

APL 1001/21 NA

NAVSHIPS 0967-066-7310

UNCLASSIFIED

ELECTRONICS FIELD CHANGE BULLETIN  
NAVAL SHIP ENGINEERING CENTER, NAVY DEPARTMENT  
WASHINGTON, D. C.

24-AN/URC-32  
10-AN/URC-32A  
7-AN/URC-32B  
15-KWT-6(8)

ADDS CONSTANT VOLTAGE TRANSFORMER 2T2

FSN 2N5820-937-0143

TYPE I, CLASS A  
ESTIMATED MAN HOURS - 3

OPERATIONAL CHANGE ( )  
NON-OPERATIONAL CHANGE (X)

Prepared by

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AUTHORIZATION NOTICE: Forces afloat or station personnel shall accomplish this field change at the earliest opportunity on ship- or shore-installed equipment affected, without reference to the Naval Ship Engineering Center.

EQUIPMENT AFFECTED: AN/URC-32, all Serial Nos.; AN/URC-32A, all Serial Nos.; AN/URC-32B, all Serial Nos.; KWT-6(8), all Serial Nos.

PURPOSE: To provide a regulated 118 volt AC source to the input of the P.A. filament and bias transformer 2T1, located within the Radio Frequency Amplifier AM-2061/URT.

PREVIOUS FIELD CHANGES: Field Change 3-AN/URC-32, Serial Nos. 1 through 627, must be performed prior to the installation of this field change.

EFFECT ON NOMENCLATURE: None.

IDENTIFICATION OF ACCOMPLISHMENT: This change can be identified by the presence of constant voltage transformer 2T2 mounted inside the right vertical main frame of the electrical equipment rack MT-2092/U, when facing the front of the equipment in question.

GENERAL DISTRIBUTION  
BUILDING 201  
CHARLESTON NAVAL SHIPYARD  
U. S. NAVAL BASE, CHARLESTON,

JAN 1967

## MATERIAL REQUIRED:

Supplied with Field Change Kit

<u>ITEM</u>	<u>REF. DESIG.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
1	2T2	1	TRANSFORMER, Constant Voltage, consisting of one Mounting Bracket and Cable Harness, with terminal identifications
2		1 pc.	HOOK-UP WIRE, #20 AWG, 10" length
3			Mounting Hardware, consisting of four 1/4"-20 X 1" B.H. Phillips Screws, four Flat Washers, four Split Lock Washers, four 1/4"-20 Hexagon Nuts
4		2	Cable Clamps and two 12-24 X 1/4" B.H. Phillips Screws
5		2	Field Change Bulletins, NAVSHIPS 0967-066-7310
6		2	Temporary Correction T-6 to NAVSHIPS 93285(B) Technical Manual for Radio Set AN/URC-32 series
7		1	Field Installation Notification of Completion Card

## TOOLS AND TEST EQUIPMENT:

Required by Installing Activity

Pliers, long nose, 6"  
Pliers, diagonal, 6"  
Wire Stripper  
Screwdriver, #4  
Steel Tape Rule  
AN/PSM-4  
Drill Motor, 3/8"  
Drill Bit, 9/32"  
Soldering Iron and Solder  
Center Punch  
Lacing Twine

## PROCEDURE:

NOTE: OBSERVE ALL APPLICABLE SAFETY PRECAUTIONS WHILE PERFORMING THIS FIELD CHANGE.

1. Disconnect all power from the AN/URC-32 Transceiver. NOTE: Turning low voltage power supply switch S1 to the OFF position does not remove the 115 volt AC from the junction box J1007/U. Disconnect power at the main switch supplying the AN/URC-32 or KWT-6(8) to insure that no power is applied to the transceiver.
2. Remove the screws securing the C-2698 (or CU-737), AM-2061/URT, and the CV-731/URC, to the right side of the electrical equipment rack, and swing all three units out on their rack hinges to allow easy access to the under side of the J1007/U junction box. Disconnect as necessary any of the inter-connecting cables which may prevent the units from swinging out. All cables should have identification sleeves at the cable connectors.
3. Remove the cover from the J1007/U junction box.
4. Refer to Figure 1. Measure down 18 inches from the top of the right main frame of the MT-2092/U electrical equipment rack. Draw a line across the face of the frame. Temporarily remove the mounting bracket from the constant voltage transformer (Item 1) in order to use it as a template for locating the mounting holes. Place the top edge of the bracket on the 18 inch line, divide the right and left margins evenly and mark the centers of each one of the four mounting slots. Center punch each of the four centers and drill a 9/32" hole at each of the four centers.
5. Replace the mounting bracket on the transformer. Mount the transformer inside the channel of the main frame. Use the four screws 1/4"-20 X 1", four flat washers, four lock washers, and four nuts in Item 3. Insert the screws from the outside of the frame with the washers and nuts on the bracket and transformer side.
6. Route the constant voltage transformer cable harness up the inside front of the electrical equipment rack main frame to the plastic insulated hexagon tie bar which is just above and behind the J1007/U junction box. Make a bend in the cable harness so that the cable will follow the hexagon bar behind the receiver overload protector to the terminal strips.
7. Count down from the top of the main frame to the 4th and 13th threaded screw holes and fasten the cable harness at these two points with the two cable clamps and the two 12-24 X 1/4" screws in Item 4. Install the clamps on the inside of the front channel lip.
8. Fasten the cable harness to the right end of the tie bar with lacing twine. Make another cable tie to the bar just behind terminal strip "S".
9. Route the individual leads of the cable harness to the top terminals of the J1007/U as follows:
  - a. Red/white lead down the right side of terminal strip "S" to terminal S-11.

- b. Green lead down the right side of terminal strip "S" to terminal S-16.
- c. Tie in the red/white and green leads to the existing cable harness.
- d. Tie the white, black and brown leads to the tie bar just behind terminal strip "P".
- e. Route the white lead to terminal P-1.
- f. Tie the black and brown leads to the tie bar just behind terminal strip "J".
- g. Route the brown lead down beside terminal strip "J" to terminal J-4.
- h. Route the black lead to terminal J-1.
- i. If necessary, cut off any excess lead at the respective terminals, strip the insulation, tin the lead ends, and make the five soldered connections:

Red/White - terminal S-11  
Green - terminal S-16  
White - terminal P-1  
Black - terminal J-1  
Brown - terminal J-4

- 10. Refer to Figure 2. Locate on the bottom side of the J1007/U the jumper which connects terminal S-11 to terminal J-4. Remove this jumper.
- 11. Refer to Figure 2. Locate on the bottom side of the J1007/U the jumper which connects terminal J-2 to terminal H2. Remove this jumper.
- 12. Refer to Figure 3. Use the 10 inch piece of hook-up wire, Item 2, supplied with the kit, and connect terminal S-11 to terminal H-2 on the bottom side of the J1007/U.
- 13. Remove the screws securing the top cover of the constant voltage transformer (cover can be pushed up the cable harness) in order to gain access to the transformer terminal board TB-1. Verify with the AN/PSM-4 that the connections have been made correctly as follows:

<u>J1007/U</u> <u>Terminals</u>	<u>Lead Color</u>	<u>Connected to</u> <u>TB-1 Terminals</u>
S-11	Red/White	H-2
S-16	Green	(ground)
P-1	White	H-1
J-4	Brown	X-2
J-1	Black	X-1

14. Verify by observation that the constant voltage transformer terminal board TB-1 is wired for 115 volt AC power input. Line input is connected to H-1 and H-2 (red/white lead connects to H-2, white lead connects to H-1). H-1 is jumpered to H-3, H-2 is jumpered to H-4. NOTE: For 230 volt AC operation, connect line input to H-1 and H-4 (red/white lead connects to H-4 and white lead connects to H-1). Jumper H-2 to H-3.
15. When it has been determined that all transformer connections are correct, replace the transformer cover.
16. Verify with the AN/PSM-4 that the terminals S-11 and H-2 in the J1007/U are connected.
17. Verify with the AN/PSM-4 that no continuity exists between H-2 and J-2 in the J1007/U.
18. Reconnect any interconnecting cables which may have been disconnected and swing the C-2698 (or CU-737), the AM-2061/URT, and the CV-731/URC back into place and secure with the screws previously removed.
19. Reconnect the transceiver to the 115 volt AC power source.
20. With "S-1" on the low voltage power supply in the OFF position, check across the J1007/U, terminals S-11 to P-1. 115 volt AC is not present.
21. Turn S-1 on the low voltage power supply to the ON position. 115 volt AC is present from S-11 to P-1.
22. Check from J-4 to J-1 in the J1007/U. 118 Volt AC  $\pm 1\%$  is present.
23. Turn the FIL OFF/TUNE/OPERATE switch on the AM-2061/URT to the TUNE position. Monitor the "6.0 V AC" test point on the AM-2061/URT with the AN/PSM-4. Note that 5.8 to 6.1 volt AC is indicated (NOTE: if the indication is below 5.8 volt AC, it is recommended that the tap connections on 2T1 which are located behind the front cover of the AM-2061/URT be changed from terminals 5 and 7 to 5 and 6. This may be necessary in order to compensate for the variations in filament currents of P.A. tubes from different manufacturers. (Refer to Figure 4.) Turn the FIL OFF/TUNE/OPERATE switch to the OFF position. Note the absence of the 5.8 to 6.1 volt AC. Turn the EXCITER R.F. GAIN control on the AM-2064/URC maximum CCW. Plate the FIL OFF/TUNE/OPERATE switch to the OPERATE position. 5.8 to 6.1 volt ac is indicated. Place the plate ON/OFF/KEY switch on the AM-2061/URT to the ON position. Place the XMIT/REC/CW TEST switch on the CV-730/URC to the XMIT position. If necessary, adjust the P.A. BIAS pot for a 150 milliamp indication on the AM-2061/URT "Plate Current" meter.
24. If all checks are okay, replace the J1007/U cover and return the transceiver to normal operation.

## ROUTINE INSTRUCTIONS:

1. Corrections to Publications and Charts. The applicable equipment technical manuals shall be corrected or replaced with the following instructions:
  - a. Maintenance support activities shall make the corrections or replacements immediately, but shall keep the superseded data in the book for support of equipments that have not been modified. Holders of equipment shall not make these corrections or replacements until after the field change has been accomplished.
  - b. Correct the technical manuals for Radio Set AN/URC-32 series, NAVSHIPS 93285(B), in accordance with Temporary Corrections T-6 to NAVSHIPS 93285(B), Item 6.
2. Record of Accomplishment. Personnel making this field change shall record the completion data of the change on Electronic Equipment History Card, NAVSHIPS 536, and the Record of Field Changes Card, NAVSHIPS 537. Report completion of the change to the Naval Ship Engineering Center, Norfolk Division, Code 1921, U.S. Naval Station, Norfolk, Virginia 23511, utilizing the Field Installation Notice of Completion (FINC) Card, NAVSECNORDIV 4700/1A, Item 7.
3. Disposition of Replaced Material. No material is replaced other than two jumpers in the J1007/U junction box. These may be discarded.
4. Disposition of Field Change Bulletin. Maintenance support activities shall maintain a library copy of this field change bulletin. Holders of equipment shall not destroy this field change bulletin until the field change has been accomplished, the equipment tested, and the applicable manuals corrected.

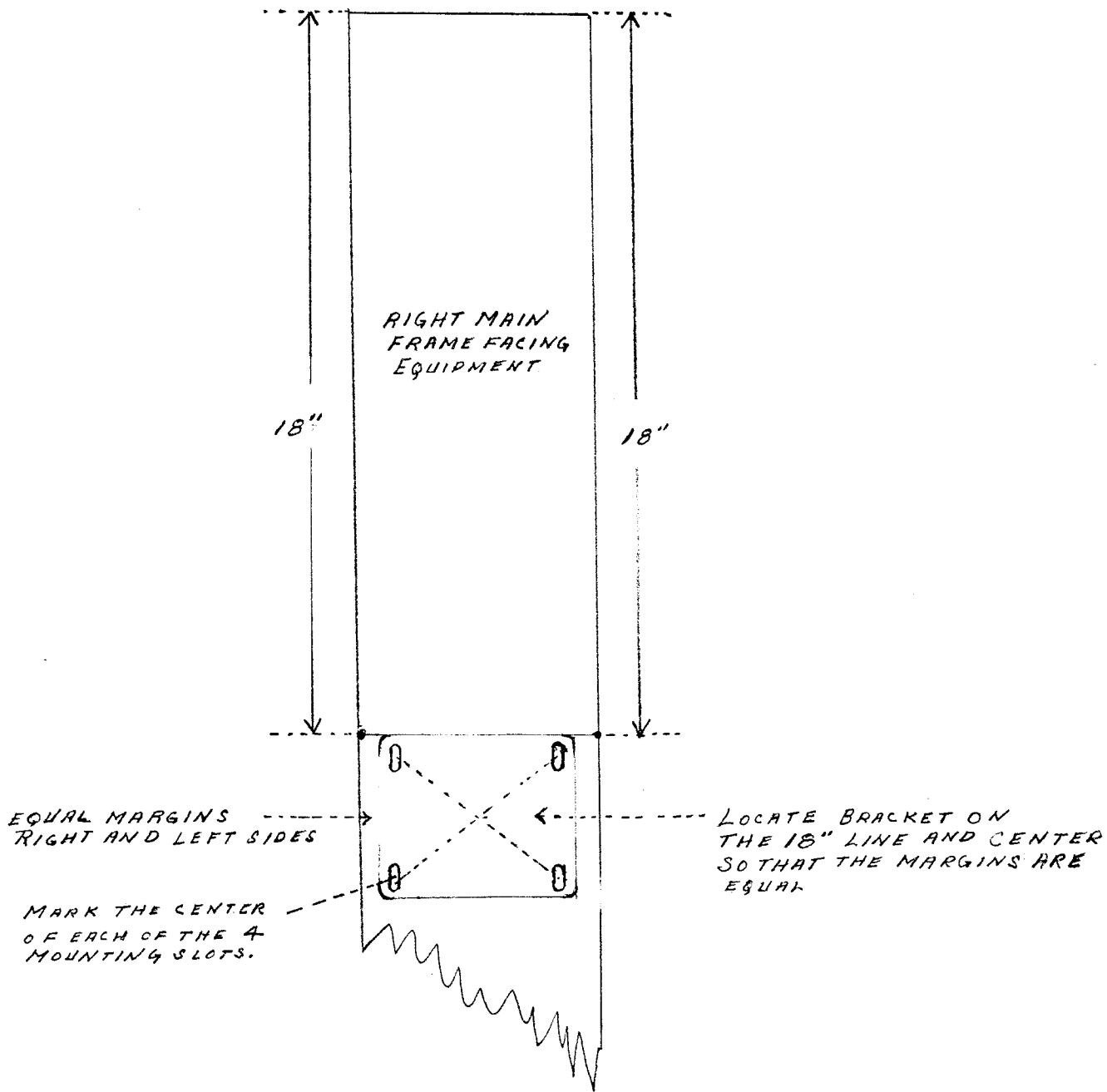


FIGURE I.

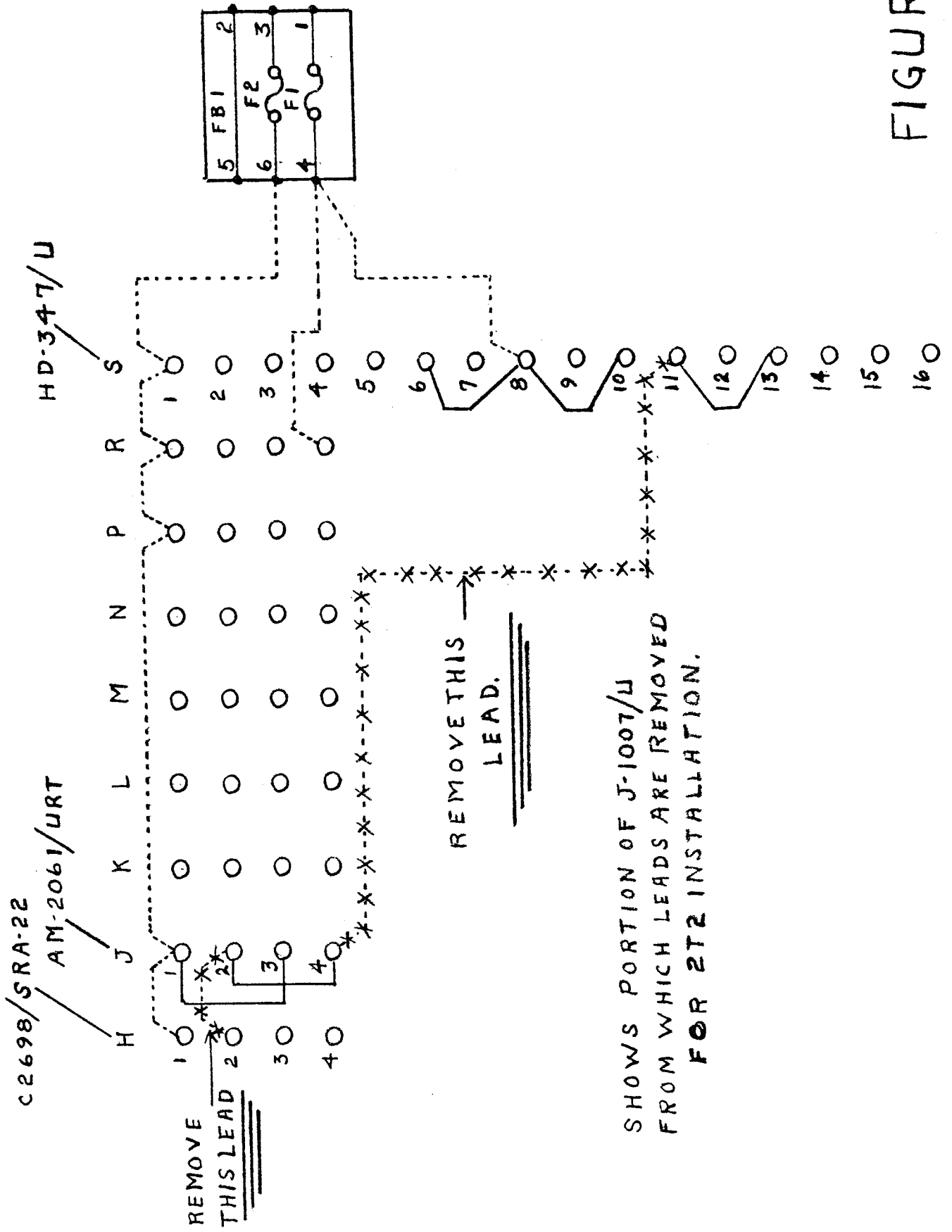
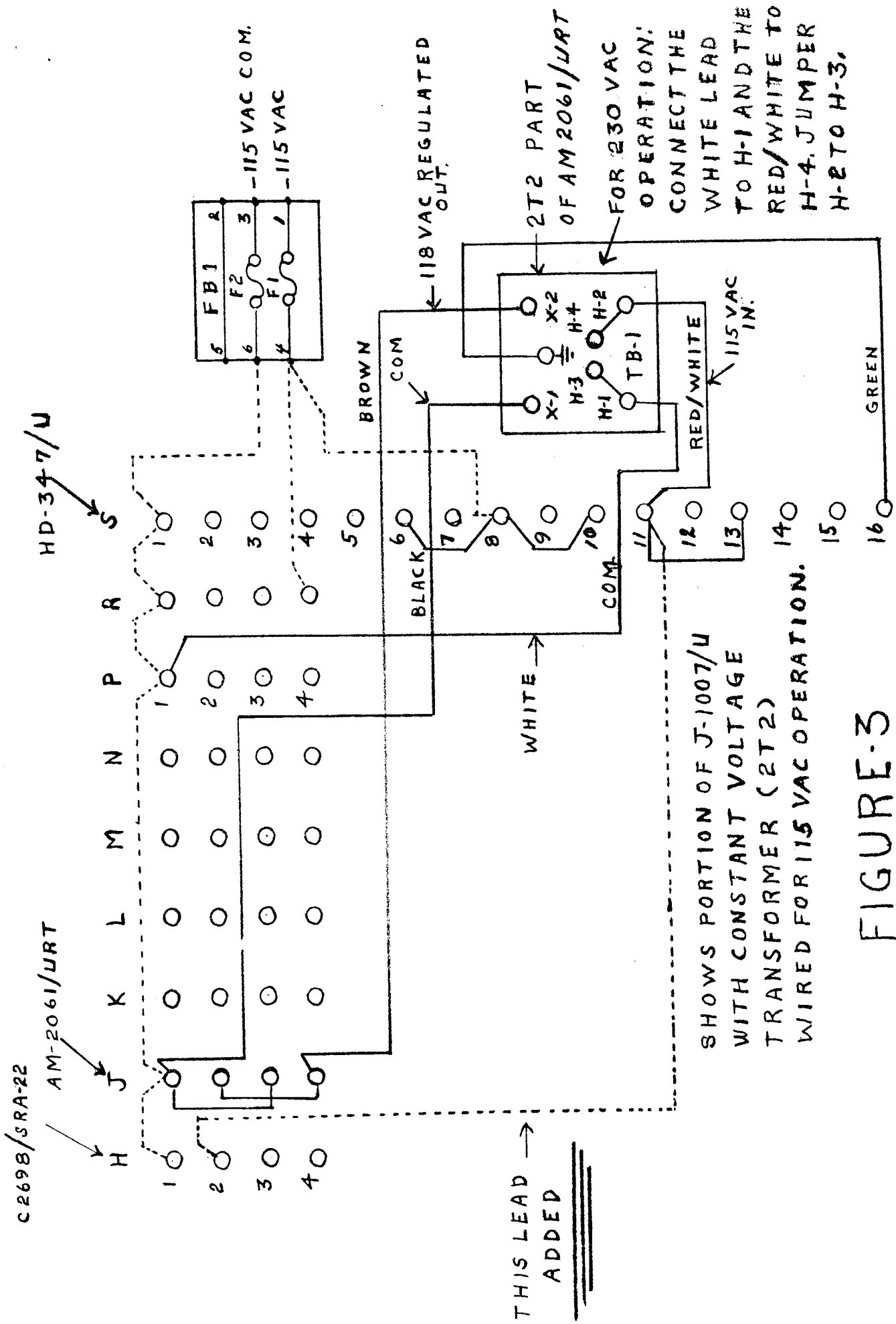


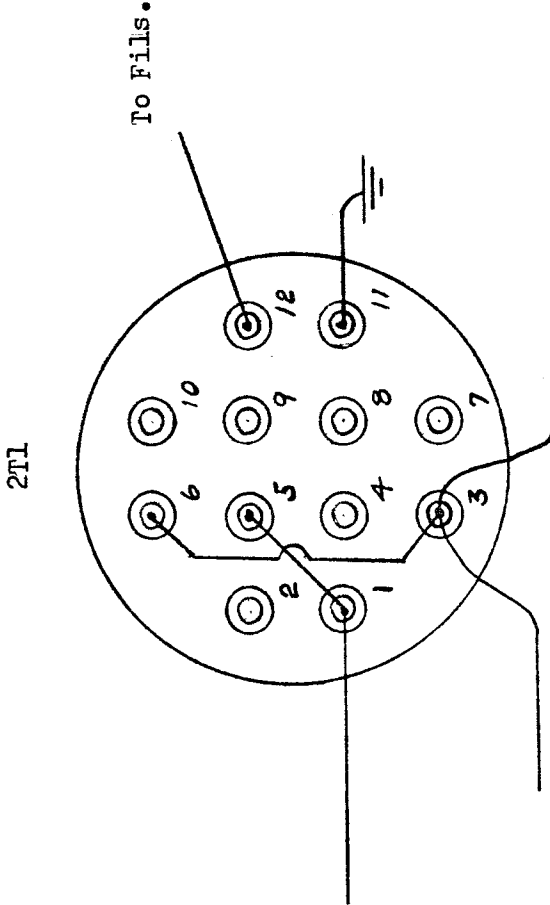
FIGURE-2.





SHOWS PORTION OF J-1007/U  
 WITH CONSTANT VOLTAGE  
 TRANSFORMER (2T2)  
 WIRED FOR 115 VAC OPERATION.

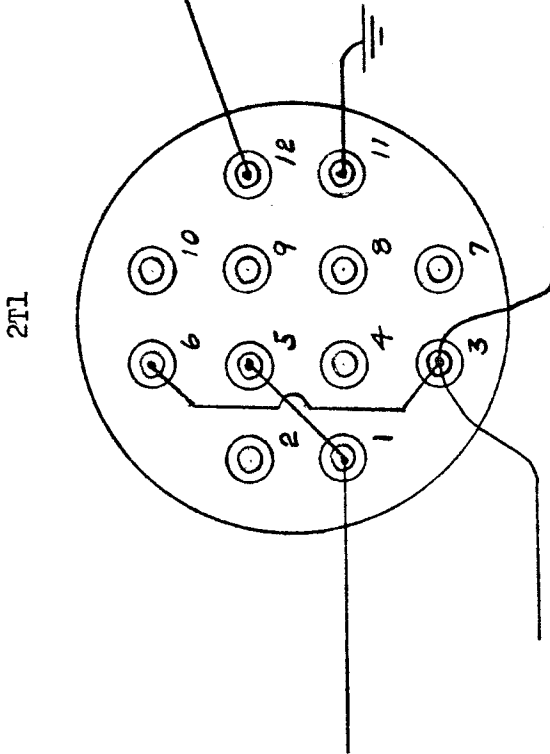
FIGURE-3



2T1

To Fils.

Filament portion of 2T1 wired for normal operation.



2T1

To Fils.

Filament portion of 2T1 showing change in wiring hook-up when filament voltage at 6.0 V AC Test Point is below 5.8 V AC.

PROCEDURE

1. Remove the jumper between terminals 3 & 7.
2. Change the wire connected to terminal 7 over to terminal 3.
3. Add a jumper between terminals 3 & 6.

FIGURE 4.

Temporary Correction T-6 to Technical Manual for Radio Set  
AN/URC-32 Series, NAVSHIPS 93285(B)

The ordering number for this temporary correction is 0967-066-7013.

This temporary correction revises the manual to reflect the equipment changes made by Field Change 24-AN/URC-32, Field Change 10-AN/URC-32A, Field Change 7-AN/URC-32B. The purpose of this field change is to supply the primary of the PA filament and bias transformer 2T1; in the Radio Frequency Amplifier AM-2061/URT with a regulated input voltage which will not vary over  $\pm 1\%$  for AC line input variations between 95 volt AC to 135 volt AC, or 190 volt AC to 260 volt AC, depending on whether the constant voltage transformer 2T2 is wired for nominal 115 volt AC line input, or nominal 230 V AC line input.

When this change is included in the manual, the manual shall cover the equipment as though Field Change 24-AN/URC-32, Field Change 10-AN/URC-32A, and Field Change 7-AN/URC-32B, had been accomplished in the equipment. This correction does not supersede any other corrections or changes.

Maintenance support activities shall make this correction in the technical manual immediately, but shall keep the superseded data intact for support of equipments that have not been modified.

Holders of equipment accompanied by technical manuals shall not make this correction in the manual until accomplishment of the field change.

Insert this temporary correction to the technical manual immediately behind the front cover of Volume 1.

1. Remove superseded pages and insert revised pages as indicated below:

<u>Page</u>	<u>Remove</u>	<u>Insert</u>
Volume 1, 1-9/1-10	Orig/Orig	TC-6/Orig
Volume 1, 1-34A/1-34B		TC-6/TC-6
Volume 1, 1-34C/1-34D		TC-6/TC-6

2. Make the following pen-and-ink corrections to Volume 1 of the technical manual, NAVSHIPS 93285B, after accomplishment of the field change. Mark each correction "TC-6":

- a. Page 2-6, column 1, paragraph 2-4.i(3)(d), delete "T1 on". Insert "2T2 part of". After "AM-2061/URT" add "(for 230 volt AC operation, see page 5-81, Figure 5-98, Note 3; or page 5-82, Figure 5-99, Note 1.)"

- b. Page 4-9, column 2, paragraph 4-3b(1)(a)3, line 7, delete "5.7 to 6.3", insert "5.8 to 6.1"

c. Page 4-10, column 2, paragraph 4-3b(2)(e), line 2, delete "(115 or 230 volts)". Insert "(118 VAC regulated)". Line 7, delete "T1" and insert "2T2". Line 8, delete all of the sentence after the word "operation." Line 13, delete "115 volt A-C". Insert "118 VAC regulated."

d. Page 4-11, 4-12, Figure 4-6. At terminal 2 of J6, delete "115/230 VAC" and insert "118 VAC regulated". Delete the note which states "For 230 VAC jumper pin 3 to pin 5 on T1. For 115 VAC operation, jumper pin 1 to pin 5 and pin 3 to pin 7 on T1." Delete "See Note" which is just to the left of T1.

e. Page 4-13- column 1, paragraph 4-3b(2)(g), line 9, delete "115", insert "118"; line 11, delete "115, insert "118".

f. Page 5-65, 5-66, Figure 5-89, delete "T1 - 230 V" and the transformer and connections just above "T1 - 230 V" in the AM-2061/URT block.

g. Page 5-77, 5-78, Figure 5-96, delete the dotted-in jumper between S11 and J4. Delete the dotted-in jumper between J2 and H2. Insert a dotted-in jumper between S11 and H2. Refer to Figure 3 of the Field Change Bulletin. Draw in 2T2 between "FB1" and the receiver input protector and make the connections as shown in Figure 3 of the Field Change Bulletin to the terminals of the J-1007/U Junction Box, include the pertinent notations.

At terminals 2 and 4 of J6, Radio Frequency Amplifier AM-2061/URT, delete "AC Line" and insert "118 VAC regulated."

h. Page 5-81, Figure 5-98. At terminals 2 and 4 of J6, delete "115 VAC". Insert "118 VAC regulated". Delete "See Note 1" and insert "See Note 3". At terminals 1 and 3 of J6, delete "115", insert "118". Delete "See Note 1" and insert "See Note 3". Delete the instructions in Note 3. Insert "For 230 VAC operation, connect AC line input to H1 and H4 and jumper H2 to H3 on TB-1 of 2T2. For 115 VAC operation, connect AC line to H1 and H2 and jumper H1 to H3, and H2 to H4 on TB-1 of 2T2. See Figure 5-96, pages 5-77, 5-78."

i. Page 5-82, Figure 5-99. At terminals 2 and 4 of J6, delete "115 VAC". Insert "118 VAC regulated." At terminals 1 and 3 of J6, delete "115" and insert "118." Delete the instructions in Note 1. Insert "For 230 VAC operation, connect AC line input to H1 and H4 and jumper H2 to H3 on TB-1 of 2T2. For 115 VAC operation, connect AC line to H1 and H2 and jumper H1 to H3, and H2 to H4 on TB-1 of 2T2. See Figure 5-96, pages 5-77, 5-78."

3. Make the following pen-and-ink correction to Volume 3 of the Technical Manual, NAVSHIPS 93285(B), after accomplishment of the field change. Mark the correction "TC-6".

Page 6-10, Table 6-2. At the bottom of the page below 2S12, under the appropriate columns, add:

<u>Ref. Desig.</u>	<u>Notes</u>	<u>Name and Description</u>	<u>Fig. No.</u>
2T2		Transformer, Constant voltage. Primary windings 95 to 135 VAC, or 190 to 260 VAC, 60 cps, 1 phase; Secondary winding, 120 volt-amps, at 118 VAC $\pm$ 1%. Mfr. Sola Electric Co.	1-14

TABLE 1-2. REFERENCE DATA FOR RADIO SET AN/URC-32( )

CHARACTERISTIC	NUMBER, RANGE, AND/OR VALUE
Frequency range	2.0 to 30.0 mc.
Wavelength	150 to 10 meters.
Tuning	
Number of bands	4.  Band 1 . . . . . 2.0 to 3.7 mc Band 2 . . . . . 3.7 to 7.7 mc Band 3 . . . . . 7.7 to 15.7 mc Band 4 . . . . . 15.7 to 30.0 mc
Number of channels	28,000 spaced at 1-kc intervals (AN/URC-32 and AN/URC-32A); 280,000 spaced at 0.1-kc intervals (AN/URC-32B).
Frequency stability	1 part in 10 <sup>6</sup> per month and 1 part in 10 <sup>8</sup> per day under all ambient conditions (using internal frequency standard).
Operating modes	CW telegraph (A1).  Double-sideband, full carrier (A3).  Single-sideband (USB and LSB), reduced carrier (A3a).  Independent-sideband, reduced carrier (A3b).  Single-sideband (USB and LSB), suppressed carrier (A3j).  Composite transmission (A9).  Single-sideband (USB), full carrier (A3H compatible) on transmit.  Frequency-shift telegraphy (F1) (850-cps shift).
Carrier suppression	45 db below peak-envelope-power output.
Suppression of undesired sideband	35 db below peak-envelope-power output.
Number of superheterodyne conversions (transmit and receive)	One in band 1; two in bands 2, 3, and 4.
Intermediate frequencies	300 kc (fixed), and 1.7 to 3.7 mc (continuously variable).
Receiver Characteristics (Cont)	
Sensitivity	1 microvolt for 10-db signal plus noise-to-noise ratio.
Selectivity	3-kc bandwidth on either sideband; 6-kc bandwidth on AM.
Input impedance	50 ohms unbalanced.
Audio distortion	5 percent maximum.

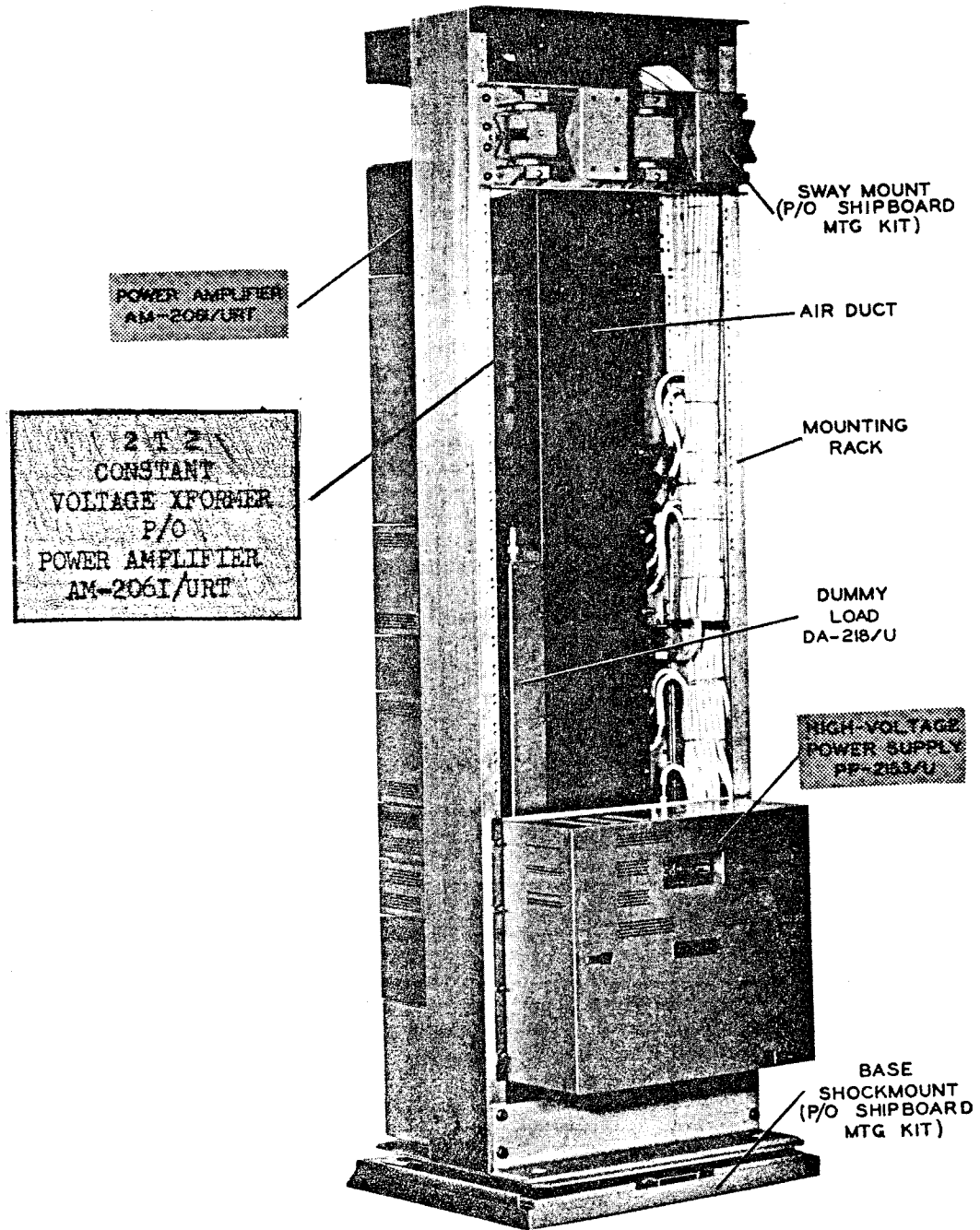


Figure 1-14. Radio Set AN/URC-32( ), Rear View

TABLE  
1-7

NAVSHIPS 93285(B)  
Table 1-7 (Continued)

AN/URC-32  
GENERAL INFORMATION

FIELD CHANGE NO. AND SERIAL NO. EFFECTIVITY	UNITS AFFECTED	BRIEF DESCRIPTION OF CHANGE	EIB NUMBER	NAVSHIPS PUBLICATION
18-AN-/URC-32 All Serial Nos. ----- 4-AN/URC-32A All Serial Nos. ----- 9-KWT-6(8) All Serial Nos. ----- 1-AN/URC-32B All Serial Nos.	Junction Box J-1007/U	Addition of 1800 ohm resistor between terminals G5 and G6	620, *628	
19-AN/URC-32 Serial No. 822 and above ----- 5-AN/URC-32A All Serial Nos. ----- 2-AN/URC-32B All Serial Nos. ----- 10-KWT-6(8) Serial No. 80 and above		A jumper wire will be connected between J15 and H14	EIB 641	
20-AN/URC-32 All Serial Nos. ----- 6-AN/URC-32A All Serial Nos. ----- 3-AN/URC-32B All Serial Nos.		The BNC connector connected to K1, will be shorted.	EIB 641	



TABLE  
1-7

NAVSHIPS 93285(B)  
Table 1-7 (Continued)

AN/URC-32  
GENERAL INFORMATION

FIELD CHANGE NO. AND SERIAL NO. EFFECTIVITY	UNITS AFFECTED	BRIEF DESCRIPTION OF CHANGE	EIB NUMBER	NAVSHIPS PUBLICATION
21-AN/URC-32 7-AN/URC-32A 4-AN/URC-32B 12 KWT-6(8) ALL SERIALS	AM-2061/URT Power Amplifier	Change Jack J3 to TNC type connector.	652	
22-AN/URC-32 Serial Nos. 1 thru 981 13 KWT-6(8) Serial Nos. 1 thru 90	PP-2154/U Power Supply	Change CR6 and CR7 to 1N 3190 type diodes	662	
23-AN/URC-32 All serial Nos. 9-AN/URC-32A Serial Nos. 1 thru 681 14 KWT-6(8) All serial Nos.	CV-731/URC Frequency Generator	Jack 8 is installed on the CV-731/URC main chassis. This change is required prior to installing .1kc electronic assembly, CV-1749/UR		0967-066-7300
24-AN/URC-32 10-AN/URC-32A 7-AN/URC-32B 15 KWT-6(8) ALL SERIALS	AM-2061/URT Power Amplifier	Provides regulated filament voltage for 2V3 and 2V4.		0967-066-7310
6-AN/URC-32B ALL SERIALS	CV-1749	Provides keyline chassis ground. Relay 3A6K1 is installed.		0967-067-3130
11A-AN/URC-32 8-AN/URC-32A 5-AN/URC-32B	CV-731/URC AM-2061/URT	AN/WRA-3 is interfaced with AN/URC-32 ( ). Requires NAVSHIPS authorization.		0285-075-5000

TABLE  
1-7

NAVSHIPS (B)  
Table 1-7 (continued)

AN/URC-3  
GENERAL INFORMATION

FIELD CHANGE NO. AND SERIAL NO. EFFECTIVITY	UNITS AFFECTED	BRIEF DESCRIPTION OF CHANGE	EIB NUMBER	NAVSHIPS PUBLICATION