DWG NO: 10513-1003	SH 1	REV A

APPLICATION		REV	DESCRIPTION	DATE	APPROVED
NEXT ASSY	USED ON	A	REVISED PER DCN # 0102057	3/7/01	------
SIMILAR TO:					

CAD MAINTAINED.
CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

AN/PRC-117F(C)

MANPACK RADIO

INTERFACE CONTROL DOCUMENT

(ICD)

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED

TOLERANCES:
FRACTIONS ±1/64
ANGLES ±1°
DEC xx ±.02 xxx ±.005

SIGNATURES		YR-MO-DY
DRAWN	B. BOORMAN	00-11-01
CHECKED	R. PORTE	00-11-16
ENGR	D. SMITH	00-11-14
APPROVED	M. TURNER	00-11-14
CONTRACT NO		
DESIGN ACTIVITY		
APPROVED		

HARRIS

TITLE
INTERFACE CONTROL DOCUMENT, AN/PRC-117F(C)

SIZE	CAGE CODE	DRAWING NO:	REV
A	14304	10513-1003	A

SCALE NONE

SHEET 1 OF 17

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1. SCOPE

This document details the interconnection scheme used in the AN/PRC 117-F radio. A block diagram of the external interfaces is shown in Figure 1. Each interface is described in detail in subsequent paragraphs. Unique program requirements are noted.

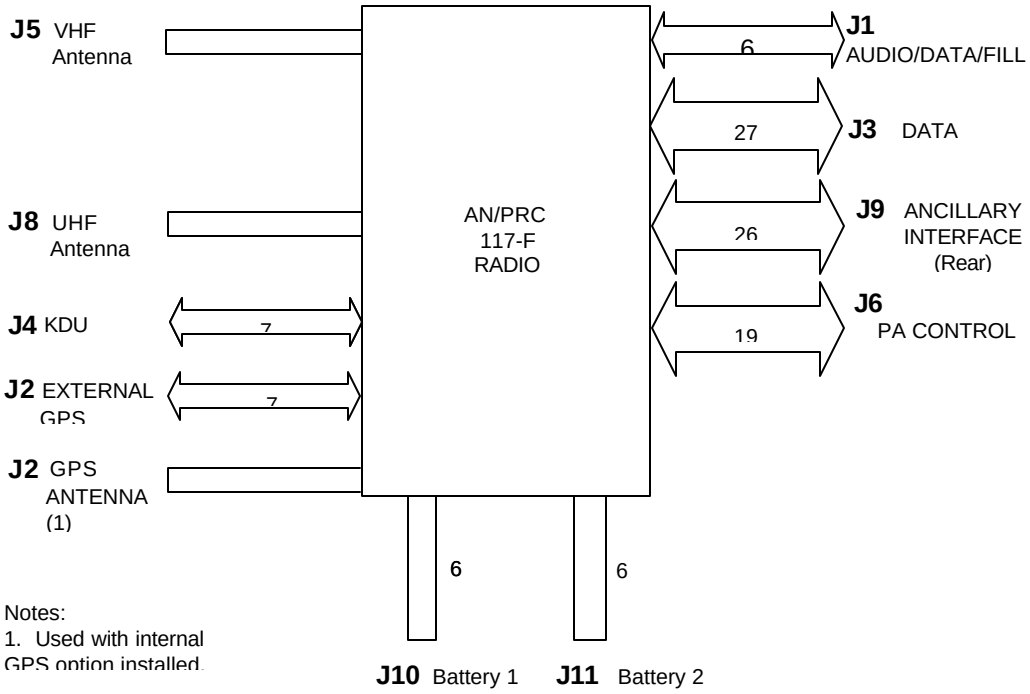

FIGURE 1: AN/PRC 117-F EXTERNAL INTERFACE DIAGRAM

2 EXTERNAL INTERFACE DETAILS

The following defines the external interface details including signal description, specification, direction, and pin-out of the AN/PRC-117F. The direction is referenced to the radio. Part numbers for each connector are listed with the Harris part-number first and the vendor/vendor-part-number second.

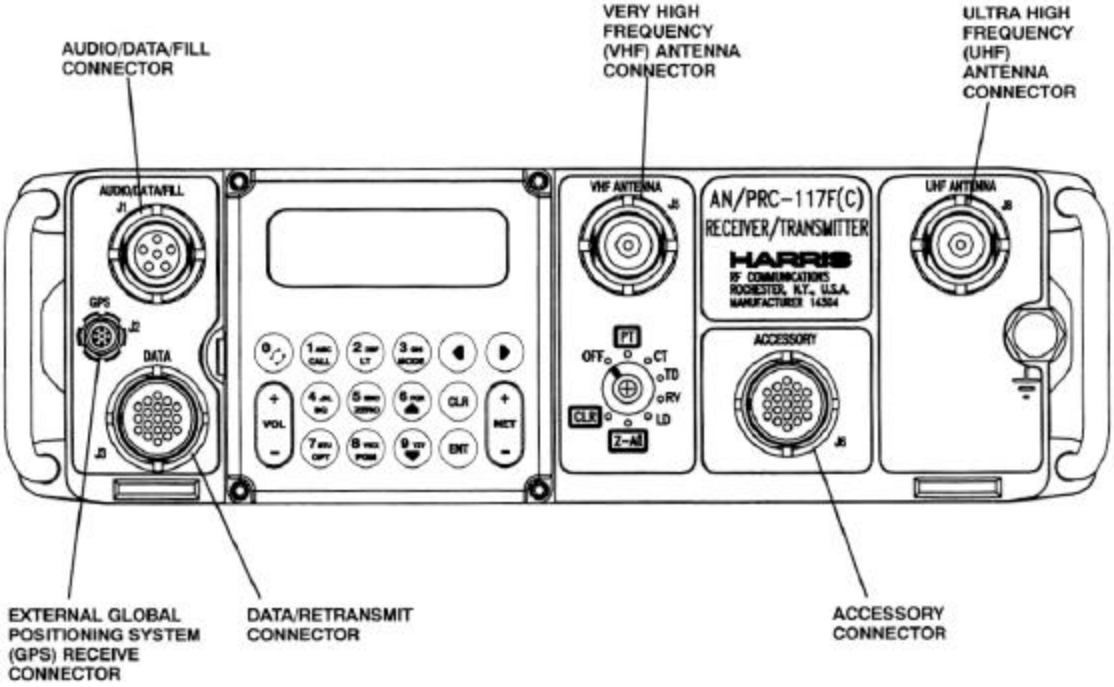

FIGURE 2: AN/PRC-117F(C) FRONT PANEL

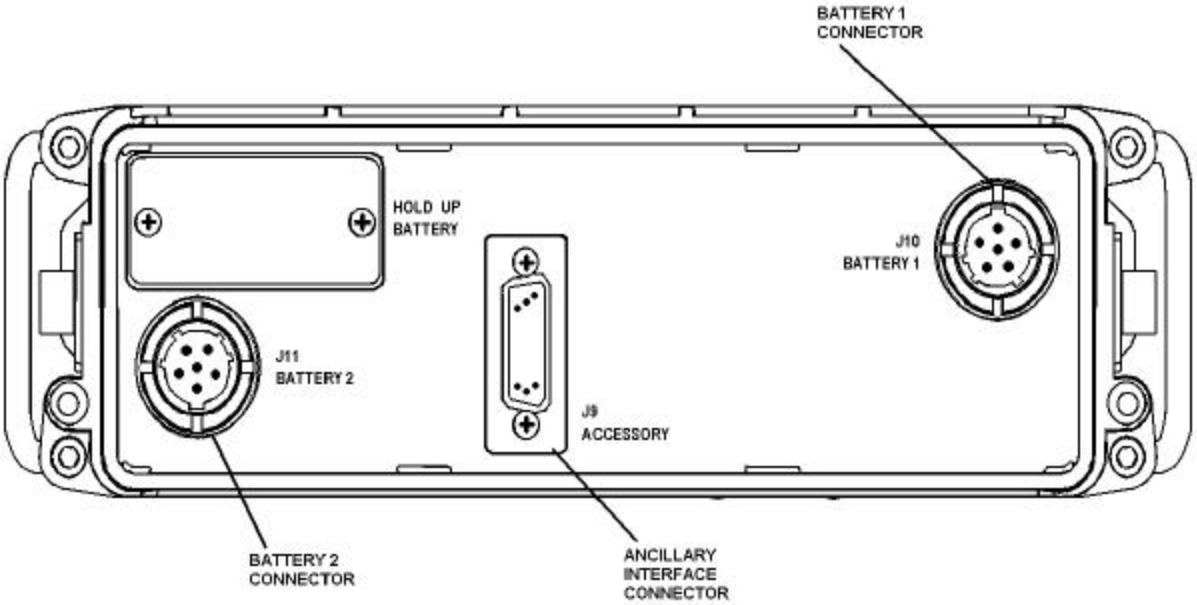

FIGURE 3: AN/PRC-117F(C) REAR PANEL

2.1 J1, AUDIO/DATA/FILL CONNECTOR

The AUDIO/DATA/FILL connector utilizes a 6-pin, filtered audio connector (PN J69-0012-001, MIL-CON 063029). This connector is located on the front panel of the AN/PRC-117F, and requires a 6 contact audio plug (PN J69-0001-623, Power Connect 040711) as a mating connector. Since AUDIO/DATA/FILL is a multifunction interface, Table 1 thru Table 3 define the pin-out details for each of three modes this connector may operate in.

The purpose of this interface is to support plaintext audio/data (via a handset or terminal device) or key loading (via the DS-101 or 102 devices).

TABLE 1: AUDIO/DATA/FILL INTERFACE DETAILS FOR AUDIO & DATA MODE

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
A	ADF_A	NA	Audio Connector Ground	Ground	Audio and Data
B	ADF_B	O	Three function pin as follows: 1. Variable Audio Out 2. Analog Data Out 3. Data Out	1. 3.0 V_{RMS} max, 600/1K Ω 2. 220 mV rms 3. MIL-STD-188-114A compatible, unbalanced	When mode is: 1. Audio 2. Analog Data 3. Data
C	ADF_C	I	Handset PTT	3.3V thru 15 KΩ, ground to activate	Audio & Data
D	ADF_D	I/O	Three function pin as follows: 1. Audio In 2. Data Clock Out 3. Analog Data In	1. 2.6mV RMS, 150 Ω 2. MIL-STD-188-114A compatible 3. 220 mV rms	When mode is: 1. Handset Audio 2. Digital Data 3. Analog Data
E	ADF_E	I	Digital Data Mode Control	3.3V thru 15 KΩ, ground to activate	Selects Digital Data Mode
F	ADF_F	I	Two function pin as follows: 1. Analog Data Control 2. Data In	1. 3.3V thru 15 KΩ, ground to activate 2. MIL-STD-188-114A compatible, unbalanced	When mode is: 1. Analog Data 2. Digital Data

TABLE 2: AUDIO/DATA/FILL INTERFACE DETAILS FOR DS-102 MODE

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
A	ADF_A	O	Fill Reference	+5.0 V Output	DS-102
B	ADF_B	I	Fill Sense/Mux	Pulled Up, ground to activate	DS-102
C	ADF_C	I/O	Fill RTS	Fill RTS	DS-102
D	ADF_D	I/O	Fill Data	Fill Data IO	DS-102
E	ADF_E	I/O	Fill Clock	Fill Clock IO	DS-102
F	ADF_F	I	Fill Override	Fill Override	DS-102

TABLE 3: AUDIO/DATA/FILL INTERFACE DETAILS FOR DS-101 MODE

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
A	ADF_A	NA	Fill Reference		DS-101D
B	ADF_B	I/O	Bal (+)	RS-485 compatible	DS-101D
C	ADF_C	-	Not Used		
D	ADF_D	-	Not Used		
E	ADF_E	I/O	Bal (-)	RS-485 compatible	DS-101D
F	ADF_F	-	Not Used		

2.2 J3, DATA

The DATA Connector utilizes a 27 pin, filtered connector (J69-0014-001, MIL-CON MC2027 or MIL-CON MC4027) . This connector is located on the front panel of the AN/PRC-117F, and requires a 27 pin data mating connector (PN J69-0016-001, MIL-CON MC2127).

This interface supports both a balanced and unbalanced data interface as well as audio, remote control and retransmit interfaces.

TABLE 4: DATA PORT INTERFACE DETAILS

Pin #	Signal Name (FOOTNOTE REFERENCES)	Dir	Description	Specs	Notes/Modes
1	R_DCE_CTS	O	Transceiver Clear To Send	Unbalanced	MIL-STD-188-114A, RS-232E Compatible
2	R_DCE_DCD	O	Transceiver Data Carrier Detect	Unbalanced, only	MIL-STD-188-114A, RS-232E Compatible

Pin #	Signal Name (FOOTNOTE REFERENCES)	Dir	Description	Specs	Notes/Modes
3	R_DCE_RXC- (1)	O	Transceiver Receive Data Clock Out	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 compatible
4	R_DCE_TXC+ (1,2)	I	Transceiver Transmit Data Clock In	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E 2. RS-485 compatible
5	GND_CHAS	NA	Chassis ground		
6	R_DCE_RXD- (1)	O	1. Transceiver RX Data (-)	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 compatible
7	R_DCE_RXD + (1)	O	Transceiver RX Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 compatible
8	R_RMT_TXD- (1,2)	I	Remote Control Transmit Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E compatible 2. RS-485 compatible
9	R_RMT_TXD + (1,2)	I	Remote Control Transmit Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E compatible 2. RS-485 compatible
10	R_RMT_RXD + (1)	O	Remote Control Receive Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E compatible 2. RS-485 compatible

Pin #	Signal Name (FOOTNOTE REFERENCES)	Dir	Description	Specs	Notes/Modes
11	R_AUDIO_OUT_F	O	Red Fixed Level Audio Out	600 ohm, 0 dBm and -10 dBm	
12	R_AUDIO_IN_F	I	Red Fixed Level Audio In	600 ohm, 0 dBm and -10 dBm	
13	GND_CHAS	NA	Chassis Ground		
14	R_BATT_OUT	O	+24.0 VDC Power Source	19.5-33Vdc @ 100ma max.	Power for external device
15	R_PTT_IN	I	Red Push To Talk	Pulled up,3.3V thru 15Kohm, ground closure to activate	
16	R_DCE_DTR (3)	I	Transceiver Data Terminal Ready, PPP Data Input	1. Unbalanced, only 2. PPP when R/T is in HPW mode	MIL-STD-188-114A, RS-232E Compatible
17	R_DCE_RXC + (1)	O	Transceiver Receive Data Clock Out	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 Compatible
18	R_DCE_TXC- (1,2)	I	Transceiver Transmit Data Clock	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 Compatible
19	R_DCE_TXD- (1,2)	I	Transceiver TX Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 Compatible

Pin #	Signal Name (FOOTNOTE REFERENCES)	Dir	Description	Specs	Notes/Modes
20	R_DCE_TXD + (1,2)	I	Transceiver TX Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 Compatible
21	R_RMT_RXD - (1)	O	Remote Control Receive Data	1. Unbalanced 2. Balanced	When mode is: 1. MIL-STD-188-114A, RS-232E Compatible 2. RS-485 Compatible
22	R_DCE_DCD_IN CTS_IN	I	Two Function pin as follows: 1. Data Carrier Detect In 2. CTS in	Unbalanced	MIL-STD-188-114A, RS-232E Compatible
23	/REX_OUT	O	Retransmit Keyline Out	Open collector	60VDC, 200mA Max.
24	R_DCE_DSR (3)	O	Transceiver Data Set Ready, PPP Data Out	1. Unbalanced, only 2. PPP when R/T is in HPW mode	MIL-STD-188-114A, RS-232E Compatible
25	/CABLE_PRES	I	Indicates Cable Present	Pulled up (3.3V thru 15Kohm), ground closure to activate.	
26	R_DCE_RTS	I	Request To Send RTS	Unbalanced	MIL-STD-188-114A, RS-232E Compatible. Note that the alternate use of RTS known as Ready to Receive is not a valid mode.

Pin #	Signal Name (FOOTNOTE REFERENCES)	Dir	Description	Specs	Notes/Modes
27	/R_DCE_BAL	I	Two function pin as follows: 1. Balanced 2. Unbalanced	Pulled up (3.3Vthru 15Kohm), ground closure to activate balanced interface.	Selects either balanced or unbalanced DTE interface. Note: As a future option provisions for bi-directional data path interfacing to a single bit serial EEPROM for smart cable ID.

NOTE 1: For unbalanced interfaces the negative signal sense is typically used. This translates to a logic 1 corresponding to a negative voltage.
NOTE 2: When using unbalanced interface, the unused input (typically the positive (+) input, reference Note 1) **must** be grounded to ensure proper receive differential data levels at the translators on the Voice/Data Processor.
NOTE 3: Radios equipped with the HPW modem designate the DSR and DTR lines for use as RX and TX of PPP packets.

2.3 J9, ANCILLARY INTERFACE CONNECTOR (REAR PANEL)

The Ancillary Interface Connector utilizes a 26 pin, filtered, subminiture, D connector (PN J22-0117-026, Positronic ODD26F32C5A00-792.22). This connector is located on the rear panel of the AN/PRC-117F and requires a 26 pin mating connector (PN J22-0121-026, Positronic ODD26M0000X).

The purpose of this connector is to support auxillary devices such as the remote control, external power amplifier vehicular adapters and other devices. A subset of these signals are located on the PA Control connector of the AN/PRC-117F radio.

TABLE 5: ANCILLARY INTERFACE DETAILS

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
1	AIC_AUD_IN	I	Black Fixed Audio In	600 ohm, 0 & -10dBm	
2	AIC_AUD_OT	O	Black Fixed Audio Out	600 ohm, 0 & -10dBm	
3	AIC_PA_CT+	BI	External PA Control +	0V, +5V differential asynch control data, 115.2 kbaud	
4	AIC_PA_CT-	BI	External PA Control -	0V, +5V differential asynch control data, 115.2 kbaud	

5	AIC_EXT_PA_FB-	I	External PA Feedback -	PA Feedback Ground Return	differential signal
6	AIC_EXT_PA_FB+	I	External PA Feedback +	+0.5V min, +4.3V typical, +6.0V max	differential signal
7	AIC_RMT_TXD-	I	Remote Control Tx Data	RS-232E Compatible	
8	AIC_SPARE1		Spare		
9	AIC_AUI_ACX+	I		5V CMOS, 10MHz	Ethernet Provision
10	/AIC_PTT_IN	I	External Push to Talk	Active Low	
11	AIC_DEBUG_RX	I	Radio Debug Port, Receive	RS-232E Compatible	Radio Debug Port
12	CHAS_GND_PS	O	External DC Power Return	DC Return	
13	AIC_AUI_ATX-	O		5V CMOS, 10MHz	Ethernet Provision
14	AIC_AUI_ATX+	O		5V CMOS, 10MHz	Ethernet Provision
15	AIC_AUI_ACX-	I		5V CMOS, 10MHz	Ethernet Provision
16	AIC_PA_ON	O	External PA On/Off Control	0.0 V - OFF +5.0 V – ON	
17	AIC_RMT_RXD-	O	Remote Control Rx Data	RS-232E Compatible	
18	AIC_/GPS_SENSE	I	Debug Port Enable	Apply 3.3V to enable Debug Port. Leave open for GPS.	Debug Port Enable
19	AIC_DEBUG_TX	O	Radio Debug Port, Transmit	RS-232E Compatible	Radio Debug Port
20	AIC_EXT_PA_PRES	I	External PA Present	19.5 - 32Vdc, less than 1mA	
21	AIC_HOP_CLK	O	Frequency Hopping Clock	Open collector, active low	

22	/AIC_KEY_OUT	O	External Keyline Out	Open collector, active low.	60 Volts 200mA MAX.
23	/AIC_RT_OFF	I	External RT On/Off	less than .8V-off @ max leakage current of 18uA. open- On (main switch on)	Front Panel Switch must be on.
24	AIC_EXT_PWR	O	AIC connector power output	19.5-33Vdc @ 100ma max.	Short Circuit Protected
25	AIC_AUI_ARX-	I		5V CMOS, 10MHz	Ethernet Provision
26	AIC_AUI_ARX+	I		5V CMOS, 10MHz	Ethernet Provision

NOTE: For unbalanced interfaces the negative signal sense is typically used. This translates to a logic 1 corresponding to a negative voltage.

2.4 J6, PA CONTROL

The PA Control connector utilizes a 27-pin, filtered connector (PN J69-0014-002, MIL-CON 063029). This connector is located on the front of the AN/PRC-117F radio, and it requires a 27-pin accessory mating connector (PN J69-0016-002, MIL-CON MC4127).

The purpose of this connector is to support auxillary devices such as the remote control, external power amplifier and other devices. These signals are a subset of those found on the rear panel Ancillary Interface Connector.

TABLE 6: PA CONTROL INTERFACE DETAILS

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
1	AIC_SPARE1				
2	GROUND				
3	AIC_PA_CT-	O	External PA Control -	0V, +5V differential asynch control data, 115.2 kbaud	
4	AIC_PA_CT+	O	External PA Control +	0V, +5V differential asynch control data, 115.2 kbaud	
5	GROUND				
6	AIC_AUDIO_	I	Black Fixed Audio In	600 ohm, 0 to -	

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
	IN			10dBm	
7	AIC_AUDIO_OUT	O	Black Fixed Audio Out	600 ohm, 0 to -10dBm	
8	/AIC_KEY_OUT	O	External Keyline Out	Open collector, active low.	60 Volts at 200mA MAX, +3.3 Volts at 2mA MAX when in a Vehicular Adaptor
9	AIC_PA_ON	O	External PA On/Off Control	+5.0 V – On 0 V – Off	
10	/AIC_RT_OFF	I	RT On/Off Control	less than .8V-off @ max leakage current of 18uA. open- On (main switch on)	Main switch must be on
11	DEBUG_TX	O	TX Debug Data	RS-232E Compatible	
12	AIC_SPARE2				
13	GROUND				
14	AIC_EXT_PA_PRES	I	External PA Present	19.5 - 32Vdc, less than 1mA	Not available when in a Vehicular Adaptor
15	FRNT_EXT_PWR	I			
16	AIC_SPARE3				
17	GROUND				
18	/AIC_PTT_IN	I	External Push to Talk	Active Low	
19	AIC_PA_FB+	I	External PA Feedback +	+0.5V min, +4.3V typical, +6.0V max	differential signal
20	AIC_PA_FB-	I	External PA Feedback -	PA Feedback Ground Return	differential signal
21	AIC_HOP_CLK	O	Frequency Hopping Clock	0V, 5V CMOS Levels	
22	DEBUG_RX	I	RX Debug Data	RS-232E	

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
				Compatible	
23	AIC_SPARE4				
24	AIC_SPARE5				
25	AIC_RMT_RXD-	O	Remote Control Rx Data	RS-232E Compatible	
26	AIC_RMT_TXD-	I	Remote Control Tx Data	RS-232E Compatible	
27	AIC_SPARE6				

NOTE: For unbalanced interfaces the negative signal sense is typically used. This translates to a logic 1 corresponding to a negative voltage.

2.5 J4, KEYPAD DISPLAY UNIT (KDU)

The Keypad Display Unit Connector utilizes a 7 pin, WW Fisher connector (PN J29-0010-401, W.W.Fischer DBPE102Z056-14). This connector is located on the front panel of the AN/PRC-117F radio (behind the KDU). The KDU interface (PN J29-0014-015, W.W.Fischer S102Z056-140+) serves as a mating connector.

The purpose of this interface is to support the MMI communication between the radio and the keypad display unit.

TABLE 7: KDU INTERFACE DETAILS

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
1	TXDAT+	I	Data from Keypad/Display	RS-485	Differential
2	TXDAT -	I	Data from Keypad/Display	RS-485	Differential
3	KDU_DETECT	I	Ground for KDU present		
4	Shield ground	I	Shield		Also power return
5	RXDAT+	O	Data to Keypad/Display	RS-485	Differential
6	RXDAT-	O	Data to Keypad/Display	RS-485	Differential
7	PWR	O	+Battery Supply to KDU	19.5-33Vdc @ 100ma max.	

2.6 J2, GLOBAL POSITIONING SYSTEM (GPS) INTERFACE CONNECTOR

The GPS Connector utilizes a 7 pin, WW Fischer connector (PN J29-0008-301, W.W.Fischer 055719). A 7-pin GPS (PN J29-0014-010, W.W.Fischer 055719) is the mating connector.

The following interface description is for the external PLGR GPS unit. This is the standard AN/PRC-117F radio configuration. Note: Signal names are WRT external GPS device.

TABLE 8: GPS INTERFACE DETAILS

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
1	Antenna	I	Provision for use of WW Fisher connector as antenna.	50 ohm	Experimental Not Connected
2	TIME_MARK _OT	I	1 PPS Time Mark Out	Load: 50 ohm nominal Pulse Width: 20 usec ± 20% Rise Time: 50 nsec max Fall Time: 1 usec max	Voltage WRT Ground: Logic 1: 3 to 5 VDC Logic 0: 0 to 0.5 VDC
3	DATA_IN	O	Serial Data Port Out RS-232 GPS Receive Data	Load: NLT 3kohm Slew rate: 30 volts/usec max Baud rate tolerance: ± 1.7 %	Voltage (WRT Ground): Logic 0: +3 to +25 VDC Logic 1: -3 to -25 VDC
4	GND	I	Ground	Signal Reference	
5	DATA_OUT	I	Serial Data Port In RS-232 GPS Transmit Data	Load: NLT 3kohm in parallel with NMT 2500 pF Slew rate: 30 volts/usec max Baud rate tolerance: ± 1 %	Voltage (WRT Ground): Logic 0: +5 to +25 VDC Logic 1: -5 to -25 VDC
6	HQ_OT	I	Have Quick Out	Sink/Source ≤ 0.5 mA Data period: 600 ± 2 usec	Voltage WRT Ground: Logic 1: 300 usec at +4.5 to +5.5 VDC followed by 300 usec at 0 to +0.5 VDC Logic 0: 300 usec at 0 to +0.5 VDC followed by 300 usec at +4.5 to +5.5 VDC
7	GPS_PWR	O	External GPS Power	Battery Voltage (19.5-33Vdc@ 100mA MAX)	Optional

2.7 J5, VHF Antenna

The VHF Antenna Connector utilizes a coaxial BNC/Bulkhead connector (PN 10511-2915-01, MIL-CON 063029). This connector is located on the front panel of the AN/PRC-117F radio. This antenna connector provides a signaling method for determining whether a whip antenna or 50 ohm antenna is connected. This port covers the radio frequency range of 30.000000 Mhz to 89.999990 Mhz.

2.8 J8, UHF Antenna

The UHF Antenna Connector utilizes a coaxial BNC/Bulkhead connector (PN 10511-2914-01, MIL-CON 063029). This connector is located on the front panel of the AN/PRC-117F radio. This port covers the radio frequency range of 90.000000 Mhz to 511.999990 Mhz. The DC power that is available on the center conductor for external satellite Satcom LNA applications is outlined on the following table:

TABLE 9: DC POWER AVAILABLE ON UHF ANTENNA CONNECTOR

Temperature	DC Power Available	Maximum Current
-40 degrees C	20VDC at 450mA nominal	900mA max
25 degrees C	20VDC at 300mA nominal	600mA max.
85 degrees C	20VDC at 140mA nominal	280mA max.

The DC is protected to the max currents above and will self reset when the over current condition is removed.

2.9 J10, J11, Batteries 1 and 2

The Battery Connectors utilize 6 pin connectors (PN J09-0037-500). These connectors are located on the rear panel of of the AN/PRC-117F radio.

The AN/PRC-117F radio is equipped with two battery connectors, either of which (or both) may be used to supply battery power to the radio. When using Lithium batteries, two batteries must be used (utilizing both connectors) to achieve full power.

TABLE 10: BATTERY CONNECTOR INTERFACES DETAILS

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
1	CELL_1A_RTN -	NA	- DC Input Voltage (Cell A)		Power return for +24VDC
2	CELL_1B_RTN -	NA	- DC Input Voltage (Cell B)		Tie to pin 4 for 24 V
3	BATT_TYPE	I	Battery Type Indicator	GND = NiCad or other OPEN = Lithium	Ground for external power source.

Pin #	Signal Name	Dir	Description	Specs	Notes/Modes
4	CELL_1A+	I	+12 VDC Input Voltage (A)		
5	CELL_1B+	I	+12 VDC Input Voltage (B)		+24 VDC
6	BATT_STAT	I/O	Charge Status for Smart Battery	Bi-directional serial	Benchmark: BQ2050 (Lithium Ion) BQ2011 (NiCad)