F. If the radio is still installed in the VAU when selecting bypass, it will give a reminder message to reconnect the antennas directly to the R/T.

After choosing to use the external 50 watt PA in the VAU, **RECEIVE LNA** can be set to **IN** or **OUT**.

15.2.2 ANTENNA

ANTENNA programming only is viewable and active when R/T is installed in VAU. This programming menu is intended to configure the operational bandwidth of the antenna connectors on the VAU to match requirements of the vehicular antenna system. **DEFAULTS** set the antenna ports to the basic designed frequency ranges.

- **DEFAULTS**
 - J4 – 30.00000 MHz to 89.99999, VHF-LOW
 - J5 – 90.00000 MHz to 224.99999, VHF-HI
 - J6 – 225.00000 MHz to 511.99999, UHF
 - J7 – All SATCOM operation, dedicated or DAMA

USER menu allows the user to program the bandwidth for each jack beginning with J4 and working upward in the frequency range. Any unassigned bandwidth is automatically programmed to J6. Bandwidth programming will stop when 511.99999 is selected for either J4 or J5. Programming remains with the VAU until the R/T is replaced with another unit.

15.2.3 BEACON Mode Preset Programming

Beacon mode can be preset to frequency, modulation and power level. Selectable beacon frequency range is 90.00000 MHz to 511.99999 MHz.

Beacon modulation is selectable for either **AM** or **FM**.

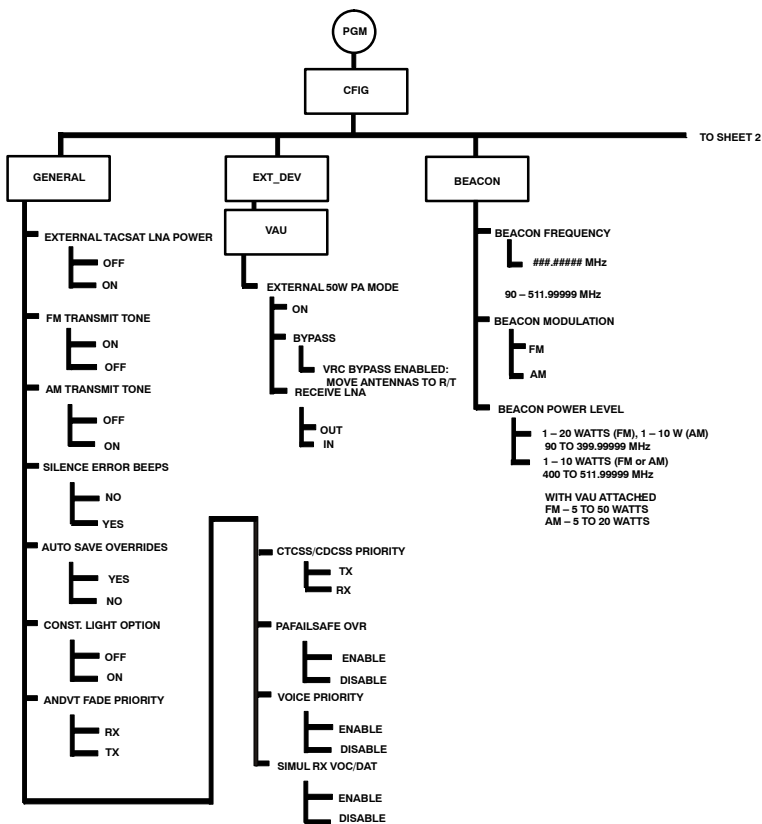
Beacon power level is selectable depending on beacon frequency:

- 20 watts – FM, 90.00000 MHz to 399.99999 MHz
- 10 watts – FM, 400.00000 MHz to 511.99999 MHz
- 20 watts PEP, 10 watts average – AM, 90.00000 MHz to 399.99999 MHz
- 10 watts PEP, 4 watts average – AM, 400.00000 MHz to 511.99999 MHz

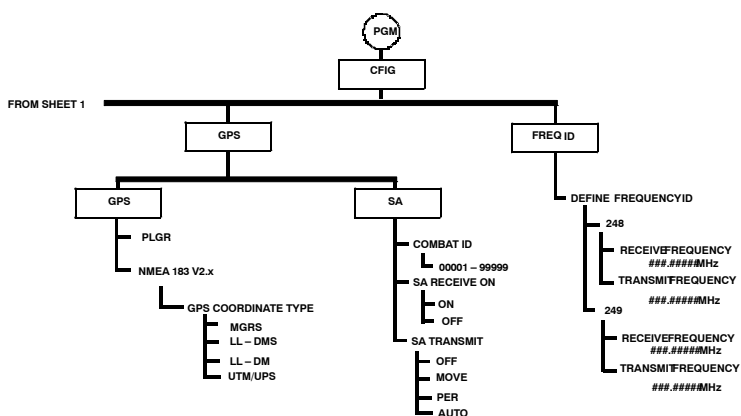
15.2.4 FREQ ID Programming

MIL-STD 188-181B Frequency codes 248 and 249 are variable frequency codes programmable by users for operation on designated satellites. After programming these codes in the Configuration menu, the selected frequencies will appear for any SATCOM net presets programmed for either of these two codes.

- a. Press the **PGM** key on KDU. Use the left/right arrow keys to select **CFIG** to access configuration programming. Press **ENT**.
- b. Use the left arrow key to select **FREQ ID**. Press **ENT**.
- c. Select Frequency Code or either **248** or **249** with up/down arrow keys. Press **ENT**.
 - 1. 248 Uplink Range – 294.800 – 314.800 MHz
 Downlink Range – 253.650 – 254.350 MHz
 - 2. 249 Uplink Range – 298.300 – 318.800 MHz
 Downlink Range – 257.150 – 257.850 MHz
- d. Input the required **RECEIVE FREQUENCY** and **TRANSMIT FREQUENCY** within limits of the MIL-STD 188-181B. Refer to Table 45 for programmable ranges for each **FREQ ID**.
- e. Programing any SATCOM net presets with either of these **FREQ ID** codes now will occur on the required frequencies.



**Figure 29. Configuration Menu Programming Tree
(Sheet 1 of 2)**



117F-128(2)M

Figure 29. Configuration Menu Programming Tree (Sheet 2)

16. PORTS PROGRAMMING

The AN/PRC-117F has a fully configurable data interface. See Figure 30 for the menu programming tree.

The AN/PRC-117F can be controlled by an optional remote control device (such as a PC) connected to either the J3 DATA connector, J6 ACCESSORY, or the rear panel J9 ACCESSORY connector. The radio's REMOTE port must be configured for communications with the remote control device.

NOTE

Using the KDU with a remote cable is not considered a true remote control as described above.

Perform the following procedure to program radio ports:

- a. Press **PGM**.
- b. Use the left/right arrow keys to select **PORTS**.
- c. Use the left/right arrow keys to select **REMOTE**, **DATA**, or **AUDIO_LEVELS**. See Figure 30.

16.1 REMOTE Port Programming

The remote port's **INTERFACE**, **PROTOCOL**, **ASYNC RATE**, **DATA BITS**, **PARITY**, **STOP BITS**, **FLOW CONTROL**, and **ASYNC ECHO** can be programmed from this menu. Select the desired port and configure these options to match the configuration of the remote device connected to the radio. Remote operation is possible on either the J3 DATA or J6 ACCESSORY connectors with the appropriate interface cable.

16.2 DATA Port Programming

When the AN/PRC-117F is connected to a data device, the data port must be programmed to match the data device's interface parameters. Either J1 ADF connector or J3 DATA connector can be used. Data devices communicate through either asynchronous or synchronous data transfer and will dictate the programming for the AN/PRC-117F data port. Ensure the data port data rate is set to match the data rate of the Net Preset being used. For example, if you are using a new preset configured for dedicated SATCOM using KG-84 with an HPW data rate set to 48 k, ensure the DTE is not set to a rate such as 9.6 K. UHF SATCOM using HPW data mode and RETRANS operation automatically configures the J3 DATA connector for proper operation.

To access the DATA Port programming menu, press **PGM**, select **PORTS**, then select **DATA**. See Figure 30.

16.2.1 ASYNC Data Programming

ASYNC programming allows the operator to set the **ASYNC RATE**, **DATA BITS**, **PARITY**, **STOP BITS**, **FLOW CONTROL**, and **ASYNC ECHO** values for asynchronous data operations. Program the AN/PRC-117F to match parameters required by the specific data device.

16.2.2 GENERAL Data Programming

Access **GENERAL** programming to set **DATA INVERSION** of **NONE**, **TX ONLY**, **RX ONLY**, or **BOTH**. These four options allow for all possible conditions that can be encountered in data communications interoperability with systems other than AN/PRC-117F. Set **TX DATA CLOCK SOURCE** and **USE CTS-IN** to properly interface synchronous devices as required. The defaults used by the radio are normally adequate for use with most MIL-STD-184 data devices and the Harris synchronous card.

16.3 Audio Levels

Depending on the requirements of an external device connected to the radio on the J3 DATA connector or J9 AIC connector, the **FIXED AUDIO LEVEL** from the radio can be set to either **0 dBm** or **-10 dBm**. This output audio level is not affected by the use of the **VOL + / -** setting.

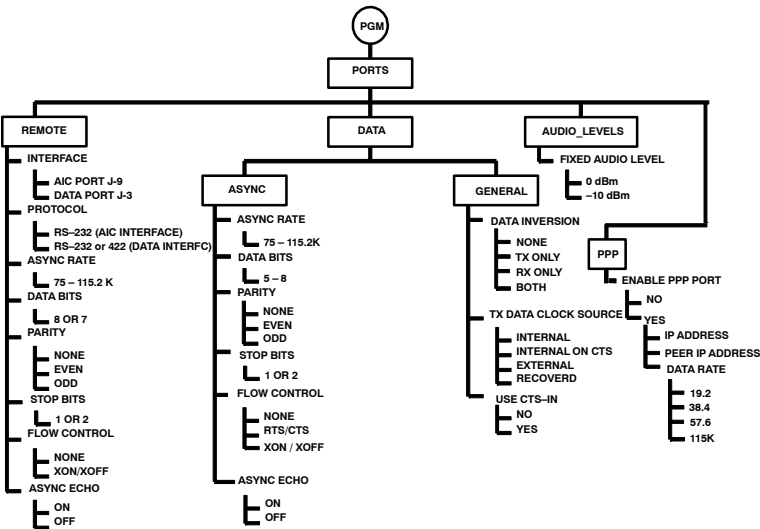


Figure 30. Ports Programming Menu Tree

17. DAMA UHF SATCOM

UHF DAMA SATCOM is a separate mode of operation in the AN/PRC-117F. DAMA operation is available on 5 kHz and 25 kHz UHF SATCOM channels that have been converted to DAMA control. 25 kHz DAMA is operated in either Automatic Control (AC) or Distributed Control (DC). Refer to Table 30 for capabilities.

Table 30. AN/PRC-117F DAMA SATCOM Capabilities

Channel Type	MOD	COMSEC	DATA VOC	DATA RATES
DAMA UHF SATCOM 5 kHz (AC) MIL-STD-188-182	5 K CKT	ANDVT	VOICE	2400
	5 K CKT	ANDVT	DATA	300, 600, 1200, 2400
	5 K CKT	KG-84C	DATA	75, 300, 600, 1200, 2400
	5 K MSG	KG-84C	DATA	75, 300, 600, 1200, 2400
DAMA UHF SATCOM 25 kHz (AC) MIL-STD-188-183	25 K AC	ANDVT	VOICE	2400
	25 K AC	ANDVT	DATA	300, 600, 1200, 2400
	25 K AC	KG-84C	DATA	75, 300, 600, 1200, 2400, 4800
	25 K AC	VINSON	VOICE	16 kbps (DASA)
	25 K AC	VINSON	DATA	16 kbps (DASA)
DAMA UHF SATCOM 25 kHz (DC)	25 K DC	ANDVT	VOICE	2400
	25 K DC	ANDVT	DATA	300, 600, 1200, 2400
	25 K DC	KG-84C	DATA	75, 300, 600, 1200, 2400
	25 K DC	VINSON	VOICE	16 kbps
	25 K DC	VINSON	DATA	16 kbps
DAMA UHF SATCOM Dedicated Calls (DASA)	25 kHz	VINSON	VOICE	16 kbps
	25 kHz	VINSON	DATA	16 kbps
	25 kHz	KG-84C	DATA	75, 300, 600, 1200, 2400, 4800, 16 kbps
	5 kHz	ANDVT	VOICE	2400
	5 kHz	ANDVT	DATA	600, 1200, 2400
	5 kHz	KG-84C	DATA	75, 300, 600, 1200, 2400
	5 kHz HPW	KG-84C	DATA	NB
	25 kHz HPW	KG-84C	DATA	WB, UFO

17.1 DAMA UHF SATCOM Programming

Figure 31 depicts the overall DAMA programming menu tree. Entry into DAMA programming takes the radio offline (not communicating).

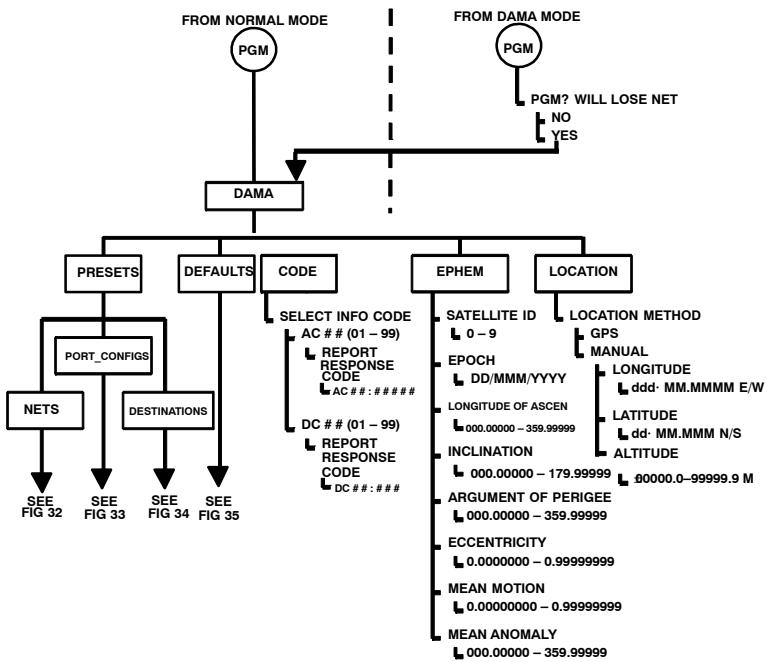


Figure 31. Overall DAMA Programming Menu Tree

17.1.1 Overall DAMA Programming Checklist

Table 31 is the DAMA programming checklist and Figure 33 is the DAMA programming tree.

Table 31. DAMA Programming Checklist

PRESETS		
Menu Item	Options	Remarks
NETS (10) 00 – 09	Refer to Paragraph 17.1.4.	Sets up the parameters required to access a DAMA channel.
PORT_CONFIG (10) 00 – 09	Refer to Paragraph 17.1.5.	Matches the DAMA channel with the desired COMSEC and mode of operation.
DESTINATIONS (50) 00 – 49	Refer to Paragraph 17.1.6.	Sets all the call parameters to use a TBA on any type of DAMA channel.
DEFAULTS		
Menu Item	Options	Remarks
DEFAULTS	Refer to Paragraph 17.1.7.	Sets defaults in CALL operating menu.
CODES		
Menu Item	Options	Remarks
SELECT INFO CODE AC # # (01–99)	REPORT RESPONSE CODE AC # #: # # # #	Allows programming of expected response to report codes for 25 kHz AC operation.
SELECT INFO CODE DC # # (01–99)	REPORT RESPONSE CODE DC # #: # # #	Allows programming of expected response to report codes for 25 kHz DC operation.

Table 31. DAMA Programming Checklist – Continued

EPHEM (Only required for passive ranging)		
Menu Item	Options	Remarks
SATELLITE ID	0 – 9	A storage location linking programmed data to the corresponding number in the DAMA Net preset. Not a UFO number.
EPOCH	DD/MM/YYYY	Enter the date for the TLE data set being used, not the current date (unless the same).
LONGITUDE OF ASCEN	000.00000–359.99999	Calculated from the TLE for the UFO being ranged.
INCLINATION	000.00000–179.00000	
ARGUMENT OF PERIGEE	000.00000–359.99999	
ECCENTRICITY	0.00000000–0.99999999	
MEAN MOTION	0.00000000–0.99999999	
MEAN ANOMALY	000.00000–359.99999	
LOCATION		
Menu Item	Options	Remarks
LOCATION METHOD	GPS	Requires PLGR/GPS to radio interface.
(Only required for passive ranging)	Manual	Lat/Long format using WGS-84 map datum.
LONGITUDE	DDD MM.MMMM E/W	Decimal minutes format in WGS-84 datum.
LATITUDE	DD MM.MMM N/S	
ALTITUDE	+/- 00000.0 – 99999.9 meters	

17.1.2 DAMA Version Setting

Two versions of DAMA are supported in the AN/PRC-117F:

- MIL-STD-188-182/183 for 5 kHz and 25 kHz channels, respectively (DAMA Rev. –)
- MIL-STD-188-182A/183A for 5 kHz and 25 kHz channels, respectively (DAMA Rev. A)

To determine which version of DAMA is currently active in the radio, perform the following procedure:

- a. Rotate function switch to **CT** position.
- b. After the radio initializes, press **MODE**.
- c. At the **OPERATIONAL MODE** prompt, select **DAMA**, and press **ENT**.
- d. Press the **OPTION** key, and then press the circular arrow key.
- e. Use the left/right arrow keys to select **VIEW**, and then **TERMINAL**.
- f. The DAMA version will be shown on the KDU screen. To change the DAMA version, refer to Paragraph 17.1.3.

17.1.3 SCC IMAGE (DAMA VERSION OPTION)

See Figure 32. When the AN/PRC-117F is equipped with the DAMA Switching option, the user can configure the radio for either DAMA Rev. – or DAMA Rev. A. To choose a DAMA version, perform the following procedure. If these menu choices do not appear, the radio is not equipped with this optional feature.

- a. Press **PGM > DAMA > SCC IMAGE**.
- b. Use the arrow keys to select either **DAMA REV DASH** or **DAMA REV A**.
- c. When asked “Are you sure”, select **YES** to accept the choice.

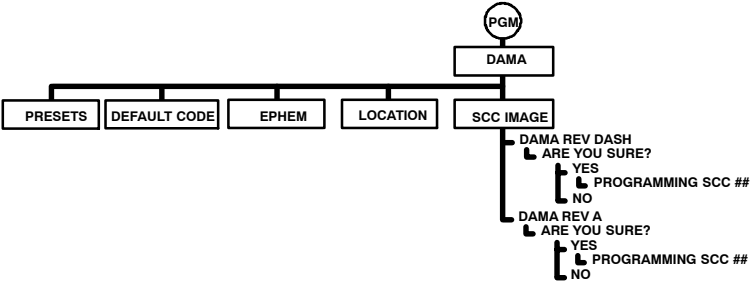
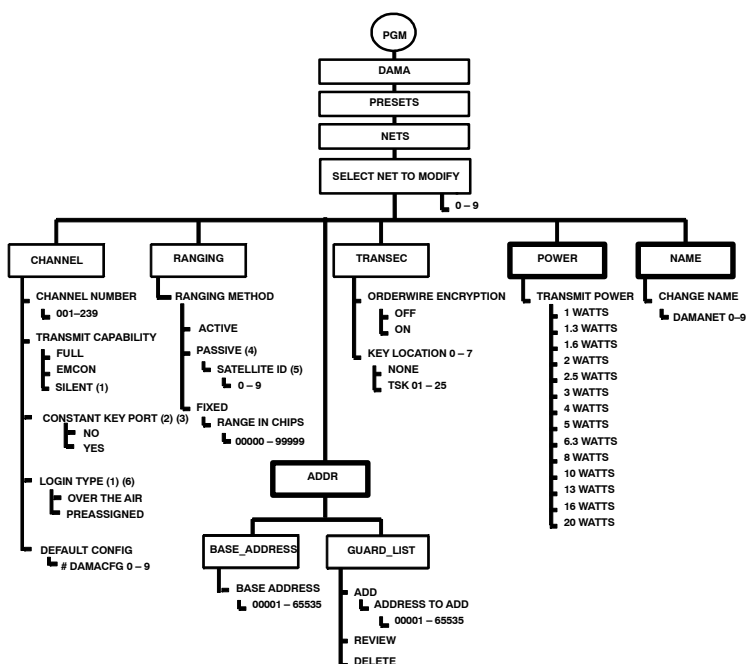


Figure 32. DAMA Version Switching



- NOTES:**
1. ONLY AVAILABLE IN 5 kHz UHF DAMA.
 2. ONLY AVAILABLE IN 25 kHz UHF DAMA.
 3. YES SETTING ONLY MAKES TRANSIT CAPABLE, NO RECEIVE.
 4. REQUIRES EPHEM DATA, POSITION AND TOD PROGRAMMING.
 5. MATCH NUMBER TO SAME USED IN EPHEM PROGRAMMING.
 6. .NOT AVAILABLE WITH DAMA REV. - .

Figure 33. DAMA Net Preset Programming Menu Tree

17.1.4 DAMA Net Preset Programming Checklist

Table 32 is the preset parameters checklist.

Table 32. DAMA Net Preset Parameters

CHANNEL		
Menu Item	Options	Remarks
CHANNEL NUMBER	FREQ CODE 001 – 249	Refer to Table 45.
RECEIVE FREQUENCY	Frequency values belonging to selected channel number	Non-standard channels cannot be used.
TRANSMIT FREQUENCY		
TRANSMIT CAPABILITY	FULL EMCON SILENT	Use FULL for normal ranging and operation. SILENT only in 5 kHz.
CONSTANT KEY PORT (25 kHz Only)	YES NO	NO for normal DAMA Operations. YES allows for longer than 17 minutes transmissions but places terminal in transmit only capability.
DEFAULT CONFIGURATION	DAMACFG0–9	Matches the Net Preset up with a DAMA Port Configuration Preset.
RANGING		
Menu Item	Options	Remarks
RANGING METHOD	ACTIVE	Normal use.
RANGING METHOD	PASSIVE	Requires loading of EPHEM data.
	SATELLITE ID, 0 – 9	Links passive ranging to where EPHEM data is stored. Not a UFO satellite number.
RANGING METHOD	FIXED	Maintenance use only.
RANGING METHOD	RANGE IN CHIPS	Used with FIXED setting.

Table 32. DAMA Net Preset Parameters – Continued

TRANSEC		
Menu Item	Options	Remarks
ORDERWIRE ENCRYPTION	OFF	PT EOW operation.
	ON	ON by present doctrine. Requires TSKs to be assigned to key locations.
KEY LOCATION 0	NONE TSK 01 – 25	DAMA EOW TSKs loaded to SATELLITE storage positions.
KEY LOCATION 1	NONE TSK 01 – 25	Assign proper key where Chan- nel Controller expects to find it. IF not known, assign key to all key locations.
KEY LOCATION 2	NONE TSK 01 – 25	
KEY LOCATION 3	NONE TSK 01 – 25	
KEY LOCATION 4	NONE TSK 01 – 25	
KEY LOCATION 5	NONE TSK 01 – 25	
KEY LOCATION 6	NONE TSK 01 – 25	
KEY LOCATION 7	NONE TSK 01 – 25	
ADDR		
Menu Item	Options	Remarks
BASE_ADDRESS	00001 – 65535	
GUARD_LIST	ADDRESS TO ADD: 00001 – 65535	Add up to 15 TBA and/or Network addresses.
	REVIEW	View programmed addresses.
	DELETE	Removes an address.

Table 32. DAMA Net Preset Parameters – Continued

POWER		
Menu Item	Options	Remarks
TRANSMIT POWER	1 – 20 watts	Steps in 1 dBm increments.
NAME		
Menu Item	Options	Remarks
CHANGE NET NAME	DAMANET 0 – 9	12 characters alphanumeric, no spaces.

17.1.5 DAMA Port Configuration Preset Checklist (10)

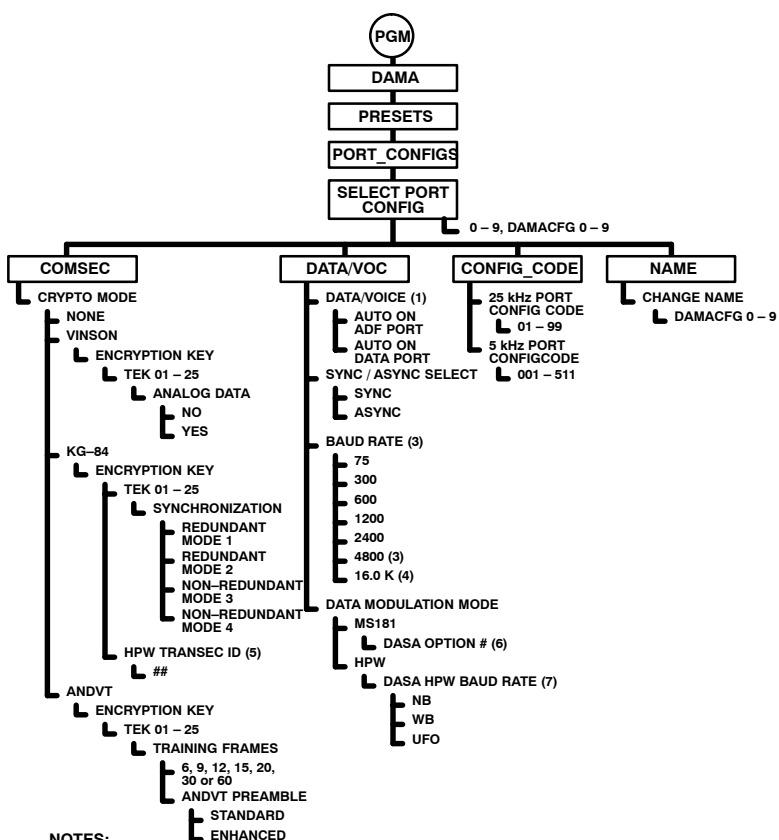
Refer to Table 33 for the port configuration preset parameters and see Figure 34 for the DAMA Port Configuration Preset menu tree.

Table 33. DAMA Port Configuration Preset Parameters

COMSEC		
Menu Item	Options	Remarks
CRYPTO MODE	NONE	Function switch in PT.
	VINSON	Not available on NB channels.
	ANDVT	2400 Max data rate.
	KG-84	Data Only.
ENCRYPTION KEY	TEK 01 – 25	Load TEKs first. Do not program empty position.
ANALOG DATA	YES NO	External devices with own modem such as KL-43C/F.
KG-84 SYNC MODE	REDUNDANT MODE 1 REDUNDANT* MODE 2 NON-REDUNDANT MODE 3 NON-REDUNDANT* MODE 4	Match mode used in net. PSC-5 only compatible with mode 4.
TRAINING FRAMES	6, 9, 12, 15, 20, 30, or 60	Sets length of Training Frames Sequence for KY-99 compatibility. 20 is default setting.
MAN TRANSEC KEY ID	TEK 01 – 25	KG-84 mode 1 only.
HPW TRANSEC KEY ID	TEK 01 – 25	KG84 mode 1 only.

Table 33. DAMA Port Configuration Preset Parameters – Continued

DATA/VOC		
Menu Item	Options	Remarks
DATA/VOICE	AUTO ON ADF PORT	With VINSON, select port to receive DATA on.
	AUTO ON DATA PORT	
	DATA OR VOICE	With ANDVT COMSEC.
	DATA	With KG-84 COMSEC
SYNC/ASYNC SELECT	ASYNC SYNC	
BAUD RATE	WB – 75, 300, 600, 1200, 2400, 4800, 16 kbps	COMSEC mode and CHAN type dependent. ASYNC requires port programming.
	NB – 75, 300,600,1200, 2400	
CONFIG_CODE		
Menu Item	Options	Remarks
DASA MODULATION MODE	MS181, HPW	HPW only valid for KG-84 mode 1.
DASA HPW BAUD RATE	NB, WB, UFO	Only for HPW DASA modulation mode.
DASA OPTION NUM	8, 10, 132, 130, A10, B10, C10	Only for MS181 DASA modulation mode.
25 kHz PORT CONFIG CO2	01 – 99	Use configuration code that matches COMSEC Type, Data rate and Data Device. Refer to Table 38.
5 kHz PORT CONFIG CODE	001 – 511	Add leading zero, same codes as in 25 kHz DAMA. Use configuration code that matches COMSEC Type, data rate and data device. Refer to Table 38.
NAME		
Menu Item	Options	Remarks
CHANGE NAME	DAMACFG 0 – 9	12 characters alphanumeric, no spaces.



NOTES:

- (1) ONLY WITH VINSON COMSEC.
- (2) ONLY WITH VINSON OR KG-84 COMSEC.
- (3) ONLY WITH KG-84 OR PT.
- (4) KG-84, VINSON, OR PT ONLY.
- (5) KG-84 MODE 1 ONLY.
- (6) MS181 DASA MODULATION ONLY.
- (7) HPW DASA MODULATION ONLY.

Figure 34. DAMA Port Configuration Preset Programming Menu Tree

17.1.6 DAMA Destination Preset Programming Checklist

AN/PRC-117F DAMA Destination Presets have the ability to be used on any type of DAMA channel. All necessary elements for each type of channel are included in the preset. Refer to Table 34 for the preset checklist and see Figure 35 for the preset programming tree.

Table 34. DAMA Destination Preset Programming Checklist

5 kHz		
Menu Item	Options	Remarks
DESTINATION	TBA 00000 – 65535	5 kHz channels only allow calls to one address.
25 kHz AC		
Menu Item	Options	Remarks
ADD DESTINATION TO ADD:	1: 00001 – 65535 2: 00001 – 65535 3: 00001 – 65535 4: 00001 – 65535 5: 00001 – 65535	25 kHz AC operation allows up to five addresses to be designated. Conference Call Capability
REVIEW	DESTINATION X of X	Allows checking of programmed addresses.
DELETE	00000 – 65535	Remove an address.
25 kHz DC		
Menu Item	Options	Remarks
CIRCUIT NUMBER	10000 – 10999	Enter the authorized 25 kHz DC circuit number.
SEARCH		
Menu Item	Options	Remarks
SEARCH AREA (5 kHz only)	LOCAL	Local footprint only.
	GLOBAL	Sets up 5 kHz MHOP operation.
NAME		
Menu Item	Options	Remarks
CHANGE NAME	DAMADEST0 0 – 49	12 digit alphanumeric name.

Table 34. DAMA Destination Preset Programming Checklist – Continued

CLEAR		
Menu Item	Options	Remarks
ARE YOU SURE	YES NO	Used to clear all parameters in the preset being programmed.

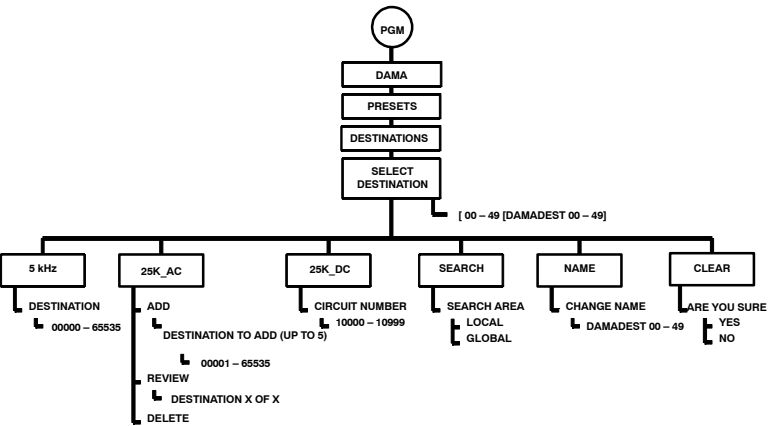


Figure 35. DAMA Destination Preset Programming Menu Tree

17.1.7 DAMA Defaults Programming Checklist

DAMA Defaults set what items appear as default values throughout the AN/PRC-117F DAMA CALL menus. This speeds up operation by reducing the amount of scrolling needed to reach the proper CALL parameters. All options for making calls are still available in the CALL menus regardless of how DAMA defaults are initially programmed. Refer to Table 35 for the checklist and see Figure 36 for the defaults programming tree.

Table 35. DAMA Defaults Programming Checklist

OUT OF SERVICE		
Menu Item	Options	Remarks
PRECEDENCE	ROUTINE, PRIORITY, IMMEDIATE, FLASH, FLASH OVERRIDE, EMERGENCY ACTION	Only used authorized precedence.

Table 35. DAMA Defaults Programming Checklist – Continued

OUT OF SERVICE		
Menu Item	Options	Remarks
REASON CODE	00–99	User developed codes.
DURATION	# # # # – SEC, MIN, HRS, DAYS	Requires to set the amount and the units before pressing ENT. Use 0000 for INDEFINITE.
PAGE		
Menu Item	Options	Remarks
ADDRESSES TO PAGE	1: # # # # # 2: # # # # # 3: # # # # #	00000 – 65535 Page users the system will not connect you to and wait for them to call.
LINK_TEST		
Menu Item	Options	Remarks
LINK TEST RATE	9.6 K 19.2 K 32 K	Sets default link test data rate when conducting link tests. Refer to Table 37 for times required to complete link tests.
CALL		
Menu Item	Options	Remarks
DURATION	# # # # – SEC, MIN, HRS, DAYS	Requires setting the amount and the units before pressing ENT. Use 0000 for INDEFINITE.
5 kHz CIRCUIT		
Menu Item	Options	Remarks
DEDICATED	YES NO	Set to YES to make call default to dedicated DASA operation.

Table 35. DAMA Defaults Programming Checklist – Continued

PAGE		
Menu Item	Options	Remarks
DURATION	##### – SEC, MIN, HRS, DAYS	Requires setting the amount and the units before pressing ENT. Use 0000 for INDEFINITE.
CHANNEL TYPE	25 kHz 5 kHz	Sets the default type of channel requested when making dedicated DASA calls.

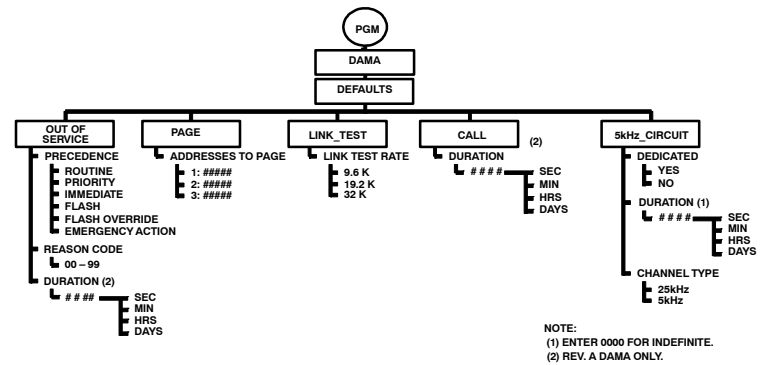


Figure 36. DAMA Defaults Programming Menu Tree

17.1.8 Passive Ranging and Ephemeris Data

Passive ranging is used when tactical situation dictates the need to control emissions from the radio. Refer to Table 36 to determine the necessary elements required for passive ranging programing and operation.

Table 36. DAMA Ranging Methods

Ranging Method Used	Transmit Capability	TIME (Options)	Location	EPHEM DATA	5kHz LOGIN
ACTIVE	FULL SILENT	Not Required	Not Required	Not Required	OVER-THE-AIR or PREAS-SIGNED.
PASSIVE	FULL SILENT (5 kHz)	YES	YES	YES	OVER-THE-AIR or PREAS-SIGNED.

17.2 DAMA UHF SATCOM Operation

25 kHz DAMA is operated in either Automatic Control (AC) or Distributed Control (DC).

The AN/PRC-117F uses the following types of DAMA presets to manage operating parameters. These presets allow for quick configuration changes to any type of operation desired.

- DAMA Net Presets, 10 each, 00 – 99
- DAMA Port Configuration Presets, 10 each, 00 – 99
- DAMA Destination Presets, 50 each, 00 – 49

Verify that SATCOM antenna is correctly orientated using a magnetic compass to point it on the proper azimuth as determined from pointing slide rule graphs or software applications. Make an approximate adjustment in the elevation angle as needed. SATCOM RSSI Test cannot be used in DAMA operation.



In DAMA SATCOM operation, the AN/PRC-117F interacts automatically with the Channel Controller transmitting and receiving as needed. This might not be apparent to the operator and contact with the antenna or exposure directly in front of the antenna should be avoided as injury to personnel may result.

17.2.1 Initial Operation

Calls can be either normal DAMA circuit service calls or DASA dedicated calls. See Figure 37.

Perform the following procedure for initial operation:

- a. Rotate function switch to **CT**.
- b. At the **OPERATIONAL MODE** prompt, select **DAMA**; press **ENT**.
- c. Select the desired **DAMA** net preset by pressing the left/right arrow keys on the KDU to scroll to the NET preset number and use the KDU numeral keys to enter the desired net preset number.

NOTE

In DAMA mode, the NET/PRE + / – key on the KDU has been disabled to prevent inadvertent changing of the net preset while in a net connected state.

- d. Press the circular change key to view that the proper **DAMA Port Configuration preset** is selected for the intended DAMA service request. If a different **DAMA Port Configuration preset** is desired, use the left/right arrow keys on the KDU to scroll to the preset number. Enter the required preset number and press **ENT**.
- e. Begin radio operation. View main screen for Network Status changes in the listed order:
 1. **ACQUIRING**
 2. **RANGING** (active ranging method only)
 3. **LOGGING IN** (5 kHz only)
 4. **CONNECTED**
- f. Network status of **CONNECTED** indicates the terminal is ready to request or receive services in the DAMA network. If terminal does not become connected, check antenna pointing, loading, and programming assignment of the proper EOW TSK and TBA. **ERROR** network status indicates that no DAMA EOW TSK has been loaded.

NOTE

Network status displayed may not be visible due to other temporary messages that are being written to the screen.

17.3 25 kHz DAMA Operation

25 kHz DAMA has two modes of operation: Automatic Control (AC) or Distributed Control (DC). The Channel Controller determines the frame format of the channel and the radio operates accordingly.

17.3.1 Place a Call in 25 kHz AC DAMA

Calls can be made from one to five terminal or network addresses. A network address is a predetermined grouping of terminals that are to be operated together as a network. Determine the following before making a call request:

- **Type of Service**
Use the proper DAMA Port Configuration Preset for the service needed from the service state display screen before placing the call. Upon changing the Port Configuration Preset with a connected terminal, the radio will send a Status Report B RCCOW to the Channel Controller for notification of the new configuration. For DASA Dedicated calls, in 25 kHz AC DAMA, a Port Configuration Preset with a configuration code must be used to signify DASA. Refer to current configuration codes in Table 38.
- **Station(s) to be Called**
DAMA Destination Presets will be used in call menus to select station(s) to be called. Terminal base addresses associated with this destination preset are shown on line below the DAMA Destination Preset name.
- **Precedence of the Call**
Use the proper precedence for the importance of the required service. Do not exceed the terminal's maximum authorized precedence as this will result in the call being denied. Not all terminals have access to every precedence level. Check with organization DAMA planners and authorization documents. At certain times, the Channel Controller can place precedence restrictions. The AN/PRC-117F will not allow a call below this precedence during these times.
- **Duration of the Call**
Request enough time to complete the required communications; service will be automatically terminated at the end of this time period.

See Figure 37. Perform the following procedure to **PLACE A CALL** using 25 kHz AC DAMA:

- a. Press the **CALL** key to bring up **SELECT REQUEST TYPE**.
- b. Select **PLACE A CALL** and press **ENT**.
- c. Select the destination to be called. Use the left/right arrow keys to select the **DAMA Destination Preset Number** field and then enter the preset number that is desired. An alternative means is to select the destination name field and scroll through the DAMA Destination Presets names with the up/down arrow keys. Press **ENT** when proper destination preset number or name is in view. The Terminal Base Addresses (TBAs) associated with this destination preset will be shown at the bottom of the display.

- d. At next display screen, choose a precedence for the CALL and press **ENT**.

NOTE

When the Channel Controller places system restrictions on the system, a minimum precedence is required to place a call on the DAMA channel. When this happens, the call precedences no longer authorized are not shown on AN/PRC-117F call menus.

- e. Enter the required **CALL DURATION** in number of seconds, minutes, hours or days or input **0000** for indefinite. Use the left/right arrow keys to select between either the unit digits field or the units. Press **ENT** when correct time and units are selected.
- f. The display will return to the main operational display. Service state will change to **PENDING**. Wait for the radio to send the request to the Channel Controller.
- g. Observe the following Service States:
- **PENDING** – Radio terminal is negotiating the sending of the call request and action on it from the Channel Controller. Wait until it becomes active or a system message is sent concerning the request.
 - **ACTIVE** – Service request has been granted, the normal indication to commence operation with the requested service.
 - **QUEUED** – Service request is being held and will be granted when channel resources are free. Wait until the service is finally granted or terminate the call and try again at a later time.
 - **DEDICATED** – Indicates that DASA operation has been granted. Operation in DASA is ruled by MIL-STD-188-181B covering 5 kHz and 25 kHz dedicated UHF SATCOM.
 - **IDLE** – The radio is not active or is setting up a service.

17.3.2 Terminate Call, 25 kHz AC DAMA

Upon completion of a call, a user should terminate the timed or indefinite call so that channel resources return to control of the Channel Controller for reassignment to other terminal users in the network.

Perform the following procedure to terminate a call:

- a. From a Service State display indicating **ACTIVE** and time remaining, press **CALL**.
- b. From **SELECT REQUEST TYPE** display, select **DISCONNECT FROM CALL** or **TERMINATE ALL** with the up/down arrow keys and press **ENT**.
- c. The **DISCONNECT FROM CALL** or **TERMINATE ALL** request is sent to the Channel Controller. The Channel Controller tears down the service and the service state of the terminal returns to any of the following service states: **IDLE**, **PENDING**, or **QUEUED** depending on any other ongoing requests.

17.3.3 Send an Out-Of-Service Request, 25 kHz AC DAMA

In 25 kHz AC DAMA, Out-of-Service Requests are sent to the Channel Controller instead of logging out as in 5 kHz DAMA. In these requests, the duration for being out of service, precedence, and reason code is transmitted. If any other station attempts to call your terminal during the out of service period, the Channel Controller can report the reason code and time to be out of service to that user.

Perform the following procedure to send an out-of-service request:

- a. Press the **CALL** key to bring up **SELECT REQUEST TYPE** display.
- b. Select **OUT OF SERVICE** and press **ENT**.
- c. Select precedence for out-of-service request and press **ENT**.
- d. Enter two-digit numerical out of service code.
- e. Enter in **DURATION** for the out of service period; use **0000** if it is to be indefinite. Press **ENT**.
- f. The out-of-service request will be sent to the Channel Controller. Watch the display for acknowledgement from the Channel Controller.

17.3.4 Return To Service, 25 kHz AC DAMA Operation

To return to service, a Status Report B RCCOW is sent to the Channel Controller to inform him that the operator has returned by choosing the menu item **RETURN TO SERVICE**. Use when leaving an operational radio unmanned. It is not necessary to use this menu item when turning back on after a period of time when powered off. The RCCOW sent to the Channel Controller in becoming connected again will be notification of your return to service.

Perform the following procedure to return to service:

- a. Press the **CALL** key to bring up **SELECT REQUEST TYPE** display.
- b. Select **RETURN TO SERVICE** and press **ENT**.
- c. A Status Report B RCCOW will be sent to the Channel Controller.

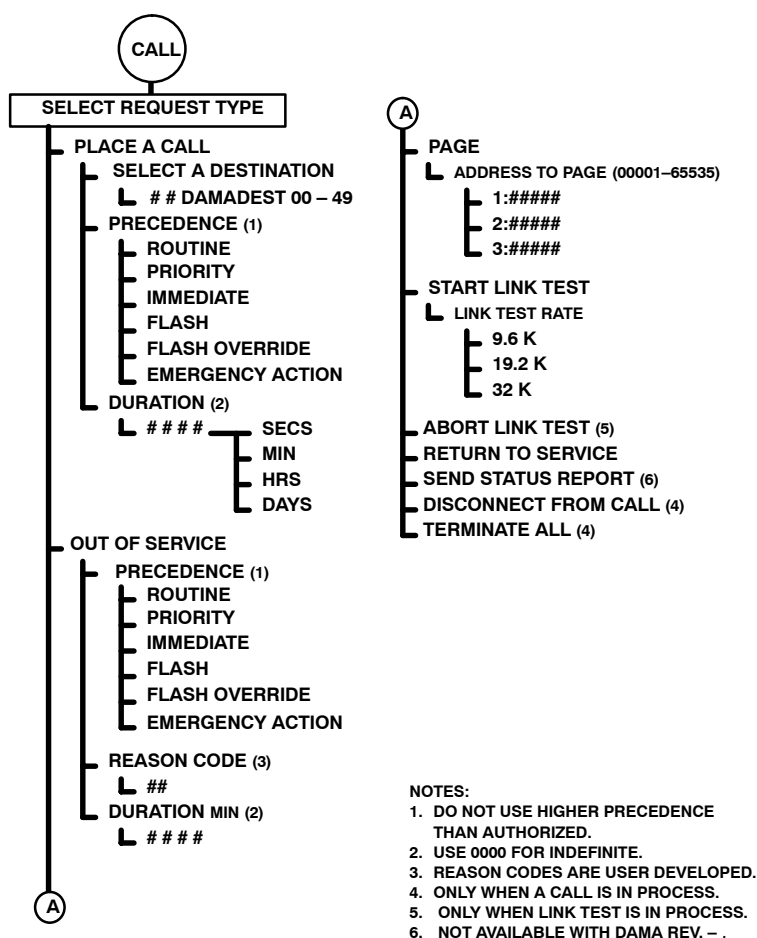


Figure 37. DAMA 25 kHz AC CALL Menu

17.3.5 PAGE (25 kHz AC DAMA Only)

In 25 kHz UHF AC DAMA, an AN/PRC-117F terminal user can page up to three other terminals. Paging is only available in 25 kHz AC DAMA. Procedures on how paged stations respond to pages are the responsibility of using organization network planners. See Figure 38.

Perform the following procedure to page:

- a. Press the **CALL** key to bring up service request screen of **SELECT REQUEST TYPE**.
- b. Select **PAGE** and press **ENT**.
- c. Use KDU number keys to type in the first address to page; press **ENT** to accept it.
- d. Repeat Step c for the second and third addresses. If no more addresses need to be paged, use **0000** and press **ENT**.
- e. The radio will send the page request to the Channel Controller. Paged station should respond as unit procedure directs.

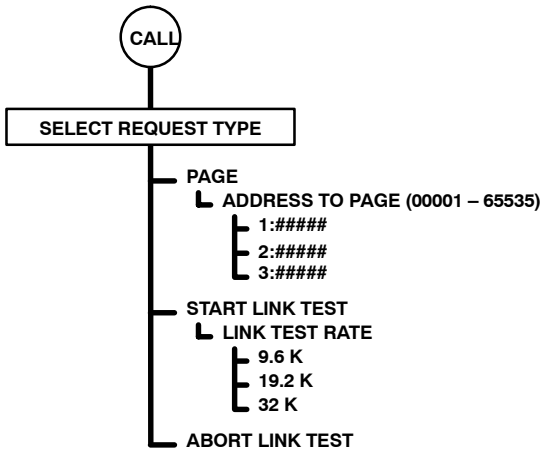


Figure 38. 25 kHz AC Paging and Link Test

17.3.6 Send an INFO Report (25 kHz AC or DC DAMA)

See Figure 38. To alleviate problems in 25 kHz AC DAMA operation, the Channel Controller has the capability to request information from the terminal operator by sending an information request code to the terminal user to get a response based on that code. The terminal user must respond to the request with an information report code in order to continue operation in DAMA.

Perform the following procedure to send an info report code at any other time:

- a. Press the **CALL** to bring up **SELECT REQUEST TYPE** display.
- b. Select **INFO REPORT** from menu and press **ENT**.
- c. Enter the desired information report response code to send to the Channel Controller and press **ENT**. The radio will send the code to the Channel Controller. (When no answer exists, send a 00000 to acknowledge the request.)

17.3.7 Start Link Test (25 kHz AC or DC DAMA)

See Figure 38. To determine suitability for data operations using more robust frame formats that support higher burst data rates, the 25 kHz DAMA has capability for link testing built into its frame format. Link testing does not reduce channel overhead allotted to supporting communications. Slower data rate link tests require more time to complete. Refer to Table 37.

Perform the following procedure to conduct a link test:

- a. Press the **CALL** key to bring up **SELECT REQUEST TYPE** display.
- b. Select **START LINK TEST** and press **ENT**.
- c. Select desired **LINK TEST RATE**; press **ENT**.
- d. A Link Test request is then sent to the Channel Controller. When the link test slot becomes available, the Channel Controller will command the radio to begin the link test.
- e. Upon completion of the link test, the radio will display the results in number of bit errors and missed acquisitions during the test. Results are automatically recorded by the Channel Controller and used in determining data burst rates. Terminals that show good results in link tests are assigned frame formats supporting more robust burst data rates.

Table 37. 25 kHz DAMA Link Test Data Rates

Link Test Data Rate	Time Required to Complete
9.6 kbps	6 – 7 minutes
19.2 kbps	2 minutes
32 kbps	1 minute

17.3.8 Abort Link Test (25 kHz AC or DC DAMA)

See Figure 39. Perform the following procedure to abort the link test to use the radio for another purpose:

- a. Press the **CALL** key to bring up the **SELECT REQUEST TYPE** display.
- b. Select **ABORT LINK TEST** and press **ENT**.

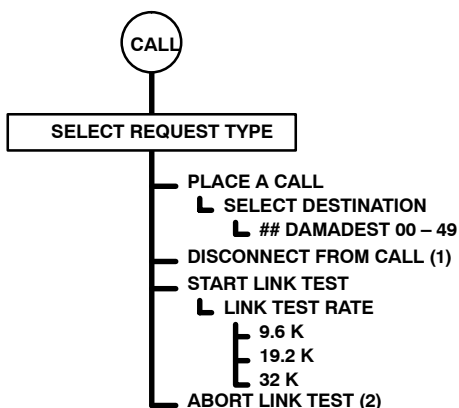
NOTE

ABORT LINK TEST is only available if a link test is in progress.

- c. The radio will abort the link test process and the link test will terminate.

17.4 25 kHz DAMA Operation, DC Operation

25 kHz DC DAMA operation is less common place and is instituted to give capability to legacy DAMA equipment still in use. DC DAMA is not true DAMA but a form of time division multiplexing that requires users to coordinate time of communications. See Figure 39. DC operation is not selectable by the AN/PRC-117F operator. The terminal operates in 25 kHz DC DAMA accordingly upon becoming net connected to a channel running DC DAMA.



NOTES:

1. ONLY IF A CALL IS IN PROGRESS.
2. ONLY IF A LINK TEST IS IN PROGRESS.

Figure 39. 25 kHz DC DAMA CALL Menu Tree

17.4.1 Place a Call, 25 kHz DC DAMA

DC operation uses circuit numbers that give the user a dedicated time slot of a predetermined data rate. Destination terminal(s) have to be on the circuit at the same time to receive any transmitted messages. Using the proper Port Configuration is also a responsibility of the terminal user.

Perform the following procedure to place a call:

- a. Rotate function switch to **CT**.
- b. After the radio initializes, press **MODE**.
- c. At the **OPERATIONAL MODE** prompt, select **DAMA**; press **ENT**.
- d. Select the desired **DAMA** net preset by pressing the left/right arrow keys on the KDU to scroll to the NET preset number and use the KDU numeral keys to enter the desired net preset number.
- e. Begin radio operation. View main screen for Network Status of **CONNECTED**.
- f. Press the **CALL** key to bring up the **SELECT REQUEST TYPE** display.
- g. Choose **PLACE A CALL** and press **ENT**.
- h. Select DAMA Destination Preset to be called and press **ENT**. The DC circuit number associated with this preset will be shown on the lower line of the display.

NOTE

In 25 kHz DC DAMA, a designation preset is not a true destination terminal as in 25 kHz AC or 5 kHz DAMA. It provides a connection to a DC circuit number giving a defined static data rate.

- i. The radio display reverts back to service state display with a service state of **PENDING** as the radio validates the requested circuit. If successful, the service state changes to **ACTIVE**. At this point operations can commence as allowed by the TX capability.

17.4.2 Disconnect from Call (25 kHz DC DAMA)

Upon finishing a call, it is standard procedure to terminate the call.

Perform the following procedure to terminate a call:

- a. From a Service State display indicating **ACTIVE**, press **CALL**.
- b. From **SELECT REQUEST TYPE** display, select **DISCONNECT FROM CALL** with the up/down arrow keys. Press **ENT**.
- c. The service state will return to **IDLE**.

NOTE

DISCONNECT FROM CALL is only available if a call is in progress.

17.5 View Network Status Messages (All DAMA Modes)

The AN/PRC-117F displays operational status messages that pop-up on the display and then are placed in a message database while DAMA operation continues. These messages are very important in determining steps in operation while using DAMA. Refer to Tables 40 and 41 for a listing of the messages and their explanation. There are two methods to view messages while operating in UHF DAMA SATCOM: message indicator method and options menu method.

17.5.1 Message Indicator Method

Perform the following procedure for the message indicator method:

- a. Press the left/right arrow keys to scroll over to the envelope icon on the operational display and press **ENT**.
- b. Use the up/down arrow keys to scroll through the message database.
- c. Press **CLR** to return back to operational screens.

NOTE

When operations on a current DAMA Net is terminated, all the DAMA status messages will be erased. Some pop-up messages require operator intervention to continue.

17.5.2 View Messages, Options Menu Method

View Messages, Options Menu Method.

NOTE

Operations on a current DAMA net will terminate if a preset is changed, the radio is powered off, or the operator enters programming. When operations on a current DAMA Net is terminated, all the DAMA status messages are erased. Some pop-up messages require operator intervention to continue.

17.6 5 kHz DAMA Operation

In 5 kHz DAMA, calls can be made to a single terminal address for a point-to-point capability or to a sub-net address giving network capability. The nine second frame length format creates long delays for voice users. 5 kHz DAMA Network operation was designed and is more suited for DATA operations. DASA dedicated service requests are used to handle service requests greater than the DAMA channel can handle adequately.

Upon entry into DAMA mode using a properly configured DAMA net preset, the AN/PRC-117F automatically acquires, ranges, and logs in with the channel controller. Network state status shows **CONNECTED** if successful. If the EOW TSK is not loaded or if the wrong TSK is being used, the AN/PRC-117F indicates a network status of ERROR indicating it cannot acquire the satellite or tries to acquire indefinitely.

DASA Call requests are placed with precedence of the call and the desired duration. Service request can be granted, placed in queue, or denied. Calls made with a precedence higher than authorized will be denied.

5 kHz DAMA has two basic modes of operation: circuit or message service. The AN/PRC-117F is placed in each mode by changing on the toggled display screens. The mode of operation must be selected prior to operation in that mode. If a message service message is received while in circuit mode, the AN/PRC-117F has to be switched to message mode to download the message.

- **Circuit Service** – Provides half-duplex encrypted voice or data service to a single destination or to a network or terminals grouped under a sub-network address.
- **Message Service** – A specialized data mode that provides for the packet transmission and reception of data messages of up to 14 kbytes in size. This requires an external data device to input the message to the AN/PRC-117F.

17.6.1 Place a Call (5 kHz Circuit Service or Dedicated DASA Call)

See Figure 40. Requesting Circuit service or Dedicated calls are essentially the same. Dedicated Service will give a channel that is not hindered by the delay the long 5 kHz DAMA frame format. Not all users have authorized use of dedicated service. Dedicated service is used to support data rates and message lengths not adequately supported by Circuit Service. Consider all the following items before placing a call:

- **Type of Service**
Use the proper DAMA Port Configuration Preset for the service needed. Select this preset from the Service state display screen before placing the call.
- **Station(s) to be Called**
DAMA Destination Presets will be used in call menus to select station(s) to be called. Terminal base addresses associated with this destination preset will be displayed on line below the DAMA Destination Preset name.
- **Precedence of the Call**
Use the proper precedence for the importance of the required service. Using a higher precedence than authorized will result in the call being denied. Not all terminals have access to every precedence level. Check with organization DAMA planners and authorization documents.
- **Duration of the Call (DASA only)**
Request enough time to complete the required communications, service will be automatically terminated at the end of this time period. Additionally, when making DASA calls, select either 5 kHz NB or 25 kHz WB channels.

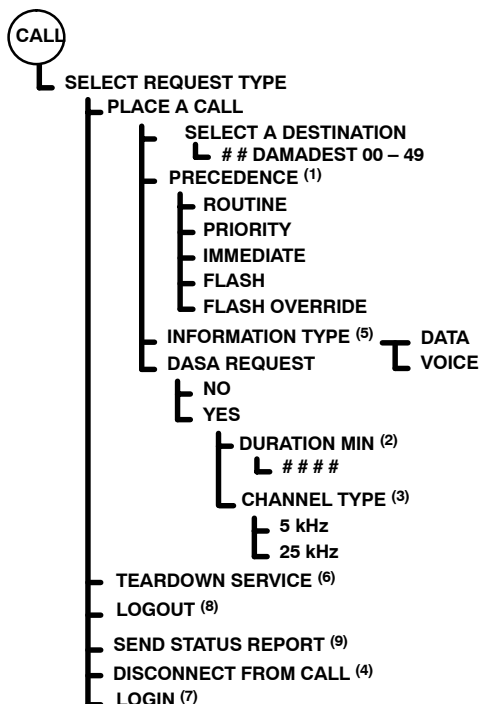
Perform the following procedure to **PLACE A CALL** using 5 kHz DAMA:

- a. Rotate function switch to **CT**.
- b. After the radio initializes, press **MODE**.
- c. At the **OPERATIONAL MODE** prompt, select **DAMA**; press **ENT**.

- d. Select the desired **DAMA** net by pressing the left/right arrow keys on the KDU to scroll to the NET preset number. Use the KDU numeral keys to enter the desired net preset number.
- e. Press the circular change key to view that the proper **DAMA Port Configuration preset** is selected for the intended DAMA service request. If a different **DAMA Port Configuration preset** is desired, use the left/right arrow keys on the KDU to scroll to the preset number. Enter the required preset number and press **ENT**.
- f. Begin radio operation. View main screen for Network Status of **CONNECTED**.
- g. Use the **CIRCULAR ARROW** key to check service state screen for 5 kHz **CKT** mode. If in **MSG** mode, use the left/right arrow keys to scroll to mode and change to **CKT** mode.
- h. Press the **CALL** key to bring up **SELECT REQUEST TYPE**.
- i. Select **PLACE A CALL** and press **ENT**.
- j. Select the destination to be called by using the left/right arrow keys to select either the **DAMA Destination Preset number** for numeric entry of the destination or the **Destination Preset Name** for scrolling using the up/down arrow keys to select the desired destination. The five digit terminal addresses associated with this destination preset will show at bottom line of the display.
- k. At next display screen, choose the precedence of the **CALL** and press **ENT**.
- l. At **DASA REQUEST?** prompt, select **YES** for dedicated service and **NO** for regular DAMA circuit service.
- m. Enter the required DASA call **DURATION** in numerical units of seconds, minutes, hours or days. Use **0000** if an indefinite time period is desired. Press **ENT** when proper time and units are selected. Time is not entered for normal DAMA calls.
- n. For DASA dedicated calls, an additional choice of **CHANNEL TYPE** is requested in the call request. Select **5 kHz** or **25 kHz**. This menu option is not shown when making a normal DAMA circuit service call.
- o. The display will return to the main operational display. Service state will change to **PENDING**. Wait for the radio to send the request to the Channel Controller.
- p. Observe the service state display for the following indications:
 - **PENDING** – Radio terminal is negotiating the sending of the call request and action on it from the Channel Controller. Wait until it becomes active or a system message is sent concerning the request.
 - **ACTIVE** – Service request has been granted, the normal indication to commence operation with the requested service.
 - **PREEMPTED** – An active service has been preempted by a higher priority service. Try calling again.
 - **DEDICATED** – Indicates that DASA operation has been granted. Operation in DASA is ruled by MIL-STD-188-181B covering 5 kHz

and 25 kHz dedicated UHF SATCOM. Use the appropriate DAMA Port Configuration preset needed for the DASA service.

- **IDLE** – The radio is not active or is setting up a service.



NOTES: 1. DO NOT USE HIGHER PRECEDENCE THAN AUTHORIZED.

2. USE 0000 FOR INDEFINITE.

3. TYPE OF CHANNEL FOR DASA REQUEST.

4. ONLY WHEN A 5 KHZ DASA CALL IS IN PROGRESS.

5. ONLY WHEN ANDVT COMSEC IS USED.

6. ONLY WHEN A 5 KHZ DAMA CALL IS IN PROGRESS.

7. ONLY WHEN LOGGED OFF.

8. ONLY WHEN LOGGED IN.

9. NOT AVAILABLE WITH DAMA REV. – .

Figure 40. 5 kHz DAMA CALL Menu

17.6.2 Teardown Service 5 kHz

Circuit service and dedicated service are torn down upon completion of the communications, if time is still remaining or if indefinite time period (0000) has been selected.

Perform the following procedure for service teardown:

- a. At end of using a DAMA service, press the **CALL** key on KDU.
- b. Use the up/down arrow keys to scroll to **TEARDOWN SERVICE**. Press **ENT** to begin teardown.
- c. Use the up/down arrow keys to select the desired service to teardown. Press the circular arrow keys to view the second screen of the service state.
- d. Press **ENT** to teardown this service.

17.6.3 Disconnect from Call (5 kHz Dedicated Call Only)

If time is remaining, Dedicated Calls should be terminated at the end of their use.

Perform the following procedure to terminate a dedicated call:

- a. At the end of using DASA dedicated service, press the **CALL** key on KDU.
- b. Use the up/down arrow keys to scroll to **DISCONNECT FROM CALL**.
- c. Press **ENT** to terminate call.
- d. Service state goes to **IDLE** after reacquiring the network home channel.

NOTE

Users in a subnet must **DISCONNECT FROM CALL** to leave the DASA channel earlier than the requested DASA time period.

17.6.4 Send a Data Message using 5 kHz DAMA Message Service

DATA messages less than 14 kbytes can be uploaded to radio and packet sent to the destination address. The terminal will prompt you when to upload the message to the radio.

Perform the following procedure to send a message:

- a. Ensure the DATA device is connected to the J1 ADF connector or J3 Data connector and is ready for operation with a message to be transmitted.
- b. Select a DAMA Port Configuration Preset that properly interfaces the data device to the radio using KG-84C encryption.
- c. Press the circular arrow key to move to service state screen and place the radio in **MSG** mode. If radio is in CKT mode, use the left/right arrow keys to scroll to **MODE** and change to **MSG** mode with the up/down arrow keys, then press **ENT**.
- d. Press the **CALL** key to bring up display for **SELECT REQUEST TYPE**. See Figure 41.
- e. Select **SEND A MESSAGE** and press **ENT**.

- f. Select **DAMA DESTINATION** preset that the message will be sent to and press **ENT**. Terminal Base Addresses associated with this preset will be shown across the bottom line of this display.
- g. The next display will be **SELECT PRECEDENCE**. The display will show the precedence last used to call your selected destination. Press **ENT** to keep it or scroll and select an alternate message precedence.
- h. After a brief configuring screen, the terminal will prompt the user to **ENTER MESSAGE** to the radio. Send the message on the data device at this time to upload it into the radio. **PRESS CLR TO ABORT**.
- i. When uploading is complete, the service state will indicate **IDLE** with a message status of one (1) for outgoing. After a message is transmitted by the radio, the outgoing message indicator number will be decreased.

17.6.5 Receive a Data Message using 5 kHz DAMA Message Service

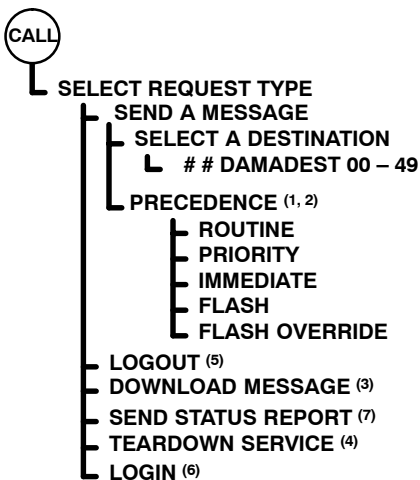
Depending on operation of your particular data device, the radio can be programmed to either automatically download a received message from the radio buffer to the data device, or it will occur manually after you have data device ready to accept the message from the radio.

When using manual message release, ensure to download messages so additional messages can be received without losing important data.

When using 5 kHz Message Service, the AN/PRC-117F is operated with a network state of **CONNECTED** and a service state of **IDLE**. When a message sender initiates the sending of a data message to your terminal, the Channel Controller looks for the presence of the destination terminal and sets up a service between the two terminals. Upon successful transmission, the AN/PRC-117F will indicate holding a message for downloading in its message buffer. If the 5K MSG mode is set to **AUTO** instead of **MANUAL**, it will send it immediately to the interfaced output data device.

Perform the following procedure to download a message using 5 kHz Message Service with Manual Message mode:

- a. Verify there is a buffered message in the radio and that the radio is in **MSG** mode.
- b. Connect the data device to the **J1** ADF Connector or **J3** Data Port as applicable and ensure it is ready to receive the message.
- c. Press the **CALL** key and bring up **SELECT REQUEST TYPE** display.
- d. Select **DOWNLOAD MESSAGE** and press **ENT**.
- e. The service state will change to **DOWNLOAD** and the message will be sent to the data device. When complete, the service state will change back to **IDLE**.
- f. Check the data device for proper reception of the message. The incoming message number will be decremented.



- NOTES:** 1. DO NOT USE HIGHER PRECEDENCE THAN AUTHORIZED.
2. UPLOAD MESSAGE TO RADIO AT THIS POINT.
3. MESSAGE IS AUTOMATICALLY SENT TO DATA DEVICE IF 5k MESSAGE MODE IS SET TO AUTOMATIC RELEASE. THE DOWNLOAD MESSAGE PROMPT ONLY APPEARS IF USING MANUAL RELEASE.
4. ONLY WHEN A SERVICE IS IN PROGRESS.
5. ONLY WHEN LOGGED IN.
6. ONLY WHEN LOGGED OUT.
7. NOT AVAILABLE WITH DAMA REV. – .

Figure 41. 5 kHz DAMA MSG Service CALL Menu

17.6.6 5 kHz DAMA Logout

Leaving the 5 kHz DAMA channel requires the terminal to logout with the channel controller. This is also required if shutting the AN/PRC-117F off for any reason like changing the batteries, adjusting the antenna, entering programming, or exiting DAMA mode.

NOTE

If the radio does go off the net without logging out, it will automatically be logged out by the Channel Controller after missing 200 ROWs (approximately 30 minutes). Until this happens, the Channel Controller will still consider the terminal to be logged in. If the terminal attempts to log in a second time, the Channel Controller may reject the second log in attempt. If this happens, go into Net Preset programming (Figure 33) and change login type to **PREASSIGNED** and the terminal will become **CONNECTED** again. Return setting to OVER-THE-AIR after the next logout.

Perform the following procedure to logout from a 5 kHz DAMA Net:

- a. Press the **CALL** key to bring up the **SELECT REQUEST TYPE** display screen.
- b. Use the up/down arrow keys to select **LOGOUT**; press **ENT** to logout.
- c. The service state and network state will switch to **DISABLED** after the Channel Controller acknowledges the logout request.
- d. The radio can now be switched to another DAMA net preset or turned off.

See Figures 42 through 44 for DAMA network and service displays.

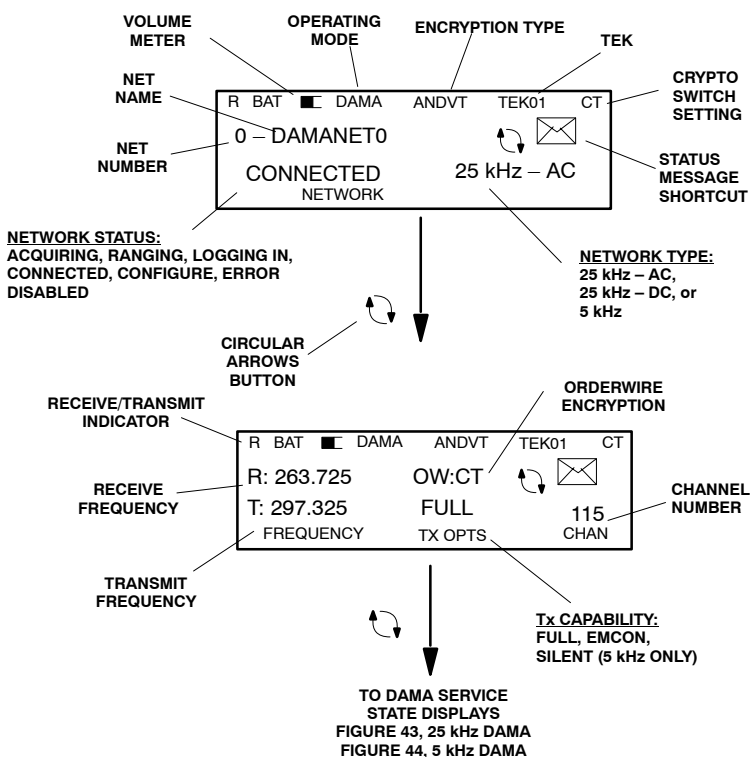


Figure 42. DAMA Network State Displays, 5 and 25 kHz

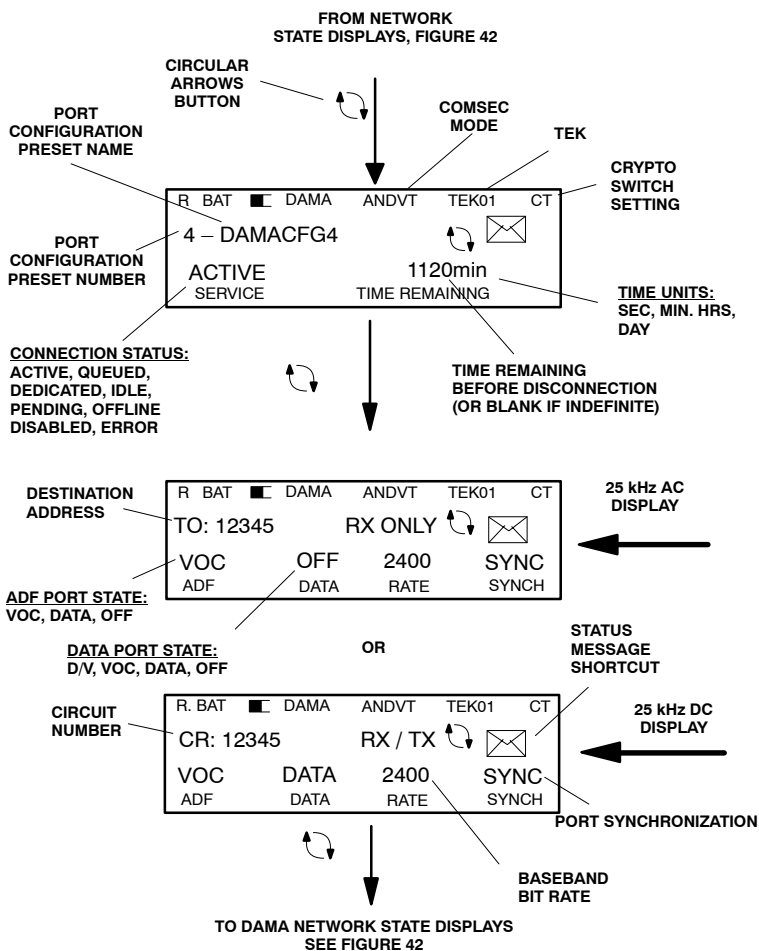
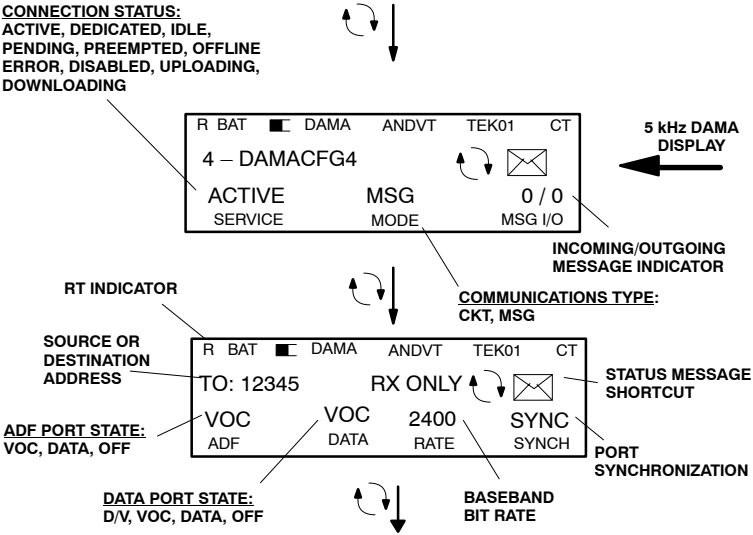


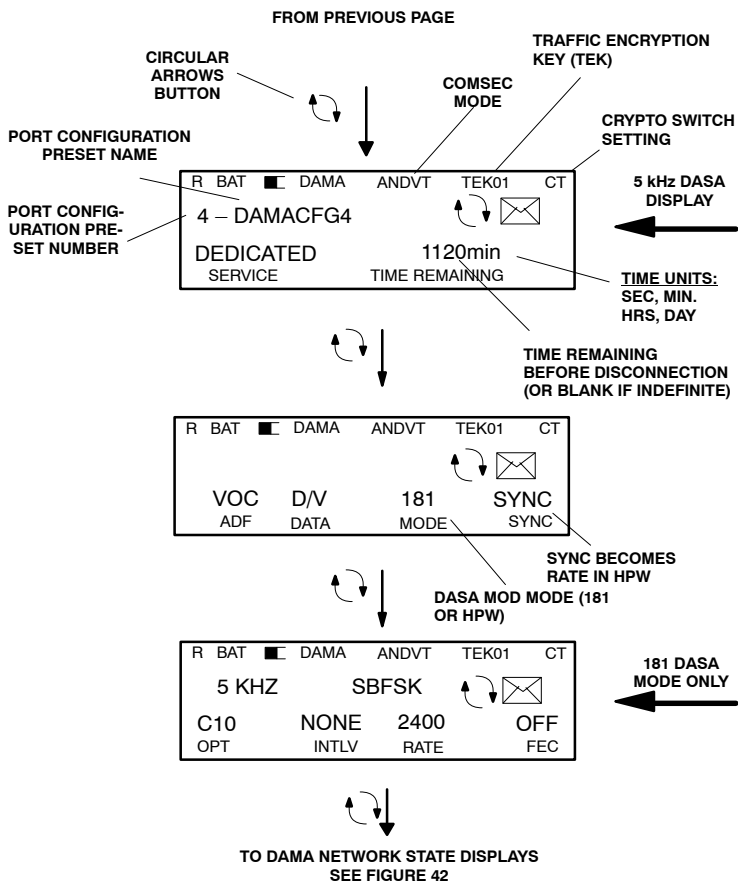
Figure 43. DAMA Service State Displays, 25 kHz

FROM DAMA NETWORK STATE DISPLAYS,
FIGURE 42



TO NEXT PAGE

Figure 44. DAMA Service State Displays, 5 kHz (Sheet 1 of 2)



**Figure 44. DAMA Service State Displays, 5 kHz
(Sheet 2 of 2)**

18. DAMA CONFIGURATION CODES

DAMA codes listed in Table 38 are current at date of this guide. DAMA codes are subject to change without notice. Check with US Naval Space and Warfare Systems Command for any changes.

Table 38. 5 kHz and 25 kHz Configuration Codes

Configuration Code	Equipment	Data Rate	Protocol	Crypto
0	Reserved	0	N/A	N/A
1	Network (Pre-arranged)	75	IAW Network/pre-arranged	IAW Network/Prearranged
2	Teletype	75	ASCII 8N2	KG-84A/C
3	Computer	75	ASCII 8N2	KG-84A/C
4	PSC-2A	75	PSC-2A	KG-84A/C
5	KL-43C/F	75	ASCII 8N2	KL-43C/F
6				
7				
8				
9				
10				
11				
12				
13				
14				
15	Network (Pre-arranged)	300	IAW Network/pre-arranged	IAW Network/Prearranged
16	Teletype	300	ASCII 8N2	KG-84A/C
17	Computer	300	ASCII 8N2	KG-84A/C
18	FAX	300	FAX	KG-84A/C
19	FAX	300	FAX	KYV-5, KY-99A/100
20	PSC-2A	300	PSC-2A	KG-84A/C
21	PSC-2A	300	PSC-2A	KYV-5, KY-99A/100
22	KL-43C/F	300	ASCII 8N2	KL-43C/F
23	Computer	300	ASCII 8N2	KYV-5, KY-99A/100
24				
25				
26				
27				

Table 38. 5 kHz and 25 kHz Configuration Codes – Continued

Configuration Code	Equipment	Data Rate	Protocol	Crypto
28				
29				
30	Network (Pre-arranged)	600	IAW Network/pre-arranged	IAW Network/Prearranged
31	Teletype	600	ASCII 8N2	KG-84A/C
32	Teletype	600	ASCII 8N2	KYV-5, KY-99A/100
33	FAX	600	FAX	KG-84A/C
34	PSC-2A	600	PSC-2A	KG-84A/C
35	PSC-2A	600	PSC-2A	KYV-5, KY-99A/100
36	KL-43C/F	600	ASCII 8N2	None
37	Computer	600	ASCII 8N2	KG-84A/C
38	Computer	600	ASCII 8N2	KYV-5, KY-99A/100
39	FAX	600	FAX	KYV-5, KY-99A/100
40				
41				
42				
43				
44				
45	Network (Pre-arranged)	1200	IAW Network/pre-arranged	IAW Network/Prearranged
46	Computer	1200	ASCII 8N2	KG-84A/C
47	FAX	1200	FAX	KYV-5, KY-99A/100
48	FAX	1200	FAX	KG-84A/C
49	PSC-2A	1200	PSC-2A	KG-84A/C
50	PSC-2A	1200	PSC-2A	KYV-5, KY-99A/100
51	DMDG	1200	DMDG	KG-84A/C
52	DMDG	1200	DMDG	KYV-5, KY-99A/100
53	KL-43C/F	1200	ASCII 8N2	KL-43C/F
54	Computer	1200	ASCII 8N2	KYV-5, KY-99A/100

Table 38. 5 kHz and 25 kHz Configuration Codes – Continued

Configuration Code	Equipment	Data Rate	Protocol	Crypto
55	TEST2	Pre- arranged	Prearranged	Prearranged
56				
57				
58				
59	Network (Pre- arranged)	2400	IAW Network/pre- arranged	IAW Network/ Prearranged
60				
61				
62				
63	FAX	2400	FAX	KYV-5, KY-99A/100
64	FAX	2400	FAX	KG-84A/C
65	Hand Set/ ANDVT	2400	Voice	KYV-5, KY-99A/100
66	Data/ANDVT	2400	Prearranged	Prearranged
67	PSC-2A	2400	PSC-2A	KG-84A/C
68	PSC-2A	2400	PSC-2A	KYV-5, KY-99A/100
69	KL-43C/F	2400	ASCII 8N2	KL-43C/F
70	Computer	2400	ASCII 8N2	KG-84A/C
71	Computer	2400	ASCII 8N2	KYV-5, KY-99A/100
72	Tactical Internet	2400	Tactical Internet	KG-84A/C
73	PC	2400	Prearranged	KG-84A/C
74	TEST1	Pre- arranged	Prearranged	Prearranged
75	Network (Pre- arranged)	4800	IAW Network/pre- arranged	IAW Network/ Prearranged
76	FAX	4800	FAX	KYV-5, KY-99A/100
77	FAX	4800	FAX	KG-84A/C
78	KL-43C/F	4800	ASCII 8N2	KL-43C/F
79	Tactical Internet	4800	Tactical Internet	KG-84A/C
80	Computer	4800	ASCII 8N2	KG-84A/C
81	Computer	4800	ASCII 8N2	KYV-5, KY-99A/100
82				

Table 38. 5 kHz and 25 kHz Configuration Codes – Continued

Configuration Code	Equipment	Data Rate	Protocol	Crypto
83				
84				
85				
86				
87				
88				
89	FAX	16000	FAX	KG-84A/C
90	Network (Pre-arranged)	16000	IAW Network/pre-arranged	IAW Network/Prearranged
91	FAX	16000	FAX	KY-57/58
92	Hand Set/ANDVT	16000	Voice	KY-57/58
93	PSC-2A	16000	PSC-2A	KYV-5, KY-99A/100
94	PSC-2A	16000	PSC-2A	KG-84A/C
95	Tactical Internet	16000	Tactical Internet	KG-84A/C
96	Computer	16000	Prearranged	KG-84A/C
97	Computer	16000	ASCII 8N2	KG-84A/C
98	DASA 5kHz	Pre-arranged	Prearranged	Prearranged
99	DASA 25kHz	Pre-arranged	Prearranged	Prearranged

19. DAMA INFORMATION REQUEST CODES

Table 39 contains DAMA information request codes.

Table 39. DAMA Information Request Codes

Code	Information Request Definition
04	Disconnect – Constant Key Offender (transmit time over 17 minutes continuous).
65	DASA Requests are reserved for guards only – The requesting user's Configuration Code indicates a DASA service and the user has requested connection to another user. Configuration Codes 98 and 99 are reserved for DASA services and only Private Guards can be assigned to DASA channels.
66	Your terminal type cannot be connected to the requested guard – The requested guard number is associated with terminals built to a different version of the MIL-STD. Check the guard number and try again. MIL-STD-188-183(–) and MIL-STD-188-183(A) use different channel codes to reference the uplink/downlink frequencies for a DAMA channel.
67	Your terminal cannot communicate on the assigned channel – The requested service is assigned on a channel that a MIL-STD-188-183(–) terminal cannot be connected to. MIL-STD-188-183(–) and MIL-STD-188-183(A) use different channel codes to reference the uplink/downlink frequencies for a DAMA channel.
68	Log Out report must be initiated from port 1 – The Log Out Information Report was sent from a port other than port 1. Change to port 1 and retry.
69	Frame Format of requester's Home Channel does not support the requested service. The network requires a time slot that is not provided on the channel your terminal is logged in on. This can occur if something was missed during the planning process and either a channel was not configured properly or the data rate defined for the network was entered in error in the DAMA Channel Controller database. It can also occur if the frame format of the channel planned to host this network had to be changed to meet an emerging, higher priority requirement. Notify your organization's communications planner.
70	Requesting party's guard list does not contain guard address.
71	Service Request Access Restriction Violation. The precedence you entered with your request was: <ul style="list-style-type: none">Higher than the access restriction established for your terminal in the DAMA Channel Controller's database. Resend your request at a lower precedence. ORLower than the channel access restriction. Orderwire traffic on this channel is heavy and is being controlled by the DAMA Channel Controller. Only requests above a given precedence level will be honored. Try again later. (Or, if authorized, try resending your request with a higher precedence.)

Table 39. DAMA Information Request Codes – Continued

Code	Information Request Definition
72	Requesting party already has an outstanding queued request. You have already sent a service request. That request is in queue at the DAMA Channel Controller awaiting assignment to a time slot. You can cancel the previous request and delete it from the queue by sending a Cancel Call orderwire message.
73	Requesting party is not authorized to activate an AllCall network. You tried to activate network address 16383 or 65535. These are special network addresses and cannot be activated by a user.
74	Requested party is already connected to a DASA service. The user you are trying to call is currently participating in a service on a DASA channel.
75	Request canceled by user.
76	Queued call canceled – service queue time-out timer expired.
77	Your terminal does not exist in the database. (The Channel Controller has no record of the calling party's address having been assigned by the addressing administrator.)
78	Request queue is currently full. (The Channel Controller queue will hold a maximum of 16 call requests. Requests received after the queue is full are canceled.)
79	Queued call canceled; connection is no longer possible. (Your call request was in the Channel Controller queue but was removed for some reason, such as the request is no longer valid.)
80	Enter a configuration code and try again. (The Channel Controller has never received a configuration code from the requesting port since the terminal was powered up or since an out-of-service RCCOW was sent from the port.)
81	Required data rate can not be supported. For non-frequency switchable terminals, the Channel Controller canceled the request because the frame format in use on the channel does not have a slot to support the baseband data rate requested. For frequency switchable terminals, no channels on the satellite can support the data rate.
82	Requested party unknown. Check the Call Directory and try again. (The called party is not in the Channel Controller database.)
83	Cannot add users to this guard. (Your port is already connected to an active guard and cannot add another party to the guard via a two-party or conference call.)
84	Cannot add a guard to your existing call. (Your port is connected to an existing call and cannot add a guard to the call.)
85	Requesting party is not authorized to activate this guard. (A guard can only be activated by a Comm Plan, a Channel Controller operator, or a net controller for a private guard not contained in the daily Comm Plan.)

Table 39. DAMA Information Request Codes – Continued

Code	Information Request Definition
86	Requesting party is not a member of this private guard. (You will not be connected to an active private guard if you have not been included on the member list.)
87	JMINI: Requesting party's terminal is unauthorized or zeroized. DAMA SAC: 5/25 kHz Slave Channel is not available from requestor's home channel.
88	Requesting party's baseband device is not compatible with this guard. (A user's request to enter an active guard is denied because the configuration code in the requesting port does not match the guard's configuration code.)
89	Requested party has no compatible baseband device. (The configuration code of the calling port can not be found in any terminal ports of the called user.)
90	None of the requested users are available. (This information request is sent in response to a conference call where no called party is available to be connected.)
91	Connection would cause contention. Not enough users are available. There are two reasons that this message may be sent: a. The connection would cause contention between ports within a terminal. b. A frequency switchable terminal cannot use the same time slot on different channels.)
92	Not all requested parties could be connected. (The conference call is connected; the caller is notified that not everyone requested was connected.)
93	Other link test in progress. (In the time interval between authorization of a link test and initiation of the link test, receipt of a second link test request will result in this cancellation response to the second request.)
94	JMINI: Unable to connect parties from different channels. DAMA SAC: Frequency switching is required but cannot be accomplished due to one or more of the following reasons: a. Terminal(s) which must frequency switch can not perform the switch. b. Data and OW channels are not on the same satellite. c. Data and OW channels are not controlled by the same Channel Controller. d. No frame segments match. e. STG is not enabled.
95	Demand Assigned activation disabled for this guard. The user has requested to join a network service that is not currently active.

Table 39. DAMA Information Request Codes – Continued

Code	Information Request Definition
96	No DASA channel available. (The Channel Controller database does not contain an available compatible DASA channel.)
97	Requesting party is already connected to a DAMA time slot. (A DASA channel connection cannot be assigned to a terminal if any of the terminal ports have a DAMA slot connection.)
98	Too many guards specified in this request. (More than one guard number was entered in a conference request for a DASA channel or DAMA time slot.)
99	Reserved for Home Channel Change at the terminal (At receipt of the first RCCOW or Initial Entry Flag from a user, the Channel Controller will automatically send a Home Channel Frequency Change CCOW to the FSCS terminal.)

20. DAMA STATUS MESSAGE LISTING

Tables 40 and 41 list the DAMA status messages.

Table 40. 5 kHz DAMA Status Messages

AN/PRC-117F DAMA Message	Explanation
MINIMUM PRECEDENCE IS: <i>precedence</i>	Reports the minimum required precedence for network access for service requests. The radio automatically prevents the operator from requesting services below the network system access restriction precedence.
SYSTEM SERVICE RESTRICTIONS ON	The network Channel Controller will not allow 2400 bps voice or data services.
SYSTEM SERVICE RESTRICTIONS OFF	The network Channel Controller will allow 2400 bps voice or data services.
NETWORK HAS BEEN SHUTDOWN	The satellite channel has changed from a DAMA channel to a Dedicated channel. If authorized, operator should activate a new DAMA net.
NETWORK IS ISOLATED	Multiple hop services (i.e. across multiple satellite footprints) are not available in the network.
NETWORK IS CONNECTED	Multiple hop services (i.e. across multiple satellite footprints) are available in the network.
PCC TRANSITIONING	A new Channel Controller is taking over. No operator action is required.
NEW VOICE SERVICE FROM:##### TO: #####	A new voice service is assigned between the respective addresses.
NEW DATA SERVICE FROM:##### TO: #####	A new data service is assigned between the respective addresses.
REQUEST QUEUED: LOCAL	Your DAMA service request is queued with a local search area.
REQUEST QUEUED: MULTIPLE HOP	Your DAMA service request is queued with a multiple hop search area.
REQUEST QUEUED: DEDICATED	Your Dedicated channel service request is queued at the Channel Controller.
REQUEST QUEUED AT TERMINAL	Acknowledges your service request which will be sent to the Channel Controller.
REQUEST DENIED: SERVICE QUEUE FULL	Your service request is denied because you have too many service requests in process. Re-request the service after terminating an existing service.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
REQUEST DENIED: TERM ACCESS RESTRICTION	Your service request is denied because it was at a precedence exceeding the assigned terminal access restriction. Check the terminal access restriction precedence.
REQUEST DENIED: SYS SERVICE RESTRICTION	Your service request was rejected because its precedence violated the current network system service restriction precedence. Check the system service restriction precedence.
REQUEST DENIED: DEST NOT LOGGED IN	Your service request is denied because the destination is not logged into the network.
REQUEST DENIED: NO MULTI-HOP RESOURCES	Your service request is denied because multiple hop channel resources are not available.
REQUEST DENIED: NO CAPACITY	Your service request is denied because the network is out of channel resources. Request your service again or if authorized, request your service again with a higher precedence.
REQUEST DENIED: I/O DATA RATE INCOMPAT.	Your circuit request is denied due to an I/O data rate incompatibility with the destination. Select a new, compatible port configuration and request the service again.
REQUEST DENIED: NETWORK ISOLATED	Your service request is denied because the destination is not on your satellite and the Channel Controller does not have access to the required satellite.
REQUEST DENIED: CHAN NOT AVAILABLE	Your service request is denied because Dedicated channel resources are not available.
REQUEST DENIED: NOT ASSIGNABLE	Your service request is denied because the service is not assignable. This may be due to inadequate link quality. Check your link quality. If it is too low, check the terminals' antenna orientation. If it is high, the destination may not have adequate link quality.
REQUEST DENIED: FREQ SWITCHING INCOMPAT	Your service request is denied because the destination cannot support automatic frequency switching. A dedicated service request cannot be sent to the destination. Request a DAMA circuit or message service to the destination.
TEARDOWN MESSAGE SENT TO NCS	Your service teardown request is being transmitted to the Channel Controller.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
SERVICE ERROR: FULL DUPLEX ASSIGNMENT	The radio received a full duplex service assignment. Since the radio supports half-duplex communications, the radio will automatically attempt to teardown the service.
SERVICE ERROR: I/O DATA RATE INCOMPAT	The radio received a service assignment with a bit rate incompatible with the current port configuration. The radio automatically attempts to teardown the service.
TEARDOWN: OPERATOR REQUESTED	A circuit or message service was torn down by the source or destination operator. Once torn down, there is no information on the service in the service info menu.
TEARDOWN: USER NOT LOGGED IN	A circuit service was torn down because the source or destination is no longer logged into the network.
TEARDOWN: PREEMPTION TIMEOUT	A preempted circuit or message service was torn down because it had been in a preempted state for longer than the time-out duration.
TEARDOWN: QUEUED SERVICE TIMEOUT	A service was torn down because it was queued at the Channel Controller for longer than the time-out duration.
TEARDOWN: MHOP CIRCUIT SETUP FAILED	A circuit service was torn down because multiple hop channel resource set-up failed.
TEARDOWN: PRECEDENCE OVERRIDE	A service was torn down due to a higher precedence service requiring the channel resources.
TEARDOWN: END-TO-END BIT TIMING LOSS	A circuit service was torn down because data timing was lost between the source and destination terminal occurred.
TEARDOWN: I/O DATA RATE INCOMPATIBILITY	A circuit service was torn down due to an I/O data rate incompatibility between the source and the destination.
TEARDOWN: UNKNOWN SERVICE	A circuit or message was torn down because the designated source of the service did not request the service.
TEARDOWN: NCS REQUESTED	A circuit or message was torn down because the Channel Controller requested it.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
TEARDOWN: UNUSED CIRCUIT TIMEOUT	A circuit service was torn down because the channel resources have been idle for longer than the time-out duration (i.e. no traffic communication).
TEARDOWN: UNACKNOW MESSAGE DELIVERY	A message service was torn down without the destination acknowledging message delivery.
TEARDOWN: LOSS OF PATH CONNECTIVITY	A multiple hop circuit service was torn down because the channel resources are no longer available.
TEARDOWN: DEST NOT FOUND W/ IN MAX HOPS	A multiple hop circuit service was torn down because the destination could not be found.
TEARDOWN: MULTIPLE PREEMPTIONS	A multiple hop circuit service was torn down because of multiple service preemptions.
TEARDOWN DENIED: SUBNET DESTINATION	Your service teardown request was denied because you tried to teardown a service for which you participate as a subnet destination. The source of a subnet is authorized teardown the service.
TEARDOWN DENIED: PREASSIGNED SERVICE	Your service teardown request was denied because you are not allowed to teardown preassigned circuit services. Only the Channel Controller can teardown a preassigned circuit service.
TEARDOWN DENIED: UNKNOWN SERVICE	Your service teardown request was denied because the service is already disabled.
LOGIN MESSAGE SENT TO NCS	Your login ROW was transmitted to the network Channel Controller.
LOGIN SUCCESSFUL	Your login ROW was acknowledged by the network Channel Controller and you are ready to request and receive communication services.
LOGIN DENIED: NO CAPACITY	Your login request was denied by the Channel Controller due to no capacity. If an alternate channel is authorized, change to that channel and attempt to login. Otherwise, wait and try again.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
LOGIN DENIED: NOT AUTHORIZED	Your login request was denied by the Channel Controller since your terminal address is not authorized to participate in the network. Check your terminal address and guard addresses.
LOGIN DENIED: ADDR ABOVE DEMARCATION	Your login request was denied by the Channel Controller because you attempted to login with your terminal address set to a subnet address value. Terminal addresses must be in the range of 1 to the demarcation address (usually 16384). Check your terminal address.
LOGIN DENIED: INVALID ADDRESS	Your login request was denied by the Channel Controller because your terminal address was invalid. It must be in the range of 1 to the demarcation address (usually 16384). Check your terminal address. If your address is valid, this could mean that your address is already logged in. Try using a preassigned login.
LOGIN FAILURE: NO RESPONSE	Your login request failed because the Channel Controller is not acknowledging your request. Reactivate the net to reinitiate login. If still no response from the Channel Controller, check antenna, and perform BIT.
MAX RADIO PRECEDENCE IS: <i>precedence</i>	Reports the highest precedence the terminal may use for service requests. The radio will automatically prevent the operator from placing a service request at a higher precedence than allowed.
SERVICE PREEMPTED	One of your active circuit or message services was preempted. Check your service info menu.
DEMARCATION ADDRESS #####	Reports the demarcation address for the network. The demarcation address designates the highest terminal node address. Addresses above the demarcation address are subnet addresses.
LOGGED OUT: TERMINAL REQUESTED	Your terminal was logged out at your request.
LOGGED OUT: NCS DIRECTED	Your terminal was logged out at the Channel Controller's request.
LOGGED OUT: NOT AUTHORIZED	Your terminal was logged out because you are not authorized to participate in the network.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
LOGGED OUT: INVALID ADDR. IN GUARD LIST	Your terminal was logged out because your net has an invalid address in its guard list.
LOGOUT DENIED: NOT LOGGED IN	Your logout request was denied because you aren't logged in.
LOGGED OUT: NO NCS RESPONSE	Your terminal was logged out at your request. However, the Channel Controller did not acknowledge your logout ROW even after the ROW was automatically retransmitted.
LOGGED OUT: DOWNLINK LOST	Your terminal was logged out because it had lost downlink acquisition for 200 consecutive frames.
NEW MESSAGE SERVICE FROM: ##### TO: #####	You are assigned channel resources for a message service between the designated source and destination.
MESSAGE ACKNOWLEDGED	You were the source of a message service which has been acknowledged by the destination.
WARNING! BUFFERED MESSAGE DISCARDED	One of your incoming buffered messages was overwritten by a newer, higher precedence incoming message. The radio can store three incoming messages at a time.
WARNING! MESSAGE TRUNCATED	Your outgoing message was greater than 14 Kbytes (after encryption) so the radio truncated the message and will continue to process the service.
MESSAGE OUTPUT COMPLETE	Your outgoing message has been completely transmitted to the destination.
MESSAGE DELIVERY COMPLETE	The downloading of your buffered, incoming message from the radio to your data device completed successfully.
MESSAGE DELIVERY FAILED	The downloading of your buffered, incoming message from the radio to your data device. Check your data device and port configuration and re-attempt download.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
NEW MESSAGE BUFFERED FROM: <i>address</i>	An incoming message has been completely received and buffered in the radio. If the radio is in message mode and configured for automatic download, the message will be automatically downloaded to the data device at this time. If the radio is configured for manual download, the message can be downloaded by going to the call menu and selecting the download command.
MESSAGE TRANSFER COMPLETE	An outgoing message has been successfully uploaded from the data device to the radio.
MESSAGE TRANSFER FAILED	The uploading of an outgoing message from the data device to the radio failed. Check your data device and port configuration and re-attempt upload.
ACQUIRING DOWNLINK	The radio is in the process of synchronizing its receive timing with the DAMA channel.
DOWNLINK ACQUIRED	The radio successfully achieved downlink acquisition (i.e. synchronizing receive timing with the DAMA channel).
DOWNLINK LOST REACQUIRING	The radio lost downlink acquisition and is automatically attempting reacquisition.
RANGE LOCK LOST	The radio lost uplink acquisition and is automatically attempting reacquisition.
RANGING IN PROGRESS	The radio is in the process of synchronizing transmit timing with the DAMA channel.
RANGING COMPLETE	The radio successfully achieved uplink acquisition (i.e. synchronizing transmit timing with the DAMA channel).
TRANSMIT INHIBITED: UPLINK LOST	When range lock is lost, the radio cannot transmit on the channel.
TRANSMIT ENABLED: UPLINK REACQUIRED	The radio successfully achieved uplink reacquisition and transmissions are enabled.
ADDRESS ADDED: #####	The specified address was added to your DAMA net guard list by the Channel Controller.
ADDRESS DELETED: #####	The specified address was deleted from your DAMA net guard list by the Channel Controller.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
ADDRESSES ADDED: #####	The specified addresses were added to your DAMA net guard list by the Channel Controller.
ADDRESSES DELETED: #####	The specified addresses were deleted from your DAMA net guard list by the Channel Controller.
UNSUCCESSFUL GUARD MODIFICATION BY NCS	The Channel Controller attempted to modify your DAMA net guard list but the radio was unable to comply.
DASA ASSIGNMENT TO CH ### FOR ### units	You have been assigned to a dedicated channel for the specified amount of time.
DASA ASSIGNMENT TO CH ###, INDEFINITE	You have been assigned to a dedicated channel for an indefinite amount of time.
ACQUISITION FAILURE: RETURNING TO CH. ###	The radio attempted to reassign to a new DAMA channel but could not complete acquisition. The radio automatically returns to the original DAMA channel.
NET ERROR: UNABLE TO REACQUIRE DOWNLINK	The radio has not been able to achieve downlink acquisition for a time-out duration. The radio will continue to attempt downlink acquisition. If the radio continues fail downlink acquisition, check antenna orientation. Otherwise, if authorized, activate a different DAMA net.
NET ERROR: UNABLE TO ACTIVE RANGE	The radio has not been able to achieve uplink acquisition for a time-out duration. The radio will continue to attempt uplink acquisition. If the radio continues fail uplink acquisition, activate a different DAMA net if authorized.
ORDERWIRE KEYS ZEROIZED	The Channel Controller zeroized the DAMA net orderwire keys.
WARNING: BIT RATE OVERRIDDEN TO ###	You were assigned a circuit with a bit rate different from the selected port configuration. Since the assigned bit rate is compatible with the crypto mode, the radio automatically overrides to the new rate.
ERROR: CRYPTO MODE INCOMPATIBLE W/SETUP	You were assigned a service with a crypto mode which is incompatible with the selected port configuration. The radio port is not activated. Toggle the PT-CT switch.
ERROR: VOICE CKT INCOMPATIBLE W/SETUP	You were assigned a voice service but the selected port configuration is for data. The radio port is not activated.

Table 40. 5 kHz DAMA Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
ERROR: DATA CKT INCOMPATIBLE W/SETUP	You were assigned a data service but the selected port configuration is for voice. The radio port is not activated.
ERROR: BIT RATE INCOMPATIBLE W/SETUP	You were assigned a service at a bit rate which is incompatible with the selected port configuration. The radio port is not activated.
ERROR: DATA MSG INCOMPATIBLE W/SETUP	You attempted to upload an outgoing message or download a buffered incoming message using an incompatible port configuration. The radio port is not activated.
ERROR: DASA CHANNEL INCOMPATIBLE W/SETUP	You were assigned to a DASA channel which is incompatible with the selected port configuration. The radio port is not activated.
SERVICE REQUEST OVERRIDDEN BY ASSIGNMENT	Warning, you were assigned a message or circuit service which you requested. However, one or more of the assignment parameters was different from your original request.
MISSED FOW	The radio missed the last FOW burst.
RECEIVED CORRUPT FOW	The radio did not successfully decode the last FOW.
LINK QUALITY UPDATE C/NO: ##.# DB-HZ	Reports the latest link quality calculation.
CHANNEL REASSIGNED TO CHANNEL ###	You were assigned to a new DAMA channel. The radio automatically attempts to acquire the new channel.

Table 41. 25 kHz Status Messages

AN/PRC-117F DAMA Message	Explanation
MINIMUM PRECEDENCE IS: <i>precedence</i>	Reports the minimum required RCCOW precedence. Only RCCOW's with a precedence equal to or greater than this is allowed to be transmitted on the network.
REQUEST QUEUED AT TERMINAL	Acknowledges your RCCOW request which will be sent to the Channel Controller.
REQUEST REJECTED: EMCON	Your RCCOW request is rejected because the radio is connected to a SHF uplink channel. This also occurs if you request a DC link test when the radio is in a transmit inhibit condition.
REQUEST REJECTED: PRECEDENCE TOO LOW	Your RCCOW request was rejected because its precedence is below the network precedence cutoff. Check precedence cutoff.
REQUEST REJECTED: CALL ALREADY TXed	Your call request has already been transmitted to the Channel Controller. The radio will automatically send a new RCCOW to the Channel Controller to terminate the call request.
REQUEST REJECTED: CONTENTION	Your RCCOW request is rejected due to half duplex contention.
REQUEST REJECTED: TRANSMIT QUEUE FULL	Your RCCOW request is rejected because you have too many RCCOW requests in-process. Re-request the RCCOW after in-process RCCOW's are acknowledged by the Channel Controller.
SERVICE PREEMPTED TIME LEFT: <i>#### units</i>	Your active circuit will be preempted in the designated amount of time.
ACQUIRING DOWNLINK	The radio is in the process of synchronizing its receive timing with the DAMA channel.
DOWNLINK ACQUIRED	The radio successfully achieved downlink acquisition (i.e. synchronizing receive timing with the DAMA channel).

Table 41. 25 kHz Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
DOWNLINK LOST REACQUIRING	The radio lost downlink acquisition and is automatically attempting reacquisition.
PORT DISABLED: DOWNLINK LOST	The radio traffic port which was active on a circuit was disabled because downlink acquisition was lost.
PORT RECONNECTED: DOWNLINK REACQUIRED	The radio traffic port was re-enabled because the downlink was reacquired.
FRAME LOCK ACHIEVED	The radio successfully received two consecutive CCOW bursts.
LOSS OF CCOW DECODE	The radio failed to decode 16 consecutive CCOW bursts.
SUCCESSFUL CCOW DECODE	The radio successfully decoded a CCOW after declaring "loss of CCOW decode."
RANGE LOCK LOST	The radio lost uplink acquisition and will automatically attempt reacquisition.
RANGING IN PROGRESS	The radio is in the process of synchronizing transmit timing with the DAMA channel.
RANGING COMPLETE	The radio successfully achieved uplink acquisition (i.e. synchronizing transmit timing with the DAMA channel).
TRANSMIT INHIBITED: UPLINK LOST	When range lock is lost, the radio cannot transmit on the channel.
TRANSMIT ENABLED: UPLINK REACQUIRED	The radio successfully achieved uplink reacquisition and transmissions are enabled.
ADDRESS ADDED: #####	The specified address was added to your DAMA net guard list by the Channel Controller.
ADDRESS DELETED: #####	The specified address was deleted from your DAMA net guard list by the Channel Controller.
ADDRESSES ADDED: #####, #####	The specified addresses were added to your DAMA net guard list by the Channel Controller.
ADDRESSES DELETED: #####, #####	The specified addresses were deleted from your DAMA net guard list by the Channel Controller.

Table 41. 25 kHz Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
UNSUCCESSFUL GUARD MODIFICATION BY NCS	The Channel Controller attempted to modify your DAMA net guard list but the radio was unable to comply.
DASA ASSIGNMENT TO CH ### FOR ### <i>units</i>	You have been assigned to a dedicated channel for the specified amount of time.
DASA ASSIGNMENT TO CH ###, INDEFINITE	You have been assigned to a dedicated channel for an indefinite amount of time.
ACQUISITION FAILURE: RETURNING TO CH. ###	The radio attempted to reassign to a new DAMA channel but could not complete acquisition. The radio automatically returns to the original DAMA channel.
NET ERROR: UNABLE TO REACQUIRE DOWNLINK	The radio has not been able to achieve downlink acquisition for a time-out duration. The radio will continue to attempt downlink acquisition. If the radio continues fail downlink acquisition, check antenna orientation. Otherwise, if authorized, activate a different DAMA net.
NET ERROR: UNABLE TO ACTIVE RANGE	The radio has not been able to achieve uplink acquisition for a time-out duration. The radio will continue to attempt uplink acquisition. If the radio continues fail uplink acquisition, activate a different DAMA net if authorized.
FRAME FORMAT CHANGE A:### B:### C:###	Reports the frame format for the A, B and C traffic segment of the DAMA frame.
CALL TERMINATED	Your active circuit was terminated.
RX ONLY CALL SET UP FOR ## <i>units</i>	You are assigned a receive only circuit for the specified duration.
RX/TX CALL SET UP FOR ## <i>time units</i>	You are assigned a receive and transmit capable circuit for the specified duration.
RX ONLY CALL SET UP INDEFINITELY	You are assigned a receive only circuit for an indefinite duration.

Table 41. 25 kHz Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
RX/TX CALL SET UP INDEFINITELY	You are assigned a receive and transmit capable circuit for an indefinite duration.
CALL REQUEST CANCELLED	Your service request was cancelled.
CALL WAITING FROM <i>address precedence</i>	You have a call waiting from the specified source at the specified precedence.
CALL WAITING TO <i>address precedence</i>	You have a call waiting to the specified destination at the specified precedence.
CALL REQUEST QUEUED FOR ## <i>time units</i>	Your call request was queued by the Channel Controller for the specified duration.
CALL REQUEST QUEUED INDEFINITELY	Your call request was queued by the Channel Controller indefinitely.
CALL REJECTED: ALREADY CONNECTED	Your call request was rejected because you are already active on a circuit.
CALL REJECTED: INVALID ADDRESSES	Your call request was rejected because the destination address(s) is invalid.
CALL REJECTED: DELETED BY USER	Your call request was cancelled while queued at the terminal.
CALL REJECTED: SERVICE TIMEOUT	Your call request was disabled because it was queued for longer than a time-out duration.
LINK TEST REJECTED: SLOT IN USE	Your link test request was rejected because the link test slot was in use.
LINK TEST INITIATED	The radio is starting a link test.
LINK TEST ABORTED	The link test was aborted.
<i>rate</i> LINK TEST ERRORS #####/#####	Reports the resulting number of bit error for the link test.
<i>rate</i> LINK TEST MISSED ACQS: ###/####	Reports the resulting number of missed acquisitions for the link test.
PARTY OUT-OF-SERVICE FOR ## <i>time units</i>	The destination of your call request is out of service for the specified duration. Your call request has therefore failed and should be re-attempted later.
PARTY OUT-OF-SERVICE INDEFINITELY	The destination of your call request is out of service for an unspecified duration. Your call request has therefore failed and should be re-attempted later.

Table 41. 25 kHz Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
CONSTANT KEY ALARM SENT TO NCS	The radio sent a constant key alarm RCCOW to the Channel Controller because the radio has been keyed continuously for 17 minutes.
ORDERWIRE KEYS ZEROIZED	The Channel Controller zeroized the DAMA net orderwire keys.
CIRCUIT DISCONNECTED	Your active circuit was terminated. The radio port is no longer active.
TX HAS BEEN DISABLED BY THE PCC	The Channel Controller disabled transmissions on the network.
TX HAS BEEN ENABLED BY THE PCC	The Channel Controller enabled transmissions on the network.
RCCOW TRANSMITTED	Your RCCOW was transmitted to the Channel Controller.
RCCOW NOT ACKNOWLEDGED	Your RCCOW was not acknowledged by the Channel Controller.
RCCOW ACKNOWLEDGED: NOT PROCESSED	Your RCCOW was acknowledged by the Channel Controller but the controller was too busy to process the request.
RCCOW ACKNOWLEDGED: REQUEST QUEUED	Your RCCOW was acknowledged and queued by the Channel Controller.
RCCOW ACKNOWLEDGED: RADIO OUT-OF-SERVICE	Your out-of-service RCCOW was acknowledged by the Channel Controller.
RCCOW ACKNOWLEDGED: REQUEST COMPLETE	Your RCCOW was acknowledged and processed by the Channel Controller.
RCCOW ASSIGNMENT ERROR: DUPLICATE ID	A radio error occurred with your RCCOW request. Reinitiate your request.
RETRYING RCCOW TRANSMISSION	The first attempt to send your RCCOW failed. The radio will automatically attempt a single retry.
UNABLE TO FIND A DEDICATED RANGE SLOT	Warning that the radio was unable to conduct its automatic, active ranging measurement because there were no channel resources.
SLOT CONNECT SUCCESSFUL	Your DC mode circuit request was successful.
SLOT CONNECT IGNORED	You received a circuit assignment which was ignored because the radio port is already in use.

Table 41. 25 kHz Status Messages – Continued

AN/PRC-117F DAMA Message	Explanation
INVALID SLOT NUMBER: #####	You placed a DC circuit request to an invalid slot number. Check your frame format and DC circuit number for compatibility.
SLOT REJECTED: NOT VOICE SLOT	You placed a DC voice circuit request but the circuit number you specified is not for 2400 or 16000 bps.
SLOT REJECTED: FRAME FORMAT MISMATCH	You placed a DC circuit request which is not compatible with the current frame format.
SLOT DISCONNECT ERROR: NOT CONNECTED	You placed a DC circuit disconnect but the radio is not active on a circuit.
INFORMATION REQUEST RECEIVED: CODE= ###	You received the specified information request code from the Channel Controller. You will be prompted to respond to this CCOW with an Information Report code. You must respond before any other RCCOW's can be transmitted by the radio.
DATA RX FROM: <i>address: precedence ## ## ## ##</i>	The radio received a data transfer from the specified source.
COMP DATA RECEIVED: <i>address: precedence ## ## ## ##</i>	The radio received a computer data transfer from the specified source.
NEW SUBMODE: AC	Reports the DAMA network is operating in Automatic Control (AC) mode.
NEW SUBMODE: DC	Reports that the DAMA network is operating in Distributed Control (DC) mode.
ERROR: DASA CHANNEL INCOMPATIBLE W/ SETUP	You were assigned to a DASA channel which is incompatible with the selected port configuration.
CHANNEL REASSIGNED TO CHANNEL ###	You were assigned to a new DAMA channel. The radio automatically attempts to acquire the new channel.
RCCOW INHIBITED: UNIT IN EMCON MODE	Your RCCOW request was inhibited because the radio is in EMCON mode. The RCCOW is automatically queued and transmitted when the radio's transmit capability changes to FULL.

21. SITUATIONAL AWARENESS (SA)

The AN/PRC-117F supports SA. SA is where a radio transmits its location information to another radio. SA can be used in the 30 to 511.975 MHz frequency range in LOS, NB and WB SATCOM, LPC/MELP, CVSD voice, or SINCGARS in the 30 to 87.975 MHz range. In order to activate SA, the radio must be given an appropriate combat ID (00001 – 99999). When SA is turned on, SA data will be transmitted with all voice transmissions. SA can be enabled under **CFG>GPS>SA**. Some considerations when programming SA include:

- Supports use of PLGR (all waveforms).
- Function switch must be in CT or TD position.
- Supports use of NMEA-0183 compliant GPS receiver (except with frequency hopping modes).
- Can use KYV-5 with Vinson keys.
- Can use EDM data (KYV-5) or SDM data types.



Some SA settings can cause the radio to key and transmit without operator intervention. Failure to plan accordingly could cause personal injury or death.

Definitions of the menu choices include the following:

- Combat ID – Enter a unique radio number. The default is the radio's serial number, but can be changed by the user.
- SA Receive – If this is **ON**, SA reports are sent out the J3 data port and PPP port (if PPP is enabled).
- SA Transmit – Choices are Off, Move, Per, or Auto:
 - **OFF** – No transmission occurs.
 - **MOVE** – Transmit every time radio moves 100 meters (300 m in VAU), crosses a grid boundary, or when PTT is pressed.
 - **PER** (Periodic) – Radio transmits SA data every two minutes, or when PTT is pressed.
 - **AUTO** – Automatically sends out SA when the PTT is pressed.

To program SA:

- a. Set AN/PRC-117F front panel knob to **CT** or **TD** position.
- b. Press the **PGM** key on the KDU. Use the left/right arrow keys to select **CFIG** to access configuration programming, and press **ENT**.
- c. Use the left/right arrow keys to select **GPS**, and press **ENT**.
- d. Use the left/right arrow keys to select **SA**, and press **ENT**.
- e. **COMBAT ID** is displayed, showing the radio serial number as default. To keep the default, press **ENT**. To configure a custom CID, enter a number that is unique for this radio, and press **ENT**.
- f. If this radio will not be receiving SA data, make sure that SA RECEIVE is **OFF**, press **ENT**, and then proceed to Step j.
- g. If this radio will be receiving SA data, use the up/down arrow keys to select **ON**, and press **ENT**. When SA RECEIVE is **ON**, SA reports are sent out the J3 data port (and also the PPP port when PPP is connected).
- h. Enter the destination SA IP Address, and press **ENT**. The default of 255.255.255.255 (broadcast) can be kept or changed.
- i. Use the up/down arrow keys to choose the SA PACKET TYPE. Choices are **SINGARS** or **HARRIS**. Press **ENT** to continue.
- j. Use the up/down arrow keys to choose SA TRANSMIT method. Choices are as follows:

OFF – No SA transmission occurs.

AUTO – Transmit SA data when any other transmission occurs (i.e. every time the handset is keyed).

PER (Periodic) – Transmit SA data when any other transmission occurs, and transmits on the programmed time period (1–1440 minute range) if no other transmission occurs. Default setting is two minutes.

MOVE – Transmit SA data when any other transmission occurs, or when the radio moves a specified distance from the last SA transmission. Setting is user programmable from 100 to 1000 meters, or 300 to 1000 meters if radio is installed in a Vehicular Adapter Unit (default settings are 100 meters and 300 meters, respectively). Radio will also transmit SA data when crossing Military Grid Reference System (MGRS) boundaries.

- k. Use the up/down arrow keys to **ENABLE** or **DISABLE** local SA reports from being sent ("Local" refers to SA reports of the radio currently being programmed).
- l. Press the **CLR** button to exit out of the programming menu.

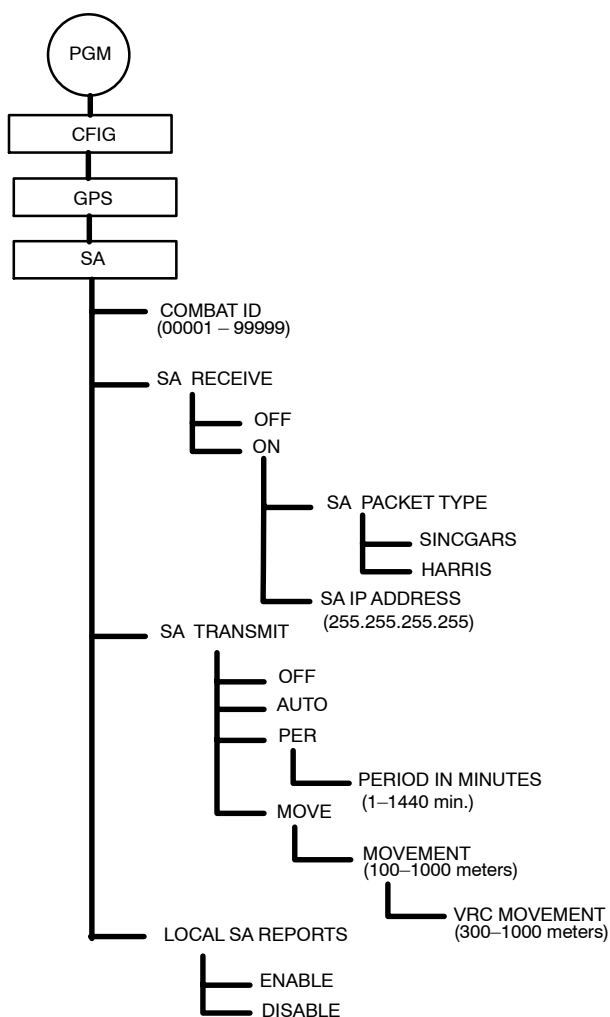


Figure 45. Situational Awareness Menu Tree

22. EXCLUSION BAND PROGRAMMING

See Figure 46 for Exclusion Band menu tree. The AN/PRC-117F supports exclusion band programming for radio use in some host countries. This feature prevents the AN/PRC-117F from keying on certain frequencies using LOS or SATCOM. SINCGARS and HAVEQUICK use their own lockout schemes. Perform the following procedure to program exclusion band:

- a. Press **PGM**.
- b. Go to **EXCLBAND** menu choice and press **ENT** to select.
- c. Select **ADD**, **REVIEW**, or **DELETE**.
- d. If adding:
 - 1. Enter start frequency in MHz.
 - 2. Enter stop frequency in MHz. When exclusion band has been entered, **EXCLUSION BAND ADDED** is displayed.
- e. If reviewing:
 - 1. Press **▲** or **▼** to scroll through list. If exclusion band has not been entered, **EXCLUSION ABND EMPTY** is displayed.
- f. If deleting:
 - 1. Press **▲** or **▼** to scroll through list.
 - 2. Press **ENT** to delete. When exclusion band has been deleted, **EXCLUSION BAND DELETED** is displayed.

23. EXCLUSION BAND CONSIDERATIONS

When exclusion bands are programmed into the AN/PRC-117F, the radio will not transmit and displays the message: **FREQUENCY EXCLUDED, TRANSMIT DISABLED**.

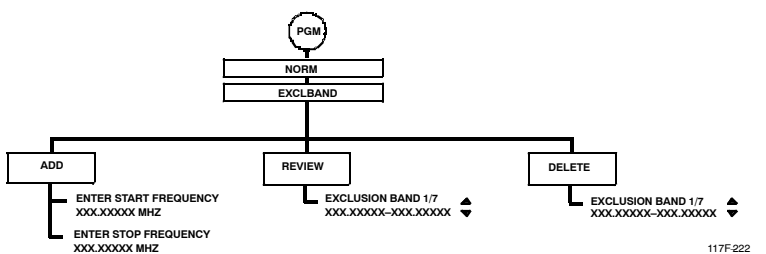


Figure 46. Exclusion Band Programming Tree

24. HPW IP PROGRAMMING

24.1 Theory of Operation

The AN/PRC-117F offers a wireless IP capability in LOS and SATCOM modes, which allows system operators to use IP-based PC software applications. The radio can be fully integrated into a local or wide area network using the radio's Ethernet interface. When configured for IP data transfer, the radio will deliver IP data packets to a remote radio station based on the routing information programmed in the radio. Any application that uses IP protocol is allowed, however latency and bandwidth considerations will make some applications impractical.

24.2 Setup Parameters

The following paragraphs provide setup information for HPW IP. This feature is used with dedicated SATCOM or LOS mode.

24.3 PPP Port Setup

Setup parameters for the PPP port when used with HPW can be accessed from **PGM > PORTS > PPP**. The bottom line of the KDU shows the current status of the PPP link and displays either PPP LINK DOWN or PPP LINK xxx.xxx.xxx.xxx (the current peer address). Parameters are as follows:

- **ENABLE PPP PORT** – Is the PPP port enabled or not (default is yes).
- **IP ADDRESS** – The IP address of the radio's PPP port.
- **PEER ADDRESS** – The IP address to offer the peer, if the peer wants a server-assigned IP address.
- **DATA RATE** – The baud rate of the PPP serial interface.

The RF-6710W-HPW has the following default settings. With radio firmware v4.0.1.7 and above, the settings can be changed if necessary.

- **IP ADDRESS** – 10.0.0.1
- **PEER ADDRESS** – 0.0.0.0 (don't offer address to peer)
- **DATA RATE** – 115 K (115200 baud)

24.4 IP Routes Setup

Setup parameters for the IP networking when used with HPW can be accessed from **PGM, NORM, GENERAL, IP_ROUTES**. IP route menu choices consist of the following:

- **ADD IP routes**
- **REVIEW IP routes**
- **DELETE IP routes**

24.5 IP Network Setup (Only for HPW Nets)

Setup parameters for the IP networking when used with HPW can be accessed from **PGM, NORM, NET, DATA/VOC**. IP network menu choices consist of the following:

- **ENABLE TCPIP**
- **WIRELESS IP ADDRESS**
- **SUBNET MASK**
- **GATEWAY ADDRESS** (000.000.000.000 is for no gateway)

25. HPW IP OPERATIONAL DISPLAYS

The AN/PRC-117F supports IP addressing with the HPW waveform. Definitions of operational displays are describe in the paragraphs that follow.

Channel access states consist of the following:

- **IDLE** – data is not being sent or transmitted.
- **WAITING** – the radio is waiting for more data to be sent.
- **SENDING** – the radio is sending data.
- **SENDING (waiting)** – the radio is ready to send data, but waiting for channel access.
- **RECEIVING** – the radio is receiving data.
- **CALLING** – the radio is attempting to connect with another radio.

HPW actual transfer rates are based on channel conditions. Typical shift points are shown in Table 42.

Kilobytes transmitted and received are defined as the following:

- **T** – is the number of kilobytes transferred since going on-net.
- **R** – is the number of kilobytes received since going on-net.

Message originator and destination meanings consist of the following:

- **ORIG** – is the origin HPW address of the most recent message.
- **DEST** – is the destination HPW address of the most recent message.

The ORIG and DEST codes displayed on the screen are defined as the lower part of the IP address on the subnet mask. For example:

If the subnet mask is 255.255.255.Y, then the HPW ID displayed is Y.

If the subnet mask is 255.255.X.Y, then the HPW ID displayed is $X * 256 + Y$.

Table 42. HPW Transfer Baud Rates

	UFO	WB	NB
LOW	18 k	21.33 k	4.3 k
MED	37 k	42.66 k	8.5 k
HIGH	56 k	—	—

26. SINGARS JULIAN DATE CALENDARS

Use the two digit date from Table 43 for the day entry in the SINGARS GTOD setting in the AN/PRC-117F.

Table 43. SINGARS Julian Date Calendar, Regular Year

D	J	F	M	A	M	J	J	A	S	O	N	D
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

27. SINGARS JULIAN DATE CALENDAR (LEAP YEAR, 2000, 2004, 2008)

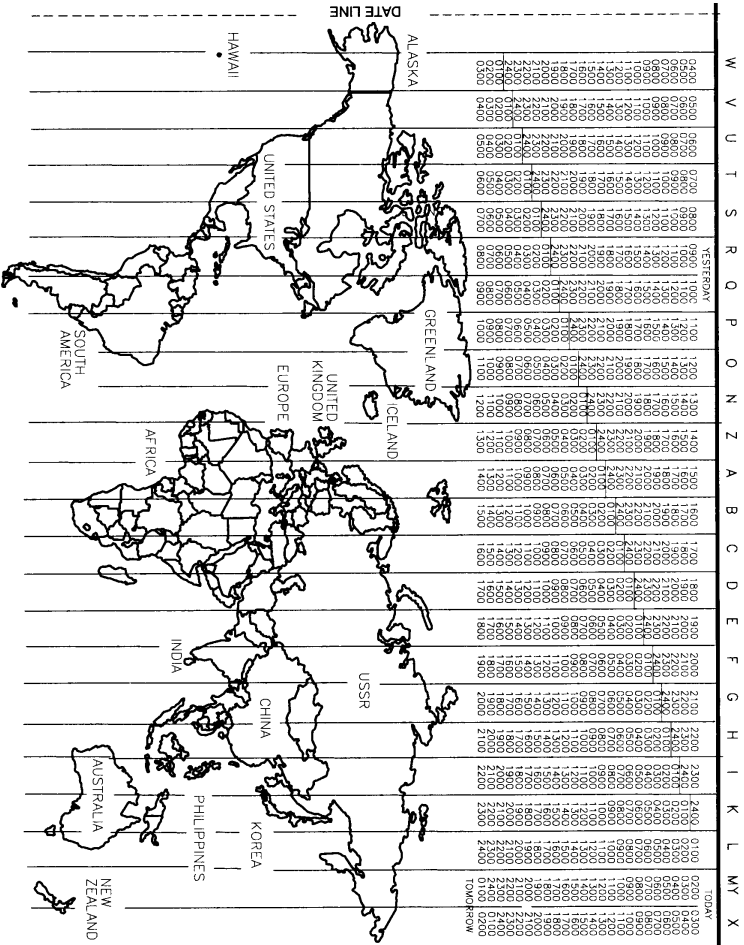
Table 44 is the Julian date calendar for leap years.

Table 44. SINGARS Julian Date Calendar (Leap Years)

D	J	F	M	A	M	J	J	A	S	O	N	D
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

28. WORLD TIME ZONE CONVERSION CHART

Use this chart to convert local time to ZULU time for modes dependent on UTC time



29. UHF SATCOM CHANNELS

Refer to Table 45 for channel List with frequency code, uplink, downlink, and bandwidth.

Table 45. Channel Numbers for SATCOM

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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
27	299.550	258.550	B6	P6	25 kHz
28	299.650	258.650	C6	Q6	25 kHz
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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
143	302.555	248.955		N38	5 kHz
144	302.565	248.965		N39	5 kHz
145	302.575	248.975	G6	027	5 kHz
146	302.585	248.985		028	5 kHz
147	302.595	248.995		029	5 kHz
148	302.600	249.000	G7		5 kHz
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
172	302.800	249.200	G15		5 kHz
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 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 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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
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
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

Table 45. Channel Numbers for SATCOM – Continued

SATELLITE CHANNEL FREQUENCY CODE LIST					
Frequency Code	Uplink Freq. (MHz)	Downlink Freq. (MHz)	Present Channel	UFO Channel	Channel Bandwidth
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		NATO IVB / SKYNET 4A	25 kHz / 25 kHz (UK)
241	307.700	254.100		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 225.000 to 511.99999	User Input 225.000 to 511.99999			5 / 25 kHz

30. UHF SATCOM FOOTPRINTS

30.1 CONUS Satellite Footprint

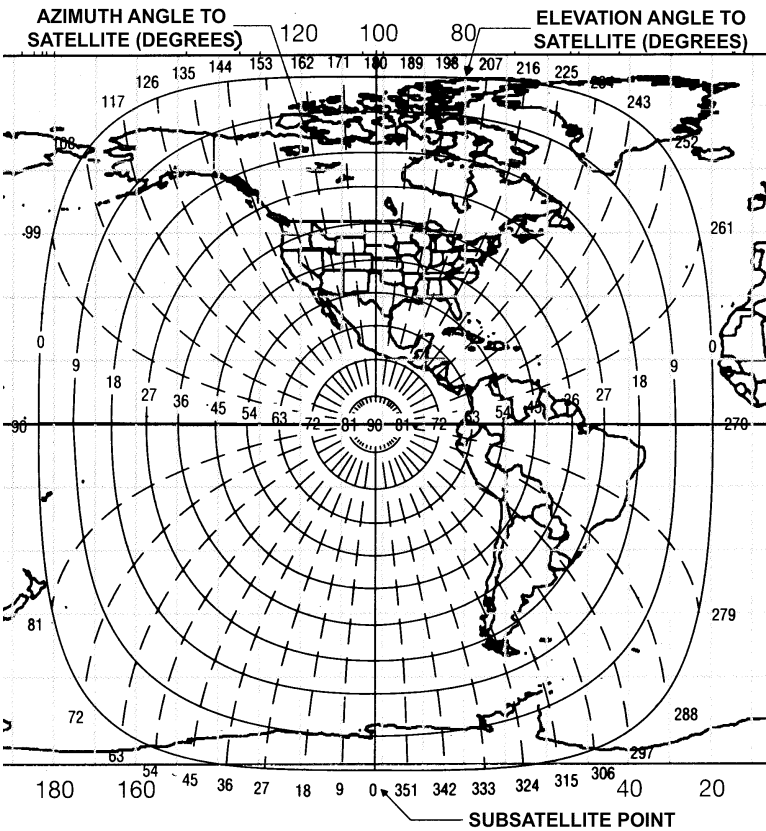


Figure 47. CONUS 100 deg W, 105 deg W

30.2 Atlantic Satellite Footprint

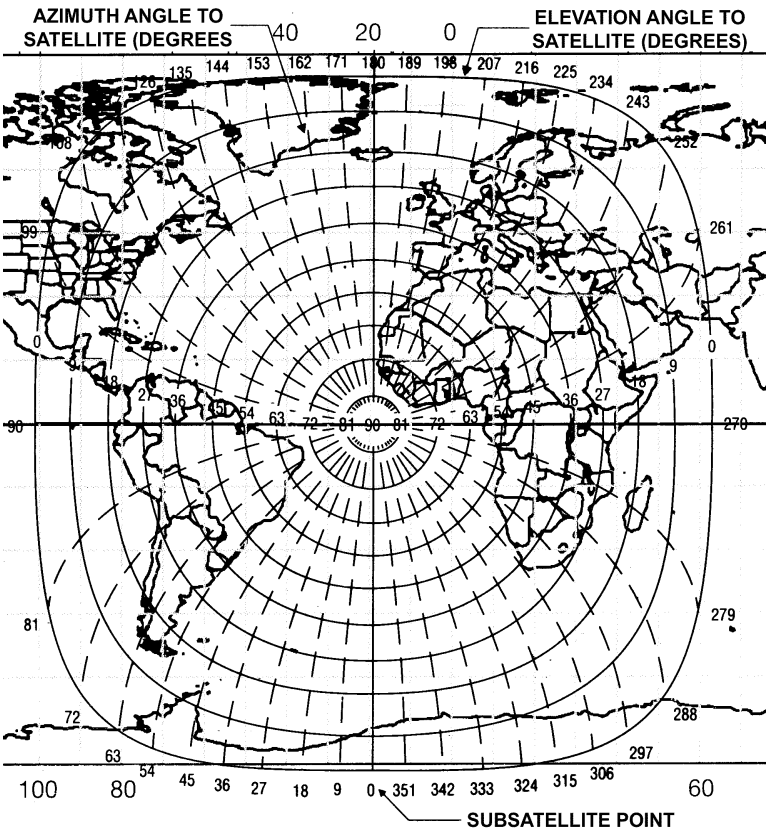


Figure 48. LANT 15 deg W, 23 deg W

30.3 Indian Ocean Satellite Footprint

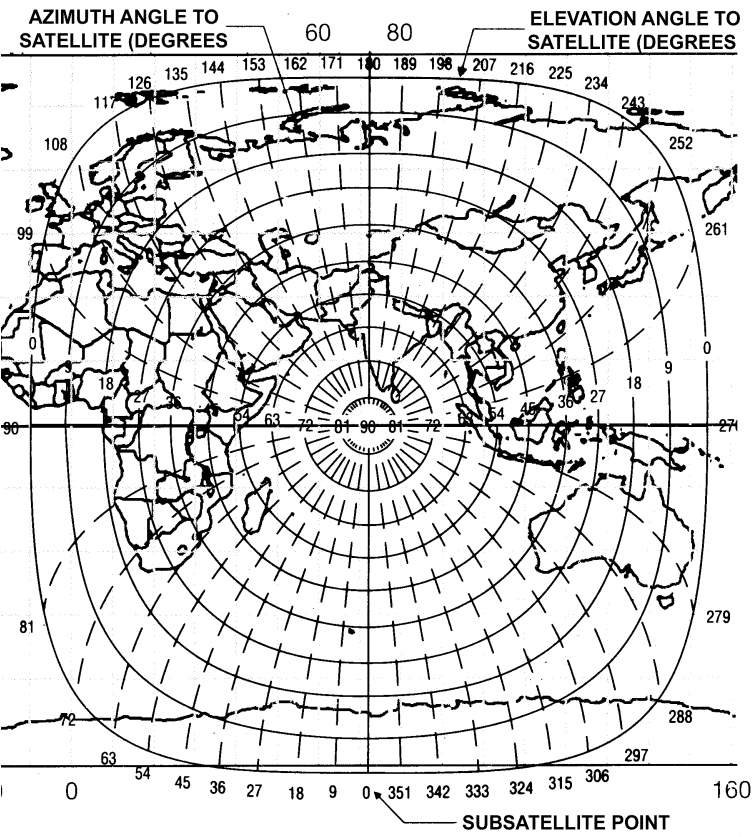


Figure 49. IO 72 deg E, 72.5 deg W

30.4 Pacific Satellite Footprint

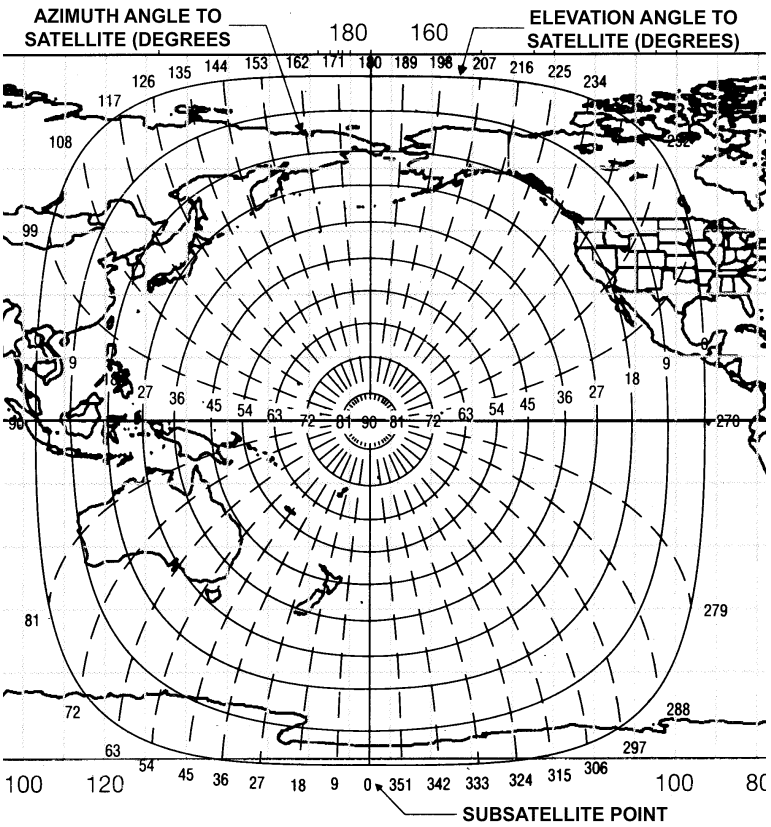


Figure 50. PAC 172 deg E, 177 deg E

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