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SECTION IV

ACCESSORIES

MMR-1 MOBILE MOUNT

Available from INTERNATIONAL is a mobile mount designed with the customer's convenience in mind. This accessory permits the transceiver to be installed or removed from the car by simply pulling the unit out, much in the same manner as an ash tray. Details of the mount are shown on another page in this section.

ANTENNAS

Without an efficient antenna, operation of your Executive is not as enjoyable as can be experienced with a well designed antenna system. INTERNATIONAL has available antennas for almost any installation.

12 POSITION TRANSMITTER SWITCH

For those who may desire the convenience of more than three transmitting crystals, INTERNATIONAL now has a crystal switch assembly which accommodates 12 crystals. This unit is easily installed and is nominally priced. Cat. No. 150-163.....\$7.50

EXECUTIVE CRYSTALS

Crystals for the preceding crystal switch assembly and all other Executive units are also available for transmitting and receiving channels 1 to 23. Frequency and part numbers of these crystals are listed on another page in this section. Price Each\$4.75

POWER PLUGS

For our customers who have only one unit and wish to use it in several different locations, INTERNATIONAL offers three different power plugs which will allow the Executive unit to be used anywhere.

6VDC plug	Part No. 150-118	Price Each.....\$7.50
12VDC plug	Part No. 150-119	Price Each.....\$7.50
115 VAC plug	Part No. 150-120	Price Each.....\$7.50
DC plug Kit	Part No. 150-191	Price Each.....\$3.95
AC plug Kit	Part No. 150-192	Price Each.....\$3.95

MMR-1

Mobil Mounting Rack

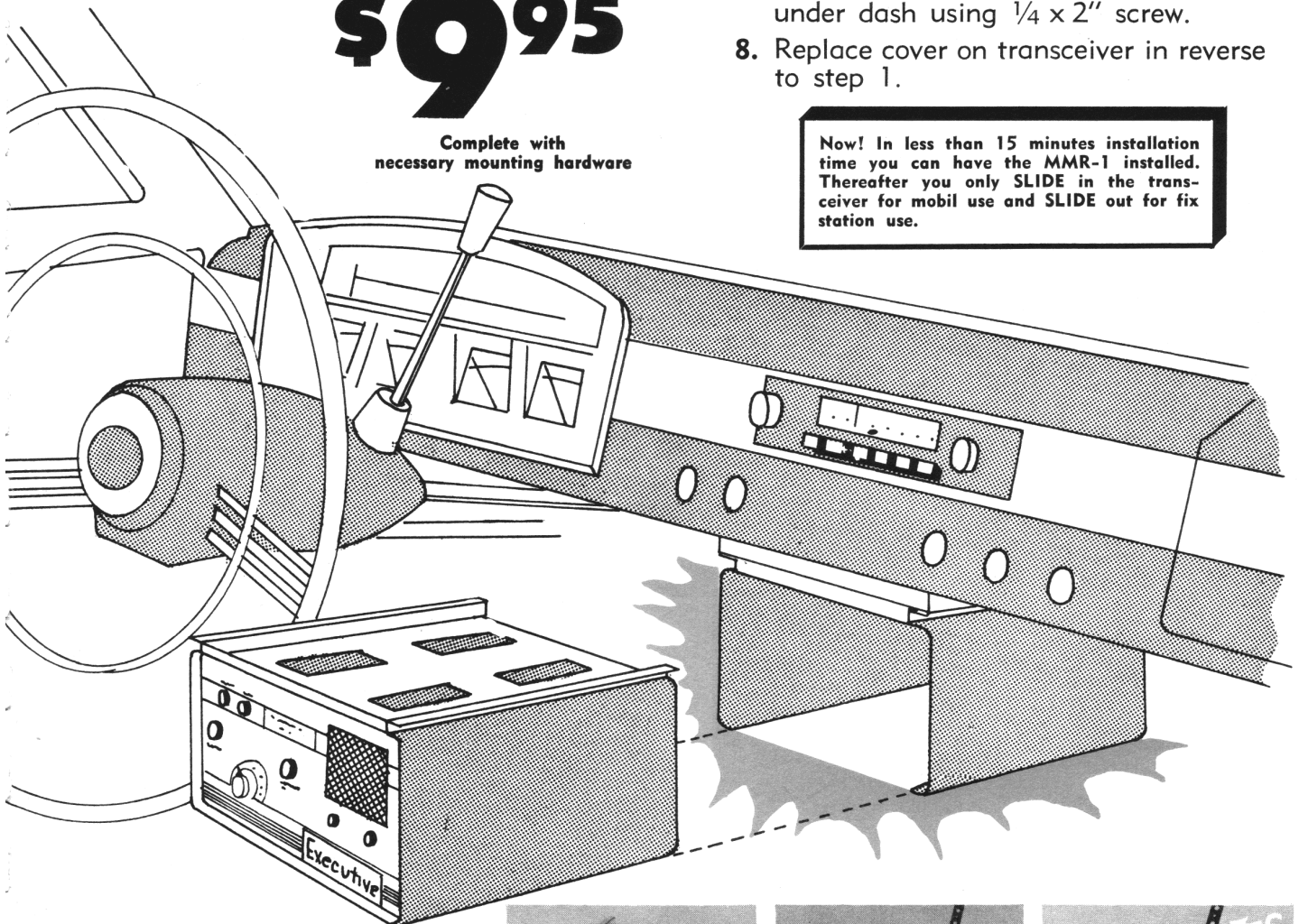
ONLY
\$995

Complete with
necessary mounting hardware

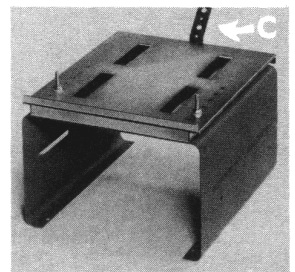
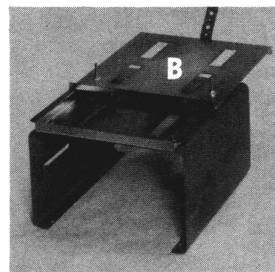
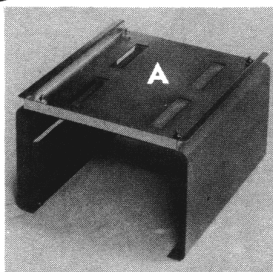
INSTALLATION INSTRUCTIONS

1. Place transceiver up-side-down and remove the four rubber feet. Turn transceiver right side up and spread case at bottom and remove.
2. Place part **A** on top of cabinet and drill four (4) 3/16" holes.
3. Use #8 x 1/2" screws and bolt part **A** to case. (with screw heads inside case.)
4. Use #8 x 1/2" screws and bolt strap **C** to part **B**.
5. Position part **B** under dash. Drill two (2) 3/16" holes.
6. Use #8 x 1" screws and bolt part **B** under dash.
7. Fasten part **C** to fire wall or a brace under dash using 1/4 x 2" screw.
8. Replace cover on transceiver in reverse to step 1.

Now! In less than 15 minutes installation time you can have the MMR-1 installed. Thereafter you only SLIDE in the transceiver for mobil use and SLIDE out for fix station use.



International
CRYSTAL MFG. CO., Inc.
OKLAHOMA CITY, OKLAHOMA



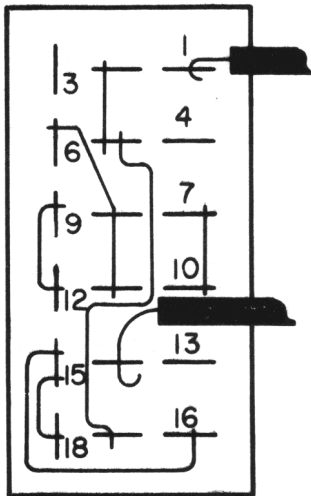
Mobil Mounting Rack

WIRING POWER PLUG FOR MODEL 50

The 3-way power supply may be operated from any one of three different power sources 115 VAC; 6VDC; or 12VDC. Depending upon voltage to be used, connect the jumper wires to the plug as indicated below. A power cord is included with the kit. If it is desired to connect the plug for battery use, two pieces of #12 or larger battery wire, no longer than three feet, should be used between the plug and battery. DO NOT USE SMALL SIZE WIRE OR LONGER LENGTHS WHEN OPERATING FROM BATTERY AS THIS CAUSES EXCESSIVE VOLTAGE LOSS.

Remove the cover from the power plug by removing the two retainer pins and then separating cover and base. The sketches below are of the connection side of the plug base. Use the #18 buss wire supplied to make jumpers. Where jumpers cross and there is danger of a short, use a length of the insulating sleeving over the wire.

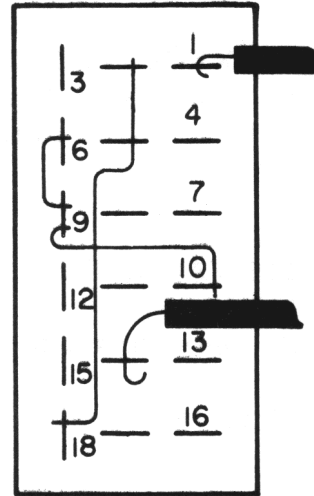
150-118



6VDC

6 V Hot to Pin 1
 6 V Ground to Pin 14
 14 Jumper Pins
 2 to 5 9 to 12
 6 to 8 17 to 5
 8 to 11 15 to 18
 7 to 10 15 to 16

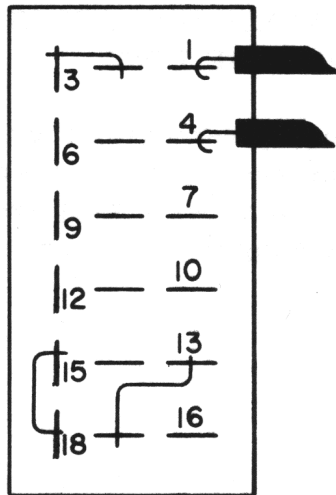
150-119



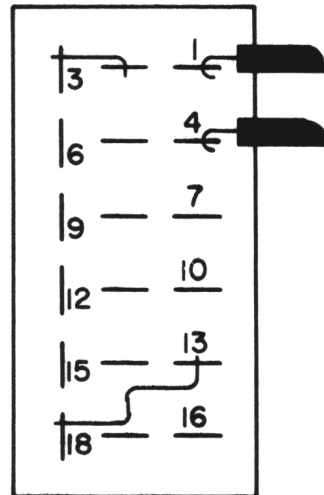
12VDC

12 V Hot to Pin 1
 12 V Ground to Pin 14
 14 Jumper Pins
 2 to 5
 6 to 9
 9 to 10
 5 to 18

150-120



150-174



115 VAC

All EXECUTIVE Model 50 Tranceivers produced after April 1, 1962 or having Serial Numbers (SD) and later will use A.C. Power Plug 150-174. Units produced prior to this date will use A.C. Power Plug 150-120.

115 VAC to Pins

1 to 4

Jumper Pins 2 to 3

13 to 17

15 to 18

115 VAC to Pins

1 to 4

Jumper Pins 2 to 3

13 to 18

Insert the wires, used for connecting to the power source, through the plug cover before connecting to the plug base. A plastic strain relief is provided for placing around the wires where they go through the cover clamp. Tighten the cover clamp screws to hold the wires in place.

CRYSTALS FOR EXECUTIVE MODELS 50 & 100 CITIZEN BANDERS

Channel Number	Channel Frequency	TRANSMITTER		RECEIVER (Type "R" Miniature)	
		Stock Number	Crystal Frequency	Stock Number	Crystal Frequency
1	26.965 mc	900-101	13482.50 kc	900-179	16965.00 kc
2	26.975 mc	900-102	13487.50 kc	900-180	16975.00 kc
3	26.985 mc	900-103	13492.50 kc	900-181	16985.00 kc
4	27.005 mc	900-104	13502.50 kc	900-182	17005.00 kc
5	27.015 mc	900-105	13507.50 kc	900-183	17015.00 kc
6	27.025 mc	900-106	13512.50 kc	900-184	17025.00 kc
7	27.035 mc	900-107	13517.50 kc	900-185	17035.00 kc
8	27.055 mc	900-108	13527.50 kc	900-186	17055.00 kc
9	27.065 mc	900-109	13532.50 kc	900-187	17065.00 kc
10	27.075 mc	900-110	13537.50 kc	900-188	17075.00 kc
11	27.085 mc	900-111	13542.50 kc	900-189	17085.00 kc
12	27.105 mc	900-112	13552.50 kc	900-190	17105.00 kc
13	27.115 mc	900-113	13557.50 kc	900-191	17115.00 kc
14	27.125 mc	900-114	13562.50 kc	900-192	17125.00 kc
15	27.135 mc	900-115	13567.50 kc	900-193	17135.00 kc
16	27.155 mc	900-116	13577.50 kc	900-194	17155.00 kc
17	27.165 mc	900-117	13582.50 kc	900-195	17165.00 kc
18	27.175 mc	900-118	13587.50 kc	900-196	17175.00 kc
19	27.185 mc	900-119	13592.50 kc	900-197	17185.00 kc
20	27.205 mc	900-120	13602.50 kc	900-198	17205.00 kc
21	27.215 mc	900-121	13607.50 kc	900-199	17215.00 kc
22	27.225 mc	900-122	13612.50 kc	900-200	17225.00 kc
23	27.255 mc	900-123	13627.50 kc	900-201	17255.00 kc

SECTION V

SERVICE AND MAINTENANCE

GENERAL

As is the case with all types of electronic equipment, the EXECUTIVE should be checked periodically by a qualified technician to ensure optimum performance at all times and to correct any condition which might later result in equipment failure due to improper adjustment, tube aging or component failure. Since the EXECUTIVE Series receiver differs somewhat in its design from conventional Citizen Band radio sets, no attempt should be made to service this equipment until the technician has become completely familiar with the basic circuitry and has a thorough understanding of the characteristics of dual conversion equipment.

In general, maintenance can be simplified by seeking a definite symptom of a fault and establishing, by reference to the block and schematic diagrams, a condition or series of conditions which might cause the symptom. This will usually help to localize the source of trouble and eliminate those sections of the equipment which are operating properly.

Many technicians tend to overlook the very simple and more obvious sources of trouble in their service work. This may be brought about by a nontechnical operator's description of a particular fault. For example, a Citizen Band operator's complaint of intermittent operation may immediately suggest relay trouble or any number of things to a technician. Yet, upon checking further, the trouble may actually be caused by a defective antenna connector or a loose microphone plug or some other condition completely external to the set. For this reason, always quickly check the entire installation for potential trouble before actually removing the set for maintenance work.

DISASSEMBLY OF THE CABINET

The front and rear panels of the unit are bolted to the chassis, so removal of the cabinet consists of removing the top and sides, which are one complete unit. To remove, turn the unit up-side down and remove four, (4) sheet metal screws which are located inside the four rubber feet. These feet will be removed at the same time. Then turn the unit up right and carefully pull the cabinet sides at the bottom of the unit slightly out and lift the cabinet off.

This will leave the bottom plate still secured to the bottom of the chassis. It is not necessary to remove this plate to service tubes or vibrator. To remove this plate, turn the unit up-side-down and remove the two screws which still remain in the bottom plate, and lift it off.

To re-assemble, simply reverse the procedure outlined above.

TEST EQUIPMENT

A properly equipped Citizen Band service shop will probably have most of the basic test equipment for servicing the INTERNATIONAL EQUIPMENT. Because of the much closer frequency tolerances used on Citizen Band radio equipment, greater precision is required of all alignment generators and frequency measuring equipment. A good stable HF signal generator will be most helpful when alignment of the receiver is necessary. Hewlett-Packard type 606-A signal generator is a good example of the type and quality of instrument which has the inherent stability and accuracy that is desirable for servicing Citizen Band radio equipment. An accurately calibrated attenuator with an auxiliary pad to reduce the generator output to 0.25 microvolts or less is very desirable for absolute receiver sensitivity measurements.

Another invaluable instrument is an RF wattmeter such as the Bird Model 611. This unit with the low power 15 watt element will be most useful for accurately checking transmitter output. The instrument is small and rugged enough for in the field checks on Executives to determine transmitter performance.

For receiver audio recovery measurements, the Heath Model AV-3 Audio Vacuum Tube Voltmeter will provide the necessary accuracy required in this test.

For frequency measurement and modulation percentage checks, the INTERNATIONAL Model C-12B Frequency meter is highly recommended. This versatile instrument specifically designed for use on the Citizen Band Channels, allows the technician to make accurate frequency and modulation checks with the minimum of set up time. The instrument can also be used as an accurate frequency standard for calibration of other equipment on Citizen Band channels.

An adequate source of well filtered low-voltage DC which can be varied over a minimum range of 5 to 15 volts with ample current capacity for good regulation is extremely desirable for service work. Although several automobile batteries can be used with taps at each cell to provide a crude range of adjustment, the upkeep and long range maintenance cost will invariably prove to be more costly than a good battery eliminator type of DC supply. One unit of this type is the Heath Model BE-5. Regulation and filtering are adequate for use directly without the need for batteries.

NOTE

Detailed information and prices on the instruments mentioned above may be obtained by contacting the appropriate manufacturer at the address listed below:
Hewlett-Packard Co., 275 Page Mill Rd., Palo Alto, Calif.
Bird Electronic Corp., 1800 E. 38th St., Cleveland 14, Ohio
International Crystal Manufacturing Co., Inc., 18 N. Lee,
Oklahoma City 2, Oklahoma
Heath Company, Benton Harbor, Michigan

PREVENTIVE MAINTENANCE

Wherever possible, a routine program of preventive maintenance should be set up on all INTERNATIONAL Executive radio installations in order to ensure maximum equipment utilization with the least number of interruptions for service work. The following list has been prepared as a guide to indicate items which should be included in a preventive maintenance program. Unusual environmental or installation conditions may make it necessary to expand or alter this list to meet individual requirements in the field.

GENERAL

Check all plugs, connectors, tubes, vibrators and fasteners for proper seating. Where equipment is subjected to extremely dusty conditions, occasionally remove the set from its case and dust with a clean, dry brush or with a clean, DRY source of compressed air. Clean the relay contacts only by drawing a small strip of ordinary bond letter paper between the contacts while holding gentle pressure on the relay armature. Do not use a file, sandpaper or any abrassive on relay contacts. The contacts are gold-plated and need only occasional cleaning to remove dust or foreign material. Vacuum or brush out any dust in the case before reinstalling the set.

MOBILE INSTALLATIONS

Check the battery connections. These must be clean and tight at all times. Check the battery at frequent intervals for condition and electrolyte level. Add water, as required, to keep the electrolyte at the proper level.

Inspect the power cable for evidence of physical damage. Check the microphone plug, cable and hanger bracket. Check all plugs and connectors for proper seating and security. Inspect the antenna system carefully. Remove the antenna plug from the set and check for continuity between the center contact of the plug and the actual antenna rod with a low range ohmmeter. Straighten or replace any bent or damaged antenna rods.

Check the voltage regulator for proper operation with the engine running. Adjust the regulator, if necessary, to prevent a voltage in excess of 7.5 volts on 6 volt systems or 14.5 volts on 12 volt systems when the generator is operating at its maximum output.

Inspect the distributor and spark plug wiring. Be sure all terminals are clean, bright and fit securely.

BASE STATION INSTALLATIONS

Check the primary line voltage to make certain it is within its normal limits. If the line voltage is subject to very large fluctuations, install a constant voltage transformer of appropriate capacity.

Inspect the microphone plug, cable and hanger bracket for evidence of excessive wear or damage. Check the antenna system, including the mast or tower, guy wires and coaxial cable. Be sure to inspect the ground wire for the mast or tower. All connections at the tower and ground rod should be clean and tight.

MINIMUM PERFORMANCE

The following routine measurements should be made at periodic intervals. If within the range indicated below, the set can be considered in good operating condition.

1. Check the receiver as follows with no signal input. This can be measured with a VTVM and audio output meter. The Volume control should be wide open, Squelch control OFF, Receive Selector in TUNE position and Tuning Dial set at Channel 9. The AVC voltage at terminal #23 on the IF unit should be from -1.3 to -1.7 and Audio Output across speaker terminals from .3 to .7 VAC. Typical meter readings with a 1 uv 400cps 30% modulated signal are -1.3 to -1.7 volts AVC and 1.8 volts AC or better on the audio output meter. (Early Model 50 production will have about 1.0 volt higher AVC with 1 microvolt.)
2. Check the receiver frequency calibration using the C-12B as a signal source on Channels 1, 9 and 22. If the Tuning dial pointer falls within 1/16th of an inch of the Channel numbers marked on the panel, the calibration is satisfactory.
3. Check the transmitter power output with a RF wattmeter. Rated output at standard input voltages of 6.8, 13.6 and 115 volts should be measured. (Normal 2 to 2.5 watts.)
4. If a reflected power meter is available, check the reflected power when transmitting. The reflected power should be almost negligible if the antenna, coax and transmitter are properly matched.
5. Check transmitter output frequency. Frequency should be .005% or better.

TROUBLE LOCALIZATION

To correct any trouble which may occur in the equipment, first try to isolate the section of the set which causes the trouble. In many instances a good visual inspection of the set will clearly indicate where the defective component is located. Reference to the block diagram of circuit functions and the schematic diagrams on the various sections of the receiver, transmitter and power supply, together with the following list of typical symptoms with probable sources of faults will be helpful in servicing the equipment.

When tubes are indicated as being the cause of the trouble, substitute a new tube of the same type for the one suspected of failure. If no improvement is noted, the original may be reinstalled. It should be noted that where tubes are referred to as trouble possibilities, the circuit components immediately associated with that particular tube may also be the source of trouble.

In trouble shooting the equipment, first check the power supply on 6 and 12 volts DC and 115 volts AC. If trouble is not in the power supply, all further checks can be made on 115 volts AC.

Connect a 115 volt power cord to the unit and remove the antenna and connect a dummy load. The dummy load can be made by connecting a #47 pilot lamp across a spare antenna plug and plugging this into the antenna jack of the unit.

VOLTAGE AND RESISTANCE CHARTS

The E & R charts gives voltages measured on all tube pins and power pin terminals under both receiving and transmitting conditions. The receiving condition voltages are listed under the column marked "R". The transmitting voltages under column "T". Resistance values are given with power removed and are shown in column marked "Res". The filament voltages are not marked AC or DC, as this will depend on whether or not the unit is being operated on the AC line or on battery input voltage.

All voltage readings are taken with the unit operating from 115 volts AC. Voltages measured when using battery input voltage will differ somewhat from those shown in the chart.

POSSIBLE TROUBLE CHART

POSSIBLE POWER SUPPLY TROUBLES

<u>COMPLAINT</u>	<u>POSSIBLE TROUBLE</u>	<u>REMEDY</u>
No B+(AC or DC)	Fuse, switch, rectifier	Replace defective parts.
No B+(DC)	Vibrator, bad connection on power cable.	Replace vibrator Resolder cable.
B+ low (DC)	Battery low, power cable to long, vibrator.	Chg. battery, shorten cable, replace vibrator.
B+ low (AC or DC)	Short in B+, bad rectifier, defective power transformer.	Remove short, replace rectifier or transformer.

POSSIBLE TRANSMITTER SECTION TROUBLES

No RF output	Defective V8 or V9 Open L14 or L15 Defective transmitter crystal	Replace tube(s) Replace coil(s) Replace crystal
--------------	------------------------------------------------------------------------	-------------------------------------------------------

	Poor relay contacts	Clean contacts
Low RF output	L12, C71 or C72 improperly adjusted-Defective V8 or V9	Re-adjust coil or capacitors-Replace tube(s)

POSSIBLE RECEIVER SECTION TROUBLES

Dead (no sound)	Defective V1, V2, V3, V4, V5 Relay contacts dirty	Replace tube(s) Clean contacts
Low volume	Defective tube as listed above. Receiver requires alignment	Replace defective tube(s)-Align if required.

MODEL 50

Power Pin No.	Voltage ($\pm 10\%$)		Resistance ($\pm 10\%$)	Unit
	Receive	Transmit		
1	0	0	∞	Converter
2	0	0	0	"
3	-2.4	-.4	13 K ohms	"
4	0	0	.1 ohms	"
5	6.3 VAC	6.3 VAC	.1 ohms	"
6	+255	-1.4	30 K ohms	"
7	-.7	-1.4	1.1 megohms	"
8	0	+5	60 ohms	"
9	0	0	0	"
10	0	0	0	I.F.
11	0	0	1.4 megohms	"
12	+1.6 to +110*	+1.3	18 K ohms	"
13	+1.1	-1.3	∞	"
14	+255	-1.4	30 K ohms	"
15	+255	-1.4	30 K ohms	"
16	+255	-1.4	30 K ohms	"
17	+255	-1.4	215 K ohms	"
18	Not Used	—	—	"
19	Not Used	—	—	"
20	-.5	-.24	65 K ohms	"
21	0	0	0	"
22	6.3 VAC	6.3 VAC	0	"
23	-.7	-1.4	1.0 megohms	"
24	1.25 VAC	0	0	"
25	.06 VAC	0	∞	"
26	0	-.6	5.6 megohms	Audio
27	+1.75	+1.7	9 K ohms	"
28	0	0	300 K ohms	"
29	+1.6 to +110*	+1.2	16.5 K ohms	"
30	0	0	26 ohms	"
31	0	0	0	"
32	+15	+15	400 ohms	"
33	+255	+250	30 K ohms	"
34	+250	+240	30 K ohms	"
35	+255	+250	30 K ohms	"
36	0	0	0	"
37	6.3 VAC	6.3 VAC	0	"
38	+15	0	215 K ohms	"

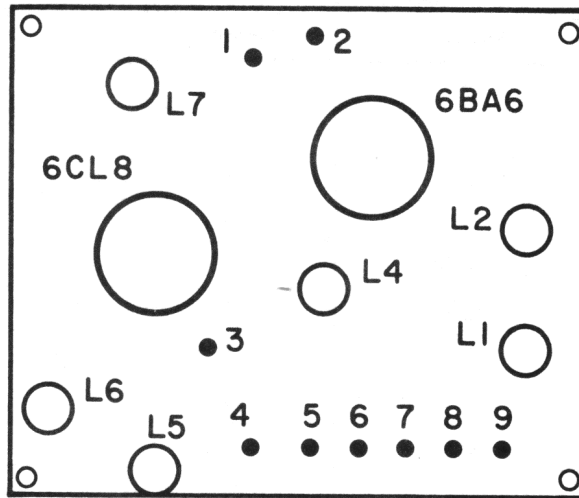
*Squelch off to full on.

"E" SERIES POWER PIN CONNECTIONS

Pin No.

- 1 10 mc out
- 2 Gnd.
- 3 Xtal switch
- 4 12v fil.
- 5 6v fil.
- 6 B+
- 7 AVC
- 8 Ant.
- 9 Gnd.

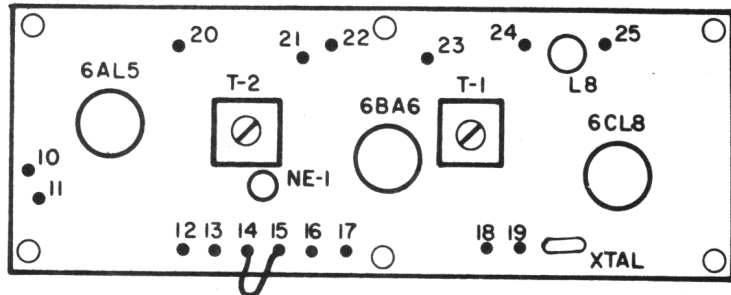
CONVERTER UNIT



Pin No.

- 10 Audio out gnd.
- 11 Audio out
- 12 To squelch control
- 13 To SW-3
- 14 Jumper to 15
- 15 Jumper to 14
- 16 B+
- 17 To squelch control
- 18 Not used
- 19 Not used
- 20 455 kc out
- 21 12v fil.
- 22 6v fil.
- 23 AVC
- 24 10 mc in hi
- 25 10 mc in lo

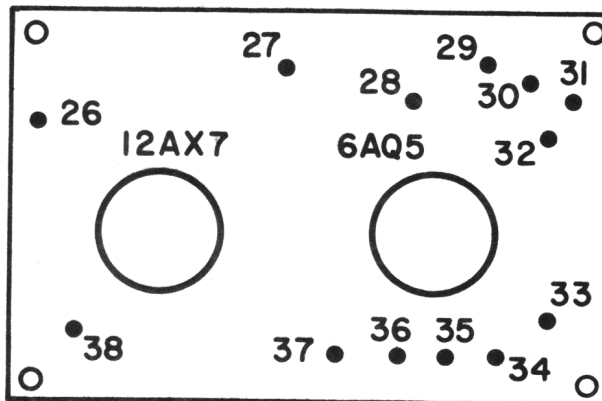
I.F. UNIT



Pin No.

- 26 Mic. in
- 27 To C49
- 28 To SW-3
- 29 To squelch control
- 30 Audio in
- 31 Gnd.
- 32 To C51
- 33 To trans. B+
- 34 To trans. plate
- 35 B+
- 36 12v fil.
- 37 6v fil.
- 38 Cathode

AUDIO UNIT



See reverse side for voltage and resistance chart