COLLINS

instruction book

Collins Radio Company

62S-1
VHF Converter

Collins Amateur Equipment Guarantee

The Collins Amateur Equipment described herein is sold under the following guarantee:

Collins agrees to repair or replace, without charge, any equipment, parts, or accessories which are defective as to workmanship or materials and which are returned to Collins at its factory or its designated Service Agency, transportation prepaid, provided:

(a) Buyer presents properly executed Warranty Verification Certificate.

(b) Notice of the claimed defect is given Collins or an authorized Service Agency, or an authorized Distributor, in writing, within 180 days from the date of purchase and goods are returned in accordance with Collins instructions.

(c) Equipment, accessories, tubes, and batteries not manufactured by Collins or from Collins designs are subject to only such adjustments as Collins may obtain from the supplier thereof.

(d) Any failure due to use of equipment for purposes other than those contemplated in normal amateur operations or in violation of Collins applicable Instruction Book shall not be deemed a defect within the meaning of these provisions.

This Warranty is void with respect to equipment which is altered, modified or repaired by other than Collins or Collins Authorized Service Agencies.

Collins reserves the right to make any change in design or to make additions to, or improvements in, Collins products without imposing any obligations upon Collins to install them in previously manufactured Collins products.

No other warranties, expressed or implied, shall be applicable to said equipment, and the foregoing shall constitute the Buyer's sole right and remedy under the agreements contained in these paragraphs. In no event shall Collins have any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

NOTICE: With each equipment or set of equipments purchased, the distributor should furnish a Warranty Verification Certificate. It is necessary that this certificate accompany the equipment when it is returned for warranty repairs. Be sure that you receive it from your distributor.

Warranty Repairs

On the opposite page are listed the Service Agencies authorized to perform warranty repair on Collins Amateur Equipments.

If you should wish to return material or equipment direct to Collins under the guarantee, you should notify Collins, giving full particulars including the details listed below, insofar as applicable. If the item is thought to be defective, such notice must give full information as to nature of defect and identification (including part number if possible) of part considered defective. Upon receipt of such notice, Collins will promptly advise you respecting the return. Failure to secure our advice prior to the forwarding of the goods or failure to provide full particulars may cause unnecessary delay in handling of your returned merchandise.

ADDRESS:

Collins Radio Company
Amateur Product Office
Cedar Rapids, Iowa

INFORMATION NEEDED:

(A) Type number, name and serial number of equipment
(B) Date of delivery of equipment
(C) Date placed in service
(D) Number of hours of service
(E) Nature of trouble
(F) Cause of trouble if known
(G) Name of distributor from whom the equipment was purchased.

Equipment returned to the Service Agency or Collins for warranty repair must be accompanied with the Warranty Verification Certificate.

Out-of-warranty Repair, Modifications, Addition of Accessories, Alignment, etc.

For information on service of this type write to the address shown below. If you wish to return your equipment for repairs, etc., without prior correspondence, be sure to include the following information attached to the equipment inside the packing carton:

(1) Complete instructions detailing work to be performed.
(2) Your return address.
(3) Method of shipment by which the equipment should be returned.
(4) Special instructions.

DIRECT YOUR CORRESPONDENCE TO:

Collins Radio Company
Product Support Division
Cedar Rapids, Iowa

HOW TO ORDER REPLACEMENT PARTS:

When ordering replacement parts, please furnish the following information insofar as applicable:

INFORMATION NEEDED:

(A) Quantity required
(B) Collins part number (9 or 10 digit number) and description
(C) Item or symbol number obtained from parts list or schematic
(D) Collins type number, name and serial number of principal equipment
(E) Unit subassembly number (where applicable)

Collins Authorized Service Agencies

ALABAMA

Beddow Engineering Services
1501 Seventh Street SE
Decatur 35601

CALIFORNIA

Ham Radio Outlet
999 Howard Avenue
Burlingame 94101

Amrad Supply, Inc.
3425 Balboa Street
San Francisco 94121

Communication Receiver Service
5016 Maplewood
Los Angeles 90004

Henry Radio, Inc.
931 N. Euclid
Anaheim 92801

Henry Radio Co., Inc.
(P.O. Box 64398)
11240 W. Olympic Blvd.
Los Angeles 90064

Amrad Supply, Inc.
1025 Harrison Street
Oakland

COLORADO

Burstein-Applebee Co. of Colorado
800 Lincoln Street
Denver 80202

FLORIDA

Ogilvie Electronics, Inc.
3101 Spring Park Road
Jacksonville 32207

Aero Maintenance Radio, Inc.
82 Fairway Drive
Miami Springs 33166

Grice Electronics, Inc.
330 East Wright Street
(P.O. Box 1911)
Pensacola 32501

Kinkade Radio Supply, Inc.
1719 Grand Central Avenue
Tampa 33606

GEORGIA

Commercial Communications
2752 Church Street
East Point 30044

HAWAII

Honolulu Electronics
819 Keeaumoku Street
Honolulu 96814

LOUISIANA

Thomas J. Morgavi Electronics
3409 Beaulieu Street
(P.O. Box 353)
Metairie 70004

MARYLAND

Electronic International Service Corp.
11305 Elkin Street
(P.O. Box 1813)
Wheaton 20902

MASSACHUSETTS

Two-Way Radio Engineers, Inc.
1100 Tremont Street
Roxbury 01969

MINNESOTA

Electronic Center, Inc.
107 3rd Avenue North
Minneapolis 55404

MISSOURI

Ham Radio Center
8342 Olive Blvd.
St. Louis 63132

MISSISSIPPI

Coker Radio & TV Service
724 Lawrence Road
Jackson 39206

NEW JERSEY

Communication Service Co.
508 County Avenue
Maple Shade 08052

NEW YORK

Electronic Servicenter of New York
65-37 Queens Blvd.
Woodside 13789

NORTH CAROLINA

Freck Radio & Supply Co., Inc.
38 Biltmore Avenue
Asheville 28801

OHIO

Universal Service
144 N. Third Street
Columbus 43215

OREGON

Portland Radio Supply Co.
1234 S.W. Stark Street
Portland 97205

TEXAS

Electronic Center, Inc.
2929 N. Haskell
Dallas 75204

Howard Radio Company
1475 Pine Street
Abilene 79601

Douglas Electronics
1118 South Staples St.
Corpus Christi 78404

UTAH

Dwyer's TV & Communications
5455 Knollcrest Street
Murray 84647

WASHINGTON

HCJ Electronics
6904 East Sprague
Spokane 99206

WISCONSIN

Amateur Electronic Supply
4828 W. Fond du Lac Ave
Milwaukee 53208

1-15-69

523-0755852-003311
3rd Edition, 15 August 1963

COLLINS

instruction book

62S-1
VHF Converter

Cedar Rapids Division | Collins Radio Company, Cedar Rapids, Iowa
Printed in U.S.A.

table of contents

table of contents (cont)

list of illustrations

list of tables

section 1

installation

1.1 Unpacking.

After unpacking, carefully examine the 62S-1 VHF Converter for visible damage. If the equipment has been damaged in shipment, save the box and packing material, and notify the transportation company. Complete and mail the equipment registration card. Check tubes for proper seating in sockets. Check tuning controls and switches for freedom of action. Check the items furnished against table 1-1.

CAUTION

Be sure to remove packing from PA compartment. Loosen the four screws in the top cover, slide cover to the left and lift off, remove packing, inspect compartment for any damage, replace cover, and retighten screws.

TABLE 1-1. ITEMS FURNISHED WITH 62S-1 VHF CONVERTER

QUANTITY	DESCRIPTION	FUNCTION	PART NUMBER
1	High-voltage adapter	62S-1 plate supply cable	548-9267-003
2	Fuses, 1.5 ampere	Spares	264-0007-00
2	Type 51 pilot lamps	Spares	262-0264-00
1	Y phono connector	Alc connections	426-5408-00
6	R-f cables	External connections	426-5076-00
1	Line cord adapter	For 2-wire socket	368-0138-00
1	Cable label	Identify cables	280-2946-00
3	Phono plugs	To modify h-f equipment cables	361-0062-00
1	UG-21D/U coaxial plug	R-f output	357-9261-00
1	No. 4 Bristo wrench	Tool	024-2900-00
1	No. 6 Bristo wrench	Tool	024-9730-00
1	No. 8 Bristo wrench	Tool	024-0019-00
1	Phono cable	PA disable jumper	426-5298-00

1.2 Cabling.

1.2.1 EXTERNAL CONNECTIONS.

The locations of jacks for external connections to the 62S-1 are shown in figures 1-1 through 1-5. Basic input-output functions and requirements are as follows:

a. VHF RF OUT, J1, connects to the appropriate vhf antenna. Nominal output impedance is 50 ohms. The mating connector for J1 is a type N cable plug, UG-21D/U.

Refer to figures 1-7 and 1-8 for connector and cable assembly information. RG-58C/U cables should be used when connecting the h-f equipments to the 62S-1.

b. CONV IN, J2, is a 50-ohm r-f input to the transmitter portion of the 62S-1. Voltage required from the external exciter or SSB generator is 0.1 volt rms at a frequency in the range of 14.0 to 14.2 mc.

c. HF ANT., J3, connects to the h-f antenna system or h-f linear amplifier normally used by the station. This jack is connected internally to J4 in the OFF and HF positions of the 62S-1 function switch. Switching circuits in the 62S-1 have negligible effect upon the impedance levels of associated h-f equipment.

d. HF RF, J4, connects to the h-f station equipment at the point where the h-f antenna or linear amplifier normally would be connected if the 62S-1 were not used. Received vhf signals, converted to the range of 14.0 to 14.2 mc by the 62S-1 receiver section, are internally connected to J4 in the VHF TUNE and VHF OPR positions of the 62S-1 function switch.

NOTE

Switch contacts associated with J4 are rated at 100 watts r-f. Do not apply higher power to this jack.

e. HF ANT. RELAY IN, J6, is used for 62S-1 keying by applying an external ground to this jack. The required ground normally is supplied by vox circuits in the associated h-f exciter.

f. HF ANT. RELAY OUT, J5, is connected to J6 in the OFF and HF positions of the 62S-1 function switch. Keyed ground from the exciter vox or push-to-talk circuits then appears at J5 to key an h-f linear amplifier. In the VHF TUNE and the VHF OPR positions of the 62S-1 function switch, J5 is disconnected from the key line to prevent keying of the h-f linear amplifier when operating on vhf.

g. PA SG OUT, J7, and PA SG IN, J8, are internally connected to the 62S-1 screen voltage switching circuits. Jack J8 is cabled to the exciter PA screen supply, and J7 is cabled to screen grids of the h-f exciter PA tubes. Internal switching in the 62S-1 connects screen voltage to the h-f exciter PA tube via J7 in OFF and HF positions of the function switch. Screen voltage is switched to the 62S-1 PA in VHF TUNE and VHF OPR positions. Screen voltage required by the 62S-1 PA is approximately 275 volts d-c at 20 ma maximum from a regulated source.

h. AUX CONT jacks, J9 through J13, are internally connected to extra circuits on the 62S-1 BAND and function switches. Jack J9 is switched to J10 on 2 meters, and the circuit is opened on 6 meters. If separate antennas are used for 6 and 2 meters, this circuit can be used to control a coaxial relay for automatic antenna switching. Jack J11 is internally switched to J13 in the VHF TUNE position and to J12 in the VHF OPR position of the 62S-1 function switch. This circuit can be used for such applications as controlling screen voltage to a separate vhf linear amplifier.

i. ALC, J14, provides alc voltage from the 62S-1 power amplifier when terminated by the proper load resistance (approximately 2 megohms). The load resistor normally is part of the h-f exciter alc circuit.

j. VHF ANT. RY, J15, provides a ground when the 62S-1 is keyed. This ground can be used to key the relay circuits in an associated vhf linear amplifier.

k. 800V IN, J16, is used to connect plate voltage to the 62S-1 power amplifier from the required external source such as the exciter. The mating connector is a BNC cable plug type UG-88/U or equivalent.

1.2.2 CABLING WITH S-LINE OR KWM-2/2A.

Figure 1-4 shows the locations of jacks for external connections to the KWM-2/2A Transceiver, while figure 1-5 shows the locations of jacks for external connections to the KWM-2/2A Transceiver, 312B-4/5 Station Control, 30L-1 or 30S-1 Linear Amplifier, and 516F-2 Power Supply. The various jack functions are explained in paragraph 1.2.1. Insert the h-v adapter between the power cable from the 516F-2 power supply and the power socket on the KWM-2/2A. The PA plate voltage for the 62S-1 is supplied to J16 from this h-v adapter. Be sure to remove the PA DISABLE jumper in the KWM-2/2A.

WARNING

Do not connect the 516F-2 A-C Power Supply to the a-c power source until all power connections between exciter and 62S-1 are completed.

Figure 1-2 shows the locations of jacks for external connections to the 32S-( ) Transmitter, while figure 1-3 shows the locations of jacks for external connections to the 32S-( ) Transmitter, 75S-( ) Receiver, 312B-4 Station Control, the 30L-1 or 30S-1 Linear Amplifier, and the 516F-2 Power Supply. The various jack functions are explained in paragraph 1.2.1. Insert the h-f adapter and remove the PA DISABLE jumper as with the KWM-2/2A.

The PA DISABLE jumper wire in both the KWM-2/2A and the 32S-( ) equipments is located under the chassis at the rear of the PA DISABLE jacks. Clip this wire at each jack and remove. After modification, it is recommended that a short length of shielded wire and two phono plugs be used to make an external jumper. Insertion of the jumper then will allow normal operation of the equipment when not connected to the 62S-1.

1.2.3 CABLING WITH KWM-1.

Figure 1-1 shows the locations of jacks on the 62S-1 for external connections to the KWM-1 Transceiver. Refer to paragraph 1.2.1 for an explanation of various jack functions. Obtain +800 volts d-c for the 62S-1 from the KWM-1 power supply. Use RG-58C/U cable with a BNC type connector to connect to the 62S-1.

1.2.3.1 KWM-1 WITH SERIAL NUMBERS BELOW 861.

a. Perform the modifications on the PA tube socket shown in figure 1-6.

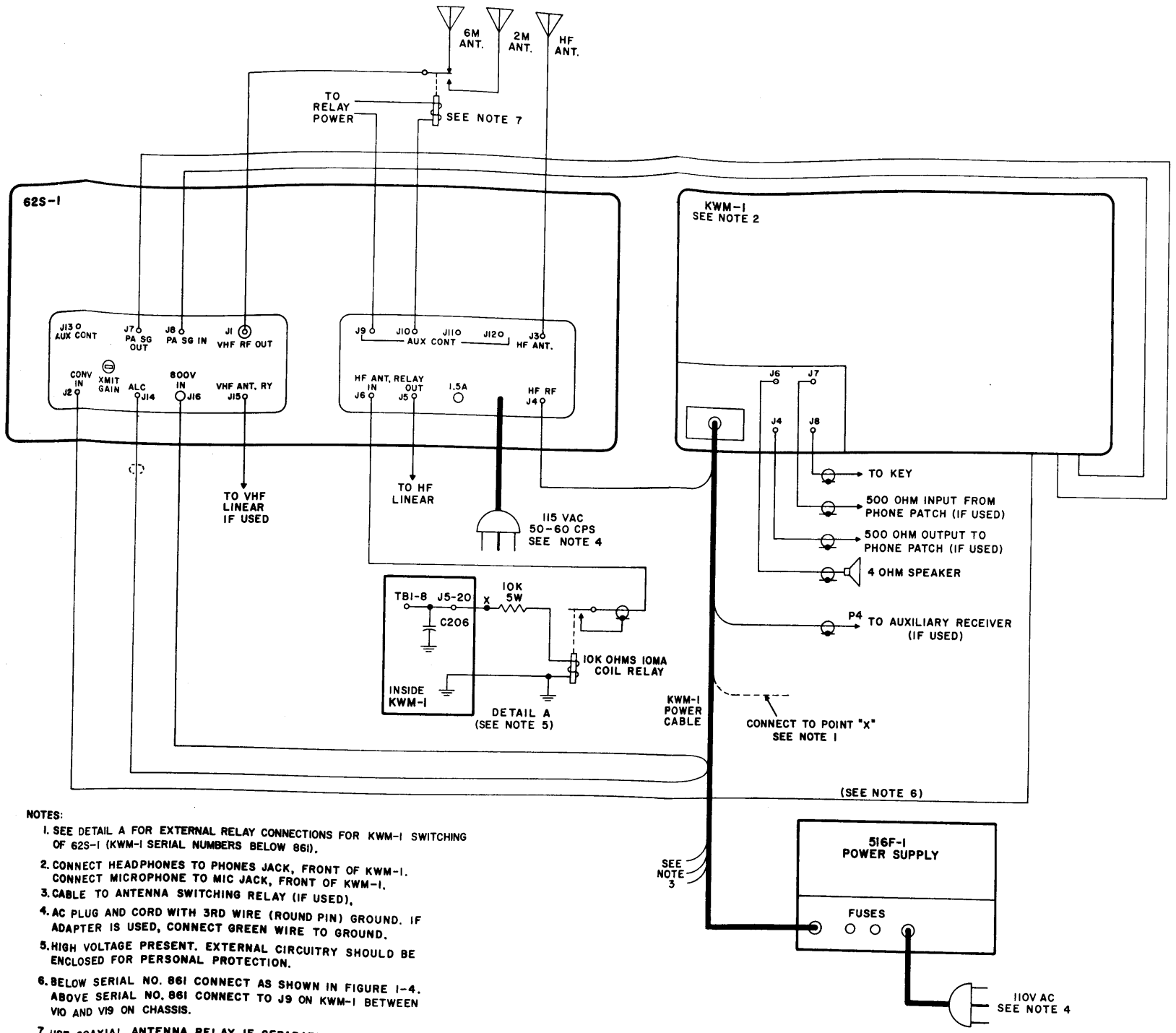
b. Run the leads out the bottom plate of the KWM-1.

NOTE

Make the leads long enough so the bottom cover of the KWM-1 may be removed for maintenance purposes. One of the holes in the bottom cover will have to be enlarged to accept RG-58C/U cable.

c. Connect the 62S-1 leads to the leads of the KWM-1 as shown in figure 1-1. Use dual female phone connectors such as those manufactured by Switchcraft.

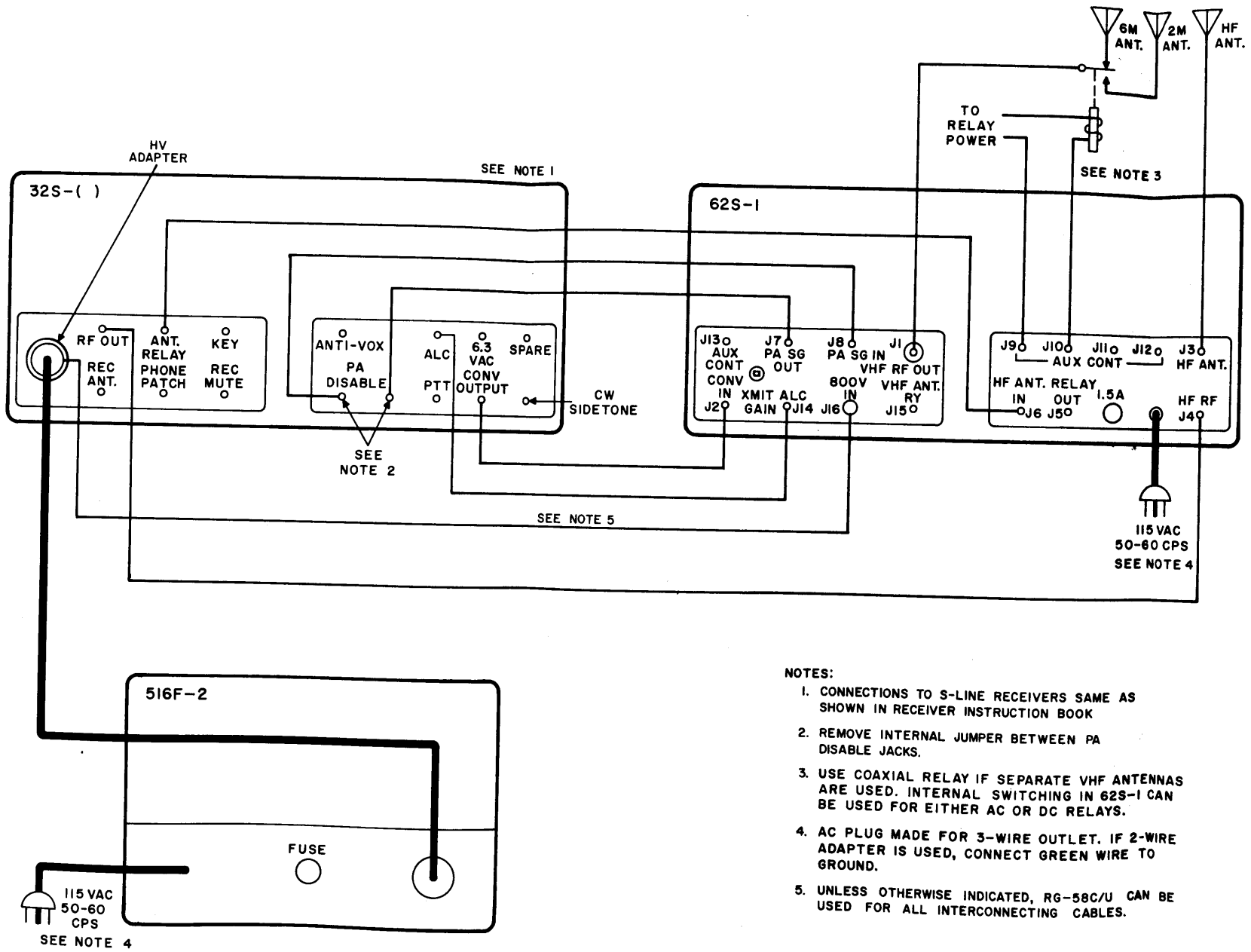
d. To return the KWM-1 to h-f operation with the 62S-1 connected, turn the 62S-1 function switch to the OFF or HF position. This connects the h-f antenna connected to J3 on the 62S-1 to the h-f antenna input jack on the KWM-1. To disconnect the KWM-1 completely from the 62S-1 (for mobile use), disconnect the 62S-1 cables and place a jumper between the two shielded wires which were connected to the PA SG IN and the PA SG OUT terminals on the rear of the 62S-1.



NOTES:

1. SEE DETAIL A FOR EXTERNAL RELAY CONNECTIONS FOR KWM-1 SWITCHING OF 62S-1 (KWM-1 SERIAL NUMBERS BELOW 861).
2. CONNECT HEADPHONES TO PHONES JACK, FRONT OF KWM-1. CONNECT MICROPHONE TO MIC JACK, FRONT OF KWM-1.
3. CABLE TO ANTENNA SWITCHING RELAY (IF USED).
4. AC PLUG AND CORD WITH 3RD WIRE (ROUND PIN) GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
5. HIGH VOLTAGE PRESENT. EXTERNAL CIRCUITRY SHOULD BE ENCLOSED FOR PERSONAL PROTECTION.
6. BELOW SERIAL NO. 861 CONNECT AS SHOWN IN FIGURE 1-4. ABOVE SERIAL NO. 861 CONNECT TO J9 ON KWM-1 BETWEEN V10 AND V19 ON CHASSIS.
7. USE COAXIAL ANTENNA RELAY IF SEPARATE VHF ANTENNAS ARE USED. INTERNAL SWITCHING IN 62S-1 CAN BE USED FOR AC OR DC RELAYS.
8. UNLESS OTHERWISE INDICATED, RG-58C/U CAN BE USED FOR ALL INTERCONNECTING CABLES.

Figure 1-1. Interconnections with KWM-1



NOTES:

1. CONNECTIONS TO S-LINE RECEIVERS SAME AS SHOWN IN RECEIVER INSTRUCTION BOOK
2. REMOVE INTERNAL JUMPER BETWEEN PA DISABLE JACKS.
3. USE COAXIAL RELAY IF SEPARATE VHF ANTENNAS ARE USED. INTERNAL SWITCHING IN 62S-1 CAN BE USED FOR EITHER AC OR DC RELAYS.
4. AC PLUG MADE FOR 3-WIRE OUTLET. IF 2-WIRE ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
5. UNLESS OTHERWISE INDICATED, RG-58C/U CAN BE USED FOR ALL INTERCONNECTING CABLES.

Figure 1-2. Interconnections with S-Line Equipment

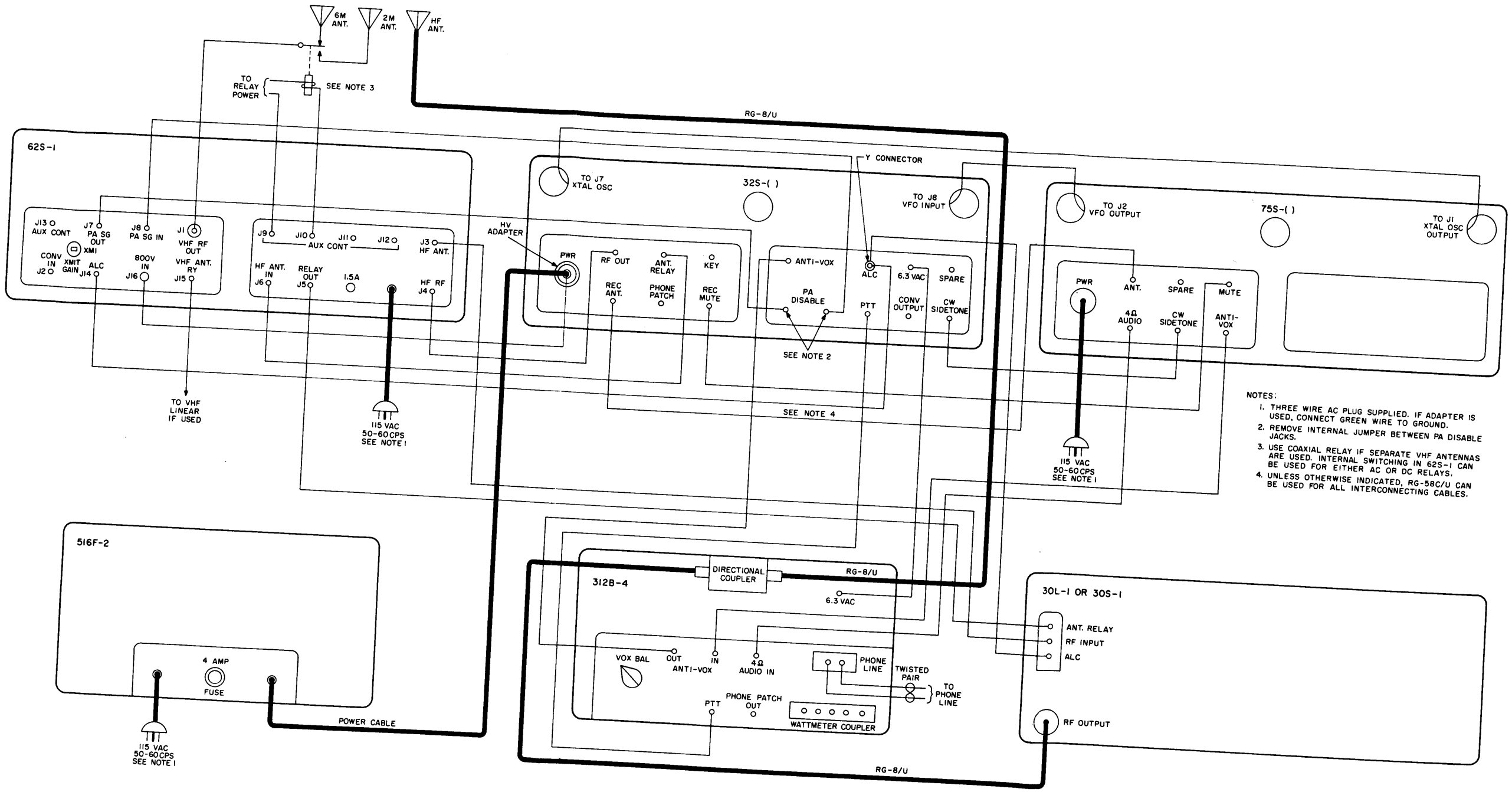
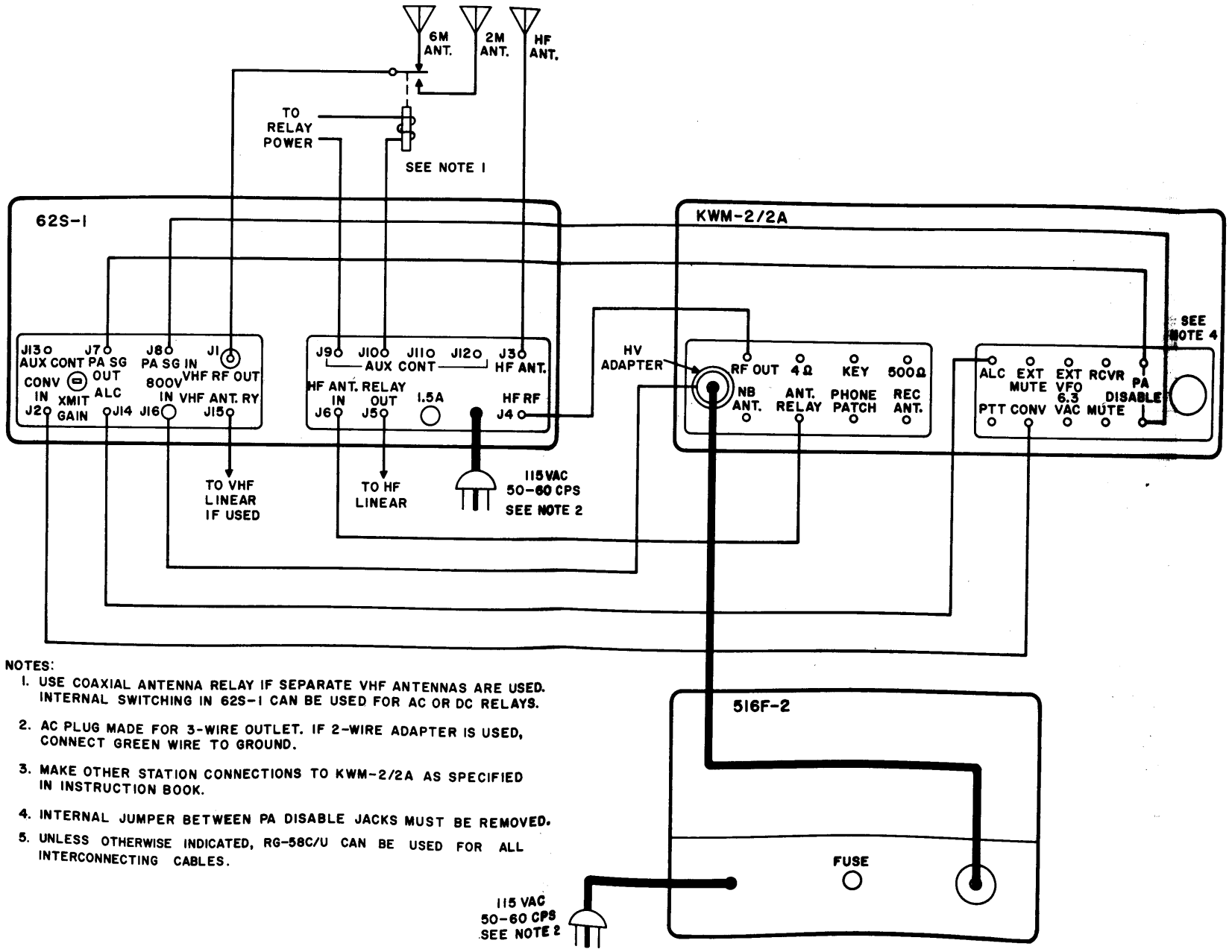


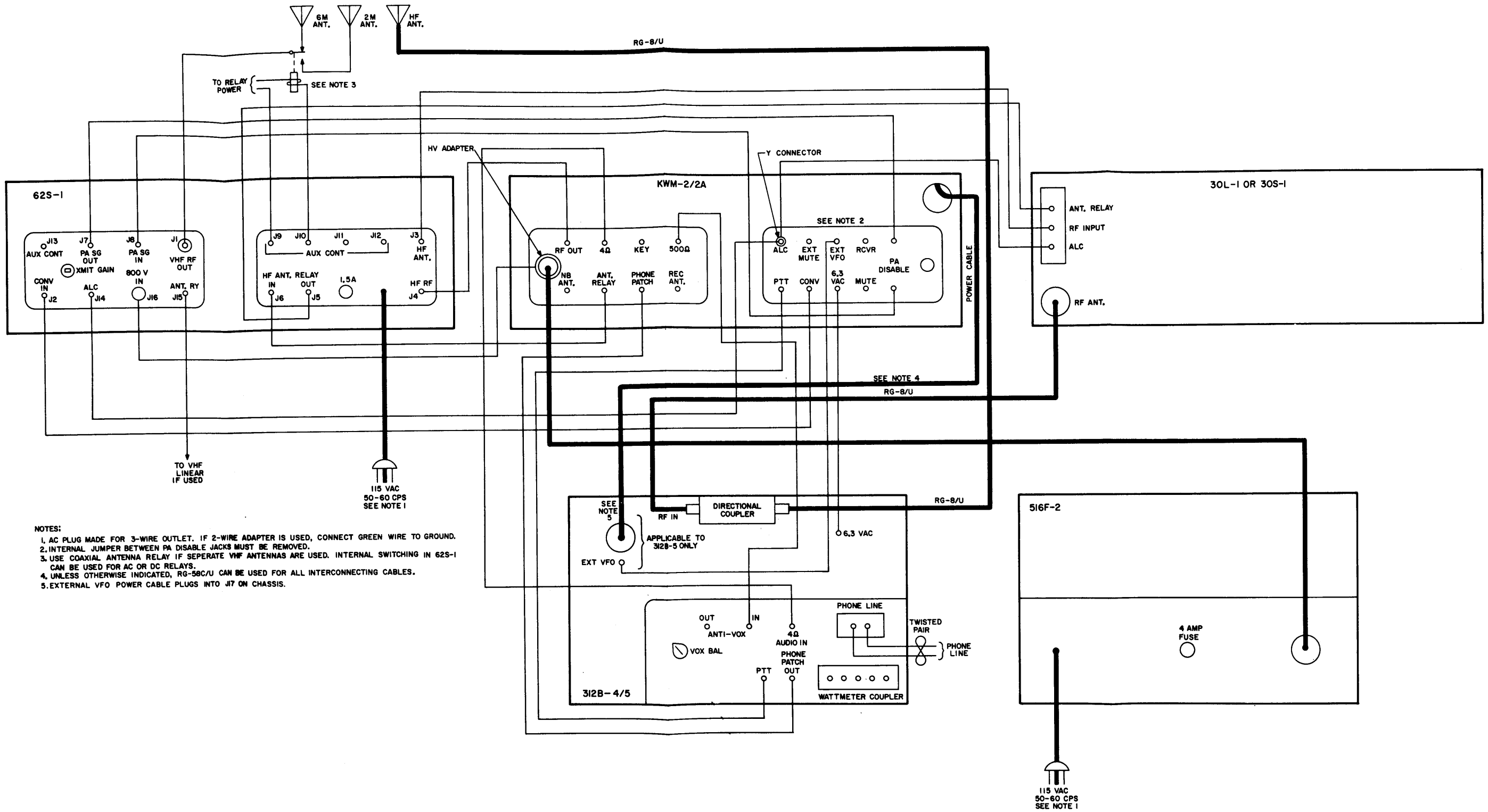
Figure 1-3. Interconnections with 75S-( ), 32S-( ), 312B-4/5, 30L-1 or 30S-1, and 516F-2



NOTES:

1. USE COAXIAL ANTENNA RELAY IF SEPARATE VHF ANTENNAS ARE USED. INTERNAL SWITCHING IN 62S-1 CAN BE USED FOR AC OR DC RELAYS.
2. AC PLUG MADE FOR 3-WIRE OUTLET. IF 2-WIRE ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
3. MAKE OTHER STATION CONNECTIONS TO KWM-2/2A AS SPECIFIED IN INSTRUCTION BOOK.
4. INTERNAL JUMPER BETWEEN PA DISABLE JACKS MUST BE REMOVED.
5. UNLESS OTHERWISE INDICATED, RG-58C/U CAN BE USED FOR ALL INTERCONNECTING CABLES.

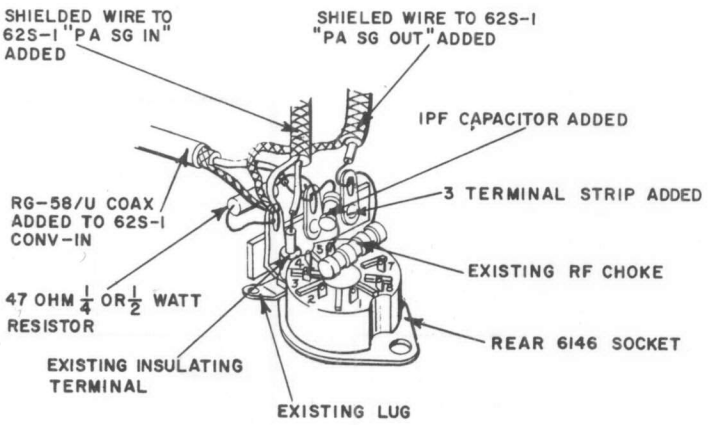
Figure 1-4. Interconnections with KWM-2/2A



NOTES:

1. AC PLUG MADE FOR 3-WIRE OUTLET. IF 2-WIRE ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
2. INTERNAL JUMPER BETWEEN PA DISABLE JACKS MUST BE REMOVED.
3. USE COAXIAL ANTENNA RELAY IF SEPERATE VHF ANTENNAS ARE USED. INTERNAL SWITCHING IN 62S-1 CAN BE USED FOR AC OR DC RELAYS.
4. UNLESS OTHERWISE INDICATED, RG-58C/U CAN BE USED FOR ALL INTERCONNECTING CABLES.
5. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON CHASSIS.

Figure 1-5. Interconnections with KWM-2/2A, 312B-4/5, 30L-1 or 30S-1, and 516F-2



NOTES:
1. PHONO CONNECTIONS ON 62S-1 END OF COAX AND SHIELDED WIRE.
2. RUN COAX OUT PERFORATED HOLES IN BOTTOM COVER OR SLOT ON REAR "DECK" OF BOTTOM COVER.
3. RUN SHIELDED WIRES OUT THROUGH PERFORATED HOLES IN BOTTOM COVER.

Figure 1-6. Modification for KWM-1 with Serial Numbers Below 861

1.2.3.2 KWM-1 WITH SERIAL NUMBERS 861 AND UP.

a. Remove the bottom cover of the KWM-1, place a 47-ohm resistor across J9, and connect the CONV IN lead from the 62S-1 to J9 located on the chassis of the KWM-1 between V10 and V19.

b. There are two ways to disable the PA screens:

(1) Connect a shielded lead to each terminal of the PA screen switch and turn switch off. PA screen switch is located on front of PA cage.

CAUTION

If the switch is left in the on position when operating vhf, the KWM-1 power supply will be overheated, and the 62S-1 may be damaged.

(2) Replace the switch with a two-hole phono receptacle and place plugs, with leads long enough to reach the outside of the KWM-1, in the phono receptacles.

c. Connect the KWM-1 to the 62S-1 with the phono connectors and cables as previously explained.

d. To return the KWM-1 to h-f operation with the 62S-1 connected, turn the 62S-1 function switch to the OFF or HF position. This connects the h-f antenna connected to J3 on the 62S-1 to the h-f antenna input jack on the KWM-1. To return to KWM-1 operation only (as in mobile h-f operation), disconnect the 62S-1 cables and place a jumper cable across the two jacks if the two-hole phono receptacle is used, or turn the PA SCREEN switch off if the switch was not removed.

NOTE

When the KWM-1 is used, one of the crystals will have to be exchanged to provide coverage from 14.0 to 14.2 mc. This is done as follows: Remove crystal Y4 (9100 kc) from its socket, and replace it by a 9050.00-kc crystal (Collins part number 291-8082-00).

1.2.4 CABLING WITH H-F LINEAR AMPLIFIER.

Figures 1-3 and 1-5 show the locations of jacks for external connections to a 30L-1 or 30S-1. The r-f input cable furnished with the 30S-1 has a length of 20.5 feet. Cut 7 feet from this length, and connect a phono plug (Collins part number 361-0062-00) to the remaining long cable. Add 7 feet to this cutoff cable if the 30S-1 is to be used only with the h-f set (62S-1 removed). The 30L-1 r-f input cable requires no modification. Figures 1-3 and 1-5 show 30L-1 and and 30S-1 Linear Amplifiers cabling when used with the 32S-( ) Transmitter and KWM-2/2A Transceiver respectively.

1.3 Initial Checks and Adjustments.

Check all connections to be sure that the interconnecting cables are plugged into the jacks appropriate to the particular station setup. Attempts to operate the station with incorrect cable connections may result in serious damage to the equipment.

After checking the connections, turn on the associated h-f equipment. Set the 62S-1 function switch to VHF OPR and the METER switch to PA PLATE, and wait 2 or 3 minutes for the equipment to warm up. Following warmup, place the system in transmit with no excitation. Set the MIC GAIN fully counterclockwise on the KWM-2/2A or 32S-( ) equipment. Set the BIAS ADJ (location shown in figure 4-1) to obtain 70-ma idling plate current. This need only be done once and checked periodically for a given installation.

In some KWM-2/2A or 32S-( ) equipment, the screen voltage supply may not be connected to the PA DISABLE jacks indicated in figures 1-2 through 1-5. The absence of idling plate current may indicate that the internal connections to these jacks are reversed. If this is found to be the case, turn off the equipment, and simply reverse the PA SG cables.

1.4 Antennas and Transmission Lines.

To obtain optimum performance on the vhf bands, care must be exercised in the selection and installation of the vhf antennas and transmission lines. Relatively small physical dimensions can become significantly large in terms of wavelength, and dielectric losses can consume a considerable portion of the transmitter output power.

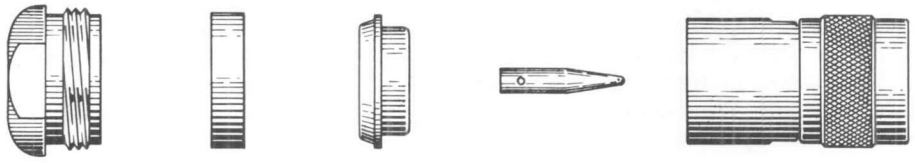
In general, single-band beam antennas will provide the best performance, especially on dx contacts. Three to five elements on 6 meters and eight or more elements on 2 meters can be considered minimum for serious vhf operation. Dual-band beams provide moderate gain and eliminate antenna switching requirements. A ground plane or half-wave coaxial antenna is satisfactory and convenient for local contacts. Antenna polarization is important, and it should be the same as is commonly used in the area.

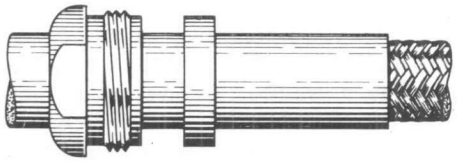
A multielement, high-gain beam antenna has a large aperture, or effective field, and the vicinity of the antenna should be free of large, conductive obstacles for a distance of several wavelengths. Assuming the antenna is installed several wavelengths above ground and is in the clear, added height will improve ground wave coverage, but it will do little to improve performance involving ionospheric propagation.

Low-loss transmission lines are required, since dielectric losses increase with frequency. For example, the power loss in 100 feet of RG-58/U cable at 144 mc is approximately 75 percent of transmitter output power. Nothing smaller than RG-8/U should be used for lengths in excess of a few feet. Avoid long cable runs whenever possible. Cables with foamed polyethylene dielectrics have appreciably less loss than equivalent solid-dielectric types. Cables with noncontaminating jackets are recommended also, because they deteriorate less with age.

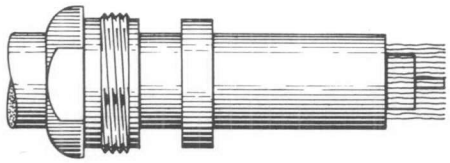
When making a vhf antenna installation using open-wire line, care should be taken to leave only enough slack in the transmission line at the antenna to allow for rotation. Excessive slack in conjunction with a supposedly balanced line (open-wire line, for example) can cause wide fluctuations in 62S-1 plate loading during windy weather. To avoid this condition, a coaxial transmission line and some type of balun feed arrangement are recommended with a balanced antenna.

ASSEMBLY INSTRUCTIONS FOR SERIES N TYPE UG-21D/U CONNECTOR

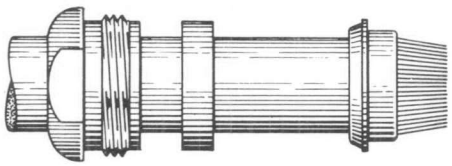




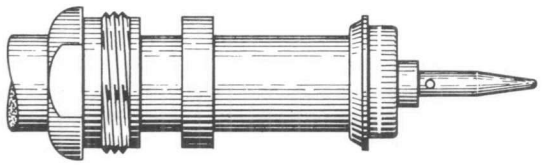
Place nut & gasket over cable, groove in gasket should face away from nut.
Cut off jacket 9/32" from end.



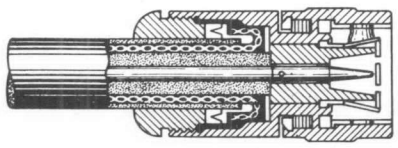
Comb out braid as shown.
Cut off cable dielectric 1/8" from end of jacket.
Make sure cut is square and center conductor is not nicked.



Pull braid wires forward and tape toward center conductor.
Place clamp over braid and push back against cable jacket.



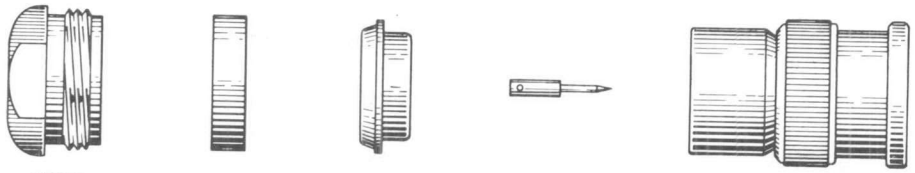
Fold back braid wires as shown, trim to proper length, and form over clamp as shown.
Solder contact to center conductor.
Do not use excessive solder or contact will not fit in connector body.

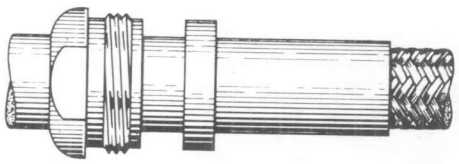


Insert cable and parts into connector body.
Make sure sharp edge of clamp seats properly in gasket.
Tighten nut to a snug fit.

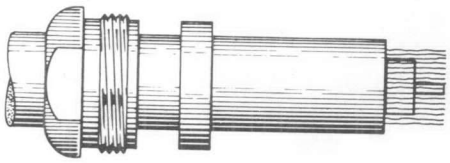
Figure 1-7. Connector Assembly Instructions, Series N

ASSEMBLY INSTRUCTIONS FOR SERIES BNC TYPE UG-88C/U CONNECTOR

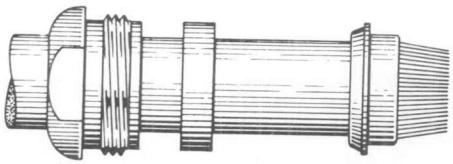




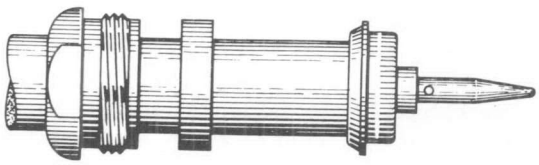
Place nut & gasket over cable, groove in gasket should face away from nut.
Cut off jacket 9/32" from end.



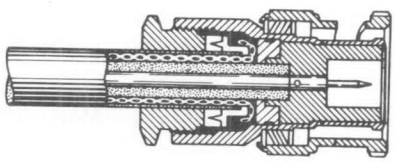
Comb out braid as shown.
Cut off cable dielectric 1/8" from end of jacket.
Make sure cut is square and center conductor is not nicked.



Pull braid wires forward and tape toward center conductor.
Place clamp over braid and push back against cable jacket.

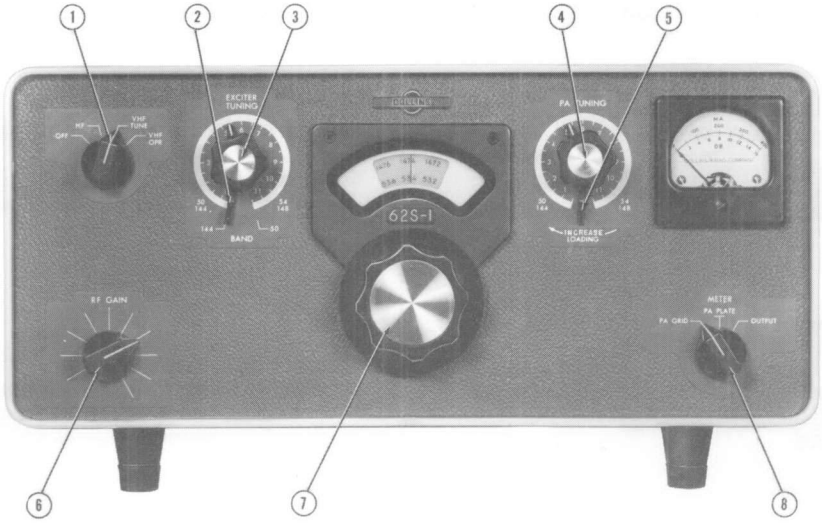


Fold back braid wires as shown, trim to proper length, and form over clamp as shown.
Solder contact to center conductor.
Do not use excessive solder or contact will not fit in connector body.



Insert cable and parts into connector body.
Make sure sharp edge of clamp seats properly in gasket.
Tighten nut to a snug fit.

Figure 1-8. Connector Assembly Instructions, Series BNC



1. Function switch
2. BAND selector
3. EXCITER TUNING control
4. PA TUNING control
5. LOADING lever
6. RF GAIN control
7. Main selector
8. METER switch

Figure 2-1. Front Panel Controls

section 2

operation

2.1 Tuning.

2.1.1 RECEIVE.

Set the h-f receiver (or transceiver) being used with the 62S-1 for normal reception at 14.0 mc. Set the 62S-1 as follows (refer to figure 2-1 for front panel control locations):

a. Set the function switch to VHF TUNE.
b. Set the RF GAIN control fully clockwise.
c. Set the BAND selector to the desired band (50 or 144).

NOTE

The 62S-1 VHF Converter is set up so that operation in the 2- and 6-meter bands are tunable in 200-kc segments. The associated h-f receiver used with the 62S-1 is used to tune the selected 200-kc segment by providing the necessary conversion of the 14.0- to 14.2-mc output from the 62S-1 to the audio intelligence desired.

d. Set the main selector to the desired 200-kc segment of the band. The frequency indicated on the dial is the lower edge of this segment. The selected 200-kc segment is tuned by tuning the h-f receiver (or transceiver) from 14.0 to 14.2 mc. For example, if the dial frequency indication is 50.4, the 200-kc segment can be tuned from 50.4 to 50.6 mc by tuning the associated h-f receiver from 14.0 to 14.2 mc respectively.
e. The h-f receiver (or transceiver) being used with the 62S-1 must be tuned as in normal h-f operation. When using a Collins transceiver, be sure that the EXCITER TUNING is always peaked while tuning from 0 to 200 on the dial. When using any one of the Collins 75S receivers, keep the PRESELECTOR control peaked up while tuning the dial from 0 to 200.

2.1.2 TRANSMIT.

2.1.2.1 PRELIMINARY CHECKS.

Before proceeding with the following tune-up procedures, make sure that the PA DISABLE jumper is disconnected in the KWM-2 or KWM-2A, and the appropriate modification has been made to the KWM-1 (see paragraphs 1.2.3.1 and 1.2.3.2). Perform the initial checks and adjustments as outlined in paragraph 1.3.

2.1.2.2 TUNEUP PROCEDURES USING KWM-1, KWM-2, AND KWM-2A.

a. Set 62S-1 function switch to VHF TUNE.
b. Set 62S-1 METER switch to PA GRID.
c. Set 62S-1 LOADING lever counterclockwise to the 3 o'clock position.
d. Set 62S-1 BAND selector to the desired band (50 or 144).
e. Position 62S-1 main selector to the desired 200-kc segment.
f. Set the XMIT GAIN control (on rear of 62S-1) fully clockwise.

NOTE

Step f need be performed only once upon initial setup.

g. Set KWM-2/2A band switch to the 14.0 position. Set the KWM-1 CRYSTAL UNIT switch to the 14.0 position.
h. Set the KWM-( ) main tuning dial to the frequency desired within the 200-kc segment selected on the 62S-1.

NOTE

As shipped from the factory, the KWM-1 tunes from 14.000 to 14.100 mc and then from 14.200 to 14.300 mc. This leaves a 100-kc gap needed for tuning the 200-kc segment selected on the 62S-1. To overcome this, remove the 9100-kc crystal from the CRYSTAL UNIT (13C-1) container, and replace it with a 9050-kc crystal (Collins part number 291-8082-00). With the new crystal installed, the first 100 kc of the 200-kc segment selected on the 62S-1 can be tuned with the KWM-1 CRYSTAL UNIT switch in the 14.0 position, while the second 100 kc of the 200-kc segment selected on the 62S-1, can be tuned with the KWM-1 CRYSTAL UNIT

switch in the 14.2 position. To restore the KWM-1 to normal operation (that is so it can operate from 14.2 to 14.3 mc) merely exchange the 9100- and 9050-kc crystals.

i. Set KWM-( ) METER switch to the GRID position.
j. Set the KWM-( ) MIC GAIN control fully counterclockwise.
k. Set the KWM-( ) PA TUNING control fully counterclockwise.
l. Set the KWM-2/2A EMISSION switch to the ON position. (Omit this step when using a KWM-1.)
m. Set KWM-( ) EMISSION switch to the LOCK position (TUNE position in KWM-1 transceivers with serial numbers below 861).
n. Advance the KWM-( ) MIC GAIN control, while rotating the 62S-1 EXCITER TUNING control until grid current is indicated on KWM-( ) Transceiver.
o. Rotate the 62S-1 EXCITER TUNING control until 62S-1 grid current is indicated.
p. Tune the KWM-( ) and 62S-1 EXCITER TUNING controls for maximum 62S-1 grid current, adjusting the KWM-( ) MIC GAIN control as necessary to keep the 62S-1 meter reading on scale.
q. Set 62S-1 meter switch to OUTPUT.
r. Tune the 62S-1 PA TUNING control and LOADING lever as follows: Advance the LOADING lever clockwise in small increments, adjusting the PA TUNING control for maximum output at each increment. Continue this process until a peak in output is obtained. Keep the 62S-1 grid current at about 1/4 scale (with the KWM-( ) MIC GAIN control) during tuning and loading.
s. Set the 62S-1 function switch to VHF OPR. Repeat the 62S-1 tuning and loading as described in step r, keeping the 62S-1 grid current at about 1/4 scale.
t. Set 62S-1 METER switch to PA PLATE, and note that the plate current is approximately 180 to 220 ma. If it is not, adjust the LOADING lever and PA TUNING control to bring it to within limits. Always adjust the PA TUNING control for maximum output with a given setting.

NOTE

The 62S-1 OUTPUT meter is only a relative indication of transmitter output and is useful as a tuning aid only. If an swr is present on the transmission line, the OUTPUT meter reading will depend on the length of the transmission line and may be high or low depending on whether a voltage loop or null exists at the the equipment end of the transmission line. Under high swr conditions (greater than 3 to 1), it may be impossible to pass through a loading peak. In this case, merely load for maximum obtainable output and monitor the plate current as described in the above steps (under such conditions it is also recommended that appropriate modifications be made to the antenna system to reduce the swr).

u. The following adjustment is made to ensure that the 62S-1 maintains control of the alc circuitry. This adjustment need be made only once upon initial setup or during maintenance. If the 62S-1 is to be used only on one band, 2 or 6 meters, make the following adjustment on that respective band only. However, if the 62S-1 is to be used on both 6 and 2 meters, make the following adjustment on the 2-meter band only.

(1) Set the KWM-( ) meter switch to PA GRID, and adjust the MIC GAIN to the grid current threshold point. Back off slightly on the MIC GAIN.
(2) Adjust the XMIT GAIN control (on the rear of the 62S-1) until grid current threshold is indicated on the 62S-1 meter. This ensures that the 62S-1 goes into grid current just before the associated h-f transmitter (or transceiver) does.
(3) Return the KWM-( ) to its normal operating condition as determined by steps n through s.

v. Set KWM-( ) EMISSION switch to the desired mode of operation, and operate as in normal h-f operation.

2.1.2.3 TUNEUP PROCEDURES USING 32S-1, 32S-2, OR 32S-3.

a. Set 62S-1 function switch to VHF TUNE.
b. Set 62S-1 METER switch to PA GRID.
c. Set 62S-1 LOADING lever counterclockwise to the 3 o'clock position.
d. Set 62S-1 BAND selector to the desired band (50 or 144).
e. Set 62S-1 main selector to the desired 200-kc segment.
f. Set 62S-1 XMIT GAIN control (on rear of 62S-1) fully clockwise.

NOTE

Step f need be performed only once upon initial setup.

g. Set the 32S-( ) FREQ CONTROL to the TRANS VFO position (REC VFO when using transceiver operation).
h. Set 32S-( ) MIC GAIN counterclockwise to the stop.
i. Set 32S-( ) EXCITER TUNING to 14.
j. Set 32S-( ) band switch to 14.0.
k. Set 32S-( ) main tuning dial to the frequency desired within the 200-kc segment selected on the 62S-1. When in transceive operation, set the receiver main tuning dial to the desired frequency.
l. Set 32S-( ) PA TUNING control counterclockwise to the stop.
m. Set 32S-( ) meter switch to PA GRID.
n. Set 32S-( ) EMISSION switch to LOCK KEY.
o. Advance the 32S-( ) MIC GAIN control while rotating the EXCITER TUNING control until grid current is indicated on the 32S( ).
p. Rotate the 62S-1 EXCITER TUNING control until 62S-1 grid current is indicated.

q. Tune the 32S-( ) and 62S-1 EXCITER TUNING control for maximum 62S-1 grid current, adjusting the 32S-( ) MIC GAIN control as necessary to keep the 62S-1 meter reading on scale.

r. Set 62S-1 meter switch to OUTPUT.

s. Tune 62S-1 PA TUNING control and LOADING lever for maximum output as follows: Advance the LOADING lever clockwise in small increments, adjusting the PA TUNING control for maximum output at each increment. Continue this process until a peak in output is obtained. Keep the 62S-1 grid current at about 1/4 scale during tuning and loading by adjusting the 32S-( ) MIC GAIN control accordingly.

t. Set 62S-1 function switch to VHF OPR, and repeat the 62S-1 PA tuning and loading as described in step s, keeping the 62S-1 grid current at about 1/4 scale.

u. Set the 62S-1 METER switch to PA PLATE, and note that the plate current is approximately 180 to 220 ma. If it is not, adjust the LOADING lever and PA TUNING control to bring it to within limits. Always adjust the 62S-1 PA TUNING control for maximum output with a given load setting.

NOTE

The 62S-1 OUTPUT meter is only a relative indication of transmitter output and is useful mainly as a tuning aid only. If an swr is present on the transmission line, the OUTPUT meter reading will depend on the length of the transmission line and may be high or low depending on whether a voltage loop or null exists at the equipment end of the transmission line.

Under high swr conditions (greater than 3 to 1), it may be impossible to pass through a loading peak. In this case, merely load for maximum obtainable output, and monitor the plate current as prescribed in the above steps (under such conditions it is also recommended that appropriate modifications be made to the antenna system to reduce the swr).

v. The following adjustment is made to ensure that the 62S-1 maintains control of the alc circuitry. This adjustment need be made only once upon initial setup or during maintenance. If the 62S-1 is to be used only on one band, 2 or 6 meters, make the following adjustment on that respective band only. However, if the 62S-1 is to be used on both 2 and 6 meters, make the following adjustment on the 2-meter band only.

(1) Set the 32S-( ) METER switch to PA GRID and adjust the 32S-( ) to the grid current threshold point. Back off slightly on the MIC GAIN control.

(2) Adjust the XMIT GAIN control (on rear of 62S-1) until grid current threshold is indicated on the 62S-1 meter. This ensures that the 62S-1 goes into grid current just before the 32S-( ) does.

(3) Return the 32S-( ) to its normal operating condition as determined by steps o through t.

w. Set 32S-( ) EMISSION switch to the desired mode of operation and operate as in normal h-f operation.

2.1.2.4 TUNEUP PROCEDURES USING ASSOCIATED EQUIPMENT OTHER THAN COLLINS.

a. Set 62S-1 function switch to VHF TUNE.

b. Set 62S-1 METER switch to PA GRID.

c. Set 62S-1 LOADING lever counterclockwise to the 3 o'clock position.

d. Set 62S-1 BAND selector to the desired band (50 or 144).

e. Set 62S-1 main selector to the desired 200-kc segment.

f. Set 62S-1 XMIT GAIN control (on rear of 62S-1) fully clockwise.

NOTE

Step f need be performed only once upon initial setup.

g. Set the associated h-f transmitter (or transceiver) controls to their approximate positions, that is, as they would normally be set for the frequency desired within the 200-kc segment selected on the 62S-1 (see following note). Do not key the transmitter (or transceiver) as yet.

NOTE

The h-f transmitter (or transceiver) must be tuned from 14.000 to 14.200 mc to cover the 200-kc segment selected on the 62S-1. For example, if the desired transmitting frequency is 144.175 mc, then with the 62S-1 main tuning selector set at 144.0, the associated h-f transmitter (or transceiver) must be tuned to 14.175 mc.

h. Advance the drive to the 62S-1, while adjusting the 62S-1 EXCITER TUNING control and h-f transmitter (or transceiver) controls until maximum 62S-1 grid current is indicated.

i. Tune the 62S-1 PA TUNING control and LOADING lever for maximum output as follows: Advance the LOADING lever clockwise in small increments, adjusting the PA TUNING control for maximum output at each increment. Keep the 62S-1 grid current at about 1/4 scale during tuning and loading by adjusting the drive (from the h-f transmitter or transceiver) accordingly. Continue this process until a peak in output is obtained. Keep the 62S-1 grid current at about 1/4 scale during tuning and loading by adjusting the drive to the 62S-1 accordingly.

j. Set the 62S-1 function switch to VHF OPR. Repeat the 62S-1 tuning and loading as described in step i, keeping the 62S-1 grid current at about 1/4 scale.

k. Set the 62S-1 METER switch to PA PLATE, and note that the plate current is approximately 180 to 220 ma. If it is not, adjust the INCR LOAD lever and PA TUNING control to bring it to within limits. Always adjust the 62S-1 PA TUNING control for maximum output with a given load setting.

NOTE

The 62S-1 OUTPUT meter is only a relative indication of transmitter output and is useful mainly as a tuning aid only. If an swr is present on the transmission line, the OUTPUT meter reading will depend on the length of the transmission line and may be high or low depending on whether a voltage loop or null exists at the equipment end of the transmission line.

Under high swr conditions (greater than 3 to 1), it may be impossible to pass through a loading peak. In this case, merely load for maximum obtainable output, and monitor the plate current as prescribed in the above steps. (Under such conditions, it is also recommended that appropriate modifications be made to the antenna system to reduce the swr.)

l. If the associated h-f transmitter (or transceiver) being used has an automatic loading control (alc) circuit incorporated, the following adjustment must be made to ensure that the 62S-1 maintains control of the alc circuitry. This adjustment need be made only once upon initial setup or during maintenance. If the 62S-1 is to be used only on one band, 2 or 6 meters, make the following adjustments on that respective band only. However, if the 62S-1 is to be used on both 2 and 6 meters, make the following adjustments on the 2-meter band only.

(1) Adjust the h-f transmitter (or transceiver) output control to the grid current threshold point on the h-f transmitter (or transceiver) output control.

(2) Adjust the 62S-1 XMIT GAIN control (on rear of 62S-1) until grid current threshold is indicated on the 62S-1 meter. This ensures that the 62S-1 goes into grid current just before the associated h-f transmitter (or transceiver) does.

(3) Return the h-f transmitter (or transceiver) output control to its normal operating condition as determined by steps h through j.

m. Set the h-f transmitter (or transceiver) to the desired mode of operation and operate as in normal h-f operation.

2.1.3 GENERAL.

When changing bands, make sure the 62S-1 BAND selector is firmly against the applicable stop.

2.1.3.1 OVER-ALL SYSTEM STABILITY.

All crystals used in the 62S-1 have a 0.0005 percent frequency tolerance (50 parts per million). The frequency tolerance of the 62S-1 at the low end of the 6-meter band is 1.78 kc, while that at the high end is 2 kc. The frequency tolerance of the 62S-1 at the low end of the 2-meter band is 6.48 kc while that at the high end is 6.7 kc.

The over-all frequency stability of the system will depend not only on the stability of the 62S-1 but also on the stability of the associated h-f equipment.

2.2 SSB and CW Operation.

When tuning is completed, set the exciter EMISSION switch to USB, LSB, or CW, as desired. Proceed as with normal h-f station operation. When using a 75S-( ) receiver and a 32S-( ) transmitter, or KWM equipments, receive and transmit frequencies may be separated by as much as 200 kc by using separate transmitter and receiver vfo's.

2.3 AM Operation.

The 62S-1 may be used as a linear converter-amplifier for any AM exciter capable of furnishing 0.07-volt rms average carrier signal into a 50-ohm load in the 14.0- to 14.2-mc range. Care should be taken not to overdrive the 62S-1, because clipping of the envelope peaks will result. However, the AM exciter can be equipped with an amplifier capable of being controlled by the 62S-1 alc voltage to prevent clipping on modulation peaks. When properly adjusted, the d-c plate current of the 62S-1 should be slightly above the 70-ma idling value with no modulation. The average power output on AM will be approximately 18 to 20 watts. The 62S-1 output tank components have insufficient voltage ratings for high-level amplitude modulation. Only linear conversion and amplification of an AM signal is recommended.

2.4 Operation with 30L-1 or 30S-1 Linear Amplifiers.

When the 62S-1 function switch is in the OFF or HF position, the procedures for station operation are the same as if the 62S-1 were not used. When the 62S-1 function switch is in the VHF TUNE or VHF OPR position, the following switching takes place: The ANT RELAY line between the KWM-2/32S-( ) and the 30L-1 or 30S-1 is opened. This prevents keying of the 30L-1 or 30S-1 relays when transmitting on vhf (30L-1 or 30S-1 inoperative). The R-F OUTPUT line of the KWM-2/32S-( ) is internally switched from the 30L-1 or 30S-1 to the 62S-1. Therefore, the 30L-1 or 30S-1 is inoperative when operating vhf.

2.5 Operation of the 62S-1 with a VHF Linear Amplifier.

2.5.1 GENERAL.

A vhf linear amplifier may be used, with the 62S-1 acting as exciter-driver, if appropriate control circuitry is provided. Such circuitry should consist of alc provisions, high-power and antenna switching provisions, and additional bias, filament, and plate (or plate and screen) power supplies. Control circuitry such as that used in 30L-1 or 30S-1 h-f linear amplifiers may be used.

2.5.2 62S-1, VHF LINEAR AMPLIFIER INTERCONNECTIONS.

Perform the applicable vhf station hookup as illustrated in figures 1-1 through 1-5. In addition, make the following connections:

Cable Type	From (62S-1)	To (VHF Linear)
RG-58/U	VHF ANT. RY	ANT RY (This connector provides a ground for keying the vhf linear on transmit when the vox circuit in the exciter is energized.)
RG-8/U or RG-58/U	VHF RF OUT	RF IN (This gives excitation to the linear.)
RG-58/U	ALC	ALC (Linear should have an alc detector, junction all alc lines.)

Tune and operate the vhf linear as applicable.

2.6 Television Interference.

Due to the proximity of the 6- to 2-meter bands to television channels, television interference may be experienced in some areas. Inadequate selectivity in the television receiver r-f stages frequently will result in fundamental overload interference. Corrective measures in this case must be taken at the television receiver. As a matter of good practice however, an earth-ground connection should be made to the transmitter chassis using heavy strap or braid which is as short as possible. In extreme cases, it may be necessary to adjust the length of this lead so that it becomes a multiple of a half-wavelength at the most troublesome transmit frequency.

Fundamental overload resulting from 6-meter operation usually can be cured by installing a high-pass filter at the tuner of the television set. The filter must be a sharp-cutoff type designed for 6-meter rejection such as the Drake model TV-300-HP. The manufacturer of the television receiver often will supply a filter at no charge upon request by the set owner.

Since the 2-meter band is located between the low-band and high-band portions of the vhf television spectrum, a high-pass filter will not reject 2-meter signals. However, a quarter-wave open stub at the 2-meter operating frequency made of 300-ohm twin lead and attached to the TV tuner antenna terminals is quite effective. To make the stub, cut a piece of twin lead to approximately 18 inches, strip one end, and attach this end to the television tuner. With the 62S-1 keyed to produce the interfering signal, prune the stub in 1/4-inch increments until the interference disappears. For convenience, the stub can be connected to the antenna terminals on the back of the set. The stub then will be considerably shorter, depending upon the length of lead between the antenna terminals and the tuner. Some improvement may be obtained by using series-resonated wave traps shunted across the TV input terminals, or parallel-resonated wave traps connected in series with each side of the balanced line. In both cases, the traps should be adjusted for minimum interference effect on the TV set while the interfering signal is present.

When engaged in local contacts, especially when high-performance antennas are used at both stations, extremely high signal levels may be applied to the 14.0- to 14.2-mc receiver being used. As a result, overloading and distortion may occur in the 14.0- to 14.2-mc receiver. The 62S-1 RF GAIN control may be adjusted to eliminate overloading; however, better system noise figures will be realized if the h-f equipment r-f gain control is used to adjust the system gain instead of using the 62S-1 RF GAIN control.

When tuning the 2-meter band, carriers will be found on approximately 144.0, 144.2, 145.0, 145.8, and 146.0 mc. In cases where the 40.0-mc crystal is used to cover 148.0 to 148.2 mc, a signal will also be found on approximately 148.0 mc. Some of these signals will be very weak, while the 144.0- and 148.0-mc signals will be the strongest. The above carrier signals are the result of the crystal-saving scheme used to obtain the 2-meter injection. Their presence is mentioned so operators will recognize them upon tuning them in.

2.7 Frequency Coverage.

Table 2-1 contains a list of crystal frequencies and operating bands that may be covered with the 62S-1 VHF Converter.

TABLE 2-1. CRYSTAL FREQUENCIES AND OPERATING BANDS

BAND-SWITCH POSITION	FREQUENCY BAND (mc)	CRYSTAL SUPPLIED (mc)
50	49.6-49.8	35.6
144	143.6-143.8	(Not supplied, CPN 289-2111-00)

TABLE 2-1. CRYSTAL FREQUENCIES AND OPERATING BANDS (Cont)

BAND-SWITCH POSITION	FREQUENCY BAND (mc)	CRYSTAL SUPPLIED (mc)
50 144	49.8-50.0 143.8-144.0	35.8 (Not supplied, CPN 289-2112-00)
50 144	50.0-50.2 144.0-144.2	36.0
50 144	50.2-50.4 144.2-144.4	36.2
50 144	50.4-50.6 144.4-144.6	36.4
50 144	50.6-50.8 144.6-144.8	36.6
50 144	50.8-51.0 144.8-145.0	36.8
50 144	51.0-51.2 145.0-145.2	37.0
50 144	51.2-51.4 145.2-145.4	37.2
50 144	51.4-51.6 145.4-145.6	37.4
50 144	51.6-51.8 145.6-145.8	37.6
50 144	51.8-52.0 145.8-146.0	37.8
50 144	52.0-52.2 146.0-146.2	38.0
50 144	52.2-52.4 146.2-146.4	38.2
50 144	52.4-52.6 146.4-146.6	38.4
50 144	52.6-52.8 146.6-146.8	38.6
50 144	52.8-53.0 146.8-147.0	38.8
50 144	53.0-53.2 147.0-147.2	39.0
50 144	53.2-53.4 147.2-147.4	39.2
50 144	53.4-53.6 147.4-147.6	39.4
50 144	53.6-53.8 147.6-147.8	39.6
50 144	53.8-54.0 147.8-148.0	39.8
50 144	54.0-54.2 148.0-148.2	40.0 (Not supplied, CPN 389-2133-00)

section 3

principles of operation

3.1 General.

The 62S-1 VHF Converter is a 6- and 2-meter transmitting and receiving converter covering the ranges of 49.6 to 54.2 mc and 143.6 to 148.2 mc in 200-kc increments. The associated h-f transmitter and receiver must cover the range of 14.0 to 14.2 mc. A block diagram of the 62S-1 is shown in figure 3-1. The schematic diagram is shown in figure 7-1.

The transmitter portion of the 62S-1 consists of five stages: a mixer, V1, in which the h-f exciting signal is converted to the vhf operating frequency; three linear voltage amplifiers, V2, V3, and V4; and a linear power amplifier, V5, operating in class AB_1. Plate voltage is removed from the mixer and the first voltage amplifier while receiving.

The receiver portion consists of a triode r-f amplifier, V7, and a triode mixer, V8, to convert received vhf signals to the h-f receive frequency. Internal relays ground the r-f amplifier grid and remove plate voltage from both the r-f amplifier and the mixer while transmitting.

Injection voltage for both the transmitter mixer and the receiver mixer is supplied by an oscillator-amplifier system, V6, V9, and V10. The crystal oscillator, V6, uses 23 crystals spaced 200 kc apart to provide a total range of 4.6 mc on either 6 or 2 meters. For 2-meter operation, a second crystal oscillator is switched into the circuit, and the 94-mc output from this oscillator is mixed with the output of the first crystal oscillator to provide the required injection frequencies.

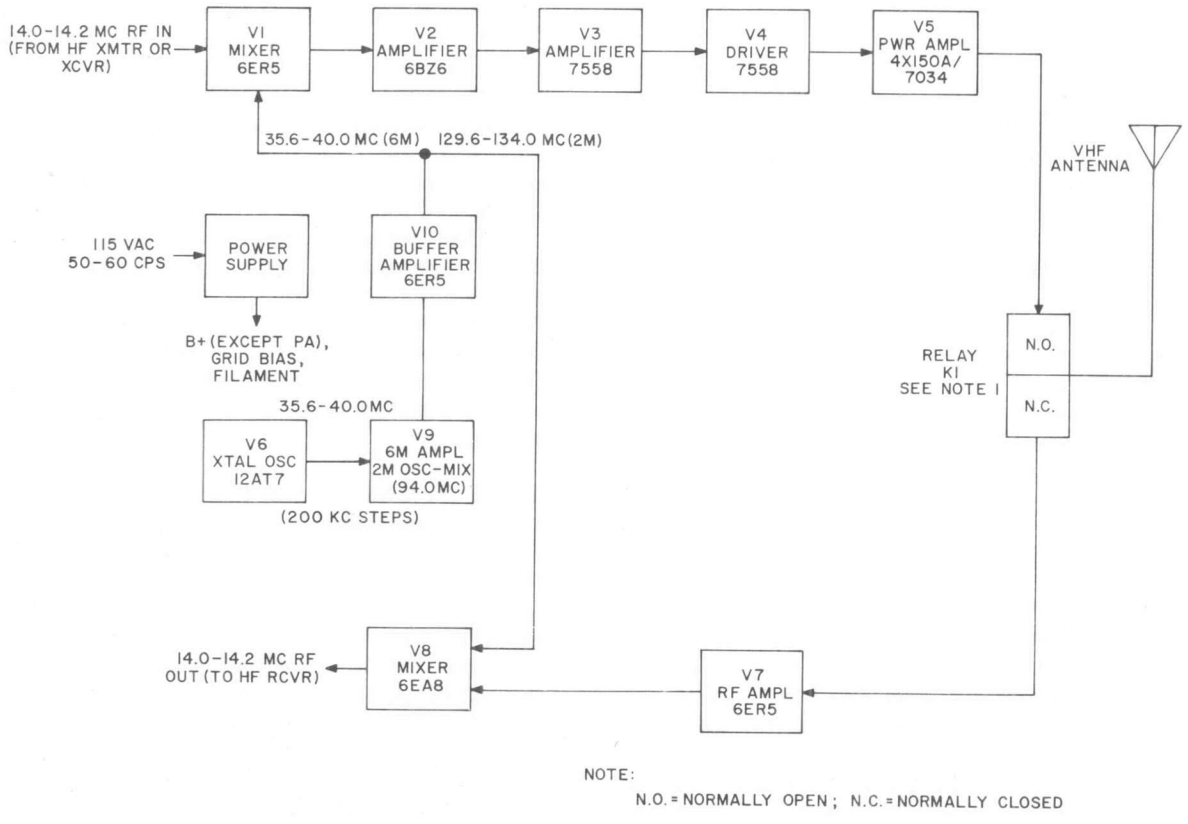


Figure 3-1. 62S-1 VHF Converter, Block Diagram

SECTION 3
Principles of Operation

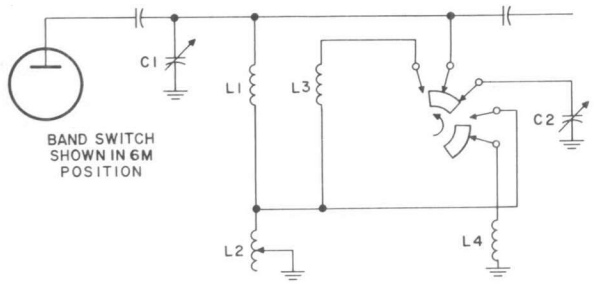


Figure 3-2. Band Switching, Simplified Schematic Diagram

3.2 Transmitter Circuits.

A simplified diagram of the transmitter tuned circuits and the bandswitching scheme is shown in figure 3-2. The net inductance of L1 in series with L2 is parallel tuned to the 6-meter band by the combination of C1, C2, and circuit capacitance. Tuning within the band is done by varying the inductance of L2 which consists of a circular ring with a rotating wiper arm. When operating on 2 meters, C2 is switched out of the circuit, L3 is switched in parallel with L1, and L4 is switched in parallel with L2. This reduces the net inductance of the circuit and the inductance range of L2 to provide the proper LC ratio and tuning range for 2-meter operation. The PA plate circuits operate on the same principle with slight differences to accommodate PA operating parameters. The PA tank circuit is resonated on 2 meters by the output capacitance of V5, the PA tube. A trimmer to provide additional capacitance is switched into the circuit on 6 meters. Double contacts are used on the PA bandswitch wafer to reduce inductive effects and to handle the circulating r-f current. Link output coupling is used with a series variable capacitor for loading adjustments.

The power amplifier stage uses a 7034/4X150A tube which has an external anode requiring forced-air cooling. With the air supply provided in the 62S-1, plate dissipation should be held to a maximum of 120 watts. The PA grid circuit includes an alc rectifier consisting of diodes CR1 and CR2 connected as a half-wave doubler. An external load resistance of approximately 2 megohms is required, and usually is part of the h-f exciter alc circuit.

3.3 Receiver Circuits.

Triode tubes are used in the r-f amplifier and mixer stages to minimize noise. The type 6ER5 tube used in these stages employs a partial shield between grid and plate to reduce grid-to-plate capacitance, thereby easing neutralizing requirements. Neutralization is used only on 2 meters, and there the principal function is to obtain a lower noise figure. An r-f gain control is included in the r-f amplifier cathode circuit so that the gain can be reduced when extremely strong unwanted signals are present near the desired signal frequency. Four tuned circuits in the mixer plate circuit provide a uniform response across the i-f output range, but response outside the passband is rapidly attenuated to minimize spurious responses.

The vhf tuned circuits and bandswitching in the receiver portion function in essentially the same way as those in the transmitter. An additional contact is used on bandswitch wafers in Z6 and Z7 to switch the neutralizing coil, L36, into the circuit on 2 meters. The variable inductor rings, illustrated by L2 in figure 3-2, are ganged to the main dial so that the 62S-1 receiver tuning tracks with the 200-kc band selected on the dial. This eliminates the need for broadband r-f circuits and provides a significant reduction in cross modulation over an equivalent broadband system.

3.4 Frequency Conversion System.

An oscillator-amplifier system provides injection frequencies for frequency conversion. The system consists of the master oscillator subunit, a second stage which functions as an amplifier on 6 meters and as an oscillator-mixer on 2 meters, and a third stage which is an injection amplifier on both bands. The second and third stages are located in the receiver subunit.

The master oscillator, V6, is crystal controlled using 23 selectable crystals to provide output frequencies from 35.6 to 40.0 mc in 200-kc steps. This frequency range provides transmitter output in the 6-meter band when mixed additively with 14.0- to 14.2-mc output from the exciter. A difference mix in the receiver mixer, V8, converts received 6-meter signals to the h-f range. Tube V10 and the pentode section of V9 are used as buffer amplifiers. On 2 meters, the two sections of V9 function as a 94-mc crystal-controlled oscillator. The pentode section also serves as a mixer. Output frequencies from the master oscillator are mixed additively with 94 mc to produce injection frequencies ranging from 129.6 to 134.0 mc. These injection frequencies then are used to heterodyne the h-f excitation to 2-meter operating frequencies and to convert received 2-meter signals to the h-f range.

Tuned circuits are used in the plate circuits of both crystal oscillators, V6 and V9, and the injection amplifier, V10. The plate circuit of V6 uses 23 selectable coils which are mounted on a turret. The appropriate coil is switched into the circuit in conjunction with the crystal selected. Both the turret and the crystal selector switch are controlled by the main selector. A double-tuned circuit, Z10, is switched into the pentode plate circuit of V9 on 2 meters to suppress unwanted mixing products. The inductor rings of Z10 are ganged to the main dial for in-band tuning. Switch sections S11, S12, and S13 are ganged to the bandswitch. A parallel-tuned trap, FL2, provides added attenuation to spurious products on 2 meters.

3.5 Control Circuits.

The basic functions of the 62S-1 control circuits are to provide compatible operation with h-f exciter vox and control circuits and convenient switching from h-f to vhf. For vhf operation, the following switching is done by the 62S-1 function switch in VHF TUNE and VHF OPR positions:

a. Screen voltage is switched from the exciter PA to the 62S-1 PA by S15B-front.

b. Exciter vox control circuits, which must furnish a ground to transmit, are connected via the HF ANT. RELAY IN jack and S15B-rear to the coil of relay K1 which is connected in series with the coil of K3. Plate voltage is connected to the opposite coil terminal of K3 via S15A-rear. Keying the exciter then keys the 62S-1 also.

c. The HF RF IN jack is connected to the 62S-1 receiver output circuit by S15A-front. Converted vhf signals are routed to the h-f receiver via this jack and the h-f antenna changeover relay (built into Collins exciters).

d. The keying circuit to the HF ANT. RELAY OUT jack is disabled by S15B-rear so that the associated h-f linear amplifier, if used, is not keyed by the h-f exciter control circuits when operating vhf.

section 4

service instructions

4.1 General.

This section covers maintenance and service of the 62S-1 VHF Converter. It includes information on trouble analysis, disassembly and reassembly, signal tracing procedures, voltage and resistance measurements, and alignment procedures. The usefulness of signal level and alignment data given depends upon the accuracy of the test equipment used. Except for an occasional touchup to compensate for possible component aging, alignment normally will be necessary only if frequency-determining components have been replaced. If any soldered parts are removed or replaced at terminals to which a diode is connected, be sure to attach an alligator clip to the diode lead. This clip acts as a heat sink to protect the diode.

WARNING

Be sure to turn off exciter and disconnect the 800-volt d-c to the 62S-1 before making any repairs.

4.2 Removal and Replacement of Subunits.

Subunit removal and replacement requires that the 62S-1 cabinet be removed. To remove the cabinet, disconnect all external leads and unplug the power cable. Lift the cabinet lid, and remove the two flathead screws which hold the chassis to the trim ring. Holding the lid down, carefully turn the 62S-1 over, and remove the four feet and the screw located midway between the rear feet. Carefully turn the 62S-1 over again and, from the rear, push the chassis forward until the front panel protrudes from the cabinet about 1 inch. Grasp the front panel at the edges, and slide the chassis out of the cabinet. Make sure the power cord clears the rear of the cabinet. Refer to section VI for chassis parts locations.

The following tools are needed for proper removal and replacement of the various subunits:

a. No. 4, 6, and 8 Bristo wrenches (as furnished with the 62S-1).
b. No. 1 flathead screwdriver (medium size).
c. Six-inch long-nosed pliers.
d. Soldering iron.
e. Rosin-core solder.
f. No. 1 and 2 Phillips-head screwdrivers.

4.2.1 REMOVAL OF TRANSMITTER SUBUNIT.

a. Set EXCITER TUNING control fully clockwise to the stop.
b. Loosen setscrews on exciter tuning pulley MP4.
c. Slide pulley forward onto dummy shaft mounted on front panel, and retighten one setscrew.
d. Remove retaining clip on band-switch linkage which holds MP29 to MP37.
e. Loosen setscrews on loading capacitor pulley MP15. Do not remove pulley. Turn LOADING lever as necessary to obtain access to setscrews.
f. Set LOADING lever to counterclockwise stop, and tape dial cable to the two pulleys. Make sure cable is held into pulley grooves.
g. Loosen front setscrew in PA tuning shaft coupler MP24.
h. Pull loading capacitor pulley MP15 off shaft.
i. Pull PA TUNING knob away from front panel until rear of shaft disengages from PA tuning shaft coupler.
j. Remove PA compartment top cover, and disconnect high voltage lead from junction of L7 and C45. Note color code.
k. Disconnect power wires from tie points on rear of PA compartment. Be sure to record location and color code of wires for reference in reassembly.
l. Unplug r-f output cable.
m. Snap meter lamp socket out of meter.
n. Turn chassis on side (power transformer down), and disconnect power leads routed through chassis grommet and connected to terminal strips TB9, TB10, and TB11. Be sure to note wire locations and color codes.
o. Pull cable through grommet from top side of chassis.
p. Unplug the two exciter r-f cables located on bottom of transmitter subunit.
q. Remove seven retaining screws (heads painted green) which hold subunit to chassis, slide subunit slightly to rear, and carefully lift away from chassis. Side plates may be removed as required for service.

4.2.2 REPLACEMENT OF TRANSMITTER SUBUNIT.

a. Turn exciter tuning shaft of transmitter subunit counterclockwise until wipers on inductor rings are at end of associated rings. Be sure that wipers make contact with rings. Inspect all wipers.
b. Using the reverse of removal procedure, slide subunit into place on chassis, replace retaining screws, and reconnect all wires and cables.
c. Set loading capacitor C50 to minimum capacitance.

d. Slide PA tuning shaft into coupler, and rotate phenolic tuning shaft MP14 in PA compartment until wiper is at end of tuning ring.

e. Set PA TUNING knob to next mark past 11 on dial, make sure that tuning shaft is recessed well into the shaft coupler, and retighten coupler setscrew.

f. Slide loading capacitor pulley MP15 onto capacitor shaft so that upper and lower pulleys are in line. Be sure that MP15 is on shaft far enough to engage setscrew stops. Remove tape.

g. With LOADING lever set at 9, tighten one setscrew on MP15, move LOADING lever as necessary to obtain access to remaining setscrew, and tighten.

h. Loosen setscrews holding exciter tuning pulley MP4 to dummy shaft.

i. Making sure that the grounding spring is in place on exciter tuning shaft MP8, slide pulley onto MP8 far enough to compress fingers on spring. Tighten setscrews

j. Re-engage band-switch linkage, and replace retaining clip.

k. Replace meter lamp socket in meter.

l. Turn chassis on end and rotate EXCITER TUNING knob to opposite stop. Check positions of wipers on inductor rings to make sure that wipers make contact with end of rings. If necessary to adjust mechanical alignment, loosen setscrews on exciter tuning pulley and slip tuning shaft to proper position. Retighten setscrews and check wiper position at opposite end of rotation.

4.2.3 REMOVAL OF OSCILLATOR SUBUNIT.

a. Unsolder the two wires on the bottom side of the chassis that route through the rubber grommet and into the oscillator subunit.

b. Unplug W3 (the cable which connects the receiver subunit to the oscillator subunit) from jack J25 (located on top of the oscillator subunit).

c. Set the main tuning dial to 143.6 (49.6) mc.

NOTE

With the main tuning dial set at 143.6 (49.6) mc, the oscillator shaft will be positioned fully counterclockwise with the main tuning dial fully clockwise.

d. Loosen the two rear setscrews (as viewed from the front of the 62S-1) on coupler MP31 (the oscillator tuning shaft coupler) with a number 10 Bristo wrench.

e. Loosen the screw on the clamp behind the dial on the main tuning dial shaft (accessible from the bottom of the unit through the hole in the dial shield) with a number 10 Bristo wrench. Pull the main dial tuning knob off its respective shaft.

f. Slide the main tuning dial shaft forward (toward the front panel) as far as possible. Tighten down the clamp loosened in step e so that the main tuning dial shaft will not accidentally slip out.

g. Remove the four greenheaded mounting screws securing the oscillator subunit to the chassis (these mounting screws are located on the bottom side of the chassis).

h. Lift the oscillator subunit from the chassis.

4.2.4 REPLACEMENT OF OSCILLATOR SUBUNIT.

a. Set the main tuning dial on the 62S-1 to 143.6 (49.6) mc (maximum clockwise).

b. Set switch S7 to crystal position 1. This is done by turning the oscillator subunit switch shaft to its maximum counterclockwise position.

c. Install the oscillator subunit on the chassis, making sure that the two power leads protruding from the bottom of the subunit are routed through the rubber grommet on the chassis to TB1 (see figure 6-2). Secure the oscillator subunit to the chassis with the four greenheaded mounting screws provided. The four greenheaded mounting screws are mounted from the underside of the chassis.

d. Loosen the screw on the clamp behind the dial on the dial shaft. Pull the dial shaft forward toward the oscillator subunit until the coupler on the dial shaft engages with the oscillator subunit switch shaft. Coupler MP31 (figure 6-1) should be positioned over the oscillator switch shaft so that the two setscrews (as viewed from the front of the 62S-1) are positioned about 1/8 inch from the end of the shaft. Tighten the most accessible of these setscrews.

e. Install the main tuning dial knob on it respective shaft. Rotate the dial shaft slightly, if necessary, so that the hair line is between 3 and 4 of the 143.6-mc calibration. Tighten the screw on the dial clamp.

f. Rotate the main tuning dial as necessary to obtain access and tighten the remaining shaft coupler setscrew.

g. Connect and solder the DA91 (white-brown) wire to the grounded terminal on TB1. Connect and solder the DA92 wire from the oscillator subunit to the solder lug on top of CR9 (see figure 6-2).

h. Check the position of the wipers and inductor rings in the receiver subunit at the main dial end stops. The wipers must make contact with the end of the rings at the end of each rotation. See the receiver subunit installation procedure if adjustments are necessary.

4.2.5 REMOVAL OF RECEIVER SUBUNIT.

a. Set main dial to 143.6 (49.6) mc.

b. Loosen setscrews on receiver tuning shaft pulley MP5, slide pulley forward onto dummy shaft mounted on front panel, and retighten one of the setscrews.

c. Remove the retaining clip which holds receiver band-switch arm MP32 to band-switch linkage arm MP37.

d. Unplug the r-f cables from J25, J28, J29, and FL2.

e. Remove the dial lamp socket assembly from the mounting bracket.

f. Set chassis on end (power transformer down), and disconnect receiver power leads from terminal strips TB4 and TB5. Be sure to record color code and locations of wires for reference in reassembly.

g. Pull the leads from TB4 to top of chassis through grommet adjacent to relay K2.

h. Remove the four retaining screws (heads painted green) which hold subunit to main chassis, and carefully remove receiver subunit.

4.2.6 REPLACEMENT OF RECEIVER SUBUNIT.

a. Set receiver tuning shaft MP6 to the end of maximum clockwise rotation, and check all inductor ring wipers to be sure that each wiper makes contact with the end of the associated ring. If required, make adjustments to individual wipers by loosening setscrews in the wiper hub. Be sure to retighten setscrews upon completion of adjustments.

b. Replace subunit on main chassis, using reverse of removal procedure.

c. After reconnecting all power leads, r-f cables, dial lamp sockets, and mechanical linkage, rotate the main dial to 148.0 mc.

d. Through the access cutouts in the main chassis, check to be sure that each inductor ring wiper makes contact with the counterclockwise end of the associated inductor ring. If an adjustment is necessary, loosen the setscrews in receiver tuning pulley MP5, rotate the tuning shaft to the required position, and retighten the setscrews. Set the main dial to the opposite end of rotation and recheck wiper positioning.

4.3 Trouble Analysis.

Many causes of trouble can be traced to defective tubes. Many tube checkers cannot duplicate the conditions under which the tubes operate in the 62S-1. Substitution of new tubes will sometimes clear an obscure case of tube trouble. Intermittent trouble conditions in tubes can usually be discovered by lightly tapping the tube envelopes. Occasionally tube pins or socket terminals will become dirty or corroded, causing an intermittent condition. When this situation is suspected, remove the tube and apply a few drops of contact cleaner to the tube pins. Replace the tube, and work it up and down in the socket a few times. Gassy tubes are indicated by their relatively intense blue glow during attempted operation. Interelectrode leakage is a common tube condition that causes trouble at very high frequencies. Shorted tubes or capacitors will often cause associated resistors to overheat and crack, blister, or discolor. Making the measurements listed in table 4-1 will help to isolate this type of trouble to a particular stage or component.

At high frequencies such as are encountered in the 62S-1, lead dress (that is, the location and arrangement of the leads used for connections in the 62S-1) is very important. It therefore behooves the person who is to service the 62S-1 not to disarrange the factory lead dress.

A logical process of elimination in conjunction with a study of the main schematic diagram, block diagram, and section 3 will aid in isolating trouble. For example, if the receiver section functions properly but the transmitter section fails to operate, trouble in the transmitter subunit should be suspected because none of this circuitry is used for receive. A stage by stage check of the transmitter subunit then should readily reveal the trouble. If the 62S-1 fails to operate in both the transmit and receive functions, trouble in the master oscillator subunit or the associated stages of V9 and V10 in the receiver subunit should be suspected, because the functioning of these stages is necessary for both transmit and receive. If the converter operates both transmit and receive on 6 meters but fails to operate on 2 meters, trouble in the 94-mc oscillator mixer, injection amplifier stage should be suspected.

If the 62S-1 is to be sent to the factory or an authorized service agency, a detailed report of operational difficulties will assist the servicing agency in making repairs within a minimum of time and expense. This is particularly important when intermittent trouble is involved.

4.4 Alignment and Neutralization.

NOTE

The 62S-1 subunits may be aligned on or off the main chassis. If alignment is done with the subunits off the main chassis, certain coaxial cable terminations are required, as are pointed out in the procedures. The procedures are written in general form to include both methods of alignment. If the 35.6-, 35.8-, and 40.0-mc crystals are not available, tuning may be done with the crystals supplied; however, for operation outside the 6- and 2-meter bands, these crystals must be used in the tuning procedures. Figures 6-1 through 6-7 include parts identification pictorials on the various subunits and main chassis of the 62S-1. Those parts not called out as above are stamped on the subunits and main chassis, next to their respective components.

For best results, a vtvm with an r-f probe should be used. A vhf signal generator furnished with a 6-db pad is recommended (the 6-db pad is not a necessity, but does allow for more accurate results). The tuning wand mentioned in some of the following alignment procedures can be purchased through various supply houses or easily made as follows: Obtain a 6-inch piece of spaghetti-type insulation and insert a brass screw in one end (with the head protruding out) and a powdered iron slug (as found in most i-f cans) into the other end (allowing a small part of it to protrude out).

4.4.1 MASTER OSCILLATOR ALIGNMENT. (See figure 6-6.)

a. Connect the pendant injection cable on the operational 62S-1 receiver subunit to J25 on the master oscillator.

b. Connect a source of 265 volts d-c capable of furnishing 20 ma and 6.3 volts a-c to the subunit. (See figure 6-6).

c. Connect a d-c vtvm probe to J17 with the meter range scale set to read approximately -3 volts d-c.

d. Rotate the main selector, S7, to the fully counterclockwise position.

e. Apply power and allow 15 minutes for warmup.
f. Adjust tuning slug behind access hole in the rear plate for maximum indication on the vtvm.
g. Repeat step f for the remaining 22 positions of the main selector and record the vtvm reading for each step. The vtvm should read -0.8 to -2.0 volts.
h. Rapidly rotate the main selector through all positions to see that all crystals start oscillating immediately.

4.4.2 RECEIVER SUBUNIT. (See figures 6-4 and 6-5.)

NOTE

Turn slug in L36 into the center of the coil.

a. Set the band switch to the 2-meter position.
b. Turn the tuning shaft counterclockwise until a straight piece of shim stock can be placed in the two slots (one in each shaft).
c. Using a grid dip meter, tune tank circuit capacitors C73, C70, and C64, in that order, to resonance at 148.2 mc.
d. Turn the band switch to the 6-meter position.
e. Tune capacitors C74, C71, and C65 for resonance at 54.2 mc, using a grid dip meter.

4.4.2.1 6-METER TUNING.

a. Connect 6.3 volts a-c and 265 volts d-c to the 62S-1 receiver subunit. (The d-c source should be capable of furnishing 40 ma.)
b. Connect the i-f output jack to an h-f receiver antenna connector, using RG-58C/U cable. Set the h-f receiver frequency to 14.1 mc.
c. Connect the antenna cable to a vhf signal generator through a 6-db pad.
d. Connect the d-c probe of a vtvm to J26 on the subunit. Set the range switch to read -1.0 to -1.5 volts full scale.
e. Position the tuning shaft as in step b of paragraph 4.4.2.
f. Set the subunit band switch to the 6-meter position.
g. To the subunit antenna connector, apply a 54.2-mc signal of sufficient magnitude to give a vtvm reading of approximately -0.5 volt.
h. Tune capacitors C74, C71, and C65 for maximum vtvm readings. Reduce the signal level to keep the vtvm reading approximately -0.5 volt.
i. Rotate the tuning shaft 330 degrees clockwise.
j. Change the vhf signal generator frequency to 49.6 mc.
k. Carefully check the tuned conditions of the r-f and mixer tank circuits with a tuning wand (a brass and powdered iron slug cemented on opposite ends of a phenolic rod).

(1) If the presence of iron causes an increase in the vtvm reading, spread the turns of the 6-meter coil(s) slightly, and repeat steps e through k.

(2) If the presence of brass causes an increase in the vtvm reading, compress the turns of the 6-meter coil(s) slightly, and repeat steps e through k.

(3) Continue the process until circuits are tuned at each end (54.2 and 49.6 mc).

l. Rotate the tuning shaft in increments of 15 degrees throughout the 330-degree travel. Adjust the signal generator to the proper frequency each time: 53.9, 53.8, etc., to correspond to 14.1-mc i-f except at the low end of the band, which should be 49.6 mc. Record the microvolts necessary for -0.5 volt d-c bias at J26 for each position. Variation in readings should not exceed 3 db.
m. Return the tuning shaft to the position specified in step b of paragraph 4.4.2.

NOTE

When tuning the capacitors, note that the J26 bias varies smoothly. If sharp tuning is noted, this indicates regeneration. Check r-f tube for proper wiring. Also check grounding of tuning shaft at each point in the subunit.

4.4.2.2 94-MC OSCILLATOR TUNING.

NOTE

Connect master oscillator to receiver subunit for adjustments in paragraphs 4.4.2.2 through 4.4.2.6.

a. Set the band switch to the 2-meter position.
b. Connect the d-c probe of a vtvm to J27.
c. Connect the transmit mixer cable to a 62S-1 transmit mixer, J18 on transmitter subunit (heater turned on).
d. Tune L33 for maximum vtvm reading. Record the vtvm reading. It should be -0.8 to -1.5 volts.
e. Check the master oscillator tuning on each position with a vtvm at J17.

4.4.2.3 INJECTION FILTER TUNING.

a. Set the master oscillator frequency to 40.0 mc.
b. Set the band-switch shaft to the 2-meter position.

NOTE

Set up the circuits (C3, C4, and L39) on the high end with a grid dip meter (134 mc) before performing the following steps. Refer to figures 6-5 and 7-1 for location of components.

c. Set the tuning shaft to the position specified in step b of paragraph 4.4.2.
d. Connect the d-c probe of a vtvm to J26 (-1.0 or -1.5 volts full scale).
e. Adjust C3, C4, and L39 for maximum vtvm reading.
f. Change the master oscillator frequency to 35.6 mc.
g. Rotate the receiver subunit tuning shaft 330 degrees clockwise.
h. Tune L39 for maximum vtvm reading.

i. Carefully check the condition of the vhf injection tuned circuits with a tuning wand.

(1) If the presence of iron causes an increase in the vtvm reading, spread the turns of the coil(s) slightly, and repeat steps a through i.

(2) If the presence of brass causes an increase in the vtvm reading, compress the turns of the coil(s) slightly, and repeat steps a through i.

j. If it is impossible to obtain circuit tuning at both ends of the range, check the circuits for faulty contacts or wiring, repair, and repeat the above steps.

k. Set the master oscillator frequency to 37.8 mc and rotate the tuning shaft to midrange (165 degrees from either end).

l. Tune L39 for maximum vtvm indication.

m. Rotate the master oscillator selector switch to each position and rotate the tuning shaft to the corresponding position (that is, when the master oscillator is at 40.0 mc, the tuning shaft should be as specified in step b of paragraph 4.4.2). Note that the vtvm reading does not fall off to less than 50 percent of the reading noted in the middle of the range (when the master oscillator is at 37.8 mc). Readings at J26 should be from -0.3 to -1.0 volt.

n. Set the band switch to the 6-meter position.

o. Set the master oscillator to 37.8 mc.

p. Tune L38 for maximum vtvm reading.

q. Rotate the master oscillator shaft from end to end, and note that the vtvm reading does not fall off to less than 50 percent of the reading noted in step p. Readings should be within the limits specified in step m.

4.4.2.4 14-MC I-F TRANSFORMER TUNING.

a. Apply a 54.1-mc signal at the antenna input of sufficient strength to produce an S-meter reading of S1 to S6 on the h-f receiver.

NOTE

A low agc reading on the h-f receiver may be used as a reference, if desired.

b. Tune the secondary of T2, the primary of T2, the secondary of T1, and the primary of T1 for maximum S-meter reading. Adjust the signal generator level as necessary to keep the S-meter reading below S6. Record the S-meter reading after tuning.

c. Tune the h-f receiver to 14.0 mc.

d. Maintain the signal generator level used in step b above (that is, leave attenuator as is).

e. Retune the signal generator for maximum S-meter reading. Record the S-meter reading.

f. Tune the h-f receiver to 14.2 mc.

g. Repeat steps e and f.

NOTE

Be sure to peak the h-f receiver at each end of the band (14.0 and 14.2 mc). As an alternate, the signal generator level may be varied at each end of the i-f bandpass (14.0 and 14.2 mc) to maintain a constant agc (or S-meter) reading. Band-pass variation should not exceed 3 db.

4.4.2.5 2-METER NEUTRALIZATION.

a. Disconnect the B+ wire from R33 on top of the chassis.

b. Perform steps a and b in paragraph 4.4.2.

c. Adjust the h-f receiver dial to 14.2 mc.

d. Set the master oscillator to 40.0 mc.

e. At the antenna input, apply a 148.2-mc signal of sufficient strength to give a reading under S6 on the h-f receiver.

f. Tune capacitors C73, C70, and C64 for maximum S-meter reading.

g. Tune L36 for minimum S-meter reading.

h. Tune C70 and C64 for maximum S-meter reading.

i. Repeat steps g and h until the null nearly corresponds to the peak.

j. Reconnect the B+ wire to R33.

4.4.2.6 2-METER TUNING.

a. Repeak C73, C70, and C64 for maximum S-meter reading while adjusting the 148.2-mc signal level to keep the h-f receiver S-meter reading above S6.

b. Rotate the tuning shaft 330 degrees clockwise.

c. Set the master oscillator to 35.6 mc.

d. Set the h-f receiver dial to 14.0 mc.

e. Change the signal generator frequency to 143.6 mc.

f. Carefully check the tuned condition of the r-f tank circuits with a tuning wand.

(1) If the presence of iron causes an increase in S-meter reading, spread the turns of the 2-meter coil(s) slightly, and repeat steps b through f of paragraph 4.4.2.5 and steps a through f of this paragraph.

(2) If the presence of brass causes an increase in S-meter reading, compress the turns of the 2-meter coil(s) slightly and repeat as in f(1).

(3) Continue the above process until the tanks are tuned at both ends of the 330-degree travel.

4.4.3 TRANSMITTER SECTION. (See figure 6-3.)

a. Perform steps a and b of paragraph 4.4.2 on the transmitter subunit.

b. Using a grid dip meter, tune capacitors C34, C31, C23, C16, and C9 to resonance at 148.2 mc.

c. Set the band switch to 6 meters.

d. Tune capacitors C36, C33, C25, C18, and C11 for resonance at 54.2 mc.

e. Turn the PA tuning shaft clockwise until the inductor ring wipers are approximately 1 inch from the end of the ring.

NOTE

Remove the top cover of the PA section.

f. Make sure the band switch is set to the 6-meter position.
g. Using a grid dip meter indicator, tune capacitor C47 for 54.2-mc resonance.
h. Rotate the tuning shaft counterclockwise until the inductor ring wipers are at the end of the ring.
i. Note the resonant frequency to be 49 mc or less. If the frequency is above 49 mc, inspect the PA for proper wiring, etc. Replace tube, if necessary, to get tuning range.

NOTE

Only a defective tube or faulty wiring will cause the tuning problem.

j. Set the band switch to the 2-meter position.
k. Repeat step e.
l. Measure the resonant frequency (this should be approximately 148.2 mc).
m. Repeat step h.
n. Measure the resonant frequency. It should be 143.6 mc or less.

NOTE

Since the construction of the tank circuit is closely controlled, failure of the circuit to tune to 143.6 mc or less in step l may be attributed to either repair errors or to a faulty tube. These possibilities also apply to failure to tune to the high end of the range. The 2-turn 2-meter plate tank coil may be spread or compressed slightly to obtain proper tuning. Be careful not to break the ceramic switch section while forming the coil.

4.4.4 EXCITER TUNING.

4.4.4.1 CONNECTIONS.

a. Solder a 22K, 1/2-watt resistor from the grid tie point on the rear of the transmitter subunit to ground.
b. Connect 6.3 volts a-c, 265 volts d-c, and -20 volts d-c to the proper terminals on the unit.

NOTE

Do not connect the bias, plate, and screen voltages to the PA tube at this time. Do connect the heater supply to the PA tube.

c. Connect a vhf signal generator (HP-608D) to J19 (no 6-db pad). Terminate the cable in 50 ohms at J19.
d. Direct a source of air into the base of the PA socket.

4.4.4.2 TUNING.

a. Perform steps a, b, and d of paragraph 4.4.2.
b. Connect the d-c probe of a vtvm to J21. (Set vtvm range switch to -1.0 to -1.5 volts full scale.)
c. Apply a 54.2-mc signal of sufficient amplitude to produce a vtvm indication.
d. Tune C11 for maximum vtvm indication. Set generator level to maintain approximately -0.5 volt d-c.
e. Set the vtvm range switch to -100 volts full scale.
f. Connect the vtvm d-c probe to J24.
g. Tune capacitors C36, C33, C25, and C18 for maximum vtvm reading, tuning in order specified.

NOTE

Set C36 and C33 at approximately the same capacity.

h. Also retrim capacitor C11 for maximum vtvm reading.
i. Record the signal generator level required to produce -55 volts at J24. If the signal generator level is below 120,000 uv, well and good. If the setting is above 120,000 uv, check tubes and check for proper size of capacitors.
j. Remove the signal source and note that the J24 bias drops to below -0.5 to -1.0 volt. This indicates no instability. The vtvm reading should be only contact bias of the 7034/4X1504.
k. Set the signal generator frequency to 49.6 mc.
l. Rotate the tuning shaft 300 degrees clockwise.
m. Carefully check the tuned condition of the tanks with a tuning wand.

(1) If the presence of iron causes an increase in the vtvm reading, spread the turns of the 6-meter coil(s) slightly, rotate the tuning shaft back counterclockwise to starting position, and repeat steps c through m until the circuits are tuned at both ends of the range.
(2) If the presence of brass causes an increase in the vtvm reading, compress the turns of the 6-meter coil(s) and perform the rest of the procedure in m(1).

n. Record the signal generator output required to produce -55 volts on the vtvm at 49.6 mc.
o. Set the signal generator to 51, 52, and 53 mc, turning the tuning shaft for maximum vtvm reading at each frequency.
p. Repeat step i. Signal generator readings should be about the same.
q. Repeat a similar tracking procedure on 2 meters with the following changes:

(1) When checking tracking to 143.6 mc, rotate the tuning shaft 270 degrees clockwise.
(2) Check the tuned condition of the circuits with a tuning wand. Compress or spread the 2-meter coil turns as necessary and return the shaft to the high-end position.

r. Repeat the above steps as necessary until the exciter is tuned at 148.2 and 143.6 mc.

s. Perform step i using frequencies 145, 146, and 147 mc.

NOTE

The 2-meter trimmer capacitors are beside the corresponding 6-meter trimmers.

t. Return the shafts to the 54.2-mc position, and retrim C36, C33, C25, C18, and C11.

4.4.5 PA TUNING.

NOTE

This procedure is written assuming a Collins S-line or KWM-1 i-f exciter is being used. Any other exciter with the required output may be used, in which case stated i-f exciter operations may be interpolated for the exciter in use.

4.4.5.1 CONNECTIONS.

a. Disconnect the 22K resistor from the PA grid tie point. Connect bias through an 18K resistor to tie point.

b. Connect the 800-volt wire and the PA screen voltage tie point to suitable fixture which connects to the h-f transmitter and high-voltage power supply.

NOTE

Voltages of 800 volts d-c at 220 ma and 275 volts d-c at 20 ma are required for plate and screen respectively.

WARNING

Do not come in contact with the 800 volts d-c, as serious injury or death could result. Also, make sure adequate air flow is available for the 7034/4X150A tube.

c. Connect the converter output and injection sources to the 62S-1 exciter.

d. Connect d-c milliammeters in the screen and plate supply leads leading to the 62S-1 PA (0 to 50 and 0 to 300 ma, respectively).

e. Set the h-f transmitter EMISSION switch to LSB or USB position.

f. Turn on the 62S-1 exciter power supply.

g. Turn on the h-f transmitter.

h. Terminate the 62S-1 PA output in 50 ohms (use a Thruline wattmeter or vtvm and adapter to monitor output - the latter is preferable).

4.4.5.2 TUNING.

a. Set the h-f transmitter MIC GAIN control counterclockwise to the point just before the switch actuates.

b. Set the 62S-1 transmitter switch to 6 meters.

c. Position the exciter tuning shaft for the high end of the band, 54.2 mc, as has been described earlier.

d. Set injection frequency to 40.0 mc.

e. Set the h-f transmitter EMISSION switch to LOCK KEY.

f. Adjust the PA bias for 70-ma idling plate current.

g. Slowly advance the MIC GAIN control clockwise until output is noted from PA.

h. Tune the h-f transmitter EXCITER TUNING control for maximum output. Also tune the 62S-1 exciter tuning for maximum output.

NOTE

Closely monitor the PA screen current. Do not allow it to stay above 40 ma for prolonged periods of time. (This may occur under conditions of complete mistuning.) Keep the plate dissipation within limits (less than 120 watts with an airflow equivalent to the 62S-1 blower).

i. Tune the PA tuning and loading controls for maximum output. Start with the loading capacitor at minimum capacity.

j. Set the h-f transmitter METER switch to GRID position.

k. Connect the d-c probe of a vtvm to J24.

l. Slowly advance the MIC GAIN control until an increase in J24 bias is noted. Note that this occurs before grid current registers on the h-f transmitter.

m. Record the power output under 62S-1 PA grid current threshold conditions. Should be greater than 65 watts PEP.

n. Repeat the above tuning procedures for the low end of the 6-meter range (49.6 mc) and the high and low ends of the 2-meter range (148.2 and 143.6 mc); also for 53, 52, 51, and 147, 146, and 145 mc.

NOTE

Capacitor C50 is for 6-meter adjustment only and should be tuned with the inductor ring wipers approximately 1 inch from the h-f end of the ring. Also, the frequency ranges should be covered in approximately 180 to 270 degrees of PA tuning shaft travel.

4.4.6 148-MC TRAP (FL2) TUNING.

The following paragraphs describe minor tuning adjustments which can be made to an assembled 62S-1.

NOTE

In case the 40.0-mc crystal is not available, perform step b and omit the remainder of this paragraph.

a. Place the system in transmit at 148.0 mc (h-f transmitter output at 14.0 mc and the 62S-1 main dial at 148.0 mc).
b. Set C144 approximately in the middle of its range.
c. Tune L39 as necessary to register d-c injection bias at J20.
d. After making sure the h-f transmitter EXCITER TUNING is peaked up at 14.0 mc, adjust the 62S-1 EXCITER TUNING for maximum grid current as read on the 62S-1 panel meter. Adjust the h-f transmitter MIC GAIN as necessary to keep the 62S-1 grid current below half scale.
e. Adjust the 62S-1 PA TUNING and LOADING controls for maximum r-f output. Start with the LOADING lever horizontal (clockwise).
f. Turn the h-f transmitter MIC GAIN control fully counterclockwise to the stop.
g. Remove the r-f cable from J19 on the 62S-1.
h. Tune C144 for minimum 62S-1 PA output.
i. Replace the cable on J19.

4.4.7 INJECTION TUNING.

Place the system in receive, 62S-1 dial at 148.0 mc.

a. Tune C3 and C4 for maximum J26 bias.
b. Set the 62S-1 main dial to 145.8 mc.
c. Tune L39 for maximum bias at J26.
d. Rotate the 62S-1 main dial from end to end, and note that the bias at J26 does not decrease more than approximately 50 percent at each end as compared to the 145.8-mc reading.
e. Place the system in receive at 51.8 mc.
f. Tune L38 for maximum injection bias at J26.
g. Rotate the main dial from end to end, and note that the J26 bias does not decrease more than 50 percent at either end as compared to the 51.8-mc reading.

4.4.8 TRIMMER ADJUSTMENTS.

4.4.8.1 TRANSMITTER.

a. Place the system in transmit at 148.2 mc (the 62S-1 dial at 148.0 mc and h-f transmitter output at 14.2 mc).
b. Rotate the 62S-1 EXCITER TUNING clockwise to a point just before the stop is reached.
c. Adjust the MIC GAIN of the h-f transmitter to register 62S-1 grid current.

NOTE

In case of complete mistuning, the r-f output may be used as an indicator until grid current is registered during tuning.

d. Adjust the appropriate exciter trimmers for maximum grid current.
e. Place the system in transmit at 54.2 mc (the 62S-1 dial at 54.0 mc and h-f transmitter output at 14.2 mc).
f. Repeat steps b, c, and d.

4.4.8.2 RECEIVER.

a. Place the system in receive on 148.2 mc (the 62S-1 dial at 148.0 mc and h-f receiver on 14.2 mc).
b. To the 62S-1 antenna input, apply a signal of sufficient amplitude to produce an S-meter reading on the h-f receiver below S6.
c. Adjust the appropriate receiver trimmers for maximum S-meter reading.
d. Place the system in receive at 54.2 mc (the 62S-1 dial at 54.0 mc and the h-f receiver on 14.2 mc).
e. Repeat steps b and c.

4.4.8.3 14-MC I-F TRIMMING.

a. Place the system in receive using a 14.1-mc i-f. Set the 62S-1 dial at 54.0, 53.0, 52.0 or 148.9, 147.0, 146.0, etc., mc. Set the h-f receiver frequency to 14.1 mc.
b. Repeat step b of paragraph 4.4.8.2.
c. Tune T_1 and T_2 for maximum S-meter reading.

4.5 Signal Tracing.

Table 4-1 lists significant test points and normal signal levels. Refer to figure 4-1 for location of test points. The values shown in table 4-1 are nominal readings taken from several pieces of equipment. Readings that are within ±10 percent of the listed values are considered within working tolerance.

4.6 Voltage and Resistance Measurements.

Table 4-2 lists voltage and resistance measurements on all of the tube sockets of the 62S-1. The values obtained in the receive mode are valid with no signal or with a normal signal input to the receiver. The values obtained in the transmit mode were measured with the h-f exciter disconnected from the 62S-1. Resistance measurements are shown for each tube on the receive mode table. Filament resistance values are not shown, since they vary greatly for different tubes of the same type. The readings obtained are nominal values, and normal operation should continue as long as readings are within ±10 percent of the values shown in table 4-2. Refer to figure 7-1.

NOTE

When measuring resistance values, be sure that all power to the 62S-1 is removed and static charges are not present.

4.7 PA Tube Replacement.

WARNING

Be sure to turn off the exciter and disconnect the 800-volt dc supply before attempting PA tube replacement.

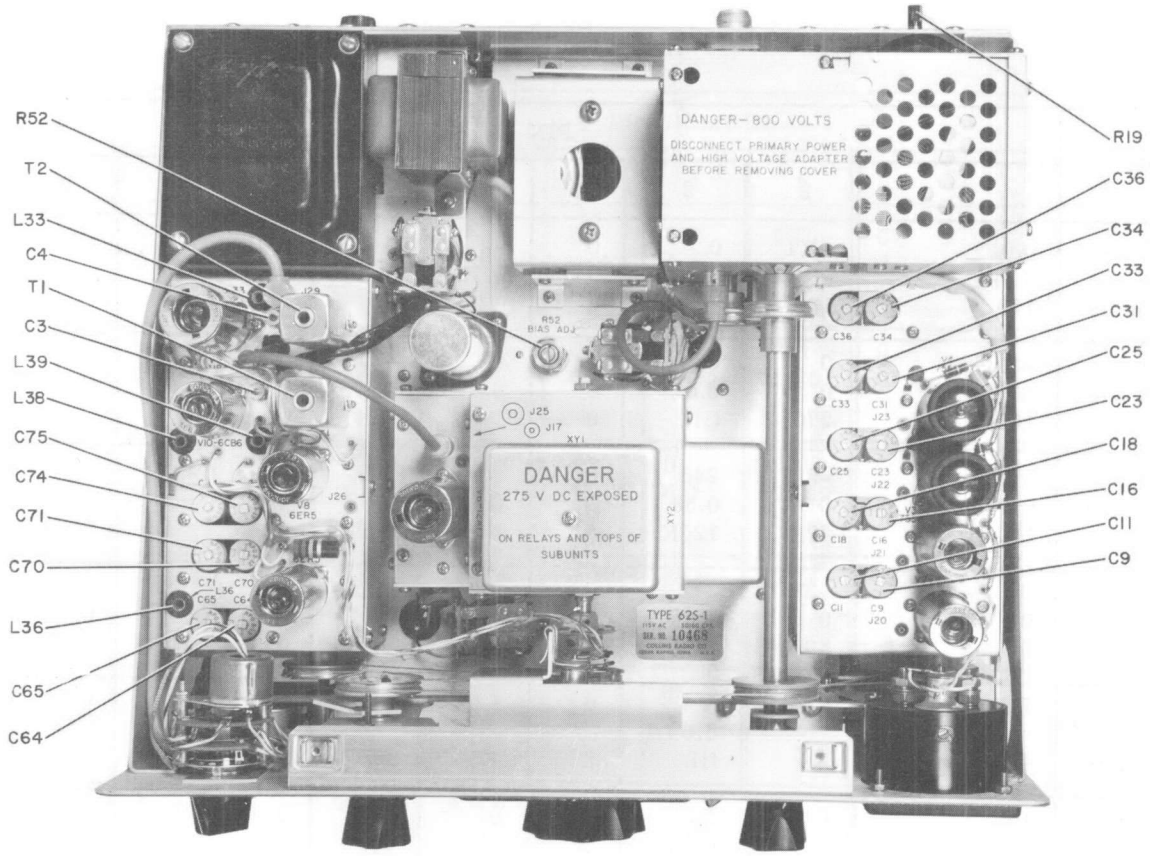


Figure 4-1. Location of Alignment and Neutralization Adjustments

TABLE 4-1. BIAS LEVELS

TEST POINT	CONDITIONS	D-C BIAS
J26	No injection to V1 and V8, r-f gain fully clockwise, signal generator connected to J28, 20,000-uv setting, receive only (6-db pad on generator output).	-0.5
J17	62S-1 in normal operating condition, receive or transmit on 6 or 2 meters.	-0.8 to -2.1
J27	Normal operating condition, receive or transmit, 2 meters only.	-0.8 to -1.5
J26	Normal operating condition, receive only.	2 meters: -0.3 to -1.0 6 meters: -0.3 to -1.5
J20	Normal operating condition, transmit only.	2 meters: -0.15 to -0.3 6 meters: -0.15 to -0.3
S- meter	Connected to h-f receiver such as Collins 75S-( ) series (or KWM series).	Meter reads upscale from noise to 0.5 uv

TABLE 4-2. VOLTAGE AND RESISTANCE MEASUREMENTS

RECEIVE MODE									
TUBE		PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V1	v d-c v a-c ohms	0.01 0.42 150	-1.1 0 100K	0 6.0 fil	0 0 0	-2 0.75 ∞	0 0 0	0.01 0.42 1K		
V2	v d-c v a-c ohms	-0.64 0 100K	0 0 270	0 6.0 fil	0 0 0	-2.2 0.38 ∞	-2.2 0.38 ∞	0 0 0		
V3	v d-c v a-c ohms	0 0 0	-21 0 72K	245 0.58 120K	0 0 0	0 6.0 fil	275 0.88 95K	0 0	0.59 120K	0 0 0
V4	v d-c v a-c ohms	0 0 0	-21 0 50K	272 0.88 95K	0 0 0	0 6.0 fil	275 0.97 95K	0 0 0	272 0.88 95K	0 0 0
V5	v d-c v a-c ohms	1.5 47K	0 2	 5.9 fil fil	0 2	1.5 47K	0 2	-45 cg 25K	0 2	880 P. 4.5K
V6	v d-c v a-c ohms	148 0.45 120K	0 0 10K	1.3 0.53 270	0 0 0	0 0 0	138 0.4 120K	0 0 10	1.3 0 270	0 6.0 fil
V7	v d-c v a-c ohms	0.63 0 82 (r-f gain cw)	0 0 56K	0 0 0	0 6.0 fil	135 0.44 115K	0 0 0	0.63 0 82 (r-f gain cw)		
V8	v d-c v a-c ohms	0.75 0.41 1K	-0.71 0.43 100K	0 0 fil	0 6.0 0	40 0.1 440K	0 0 0	0.75 0.41 1K		
V9	v d-c v a-c ohms	100 0.21 100K	-1.5 0 4.7K	100 0.26 100K	0 0 0	0 6.0 fil	100 2.2 100K	1.8 0.9 270	1.3 0.17 270	-0.1 0 10
V10	v d-c v a-c ohms	1.0 0 180	.02 .15 100K	0 0 0	0 6.0 fil	150 1.5 6K	0 0 0	1.0 0 180		

TRANSMIT MODE									
TUBE		PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V1	v d-c v a-c	0.5 0.45	-0.3 0	0 6.0	0 0	80 1.3	0 0	0.8 0.45		

TABLE 4-2. VOLTAGE AND RESISTANCE MEASUREMENTS (Cont)

TRANSMIT MODE (Cont)									
TUBE		PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V2	v d-c v a-c	0 0.3	3.4 0	0 5.9	0 0	258 2.4	183 0.64	0 0		
V3	v d-c v a-c	0 0	-20 0.43	245 0.6	0 0	0 6.0	271 1.75	0 0	245 0.6	0 0
V4	v d-c v a-c	0 0	-21 0	269 0.88	0 0	0 6.0	272 0.91	0 0	269 0.88	0 0
V5	v d-c v a-c	292	0.14	5.9 fil	0.14	292	0.14	-45 cg	0.14	830 P.
V6	v d-c v a-c	143 0.45	0 0	1.3 0.54	0 0	0 0	134 0.44	0 0	1.3 0	0 6.0
V7	v d-c v a-c	0 0	0 0	0 0	0 6.0	-0.53 0.18	0 0	0 0		
V8	v d-c v a-c	0.05 0.41	-1.4 0.41	0 0	0 6.0	-1.2 0	0 0	0.05 0.41		
V9	v d-c v a-c	100 0.21	-1.5 0	100 0.26	0 0	0 6.0	100 2.2	1.8 0.9	1.3 0.5	-0.1 0
V10	v d-c v a-c	1.0 0	.02 .15	0 0	0 6.0	150 1.5	0 0	1.0 0		

a. Remove PA compartment top cover.

b. Remove screw which holds tab on PA tube clamp to the end of blocking capacitor C46.

c. With a rocking motion, gently work the tube out of the socket.

d. Loosen the screw in the tube clamp and slide the tube out of the clamp.

e. Slide replacement tube into the clamp until the bottom of the clamp is positioned 1/8 inch from the bottom edge of the plate cooling fins.

f. Temporarily set the tube into the socket so that the key on the tube locating pin is aligned with the socket keyway. It is not necessary to push the tube fully into the socket.

g. Position the clamp on the tube socket so that the tab is properly aligned with the screw hole in C46.

h. Remove the tube and tighten the clamp.

i. Align tube locating pin with socket keyway; carefully work tube into socket with a rocking motion. If considerable resistance is encountered, do not force tube. Remove tube; check socket for deformed contacts. Straighten contacts, if necessary; reinsert tube.

j. Replace screw in C46 and replace PA compartment cover.

4.8 Dial Cord Replacement.

Plastic-sheathed metallic cable, Collins part no. 432-1009-00, is required for the 62S-1 dial cords. The lengths required are 45 inches for exciter tuning, 30 inches for receiver tuning, and 20 inches for PA loading. The cables can be tied to the springs.

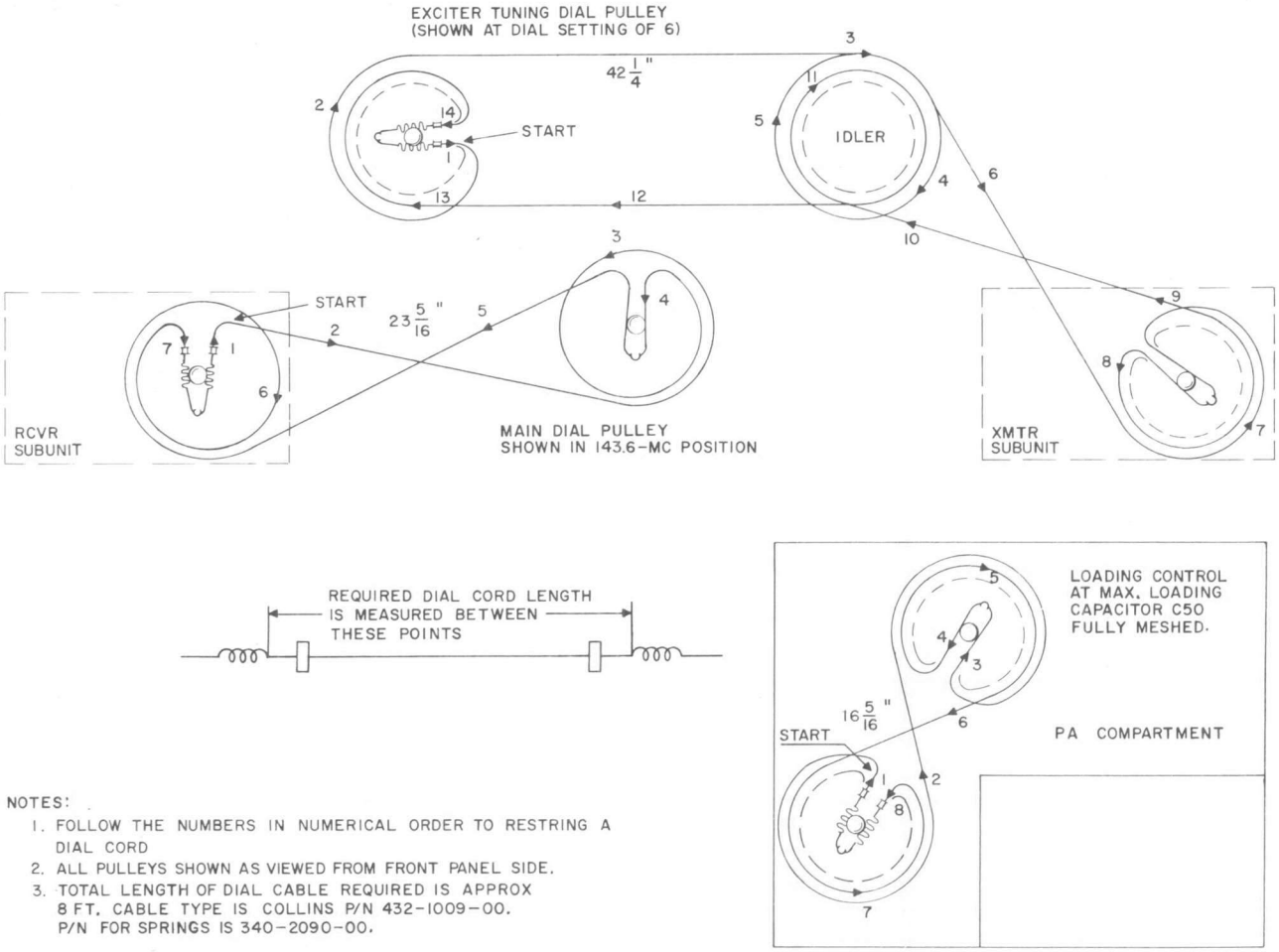


Figure 4-2. Dial Cord Stringing Diagram

Regarding tools, a surgical hemostat or Xcelite type 43H seizer will be found useful.

4.8.1 RECEIVER TUNING.

a. Attach replacement dial cord to dial springs. Adjust length so that cord, as measured between the ends of the springs to which the cord is attached, is 23-5/16 inches long.

b. Set main dial to 143.6 mc.

c. Set receiver tuning shaft so that inductor ring wipers are positioned at the clockwise end of associated rings.

d. Check the positions of the pulleys on the main dial and the receiver subunit. They should be positioned approximately as shown in figure 4-2.

e. Attach free end of one dial spring to receiver tuning pulley and string cord as shown in figure 4-2. The previously mentioned hemostat or seizer can be used to clamp the cord in place on the main dial pulley while completing the final turn around the receiver pulley and attaching the spring to the pulley.

f. When dial cord is in place, rotate main dial to opposite end and back to equalize tension in cord, and check position of inductor ring wipers. They should make contact with inductor rings at each end of rotation. If adjustment is necessary, use procedure specified in steps c and d of paragraph 4.2.6.

4.8.2 EXCITER TUNING.

a. Attach replacement dial cord to dial springs. Adjust length so that cord, as measured between ends of springs to which cord is attached, is 42-1/4 inches long.

b. Set EXCITER TUNING to 6, and check positioning of exciter tuning pulleys. If necessary, set pulleys to positions shown in figure 4-2. Wipers on exciter inductor rings should be positioned at midpoint of rings.

c. Attach spring on one end of cord to exciter tuning pulley (MP17, figure 6-1) and string cord as shown in figure 4-2. Use hemostat or seizer to clamp cord to pulley on exciter subunit MP4 while making second turn around idler and returning to exciter tuning pulley MP17.

TABLE 4-3. MASTER OSCILLATOR SUBUNIT CRYSTAL LOCATIONS

CRYSTAL BOARD XY1					
CRYSTAL BOARD POSITION	OCCUPIED BY	CRYSTAL FREQUENCY (mc)	CRYSTAL BOARD POSITION	OCCUPIED BY	CRYSTAL FREQUENCY (mc)
1	Y4	36.2	8	Y13	38.0
2	Y3	36.0	9	Y12	37.8
3	Y23	*40.0	10	Y11	37.6
4	Y2	*35.8	11	Y10	37.4
5	Y1	*35.6	12	Y9	37.2
6	Y7	36.8	13	Y6	36.6
7	Y8	37.0	14	Y5	36.4
CRYSTAL BOARD XY2					
1	Y18	39.0	8	Empty	None
2	Y17	38.8	9	Empty	None
3	Y16	39.6	10	Empty	None
4	Y15	38.4	11	Empty	None
5	Y14	38.2	12	Empty	None
6	Y20	39.4	13	Y21	39.6
7	Y19	39.2	14	Y22	39.8
*Not supplied					

d. Maintaining tension on the cord, complete 3/4 turn around exciter tuning pulley MP17 and slip free end of spring over retaining tab.

e. Rotate EXCITER TUNING knob to counterclockwise stop and check position of wipers on exciter inductor rings. Wipers should make contact with clockwise end of rings. Make adjustments, if necessary, as specified in step a of paragraph 4.2.2.

4.8.3 PA LOADING.

a. Attach replacement dial cord to dial springs. Adjust length so that cord, as measured between ends of springs to which cord is attached, is 16-5/16 inches long.

b. Set LOADING lever at maximum. PA loading pulleys should be aligned as shown in figure 4-2, and loading capacitor C50 should be fully meshed.

c. String dial cord as shown in figure 4-2.

d. Set LOADING lever at minimum, and check to be sure that C50 is at minimum capacitance.

4.9 Master Oscillator Subunit Crystal Locations.

Table 4-3 lists the crystal locations on crystal boards XY1 and XY2 (see figure 6-1). The crystal board positions are numbered 1 through 14 on each crystal board.

section 5

specifications

5.1 General.

The 62S-1 provides transmit and receive functions in the frequency ranges of 49.6 to 54.2 mc and 143.6 to 148.2 mc. Power output is a minimum of 65 watts. With the crystals furnished, complete coverage of the 6- and 2-meter bands is provided. These ranges are 50.0 to 54.0 mc and 144.0 to 148.0 mc, respectively. Additional switching circuits and crystal sockets are provided for extra band coverage if the operator desires. Available crystals are listed in table 2-1.

5.2 Frequency Coverage.

The 62S-1 provides a frequency coverage on any of 23 200-kc bands in the 6- and 2-meter ranges. This is accomplished by crystal switching from the main selector on the front panel of the 62S-1. Twenty crystals are furnished with the equipment. The other three positions may be used for extra-band coverage.

5.3 Requirements for Operation.

The converter requires the following power supply voltages:

+800 volts d-c at 220 ma for the PA plate circuit.

+275 volts d-c at 20 ma for the PA screen circuit.

115 volts a-c, 50 to 60 cps at approximately 75 watts. This provides primary power to the internal power supply which furnishes bias, relay, and low power tube voltages to the equipment.

5.4 Specifications.

Size	6-1/2 inches high, 13 inches wide, 14-3/4 inches deep.
Weight	25 pounds.
Frequency range . .	49.6 to 54.2 mc and 143.6 to 148.2 mc. With crystals furnished, bands are as follows: 6 meters: 50.0 to 54.0 mc, in 200-kc increments. 2 meters: 144.0 to 148.0 mc, in 200-kc increments.
Mode	CW, SSB, or AM.

Figure 5-1. 62S-1 VHF Converter

SECTION 5
Specifications

Type of service . . . Attended operation. Continuous on receive and transmit.

Plate power input . . 160 watts.

Power output . . . . 65 watts PEP nominal into 50-ohm load.

Output load impedance . . . . . 50 ohms nominal.

Input impedance . . . Approximately 50 ohms.

Sensitivity . . . . . When operated with 75S-1/2/3 on AM function:

2 meters: 1.2 microvolts for at least 10-db signal-plus-noise to noise ratio (noise factor approximately 4 db).

6 meters: 1.2 microvolts for at least 10-db signal-plus-noise to noise ratio (noise factor approximately 4 db).

Frequency stability. . Frequency stability is dependent upon the equipment used with the 62S-1. Crystals of 0.005 percent tolerance are used throughout the 62S-1.

Image rejection . . . Greater than 100 db on 6 meters.

Greater than 60 db on 2 meters.

I-f rejection . . . . Greater than 70 db.

Oscillator feedthrough and mixer products (undesired) . . . . . At least 60 db below PEP.

Second harmonic . . At least 35 db below PEP.

Third order distortion . . . . . At least 20 db below PEP.

5.5 Tube, Fuse, and Semiconductor Complement.

Table 5-1 lists the tube, fuse, and semiconductor complement.

TABLE 5-1. TUBE, FUSE, AND SEMICONDUCTOR COMPLEMENT

SYMBOL	FUNCTION	TYPE
V1	Transmit mixer	6ER5
V2	Transmit r-f amplifier	6BZ6
V3	Transmit r-f amplifier	7558
V4	Transmit driver	7558
V5	Transmit power amplifier	7034/4X150A
V6	35.6- to 40-mc oscillator	12AT7
V7	Receive r-f amplifier	6ER5
V8	Receiver mixer	6ER5
V9	94-mc oscillator, mixer, injection amplifier	6EA8
V10	Injection amplifier	6ER5
CR1, CR2	Alc rectifiers	1N457
CR3, CR4, CR5, CR6	Bridge rectifiers, low-voltage power supply	1N1095
CR7	Bias voltage rectifier	1N1095
CR8	R-f output rectifier	1N198
F1	Power supply fuse	1-1/2 amp, 125 volts a-c

5.6 Available Accessories.

Table 5-2 lists the accessories available for use with the 62S-1.

TABLE 5-2. AVAILABLE ACCESSORIES

ITEM	FUNCTION	COLLINS PART NUMBER
Extra crystals	Additional band coverage	See table 2-1.
516F-2 A-C Power Supply	A-c power supply (For 62S-1 PA plate and screen)	522-1170-00

section 6

parts list

ITEM	DESCRIPTION	COLLINS PART NUMBER
	62S-1 VHF CONVERTER	522-2376-00
B1	MOTOR, ALTERNATING CURRENT: shaded pole motor, 115 v, 60 cps; 0.20 amp max starting, 0.15 amp running; 3200 rpm; Barber-Coleman part DYAB-115-32	230-0376-00
C1	CAPACITOR, FIXED, CERAMIC: 820 uuf +100% -20%, 500 v dc; Sprague Electric Co. part no. 40C236A2	913-3008-00
C2	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C3	CAPACITOR, VARIABLE, CERAMIC: 0.5 uuf to 4.5 uuf; 500 v dc; Cambridge Thermionic Corp. part no. CST-6	917-1125-00
C4	CAPACITOR, VARIABLE, CERAMIC: same as C3	917-1125-00
C5 thru C8	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C9	CAPACITOR, VARIABLE, CERAMIC: 1.5 uuf min. to 7.0 uuf max, 350 v dc; Erie Resistor part no. 557006 COPO 10R	917-1192-00
C10	CAPACITOR, FIXED, CERAMIC: 27 uuf ±5%, 500 v dc; Centralab, Division of Globe Union, Inc.	916-4332-00
C11	CAPACITOR, VARIABLE, CERAMIC: 5.0 uuf min. to 25.0 uuf max, 350 v dc; Erie Resistor part no. 557006 COPO 39R	917-1194-00
C12 thru C15	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C16	CAPACITOR, VARIABLE, CERAMIC: same as C9	917-1192-00
C17	CAPACITOR, FIXED, CERAMIC: 39 uuf, ±5%, 500 v dc; Centralab, Division of Globe Union, Inc.	916-4352-00
C18	CAPACITOR, VARIABLE, CERAMIC: 3.0 uuf min. to 12.0 uuf max, 350 v dc; Erie Resistor part no. 557006 COPO 17R	917-1193-00
C19	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C20	CAPACITOR, FIXED, CERAMIC: 0.82 uuf ±5%, 500 v dc; Stackpole Carbon part no. GA-.82UUFPORM5PCT	913-2975-00
C21	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C22	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C23	CAPACITOR, VARIABLE, CERAMIC: same as C9	917-1192-00
C24	CAPACITOR, FIXED, CERAMIC: 15 uuf ±5%, 500 v dc; Centralab, Division of Globe Union, Inc.	916-0671-00
C25	CAPACITOR, VARIABLE, CERAMIC: same as C11	917-1194-00
C26	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C27	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C28	CAPACITOR, FIXED, CERAMIC: 1000 uuf +100% -20%, 500 v dc; Erie Resistor part no. 851000 Z5UO 102Z	913-3009-00
C29	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C30	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C31	CAPACITOR, VARIABLE, CERAMIC: same as C18	917-1193-00
C32	CAPACITOR, FIXED, CERAMIC: 9.1 uuf ±5%, 500 v dc; Stackpole Carbon Co. part no. GA-9.1UUFPORM5PCT	913-2999-00
C33	CAPACITOR, VARIABLE, CERAMIC: same as C11	917-1194-00
C34	CAPACITOR, VARIABLE, CERAMIC: same as C18	917-1193-00
C35	CAPACITOR, FIXED, CERAMIC: same as C10	916-4332-00
C36	CAPACITOR, VARIABLE, CERAMIC: same as C11	917-1194-00
C37 thru C41	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C42 thru C44	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C45	CAPACITOR, FIXED, CERAMIC: 500 uuf ±20%, 2000 v dc; Centralab part no. DA140-231CB	913-3195-00
C46	CAPACITOR, FIXED, CERAMIC: 1000 uuf ±20%, 5000 v dc; Centralab Div. of Globe Union, Inc. part no. DA858-003	913-0101-00
C47	CAPACITOR, VARIABLE, AIR: 50 uuf max, 4 uuf min.; E.F. Johnson Co. part no. 11725-193	922-4300-00
C48	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C49	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C50	CAPACITOR, VARIABLE, AIR: 6.4 uuf min. to 100 uuf max, 1000 v dc; E.F. Johnson Co. part no. 158-5-A	922-0626-00
C51	CAPACITOR, FIXED, CERAMIC: 1.0 uuf ±5%, 500 v dc; Stackpole Carbon Co. part no. GA-1.0UUFPORM5PCT	913-2977-00
C52	CAPACITOR, FIXED, CERAMIC: same as C51	913-2977-00
C53	CAPACITOR, FIXED, CERAMIC: 4700 uuf ±20%, 500 v dc; Sprague Electric Co. of Wisconsin	913-3012-00
C54	CAPACITOR, FIXED, CERAMIC: same as C53	913-3012-00
C55	NOT USED	
C56	CAPACITOR, FIXED, CERAMIC: same as C53	913-3012-00
C57	CAPACITOR, FIXED, MICA: 510 uuf ±5%, 300 v dc; Electro Motive Mfg. Co. part no. DM15F510J03	912-2867-00
C58	CAPACITOR, FIXED, MICA: 47 uuf ±10%, 500 v dc; Electro Motive Mfg. Co. part no. DM15E470K500WV	912-2793-00
C59	CAPACITOR, FIXED, CERAMIC: 1500 uuf +100% -20%, 500 v dc; Sprague Electric Co. of Wisconsin	913-3010-00
C60	NOT USED	
C61	CAPACITOR, FIXED, MICA: 12 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15C120J01	912-2756-00
C62	CAPACITOR, FIXED, MICA: 68 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15E680J500WV	912-2804-00
C63	CAPACITOR, FIXED, CERAMIC: same as C10	916-4332-00
C64	CAPACITOR, VARIABLE, CERAMIC: same as C18	917-1193-00
C65	CAPACITOR, VARIABLE, CERAMIC: same as C11	917-1194-00
C66 thru C68	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C69	CAPACITOR, FIXED, CERAMIC: 0.51 uuf ±5%, 500 v dc; Stackpole Carbon Co. part no. GA-.51UUFPORM5PCT	913-2964-00
C70	CAPACITOR, VARIABLE, CERAMIC: same as C18	917-1193-00
C71	CAPACITOR, VARIABLE, CERAMIC: same as C11	917-1194-00
C72	CAPACITOR, FIXED, CERAMIC: same as C24	916-0671-00
C73	CAPACITOR, VARIABLE, CERAMIC: same as C18	917-1193-00
C74	CAPACITOR, VARIABLE, CERAMIC: same as C11	917-1194-00
C75	CAPACITOR, FIXED, MICA: 18 uuf, ±5%, 500 v dc; Electro Motive part no. DM15C180J01	912-2762-00
C76	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C77	CAPACITOR, FIXED, CERAMIC: 3.0 uuf ±5%, 500 v dc; Stackpole Carbon Co. part no. GA-3.0UUFPORM5PCT	913-2988-00
C78	CAPACITOR, FIXED, MICA: 100 uuf ±5%, 500 v dc; Electro Motive part no. DM15F101J500 WV	912-2816-00
C79	CAPACITOR, FIXED, MICA: same as C78	912-2816-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
C80	CAPACITOR, FIXED, MICA: 120 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15F121J500WV	912-2822-00
C81	CAPACITOR, FIXED, MICA: 820 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM20F821J500WV	912-3309-00
C82	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C83	CAPACITOR, FIXED, MICA: 5 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15C050J01	912-2750-00
C84	CAPACITOR, FIXED, MICA: 22 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15C220J500WV	912-2768-00
C85	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C86	NOT USED	
C87	CAPACITOR, FIXED, MICA: 510 uuf ±10%, 300 v dc; Electro Motive Mfg. Co. part no. DM15F510K03	912-2868-00
C88	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C89	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C90	CAPACITOR, FIXED, CERAMIC: same as C51	913-2965-00
C91 thru C93	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C94	CAPACITOR, FIXED, CERAMIC: 12 uuf ±5%, 500 v dc; Centralab, Division of Globe Union, Inc.	916-0141-00
C95	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C96	CAPACITOR, FIXED, CERAMIC: 6.8 uuf ±5%, 500 v dc; Stackpole Carbon Co. part no. GA-6.8UUFPORM5PCT	913-2996-00
C97	CAPACITOR, FIXED, MICA: same as C78	912-2816-00
C98	CAPACITOR, FIXED, CERAMIC: 10,000 uuf ±20%, 500 v dc; Sprague Electric Co. of Wisconsin	912-3013-00
C99	CAPACITOR, FIXED, CERAMIC: same as C98	913-3013-00
C100	CAPACITOR, FIXED, ELECTROLYTIC: 25 uf -10% to +100%, 150 v dc; Sprague Electric part no. D34460	183-1787-00
C101	CAPACITOR, FIXED, ELECTROLYTIC: same as C100	183-1787-00
C102	CAPACITOR, FIXED, ELECTROLYTIC: 50 uf -10% to +100%, 450 v dc; Sprague Electric part no. D35774	183-1409-00
C103 thru C106	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C107	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C108 thru C112	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C113 thru C122	CAPACITOR, FIXED, CERAMIC: same as C53	913-3012-00
C123	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C124	CAPACITOR, FIXED, CERAMIC: same as C55	913-3886-00
C125	NOT USED	
C126 thru C128	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C129 thru C131	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C132	CAPACITOR, FIXED, CERAMIC: 20 uuf ±5%, 500 v dc; Centralab, Division of Globe Union, Inc.	916-0677-00
C133	CAPACITOR, FIXED, CERAMIC: 18.0 uuf ±5%, 500 v dc; Centralab, Division of Globe Union, Inc.	916-0674-00
C134 thru C139	CAPACITOR, FIXED, CERAMIC: same as C132	916-0677-00
C140	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C141	CAPACITOR, FIXED, CERAMIC: same as C1	913-3008-00
C142	NOT USED	
C143	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C144	CAPACITOR, VARIABLE, CERAMIC: 8.0 uuf min to 75.0 uuf max, 350 v dc; Erie Resistor Corp. part no. 557018 U2P0 34R	917-1075-00
C145	CAPACITOR, FIXED, MICA: 56 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15E560J01500WV	912-2798-00
C146 thru C149	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C150	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C151	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C152	CAPACITOR, FIXED, CERAMIC: same as C42	913-3008-00
C153	CAPACITOR, FIXED, CERAMIC: same as C59	913-3010-00
C154	CAPACITOR, FIXED, MICA: 110 uuf ±5%, 500 v dc; Electro Motive Mfg. Co. part no. DM15F111J500WV	912-2819-00
C155	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
C156	CAPACITOR, FIXED, CERAMIC: same as C28	913-3009-00
CR1	SEMICONDUCTOR DEVICE, DIODE: silicon, hermetically sealed; Hughes Aircraft Co. part no. 1N457	353-0204-00
CR2	SEMICONDUCTOR DEVICE, DIODE: same as CR1	353-0204-00
CR3	SEMICONDUCTOR DEVICE, DIODE: silicon; Texas Instruments	353-1547-00
CR4 thru CR7	SEMICONDUCTOR DEVICE, DIODE: same as CR3	353-1547-00
CR8	SEMICONDUCTOR DEVICE, DIODE: germanium, hermetically sealed; Erie Resistor Corp. part no. 1N198	353-0160-00
CR9	SEMICONDUCTOR DEVICE, DIODE: silicon; hermetically sealed; Motorola, Inc. type 1N3005A	353-1388-00
CR10	SEMICONDUCTOR DEVICE, DIODE: same as CR1	353-0204-00
CR11	SEMICONDUCTOR DEVICE, DIODE: same as CR1	353-0204-00
DS1	LAMP, INCANDESCENT: 6 to 8 v, 0.25 amp current, miniature bayonet base, G-3-1/2 bulb; Chicago Miniature Lamp Works part no. 51	262-0264-00
DS2	LAMP, INCANDESCENT: same as DS1	262-0264-00
E1	CONTACT, ELECTRICAL: beryllium copper, gold plated surface, 0.484 in. dia by 0.040 in. h o/a dim.	544-7455-003
F1	FUSE, CARTRIDGE: brass, nickel plated, glass enclosed, time lag, 1.5 amp, 125 v max; 0.250 in. dia by 1-1/4 in. lg; Bussmann Mfg. Co.	264-0007-00
FL1	FILTER, BAND PASS: 14.1 mc center frequency; 13.5 mc to 14.7 mc band w; 50 ohms input and output; 25/32 in. by 25/32 in. by 3 in. o/a dim.; Communications Coil Co. part no. X-449-1	278-0668-00
FL2	FILTER, RADIO INTERFERENCE: 1.250 in. by 1.375 in. by 2.050 in. o/a dim.	548-6757-003
H1	NOT USED	
H2	SCREW, MACHINE: steel; passivate finish; Phillips recessed head; 6-32 thd, 0.438 in. lg	543-8116-00
J1	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 rd female contact, straight shape, 1 in. by 1 in. by 1.106 in. o/a; Amphenol-Borg	357-9003-00
J2	JACK, TELEPHONE: steel, miniature, panel mounted Switchcraft, Inc. part no. 3501FP	360-0148-00
J3 thru J15	JACK, TELEPHONE: same as J2	360-0148-00
J16	CONNECTOR, RECEPTACLE, ELECTRICAL: straight shape; 1 contact; panel mounting; RF Products Co. part no. 87075	357-9183-00
J17	JACK, TIP: receptacle connector for use with 0.080 in. dia male contact; 1250 v rms, -65 deg C to +200 deg C; Sealectro part no. SKT-5-BC GREEN	360-0142-00
J18	JACK, TELEPHONE: same as J2	360-0148-00
J19	JACK, TELEPHONE: same as J2	360-0148-00
J20	JACK, TIP: for use with standard 0.080 in. dia male contact; Black; Sealectro part no. SKT-5-BC BLACK	360-0137-00
J21	JACK, TIP: nonprecious metal, precious metal plated; Sealectro part no. SKT-5-BC BROWN	360-0138-00
J22	JACK, TIP: beryllium copper, teflon insulation; 5.5 amp continuous duty current rating; Sealectro part no. SKT-5-BC RED	360-0139-00
J23	JACK, TIP: accommodates standard phone tip; 1,250 v ac, 5.5 amps; Sealectro part no. SKT-5-BC ORANGE	360-0140-00
J24	JACK, TIP: receptacle connector for use with 0.080 in. dia male contact; 1,250 v rms; -65 deg C to +200 deg C; Sealectro part no. SKT-5-BC YELLOW	260-0141-00
J25	JACK, TELEPHONE: same as J2	360-0148-00
J26	JACK, TIP: for use with standard 0.080 in. dia male contact; blue; Sealectro part no. SKT-5-BC BLUE	360-0143-00
J27	JACK, TIP: for use with standard 0.080 in. dia male contact; gray; Sealectro part no. SKT-5-BC GRAY	360-0144-00
J28	JACK, TELEPHONE: same as J2	360-0148-00
J29	JACK, TELEPHONE: same as J2	360-0148-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
J30	JACK, TIP: accommodates 1/8 in. plug; ceramic insulation brass contacts; Jones, Howard B., Div of Cinch Mfg. Co. part no. 201-11-01-018	360-0088-00
J31	JACK, TELEPHONE: same as J2	360-0148-00
J32	JACK, TELEPHONE: same as J2	360-0148-00
J33	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 female contacts; 5 amps; Amphenol Borg part no. 78-S11M-1005	372-1952-00
K1	RELAY, ARMATURE: antenna switching type, 2 C contact arrangement; 2 amps, 175 w, 2.30 mc; 1 inductive winding 115 v dc, 10,000 ohms; Potter and Brumfield, Inc. part no. KR-2565	970-1914-00
K2	RELAY, ARMATURE: same as K1	970-1914-00
K3	RELAY, ARMATURE: same as K1	970-1914-00
L1	COIL, RADIO FREQUENCY: single layer wound; magnet wire; 4.70 uh inductance; Jeffers Electronics Div. of Speer Carbon Co. part no. 10200-36	240-0160-00
L2	COIL, RADIO FREQUENCY: same as L1	240-0160-00
L3	COIL, RADIO FREQUENCY: same as L1	240-0160-00
L4	COIL, RADIO FREQUENCY: single layer wound; magnet wire; 39 uh inductance, 2.00 ohms dc; 500 ma current; Delevan Electronics Corp. part no. 2150-38	240-0171-00
L5	COIL, RADIO FREQUENCY: same as L1	240-0160-00
L6	COIL, RADIO FREQUENCY: same as L1	240-0160-00
L7	COIL, RADIO FREQUENCY: single layer wound; 100 turns #28 AWG; formvar insulation	548-9195-002
L8	COIL, RADIO FREQUENCY: single layer wound; 1.5 uh nominal inductance; 0.50 ohms dc resistance, 650 ma current rating; Jeffers Electronics Div. of Speer Carbon Co. part no. 10100-129	240-0063-00
L9 thru L31	COIL: part of Z1	
L32	COIL, RADIO FREQUENCY: single layer wound; 10.0 uh inductance; 510 ma current, 2.0 ohms resistance; Jeffers Electronics Div. of Speer Carbon Co. part no. 10402-40	240-0182-00
L33	COIL, RADIO FREQUENCY: single layer wound; 4 turns #22 AWG; formvar insulation	548-9148-002
L34	COIL, RADIO FREQUENCY: single layer wound; 0.47 uh nominal inductance, 0.09 ohm max dc resistance, 1600 ma max current rating; Jeffers Electronics Div. of Speer Carbon Co. part no. 10100-126	240-0060-00
L35	COIL, RADIO FREQUENCY: same as L4	240-0171-00
L36	COIL, RADIO FREQUENCY: single layer wound; 35 turns #28 AWG; formvar insulation	548-9247-002
L37	COIL, RADIO FREQUENCY: 1000 ma current rating; 2.20 uh, ±20%, 0.50 ohms; Delevan Electronics Corp. part no. 2150-08	240-0156-00
L38	COIL, RADIO FREQUENCY: single layer wound; 7 turns #24 AWG; formvar insulation	548-9151-002
L39	COIL, RADIO FREQUENCY: single layer wound; 4-1/2 turns #22 AWG; formvar insulation	548-9150-002
L40	REACTOR: 1 coil, 3.0 hy inductance, 0.120 A current, 100 ohms resistance; Stancor Electronics part no. 11272	668-0020-00
L41	COIL, RADIO FREQUENCY: single layer wound; 46 turns, #25 AWG wire; 6.5 uh nominal inductance; 0.05 ohm dc resistance, 1.5 amp current rating; Delevan Electronics Corp. part no. BP868	240-1037-00
L42	COIL, RADIO FREQUENCY: 2.20 uh ±10%, 125 mc frequency, 1.10 ohms max dc resistance, 450 ma dc current rating; Jeffers Electronics part no. 10100-130	240-0064-00
L43	COIL, RADIO FREQUENCY: 850 ma current; 1.00 uh ±20%; 0.30 dc resistance ohms, 7/16 in. lg; 2 wire leads; Jeffers Electronics Div. of Speer Carbon Co. part no. 10100-128	240-0062-00
L44	COIL, RADIO FREQUENCY: universal wound, 3 pi; 72 turns each section, #36 AWG wire; 220 uh inductance; 100 ma current; Delevan Electronics Corp. part no. BS-217	240-0198-00
L45	COIL, RADIO FREQUENCY: same as L8	240-0063-00
M1	MULTIMETER: scale marked 0 thru 400 ma, 0 thru 16 db; linear, 40 scale divisions; 46 ohms meter resistance; 2.217 in. by 2-3/8 in. by 2-3/8 in.; Electric Design of Mfg. Corp. part no. 458-0454-00	458-0454-00
MP1	SHAFT, STRAIGHT: chromate dipped; 1.500 in. lg, thd, 0.750 in. with no. 1/4 (0.250) in. -28 thd	548-9120-002

ITEM	DESCRIPTION	COLLINS PART NUMBER
MP2	ARM, SPIDER: aluminum, chromate dipped finish; 0.312 in. by 0.460 in. by 2.375 in. o/a dim.; four 0.032 in. dia slots, 0.312 in. deep	548-9121-002
MP3	NOT USED	
MP4	PULLEY, GROOVE: steel, tin plated, 1.375 in. od by 0.250 in. w; four 0.156 in. dia holes; includes hub 0.500 in. dia by 0.374 in. lg., two #6-40 thd holes at 90 deg; 0.189 in. id	548-9129-00
MP5	NOT USED	
MP6	SHAFT, STRAIGHT: brass, silver plated; 0.188 in. dia by 6.125 in. lg, slotted 0.031 in. w by 0.031 in. lg	548-9138-002
MP7	SHAFT, STRAIGHT: electro film dry lubricant finished; 0.248 in. dia by 5.813 in. lg, slotted 0.031 in. w by 0.031 in. lg	548-9141-002
MP8	SHAFT, STRAIGHT: brass, silver plated; 0.188 in. dia by 7.438 in. lg; slotted 0.031 in. w by 0.031 in. lg	548-9179-002
MP9	ARM, LEVER: aluminum, chromate dipped finish; 0.375 in. dia by 1.500 in. lg; two #4-48 in. thd holes; includes one roll pin	548-9182-002
MP10	BEARING, SLEEVE: nylon; 0.500 in. od by 0.250 in. lg, 0.197 in. id	543-8080-002
MP11	SHAFT, SHOULDERED: melamine; 0.248 in. dia by 3.406 in. lg; slightly flatted on dia	548-9180-002
MP12	ARM, LEVER: cres, passivated finish; 0.375 in. dia by 1 in. lg slotted 0.099 in. dia by 0.219 in. lg; two #4-48 thd holes	548-9183-002
MP13	SHAFT, SHOULDERED: melamine; 0.248 in. dia by 7.688 in. lg, slotted one end 0.031 in. w by 0.031 in. lg	548-9192-002
MP14	SHAFT, STRAIGHT: plastic; 0.187 in. dia by 3.688 in. lg, grooved 0.175 in. dia by 0.063 in. lg	548-9197-002
MP15	PULLEY, GROOVE: steel, tin plated; 1.094 in. dia by 0.313 in. lg; bottom of groove at 90 deg angle; includes one hub 0.500 in. dia by 0.374 in. lg; two #6-32 thd holes located 120 deg apart	548-9226-00
MP16	PULLEY, GROOVE: steel, tin plated; 1.375 in. od by 0.250 in. lg, 0.376 in. w across flats; includes 1 hub 0.500 in. dia by 1.093 in. lg, two #6-40 thd holes at 90 deg; slotted 0.032 in. dia by 0.406 in. lg	548-9227-00
MP17	PULLEY, GROOVE: steel, tin plated; 1.375 in. dia by 0.250 in. lg, 0.376 in. w across flats, includes 1 hub 0.500 in. dia by 0.500 in. lg, two #6-40 in. thd holes at 90 deg; 1 stop, shaft 1.376 in. dia by 0.625 in. lg, 0.063 in. thk	548-9228-00
MP18	PULLEY, GROOVE: steel, tin plated; 1.094 in. dia by 0.313 in. lg; includes hub 0.563 in. dia by 0.687 in. lg; two #6-40 thd holes at 90 deg	548-9229-00
MP19	ARM, DRIVE: aluminum, chromate dipped finish; 1 hub 0.563 in. dia by 0.500 in. lg; two #6-40 thd holes, includes 1 arm, drive 0.080 in. thk by 1.063 in. by 2.594 in. o/a dim.; slotted 1 end 0.781 in. dia by 0.469 in. deep, other end slotted 0.187 in. dia by 0.531 in. deep; 0.094 in. max bend	548-9231-00
MP20	COUPLING, SHAFT, RIGID: aluminum, chromate dipped finish; 0.625 in. dia by 0.625 in. lg, four #6-40 thd holes, two located at 90 deg, two spaced 0.313 in. C to C	548-9230-002
MP21	SHAFT, STRAIGHT: aluminum, chromate dipped finish; 0.187 in. dia by 2.313 in. lg, flatted 0.156 in. dia by 1.938 in. lg, both ends chamfered 0.031 in.	548-9242-002
MP22	SHAFT, SHOULDERED: cres; 0.250 in. dia by 2.375 in. lg, flatted 0.156 in. dia by 0.562 in. lg, grooved 0.029 in. w	548-9248-002
MP23	SHAFT, SHOULDERED: cres; 0.250 in. dia by 8.750 in. lg, flatted one end 0.156 in. dia by 0.562 in. lg	548-9252-002
MP24	COUPLING, SHAFT, RIGID: aluminum, chromate dipped finish; 0.500 in. dia by 0.500 in. lg, two #6-40 thd hole spaced 0.250 in. C to C	548-9253-002
MP25	LEVER, REMOTE CONTROL: aluminum, chromate dipped finish; 0.063 in. by 0.500 in. by 1.813 in. o/a dim.; two 0.255 in. dia holes, one 0.187 in. dia hole slotted 0.063 in. w	548-9255-002
MP26	BEARING, SLEEVE: cres, 0.425 in. id, 0.500 in. od, 0.125 in. lg; slotted 0.031 in. w	548-9262-002
MP27	SHAFT, STRAIGHT: aluminum tube, chromate dipped finish; 0.375 in. dia by 6.750 in. lg	548-9264-002
MP28	PULLEY, GROOVE: plastic; 1.375 in. dia by 0.250 in. lg; two grooves 0.062 in. dia	548-9266-002

ITEM	DESCRIPTION	COLLINS PART NUMBER
MP29	LEVER, REMOTE CONTROL: same as MP25	548-9255-002
MP30	BEARING, SLEEVE: same as MP26	548-9262-002
MP31	COUPLING, SHAFT, FLEXIBLE: phosphor bronze disk, brass body; 0.2525 in. id, 1.094 in. od 0.648 in. lg; 4 setscrews; Oak Mfg. Co. part no. 6422-008	015-0011-00
MP32	SHAFT, SHOULDERED: aluminum, anodized finish; 0.375 in. w across flats, 0.094 in. h hex; shaft thd with 8-32 thd to within 0.063 in. of shoulder; chamfered 0.031 in., 45 deg	548-9281-002
MP33	SHAFT, SHOULDERED: same as MP32	548-9281-002
MP34	SHAFT, SHOULDERED: cres with passivated finish; 0.375 in. dia by 1.537 in. lg; one end flatted 0.156 in. dia by 0.656 in. lg	548-9263-002
MP35	GEARSHAFT, SPUR, PRESSED: cres, passivate finish; 33 teeth; 0.729 in. od, 1.443 in. lg shaft	548-9235-002
MP36	DIAL ASSEMBLY: dial marked 49.6 thru 54.0 and 143.6 thru 148.0; 3-15/16 in. dia by 1 in. thk	548-9269-003
MP37	CONNECTING, LINK: aluminum, chromate dip finish; 0.63 in. by 0.375 in. by 10.625 in.	548-9258-002
MP38	CONTACT, ELECTRICAL: beryllium copper, silver plated; 0.218 in. by 0.250 in. by 1.0625 in.	548-9216-003
MP39	FOOT, CABINET: aluminum; 0.984 in. dia by 0.719 in. lg	543-8101-002
MP40	SHIELD, COIL: aluminum, cadmium plated finish; 0.875 in. by 1.375 in. by 1.425 in. o/a dim.	548-6755-003
MP41	SHIELD, COIL: aluminum, cadmium plated finish; 0.1375 in. by 1.425 in. by 1.828 in. o/a dim.; includes rivet	548-6756-003
MP42	RETAINER, ELECTRON TUBE SOCKET: aluminum, chromate dipped finish; 1.297 in. by 1.415 in. by 3.125 in. o/a dim.; seven 1.136 in. dia holes; includes one jack, tip 0.218 in. dia by 0.109 in. lg	548-9112-002
MP43	RIBBON, COPPER: silver-plated; 0.010 in. thk by 0.100 in. w; Improved Seamless Wire part no. C34-5347	430-1002-00
MP44	CONTACT, ELECTRICAL: copper with gold plated finish; 12 slots slots spaced 30 deg apart; 0.484 in. dia by 0.005 in. thk	544-7455-003
MP45	AMPLIFIER SUBASSEMBLY, POWER:	548-9170-00
MP46	SWITCH SECTION, ROTARY: steatite insulation; 1.328 in. dia by 1.297 in. lg; includes 3 terminal studs, 0.125 in. by 0.125 in. by 0.478 in. o/a; spaced 60 deg apart	548-9130-00
MP47	RETAINER, ELECTRICAL SHIELD: steel material, cadmium plated finish; tube shield base for 9 pin noval tube socket; Cinch Mfg. Co. part no. 441-43-22-212	141-0160-00
MP48	MOUNT, RESILIENT: rubber, 30 durometer hardness; 0.375 in. w by 0.750 in. lg; Lord Mfg. Co. part no. J-3112-5-1	200-1776-00
MP49	CAN, SHIELD: aluminum, chromate dipped finish; 1.281 in. by 2.313 in. by 2.688 in. o/a dim.	548-9284-002
MP50	CAN, SHIELD: aluminum, chromate dipped finish; 1.281 in. by 2.313 in. by 2.688 in. o/a dim.	548-9285-002
O1	KNOB: push-on type, spring steel; 0.250 in. od, flatted 0.156 in.	543-8039-002
O2	KNOB: push-on type, includes spring and disc; spring steel with spring steel finish; 0.250 in. od, flatted to 0.156 in.	543-8041-00
O3	KNOB: fluted, push-on type; includes spring; spring steel with spring steel finish; 0.250 in. od, flatted to 0.156 in.	543-8044-00
O4	KNOB: setscrew type, polystyrene knob with nickel plated brass hub; 0.250 in. dia by 0.563 in. lg; Miller, James, Mfg. Co., Inc. part no. A-019	281-0160-00
O5	KNOB: same as O1	543-8039-002
O6	KNOB: same as O1	543-8039-002
O7	KNOB: same as O4	281-0160-00
P1	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 male contacts, 5 amps; Amphenol-Borg part no. 86-CP11-1008	372-1950-00
R1	RESISTOR, FIXED, COMPOSITION: 0.10 megohm ±10%, 1/2 w; Allen Bradley type EB	745-1436-00
R2	RESISTOR, FIXED, COMPOSITION: 1000 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1352-00
R3	RESISTOR, FIXED, COMPOSITION: 56,000 ohms ±10% 1 w; Allen Bradley type GB	745-3426-00
R4	RESISTOR, FIXED, COMPOSITION: same as R1	745-1436-00
R5	RESISTOR, FIXED, COMPOSITION: 270 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1328-00
R6	RESISTOR, FIXED, COMPOSITION: 47,000 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0809-00
R7	RESISTOR, FIXED, COMPOSITION: 39,000 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1419-00
R8	RESISTOR, FIXED, COMPOSITION: 22,000 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1408-00
R9	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R10	RESISTOR, FIXED, COMPOSITION: same as R6	745-0809-00
R11	RESISTOR, FIXED, COMPOSITION: same as R8	745-1408-00
*R12	RESISTOR, FIXED, COMPOSITION: 1800 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1363-00
*R12	RESISTOR, FIXED, COMPOSITION: 2200 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1366-00
*R12	RESISTOR, FIXED, COMPOSITION: 2700 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1370-00
*R12	RESISTOR, FIXED, COMPOSITION: 3300 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1373-00
*R12	RESISTOR, FIXED, COMPOSITION: 3900 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1377-00
R13	RESISTOR, FIXED, COMPOSITION: 820 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1349-00
R14	RESISTOR, FIXED, COMPOSITION: 12 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0680-00
R15	RESISTOR, FIXED, COMPOSITION: 10,000 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1394-00
R16	RESISTOR, FIXED, COMPOSITION: same as R8	745-1408-00
R17	RESISTOR, FIXED, COMPOSITION: 82,000 ohms ±10%, 2 w; Allen Bradley type HB	745-5733-00
R18	RESISTOR, FIXED, COMPOSITION: 47 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1296-00
R19	RESISTOR, VARIABLE, COMPOSITION: 500 ohms ±30%, 0.2 w; Chicago Telephone Co. type 70	376-4631-00
R20	RESISTOR, FIXED, COMPOSITION: 150 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1317-00
R21	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R22	RESISTOR, FIXED, COMPOSITION: 47,000 ohms ±10%, 2 w; Allen Bradley type HB	745-5722-00
R23	RESISTOR, FIXED, COMPOSITION: 15,000 ohms ±10%, 2 w; Allen Bradley type HB	745-5701-00
R24	RESISTOR, FIXED, COMPOSITION: same as R5	745-1328-00
R25	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R26	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R27	RESISTOR, FIXED, COMPOSITION: same as R15	745-1394-00
R28	RESISTOR, FIXED, COMPOSITION: same as R5	745-1328-00
R29	RESISTOR, FIXED, COMPOSITION: 10 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1268-00
R30	RESISTOR, FIXED, COMPOSITION: 56,000 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1426-00
R31	RESISTOR, FIXED, COMPOSITION: 82 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1307-00
R32	RESISTOR, VARIABLE, WIREWOUND: 10,000 ohms ±10%, 2 w; Allen Bradley type HB	377-0565-00
R33	RESISTOR, FIXED, COMPOSITION: 18,000 ohms ±10%, 2 w; Allen Bradley type HB	745-5705-00
R34	RESISTOR, FIXED, COMPOSITION: same as R1	745-1436-00
R35	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R36	RESISTOR, FIXED, COMPOSITION: 0.33 megohms ±10%, 1/2 w; Allen Bradley Type EB	745-1457-00
R37	RESISTOR, FIXED, COMPOSITION: 10 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0677-00
R38	RESISTOR, FIXED, COMPOSITION: 270 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0728-00
R39	RESISTOR, FIXED, COMPOSITION: same as R8	745-1408-00
R40	RESISTOR, FIXED, COMPOSITION: 4700 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0773-00
R41	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R42	RESISTOR, FIXED, COMPOSITION: same as R38	745-0728-00
R43	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R44	RESISTOR, FIXED, COMPOSITION: same as R1	745-1436-00
R45	RESISTOR, FIXED, COMPOSITION: 4700 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1380-00
R46	RESISTOR, FIXED, COMPOSITION: 180 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1321-00
R47	RESISTOR, FIXED, COMPOSITION: same as R30	745-1426-00
R48	RESISTOR, FIXED, COMPOSITION: 15,000 ohms ±10%, 4 w; Allen Bradley part no. HM 1532	745-9746-00
R49	RESISTOR, FIXED, COMPOSITION: 1800 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1363-00
R50	RESISTOR, FIXED, COMPOSITION: 100 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1310-00
R51	RESISTOR, FIXED, COMPOSITION: 2200 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1366-00

*To be chosen in test.

ITEM	DESCRIPTION	COLLINS PART NUMBER
R52	RESISTOR, VARIABLE, WIREWOUND: 5000 ohms ±10%, 2 w; Chicago Telephone Supply part no. KQ22479	377-0110-00
R53	RESISTOR, FIXED, COMPOSITION: 2700 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1370-00
R54	RESISTOR, FIXED, COMPOSITION: 0.15 megohms ±10%, 1 w; Allen Bradley type GB	745-3443-00
R55	RESISTOR, FIXED, COMPOSITION: 47 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0701-00
R56	RESISTOR, FIXED, COMPOSITION: same as R14	745-0680-00
R57	RESISTOR, FIXED, COMPOSITION: same as R14	745-0680-00
R58	RESISTOR, FIXED, COMPOSITION: 47 ohms ±10%, 1 w; Allen Bradley type GB	745-3296-00
R59	RESISTOR, FIXED, COMPOSITION: 18,000 ohms ±10%, 1/2 w; Allen Bradley type EB	745-1405-00
R60	RESISTOR, FIXED, COMPOSITION: 1 megohm ±10%, 1/2 w; Allen Bradley type EB	745-1478-00
R61 thru R67	RESISTOR, FIXED, COMPOSITION: same as R60	745-1478-00
R68 thru R70	RESISTOR, FIXED, COMPOSITION: same as R14	745-0680-00
R71	RESISTOR, FIXED, COMPOSITION: same as R2	745-1352-00
R72	RESISTOR, FIXED, WIREWOUND: 6000 ohms ±10%, 10 w; IRC	710-9064-00
R73	RESISTOR, FIXED, COMPOSITION: 3900 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0770-00
R74	RESISTOR, FIXED, COMPOSITION: 1500 ohms ±10%, 1/4 w; Allen Bradley type CB	745-0755-00
R75	RESISTOR, FIXED, COMPOSITION: same as R6	745-0809-00
S1	SWITCH SECTION, ROTARY: 2 circuit, 2 pole, 12 position; 5 moving contacts, 6 fixed contacts; Oak Mfg. Co.	269-2327-00
S2	SWITCH SECTION, ROTARY: same as S1	269-2327-00
S3	SWITCH SECTION, ROTARY: same as S1	269-2327-00
S4	SWITCH SECTION, ROTARY: same as S1	269-2327-00
S5	SWITCH SECTION, ROTARY: same as S1	269-2327-00
S6	SWITCH SECTION, ROTARY: 2 moving and 12 fixed contacts; ceramic insulation; 1/16 in. by 1-5/8 in. by 1-7/8 in.; includes 5 shorting straps	548-9194-002
S7A	SWITCH, ROTARY: 1 circuit, 1 pole, 23 position, 1 section, 1 moving, 24 fixed contacts; Grigsby Co., Inc. part no. 25944-724LR-1	259-1506-00
S7B	SWITCH, SECTION, ROTARY: 1 circuit, 1 pole, 24 position, 1 moving, 23 fixed contacts; Grigsby Co., Inc. part no. 25967-724LR	269-2306-00
S7C	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 24 position, 1 moving, 23 fixed contacts; Grigsby Co., Inc. part no. 25968-724LR	269-2307-00
S8	SWITCH SECTION, ROTARY: 3 circuit, 3 pole, 12 position; 5 moving contacts, 7 fixed contacts; Oak Mfg. Co. type FC	269-2342-00
S9	SWITCH SECTION, ROTARY: 3 circuit, 3 pole, 12 position; 4 moving contacts, 7 fixed contacts; Oak Mfg. Co. type FC	269-2343-00
S10	SWITCH SECTION, ROTARY: 2 circuit, 2 pole, 12 position; 5 moving contacts, 6 fixed contacts; Oak Mfg. Co. type F	269-2313-00
S11	SWITCH SECTION, ROTARY: 1 circuit, 1 pole, 12 position; 2 moving contacts, 5 fixed contacts; Oak Mfg. Co. part no. 217684-F	269-2344-00
S12	SWITCH SECTION, ROTARY: same as S11	269-2344-00
S13	SWITCH SECTION, ROTARY: same as S11	269-2344-00
S14	SWITCH, ROTARY: 2 circuit, 2 pole, 3 position, 1 section, 2 moving contacts, 8 fixed contacts; Grigsby Co., Inc. part no. 25705-4MLR-1	259-1638-00
S15	SWITCH, ROTARY: 8 circuit, 8 pole, 4 position, 2 section; 8 moving contacts, 27 fixed contacts; Grigsby Co., Inc. type 4MLR	259-1505-00
S16	INTERLOCK ASSEMBLY: c/o 63 washers part no. 310-0396-00, 3 screws part no. 343-0338-00, 1 spring, Shorting part no. 554-0467-00, 1 lug part no. 304-0014-00, 1 Terminal part no. 306-0979-00, 1 eyelet part no. 307-1091-00	
T1	TRANSFORMER: p/o FL1	
T2	TRANSFORMER: p/o FL1	

ITEM	DESCRIPTION	COLLINS PART NUMBER
T3	TRANSFORMER, POWER, STEP-UP AND STEP-DOWN: 115 ac, 50 to 60 cps input, 275 v dc at 125 ma, 80 v dc at 10 ma, 6.3 v ac at 6.5 amps output; 3-3/16 in. by 3-13/16 in. by 5 in. o/a; Stancor Electronics part no. 30064	662-0035-00
TB1	TERMINAL BOARD: phenolic with 3 solder-lug terminals; 11/16 in. w by 1-1/8 in. lg; Cinch Mfg. Corp. part no. 332-1403-165	306-0001-00
TB2	TERMINAL BOARD: phenolic; 1/16 in. by 3/8 in. by 2-1/4 in.; includes 6 solder lug terminals; Cinch Mfg. Co.	306-0083-00
TB3	TERMINAL BOARD: same as TB2	306-0083-00
TB4	TERMINAL BOARD: same as TB2	306-0083-00
TB5	TERMINAL BOARD: Bakelite, insulated, 3 wiring lugs, one mounting lug, 23/32 in. w by 1-1/2 in. lg; Cinch Mfg. Corp. part no. 1532	306-2230-00
TB6	TERMINAL BOARD: same as TB1	306-0001-00
TB7	TERMINAL BOARD: same as TB2	306-0083-00
TB8	TERMINAL BOARD: same as TB2	306-0083-00
TB9	TERMINAL BOARD: same as TB5	306-2230-00
TB10	TERMINAL BOARD: same as TB5	306-2230-00
TB11	TERMINAL BOARD: same as TB1	306-0001-00
TB12	TERMINAL BOARD: same as TB5	306-2230-00
TB13	TERMINAL BOARD: same as TB1	306-0001-00
TB14	TERMINAL BOARD: same as TB1	306-0001-00
V1	ELECTRON TUBE: miniature triode; Sylvania Electric Co. part no. 6ER5	255-0384-00
V2	ELECTRON TUBE: pentode; Sylvania Electric Co. part no. 6 BZ6	255-0240-00
V3	ELECTRON TUBE: beam power; RCA part no. 7558	257-0181-00
V4	ELECTRON TUBE: same as V3	257-0181-00
V5	ELECTRON TUBE: tetrode; Eitel-McCullough, Inc. part no. 7034/4X150A	256-0124-00
V6	ELECTRON TUBE: glass envelope, twin triode; Radio Corp. of America part no. 12AT7	255-0205-00
V7	ELECTRON TUBE: same as V1	255-0384-00
V8	ELECTRON TUBE: same as V1	255-0384-00
V9	ELECTRON TUBE: triode-pentode; Radio Corp. of America part no. 6EA8	255-0379-00
V10	ELECTRON TUBE: pentode; same as V1	255-0384-00
W1	CABLE ASSEMBLY, POWER ELECTRICAL: 3 conductors; molded-on male plug; Cornish Wire Co. part no. 0220-20	426-1465-00
W2	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms, 29.5 uuf per foot; 27 strands of #36 AWG tinned copper wire; 11 in. lg; Switchcraft, Inc.	426-5245-00
W3	CABLE ASSEMBLY, RADIO FREQUENCY. coaxial; 50 ohms, 29.5 uuf per foot; 27 strands of #36 AWG tinned copper wire; 7-1/2 in. lg; Switchcraft, Inc.	426-5246-00
W4	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms, 29.5 uuf per foot; 27 strands of #36 AWG tinned copper wire; 11-5/8 in. lg; Switchcraft, Inc.	426-5270-00
W5	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms, 29.5 uuf per foot; 27 strands of #36 AWG tinned copper wire; 5-1/8 in. lg; Switchcraft, Inc.	426-5247-00
W6	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms, 29.5 uuf per foot; 27 strands of #36 AWG tinned copper wire; 6-1/8 in. lg; Switchcraft, Inc.	426-5271-00
W7	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms; 29.5 uuf per foot, 27 strands of #36 AWG tinned copper wire; 11-3/4 in. lg; Switchcraft, Inc.	426-5272-00
W8	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms, 29.5 uuf per foot, 27 strands of #36 AWG tinned copper wire; 1-3/4 in. lg; Switchcraft, Inc. part no. 4C-1575	426-5298-00
W9	CABLE ASSEMBLY, RADIO FREQUENCY: both ends of grey jacket, modified RC-58C/U coaxial cable terminated in straight phone plugs; 50 ohms; 14 db/100 feet max at 400 mc; Switchcraft part no. 4C-1336	426-5076-00
W10 thru W14	CABLE ASSEMBLY, RADIO FREQUENCY: same as W9	426-5076-00
W15	CABLE ASSEMBLY, RADIO FREQUENCY: forked type; c/o a stranded insulated conductor with an o/a shield and outer jacket; 7 strands of 30 AWG min stranding combination, #22 AWG wire; 31 uuf; Switchcraft part no. 330F-1	426-5408-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
XDS1	LAMP, INCANDESCENT: for use with miniature bayonet bulb; 1-3/8 in. lg overall; Micarta Fabricators, Inc. part no. DB718	262-1210-00
XDS2	LAMP, INCANDESCENT: same as XDS1	262-1210-00
XF1	FUSEHOLDER: extractor post type; 250 v; 15 amps; ferrule terminals; plastic body, brass contacts; Bussmann Fuse Div. of McGraw-Edison Co. part no. HKP-HJR-ZZ	265-1019-00
XV1	SOCKET, ELECTRON TUBE: type E7 pin miniature; silver plated copper contacts; Sylvania Electric Products, Inc. Parts Div. part no. 7470-0125	220-1203-00
XV2	SOCKET, ELECTRON TUBE: same as XV1	220-1203-00
XV3	SOCKET, ELECTRON TUBE: brass, 9 bottom mounting copper contacts for use with UHF type tube socket without center shield; Elco Corp. part no. STCP512-SPH. 125	220-1453-00
XV4	SOCKET, ELECTRON TUBE: same as XV3	220-1453-00
XV5	SOCKET, ELECTRON TUBE: 6 contacts, black phenolic insulation	548-9212-003
XV6	SOCKET, ELECTRON TUBE: 9 contact miniature; copper non-magnetic alloy contacts, plated; phenolic insulation; Sylvania Electric Products, Inc., Parts Div. part no. 7490-0100	220-1244-00
XV7	SOCKET, ELECTRON TUBE: same as XV1	220-1203-00
XV8	SOCKET, ELECTRON TUBE: same as XV1	220-1203-00
XV9	SOCKET, ELECTRON TUBE: same as XV6	220-1244-00
XV10	SOCKET, ELECTRON TUBE: same as XV1	220-1203-00
XY1	SOCKET, CRYSTAL: 14 contact positions; silver plated copper contacts; phenolic body; 0.343 in. by 2.062 in. by 2.450 in. excluding terminals; Amphenol-Borg Electronic Corp. part no. 33-807	292-0072-00
XY2	SOCKET, CRYSTAL: same as XY1	292-0072-00
Y1	NOT SUPPLIED	
Y2	NOT SUPPLIED	
Y3	CRYSTAL UNIT, QUARTZ: 36.0000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2113	289-2113-00
Y4	CRYSTAL UNIT, QUARTZ: 36.2000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2114	289-2114-00
Y5	CRYSTAL UNIT, QUARTZ: 36.4000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2115	289-2115-00
Y6	CRYSTAL UNIT, QUARTZ: 36.6000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2116	289-2116-00
Y7	CRYSTAL UNIT, QUARTZ: 36.8000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2117	289-2117-00
Y8	CRYSTAL UNIT, QUARTZ: 37.000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2118	289-2118-00
Y9	CRYSTAL UNIT, QUARTZ: 37.2000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2119	289-2119-00
Y10	CRYSTAL UNIT, QUARTZ: 37.4000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2120	289-2120-00
Y11	CRYSTAL UNIT, QUARTZ: 37.6000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2121	289-2121-00
Y12	CRYSTAL UNIT, QUARTZ: 37.8000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2122	289-2122-00
Y13	CRYSTAL UNIT, QUARTZ: 38.0000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2123	289-2123-00
Y14	CRYSTAL UNIT, QUARTZ: 38.2000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2124	289-2124-00
Y15	CRYSTAL UNIT, QUARTZ: 38.4000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2125	289-2125-00
Y16	CRYSTAL UNIT, QUARTZ: 38.6000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2126	289-2126-00
Y17	CRYSTAL UNIT, QUARTZ: 38.8000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2127	289-2127-00
Y18	CRYSTAL UNIT, QUARTZ: 39.0000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2128	289-2128-00
Y19	CRYSTAL UNIT, QUARTZ: 39.2000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2129	289-2129-00
Y20	CRYSTAL UNIT, QUARTZ: 39.4000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2130	289-2130-00
Y21	CRYSTAL UNIT, QUARTZ: 39.6000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2131	289-2131-00
Y22	CRYSTAL UNIT, QUARTZ: 39.8000 mc frequency; Midland Mfg. Co., Inc. part no. M9-2132	289-2132-00
Z1	AMPLIFIER SUBASSEMBLY: 1-1/4 in. by 2-11/64 in. by 3-3/16 in.; capacitors in this assembly symboled C9, C11, C132	548-9217-004
Z2	AMPLIFIER SUBASSEMBLY: same as Z1	548-9217-004
Z3	AMPLIFIER SUBASSEMBLY: 1-1/4 in. by 2-11/64 in. by 3-3/16 in.; capacitors in this assembly symboled C23, C25, C134	548-9218-004
Z4	AMPLIFIER SUBASSEMBLY: 1-1/4 in. by 2-11/64 in. by 3-3/16 in.; capacitors in this assembly symboled C31, C33, C135	548-9219-004
Z5	AMPLIFIER SUBASSEMBLY: 1-1/4 in. by 2-11/64 in. by 3-3/16 in.; capacitors in this assembly symboled C34, C36, C136	548-9220-004
Z6	RECEIVER SUBASSEMBLY, NO. 1 CONVERTER:	548-9131-00
Z7	NOT USED	
Z8	RECEIVER SUBASSEMBLY, NO. 2 CONVERTER:	548-9132-00
Z9	RADIO FREQUENCY TUNER SUBASSEMBLY:	548-9125-003
Z10	RECEIVER SUBASSEMBLY, NO. 3 CONVERTER:	548-9133-00
	62S-1 ACCESSORY GROUP	
	ADAPTER, CONNECTOR: 2 male, 3 female contacts, 15 amps, 125 v ac; 2 connector mating ends, Bell Electric Co.	368-0138-00
	FUSE, CARTRIDGE: glass enclosed, time lag 1.5 amps, 125 v max, 0.36 ohms resistance; Bussman Mfg. Co. type MDL (qty 2)	264-0007-00
	LAMP, INCANDESCENT: 6 to 8 v, 0.25 amps current, miniature bayonet base, G-3-1/2 bulb; Chicago Miniature Lamp Works part 51 (qty 2)	262-0264-00
	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial cable; terminated with three connectors	548-9267-003
	CONNECTOR, PLUG, ELECTRICAL: 1 contact, 1 connector mating end; Amphenol Canada, Ltd	357-9261-00
	KEY, SOCKET HEAD SCREW: steel; splined type, 6 flutes, 0.094 in. major dia; "L" type, handle, 1.875 in., nom lg; Bristol Co. part no. S-094 CAD OR ZINC PL	024-0019-00
	KEY, SOCKET HEAD SCREW: steel; splined type, 4 flutes, 0.076 in. major dia; 1.749 in. nom lg; Bristol Co. part no. S-076-4 CAD OR ZINC PL	024-9730-00
	KEY, SOCKET HEAD SCREW: steel; splined type, 6 flutes, 0.060 in. major dia; "L" type, handle, 1-9/16 in. nom lg; Bristol Co. part no. S-060 CAD OR ZINC PL	024-2900-00
	CABLE ASSEMBLY, RADIO FREQUENCY: coaxial; 50 ohms, 29.5 uuf per foot, 27 strands of #36 AWG tinned copper wire; 1-3/4 in. lg; Switchcraft, Inc. part no. 4C-1575	426-5298-00

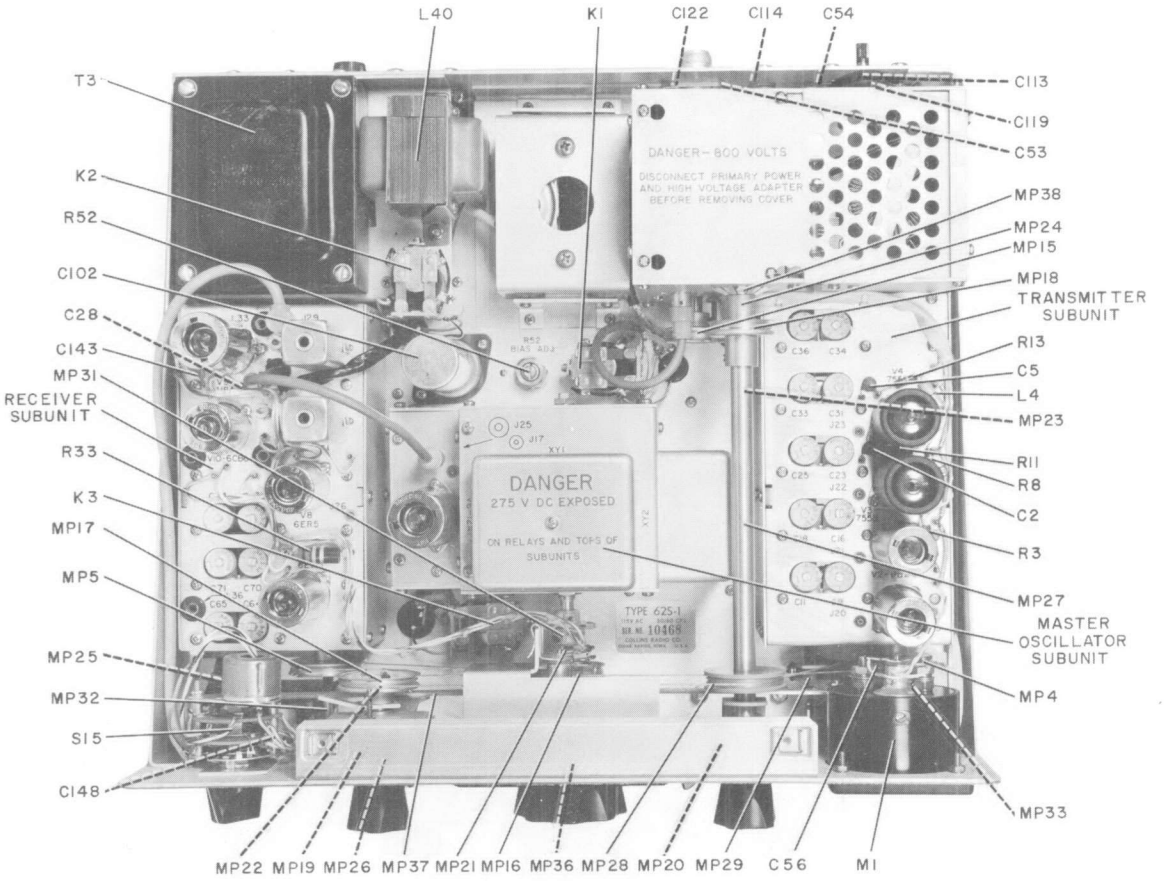


Figure 6-1. Top View, Parts Identification

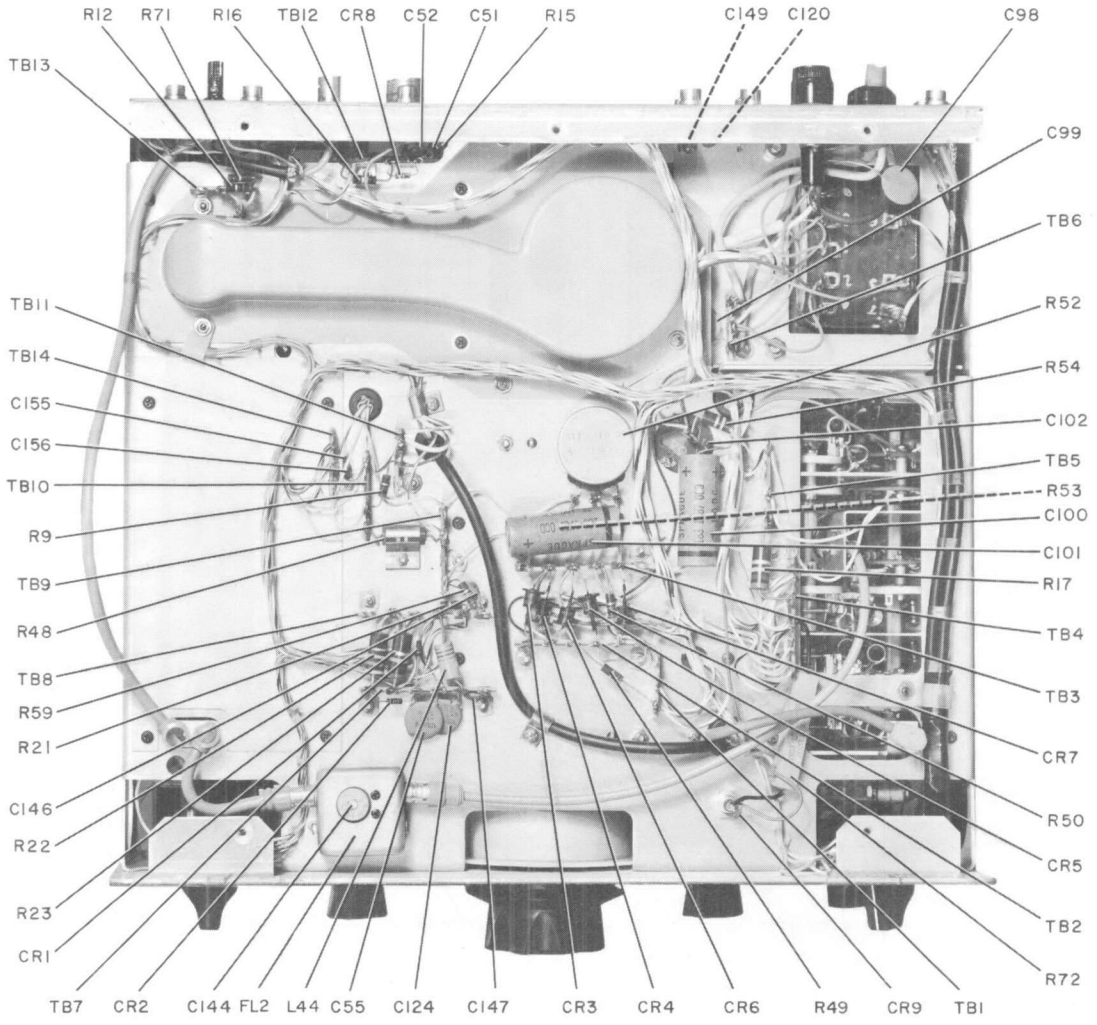


Figure 6-2. Bottom View, Parts Identification

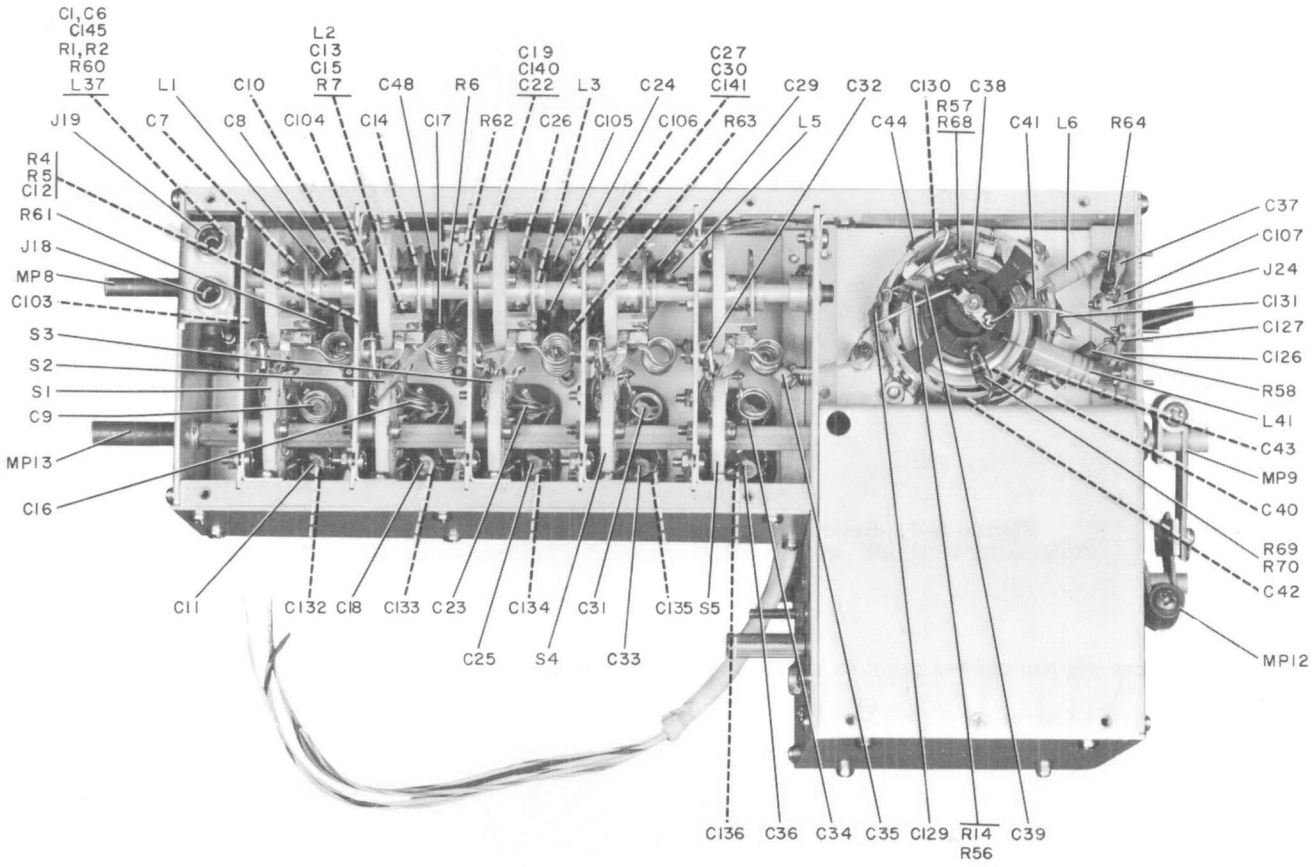


Figure 6-3. Transmitter Subunit, Bottom View, Parts Identification

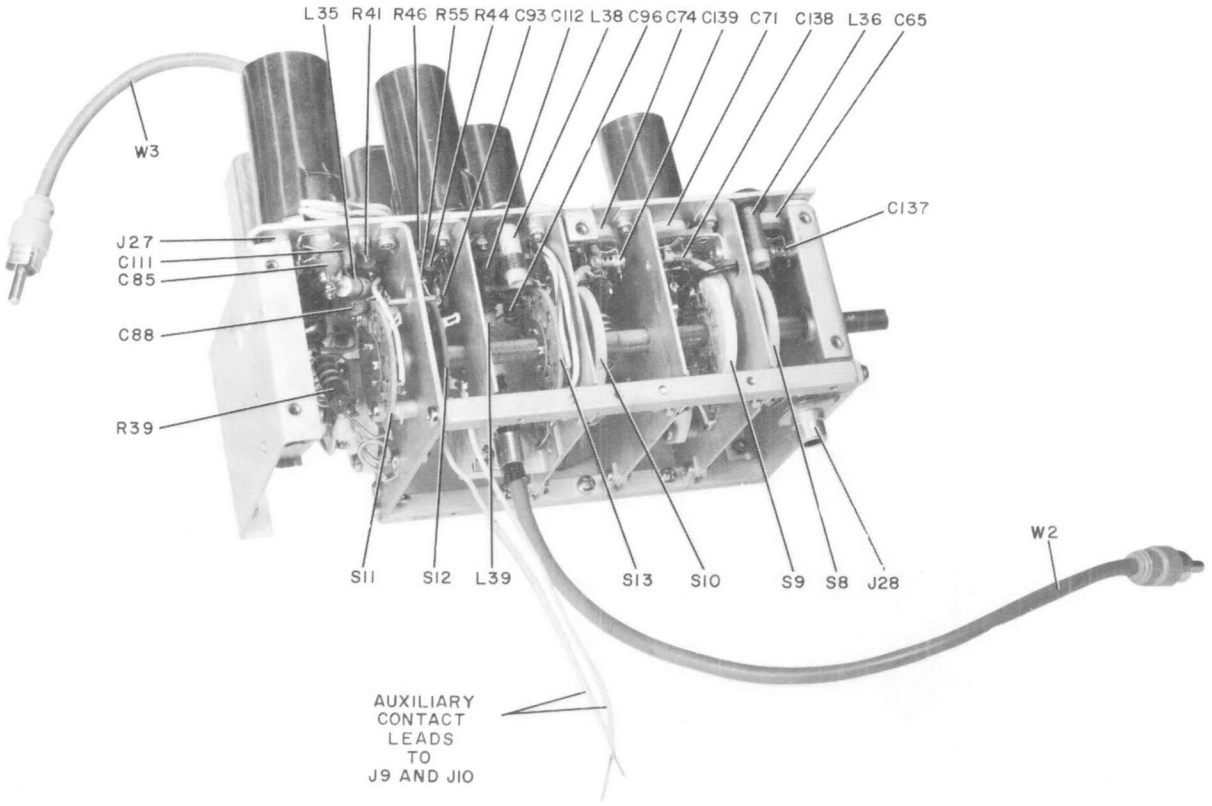


Figure 6-4. Receiver Subunit, Left Side, Parts Identification

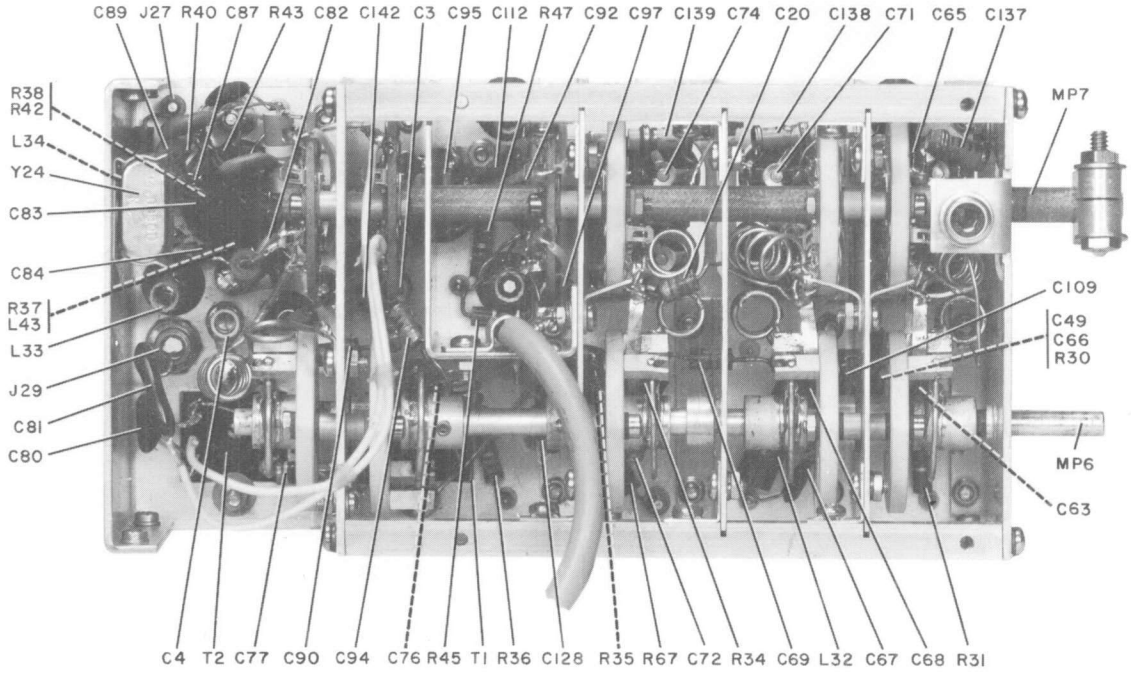


Figure 6-5. Receiver Subunit, Bottom View, Parts Identification

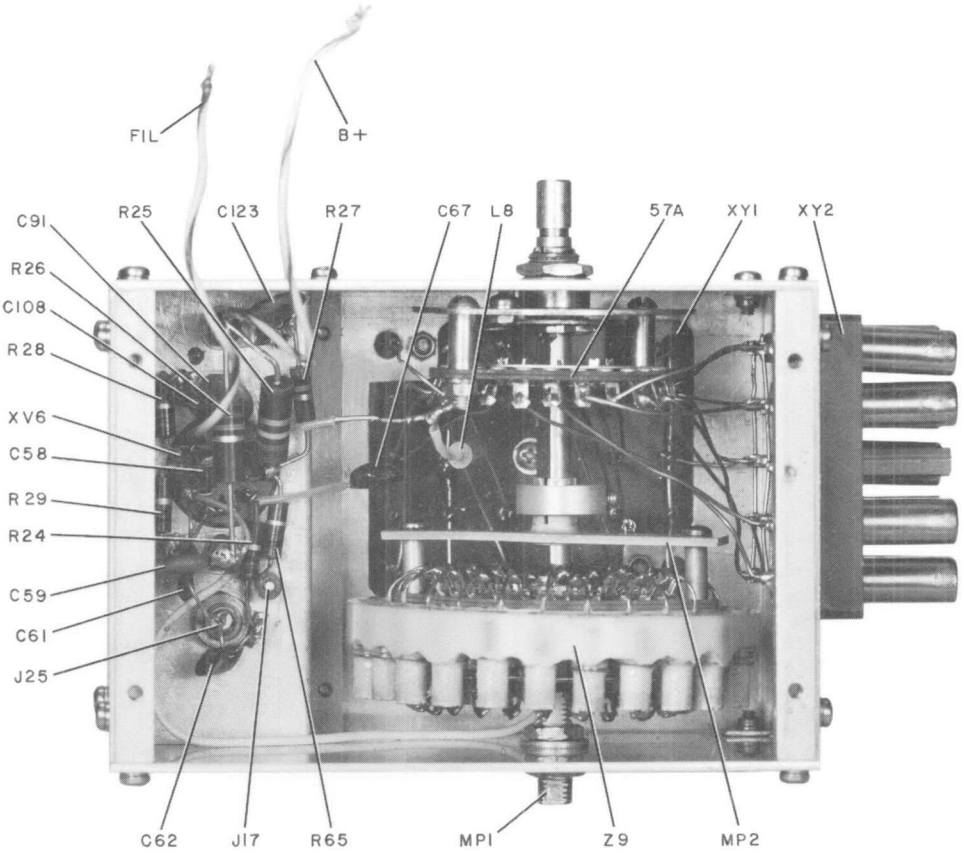


Figure 6-6. Master Oscillator Subunit, Bottom View, Parts Identification

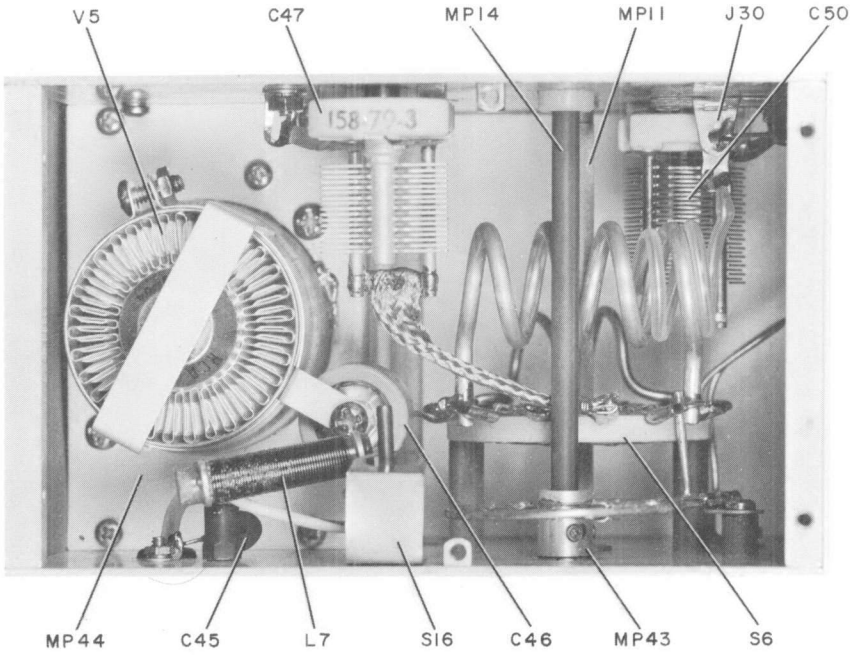
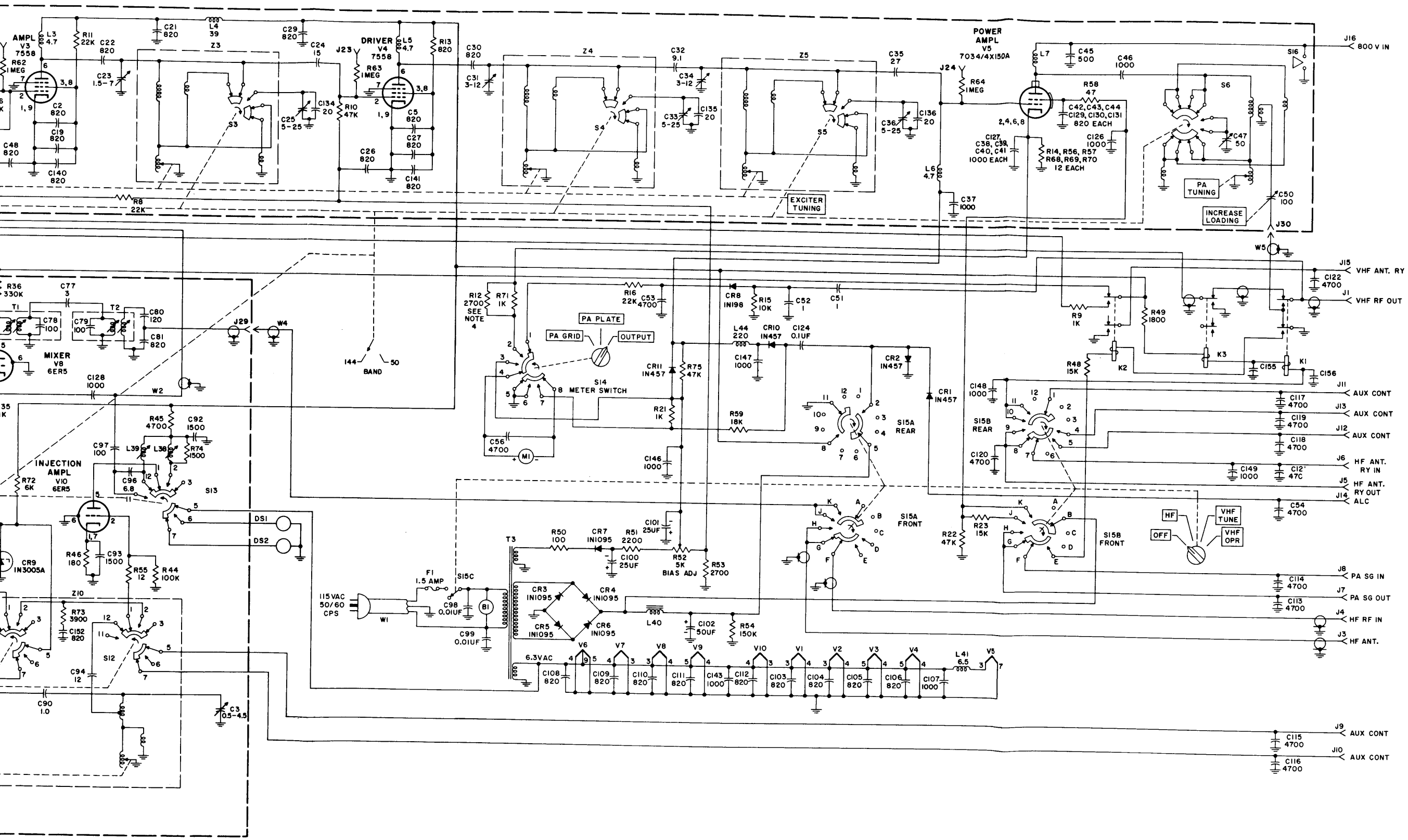


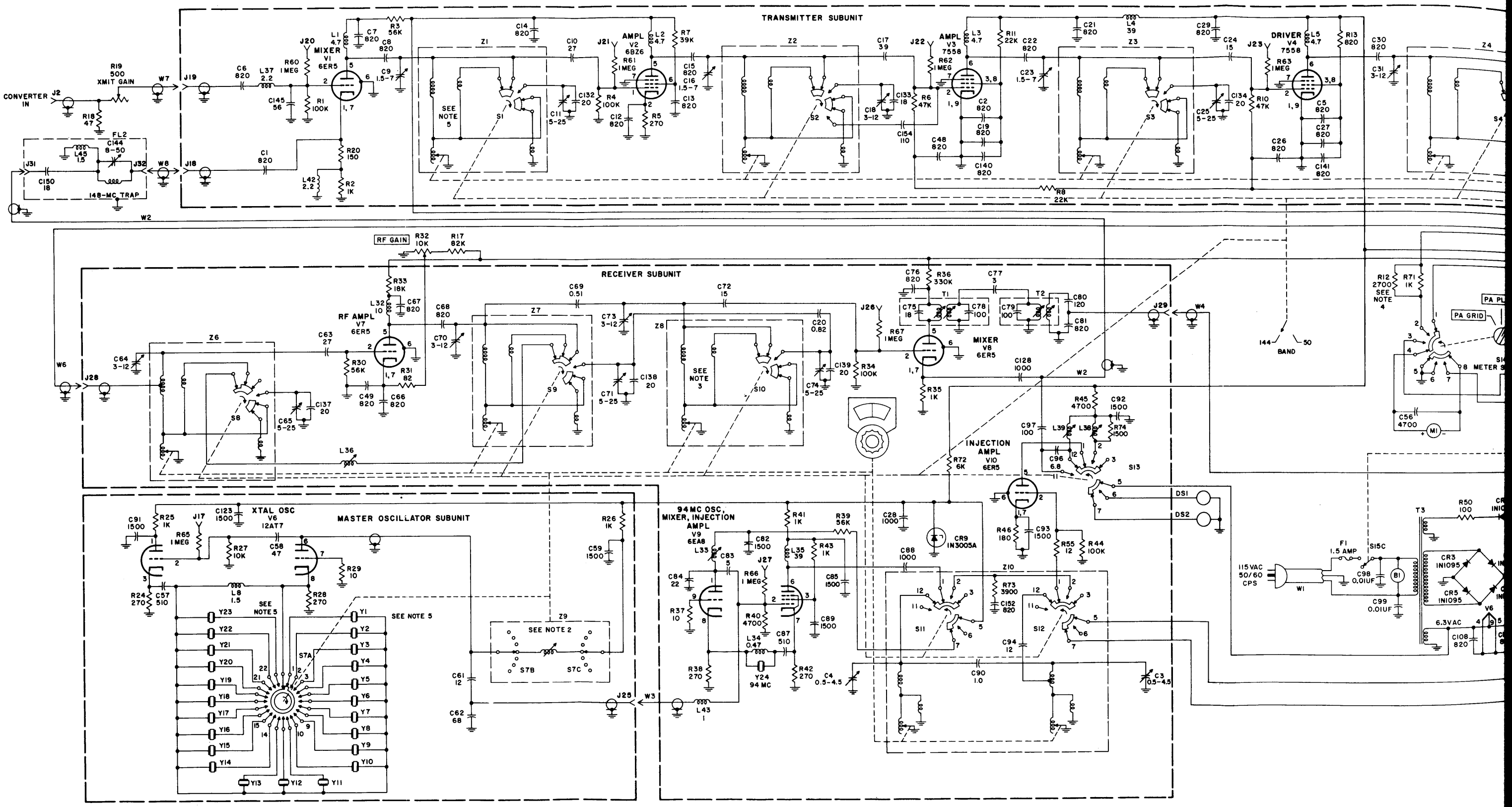
Figure 6-7. PA Compartment, Top View, Parts Identification



NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICOFARADS (UUF), AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. Z9 IS A TURRET CONSISTING OF TWO SINGLE-POLE 23-POSITION SWITCH WAFERS AND COILS L9 THRU L31.
3. FOUR-LOOP COILS INDICATE 6 METER COILS AND TWO-LOOP COILS INDICATE 2 METER COILS.
4. TYPICAL VALUE SHOWN. FINAL VALUE BETWEEN 1800 AND 3900 OHMS. DETERMINED BY PRODUCTION TEST.
5. CRYSTALS Y1, Y2, AND Y23 NOT FURNISHED.

Figure 7-1. 62S-1 VHF Converter, Schematic Diagram


TRANSMITTER SUBUNIT
RECEIVER SUBUNIT
MASTER OSCILLATOR SUBUNIT
CONVERTER IN
J2
R19 500 XMIT GAIN
R18 47
W7
J19
FL2
L45 1.5
C144 8-50
J31
J32
C150 18
148-MC TRAP
W8
J18
W2
C6 820
L37 2.2
C145 56
C1 820
L42 2.2
R20 150
R2 1K
J20
MIXER V1 6ER5
L1 4.7
C7 820
R3 56K
C8 820
R60 1MEG
R1 100K
C9 1.5-7
Z1
SEE NOTE 5
S1
C14 820
C10 27
C11 5-25
C132 20
J21
AMPL V2 6BZ6
L2 4.7
R7 39K
R61 1MEG
R4 100K
C12 820
R5 270
C15 820
C16 1.5-7
C13 820
Z2
S2
C17 39
C18 3-12
C154 110
J22
AMPL V3 7558
L3 4.7
R11 22K
C22 820
R62 1MEG
R6 47K
C133 18
C48 820
C2 820
C19 820
C140 820
R8 22K
C23 1.5-7
Z3
S3
C21 820
L4 39
C29 820
C24 15
C25 5-25
C134 20
J23
DRIVER V4 7558
L5 4.7
R13 820
R63 1MEG
R10 47K
C26 820
C5 820
C27 820
C141 820
C30 820
C31 3-12
Z4
S4
RF GAIN
R32 10K
R17 82K
R33 18K
L32 10
C67 820
RF AMPL V7 6ER5
C68 820
C69 0.51
C72 15
C73 3-12
C70 3-12
Z6
Z7
Z8
S8
S9
S10
SEE NOTE 3
C64 3-12
C63 27
R30 56K
R31 82
C49 820
C66 820
C65 5-25
C137 20
C71 5-25
C138 20
C20 0.82
C74 5-25
C139 20
R34 100K
J26
R67 1MEG
C76 820
R36 330K
T1
C75 18
C78 100
C77 3
T2
C79 100
C80 120
C81 820
MIXER V8 6ER5
J29
W4
144
50
BAND
C128 1000
W2
R35 1K
L36
R45 4700
C92 1500
C97 100
L39
L38
R74 1500
C96 6.8
INJECTION AMPL V10 6ER5
R72 6K
S13
DS1
DS2
R46 180
C93 1500
R55 12
R44 100K
C28 1000
CR9 IN3005A
C88 1000
Z10
R73 3900
C152 820
S11
S12
C94 12
C90 1.0
C3 0.5-4.5
C4 0.5-4.5
R12 2700 SEE NOTE 4
R71 1K
PA PL
PA GRID
S1
METER S
C56 4700
MI
XTAL OSC V6 12AT7
C91 1500
R25 1K
J17
C123 1500
R65 1MEG
R27 10K
C58 47
R29 10
R24 270
C57 510
L8 1.5
R28 270
SEE NOTE 5
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y11
Y12
Y13
Y14
Y15
Y16
Y17
Y18
Y19
Y20
Y21
Y22
Y23
S7A
S7B
S7C
Z9
SEE NOTE 2
R26 1K
C59 1500
C61 12
C62 68
J25
W3
94 MC OSC, MIXER, INJECTION AMPL V9 6EA8
L33
C83 5
C82 1500
R41 1K
R39 56K
L35 39
R43 1K
J27
R66 1MEG
C84 22
R37 10
R40 4700
L34 0.47
C87 510
C85 1500
C89 1500
R38 270
Y24 94 MC
R42 270
L43 1
115 VAC 50/60 CPS
W1
F1 1.5 AMP
S15C
C98 0.01UF
B1
C99 0.01UF
T3
R50 100
CR3 IN1095
CR5 IN1095
6.3VAC
V6
C108 820

index