

## SECTION 7 INSTALLATION

### 7-1. UNPACKING AND HANDLING.

7-2. Special procedures need not be followed when unpacking units of the AN/WRC-1B system. Since the system is comprised of accurately calibrated precision units, rough handling should be avoided. Extreme caution must be taken when removing each unit from its packing container to prevent damage to the controls and connectors.

### 7-3. POWER REQUIREMENTS.

7-4. The AN/WRC-1B system is designed to operate from a nominal 115-Vac, single-phase, 48- to 450-Hz power source. Refer to figure 5-10 for a primary power distribution diagram of the system.

### 7-5. SITE SELECTION.

7-6. In selecting a shipboard installation site, adequate consideration must be given to space requirements (figures 7-1, 7-2 and 7-3). These requirements will include space for servicing the slide-mounted equipment when extended from the case, for shock-mount deflection, and for cable bends. The CU-937/UR must be placed close to the base of the antenna to permit the connection between the antenna and the antenna and the CU-937/UR to be made with a 12-inch long stranded copper conductor. For best results, the antenna should be mounted as high as possible above the ship's superstructure. However, the cable between the CU-937/UR and the J-1265/U should not exceed 300 feet.

7-7. In selecting a shore installation site, similar considerations must be given to the space requirements. The antenna should be mounted high enough to clear any surrounding hills, wood, or buildings. In addition, the antenna should be located as far as

possible from any high-power transmission lines or hospitals to prevent interference.

### 7-8. INSTALLATION REQUIREMENTS.

#### NOTE

Installation of the equipment requires reference to the appropriate Installation Control Drawings (not provided in this manual).

7-9. **CONSIDERATIONS.** The following factors should be considered when determining the proper location of the AN/WRC-1B system:

- a. Best operating conditions.
- b. Ease of maintenance, adjustment of equipment, and replacement and repair of defective parts or complete units.
- c. Possibility of interaction between units and other electronic equipment in the vicinity.
- d. Critical and minimum cable length requirements.
- e. Adequate heat dissipation.
- f. Availability of an adequate ground.

7-10. **INSTALLATION.** Units of the AN/WRC-1B are stacked and secured together in the order shown in figure 7-1. Mounting brackets and hardware are supplied with each unit. These brackets facilitate stacking of the units.

7-11. To install the AN/WRC-1B system, proceed as follows:

- a. After determining the best location for the system, set shock mount on mounting surface and mark off mounting holes. Drill or prepare mounting surface as required.

WARNING

To avoid injury to personnel, do not overstress mounting bolts, since shock may cause them to shear.

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CAUTION  
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Be sure to use the system Shock Mount MT-3115/WRC-1 when the AN/WRC-1B units are to be stacked. The receiver Shock Mount MT-3114/UR will not support the weight of the stacked AN/WRC-1B units.

NOTE

In shore installations, the shock mounts are not normally used. Return the mounts to the supply system.

b. Using the hardware provided, secure shock mount to mounting surface.

c. Attach mounting brackets to the sides of each unit as shown in figure 7-1, using hardware supplied.

d. Using the hardware provided, bolt the units together in the order shown in figure 7-1. Bolt the R-1051B/URR to the shock mount.

e. Mount the J-1265/U to bulkhead using the mounting plate provided (figure 7-2). The mounting plate must be drilled as required. Observe caution in locating mounting bolt holes only within the portion of the mounting plate extending beyond the chassis on each side. The mounting bolts (provided by the installing activity) may be welded to the bulkhead or stanchions. Since the mounting plate is aluminum, it cannot be welded directly to the steel structure of the ship.

NOTE

The installing activity must supply proper glands for J-1265/U stuffing tubes.

f. To install the CU-937/UR, drill mounting holes (figure 7-3) approximately 10 inches from the antenna base and bolt the CU-937/UR to the mounting surface.

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CAUTION  
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Ensure good metal-to-grounds for all units.

7-12. To install the equipment in an equipment rack, proceed as follows:

a. Attach one mounting bracket (figure 7-4) to each side of each unit using the hardware supplied.

b. Place units in the rack in the order shown in figure 7-1 and bolt bracket to front of rack. The use of installed rack shelves or base plates is recommended in rack installations.

c. Perform steps e and f of paragraph 7-11.

7-13. INTERCONNECTION. Interconnection of the units of the AN/WRC-1B system is shown in figure 7-5. All connections are made at the rear of the units, with the exception of the headset, the handset, and the local CW key connections. The headset is connected to the USB PHONES connector on the R-1051B/URR front panel. The handset is connected to the HANDSET connector on the T-827B/URT front panel, and the CW key (if used) is connected to the CW KEY connector, also on the T-827B/URT front panel. Connect a ground lead to the base of the shock mount. Refer to table 7-1 for normal interconnection information.

7-14. PRIMARY POWER ADJUSTMENTS. The AN/WRC-1B is designed to operate

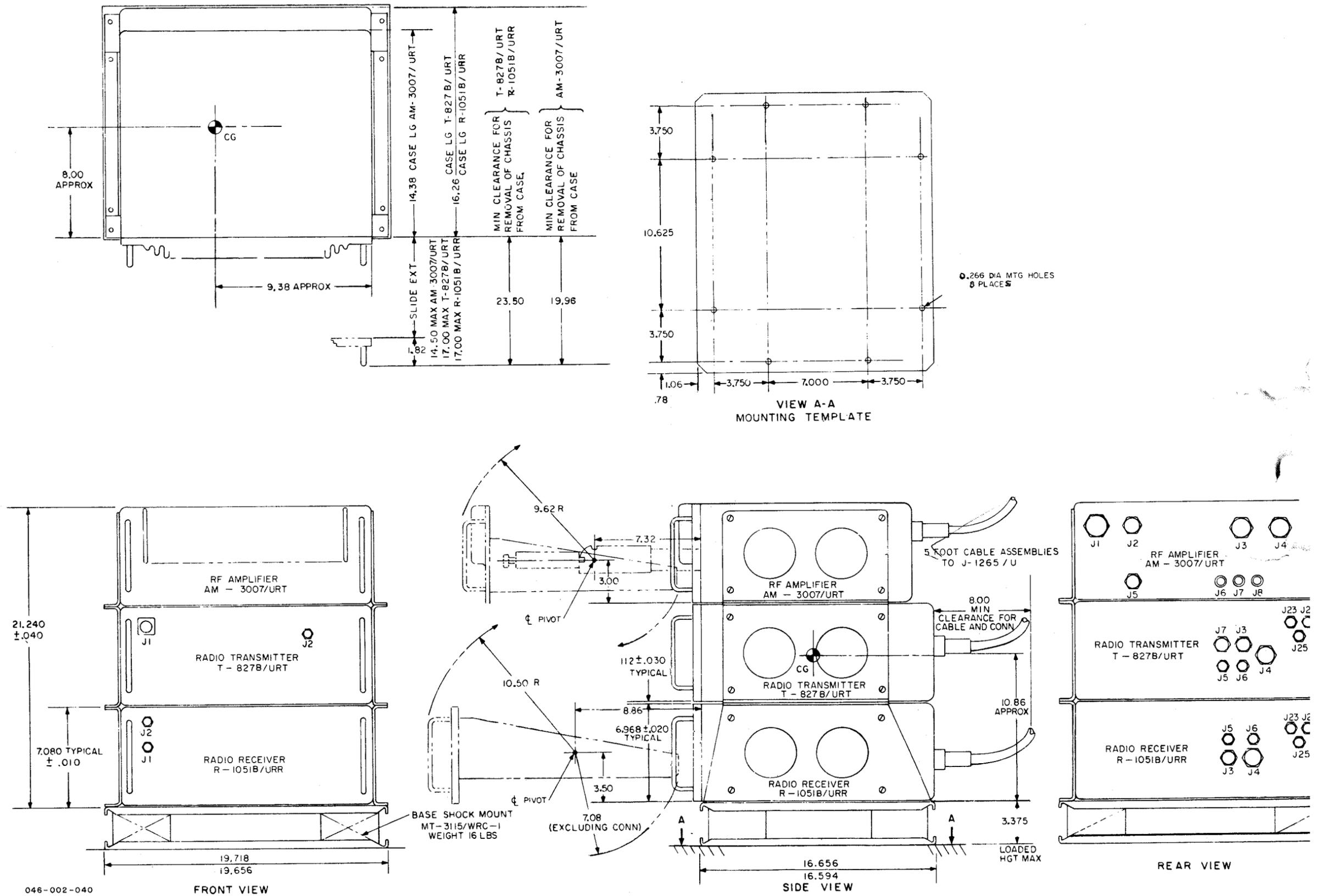
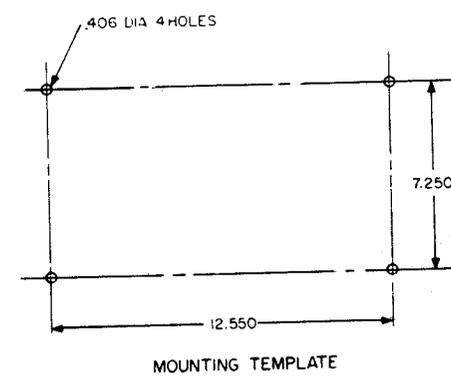
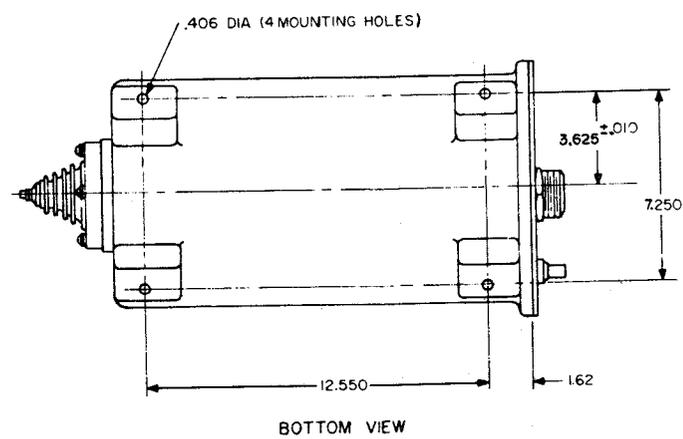
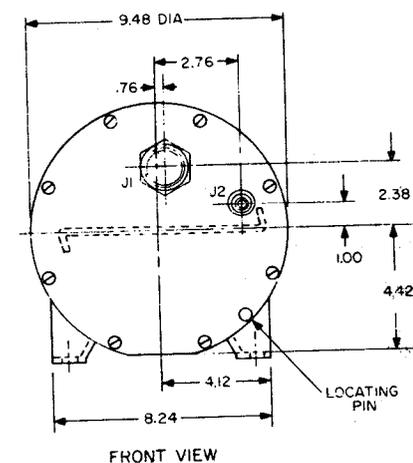
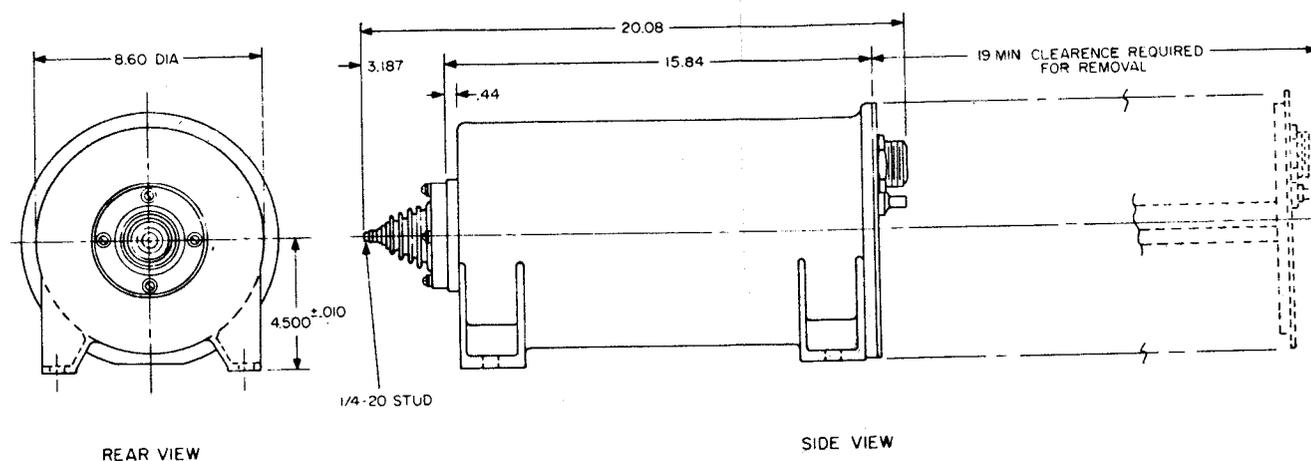


Figure 7-1. Radio Set AN/WRC-1 System Installation  
7-3/(7-4 bla



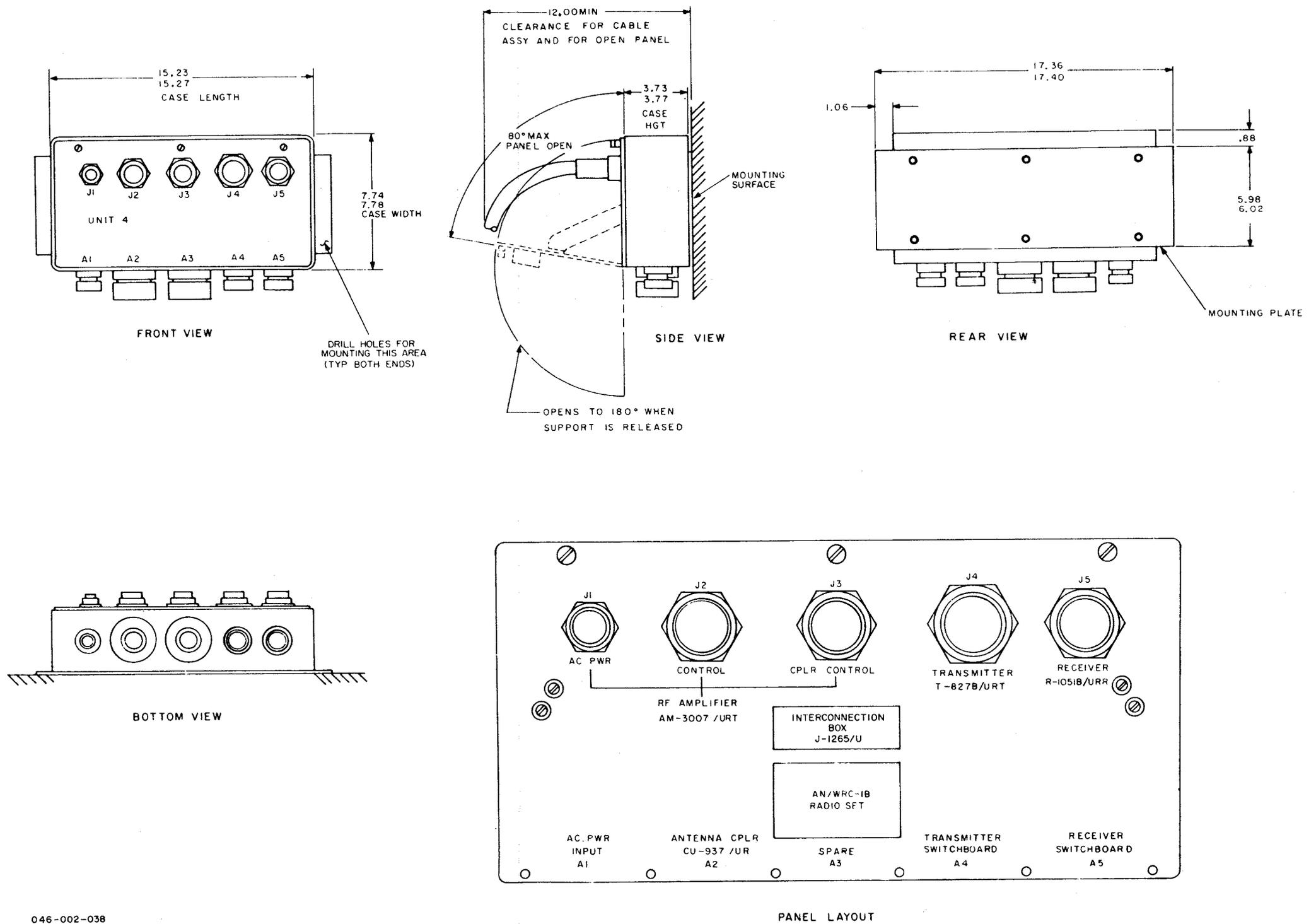
NOTES:

1. SPECIFICATIONS
  - SIZE 935 IN3
  - WEIGHT 30LBS (APPROX)
  - HEAT DISSIPATION 50WATTS MAX
  - TEMPERATURE -28°C TO +65°C (OPERATING)
  - FREQUENCY RANGE 2-30 MHZ

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Figure 7-2. Interconnection Box J-1265/U,  
Dimensions

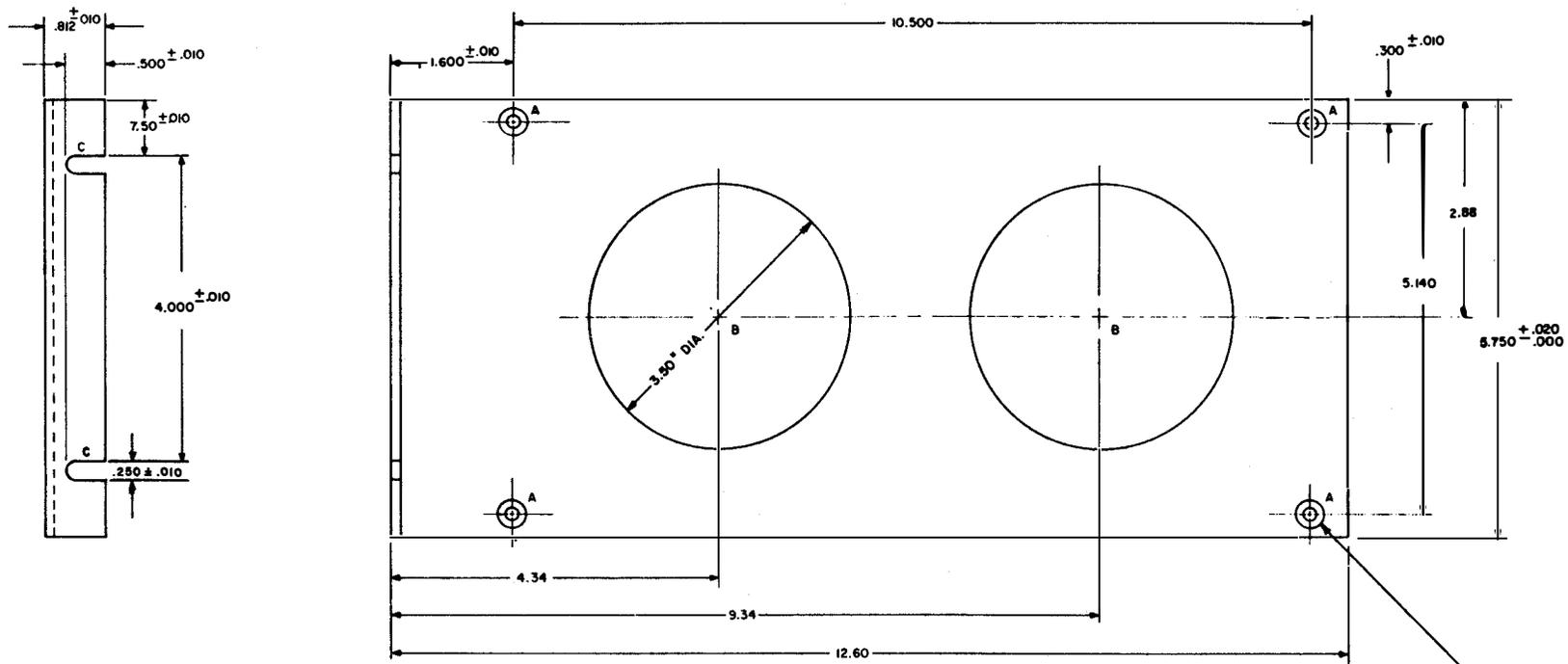
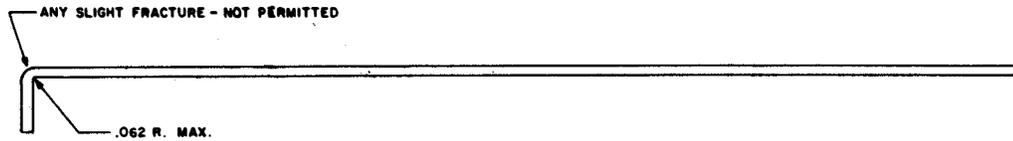
7-5/(7-6 blank)



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Figure 7-3. Antenna Coupler CU-937/UR, Dimensions

7-7/(7-8 blank)



NOTES:

1. FINISH: IRIDITE NO. 14 PER MIL - C - 5541  
PAINT PER MIL - E - 15090 ENAMEL  
EQUIPMENT, LIGHT GRAY (FORMULA NO II)
2. MATERIAL: .125" THICK ALUMINUM ALLOY  
5052-H32 PER QQ-A-318
3. NOT SUPPLIED. IF REQUIRED, INSTALLATION  
ACTIVITY MUST FABRICATE

046-0Q2-045

.228" DIA. C'SK 82°  
TO .392 / .402" DIA.

Figure 7-4. Radio Set AN/WRC-1B, Mounting Bracket for Rack Mounting

TABLE 7-1. RADIO SET AN/WRC-1B, INTERCONNECTIONS

CABLE	FROM	TO
W5	1J4 (Receiver)	4J5 (Interconnection Box)
W7	1J23 (Receiver)	3J7 (RF Amplifier)
W4	2J4 (Transmitter)	4J4 (Interconnection Box)
W6	2J23 (Transmitter)	3J6 (RF Amplifier)
W1	3J5 (RF Amplifier)	4J1 (Interconnection Box)
W2	3J3 (RF Amplifier)	4J2 (Interconnection Box)
W3	3J4 (RF Amplifier)	4J3 (Interconnection Box)
W8	3J8 (RF Amplifier)	5J2 (Antenna Coupler)
W9	4A1 (Interconnection Box)	AC Power Input
W10	4A2 (Interconnection Box)	5J1 (Antenna Coupler)
W11	4A4 (Interconnection Box)	Transmitter Switchboard
W12	4A5 (Interconnection Box)	Receiver Switchboard

from a nominal 115-Vac supply. The movable tap on the input of the transformer (3A3T1) in the AM-3007/URT is set for a 115-Vac input when shipped. If the supply voltage is not 115 Vac, refer to figure 5-31 and move the taps on the primary of the transformer as follows:

- a. Loosen the front-panel screws and slide the AM-3007/URT chassis out from the case until the slides lock.
- b. Tilt the chassis up 90 degrees to expose the bottom. Transformer 3A3T1 will now be in the lower left-hand corner of the chassis.
- c. Unsolder the movable input lead (top). Do not unsolder the common lead.
- d. Referring to figure 5-31, wrap the end of the movable lead around the input terminal corresponding to the input voltage.

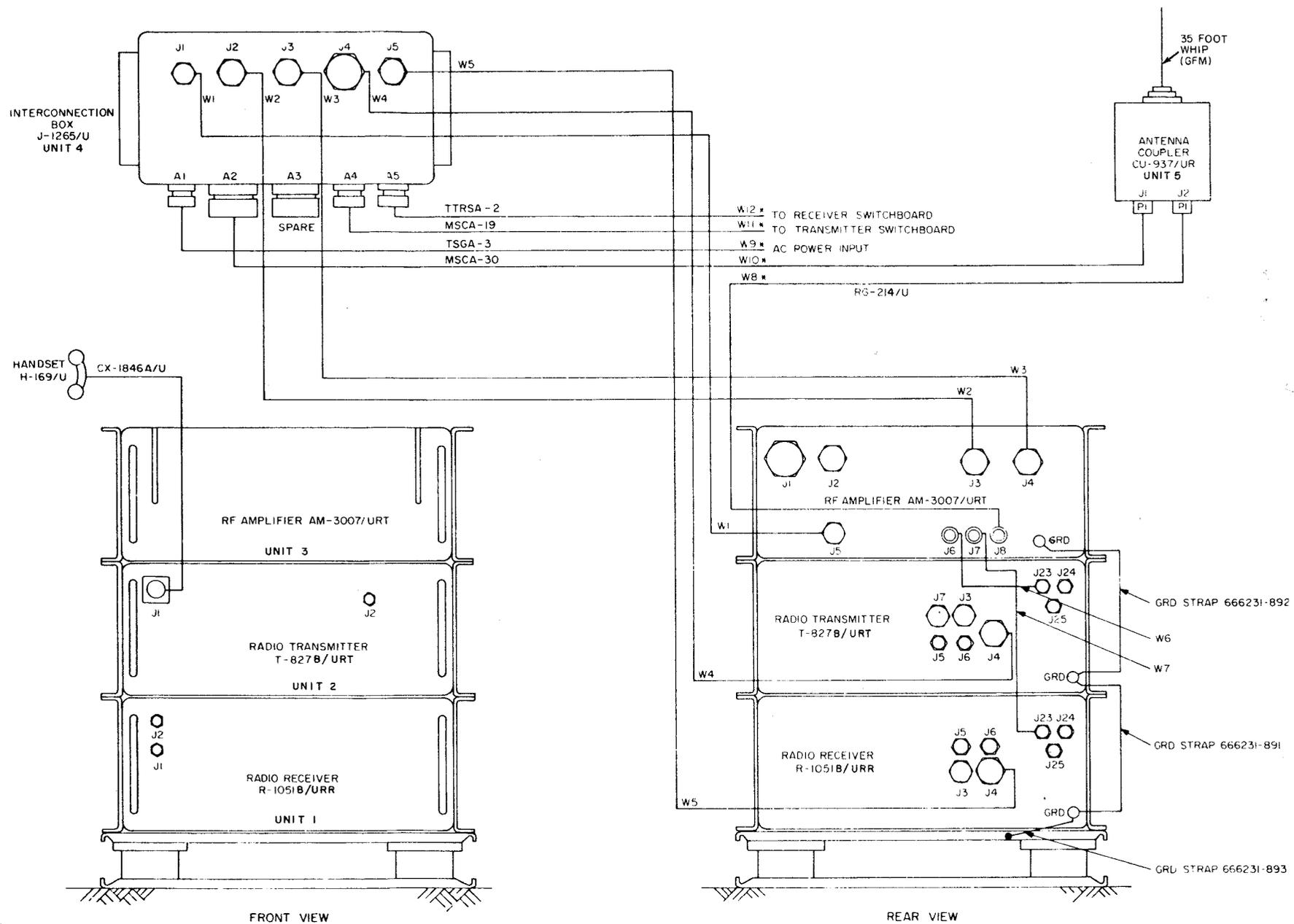
- e. Solder the lead to the terminal, ensuring that a good solder connection is made.

- f. Tilt chassis back to horizontal, release the slide locks, slide chassis back into case, and secure it.

- g. Refer to figure 5-13 and repeat steps a through f for input transformer 2A2T1 in the T-827B/URT.

- h. Refer to the receiver chassis and main frame schematic in NAVSHIPS 0967-427-4010, and repeat steps a through f for input transformer 1A2T1 in the R-1051B/URR.

7-15. ANTENNA COUPLER PROGRAMMING. Antenna Coupler CU-937/UR and Interconnection Box J-1265/U, as shipped, are programmed for use with a 35-foot whip antenna. If operation with a 15- or 25-foot whip antenna is required, the



NOTE:

\* CABLE ASSEMBLIES OTHER THAN W1 THRU W7 ARE SUPPLIED BY THE INSTALLING ACTIVITY

046-002-041

Figure 7-5. Radio Set AN/WRC-1B, Interconnection Diagram

7-11/(7-12 blank)

J-1265/U and CU-937/UR terminal boards must be reprogrammed. Reconnect W10 leads as shown in table 7-2, rewire J-1265/U terminal boards as shown in table 7-3, and rewire CU-937/UR terminal board as shown in table 7-4. Doublecheck all connections before applying power.

7-16. REQUIREMENTS FOR SPECIAL USAGE. Certain adaptations and/or connections must be made to equip the AN/WRC-1B system for operation under special usage situations. These requirements are given in the following paragraphs.

7-17. Local FSK Transmission. If local FSK transmission is required, proceed as follows:

a. Connect teletypewriter loop and key lines to connector J7 (LOCAL FSK IN) on the rear of the T-827B/URT. (See figure 5-13.)

b. Loosen front-panel screws and pull T-827B/URT chassis out from case. Set CTR FREQ switch on top of FSK Tone Generator Electronic Assembly at desired center frequency (2000 or 2550 Hz).

c. Refer to figure 5-13 and jumper E4 to E7 to increase loop current, if required.

d. Slide chassis back into case and secure it.

e. Set transmitter mode selector switch to ISB/FSK or at FSK, and set transmitter LOCAL/REMOTE switch to LOCAL.

7-18. Remote FSK Transmission. If remote FSK transmission is required, proceed as follows:

a. Connect the remote teletypewriter loop and key lines.

b. Loosen front-panel screws and pull T-827B/URT chassis out from case, Set CTR FREQ switch on top of the FSK Tone Generator Electronic Assembly at desired center frequency (2000 or 2550 Hz).

c. Slide chassis back into case and secure it.

d. Loosen the three screws securing front panel of the J-1265/U and open panel.

e. Refer to figure 5-8 and jumper E1 to E2 to increase remote loop current, if required.

f. Close J-1265/U front panel and secure it.

TABLE 7-2. INTERCONNECTING CABLE W10, INTERCONNECTION BOX J-1265/U  
TERMINAL BOARD CONNECTIONS

W10J1 ANTENNA COUPLER CU-937/UR	15-FOOT WHIP ANTENNA	25-FOOT WHIP ANTENNA	35-FOOT WHIP ANTENNA
J1-Z	No Connection	No Connection	No Connection
J1-Y	No Connection	TB5-6B	No Connection
J1-S	No Connection	No Connection	No Connection
J1-P	TB4-1A	No Connection	No Connection
J1-a	TB4-2A	TB4-1A	TB4-1A
J1-R	TB4-3A	TB4-2A	TB4-2A
J1-T	TB4-7A	TB4-6A	TB4-5A
J1-U	TB4-10A	No Connection	TB4-6A

TABLE 7-2. INTERCONNECTING CABLE W10, INTERCONNECTION BOX J-1265/U  
TERMINAL BOARD CONNECTIONS (Cont)

W10J1 ANTENNA COUPLER CU-937/UR	15-FOOT WHIP ANTENNA	25-FOOT WHIP ANTENNA	35-FOOT WHIP ANTENNA
J1-V	TB4-11A	TB5-1B	TB4-7A
J1-X	No Connection	TB4-9A	TB4-8A
J1-W	TB4-12A	TB5-7B	TB5-2A
J1-A, -B, -C, -D, -G, -H, -J, -K, -L, -M and -N	These conductors are always connected as shown in figure 5-8.		

TABLE 7-3. INTERCONNECTION BOX J-1265/U, TERMINAL BOARDS,  
ANTENNA PROGRAMING

15-FOOT WHIP ANTENNA		25-FOOT WHIP ANTENNA		35-FOOT WHIP ANTENNA	
FROM	TO	FROM	TO	FROM	TO
TB4-3B	TB4-4B	TB4-2B	TB4-3B	TB4-2A	TB4-3A
TB4-4B	TB4-5B	TB4-3B	TB4-4B	TB4-3A	TB4-4A
TB4-5B	TB4-6B	TB4-4B	TB4-5B	TB4-7A	TB4-10A
TB4-7B	TB4-8B	TB4-6B	TB4-7B	TB4-8A	TB4-9A
TB4-8B	TB4-9B	TB4-8B	TB5-1A	TB4-10A	TB4-11A
TB4-11B	TB5-3A	TB5-1A	TB5-2A	TB4-11A	TB4-12A
TB5-3A	TB5-5A	TB5-2A	TB5-3A	TB4-12A	TB5-1A
TB5-5A	TB5-6A	TB5-3A	TB5-4A	TB5-1A	TB5-5A
TB5-6A	TB5-7A	TB5-4A	TB5-5A	TB5-2A	TB5-3A
TB4-12A	TB5-1A	TB4-9A	TB4-1-B	TB5-3A	TB5-4A
TB5-1A	TB5-2A	TB4-10B	TB4-11B	TB5-5A	TB5-6A
TB5-2A	TB5-4A	TB4-11B	TB4-12B	TB5-6A	TB5-7A

TABLE 7-4. ANTENNA COUPLER CU-937/UR, TUNING INDUCTOR PREPOSITIONING, CIRCUIT CONNECTIONS (TB1 OF ANTENNA COUPLER)

TB1	15-FOOT WHIP ANTENNA	25-FOOT WHIP ANTENNA	35-FOOT WHIP ANTENNA
	WIRE NUMBER	WIRE NUMBER	WIRE NUMBER
1	4	4	4
2	Blank	Blank	Blank
3	Blank	Blank	Blank
4	1	1	1
5	2	2	Blank
6	5, 9	Blank	9
7	Blank	5	2, 6
8	3, 6	3, 6	5, 7
9	7, 8	7, 9	3, 8
10	10	10	10
11	11	8, 11	11

g. Set transmitter mode selector switch to ISB/FSK or FSK, and set transmitter LOCAL/REMOTE switch to REMOTE.

7-19. Use with Ship's Frequency Standard. If it is required to use the ship's frequency standard for operation, proceed as follows:

a. Connect the ship's frequency standard output to connector J25 (EXT 5 MC IN) on the rear of the T-827B/URT and to connector J25 (EXT 5 MC IN) on the rear of the R-1051B/URR.

b. Loosen front-panel screws and slide both chassis from their respective cases.

c. Set switch S1 (COMP/INT/EXT) on top of Frequency Standard Electronic Assembly to EXT. This electronic assembly is located at the right rear of both chassis.

d. Slide both chassis back into the cases and secure them.

7-20. Dual Use of Single Frequency Standard. If it is required to use the output from the T-827B/URT internal Frequency Standard Electronic Assembly in the R-1051B/URR, proceed as follows:

a. Loosen the front-panel screws and slide the T-827B/URT chassis out from the case.

b. Set switch S1 (COMP/INT/EXT) on top of the Frequency Standard Electronic Assembly to COMP. This electronic assembly is located at the right rear of the chassis.

c. Slide chassis back into case and secure it.

d. Connect cable between connector J24 (INT 5 MC OUT) on the rear of the T-827B/URT and connector J25 (EXT 5 MC IN) on the rear of the R-1051B/URR.

e. Loosen front-panel screws and slide R-1051B/URR chassis from case.

f. Set switch S1 (COMP/INT/EXT) on top of Frequency Standard Electronic Assembly to EXT. This electronic assembly is located at right rear of chassis.

g. Slide chassis back into case and secure it.

7-21. If it is required to use the output from the R-1051B/URR internal Frequency Standard Electronic Assembly in the T-827B/URT, perform the steps above, substituting the receiver for the transmitter and vice versa. A whole chain of units may be set up using one frequency standard in this manner.

7-22. Use of External Frequency Standard for Calibration. If it is required to use an external frequency standard for calibration of the T-827B/URT, proceed as follows:

a. Connect the external frequency standard to connector J25 (EXT 5 MC IN) on the rear of the T-827B/URT.

b. Loosen the front-panel screws and slide the T-827B/URT chassis out from the case.

c. Set switch S1 (COMP/INT/EXT) on top of Frequency Standard Electronic Assembly to COMP. This electronic assembly is located at the right rear of the chassis.

d. Slide chassis back into case and secure it.

e. After calibration, ensure that cables are reconnected as they were initially and all switches are in the proper positions.

7-23. To use an external frequency standard for calibrating the receiver, perform the steps above, substituting the R-1051B/URR for the T-827B/URT.

7-24. Use of Both Internal Frequency Standards. If the internal frequency standards of each unit are to be used, proceed as follows:

a. Loosen front-panel screws and slide T-827B/URT chassis out from case.

b. Set switch S1 (COMP/INT/EXT) on top of Frequency Standard Electronic Assembly to INT. This electronic assembly is located at right rear of chassis.

c. Slide chassis back into case and secure it.

7-25. Simplex Operation. If simplex operation is required, proceed as follows:

a. Ensure that connector J23 (ANT 50  $\Omega$ ) on the rear of the R-1051B/URR is connected to connector J7 (RCVR ANT RELAY) on the rear of the AM-3007/URT.

b. Loosen the front-panel screws and slide the R-1051B/URR chassis out from the case.

c. Ensure that switch S9 (SIMPLEX/DUPLEX) is in the SIMPLEX position. This switch is located just behind the front panel on the left side of the chassis.

d. Slide the chassis back into the case and secure it.

7-26. Duplex Operation. If duplex operation is required, proceed as follows:

a. Ensure that connector J23 (ANT 50  $\Omega$ ) on the rear of the R-1051B/URR is connected to a different antenna than the one connected to the CU-937/UR.

b. Loosen the front-panel screws and slide the R-1051B/URR chassis out from the case.

c. Ensure that switch S9 (SIMPLEX/DUPLEX) is in the DUPLEX position.

d. Refer to figure 5-8 and perform the steps outlined in note 6 on the figure.

e. Slide chassis back into case and secure it.

7-27. Use of Auxiliary Power. If the use of auxiliary power is required, proceed as follows:

a. Disconnect cables from connector J4 on the rear of the R-1051B/URR and the T-827B/URT.

b. Using a type MS-3186-5S connector, connect the auxiliary power to connector J3 (AUX AC PWR IN) on the rear of the R-1051B/URR and the T-827B/URT.

c. Loosen the front-panel screws and slide both the R-1051B/URR and the T-827B/URT chassis from the cases.

d. Set switch S7 (AUX/NORM) on both units to AUX. This switch is located just behind the front panel on the left side of the cases of the chassis.

e. Slide both chassis back into the cases and secure them.

7-28. Use with an External VSWR Meter. If the use of an external Vswr meter is required due to the length of the cabling, refer to figure 5-28 and connect a wattmeter element (same as the one in the AM-3007/URT) to the appropriate pins of the connector at the CU-937/UR end of the cable. Then proceed as follows:

a. Loosen the front-panel screws and pull pull the AM-3007/URT chassis out from the case.

b. Set switch S8 (RF PWR MTR) to EXT. This switch is located at the right front of the chassis.

c. Slide chassis back into the case and secure it.

7-29. Use with a Balanced, Grounded, Center-Tap Operation. The audio transformers in the T-827B/URT and R-1051B/URR (located in the Transmitter Audio Amplifier and Receiver IF./Audio Amplifier Electronic Assemblies) do not have grounded center taps as supplied. If it is required that these transformers work into a balanced, grounded, center-tap circuit, proceed as follows:

CAUTION

Do not ground center taps if working into an unbalanced circuit.

a. Loosen the front-panel screws and slide the T-827B/URT and R-1051B/URR chassis from the cases.

b. For instructions covering the R-1051B/URR, refer to Section 7 of NAVSHIPS 0967-427-4010.

c. Tilt transmitter chassis up 90 degrees to expose bottom. Refer to figure 5-35 and locate J18 and J19.

d. Refer to figure 5-13 and perform the steps outlined in note 6 on that schematic.

e. Tilt chassis back to horizontal, release slide locks, slide chassis back into case, and secure it.

7-30. INSPECTION AND ADJUSTMENT.

7-31. INSPECTION. Each major unit of the AN/WRC-1B system should be carefully checked for damage to indicators and switches and for loose hardware and knobs. Make sure that all electronic assemblies are firmly seated and that tubes are properly secured in tube sockets. Check connectors for dirt, damage to pins, and broken insulators. Replace or repair as necessary. Check that all cables are properly connected and that all fuses are in place.

7-32. INTERFERENCE REDUCTION. As a precaution against interference, operate the AN/WRC-1B system with all units bolted securely in their cases. Check that proper ground connections have been made to the AN/WRC-1B system units, and to the CU-937/UR.

7-33. ADJUSTMENT. After installation, refer to Maintenance Standards Books, NAVSHIPS 0967-427-5030, NAVSHIPS 0967-427-4030, and NAVSHIPS 0967-427-3030. Use the procedures therein outlined to check out the AN/WRC-1B. Should any adjustments be found necessary, refer to the applicable procedures in Section 5 of this manual. Before beginning the checkout procedures, ensure that the following switches are in the proper positions according to the type of installation.

a. Radio Transmitter T-827B/URT:

LOCAL/REMOTE (S1)  
AUX/NORM (S7)  
CTR FREQ (A5S1)

b. Radio Receiver R-1051B/URR:

LOCAL/REMOTE (S1)  
SIMPLEX/DUPLEX (S9)  
AUX/NORM (S7)

c. RF Amplifier AM-3007/URT:

PRIMARY POWER Selector (S2)  
ANTENNA INTERLOCK (S9)  
ANT CPLR BYPASS (S7)  
RF PWR MTR (S8)

7-34. PERFORMANCE CHECKS. Perform the applicable operating procedures described in Section 2 to ensure proper installation.