

SECTION 2

INSTALLATION

2.1 GENERAL INFORMATION

The RF-3466A provides an interface between a digital data source and an HF transceiver system. The unit can be configured for on-site or remote control use. This chapter describes general installation considerations and procedures. Actual installation procedures will depend upon the particular application. Items to consider when planning installation include: size and weight of the unit, availability of power, proximity of the modem to other equipment, accessibility of controls and indicators, and air flow.

Installation will include:

- Connecting the modem to a power source.
- Connecting cables to the rear panel.
- Selecting Internal, External 1 MHz, or External DTE frequency standard.
- Checking and adjusting audio output level.

2.1.1 Tools and Equipment

The following tools and test equipment are recommended to install and set-up the modem:

- True RMS Voltmeter such as the Fluke #8060A or HP3400A
- Standard Electronic/Technician Tools
- RS-232 Interface breakout box such as the Blackbox #SAM232-55 for troubleshooting RS-232 interface lines.

2.1.2 Size

The modem's dimensions are shown in figure 2-1. The unit weighs 35 lbs. (15.9 kg).

2.1.3 Power

The RF-3466A requires a 90-150/150-300 Vac, 47-440 Hz, single-phase power source. The RF-3466A can, if required, be equipped to run from a 20 to 32 Vdc source, or 10 to 16 Vdc source (optional power supplies required). Maximum power dissipation is 80 watts.

2.2 UNPACKING

Carefully remove unit from shipping container and retain carton for repacking if necessary. Inspect for damage and check packing list to account for all equipment on the list. Notify carrier if unit is damaged or items are missing.

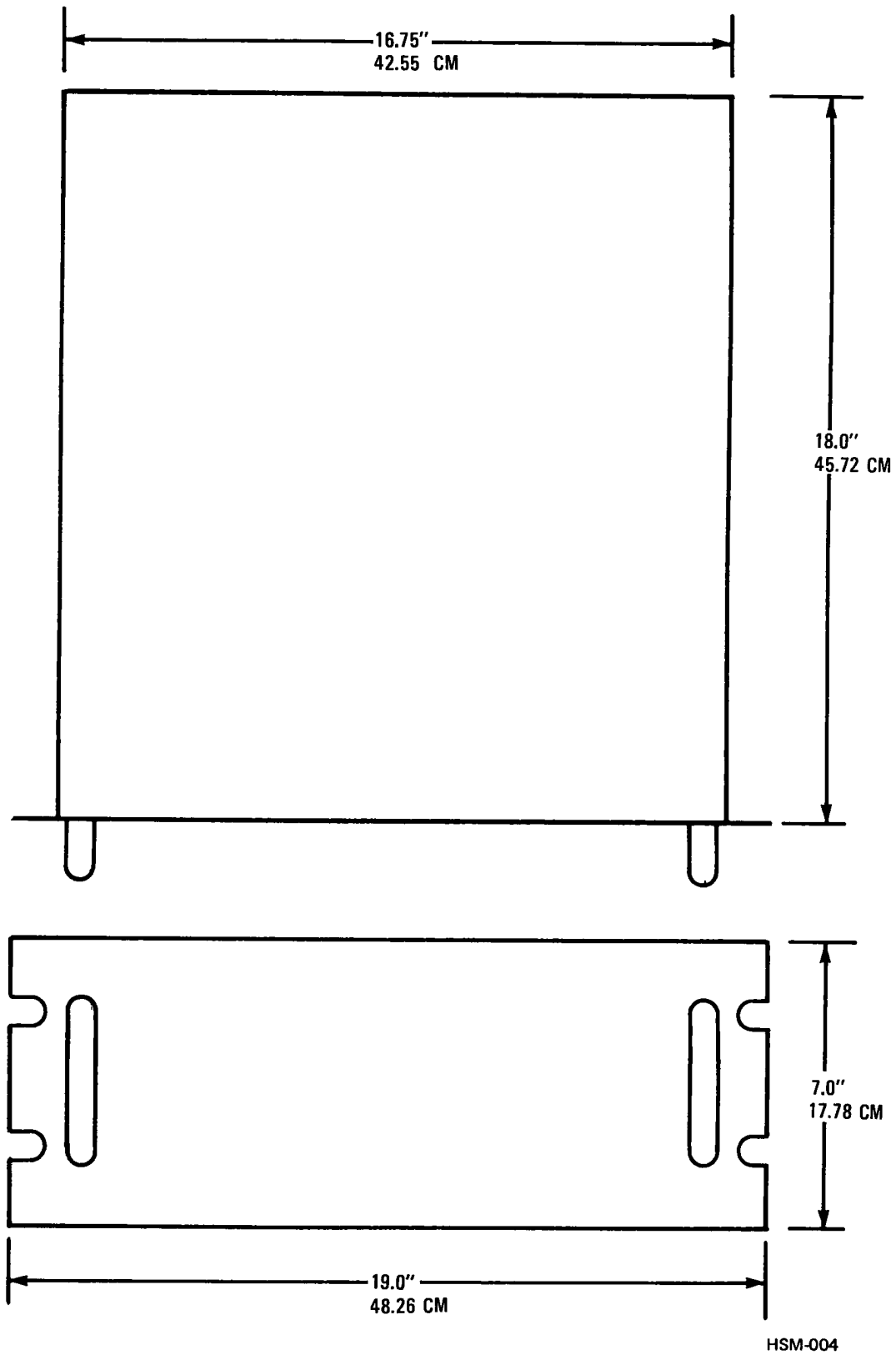


Figure 2-1. RF-3466A Dimensions

2.3 ANCILLARY KIT

Table 2-1 shows the items that are supplied with the RF-3466A Ancillary Kit (10133-3021).

Table 2-1. Ancillary Kit (10133-3021)

Quantity	Part Number	Description
5	F-0011	Fuse, 1-1/2 Amp, QA
5	F-0013	Fuse, 3.0 Amp, QA
1	J-0092	Connector, D, 15 Pin, Female
1	J22-0014-001	Connector, D, 9 Pin, Male
1	J22-0037-001	Connector, D, 25 Pin, Male
10	J45-0018-012	Connector, Pin
1	J55-0002-003	Connector Housing, 25 Pin
2	J55-0002-004	Connector Housing, 15 Pin
1	J55-0002-005	Connector Housing, 9 Pin
1	P-0096	Connector, D, 15 Pin, Male
1	10133-0015	Cable, Ac Power
1	10133-0019	Firmware Configuration

2.4 MOUNTING OPTIONS

The RF-3466A Universal HF Modem may be stack-mounted (P/N 10133-0055), or rack mounted (P/N 10133-0050). The rack mount kit includes the slide mounting bracket and all screws and washers needed for installation (figure 2-2).

2.5 POWER CONNECTIONS

WARNING

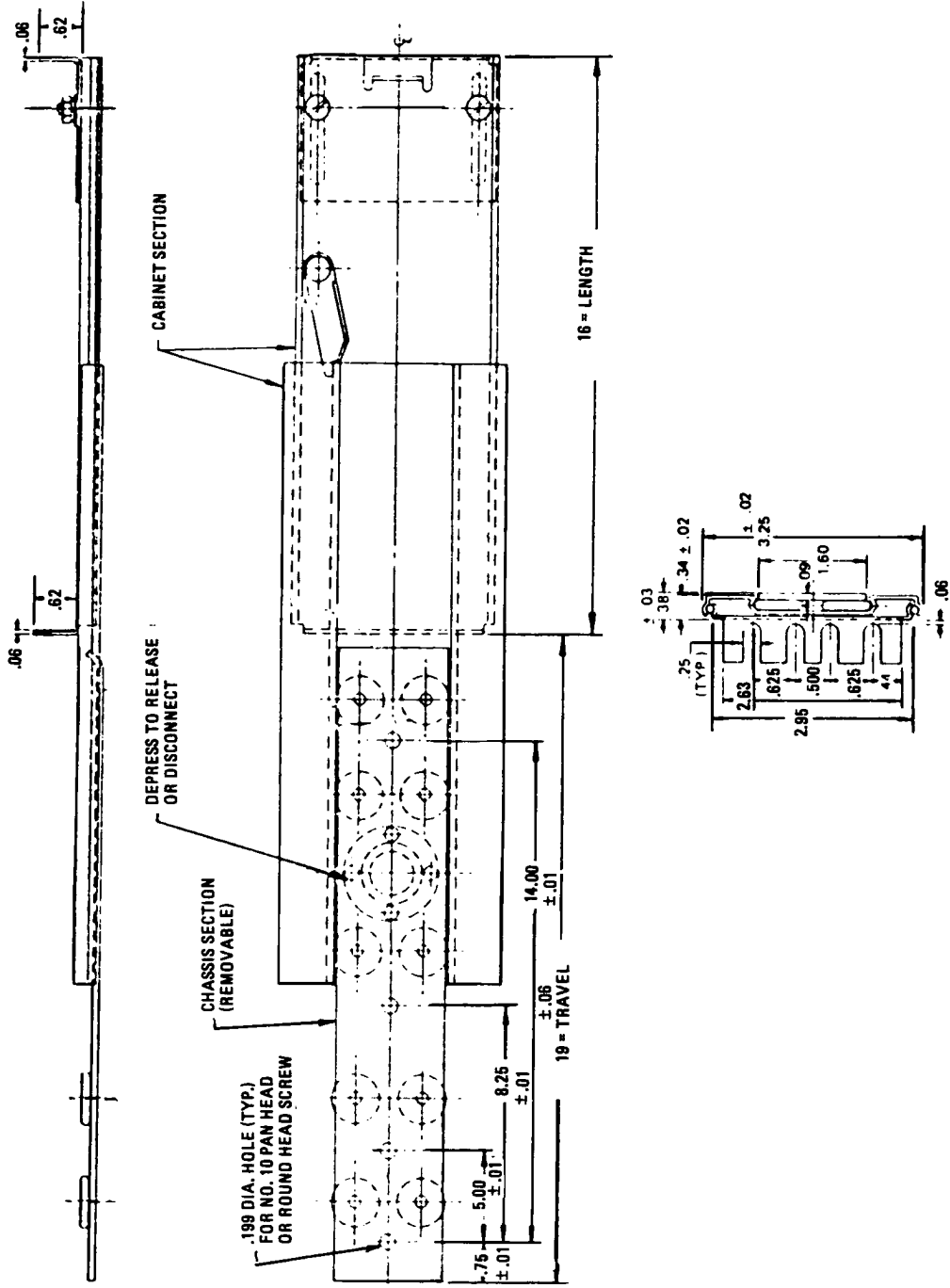
Do not energize this equipment unless the frame and all exposed metal parts are grounded.

If S1 is in the wrong position, severe damage to equipment and personal injury can occur.

Switch S1 on the Ac power supply must be set to the proper line voltage position before energizing. (See figure 2-3.)

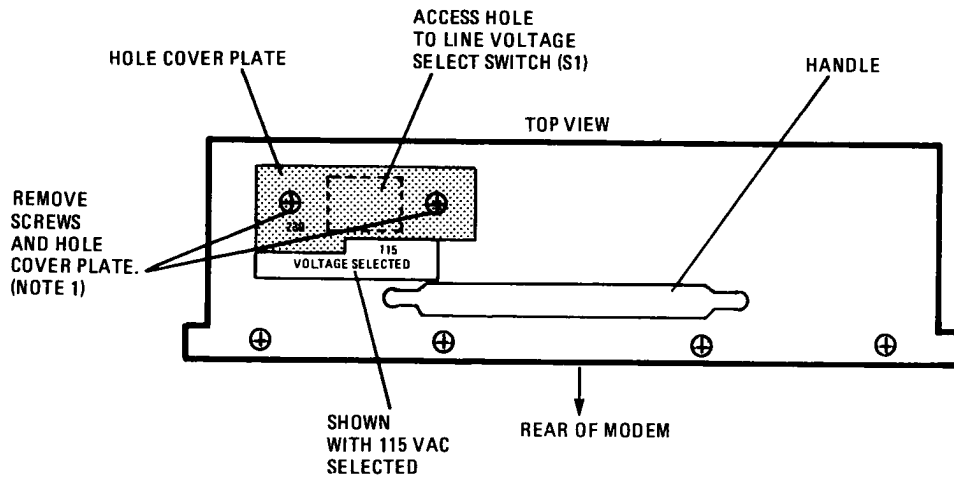
The RF-3466A Universal HF Modem can be powered by 115 Vac or 230 Vac line voltage. The installation kit includes line cords for connections to 115 Vac sources. Line cords for 230 Vac must be individually constructed for the particular applications. The line cord for the selected line voltage plugs into the power connector on the rear panel.

Removal and replacement procedures for the power supply are described in section 5.



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Figure 2-2. Slide Mount Bracket Kit



NOTES:

- 1.) AFTER SETTING LINE VOLTAGE SELECT SWITCH (S1) REPLACE HOLE COVER PLATE SUCH THAT NOTCH IN PLATE LEAVES ONLY THE VOLTAGE SELECTED EXPOSED (230 OR 115 VAC).

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Figure 2-3. Ac Power Supply Voltage Selection Switch

2.6 REAR PANEL CONNECTIONS

All input, output, and power connections are on the rear panel. The rear panel connectors are listed in table 2-2 and identified in figure 2-4. Connector pin outs are listed in tables 2-3 through 2-7.

Table 2-2. Rear Panel Connectors

Connector Designated	Function	Type	Part No.
J1	DTE Connector	25 Pin, Female D	J22-0035-001
J2	Ext. 1 MHz Input	Coaxial BNC	J90-0004-001
J3	Transceiver Connector	15 Pin, Female D	J22-0053-001
J4	Transceiver Connector	15 Pin, Male D	J22-0053-002
J5	Remote Connector	9 Pin, Female D	J22-0034-001
J6	Power Input	4 Pin, Box Receptacle	MS3102A-16-9P

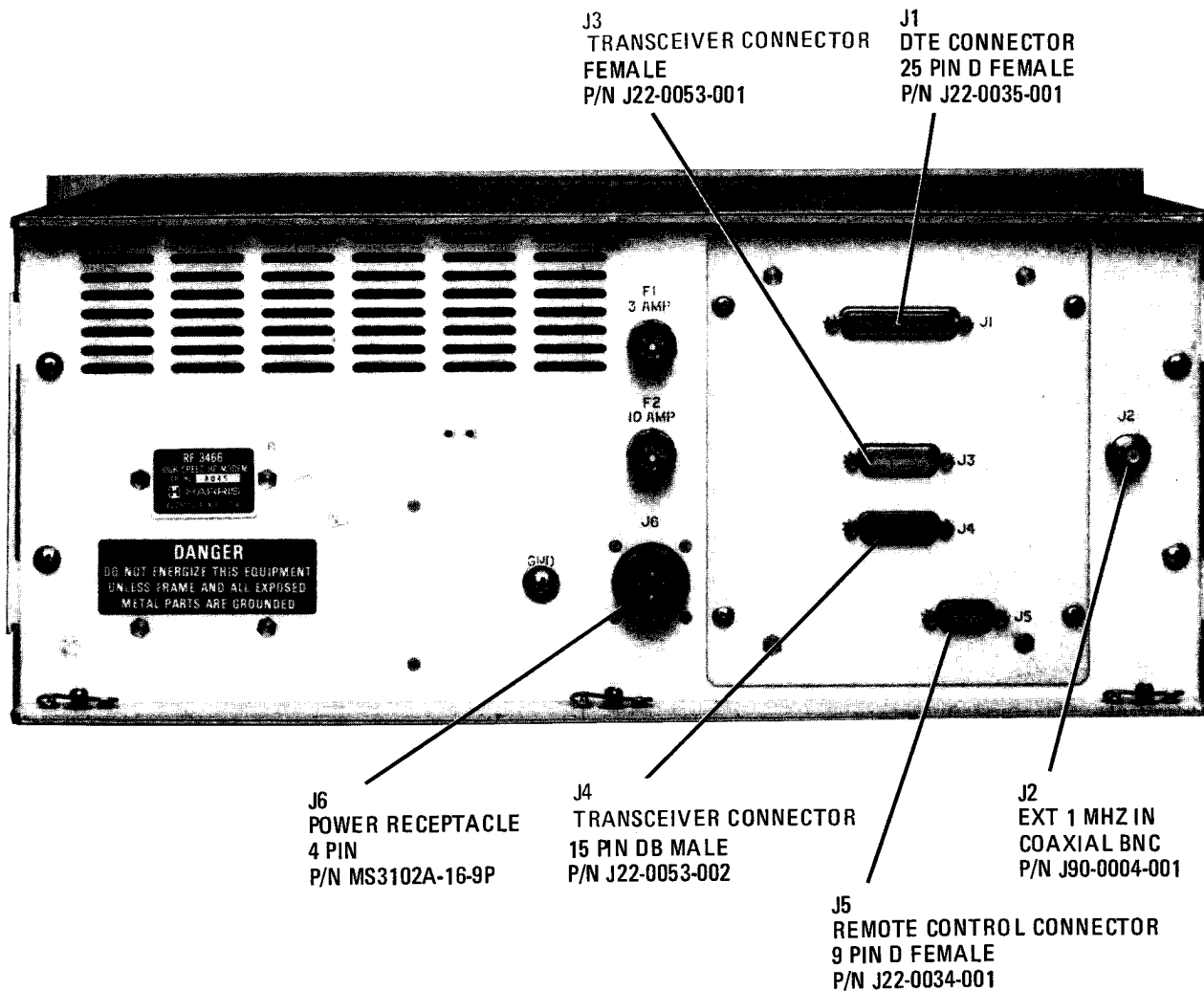


Figure 2-4. Rear Panel Connectors

Table 2-3. Data Terminal Connector J1 Pin Identification

Pin	Signal Name	Description/Remarks
1	Protective Ground	
2	TXD	Serial data from DTE
3	RXD	Serial data to DTE
4	RTS	Request-to-Send
5	CTS	Clear-to-Send
6	DSR	Data Set (Modem) Ready
7	Signal Ground	

Table 2-3. Data Terminal Connector J1 Pin Identification (Cont.)

Pin	Signal Name	Description/Remarks
8	RLSD	Modem has received signal and achieved data sync
11	SEC RXC	Secondary receive clock generated by RF-3466A
12	SEC RLSD	Secondary receive signal detect
13	SEC CTS	Secondary clear-to-send
14	SEC TXD	Serial data from DTE #2
15	TXC	Clock is generated by RF-3466A
16	SEC RXD	Serial data to DTE #2
17	RXC	Clock is generated by RF-3466A
18	SEC TXC	Secondary transmit clock generated by RF-3466A
19	SEC RTS	Request to Send from DTE #2
20	DTR	Data Terminal Ready
21	Not Used	Not Used
22	Not Used	Not Used
23	Not Used	Not Used
24	EXT TXC	Clock is generated by DTE #1
25	AUX IN 1	Not Used

Table 2-4. Connector J3 Pin Identification

Pin	Signal Name	Description/Remarks
1	AUDIO A OUT +	Channel A audio to XMTR
2	AUDIO A OUT -	Channel A audio to XMTR
3	RX MUTE A	
4	RX MUTE B	
5	AUDIO B OUT +	Channel B audio to XMTR
6	AUDIO B OUT -	Channel B audio to XMTR
7, 8	FILT TX SPARE	Not Used
9	AUDIO A IN +	Channel A audio from RCVR
10	AUDIO A IN -	Channel A audio from RCVR
11	FILT TX SPARE	
12	KEYLINE A	
13	KEYLINE B	
14	KEYLINE COMMON	
15	MUTE COMMON	

Table 2-5. Connector J4 Pin Identification

Pin	Signal Name	Description/Remarks
1	AUDIO A IN +	Channel A audio from RCVR
2	AUDIO A IN -	Channel A audio from RCVR
3	RX SPARE	Not Used
4	RX SPARE	Not Used
5	AUDIO B IN +	Channel B audio from RCVR
6	AUDIO B IN -	Channel B audio from RCVR
7	SPARE	Not Used
8	RX MUTE A	
9	RX MUTE B	
10	RX MUTE COMMON	
11	AUDIO B OUT -	Channel B audio to XMTR
12	AUDIO B OUT +	Channel B audio to XMTR
13	KEYLINE B	
14	KEYLINE COMMON	
15	Not Used	

Table 2-6. Remote Connector J5 Pin Identification

Pin	Signal Name	Description/Remarks
1	GND	
2	Not connected	
3	422 OUT +	RS-422 Data Stream (+)
4	422 IN +	RS-422 Data Stream (+)
5	GND	
6	422 IN -	RS-422 Data Stream (-)
7	Not connected	
8	Not connected	
9	422 OUT -	RS-422 Data Stream (-)

Table 2-7. Power Connector J6 Pin Identification

Pin	Signal Name	Description/Remarks
A	Chassis Ground	
B	115 Vac/230 Vac	Hot
C	+ 24 Vdc	Not used for ac operation
D	115 Vac/230 Vac Return	Neutral

2.7 SYSTEM INTERCONNECTIONS

The RF-3466A can be used in several system configurations. Figure 2-5 illustrates typical configurations used for asynchronous and synchronous data terminal equipment. Figure 2-6 shows a diagram of typical configurations for transceiver operation and frequency diversity installations. Figure 2-7 diagrams a typical configuration for dual independent FSK or simultaneous FSK and 39 tone modes.

2.8 INITIAL SETUP AND CHECKOUT

At the time of installation, parameters for the modem's data interfaces must be selected and output audio level must be readjusted if a level other than 0 dBm is required. Interface parameters for the DTE and remote control unit, as well as other operating parameters, are selected at the front panel. All front panel settings are described in section 3. When the modem is shipped from the factory; however, it contains selected operating parameters for all modes of operation. These are shown in tables 2-8 through 2-13.

2.8.1 RS-232 or MIL-STD-188C Select

The modem is compatible with EIA interface standard RS-232C or the military interface standard MIL-STD-188C. Switch S-1, on the Filter Number One PWB Assembly (P/N 10133-1080), is used to select either interface standard. When using the MIL-STD-188C standard, switch S2 on the same assembly selects the logic polarity. The modem is normally configured for EIA RS-232C operation.

2.8.2 Audio Output Level Adjustment Procedure

CAUTION

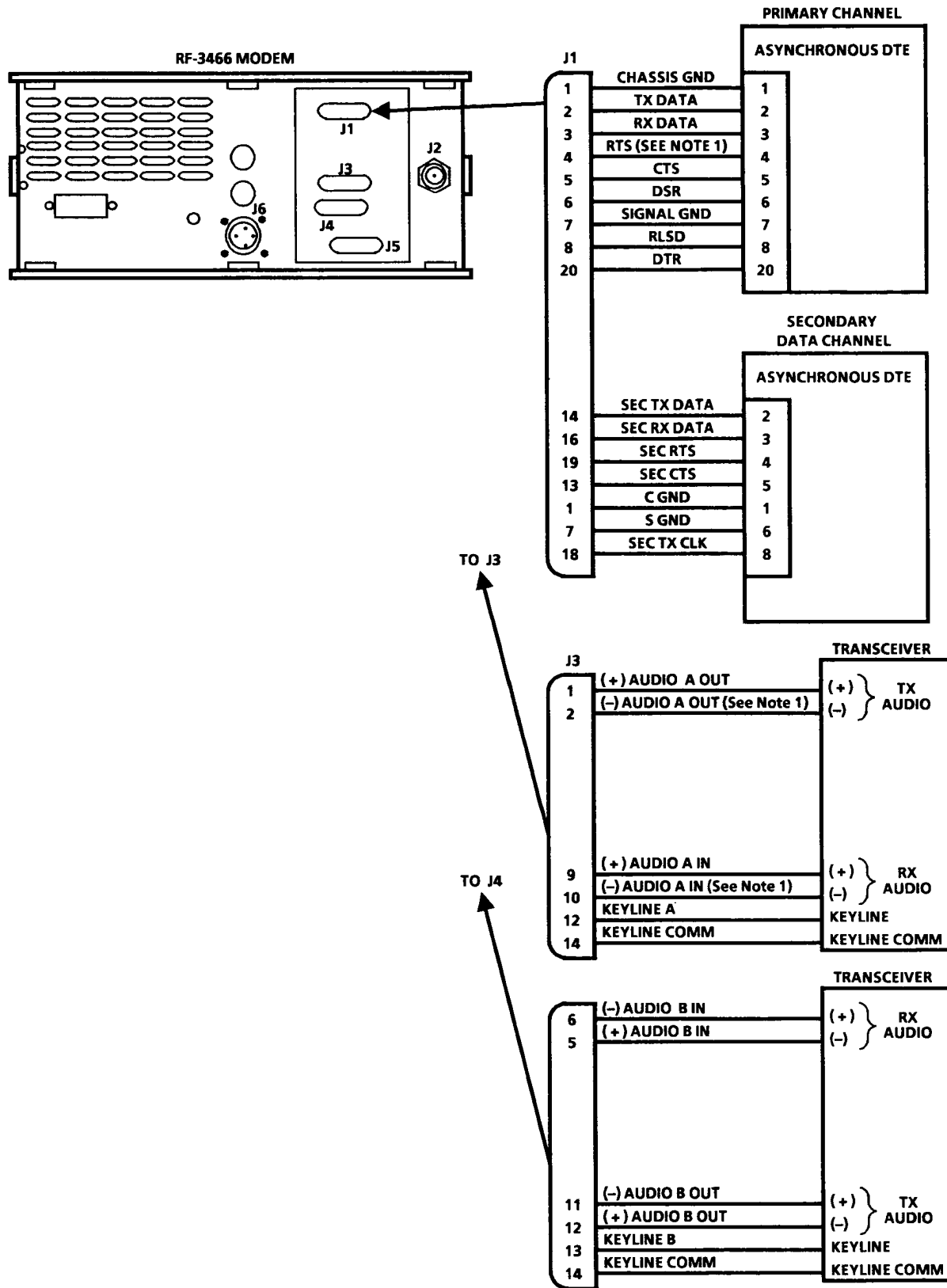
DO NOT attempt to adjust R45 on the Analog I/O PWB. Adjustment of this potentiometer requires precision instruments and special procedures.

- a. Terminate both the AUDIO A OUT and AUDIO B OUT with 600-ohm loads. (This can be achieved by connecting modem to transmitter inputs.) Remove unit top cover.

NOTE

Refer to figure 2-8 for test point and potentiometer locations.

- b. At the rear panel, place a jumper between J1-4 (RTS) and J1-6 (DSR).
- c. Use a true RMS-reading meter (HP-3400A or equivalent) capable of measuring a 0-dBm (0.775 V_{rms}) signal and monitor the AUDIO A OUT signal between TP1 and TP2 on the Rear Panel Filter No. 2 PWB.
- d. Adjust R22 on the Analog I/O board until the AUDIO A OUT signal level measures whatever signal level is desired, from -16 dBm to +6 dBm.
- e. Measure the AUDIO B OUT signal level between TP3 and TP4 on the Rear Panel Filter No. 2 PWB. The signal level should measure within ± 0.5 dB of that measured at AUDIO A OUT. If not, readjust R22, and recheck the AUDIO A OUT signal level.
- f. Remove the jumper from J1-4 and J1-6 on the rear panel.



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Figure 2-7. Dual Independent FSK or Simultaneous FSK and 39 Tone Mode

Table 2-8. Selected Operating Parameters for Main Set Up Mode

Parameter	Configuration as Shipped	Paragraph Reference
Remote Ident	255	3.9.1
Remote Rate	9600 bps	3.9.2
Power Up Bit	On	3.9.3
Halt/Fault	On	3.9.4
Loopback	Off	3.9.5
Clock	Internal	3.9.6
*Diag Rate	2400 bps	N/A
*Diag Parity	Off	N/A
*Diag Char Size	8	N/A
*Diag Stop Bits	1	N/A

*For use by service personnel only

Table 2-9. Selected Operating Parameters for 39-Tone Mode

Parameter	Configuration as Shipped	Paragraph Reference
Rate	2400 bps	3.9.2
Interleave	Long	3.9.7
DTE	Synchronous	3.9.8
Chan	A only	3.9.9
Duplex	Full	3.9.10
Key Delay	45 ms	3.9.11
Clipping	On	3.9.12
Time/F Div	On	3.9.13
Dopplr Track	On	3.9.14
Acquire	Normal	3.9.15

**Table 2-10. Selected Operating Parameters for 39-Tone Mode
 (if DTE is Asynchronous)**

Parameter	Configuration as Shipped	Paragraph Reference
DTE Rate	2400 bps	3.9.16
DTE Parity	Off	3.9.8
DTE Char Size	8	3.9.8
DTE Stop Bits	1	3.9.8
DTE Echo	Off	3.9.17
Async EOM	On	3.9.18
Flow	Xon/Xoff	3.9.19

Table 2-11. Selected Operating Parameters for Robust Serial Option

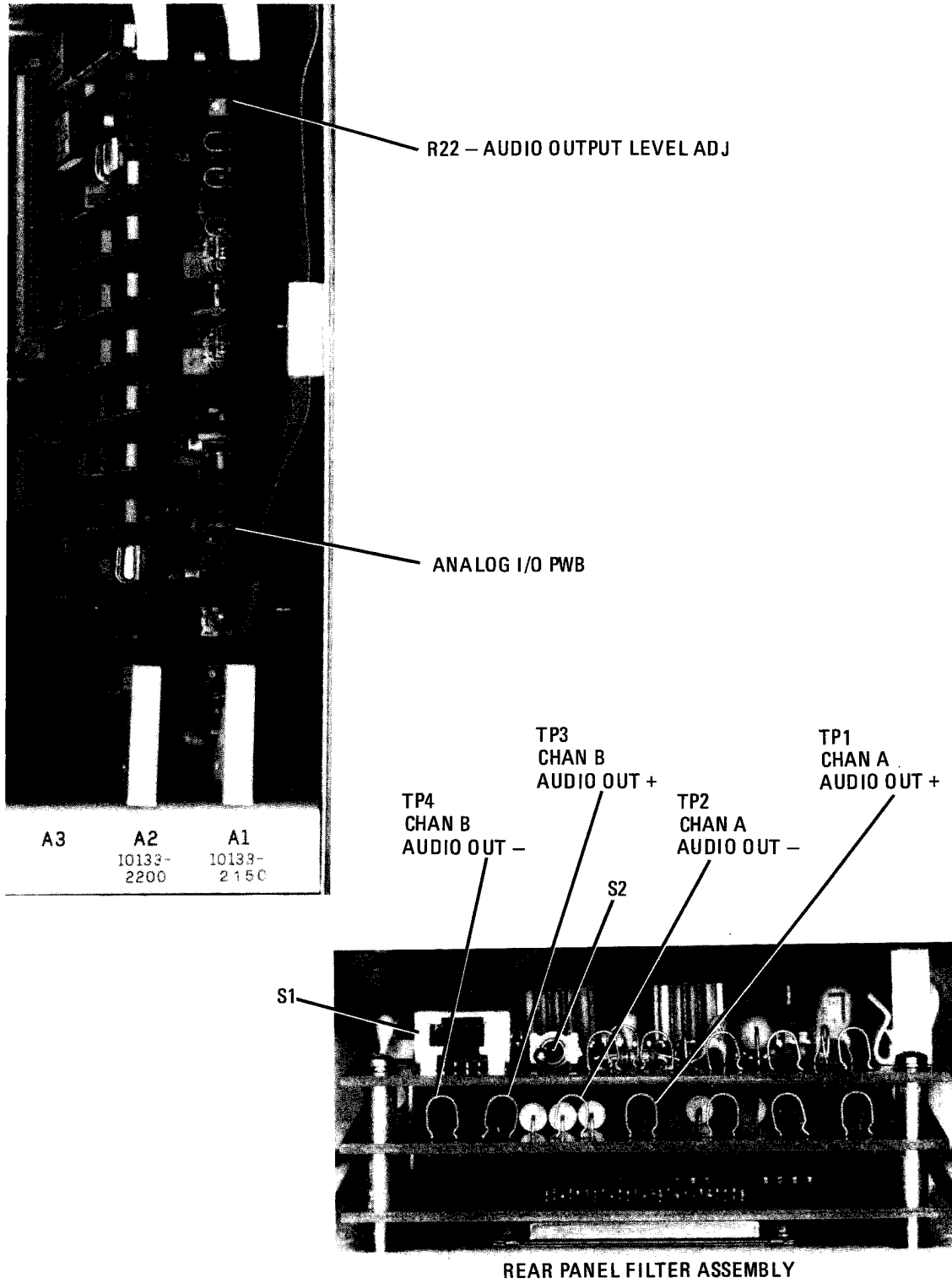
Parameter	Configuration as Shipped	Paragraph Reference
Interleave	9.6s	3.9.20
DTE	Synchronous	3.9.16
Chan	A only	3.9.9
Duplex	Full	3.9.10
Key Delay	45 ms	3.9.11

**Table 2-12. Selected Operating Parameters for Robust Serial Mode Option
 (if DTE is Asynchronous)**

Parameter	Configuration as Shipped	Paragraph Reference
DTE Rate	2400 bps	3.9.16
DTE Parity	Off	3.9.8
DTE Char Size	8	3.9.8
DTE Stop Bits	1	3.9.8
DTE Echo	Off	3.9.17
Flow	Xon/Xoff	3.9.19

Table 2-13. Selected Operating Parameters for FSK Mode

Parameter	Configuration as Shipped	Paragraph Reference
Channel A		
Rx Rate	300 bps	3.9.21
Tx Mark	1575.0 bps	3.9.22
Tx Space	2425.0 bps	3.9.23
Rx Mark	1575.0 bps	3.9.24
Rx Space	2425.0 bps	3.9.25
Chan	Independent	3.9.26
Tx Rate	300 bps	3.9.27
Thresh Track	On	3.9.28
Mod Out	On	3.9.29
Polarity	Tx + Rx +	3.9.30
Mark Hold	Auto	3.9.31
Tune	Mark/Space	3.9.32
Track Tune	Off	3.9.33
Mod AB Mix	Off	3.9.34
DTE Rx Clock	A	3.9.35
Channel B		
Rx Rate	300 bps	3.9.21
Tx Mark	1575.0 bps	3.9.22
Tx Space	2425.0 bps	3.9.23
Rx Mark	1575.0 bps	3.9.24
Rx Space	2425.0 bps	3.9.25
Tx Rate	300 bps	3.9.27
Thresh Track	On	3.9.28
Mod Out	On	3.9.29
Polarity	Tx + Rx +	3.9.30
Mark Hold	Auto	3.9.31
B Analog In	B	3.9.36



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Figure 2-8. Test Point and Potentiometer Locations

This completes the signal level adjustments. Remove test probes. Connect cables going to the transmitter and receiver. Set operating parameters (paragraph 2.8) before replacing the top cover.

2.8.3 Frequency Standard

The RF-3466A has a built-in 9600-Hz frequency standard, with a stability of 10 parts-per-million. To select this internal standard, set the CLOCK option in the Main Setup mode to "Internal", as described in paragraph 3.8.1.

Either of two external frequency standards can be used in place of the internal frequency standard. An external 1-MHz signal, with a level between 0.7 and 2.0 Vrms, may be injected at rear panel J2 when a higher degree of accuracy is required. To select this external standard, set S2-1 of the A8 assembly to OPEN, and set the CLOCK option in the Main Setup mode to "Ext 1 MHz". Note that A8 S2-1 must be set CLOSED if an external 1 MHz standard is not connected to the RF-3466A or improper operation may occur.

In synchronous mode, the RF-3466A normally supplies both the transmit and receive clocks to the connected data terminal. When DTE external clock option is selected, the data terminal supplies the transmit data clock to the RF-3466A, while the RF-3466A still supplies the receive data clock. The frequency of the external transmit clock input must be the same as the baud rate (75 to 2400 Hz) between the data terminal and the RF-3466A modem, and must be accurate to within 10 parts per million. Therefore, it must be the same as the baud rate set at the remote control or RF-3466A modem. The external transmit clock input must be present at pin 24 of rear panel J1 and provide an RS-232 logic level. DTE external clock option is only available for synchronous operation. To select this clock, set the CLOCK option in the Main Setup Mode to "Ext DTE".

2.8.4 Switch and Jumper Configurations

Table 2-14 shows the switch and jumper configuration as shipped for all RF-3466A PWBs. This information is supplied in the event of assembly replacement or repair.

Table 2-14. Switch and Jumper Configurations

Assembly	Switch Setting/ Jumper Installed	Function
A1	S1 - Normal E1 to E2, E4 to E5 E7 to E8	Multiplier Calibration + 5 dBm to -25 dBm Audio Input Range AGC Enabled
A2	E3 to E4 E7 to E8	HIL Done - Polarity Invert FFT Done - Polarity Invert
A4	E50 to E51 E53 to E54	DMA Request 0 Invert DMA Request 1 Invert
A5	E2 to E3	DMA Request Invert
A6	E50 to E51 E53 to E54	DMA Request 0 Invert DMA Request 1 Invert
A7	E55 to E56 E58 to E59	FEC/IO Interrupt Mod/Demod Interrupt

Table 2-14. Switch and Jumper Configurations (Cont.)

Assembly	Switch Setting/ Jumper Installed	Function
A8	E1 to E2 S2-1 Closed S2-2 Closed	Watchdog Timer Enable EXT 1 MHz Disable Reserved
A12A1A1	E2 to E3 S1-EIA S2-POS	Clock Polarity Select DTE Level Select MIL-188 DTE Data Polarity Select