INSTRUCTION BOOKLET

RADIO SET AN/SRC-42 (V)

RECEIVER-TRANSMITTER
RT-1099/SRC-42(V)
SERIAL NOS. 1-745

AMPLIFIER-ANTENNA COUPLER
AM-6560(P)/SRC-42(V) (50W)
SERIAL NOS. 1-375

AMPLIFIER-ANTENNA COUPLER
AM-6560(P)/SRC-42(V) (125W)
SERIAL NOS. 376-745

MADE FOR
DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD
CONTRACTS DOT-CG-13,790-A
AND DOT-CG-23,413-A
CONTRACTOR
SUNAIR ELECTRONICS, INC.
FT. LAUDERDALE, FLA.

SUNAIR PUBLICATION 99485

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GUARANTEE

Sunair Electronics warrants equipment supplied under contracts DOT-CG-13,790A and DOT-CG-23,413-A for a period of one (1) year after delivery in accordance with ASPR clause, 7-105.7 31 March 1969, Rev. 1.

Sunair Electronics will replace or repair (at Sunair's discretion) any defective component(s) provided that the failure is within the terms of this warranty and is not due to damage, misuse, improper installation or unauthorized modification or repair.

PRECAUTIONARY NOTICE SEMICONDUCTOR DEVICES/INTEGRATED CIRCUITS

This equipment contains semiconductors/integrated circuits; See Page 4-1 before attempting to service.

SECTION 1

1. GENERAL DESCRIPTION.-

1.1 General.- The AN/SRC-42(V) system is a six channel, 50 watt or 125 watt PEP single sideband and compatible AM radio set covering the frequency range of 2.0 to 8.0 MHz. It is designed to be installed upon Coast Guard vessels equipped with standard whip antennas and powered from 13.2 VDC or 26.4 VDC batteries. The system is composed of the following items:

(a) Receiver-Transmitter Unit, Radio (RCVR/XMTR); RT-1099/SRC-42(V)
(b) Power Amplifier-Antenna Coupler (PA/CPLR); AM-6560(P)/SRC-42(V) (50W or 125W)
(c) Handset, H-189/GR
(d) Loudspeaker, University MM-2
(e) Installation kit
  (aa) Power Cable 15 feet (Connector installed on 1 end)
  (bb) Loudspeaker Cable 10 feet (Connector installed on 1 end)
  (cc) Interconnect Cable 25 feet (Connector installed on 1 end)
  (dd) RF Cable 25 feet (Connector installed on 1 end)
  (ee) Mounting Bracket, RCVR/XMTR
  (ff) Connectors for (cc) and (dd)

1.2 Specifications.-

(a) Frequency Range: 2.0 to 8.0 MHz
(b) Channels : 6 Single Frequency Simplex
(c) Input Power : Positive or Negative ground
Receive (Oven on) -------
4 amps at 13.2V
2 amps at 26.4V
Transmit 2 tone 700 Hz and 2300 Hz
(Oven on)
125 watt module (99603) (50W Avg.)
20 amps at 13.2V
10 amps at 26.4V
50 watt module (99595) (20W Avg.)
12 amps at 13.2V
6 amps at 26.4V

(d) Environmental : Temperature -30°C to +50°C
Altitude - Not applicable
Humidity: 95% at 50°C for 48 hrs.

(e) Transmitter : 125 watt module — AME: 125W PEP; SB: 125W PEP
50 watt module — AME: 50W PEP; SB: 50W PEP

(aa) Frequency Stability ------- ±20 Hz

(bb) Operating Modes ----------- A3J (Carrier 40db below PEP)
A3H (Carrier -3 to -6db below PEP)

(cc) Harmonic and Spurious Suppression ---------- 61db below avg. power measured at antenna coupler output.

(dd) Audio Frequency Response -- 2.1 kHz minimum at the 6db attenuation points. Lower 6db point less than 400 Hz.

(ee) Intermodulation Distortion- Not more than 25db below mean power.

(ff) ALC ---------- Less than 1db increase in output power for 10db increase in audio input.

(gg) Lower Sideband Suppression- At least 50db below PEP.

(hh) Output Impedance ---------- 50 ohm resistive.

(ii) Hum and Noise Suppression - 40db below PEP

(jj) Endurance
125 watt ---------- 1/2 hr. 2 tone at 50W average with ambient temperature of 60°C.
50 watt ---------- 4 hrs. 2 tone at 20W average with ambient temperature of 25°C.

(f) Receiver

(aa) Frequency Stability ------- ±20 Hz

(bb) Sensitivity ---------- AM 6db S/N 2uv
SB 10db S/N 2uv

(cc) Selectivity ---------- AM: Between 5 and 8 kHz 6db not more than 30 kHz 60db
SB: Between 2.1 and 2.5 kHz 6db
Not more than 7.5 kHz 60db

(dd)	AGC	Not more than 10db increase in audio output from 10 to 500,000 uv input.
(ee)	Spurious Attenuation	Not less than 60db (including I.F. and images)
(ff)	Audio Response	Minimum 6db bandwidth 2.1 kHz; lower 6db bandwidth less than 400 Hz.
(gg)	Gain	AM & SB: Not more than 5uv input for 5 watts output (16 ohms) Not more than 5uv input for 10 mw output (1000 ohms)
(hh)	Audio Distortion	AM & SB: Not more than 10% 5W Not more than 5% 10mw
(ii)	Squelch	AM & SB: Signals greater than 15uv shall break maximum squelch setting.
(jj)	Noise Limiter	Shall reduce impulse noise in audio output.
(kk)	Intermodulation (A3J Mode)	2 tone input 700 Hz & 2300 Hz; 50 to 500,000 uv input, IM products must be 25db below each tone of audio output.
(ll)	Cross Modulation (A3 Mode)	Audio output not more than 10db less than rated output for the following: Desired signal=20uv; Undesired=1,000uv Desired signal=2,000uv; Undesired=100,000uv

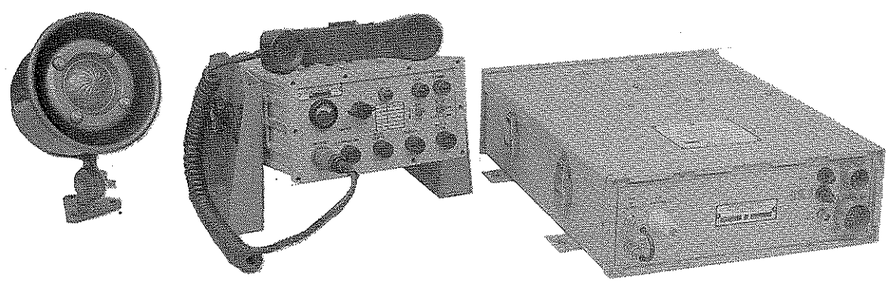
(mm) Desensitization (A3 mode)-- (Desired signal No modulation fo Undesired signal 30% modulation 1 kHz fo ± 15 kHz) Receiver output must not decrease more than 8db for undesired signal of 10,000 microvolts. (Desired signal 10uv 30% mod. 1 kHz fo; Undesired signal no modulation 2 MHz to 8 MHz excluding ±15 kHz of fo.)

(g) Size

RCVR/XMTR 10"x8"x4½" LWH
PA/CPLR, 15"x14"x4½" LWH

(h) Weight

RCVR/XMTR, 11 lbs
PA/CPLR, 23 lbs



RT-1099/SRC-42(V)

AM-~~6550~~ 6560(P)/SRC-42(V)

Figure 1-1 SYSTEM COMPONENTS

SECTION 2

1. INSTALLATION.-

1.1 Equipment Layout.- See Figures 2-2, 2-3, 2-4 and 2-5 for installation details.

1.1.1 RCVR/XMTR.-Mounting details for the RCVR/XMTR are shown in Figure 2-2. The RCVR/XMTR must be mounted in its cradle with the cradle attached to the boat in a convenient location for operation. All controls for system operation are located on the RCVR/XMTR front panel including the connector for the handset. The cradle is designed for overhead, deck, or bulkhead mounting and will allow tilting the RCVR/XMTR in 10 degree increments.

1.1.1.1 Grounding.- A grounding stud (Figure 2-4) is supplied on the rear of the RCVR/XMTR. This should be connected to the vessel ground system by the most direct route using a number AWG 16 or 18 wire.

1.1.1.2 Interconnection.- Figure 2-4 shows the system interconnection details. All necessary cables and connectors are supplied for installation with the exception of the wires required for grounding. The interconnect cable and r-f cables are supplied with one end unterminated. After location of the RCVR/XMTR and PA/CPLR in the vessel it will be necessary to install the connectors on the cables in accordance with Figure 2-5.

1.1.2 PA/CPLR.- Mounting details for the PA/CPLR are shown in Figure 2-3. The unit is designed to be mounted to any flat surface in any plane by bolting the four ears, which are welded to the case, to the surface with 1/4 inch studs.

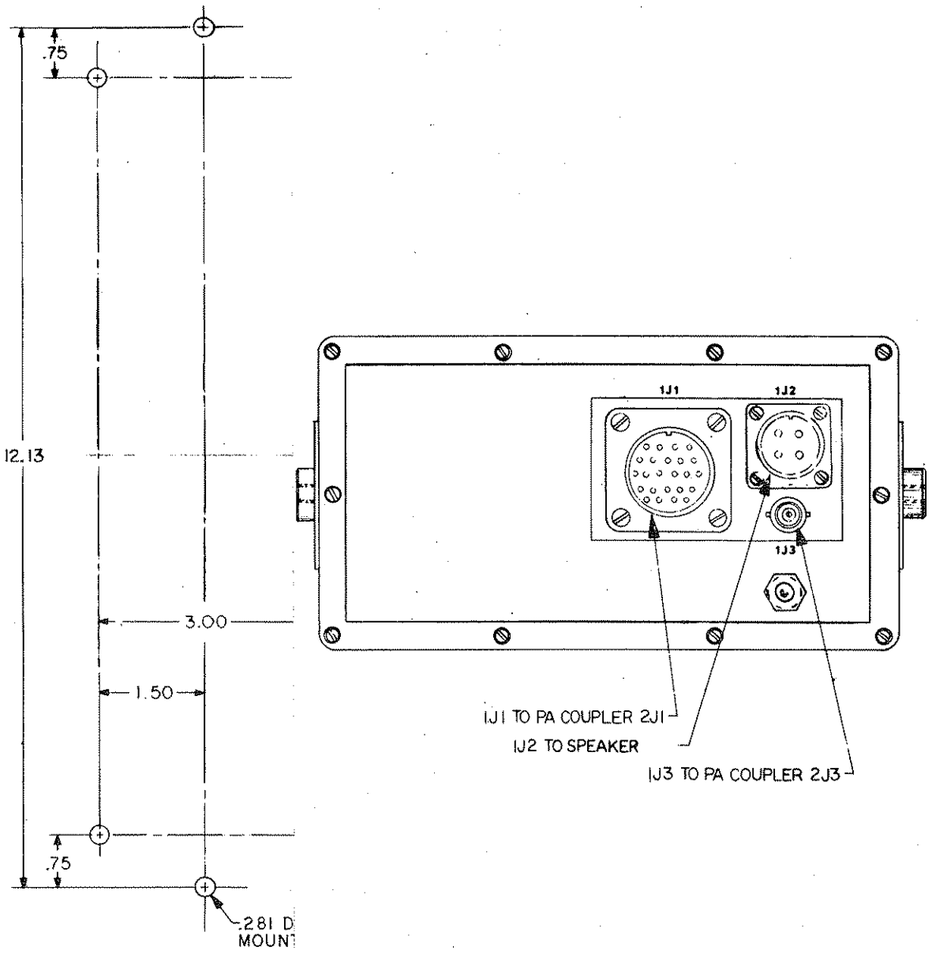
NOTE

The antenna coupler must be final tuned after installation. It is therefore necessary that it be installed so as to allow removal of the top cover.

1.1.2.1 Grounding.- A grounding stud (Figure 2-4) is supplied on the rear of the unit. Connect a #12AWG wire to the stud and secure the other end to the vessel ground by the most direct route. It is extremely important to provide a low impedance r-f ground to obtain adequate radiation efficiency from the antenna. If the vessel is constructed of metal simply bolting the PA/CPLR to the metal structure or skin is sufficient. However if the vessel is of wood or fiberglass construction it will be necessary to connect the PA/CPLR grounding stud to all available metal such as engines and ground plates and these in turn should be connected to an externally mounted ground plate which is in contact with the water. Failure to provide an adequate r-f ground will radically change the antenna coupler tuning and will also result in reduced radiation efficiency and poor communications.

1.1.2.2 Interconnection.- Figure 2-4 shows the interconnecting cable details. The power cable can be connected directly to the ships battery as the input cable is fused in the PA/CPLR. If a breaker is used it must be 15a for 13.2VDC or 7.5a to 10a amps for 26.4VDC for 50 watt operation. For 125 watt operation, the breaker should be 25a for 13.2VDC operation and 10 amps to 15 amps for 26.4VDC operation. Due to voltage loss the maximum power cable length from the ships battery to the PA/CPLR must not exceed 15 feet for a 13.2VDC system and 25 feet for a 26.4VDC system. In general, the power cable should be as short as possible. The antenna terminal is located on the front panel and should be connected to the antenna with insulated antenna wire type MIL-W-6370 or equal. The lead length from the terminal to the antenna should not exceed 12 inches for optimum efficiency. Additionally the wire should not run in close proximity to and parallel to any metallic object. If it is to pass through a metal skin it should be dressed at right angles to the metal surface. The lead in wire is a portion of the antenna and extremely high r-f voltage will be present, so it is necessary that the wire be as short as possible and dressed and installed correctly.

1.2 Adjustments After Installation.- Check that all cables are installed and the antenna connected in accordance with Figure 2-4.



MOUNTING DIMS FOR

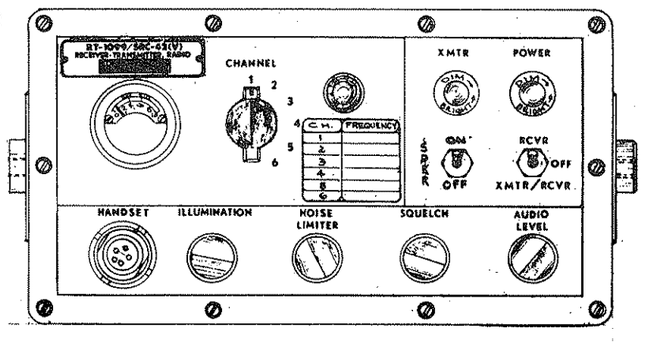
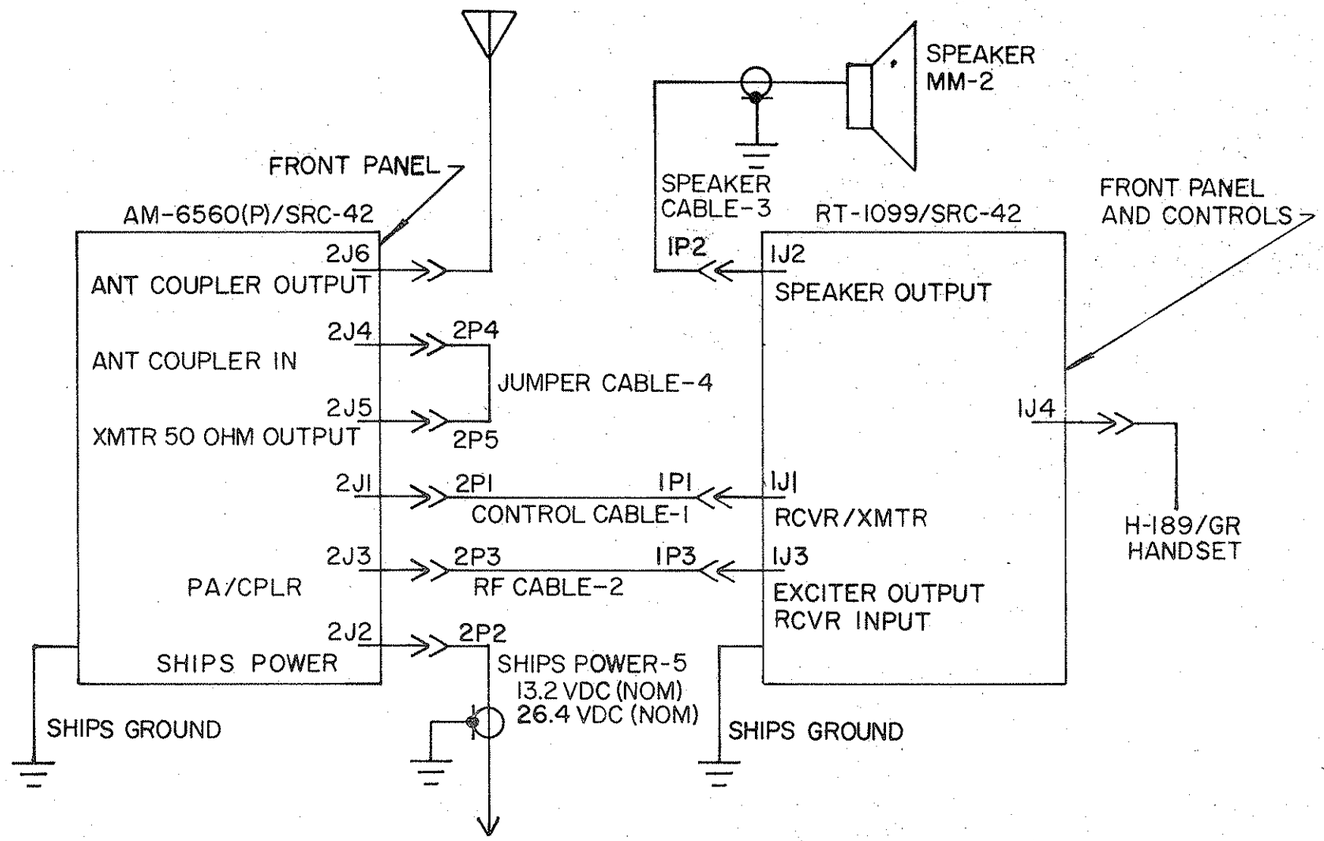


FIGURE 2-2
RECEIVER/TRANSMITTER
MOUNTING DETAILS



NOTES

1. CONTROL CABLE - Supplied with connector, P1 (ITT Cannon CA-06R24-28S), on one end, 25 feet long. The other end cut to length and connector attached to cable. Cable consist of 18 conductors, shielded, and connector has 6 spare pins.

2. R.f. CABLE - RG-58/U supplied with crimp type waterproof BNC for RCVR/XMTR end, 25 feet long. Cut to length and attach standard BNC connector.

3. SPEAKER CABLE - Consist of 2 conductors shielded 10 feet long with 2J2 (ITT Cannon CA06R-14S-2P) attached to one end. Cut to length and ground shield to ships ground. Connector has two spare pins.

4. JUMPER CABLE - 3 inch RG-58/U with standard BNC connector on each end. No installation required.

5. SHIPS POWER - Important - Check tag on AM-6560(P) to determine correct voltage to use (13.2 VDC or 26.4 VDC). If no tag on AM-6560(P), check power supply wiring before turning unit on. Cable consist of 2 #12 AWG wires, shielded, 15 ft. long. Connector 2P2 (ITT Cannon CA06R-18-11S) installed on one end. Connect white wire to ships power + (plus) and black wire to ships power - (minus). Always make ships power cable as short as possible to prevent excess line loss. Ground shield to ships ground.

FIGURE 2-4

SYSTEM INTERCONNECTION DETAILS

(a) Remove the screws from the top cover of the unit, unsnap the side catches, and remove the cover.

NOTE

Coupler must remain in approximate same position with the same ground wire and antenna lead in wire lengths. Channels 5 and 6 were not used in the original equipment.

(b) Connect watt meter between RF output, 2J5, and Coupler Input, 2J4.
(c) Apply power to radio set by turning on power switch on RCVR/XMTR front panel.
(d) Set channel switch to the highest frequency (chan. #4)
(e) Adjust the gain control on the PA module, 2A3, to maximum counterclockwise position.
(f) Key transmitter with key switch, 2S1, located in PA/CPLR.
(g) Turn gain control on PA clockwise to get 5 to 10 watts for tuning. Check wattmeter for reflected power.
(h) If reflected power is greater than 1 watt, use screwdriver or tuning tool and tune L4 and C4, located in antenna coupler enclosure, for minimum reflected power. It is normally necessary to alternately tune L4 and C4 for minimum reflected power.
(i) If the reflected power cannot be reduced to 1 watt or less it will be necessary to move the tap on air dux L7 or change the capacitor, C7, C8, C9, or C10, which is connected across the input padder capacitor.

NOTE

Variable inductance, L1-L6 increases when the slug is turned clockwise and input padder capacitance increases when turned counter clockwise. Therefore if a dip on the watt-meter is being approached (minimum reflected power) and the variable component (L or C) reaches a minimum or maximum the fixed component L7 or C7-C10 must be changed.

(j) To change the air dux tap (L7) or input capacitor (C7-C10) remove the cover from the coupler module. Set variable L to minimum inductance (max counter clockwise position)

(k) If the tap is to be changed unscrew the correct channel number tap and with wattmeter reading reverse power, key transmitter.

(l) Touch tap to air dux turns and secure to tap that shows minimum reflected power. (Do not short two turns together)

(m) Replace cover and alternately tune variable L and C for minimum reflected power.

NOTE

The effective inductance of the air dux may be changed when the cover is replaced, it may therefore be necessary to try several different taps that will yield the best tune when the cover is replaced.

(n) If the minimum reflected power is approached when tuning the variable capacitor and the inductance has been optimized the input capacity must be changed.

(o) Change input capacity by moving the appropriate channel jumper wire to one of the four capacitors C7-C10 and securing to the selected capacitor stand-off post.

(p) Replace cover, key transmitter and tune L and C for minimum reflected power.

(q) Turn the gain control on 2A3 clockwise to set the output carrier power to the desired level.

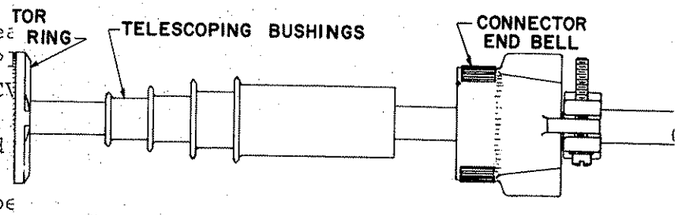
(r) When minimum reflected power is achieved note forward power, which should be 12 to 15 watts for 50 watt PEP (40 to 45 watts for 125 watt PEP).

(s) If forward power is not correct, slightly tune L and C to achieve correct power and recheck reverse power for less than 2 watts.

(t) Repeat above procedure for each active channel in the radio set, preceding from the highest channel to the lowest channel.

(u) Replace top cover by snapping the catches and tightening the screws.

IMPORTANT--Rea
lP
RCV

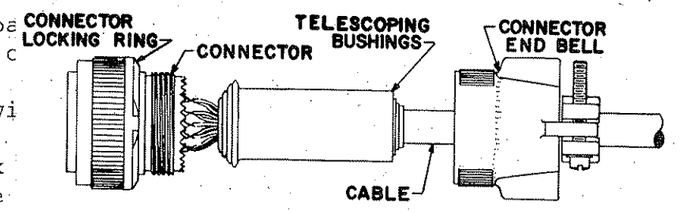


1. Cut cable to desired

2. Slide connector endbe
cable as shown. Make
correctly.

3. Strip plastic cover c

4. Strip outer shield ba
inserted into pin Z c

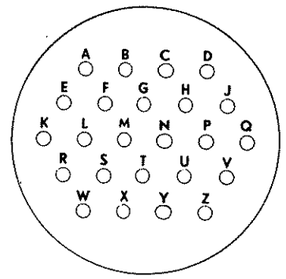


5. Strip and tin each wi

6. Strip the black coax
be inserted into the
(The white coax is a
or tinned).

7. Using an OHM meter, c
of the cable. All wi

8. Spread wires and posi
insertion into connec
from top to bottom or
to be soldered. Sold



CONNECTOR PIN LAYOUT

9. Check with ohm meter
Also, check for short

10. Slide connector locki

11. Slide telescoping bus
to stress soldered co
and within ½ inch of

12. Slide connector end b
Make sure cable clamp
bell. Make sure conn
PA/CPLR 2J1 or RCVR/E

13. Pull bushings back aw
bell.

14. Tighten cable clamp s
rear of end bell.

15. Recheck cable with ohm
for shorts.

ITEMS SUPPLIED	
ITT Cannon Connector	CA06R24-28S
-7 Telescoping Bushing	AN3420-16
-6 Telescoping Bushing	AN3420-12
-5 Telescoping Bushing	AN3420-10
-4 Telescoping Bushing	AN3420-8

FIGURE 2-5
2P1 CONNECTOR INSTALLATION

(v) Re-install PA/CPLR and secure mounting bolts to the four mounting ears, if it has been removed.

1.2.3 System Check.- After the antenna coupler has been tuned to the antenna there are no further adjustments that must be made before releasing the radio set to operating personnel. A system check as detailed in Section 3 should be made to insure that the radio set is fully functional. Refer to Section 4 Maintenance, if problems are encountered.

SECTION 3

1. OPERATION.-

1.1 Introduction.- The AN/SRC-42 radio set is designed to provide voice communications between Coast Guard vessels, and other ship and shore stations operating in either the single sideband (SSB) or double sideband mode (AM). Voice input into the transmitter is via the H-189 handset connected to the front panel and audio output is received into the H-189 handset receiver. Additional audio output for the 16 ohm loudspeaker is connected to the rear panel connector, 1J2. The loud-speaker audio is switched "on" or "off" by the front panel mounted "Speaker" switch.

1.2 Precautions.- The radio set cannot be damaged by manipulating any of the controls on the receiver/transmitter front panel. The following procedure should be followed in order to achieve optimum communications.

(a) When transmitting speak at a normal voice level with the microphone held approximately 1/2 inch from mouth.

(b) Set squelch control only when traffic is not being received in order to avoid missing subsequent calls at a lower signal level.

(c) Allow fifteen minutes for the oscillators to stabilize before transmitting.

1.3 Operating Instructions, AN/SRC-42(V) Radio Set.-

(a) To energize Radio Set place RCVR-OFF-XMTR/RCVR switch in XMTR position.

NOTE

Amber "POWER ON" light is illuminated. Allow 15 minutes warm up time for Xmtr frequency to stabilize before Transmitting.

(b) Set degree of Front Panel illumination desired with ILLUMINATION control. The degree of illumination of the XMTR and "POWER ON" lights may be mechanically adjusted by turning their lenses.

(c) Select desired Channel with CHANNEL select control.
(d) Turn SQUELCH and NOISE LIMITER controls full C.C.W. Adjust AUDIO LEVEL control to desired speaker/ handset output listening level.

NOTE

Speaker may be secured with SPEAKER ON/OFF switch.
Front panel meter indicates relative level of received signal.

(e) If desired the receiver may be squelched (silenced) by slowly rotating SQUELCH control C.W. when no signals are being received. Set SQUELCH control just to the position where receiver noise is silenced.

NOTE

Squelch should not be set higher (C.W.) than necessary as a weak signal may not break the squelch.

(f) The NOISE LIMITER control may be adjusted if desired to reduce background noise (Static) by rotating control C.W. while signals are being received.
(g) To transmit press Push to Talk (PTT) switch on handset and speak in normal voice level, directly into the microphone. The microphone should be held approximately 1/2 inch from lips.

NOTE

Front panel meter will indicate relative Xmtr power output when transmitting.
Red XMTR light is illuminated when transmitting.

(h) Transmit function of the Radio Set may be secured by placing RCVR-OFF-XMTR/RCVR switch in RCVR position.
(j) To secure the Radio Set place RCVR-OFF-XMTR/RCVR in the OFF position.

SECTION 4

SEMICONDUCTOR DEVICES/INTEGRATED CIRCUITS - PRECAUTIONS

Semiconductor devices can be damaged by transients, capacitive leakage currents, resistive leakage currents, and static discharges, which would have no permanent effect on electron tubes. Hence body static must be discharged, and external grounds and AC lines must be disconnected to eliminate ground-return paths, before touching semiconductor device terminals with hand tools, or especially with soldering guns or irons (element windings have high capacitance to ground).

To avoid transients, never unsolder transistors, diodes, or other semiconductor devices, nor remove them from plug-in mountings, without first de-energizing sources of element voltages.

Installation with reversed leads, also polarity reversal of supply voltages, usually results in serious degradation or failure.

Do not test any integrated or microelectronic circuit device without carefully observing input/output limitations and other applicable precautions. The minute semiconductor junctions are easily damaged, making it necessary to discard the entire device.

Before attempting to use ohmmeters for circuit tracing where semiconductor devices (especially transistors) are involved, or for semiconductor device testing, take the following precautions:

Beware of destructive high currents often present on low-ohm ranges.
Beware of voltages on high-ohm ranges which may be in excess of rated breakdown voltages of transistors, diodes, etc.
Determine ohmmeter internal battery polarity present on the test leads (usually the reverse of the marked polarity, which applies only to the voltage or current ranges of multimeters).

Heat sinks are often at above-chassis-ground potential, hence precautions should be taken to avoid shock and possible short-circuits. Do not introduce obstructions to air flow in the vicinity of heat sinks; loss of cooling capacity can result in overheating with resultant failure of semiconductor devices mounted on the heat sink.

1. Theory of Operation.-
Figure 4-1 is a functional block diagram of the AN/SRC-42(V) System. The Receiver/Transmitter (RCVR/XMTR) RT-1099/SRC-42(V) is contained in one enclosure and the Power Amplifier-Antenna Coupler (PA/CPLR) AM-6560(P)/SRC-42(V) is in a separate chassis. The RCVR/XMTR contains the entire receiver and the exciter portion of the system. The PA/CPLR contains the system power supply, R.F. power amplifier, ALC (2A5) and the antenna coupler.

1.1 Receiver/Transmitter (RT-1099/SRC-42(V).-
The RCVR/XMTR is shown pictorily in Figure 6-8 and 6-1 and the complete chassis wiring diagram is Figure 6-8. The complete receiver is included in the RCVR/XMTR unit and consists of modules 1A1, 1A3, 1A4, 1A6 and 1A7. The exciter portion of the RCVR/XMTR unit consists of 1A2, 1A3, 1A5, and 1A7. Note that two modules are shared by both receiver and exciter. These are 1A3, the filter module and 1A7, the oscillator- oven module. Location of the RCVR/XMTR modules is shown in Figure 6-1.

1.1.1 Chassis Items.-

1.1.1.1 Connectors.-

1.1.1.1.1 Control (1J1).-
Input power and control lines are brought into the RCVR/XMTR on 1J1. Three D.C. voltages are required for the RCVR/XMTR; 44V, 14V and 10 volts. These voltages are supplied by the PA/CPLR unit, which contains the entire power supply module (2A2). The control lines from the RCVR/XMTR to the PA/CPLR are six (6) channeling wires, PTT line, ON-OFF and AM select. Control lines from the PA/CPLR to the RCVR/XMTR are ALC and METER Drive. Two separate grounds connect the RCVR/XMTR and the PA/CPLR modules together. These are 44V return and signal ground.

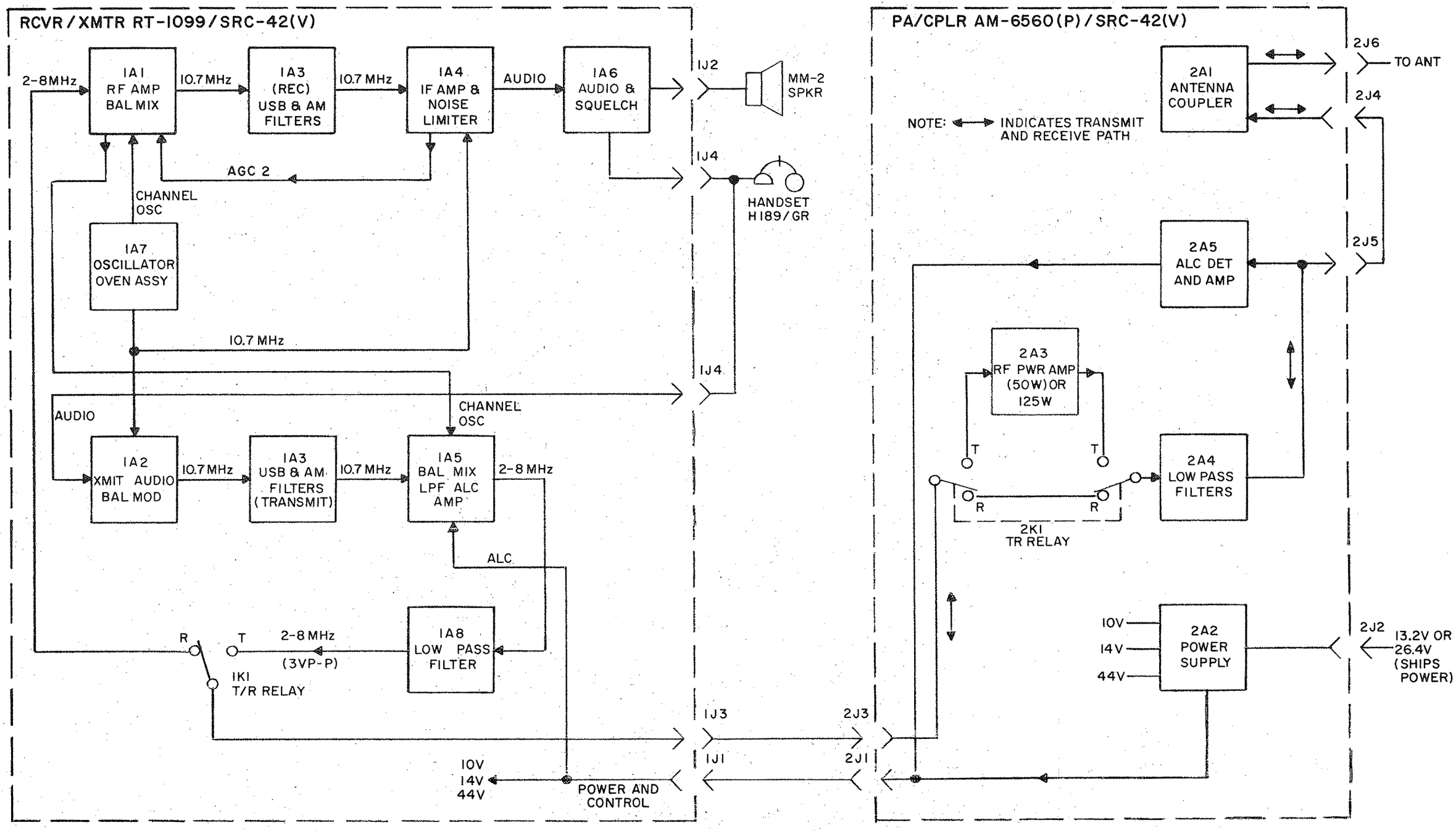


FIGURE 4-1
FUNCTIONAL BLOCK DIAGRAM
AN/SRC-42(V) SYSTEM

1.1.1.1.2 RF Input-RF Output (1J3).-
Exciter output and receiver input are brought into the RCVR/XMTR via 1J3. Input is switched between 1A1 for receive and 1A5 for transmit by relay 1K1, the TR relay.

1.1.1.1.3 Audio Outputs and Inputs.-
Two audio outputs are provided. The 5 watt (16 ohms) output is on pin A of 1J2 with the return on pin C. The 10 milliwatt audio for the H-189 (1000 ohms) is on pin B of 1J4 with the return on pin A. The audio input from the H-189 handset is on pin D of 1J4.

1.1.1.2 Switches.-

1.1.1.2.1 RCVR-OFF-XMTR/RCVR (1S1).-
This switch controls all the power on the unit. When 1S1 is toggled to the RCV position, the circuit path is completed between pin X and W of 1J1 and the ON-OFF relay in the PA/CPLR is energized, turning on power to the power supply. With 1S1 in the RCVR position, the PTT line is not connected to the handset PTT line and the transmitter cannot be keyed from the handset. However, when 1S1 is toggled to the XMTR/RCVR position, the handset PTT line is connected to the PTT line going to the PA/CPLR unit and the transmitter can be keyed on from the handset.

1.1.1.2.2 SPKR ON-OFF.-
This switch, 1S2, controls the audio to the speaker. When 1S2 is in the ON position, audio is supplied to pin E of 1A6 and the 5 watt amplifier delivers power to the speaker. When 1S2 is in the off position, no audio is delivered to the input of the 5 watt amplifier. R1, 680 ohms, terminates the audio transformer when the speaker is off. This action prevents changes in the handset audio when the speaker is turned on or off.

1.1.1.2.3 Switch Wafers.-
There are five switch wafers controlled by the channel select switch. Wafer S3A is the AM control function and can be connected to make any or all six channels AM. S3B is the channel control wafer and supplied 10VDC to the channel oscillators in 1A7 and thus determines the frequency of operation. Wafer S3C is a grounding wafer that controls the selected channel in the PA/CPLR unit.

A ground is supplied by S3C and the wafer in the PA/CPLR will turn until the open seeking wafer is on the correct channel. S3D and S3E switch the input and output of 1A8, the RCVR/XMTR low pass filter.

1.1.1.3 Controls.-

Four controls are located on the front panel. These are Audio Level, Squelch, Noise Limiter and Illumination. The audio control changes the level of audio applied to pin R of 1XA6. The Noise Limiter control supplies from 0 to 10VDC to pin P of 1XA4. Squelch action is obtained by supplying a positive voltage to pin U of 1XA6. The brilliance of the panel illumination light is controlled by the illumination control.

1.1.1.4 Indicating Lamps.-

Three lamps are employed in the RCVR/XMTR. DS1 is the panel illumination lamp (red) and is controlled by the illumination control. DS3 is the "ON" amber lamp that indicates when the unit is on. DS2 is the "XMIT ON" (red) lamp illuminated when the transmitter is keyed on. DS2 and DS3 brilliance are controlled by dimmable lamp-holders.

1.1.1.5 Relay 1K1.-

Relay 1K1 is the Transmit-Receive (T/R) relay and performs the following functions:

a) Switches 10V from receive circuits to transmit circuits.
b) Switches 14V from receive circuits to transmit circuits.
c) Switches R.f. output of RCVR/XMTR from 1A1 to 1A5.
d) Switches USB select line from receive to transmit.

1.1.1.6 Meter.-

The meter is used to indicate relative receive signal strength and relative transmit power output. During receive, the meter is driven from pin E 1XA4 and will read near full scale with an input signal of approximately 30 microvolts. In the transmit mode, the meter reads near full scale with 125 watts PEP output.

1.1.2 Modules.-

1.1.2.1 Filters, R.f. Amplifier and Balanced Mixer (1A1).- (Figure 6-1A Schematic Diagram)

1.1.2.1.1 Input Filter and AGC-2.-
The R.f. input comes in on pin U and passes through the input filter (L2, L3, L4, L5 and associated capacitors) and through T1 to the signal gate of Q3. AGC-2, a delayed AGC, is accomplished by diodes CR1, CR2, CR3 and CR4. These diodes are used as variable resistors and attenuate the input signals for high signal levels to prevent overdriving the gate of the R.f. amplifier. AGC-2 action is accomplished by current passing through CR1, CR2, CR3 and CR4 when Q2 begins conducting. The input filter is a 50 ohm band pass filter with cutoff frequencies of 1.7 MHz and 9.0 MHz and has a 35 db stop band rejection.

1.1.2.1.2 R.f. Amplifier, AGC-2 and Output Filter.-
The signal applied to G1 of the 3N141 (Q3) is amplified and stepped down in T2 to the second band pass filter. Q3 has approximately 10 db of gain. AGC-2 is applied to G2 of the amplifier (Q3) via R9. R9 is driven from the AGC detector and amplifier located in 1A4. The gain of Q3 is reduced when the AGC-2 voltage decreases. It should be noted that AGC-2 is amplified and delayed in Q1 and Q2 before it is applied to the diodes CR1, CR2, CR3 and CR4. The output filter consists of L6, L7, L-10 and L11 and associated capacitors. It also has a 35 db stop band rejection with cut off frequencies of 1.7 and 9 MHz but has a 500 ohm impedance. The output of this filter is fed to G1 of Q4 and Q5, the balanced mixer.

1.1.2.1.3 Balanced Mixer and Oscillator Filter.-
The signal applied to G1 of Q4 and Q5 is mixed with the channel oscillator which is applied through T4. The input signal range is 2-8 MHz while the oscillator frequency range is 12.7-18.7 MHz. The I.f. frequency is 10.7 MHz. It should be noted that the mixer is balanced to the input signal; both signal gates are driven in parallel. The oscillator gates, G2, are driven 180^{o} out of phase by T2. A high-pass filter (L8 and L9 and associated capacitors) is used between pin D, channel oscillator input, and the input to T4. The

purpose of this filter is to prevent carrier oscillator (10.7 MHz) from entering the balanced mixer. A balance adjustment, R19, is used to balance 5.35 MHz (½ IF) and eliminate this spurious response. The output of the balanced mixer is tuned to 10.7 MHz by C44 and T3. T3 is a stepdown transformer used to match the output of the balanced mixer to the input of the 10.7 MHz filters located on 1A3.

1.1.2.2 Filters and Switching (1A3).-
(Figure 6-3 Schematic Diagram)

This module contains the USB filter and the AM filter. The AM filter has 6db bandwidth of 5 to 8 kHz and a 60db bandwidth of less than 30kHz. The USB filter has a 6db bandwidth of 2.1 to 2.5 kHz and 60db attenuation points of less than 7.5 kHz. The AM filter is used on receive only and the USB filter is used on receive in USB receive and in transmit on AME and USB. Therefore, some means must be provided to switch the filters into the signal path. The switching between transmit and receive is accomplished by diodes CR1 and CR2 on the input and transistors Q3 and Q4 on the output.

For the transmit condition, 10V(T) is applied to pins S and D of 1XA3. Also, USB SEL voltage is applied to pin R of 1XA3. (The USB filter is ALWAYS used during the transmit mode). 10V(T) applied to pin S gates on diode CR2 via R1, R4 and Q2 base. That is, DC current flows through these components and creates a low resistance path for the transmit input applied to pin U. The cathodes of diodes CR1 and CR2 are connected together and, since no 10V(R) voltage is applied to pin M of 1XA3, diode CR1 is reversed biased, the REC INPUT is blocked from the base of Q1. Also, since no AM voltage is applied to pin L of 1XA3, Q1 base to collector presents a low impedance to the signal path and any input to the AM filter is effectively shorted to ground via C5.

The XMIT INPUT passes through R1, CR2, R4, Q2, R8 and C7 to the input of FL2, the USB filter. The output of the USB filter passes through C15 and CR6. CR6 is gated on by the USB SEL line voltage causing DC current to flow through R10, R11, CR6 and R13 to ground. CR5 is reversed biased (cutoff) by the DC voltage on the cathode of CR6.

(No AM voltage is applied). The transmit signal passes from the cathode of CR6 through R16, through Q4 and C21 to the output on pin C of 1XA3. Q4 is an emitter follower that is turned on by 10V(T) applied to pin D. This voltage passes through CR7 and R19 to the collector of Q4. Q3 base to collector junction is a low impedance because there is no 10V(R) applied to pin M. C18 effectively shorts to ground any signal that might appear on the base of Q3.

During the receive mode, CR1 is turned on and CR2 is reversed biased; Q3 is conducting and Q4 presents an AC short to the input. The selection of either AM filter or USB filter is accomplished as follows:

AM Selection.- The AM line, pin L, has voltage applied and causes diode CR3 to conduct. This action turns on Q1, allowing the receive signal to pass through Q1 to the input of the AM filter. Q2 effectively shorts out the input to the USB filter because no voltage is applied to the USB SEL line. The AM voltage also gates on CR5 while CR6 is reversed biased.

USB Selection.- The USB line, pin R, has voltage applied and CR4 gates on Q2. The receive signal is applied to the input of the USB filter while Q1 effectively shorts out the input to the AM filter. Diode CR6 is gated on While CR5 is reversed biased.

For transmit, the signal path through the filter module is as follows: The signal enters on pin U, passes through C1, CR2, R4, Q2, R8, C7, USB filter, C15, CR6, R16, Q4, C21, and pin C. For AM Receive, the signal path is as follows: The signal enters on pin T, passes through C2, CR1, R3, Q1, R7, C6, AM filter, C14, CR5, R15, Q3, C20, and pin B. For USB Receive, the signal passes through pin T (Receive input), C2, CR1, R4, Q2, R8, C7, USB filter, C15, CR6, R15, Q3, C20 and pin B. The selection of either AM filter or the USB filter is accomplished by the AM voltage (pin L) or the USB select voltage (pin R). These voltages are generated by switching circuitry located on 1A5. This circuit is arranged so that USB select voltage is always present on transmit. (See Table 4-1 for AM-USB SEL operation).

1.1.2.3 I.F. Amplifier and Noise Limiter (1A4).-
(Figure 6-4 Schematic Diagram)

1.1.2.3.1 I.F. Amplifier.-
The I.F. amplifier consists of U1A, U1B, U1C, U1D, U2A, U2B, U2C and U2D. These are all individual transistors housed in two integrated circuits (I.C.), U1 and U2. The signal is fed to U1A and U1B where it is amplified. The collector of U1B is resonanted to 10.7 MHz by L1 and C9. U1C is an emitter follower used to drive the second amplifier, U2A and U2B. The collector of U2B is also tuned to 10.7 MHz. The output of U2B is coupled to the AGC detector, CR3 and CR4 via C31 and U2C. The two I.C. amplifier produces approximately 75db of gain.

1.1.2.3.2 Noise Limiter.-
The noise limiter consists of C27, C32, CR1, CR2, Q1, Q2 and associated circuitry. Diodes CR1 and CR2 are shunt clipping diodes and are allowed to conduct by a variable bias voltage supplied through R26 and R36. This bias voltage is controlled by the noise limiter control on the RCVR/XMTR panel. CR1 and CR2 are used to clip noise spikes that occur in the I.F. output and cause AGC voltage to be generated. AGC voltage reduces the gain of U1 and U2. Clipping these noise spikes will cause the receiver gain to be higher and noise will be reduced. A sample of the positive noise spike is obtained at the cathode of CR1 and fed through C21 to the base of Q1. Q1 and Q2 are connected as a schmitt trigger and positive pulses applied to the base of Q1 appear as positive pulses on the collector of Q2. These positive pulses cause Q3 to saturate and short out the noise pulses coming from the product detector via R46 and C37. This effective "noise blanking" reduces the noise spikes more than could be obtained with only shunt limiting diodes.

1.1.2.3.3 AGC Detector and Amplifier.-
The D.C. voltage output from CR3 and CR4 (AGC detector) is amplified in U2D and used to reduce the gain of U1 and U2. The emitter of U2D is coupled through CR5 and R39 to R6 and CR6. As the signal input increases, a positive going voltage on the emitter of U2D reduces the current in U1B and U2B and drastically reduces the gain of the I.F. amplifier. The output of U2D (emitter) is coupled

to U3C via R40 and is used to drive the meter to indicate receive signal strength. A delayed AGC-2 is developed by dividing the output of U2D in R54 and R53 and driving the base of U3E. This AGC-2 voltage is used to reduce the gain of the R.F. amplifier, located in 1A1. Transistor Q4 is used to drive the squelch circuit, located on 1A6. The positive going AGC voltage from pin 10 of U2 drives the base of Q4 positive. The emitter of Q4 also rises positive, causing the squelch drive line to increase in a positive direction. This action causes the squelch to break.

1.1.2.3.4 Product Detector.-
The product detector consists of U3A, U3B, and U3D and associated circuitry. In the AM mode, the circuit performs as an amplitude detector, that is, R50 limits the current through U3B. In the USB mode, 10.7 MHz is applied to pin 9 of U3D and the collector load of U3B is reduced to 3.3k (via R49 and CR7) and product detection occurs.

1.1.2.4 Audio and Squelch (1A6).-
(Figure 6-6 Schematic Diagram)

1.1.2.4.1 Handset Audio Amplifier.-
The audio amplifier consists of transistors U1A, U1B, U1C, U1D, U1E, U1F and U1G which are contained in integrated circuit U1. The output of the product detector (pin J of 1A4) is fed to pin L of 1A6 and to U1A via C1. U1A is an emitter follower to provide a high input impedance to the product detector. The output of U1A is fed to the audio control on the RCVR/XMTR panel and back to U1B via C4. U1B, U1C, U1D and U1E are voltage amplifiers that are used to drive the push-pull output pair U1F and U1G. U1F and U1G are powered by the 14 volt line, via R12. U1F and U1G drive transformer T1 to provide the handset audio output and the drive for the 5 watt audio amplifier, Q5 and Q6.

1.1.2.4.2 Five Watt Audio Amplifier.-
Transformer T1 has two outputs, one low level (0-10 milliwatts) for the H-189/GR handset and a second high level output to drive the 5 watt complimentary output Q5 and Q6. Q5 and Q6 are powered by the 44 volt line via R14. The impedance of the MM-2 speaker is 16 ohms and requires a large voltage to generate the required 5 watts output.

1.1.2.4.3 Squelch.-

The squelch circuit consists of Q1, Q2, Q3, Q4 and associated circuitry. Q4, when saturated, silences the audio output by removing the voltage from U1B, U1C, U1D and U1E. Q4 is driven from Q2 and Q3, which are configured as a schmitt trigger to achieve a sharp cutoff threshold. Q2 and Q3 are driven by Q1, an emitter follower, from R6, the maximum squelch threshold adjustment. R6 is adjusted to set the maximum signal required to break the squelch when the panel control is adjusted maximum clockwise. It is normally set so that a 15 microvolt input signal will open the squelch with the panel control maximum clockwise. Q1 is driven by a positive going voltage supplied by 1A4, pin M.

1.1.2.5 Oscillator-Oven (1A7).-

(Figure 6-7 Schematic Diagram)

The oscillator-oven module contains a proportional control oven, a 10.7 MHz carrier oscillator and a channel oscillator, plus switching diodes to select channel frequencies and oscillator levels.

1.1.2.5.1 Oven.-

The oven used is a proportionally controlled oven and is powered by the 44V line (pins P and R). The oven is housed between the outer cover and the inner cover. When the oven is first turned on, approximately .6A flows through the heating coil. After the temperature inside the oven reaches 75 to 78°C, the current reduces to .2 to .3 amperes and a slow cycling process maintains the oven temperature at 76°C ± 2°C.

1.1.2.5.2 Channel Oscillator (1A7A2).-

The channel oscillator amplifier consists of U1A, U1B, U1C, U1D and U1E (contained in integrated circuit U1) and associated circuitry. The channel oscillator amplifier is contained on a small plug-in circuit board 1A7A2. The input to the amplifier is the junction of C1, R1 and CR1-CR6. The oscillator output is the emitter of U1E. Oscillation occurs via U1A, U1C, U1D, R8, C6, C5, C1, R1 path; but only when the junction of R1, C1 and CR6 is at a high impedance. The high impedance occurs only when the crystal used is at its parallel resonance. The crystals are selected and switched into the oscillator

circuit by R1-R6, CR1-CR6, and R7-R12. When 10VDC is applied to pin J of 1XA7, current flows through R4, CR4 and R2 (on 1A7A2) and channel 4 crystal is selected. Note R1-R6, CR1-CR6 and R7-R12 are on 1A7A1 PC board. The crystals used are standard HC-6 and plug into sockets. Frequency adjustment is accomplished by trimmers C1-C6.

1.1.2.5.3 10.7 MHz Carrier Oscillator (1A7A1).-
The 10.7 MHz carrier oscillator is composed of Q1, Q2, and Q3 and associated circuitry. This oscillator is used in SB receive and in the transmit mode. Q1 is configured as a COLPITTS oscillator, with Q2 as an emitter follower to prevent load changes from changing the frequency of the oscillator. The carrier oscillator is turned on by applying +10VDC to either pin B or pin C of 1XA7. Pin B is used for the transmit mode and pin C is used for SB receive. It should be noted that when +10VDC is applied to pin C for S.B. receive, diode CR10 is used to attenuate the 10.7 MHz output from Q3 emitter. This action is required to prevent overdriving the product detector and reduce stray I.f. pickup in the receiver.

1.1.2.6 Transmit Balanced Modulator, Audio ALC (1A2).-
(Figure 6-2 Schematic Diagram)
This module contains the transmitter balanced modulator, audio ALC and the circuitry for carrier injection for AM transmit mode.

1.1.2.6.1 Balanced Modulator.-
The balanced modulator is an integrated circuit that contains 8 transistors. The audio input is applied to pins 1 and 4 while the 10.7 MHz carrier is applied to pin 7. The carrier is balanced by R27. The double sideband suppressed carrier output appears on pin 6. This output is further amplified in Q1 and Q3. Q3, an r.f. amplifier, has its collector tuned (L1, C9) to 10.7 MHz. The balanced modulator output is brought to pin J of 1XA2.

1.1.2.6.2 Audio ALC.-

The output from the H-189/GR handset is fed to pin U of 1XA2. This output is .5-2 millivolts and must be amplified before being applied to the balanced modulator. Transistors U1E, U1B, U1D and U1C are used as voltage amplifiers to increase the level of the handset output. Transistor Q2 is used as a voltage detector and A.C. amplifier to keep the audio input level to the balanced modulator nearly constant. The ALC action is accomplished by Q2 emitter output cutting off U1E and reducing its gain. Also, diode CR1 acts as a variable resistance and reduces the input applied to U1E base. R23 is used to adjust the input level to the balanced modulator.

1.1.2.6.3 AM Injection.-

For operation in the A3H mode, carrier has to be inserted after the USB filter (located on 1A3). R37, CR4, R38 and associated capacitors provide a means of injecting carrier for A3H operation. When 10VDC is applied to pin E (AM select), diode CR4 conducts and 10.7 MHz is fed through C26, CR4, R38 and C31 to pin B. R38 is a potentiometer used to adjust the level of carrier inserted. The carrier is inserted on 1A5 via pin S and R10.

1.1.2.7 Transmit Balanced Mixer, LPF and ALC Amplifier (1A5).- (Figure 6-5 Schematic Diagram)

Module 1A5 accepts the 10.7 MHz lower sideband signal from 1A3 and translates this signal to the proper output frequency. 1A5 also contains the USB-AM switching circuitry.

1.1.2.7.1 Balanced Mixer

The balanced mixer consists of T1, Q1, Q2, T2, and associated circuitry. 10.7 MHz lower sideband from 1A3 is fed to pin U, through R2 and to the primary of T1. The secondary of T1 drives the signal gates of Q1 and Q2 in push-pull. The channel oscillator is applied to the signal gates of Q1 and Q2 via the center tap of T1. It should be noted that the channel oscillator is applied to both signal gates in the same phase where the 10.7 MHz lower sideband signal is applied in push-pull (180° out of phase). L1, L2 and associated capacitors form a low-pass filter to remove harmonics of the channel oscillator before it is applied to the balanced mixer. The 10.7 MHz lower sideband signal and the channel oscillator are

mixed together to produce the desired output UPPER side-band signal. For example, if the audio modulating signal is 1 kHz, the 10.7 MHz filter output will be 10.699 MHz. If the desired output frequency is 4048.500, the channel oscillator frequency will be 14.7485 MHz. Mixing action in the balanced mixer would result in 14.7485 MHz-10.6990 MHz equals 4049.5, which is 1 kHz higher than the assigned frequency. T2 is a broadband transformer that couples the balanced mixer push-pull output into the low-pass filter. R6 is a potentiometer used to balance the mixer for noise and spurious products.

1.1.2.7.2 Low Pass Filter.-

L3, L4, L5, L6 and associated capacitors form a low-pass filter to attenuate harmonics of the balanced mixer output. This filter has a cutoff frequency of 9.0 MHz and has a 55db stop band rejection.

1.1.2.7.3 ALC Amplifier.-

The output of the low-pass filter is coupled to the drain of Q8. ALC voltage is applied to the gate of Q8 and reduces the gain. The ALC voltage is derived in the PA/CPLR in 2A5, ALC detector and amplifier. Approximately 10db of gain reduction can be obtained in Q8 with maximum ALC input. Q9, Q10 and Q11 are amplifiers that are used to increase the level of the signal sufficiently to drive the PA located in the PA/CPLR unit.

1.1.2.7.4 AM-USB Select Switching.-

Transistors Q4, Q5, Q6, Q7, and associated components are used for automatic generation of AM and USB select voltages. These voltages are used in 1A3 to select either AM or USB filters and for other functions in the radio set. The AM SELECT line, pin P, is the line used to condition the radio set for AM operation in receive (A3) and compatible AM (A3H) in transmit. When 10V is applied to the AM select line, the set is conditioned for AM operation. When the AM select line is at 0 volts, the set is conditioned for USB receive and USB transmit. The USB select line, pin J, is controlled by Q6 and Q7. With no AM select voltage, R17 supplies base voltage to Q7 and the USB select line is near 10V. However, if 10 volts is applied to the AM select line, pin P, Q6 is

saturated, the base of Q7 is near ground and the USB select line is reduced to near zero volts. During the transmit mode, the USB select line is always near 10V because Q5 is saturated by R15 and 10V(T). (The USB filter is always used during transmit). Q3 is a switch used to ground the 10.7 MHz carrier insertion when in the USB mode.

Table 4-1 presents in tabular form the voltages generated by Q5, Q6 and Q7.

PIN P (AM SEL)		PIN M	PIN F	PIN N	PIN J
		10V	10V(T)	AM	USB SEL
10V	Rec (AM)	10V	0	7.1V	0V
10V	Transmit(AM)	10V	10V	0V	8.5V
0V	Rec (SB)	10V	0	0V	8.8V
0V	Transmit(SB)	10V	10V	0V	8.5V

TABLE 4-1
1A5 USB SEL AND AM VOLTAGES

1.1.2.8 Low Pass Filter (1A8).-
(Figure 6-8 Schematic Diagram)
1A8 is mounted on the rear of the channel selector switch S3. This low pass filter has a 3.3 mHz cutoff and has approximately 35db stop band rejection. It should be used for all frequencies of operation below 3.1 mHz. It is used to prevent spurious products at the output of the PA (2A3), located in the PA/CPLR unit. Switch wafers S3D and S3E switch the filter in series with 1A5 output. For frequencies above 3.1 mHz, the filter is bypassed by shorting between the contact positions on S3D and S3E and removing the filter input and output from those particular contacts. (See Figure 6-8 REC/XMTR Wiring Diagram)

1.2 Power Amplifier-Antenna Coupler (PA/CPLR); AM-6560(P)/SRC-42(V).-

1.2.1 General.-
The PA/CPLR unit contains the power supply (2A2), antenna coupler (2A1), R.f. power amplifier (PA) (2A3) (50 watt PEP module or 125 watt PEP module), low pass filters

(2A4), ALC detector and amplifier (2A5) and connectors and switches required for system operation. The unit is shown pictorily in Figures 6-16 and 6-17 with the schematic shown on Figure 6-15.

1.2.2 Connectors, Switching and Chassis Items.-

1.2.2.1 Connectors.-

Ships power is brought in on pins D and E (+) and pins B and C (-) of 2J2. Pin A of 2J2 connects to the shield on the input power cable. 2J1 is the control connector and provides the connections from the PA/CPLR to the RCVR/XMTR. The R.f. drive from the exciter is brought in through 2J3. This connector also provides the receiver input from the PA/CPLR to the RCVR/XMTR. The output of the antenna coupler is 2J6. The 50 ohm input to the antenna coupler is 2J4 while the 50 ohm output from the PA is brought to 2J5. A small jumper cable is provided on the panel to connect 2J4 and 2J5 together for operation. All connectors are located on the front panel of the PA/CPLR unit.

1.2.2.2 Switching.-

1.2.2.2.1 Switch Wafers.-

Switch wafer 2S2A is an "open-seeking" wafer that controls the motor (M1). The motor will revolve until there is no longer a ground present. For example, if a ground is placed on channel 3 wire in the RCVR/EXCTR, motor M1 will rotate until a ground is no longer present on the motor and 2S2A wiper will stop on position 3. Switch wafers 2S2B and 2S2C are used to select the low pass filter, 2A4. Wafers 2S1A, 2S1B, 2S1C, and 2S1D are contained on the antenna coupler module (2A1) and are not considered a part of the PA/CPLR chassis items.

1.2.2.2.2 Antenna Tune Switch.-

2S1 is the antenna tune switch. It is a DPDT toggle switch located on the motor bracket and is used to key the transmitter on in the AM mode for coupler tuning.

1.2.2.2.3 Relays.-

Two relays are used in the PA/CPLR chassis. Both are plug-in types and are easily replaced. 2K2 is the motor control relay. When it is energized by a ground presented

by 2S2A, the motor M1 will run until the ground is removed. 2K2 also interrupts the 14 volts to 2K1. This action prevents the transmitter from being keyed on while the unit is changing channels. When the ground is removed from 2S2A, 2K2 falls out and a short is placed across the motor winding to provide a braking action and prevent overshoot. Relay 2K1 is the T/R relay and switches 14V to the PA and the coupler 50 ohm input from the receiver to the PA output.

1.2.2.3 Capacitors.-

Several by-pass capacitors are located on the chassis. These are shown on the schematic diagram in Figure 6-15. The large capacitor (1000UFD 75V) C6 can easily be replaced by removing the hold down screw and the terminal screws.

1.2.3 Modules.-

1.2.3.1 Antenna Coupler (2A1).-
(Figure 6-15 Schematic Diagram)

This module contains the inductors and capacitors needed to match the transmitter 50 ohm output to the antenna impedance. No soldering is required to change components or to remove the module, should this be required. The poles of 2S1A, 2S1B, and 2S1C are all tied together and are at a 50 ohm impedance level. 2S1A selects the channel variable input capacitance (425-1260pf). If a larger value of input capacity is required, wafer 2S1B selects one of four possible values of fixed capacity (1000, 2000,3000,3900pf). 2S1C wafer selects the variable inductor for a particular channel; L1 thru L6. The other end of the variable inductors is provided with a screw type terminal used to select the proper inductance on L7. 2S1D is used to select a shunt output capacitor for using the pi-network configuration. Three values are available- 50, 100, 150pf. As stated previously, no soldering is required. Also, storage post are provided to store wires from 2S1C and 2S2D that are not used to tie to a capacitor. In order to remove the coupler module, the motor shaft must be removed and the four screws that mount the coupler to the chassis.

1.2.3.2 Power Supply (2A2).-
(Figure 6-15 Schematic Diagram)

1.2.3.2.1 DC-DC Converter.-

The power supply is designed to operate from 13.2VDC, +15% -20% and from 26.4VDC +15% -20%. Reverse polarity protection is provided by CR2. If the improper polarity (- on pin D and E of 2J2) diode CR2 will not allow K1 to pull in and the unit cannot be turned on. The ON-OFF switch is located in the RCVR/XMTR unit and the ON-OFF control lines are brought to pins W and X (2J1) and into the power supply on pin C of 2XA2. When the ON-OFF switch is turned to the ON position, current flows from pin R 2XA2 (+), through K1, through CR2, to pin C 2XA2, to pin W, 2J1, through the ON-OFF switch in the RCVR/XMTR, back through pin X 2J1 to the (-) side of the input power. When K1 is energized, the negative side of the ships power is applied to the emitters of Q1, Q2, Q3 and Q4 and the DC-DC converter begins operation. For 26VDC operation, the wiring of TB-A is as shown in Figure 6-15. For 13.2V operation, the black wire is moved to terminal 4, the white wire is moved to terminal 2 and the white-orange wire is moved to terminal 3. The white and black wires are connected to the collectors of the switching transistors and when they are moved to terminals 4 and 2, respectively, transformer T1 is connected for the proper volts per turn on the primary for 13.2V operation. The white-orange wire, when moved to terminal 3, shorts out the current limiting resistor, R2, for the ON-OFF relay. The DC-DC converter uses four transistors, Q1, Q2, Q3, and Q4. Q1 and Q2 switch one side of T1 primary and Q3 and Q4 switch the other side. The parallel transistors share the current, resulting in better regulation for heavy loads. Relay K2 is used to switch the base drive to the switching transistors to reduce the battery drain in the receive mode. K2 also switches 44V to 2A3 in the transmit mode. K2 is energized in the transmit mode and increases the base drive for the heavy transmit current load. R5, C3 and CR1 comprise a starting circuit to assure that the converter will always start to oscillate.

1.2.3.2.2 44 Volt Circuit.-

The 44 volt square wave output from T1 is fed to CR1 diode bridge for rectification. Capacitor C1 is a noise filter capacitor. The 44VDC output is brought out on pins H and F.

C6 is a large 1000MFd 75V capacitor located on the chassis for filtering the 44 volt line.

1.2.3.2.3 14V and 10V Regulator.-

The 14V AC output from the converter transformer is fed to CR2 for rectification to D.C. A .25 ohm resistor is used to prevent large current surges from damaging the bridge, CR2. The 14V output is taken from pin D 2XA2. Q5 is connected as a series regulator. Zener CR3 keeps the base voltage of Q5 constant so that the 10V output does not change for varying load or input voltage. The 10V line is brought out on pin E, 2XA2.

1.2.3.3 PA Module (2A3).-

(Figure 6-15 Schematic Diagram)

There are two PA modules, 50 watts PEP and 125 watts PEP, that are designed to plug into the PA/CPLR chassis. Operation of both modules is identical with the exception of the power output capability. The input to the PA enters the module on pin J and passes through a gain control to the first stage, Q1. Q1 is operating class A and has voltage applied only during the transmit mode. The collector of Q1 operates into T1 which is a broad-band transformer. The secondary of T1 drives the bases of Q2 and Q3 in push-pull. Q2 and Q3 are the drivers that must supply the power drive for the output transistors. T2 couples the drive from Q2 and Q3 into the bases of Q4 and Q5 for the 50 watt module or into the bases of Q4, Q5, Q6, Q7, Q8 and Q9 for the 125 watt version. The power output is coupled to pin B in transformer T3. The 50 watt transformer has a 4t:5t ratio while the 125 watt version has a 2t:4t ratio. The base bias for Q2 and Q3 is supplied from a resistive divider, R6 and R7. Diode CR1 provides thermal compensation for the idle current of Q1 and Q2. Base bias for the output transistors, Q4, Q5, Q6, Q7, Q8 and Q9, is provided by CR2 and the resistive divider, R14 and R12. No adjustments are required on the PA module other than R1, the gain control. This adjustment is used to reduce output power for antenna coupler tuning.

1.2.3.4 Low Pass Filters (2A4).-

(Figure 6-15 Schematic Diagram)

2A4 contains three low pass filters. L3, L4, L9 and associated capacitors form the 3.3 MHz low pass filter

which is to be used for frequencies below three MHz. L2, L5, L8 and associated capacitors comprise the 5.5 MHz low pass filter. Frequencies from 3 to 5 MHz should be routed through this filter. Frequencies from 5 to 8 MHz should be routed through the 9.2 MHz low pass filter. The 9.2 MHz filter is composed of L1, L6, L7 and associated components. The filters all have a stop band attenuation of 52db and are used to reduce the harmonic output of the PA. The input and output switching is accomplished by 2S2B and 2S2C, located on the PA/CPLR chassis. Changing any particular channel to a different filter can be done by moving the channel wires to the proper filter with a screw driver. Soldering is not required.

1.2.3.5 ALC Detector and Amplifier (2A5).-
(Figure 6-15 Schematic Diagram)
The purpose of the ALC detector is to detect the peak power output of the transmitter (50 ohm) and provide a d.c. control voltage that can be applied to the ALC amplifier in the RCVR/XMTR and keep the power output relatively constant with changes of input audio and gain variations within the system. Two ALC detectors are used, one for AM operation and another for USB operation.

1.2.3.5.1 AM Detector.-
The AM detector consists of R2, R3, CR3 and associated components. The R.f. output, pin 5 (2XA5) is divided down and rectified in CR3 to generate a positive voltage on the gate of Q2. This voltage is proportional to average power of the carrier since CR2 serves to clip the modulation peaks. R3 is an adjustment to set the level of AM carrier output. The prime objective of the AM detector and amplifier is to maintain a constant carrier. The D.C. voltage applied to the gate of Q2 is amplified and applied to Q4, the ALC output stage. When 10VDC is applied to pin 4 (AM select line) R14 becomes the drain load for Q2. This action is required to shorten the ALC time constant for AM operation to prevent the USB peak detector from causing downward modulation when operating in the AM mode. Diode CR1 effectively shorts out any R.f. input to the AM detector when operating in the USB mode.

1.2.3.5.2 USB Detector.-

The USB detector consists of R1, R4, CR4 and associated components. Diode CR4 rectifies the AC voltage from R4 and provides a D.C. voltage to drive the gate of Q1. The D.C. voltage applied to the gate of Q1 is proportional to the peak R.f. voltage at the transmitter output. R4 can be adjusted to set the level of peak R.f. output before ALC action begins. It should be noted that the USB detector and amplifier is used in both AM and USB modes. The gate voltage of Q1 is amplified and applied to the base of Q4, the ALC output amplifier. Note that in the USB mode, the ALC time constant is R16 and C12 while in AM the time constant is R14 and C12.

1.2.3.5.3 Meter Drive and Switching.-

The meter on the panel of the RCVR/XMTR is driven in transmit by R6 and CR5 and brought out from pin E (2XA5). Q3 is a switch that keeps maximum ALC voltage on the transmitter during the receive mode. When the transmitter is initially keyed on, the ALC voltage decays slowly and prevents large transient voltages on the transmitter output.

2. SPECIFICATION TEST PROCEDURES.-

2.1 General Information.-

The tests outlined in the following paragraphs should be performed after equipment maintenance or periodically to determine if the radio set still conforms to the specifications.

2.2 Test Equipment Required.-

(a) Frequency Counter, HP 5245L or equal
(b) Coaxial 50 ohm load, Bird 81B or equivalent
(c) Oscilloscope, Tektronix 543B or equivalent
(d) Signal Generator HP 606 or equivalent
(e) Watt meter Bird 43 or equivalent
(f) Audio Oscillator HP 200CD or equivalent (2 required)
(g) Attenuator, Kay 30-0 or equivalent
(h) VTVM Audio HP 400H or equivalent
(i) VTVM HP 410-B or equivalent
(j) VOM, Simpson 260 or equivalent
(k) Audio Distortion Analyser HP 330C or equivalent
(l) Power Supply HP 6268A or equivalent

2.2.1 Receiver Test Procedures.-
Connect the AN/SRC-42(V) and the required test equipment as shown in Figure 4-1.

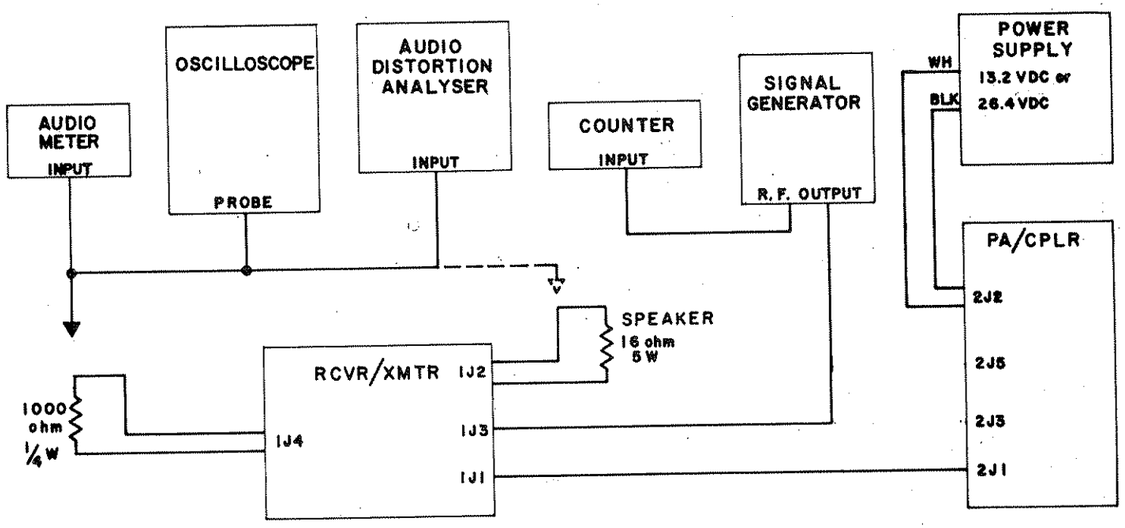


FIGURE 4-2 RECEIVER SPECIFICATION TEST SET-UP

CAUTION

BEFORE TURNING THE UNIT ON, CHECK THE POWER SUPPLY (2A2), TO DETERMINE THE PROPER VOLTAGE TO USE FOR THE UNIT. IF THE 2A2 WIRING IS NOT INDICATED ON THE OUTSIDE OF THE PA/CPLR UNIT, REMOVE THE TOP COVER AND CHECK THE TOP OF THE POWER SUPPLY OR THE WIRING OF TB-A IN THE POWER SUPPLY.

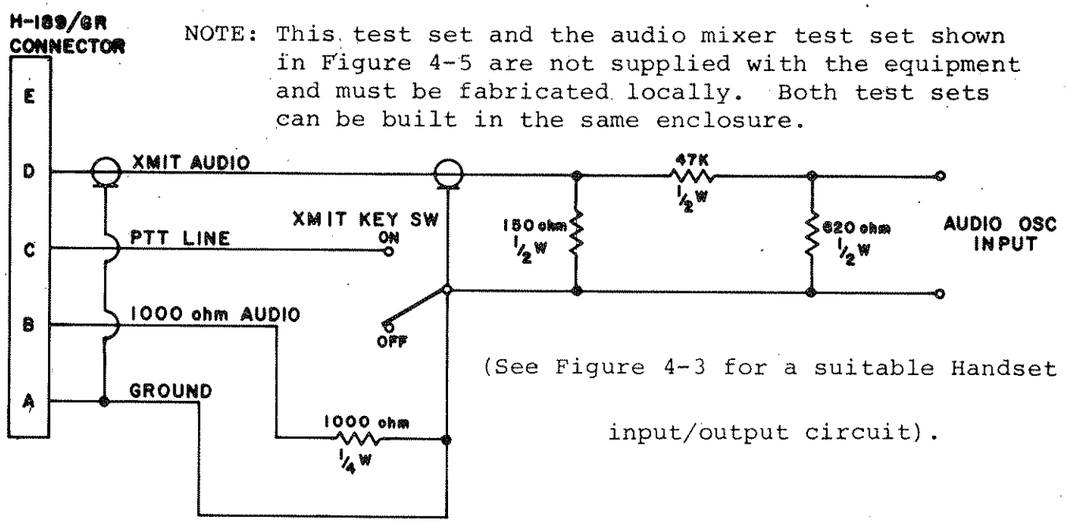
(a) Turn unit on with the RCVR-OFF-XMTR/RCVR switch on the front panel of the RCVR/XMTR.

Make sure switch is in the RCVR position (UP) as this will prevent accidently keying on the transmitter with the PTT line in the RCVR/XMTR unit.

THE TRANSMITTER CAN STILL BE KEYED ON IN THE PA/CPLR WITH THE KEY SWITCH.

(b) Connect the H-189/GR handset or a suitable load resistor to 1J4.

(c) Connect the MM-2 speaker or a suitable load resistor to 1J2.
(See Figure 4-3 for a suitable Handset input/output circuit).



NOTE: This test set and the audio mixer test set shown in Figure 4-5 are not supplied with the equipment and must be fabricated locally. Both test sets can be built in the same enclosure.

(See Figure 4-3 for a suitable Handset input/output circuit).

FIGURE 4-3 HANDSET INPUT-OUTPUT CIRCUIT

2.2.1.1 Receiver Sensitivity Test.-

(a) Set Noise limiter and Squelch fully counter clockwise.
Select an AM channel.

(b) Connect audio meter to 16 ohm output, turn speaker on and adjust meter to 3V scale.

(c) Set signal generator to proper frequency, 2 microvolts and 30% 1000 Hz modulation. Adjust audio control until the audio meter reads 3.1 volts.

(d) Remove the modulation and note signal to noise ratio. (If out of specification see 3.2.1 Receiver adjustments or 4.2.1.1 Trouble Analysis Chart).
(e) Repeat steps a,b,c, and d for all AM channels.
(f) For sideband channels, remove the modulation from the signal generator and reduce the output to 1 microvolt. Adjust the audio output to 3.1 volts and adjust the signal generator frequency until the meter peaks. Remove the signal generator output from 1J3 and note the signal to noise ratio.

NOTE

ALL CHANNELS CAN BE MADE SIDEBAND BY REMOVING THE WHITE VIOLET WIRE ON S3A, THE CHANNEL SELECT SWITCH. THIS WIRE CAN BE REMOVED BY UNSCREWING THE CONNECTOR. THE WHITE VIOLET WIRE IS THE AM SELECT LINE.

2.2.1.2 Receiver Squelch Sensitivity.-
(a) Adjust the signal generator to the standard test voltage (2 microvolts 30% mod. 1000 Hz for AM and 1 microvolt no mod. for sideband) and adjust the frequency of the signal generator to maximum meter reading. Adjust the squelch control fully clockwise. Increase the output level of the signal generator slowly until the squelch breaks, ie, the meter reads. The squelch should break below 15 microvolts for each channel. (If the squelch does not break at 15 microvolts or below, see 3.2.1.4)

2.2.1.3 Selectivity.-
(a) Reset squelch control fully counterclockwise and for AM channels adjust the output level of the signal generator until the signal to noise ratio is 6 db. (This should be approximately 1 microvolt). Note the meter reading. Increase the output of signal generator 6 db and increase the frequency of the signal generator until the audio meter reading returns to the original reading. Record this frequency. Decrease the frequency of the signal generator until the meter reads the same as the on frequency reading. Record this frequency. The

difference between the high frequency and the low frequency is the 6 db bandwidth.

(b) Reset the frequency and output level of the signal generator to obtain a 6db S/N at center frequency. Note meter reading. Increase the output level of the signal generator 60 db and repeat the procedure of (a) above, that is change the frequency high and low until the meter returns to the reference mid-band reading. Record both high and low frequencies and find the difference which is the 60db bandwidth.

(c) For sideband channels, repeat the steps of (a) and (b) above except use no modulation and adjust the midband signal to noise ratio to 10db. (This level should be approximately .4 microvolts).

(d) If the 6db or 60db measurements are not within specifications for either filter, the faulty filter should be replaced. The filter is sealed and no adjustments are required.

2.2.1.4 1/2 IF Spurious Response.-

(a) Increase the output level of the signal generator 60db above the 6db S/N output on an AM channel. Adjust the frequency of the signal generator to 5.35 MHz and note if the output is noticeable. If the 1/2 IF rejection is not within specification, see 3.2.1.3.

2.2.1.5 Audio Power Output.-

(a) Connect the audio meter to the 5 watt output

(b) Set audio meter to 10 volt scale.

(c) Adjust the signal generator to standard AM signal and adjust the frequency for maximum meter response. Increase the signal generator output to five micro-volts and adjust audio control on RCVR/XMTR for 8.9 volts. (This is 5 watts across 16 ohms)

(d) Audio distortion can be checked visually with the oscilloscope or with the distortion analyser. The distortion should be less than 10%.

(e) To check single sideband audio power output and distortion use the same procedure except remove modulation and adjust signal generator frequency to yield 1000 Hz audio output.

(f) To check the handset audio output and distortion, connect the audio meter to the 1000 ohm load and set to 3 volt scale. Repeat the procedure for the 5 watt test, but adjust the audio level to 3.2 volts. (3.2 volts is 10 milliwatts across 1000 ohms.)

(g) If either of the audio outputs does not meet specification, refer to 4.2.1.1

2.2.1.6 Automatic Gain Control (AGC).-

(a) Using same test set up as in 2.2.1.5, monitor either audio output and increase the signal generator output from 5 microvolts to 500,000 microvolts and note the meter reading. The audio output should not increase more than 10db from 10 microvolts to 500,000 microvolts. The waveform can be checked with the oscilloscope or the distortion analyser. If there is excess distortion of the audio output, see 4.2.1.1.

(b) To check the AGC attack and decay time, the RCVR/XMTR must be removed from the case and the AGC line (1XA4 Pin C) monitored with an oscilloscope to read D.C. voltage and 1 volt per division at 1XA4, Pin C. With the signal generator output set to 500,000 microvolts, alternately connect and disconnect the signal generator to the receiver input and note the attack time and the decay time. The attack time (the time required for the AGC-2 voltage to drop to near zero) should be less than 10 milliseconds. The decay time (the time required for the AGC-2 voltage to rise to its no input signal value) should be greater than .2 seconds.

(c) The AGC threshold can be checked by observing the level of on frequency input signal that causes the front panel meter to deflect. This level should be 5 microvolts or less.

2.2.1.7 Noise Limiting.-

(a) Disconnect the signal generator and connect the short jumper cable between 2J4 and 2J5 and reconnect 2J3 to 1J3. Connect a wire, clip lead or antenna to 2J6, the antenna connector. Note the impulse noise. Advance the noise limiter control clockwise and note the reduction of noise on the meter. If the noise limiter does not function, see 4.2.1.1 (An alternate method of checking the noise limiter is to use an impulse generator, such as Empire Devices, fed directly into the receiver input.)

2.2.2 Transmitter Test Procedures.-

(a) Connect the AN/SRC-42(V) and the test equipment as shown in Figure 4-4. Turn the RCVR-OFF-XMTR/RCVR switch to the XMTR/RCVR position (down). This will enable the transmitter to be keyed from the RCVR/XMTR PTT line.

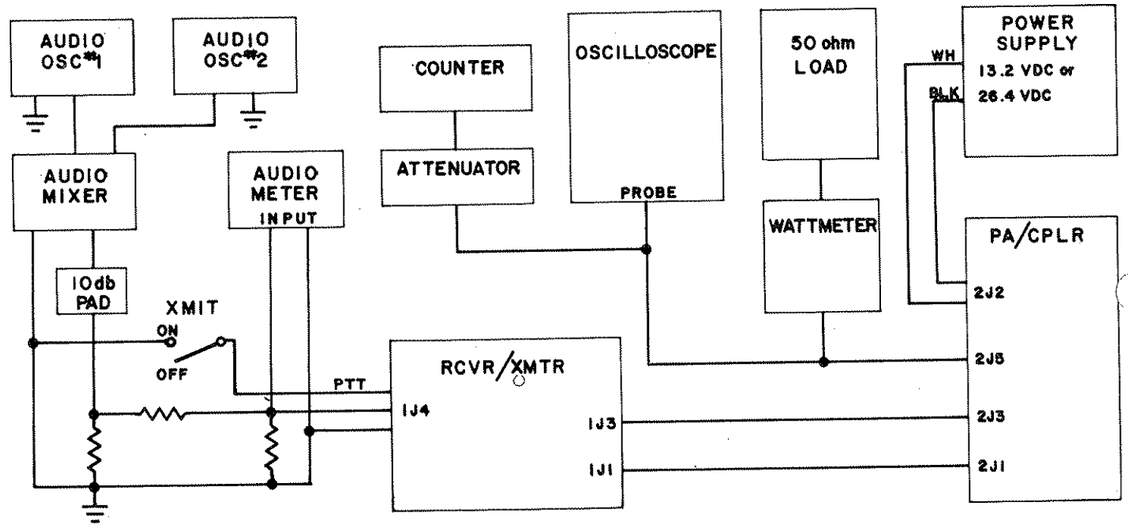


FIGURE 4-4 TRANSMITTER SPECIFICATION TEST SET-UP

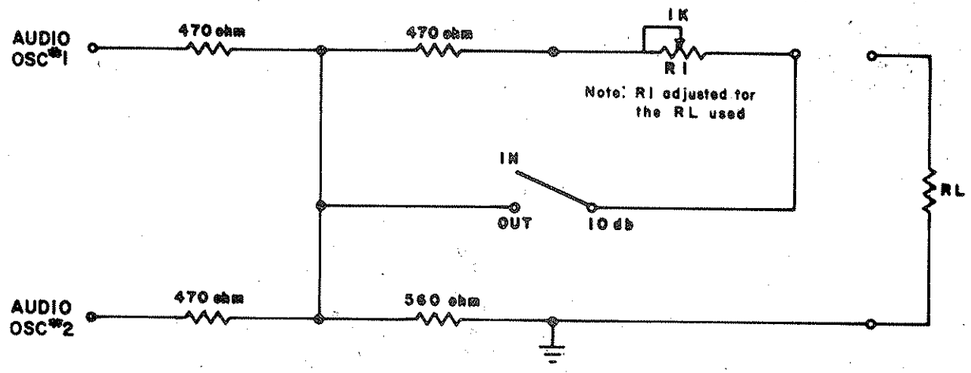


FIGURE 4-5 TYPICAL AUDIO MIXER CIRCUIT WITH 10db PAD

The transmitter can be checked quantitatively using the H-189/GR handset instead of the input-output circuit as shown in Figure 4-4. However, the level of the audio signal required to produce sufficient modulation cannot be measured unless the input-output test cable is used.

CAUTION

DO NOT CONNECT THE FREQUENCY COUNTER DIRECTLY TO THE TRANSMITTER OUTPUT.

2.2.2.1 Transmitter Power Output.-

(a) Turn unit on to the XMTR/RCVR position and allow a 15 minute warmup. Select AM channel, disconnect one audio oscillator; and key transmitter with the handset or the test set. (Note- unit may also be keyed on, ALWAYS IN AM, with the test key, 2S1, in the PA/CPLR unit). Note power output on wattmeter.

Check all AM channels. With no modulation, the AM power should be between 40 and 50 watts for the 125 watt module and between 17 and 20 watts for the 50 watt module. If the carrier power does not meet specification, see 3.2.2.4, 3.2.2.5 or 4.2.2.1

2.2.2.2 Automatic Level Control.-

(a) Set channel selector switch to a SB channel. (See note on page 4-25) Apply a two tone signal, each tone equal, of 700Hz and 2300Hz. Monitor 1XA2 Pin U and adjust audio oscillators for equal amplitudes. Increase audio oscillator outputs until the meter reads .0008 volts with the 10db pad in the circuit. Note power output.

(b) Power output for the 125 watt module should be 50 watts. Power output for the 50 watt module should be 20 watts.

(c) Switch out the 10db pad and the meter should increase to .0025V.

(d) Note the power output reading. The output power should increase no more than 1db for either power output module. If the ALC does not meet specifications, see 3.2.2.4, 3.2.2.5, or 4.2.4.6.1

(e) To check the automatic level control on AM, select an AM channel and apply 1500 Hz from one audio oscillator, disconnect the other. Adjust the audio oscillator level until the audio meter reads .0008 volts. Note the transmitter power output. (The transmitter output should increase from approximately 17 watts with no modulation to about 20 watts with modulation for the 50 watt module. For the 125 watt module, the power will remain essentially constant between no modulation and modulation) Remove the 10db pad and the meter should increase to .0025V. The output power of either output module should not increase more than 1 db.

2.2.2.3 Modulation Requirements.-

(a) Disconnect the Handset input output circuit and connect the handset.

(b) Key transmitter on AM channel and note the modulation pattern on the oscilloscope. Talking in a normal voice approximately 1/2 inch from the microphone should produce solid modulation on the carrier.

(c) Switch to SB channel. Normal speech should produce peaks of 10 to 15 watts for the 50 watt module and a sustained whistle should produce 35 to 50 watts. For the 125 watt module, normal speech should produce peaks of 20 to 30 watts and a sustained whistle should produce between 70 and 125 watts.

2.2.2.4 Hum and Noise.-

(a) Select a SB channel and connect the Handset Input Output circuit to the handset connector. Apply a two tone signal, 700 Hz and 2300 Hz, to the audio input. With rated power output from the transmitter, note the peak to peak oscilloscope reading. Remove the audio oscillators from the audio mixer and note the oscilloscope reading. The residual hum should be at least 40 db below the rated output reading. (An alternate method would be to use a HP 410B meter instead of the oscilloscope). If this measurement is not within specification, see 3.2.2.2

2.2.2.5 Audio Bandwidth.-

(a) Select SB channel. Disconnect one audio oscillator and reduce the level of the other to zero. Key transmitter on and adjust the frequency of the audio oscillator to 1000 Hz. Increase the level until power output reads approximately 1/2 rated output. (Make sure output level is below the ALC threshold, 10 watts for 50 watt module and 20 watts for 125 watt module) Note reference power level at 1000 Hz and lower the audio frequency until the power drops 6db. Note frequency. Increase the frequency of the audio oscillator until the power again drops 6db. Again note the frequency. The difference between the high audio frequency and the low audio frequency is the 6db bandwidth. The 6db bandwidth should be at least 2.1kHz with the lower frequency 6db point less than 400 Hz. If this measurement is not within specifications, see paragraph 4.2.2.1 of this section.

2.2.2.6 Frequency Accuracy and Stability.-

(a) Remove all modulation; handset or handset input output circuit.

(b) Make sure carrier attenuator is inserted between transmitter 50 ohm output and the counter. (A

suitable carrier attenuator is a series 4.7k 1/2 watt resistor followed by a 50 ohm 1/2 watt resistor to ground)

(c) Select AM channel and key transmitter. Note frequency on counter. Check all AM channels. Frequency should be within 20Hz of assigned carrier frequency.

(d) Select SB channel. Insert 1000 Hz audio through the handset input-output circuit into the handset connector, 1J4. Key transmitter and note frequency. The frequency should be the assigned carrier frequency plus 1000Hz. Check all SB frequencies.

(e) The frequency of any SB channel can also be checked by using the XMT KEY switch in the PA/CPLR unit. When this key is turned to the transmitter on position, the RCVR/XMTR is conditioned for AM operation.

(f) If any frequencies are not within specifications, see section 3.2.1.5

3. ADJUSTMENT AND ALIGNMENT PROCEDURES.-

3.1 General Information.-

(a) The RCVR/XMTR and the PA/CPLR units are designed for minimum variations in specifications. After the initial factory alignment and adjustments, no further internal adjustments are required unless P.C. boards are changed or operating frequencies are altered. If the output power module is changed, internal adjustments are required. Periodic adjustments and alignment should be scheduled to insure peak performance of the equipment.

3.2 Equipment Required.-

(a) Same as paragraph 2.2

3.2.1 Receiver Adjustments.-

(a) Remove the 10 screws holding the RCVR/XMTR front panel to the case. Slide the chassis out of the case. The chassis may be removed without removing the three connectors on the rear of the unit. For all receiver adjustments, it is recommended that the signal generator be inserted at 1J3 rather than 2J5.

CAUTION

IF THE PTT LINE IS INADVERTENTLY GROUNDED WITH THE SIGNAL GENERATOR CONNECTED TO 2J5, DAMAGE COULD RESULT TO THE GENERATOR IF THE SET IS ON AN AM CHANNEL OR ON A SB CHANNEL WITH TRANSMIT AUDIO DRIVE.

3.2.1.1 Mixer and IF Amplifier Tuning.-

(a) Turn noise limiter and squelch controls fully counter-clockwise.
(b) Use the test set-up shown in Figure 4-2, except signal generator can be injected into 1J3 instead of 2J5.
(c) Select AM channel and adjust frequency of signal generator to the correct frequency and adjust the output level (30% AM 1kHz mod.) until a meter reading is obtained.
(d) Adjust audio control to convenient meter reading (3.1V across 16 ohms). Using an insulated alignment tool adjust 1A1C44 for maximum meter reading. Continually reduce signal generator to keep the same meter reference. Make sure input signal generator level is kept below the AGC threshold level approximately 5 microvolts. The front panel meter will begin deflecting at AGC threshold.
(e) Adjust 1A4C8 and 1A4C20 for maximum meter reading. 6db S/N should be approximately 1 microvolt.

3.2.1.2 1/2 IF Balance Adjustment.-

(a) Use the same test set-up as in 3.2.1.1
(b) Adjust signal generator to 5.35 MHz and increase the output level until the meter reads. Adjust 1A1R19 for minimum output on the meter. Continue to increase the signal generator output to obtain the best possible null.

3.2.1.3 AGC-2 Adjustment.-

(a) Use the same test setup as in 3.2.1.1
(b) Select AM channel and set signal generator to center frequency and 2 microvolts with 30% 1 kHz AM modulation. Monitor 1A1TP1 (Red) with VOM set to 10VDC scale. Increase the signal generator output to 2000 Micro-volts.

(c) Adjust 1A4R53 until the VOM reads between 6.8VDC and 7.2VDC
(d) Note meter reading on the front panel should be approximately full scale.

3.2.1.4 Internal Squelch Adjustment.-
(a) Use the same test set-up as in 3.2.1.1
(b) Check the 2 microvolt sensitivity on all AM channels and the 1 microvolt sensitivity on all SB channels.
(c) Using the audio meter output, determine which channel has the least gain. That is, without changing the audio control, note the channel that produces the largest output with a standard input signal.
(d) Select the channel with the least gain and adjust the signal generator to center frequency. Turn the squelch control fully clockwise.
(e) Increase the output level of the signal generator until the squelch breaks. If the level is less than 15 microvolts, adjust 1A6R6 counter clockwise until the audio stops. If the level is greater than 15 microvolts, set the signal generator output to 15 microvolts and adjust 1A6R6 clockwise until the audio starts. Recheck by reducing the signal generator output to zero and slowly increasing to determine where the squelch breaks. Several adjustments might be required to set exactly to 15 microvolts.
(f) Recheck all channels to determine if the squelch breaks below 15 microvolts.

3.2.2 Transmitter Adjustments.-
Connect the equipment as shown in Figure 4-4. Remove the white-violet wire from S3A wafer so all channels will be conditioned for sideband operation. Note that all channels can be keyed on in the AM mode by using the KEY switch in the PA/CPLR unit.

3.2.2.1 Carrier Balance Adjustment.-
(a) Remove both audio oscillators from the input to the audio mixer.
(b) Make sure the gain control on 2A3 is maximum clockwise.
(c) Key the transmitter on with the switch on the handset input output circuit or the PTT line.

(d) Adjust 1A2R27 for minimum output voltage on the oscilloscope. (The HP410B meter may be used in lieu of the oscilloscope.)

3.2.2.2 Balanced Mixer Adjustment

(a) Using the same test set-up as in 3.2.2.1, key the transmitter on and adjust 1A5R6 for minimum voltage on the oscilloscope or the meter.

(b) Recheck carrier balance 1A2R27 and adjust both adjustments for minimum output on the meter or oscilloscope.

NOTE

Check the output voltage on all channels and make final adjustment of the mixer balance control, 1A5R6, on the channel that has the highest output voltage. The output voltage on all channels after balancing carrier and mixer should be less than 0.5 volts RMS on all channels.

3.2.2.3 Audio Input Adjustment.-

(a) Make sure all channels are conditioned for SB operation; WHT-VIO wire removed from S3A.

(b) Remove the coax cables from 2J3 and 2J5 and connect them together with coax T or bullet. This bypasses the PA/CPLR and terminates 1J3 with a 50 ohm load.

(c) Connect both audio oscillators to the input of the audio mixer and set equal tones to 700Hz and 2300Hz (use an oscilloscope to balance tones). Make sure 10db pad is adjusted properly to give a 10db increase in audio level when the pad is shorted out. With the 10db pad IN, adjust both audio oscillators until the audio meter reads .0008 volts (Both tones equal). Short out 10db pad and the meter should increase to .0025 volts.

(d) With 10db pad in (Minimum voltage on audio meter), key transmitter on.

(e) Observe waveform on oscilloscope. Adjust 1A2R23 (audio input control) until the RCVR/XMTR output is 3 volts peak to peak on the oscilloscope. Check on the highest frequency channel. Do not increase

audio input control clockwise more than enough to yield 3 volts peak to peak for the highest frequency in the unit. If the audio input control is advanced too far clockwise, the balanced modulator will be over driven and distortion will result in the output.

(f) Check the output of all channels and be sure all outputs are at least 3 volts peak to peak. Note some flat topping may occur on the lower frequencies but this is satisfactory because no ALC voltage is being applied to 1A5.

(g) Short out the 10db pad in the handset input output circuit. The output of the RCVR/XMTR unit should not change more than 1db. (The audio AGC circuit on 1A2 should hold the modulator input nearly constant)

(h) Unkey the transmitter. Remove one audio oscillator and set the other to 1500 Hz and adjust the output level until the audio meter reads .0008 volts with the 10db pad in the circuit. Make sure PA/CPLR unit is still bypassed; 50 ohm load on output of the RCVR/XMTR.

(i) Key the transmitter on with the KEY switch in the PA/CPLR unit. The unit is now conditioned for AM. Adjust the AM injection control (1A2R38) until the carrier is larger than the modulation and the resulting modulation is approximately 80%. See Figure 4-6.

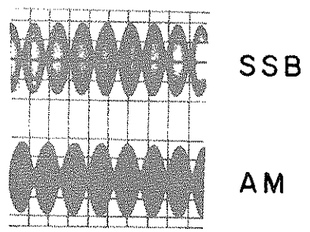


Figure 4-6
Typical 2 Tone SSB and AM Waveforms

3.2.2.4 ALC Adjustment (SSB).-

(a) Connect equipment as shown in Figure 4-4 and drive PA/CPLR with RCVR/XMTR output.
(b) Make sure all channels are in the SSB mode (WHT-VIO wire removed from S3A). Adjust 2A5R4 (SB ALC) control maximum clockwise. This will result in maximum power output. (No ALC voltage developed)
(c) Set channel selector to the highest frequency channel.
(d) Connect two tone (700Hz and 2300Hz) to input of handset input output circuit and adjust to .0008 volts.
(e) Adjust gain control on 2A3 to approximately 1/2 maximum clockwise.
(f) Key transmitter on and note wattmeter reading. Increase the output power by adjusting the gain control on 2A3 clockwise. Set the output power to exceed the rated output power by 20 watts. See Table 4-2.

Rated PEP	Module used	Wattmeter Reading for 2 equal tones	2A3 Gain Adjust. with NO ALC	AM Carrier
50 Watt	99595	20 Watts	40 Watts	17-20 Watts
125 Watt	99603	50 Watts	70 Watts	45-50 Watts

TABLE 4-2
Power Output for 50 Watt and 125 Watt Modules

(g) Adjust SB ALC control counterclockwise until rated power is obtained.
(h) Check all channels on SB and note power variation over the frequency range. All channels should be within 1 db and a minimum of 50 watts for the 125 watt module and a minimum of 20 watts for the 50 watt module.

NOTE

On some units, it may be necessary to increase the gain setting on 2A3 and DECREASE the audio input on 1A2 to obtain the optimum ALC characteristic. That is, if the gain setting on 2A3 is too low, the output from the RCVR/XMTR can distort and flat-top before a sufficient drive level is reached for the PA.

3.2.2.5 ALC Adjustment (AM).-

(a) Connect WHT-VIO wire to S3A so all AM channels will be conditioned for AM.
(b) Remove all modulation from handset input output circuit.
(c) Key the transmitter on AM channel and adjust 2A5R3 (AM ALC) counter clockwise until proper AM power is obtained. Check Table 4-2. Check all AM channels for the proper output power.
(d) Use one audio oscillator and adjust the frequency to 1500Hz. Adjust the output level to .0008 volts. Key transmitter on and note power output and wave shape. The power output should increase slightly when modulation is applied.
(e) Reduce the level of the audio oscillator and make sure that the level of the carrier is greater than the level of the modulating sideband (80% modulation). See Figure 4-6. If the level of the carrier is less than the level of the modulating sideband, re-adjust 1A2R38 to the correct level.
(f) Re-check all AM channels with single tone modulation and SB channels with 2 tone modulation.

3.2.2.6 Oscillator Adjustment

(a) Slide RCVR/XMTR case forward to the front panel and allow 1 hour warm up with the unit closed.
(b) By pass PA/CPLR unit; terminate 1J3 with 50 ohm load
(c) Slide RCVR/XMTR case back approximately two inches and turn unit upside down to adjust oscillator trimmers. (See Figure 6-8.)
(d) Monitor 10.7 MHz carrier output with counter between 1XA7-pin D and ground.
(e) Key the transmitter on with the test key in the PA/CPLR. Adjust the 10.7 MHz trimmer capacitor for 10.7 MHz plus or minus 1 Hz.
(f) Remove the counter from the 10.7 MHz output and monitor the RCVR/XMTR output on 1J3.
(g) Select channel one and adjust the trimmer for the channel frequency plus or minus 2 Hz.
(h) Repeat for each channel.
(i) Recheck carrier oscillator frequency on pin D of 1XA7. Re-adjust if required. Make sure carrier oscillator is within plus or minus 1 Hz.
(j) Re-check all channel frequencies.

(k) Secure all variable capacitor rotors with several drops of Polystyrene Q-Dope or Glyptol.
(l) Close RCVR/XMTR case to front panel and allow 1/2 hr for sealant to harden.

4. TROUBLE SHOOTING AND REPAIR.-

4.1 General Information.-

4.1.1 When the RCVR/XMTR is removed from the case, a visual inspection should be performed to check for broken wires, loose or shorted contacts or damaged components. The top and bottom cover of the PA/CPLR unit may be removed for maintenance.

4.1.2 Malfunctions in the RCVR/XMTR may be isolated quite rapidly by the substitution of circuit boards. However, if no spare boards are available, a general signal tracing procedure in conjunction with the trouble analysis charts may be used. Once the faulty circuit board has been isolated it may be returned to Sunair Electronics, for repair or the signal and DC voltage tables provided in this section may be utilized to repair defective boards. A P.C. card extender is provided in the maintenance kit for use with PC Boards 1A1 through 1A6. 1A7, 2A2, and 2A3 may be serviced by use of the extender cables.

4.2 Test Equipment Required.-

(a) RF Voltmeter	H-P Model 410B, or equivalent
(b) RMS Voltmeter	H-P Model 400L, or equivalent
(c) RF Signal Generator	H-P Model 608D, or equivalent
(d) Audio Oscillator	H-P Model 200CD, or equivalent (2)
(e) Wattmeter (100W Element)	Bird Model 43, or equivalent
(f) Dummy Load, 50 ohms	Bird Model 81B, or equivalent
(g) Oscilloscope	Tektronix Model 543B, or equivalent
(h) Multimeter 20K ohms/volt	Simpson Model 260, or equivalent

4.2.1 Receiver.-

All the receiver circuitry is contained within the RCVR/XMTR. The input signal to the receiver is routed from the antenna through the antenna coupler, through 2A4, through 2K1, 2J3, 1J3, 1K1 and to pin U of 1XA1. A receiver failure could be caused by a component located in the PA/CPLR unit. All receiver tests can be performed by using 1J3 as the signal input.

4.2.1.1 Receiver Trouble Analysis Chart.-

Symptom	Probable Cause	Remedy
No audio output on any channel, AM or SSB	Squelch control set to quiet receiver.	Turn squelch control fully CCW.
	Internal squelch control 1A6R6 not adjusted properly	Refer to paragraph 3.2.1.4
	No 10V or 14V	Check 2A2 in PA/CPLR
	No 44V (Will effect 5 Watt output only; Handset would still function)	Check 2A2 in PA/CPLR
	Channel oscillator defective	Check 1A7A2,replace defective board
	Defective relay 1K1	Replace relay
	Defective audio control 1R2 or squelch control 1R3	Replace defective parts.
	Defective switch 1S2 (effects 5 watt output only)	Replace switch

Symptom	Probable Cause	Remedy
	Defective circuit boards 1A1,1A3,1A4, or 1A6	Substitute circuit boards or trouble shoot boards using P.C. board voltage charts.
No audio outputs on some channels, AM or SSB	Defective crystals in channel oscillators.	Replace crystal (s).
	Defective channel selector switch wafer 1S3B	Replace Channel selector switch.
	Defective diode switching in 1A7A1	Use 1A7 extender cable and P.C. board voltage table. Substitute new 1A7A1 board.
No audio output on AM,SSB normal	AM filter defective on 1A3	Replace filter or 1A3.
	Defective component in 1A3 AM signal path	Trouble shoot and replace bad component.
	No AM voltage getting to 1XA3 pin L	Defective component on 1A5 USB SEL-AM switching circuitry
No audio output on SSB, AM normal	10.7 Mhz carrier osc. failed	Check 10.7 MHz circuitry on 1A7A1 using 1A7 extender cable.
	USB filter failed on 1A3	Replace filter or 1A3.
	Defective component on 1A3 in USB signal path	Trouble shoot and replace part.

Symptom	Probable Cause	Remedy
	No USB SEL voltage being supplied to 1XA3 pin R.	Component failure on 1A5 in the AM-USB SEL switching circuitry.
Sensitivity low (poor noise figure)	1A1 defective	Replace or repair 1A1
Unable to meet the requirements of Paragraph 2.2.1.1	1A4 not tuned properly	Adjust tuning capacitors in accordance with paragraph 3.2.1.1
	Low channel oscillator injection	Check 1A7 Channel oscillator output against voltage measurement chart.
	Faulty AM or USB filter	Replace or repair 1A3.
	1A1C44 detuned on 1A1	Retune in accordance with paragraph 3.2.1.1
Low gain, unable to meet rated output. Paragraph 2.2.1.5	Defective 1A1,1A3, or 1A4	Replace or repair boards using module schematic diagrams and voltage tables.
Unable to meet selectivity requirements of paragraph 2.2.1.3	FL1 or FL2 faulty on 1A3	Replace defective filter.

Symptom	Probable Cause	Remedy
AGC defective, audio output increases excessively with an increase of RF input signal, or unable to meet the requirements of paragraph 2.2.1.6	Improper adjustment of 1A4R53	Readjust in accordance with paragraph 3.2.1.3
	Defective components on 1A4 or 1A1	Trouble shoot PC boards using module schematics and voltage tables.
Audio frequency response does not meet the requirements of paragraph 2.2.2.5	Faulty FL1 or FL2 on 1A3	Replace filter or 1A3
	Defective coupling capacitor on 1A6	Trouble shoot and replace defective part.
	Faulty transformer 1A6T1	Replace transformer
Audio output distorted on SSB, AM normal	10.7 MHz oscillator or channel oscillators off frequency.	Adjust oscillator frequencies in accordance with paragraph 3.2.2.6
	Transmitting station off frequency.	Check 10.7 MHz oscillator and channel oscillator to be certain.
Audio distortion present for AM and SSB modes.	AGC not functioning properly	Check adjustment of 1A4R53. (Paragraph 3.2.1.3)
	Distortion occurring in 1A6	Check operating voltages and waveforms for 1A6.

Symptom	Probable Cause	Remedy
Unable to meet 1/2 IF rejection of paragraph 2.2.1.4	Improper adjustment of 1A1R19	Adjust in accordance with paragraph 3.2.1.2
Squelch inoperative, will not squelch when panel control turned fully CW.	Defective squelch control.	Replace control.
	1A6R6 not adjusted properly	Readjust in accordance with paragraph 3.2.1.4
	Defective squelch circuit	Repair using schematic diagram and voltage tables. Replace entire board 1A6.

4.2.1.2 Receive Mode-RCVR/XMTR Chassis DC Voltages.- Figure 6-8 presents all the important test points for the RCVR/XMTR as viewed from bottom of the RCVR/XMTR unit. Table 6-8 is a tabulation of all the chassis DC voltages for the AM receive mode. The SB receive mode DC voltages are presented in Table 6-8. It should be noted that the only appreciable difference between these two tables is the voltages present on the AM line and the USB SEL line. No AC voltages or waveforms are shown for the chassis voltage measurements.

4.2.1.3 Individual Module Voltage Tables.- AC and DC voltages with waveforms are shown in Tables 6-1 through 6-12. Measurement conditions are given for each table along with other pertinent notes. Each module within the RCVR/XMTR unit may be checked individually by the use of a signal source (RF signal generator or audio generator) and the appropriate DC voltages. It should be noted however that there two modules that provide signals to other modules. These are as follows: 1A5 PROVIDES AM AND USB SEL VOLTAGE FOR 1A3 AND OTHER MODULES. 1A1 PROVIDES CHANNEL OSCILLATOR TO 1A5. For example, if 1A5 is removed, there will be no AM voltage or USB SEL voltage. Likewise, if 1A1 is removed, no channel oscillator will be supplied to 1A5.

4.2.2 Exciter.-

The exciter portion of the RCVR/XMTR unit is contained on 1A2, 1A3 and 1A5 with 1A1 supplying the channel oscillator for 1A5. (A high pass filter on 1A1 is used to remove 10.7 MHz before the channel oscillator is applied to 1A5). Figure 6-8 can be used to locate all chassis test points. Tables 6-1 through 6-12 present all the module voltages for the chassis and modules 1A2, 1A3, and 1A5. The measurement conditions are shown on the tables. Exciter measurements can be made with 1J3 terminated with a 50 ohm load.

4.2.2.1 Exciter Trouble Analysis Chart.-

Symptom	Probable Cause	Remedy
No output on any channel, SSB or AM	No 10 Volts	Check 2A2 10 volt regulator.
	Defective carrier or channel oscillator	Check 1A7 oscillator outputs.
	Defective USB filter	Replace filter or 1A3
	Faulty relay 1K1	Replace relay
	Defective 1A2,1A3, or 1A5 (Also, possible open in channel osc. path on 1A1)	Replace or repair boards.
No output on some channels, SSB or AM	Bad crystal in 1A7	Replace crystal
	Faulty DC switching on one or more channels on 1A7A1	Replace 1A7 or repair.

Symptom	Probable Cause	Remedy
	Improper switching on 1S3B	Replace channel selector switch.
No output on SSB. No modulation on AM AM Carrier normal	1A2R23 turned fully CCW.	Adjust 1A2R23 in accordance with 3.2.2.3
	Faulty component on 1A2 in audio circuit.	Replace board or repair.
No carrier on AM SSB channels normal	1A2R38 improperly adjusted	Adjust in accordance with 3.2.2.5
	Defective component in AM injection circuit on 1A2	Replace 1A2 or repair board.
Output on SSB without any audio input	1A2R27 not adjusted properly. Also, 1A5R6	Adjust potentio-meters in accordance with 3.2.2.1 and 3.2.2.2
	Defective balanced modulator on 1A2.	Replace 1A2 or repair board.
	Defective USB filter on 1A3	Replace filter or 1A3
	Improper AM USB SEL switching on 1A5	Replace 1A5 or repair board.

4.2.3 Oscillator Oven Assembly.-

The oscillator oven assembly can best be repaired or checked by using the extender cable supplied in the maintenance kit. Remove the oven from the RCVR/XMTR unit by taking out the four screws in the bottom of the chassis. Connect the male portion of the cable into 1XA7 making sure the key A on the connector is correct. Turn the oven assembly upside down and connect the female portion of the extender cable to the connector on the oven. Make sure pin A of the cable mates with pin A on 1A7.

4.2.3.1 1A7 Trouble Analysis Chart.-

Symptom	Probable Cause	Remedy
No 10.7 MHz carrier output on RCVR	No SB REC voltage applied to pin C on 1A7	Check 1K1 or 1A5, for USB SEL voltage.
10.7 MHz normal on RCVR but none on XMIT	No SB TRAN voltage on pin B of 1A7	Check 1K1 or 1A5
No 10.7 MHz on XMIT or RCVE	Faulty crystal	Replace crystal
	Faulty transistor	Repair or replace 1A7A1
	Q1,Q2, or Q3 on 1A7A1.	
	Defective component 1A7A1	Use normal trouble shooting techniques with Table 6-7.
No channel oscillator output on any channel	No 10 volts on pin L of 1A7	Check wiring or power supply 2A2
	1A7A2 amplifier defective	Replace 1A7A2 or repair using Table 6-7.
Channel oscillator output on some channels but none on others	Defective crystal	Replace crystal
	Faulty switching component on 1A7A1	Replace 1A7A1 or repair board.
	No DC switching voltage on pins E,F,H,J,M or N	Check wiring or 1S3B. Replace channel selector switch,1S3B.

4.2.4 PA/CPLR.-

The PA/CPLR unit is shown pictorily in Figure 6-16 (Top view) and Figure 6-17 (Bottom view). All portions of the PA/CPLR may be checked WITHOUT the RCVR/XMTR by using a clip lead to turn the unit on. Connecting a clip lead from the cathode of CR2 to pin K, L, M and N of 2XA2 will turn the unit on or just connecting across the ON-OFF relay, K1, will accomplish the same purpose. The RCVR/EXCTR can also be used in the conventional manner, if desired.

4.2.4.1 General.-

To service the PA/CPLR unit, remove the screws from the top cover and un-snap the catches on the sides. The top cover may be removed.

CAUTION

DO NOT RUN THE TRANSMITTER FOR PROLONGED PERIODS OF TIME WITHOUT THE TOP COVER IN PLACE WITH ALL SCREWS INSTALLED. THE TOP COVER PROVIDES HEAT SINKING FOR THE PA AND THE POWER SUPPLY.

Test cables are provided for 2A2 and 2A3 and should be used for trouble shooting major faults. The bottom cover may be removed by removing the six screws. Check carefully for broken wires or burned components.

4.2.4.2 PA/CPLR Trouble Analysis Chart.-

Symptom	Probable Cause	Remedy
No 14V XMIT supplied to 2A3	Relay 2K1	Replace relay
No 44 volt XMIT supplied to 2A3	Relay 2A2K2 in power supply	Replace relay
Motor B1 will not operate	Motor defective	Replace motor
	Relay 2K2 faulty	Replace relay

Symptom	Probable Cause	Remedy
Motor B1 over-shoots, that is, the rotors of switch wafers 2S2A, 2S2B, etc. do not stop on contacts.	Relay 2K2 faulty (Dynamic brake)	Replace relay
	Switch wafer mounting bracket that holds 2S2A not properly adjusted.	Loosen two screws holding mounting bracket and re-adjust in accordance with paragraph 4.3.
Switch wafers in 2A1 not aligned with other wafers.	Shaft coupling not adjusted properly	Adjust coupling.
Relay 2A2K2 chatters on transmit	Short in 2A3	Check 2A3 for shorted transistor
	Shorted capacitor on chassis.	
Relay 2A2K2 chatters on RCVR	C2,C5, or C6 shorted.	Replace shorted capacitor.
44 volt line drops excessively on modulation peaks during transmit mode.	C6 open	Replace C6.
No signal path from 2J5 to 2J3	2A4 filter board defective	Replace 2A4.
	2S2B and 2S2C wired to the wrong filter for the frequency being used	Connect correctly
	Defective 2S2B or 2S2C	Replace switch wafer (s).

4.2.4.3 2A2 Power Supply.-

The power supply consist of two subassemblies, 2A2A1 and 2A2A2. 2A2A1 contains the DC-DC converter transformer, CR1 bridge, CR2 bridge, and associated components. (2A2A1 is shown enclosed in dashed lines in Figure 6-15). 2A2A2 subassembly may be removed from 2A2A1 by removing the two screws on each side and pulling the subassembly out of 2A2A1. This is shown pictorily in Figure 6-10. Terminal strip TB-A is used for configuring the power supply for 26.4 V operation or 13.2V operation. Instructions for the proper connections are given on the top of transformer T1 and also shown in Figure 6-15.

4.2.4.3.1 2A2 Trouble Analysis Chart.-

(The following chart based on 2A2 operating without any load; 2A3, 2A5 and RCVR/XMTR removed)

Symptom	Probable Cause	Remedy
No 10V output, 14V and 44V normal	Transistor Q5 open base-emitter junction	Replace Q5 or 2A2A2 subassembly.
	CR3 shorted	Replace zener diode
	C8 or C9 shorted	Replace faulty component
No 14V or 10V 44V normal	Diode bridge CR 2 open	Replace defective part
	14V winding on T1 open.	Replace T1 or 2A2A1 subassembly.
	Surge resistor 2A2A1R1 open	Replace resistor
14V and 10V normal,no 44V	Diode bridge CR1 open	Replace diode bridge or subassembly 2A2A1
	44 volt winding on T1 open.	Replace T1 or 2A2A1 subassembly.

Symptom	Probable Cause	Remedy
Excessive ripple or hum on 10V line	CR3,C8, or C9 open	Replace faulty part
10V line same as 14V line	Transistor Q5 shorted.	Replace Q5 or subassembly 2A2A2.
Excessive converter hum (1.4kHz)	RF by-pass capacitor(s) open or not connected.	Check 2A2A1-C1, C2,C4 or 2A2A2-C2,C4,C5,C7.
ON-OFF relay will not pull in	2A2A2CR2 open	Replace
	K1 coil open	Replace relay K1
DC-DC Converter will not start oscillating.	WHT and BLK wires on TB-A reversed. Capacitor 2A2A2C3 open	Correct wiring of TB-A Replace capacitor.
ON-OFF relay chatters or fuse F1 blows	Switching transistor(s) Q1,Q2,Q3, or Q4 shorted.	Replace shorted transistor.

4.2.4.4 2A3 Power Amplifier.-

The schematic diagram for the power amplifier is shown in Figure 6-15. The schematic for the 125 watt module is shown. The 50 watt module is similar except that some components are removed and the PA chassis is different. Operation of the PA can be checked independently of the RCVR/XMTR by driving the PA/CPLR 2J3 with a signal generator and terminating 2J5 with a 50 ohm load. Care should be exercised to drive the PA with the proper frequency for the channel being tested. In other words, the driving frequency should be within the pass band of the filter being used on 2A4.

A standard AM signal with about 80% modulation can be used or two RF generators with a two tone mixer for driving the PA.

CAUTION

USE CAUTION NOT TO OVERHEAT THE PA WHILE TESTING WITH THE PA/CPLR TOP COVER REMOVED. DO NOT OPERATE THE 50 WATT OR THE 125 WATT MODULE FOR OVER 5 MINUTES AT FULL POWER WITHOUT SOME HEAT SINK ATTACHED TO THE MODULES OR COOLING AIR.

Use the test cable for 2A3 supplied in the maintenance kit to trouble shoot the PA.

4.2.4.4.1 2A3 Trouble Analysis Chart.-
(The following chart based on the PA being driven by a signal generator and output terminated with a 50 ohm load)

Symptom	Probable Cause	Remedy
Relay 2A2K2 chatters or F1 blows when transmitter keyed on.	Q2,3,4,5,6,7,8,or 9 shorted.	Remove the screws from the TO-3 transistors until the shorted transistor is found. Replace faulty transistor. See Note 1
	Capacitor shorted on PC board.	Replace defective part.
	Transformer shorted on PC board.	Replace transformer or PC board.
	Diode CR1 or CR2 open causing excess idle current.	Check diode voltage. Replace if defective.

Symptom	Probable Cause	Remedy
Low gain; excess drive required to obtain rated power output.	Potentiometer 2A3R1 not adjusted properly.	Turn 2A3R1 clockwise to increase gain.
RF output flat-tops before rated PEP obtained	Q4,5,6,7,8 or 9 open base emitter junction open.	Replace transistor(s).
	Transistor(s) Q2,3, 4,5,6,7,8, or 9 not saturating down to proper level.	
	Resistors R9,R10, R16,17,18,19,20 or 21 open.	Replace defective resistor. See note 2

Note 1- When replacing TO-3 transistors, be sure to check mica insulating washer and use Dow Corning DX-4 silicone grease to assure adequate heat transfer from the transistors to the chassis.

Note 2- These emitter resistors may be checked with an ohmmeter by removing the TO-3 transistors and measuring from the emitter connection to chassis ground. The resistance should measure 1 ohm from each emitter to ground.

4.2.4.5 2A4-Low Pass Filters.-

2A4 is located on the chassis and can be removed by removing the three inputs, three outputs and the four hold down screws. It is composed of RF chokes and capacitors and contains no active components. The schematic diagram is shown in Figure 6-15 between switch wafers 2S2B and 2S2C. The frequency response of the three filters can be readily checked by using a H.P. 606 signal generator or equivalent and a 50 ohm load.

The procedure is as follows:

(a) Make sure radio set is in the receive mode. (2K1 not energized)

(b) Drive 2J3 with the signal generator with 2J5 terminated with a 50 ohm load.

(c) Monitor 2J5 with a meter or an oscilloscope.

(d) Select one of the three filters on 2A4 by selecting the proper channel.

(e) Adjust the signal generator to 2.0 MHz and note the output level at 2J5. (Use a convenient level out of the signal generator, such as 2 volts RMS)

(f) Increase the frequency of the signal generator until the output level drops 6 db. Note this frequency. The frequency where the output drops 6 db should be within ±10% of the filter specified cut-off frequency. (See paragraph 1.2.3.4 of this section) If the filter does not have the proper characteristics, normal trouble shooting techniques should reveal the faulty component. Capacitors should be checked for shorts and inductors should be tested for being open (DC) or shorted (no inductance).

4.2.4.6 2A5-ALC Detector and Amplifier.-

2A5 can be easily removed by removing the one screw holding it to the coupler shield and unplugging the PC board. The ALC board can be tested in the PA/CPLR using the same test setup as for checking the RF power amplifier, 2A3. Drive 2J3 with a H.P. 606 (or equivalent) signal generator and monitor the output from the ALC output, pin 3, 2XA5. The output DC voltage should increase in magnitude when the RF power increases.

4.2.4.6.1 2A5 Trouble Analysis Chart.-

Symptom	Probable Cause	Remedy
No ALC control on SSB or AM (Transmitter output much greater than rated)	Potentiometers 2A5R4 and 2A5R3 fully clockwise (Maximum power on both SSB and AM)	Adjust controls in accordance with 3.2.2.4 and 3.2.2.5

Symptom	Probable Cause	Remedy
	Transistor Q4 open	Replace defective part.
	No 10V applied to pin 1 2XA5	Check wiring or Power supply.
	Transistors Q1 or Q2 defective.	Replace transistors.
Transmitter power output much lower than rated and controls 2X5R3 and R4 have no control.	Transistor Q4 shorted.	Replace faulty part.
	Transistors Q1,Q2 or Q3 shorted.	Replace defective transistor.
AM ALC normal but no SSB ALC	CR4,CR6, or Q1 defective	Replace 2A5 or defective parts.
SSB ALC normal but no AM ALC	CR1,CR2,CR3,CR7 or Q2 defective	Replace defective component.
No meter drive	CR5 defective or C8 shorted.	Replace defective component(s).

4.2.4.7 2A1-Antenna Coupler.-

The antenna coupler can be removed from the PA/CPLR chassis in the following manner:

(a) Remove the antenna coupler cover. Before attempting to remove the shaft coupling, select channel three with the channel selector switch. This assures the screws for the shaft coupling are positioned up for access. When re-installing the antenna coupler, make sure the shaft is through all four wafers on 2A1 and all are set to channel three. After the antenna coupler is installed, the shaft may be pushed through the coupler shield and into the shaft coupling.

(b) Remove the shaft coupling between switch wafers 2S2B and 2S2C.

(c) Remove the shaft through switch wafers 2A1S1A,S1B, S1C and S1D.

(d) Remove the four screws from the antenna coupler PC board.

(e) Remove the two screws holding the LC bracket to the side of the antenna coupler shield.
(f) Remove the 50 ohm input wire from the PC board. (2J4)
(g) Remove the high voltage output from the ceramic feed through. (2J6)
(h) Remove the entire antenna coupler assembly from the PA/CPLR unit.
(i) To replace the antenna coupler, repeat the above steps but in reverse order.

The antenna coupler must be installed in the PA/CPLR unit before any final tuning can be done. (See Section 1.2.2.2). However, with the coupler removed, normal trouble shooting techniques can be used to determine if all capacitors and inductors are connected properly or to check for broken wires. A signal generator and an oscilloscope can be used to check the action of the antenna coupler when it is removed from the PA/CPLR unit. Drive the coupler input 50 ohm point with the signal generator and observe the output across the 6.8 megohm resistor. At resonance, the output voltage should increase. However, the resonant frequency will DECREASE when the antenna coupler is installed inside the antenna coupler shield because of the effective reduction in inductance of L7 when placed inside the shield.

4.2.4.7.1 Spark Gap Adjustment.-
The spark gap consists of 2MP8 plus a screw and lock nut. The assembly is bolted to the rear of the antenna feed through insulator, 2J6, and the spark gap is the spacing between the end of the screw and the inside surface of the PA/CPLR front panel. The gap is adjusted at the factory for a spacing of 1/8 inch. If it has to be removed for any reason the gap should be checked when it is re-installed to the rear of 2J6. If the spacing is not correct, loosen the lock nut on the gap adjustment screw and adjust until the spacing is 1/8" and re-tighten the lock nut.

4.3 Mechanical Adjustments and Gasket Replacement.-
Switch wafer 2S2A is an open seeking wafer that controls motor control relay 2K2. It is mounted on an adjustable mounting plate (2MP13) that can be set so the wipers on switch wafers 2S2B and 2S2C will stop exactly in the middle of the mating contact. Due to wear of the motor, motor gearhead, and the switch wafers themselves, this

adjustment should be checked periodically as follows:

(a) Channel the radio set and observe the position of the switch wafer wiper contact (2S2B) with the fixed contact. It should be centered.

(b) If the wiper contact is stopping too soon, loosen the two adjustment screws (See Figure 6-16) and advance the mounting plate counter clockwise and re-tighten the screws. Check again and adjust the position of the switch wafer mounting plate until proper alignment is achieved.

(c) If the wiper arm is overshooting the contact, move the switch wafer mounting plate clockwise and re-tighten the screws. Continue the adjustment until the contacts on 2S2B and 2S2C are aligned.

(d) Check the alignment of the switch wafers in the antenna coupler, 2A1. This can be accomplished by viewing the wiper on 2A1S1D, the ceramic wafer. If this contact is not stopping correctly, adjust the coupling between wafers 2S2B and 2S2C.
The shaft couplings used are designed to have one set screw on the flat portion of the shaft and the other on the round surface. The gaskets used in the AN/SRC-42(V) are listed below for reference.

Part Number	Description	Use
1. 10694	Gasket, Connector	RCVR/XMTR-Beneath 1J1,1J2 and 1J3
2. 10799	Gasket,Connector to Case.	RCVR/XMTR-Seals Rear opening.
3. 10693A 10693A-1	Gasket, Panel	RCVR/XMTR (2 used)-Under front and rear panel of unit. (Rear 10693A-1)
4. 10695	Gasket, Inter-connector	PA/CPLR-One used, beneath 2J1, 2J2 and 2J3
5. 84086	Gasket,PA/CPLR	PA/CPLR-Three used, 36 inch lengths.

Of the 5 types of gaskets used, two are subject to wear and should be inspected periodically to determine if they should be replaced. Gasket 84086 is used on the front and rear cast panels of the PA/CPLR. It consists of two 36 inch lengths of closed cell E.P.T. sponge with PSA on one side. If the gasket(s) appear to be worn or torn, remove the old gasket with an exacto knife or razor blade. Make sure all the old gasket is off. Clean the surface and replace with the new gasket. The plastic seal must be removed from the gasket before it is installed on the panel. The gasket is longer than required and should be lapped and both ends cut to provide a smooth junction between the ends of the gasket.
10799 is a punched gasket and is used in the RCVR/XMTR. It is on the inside of the RCVR/XMTR case and should be inspected for wear or tearing. If it needs to be replaced, remove the rear panel from the case extrusions and scrape off the old gasket, clean the surface and install the new gasket. This gasket also has an adhesive on one side and the plastic cover must be removed from the gasket before it is installed on the panel.

All the other gaskets should never need replacement unless they are accidently torn or damaged. Replacement of these gaskets requires removing the screws from the connectors or panels. It should be noted that all front panel controls on the RCVR/XMTR use waterseal hardware to prevent water leakage. These waterseal nuts should be checked periodically to be sure that no water can enter. The panel knobs can be removed to check all waterseal nuts.

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) Chassis Electrical Parts

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	Receiver-Transmitter	12338	99600	AN/SRC-42	(V)		99600
C1	Capacitor,.05UFD 100V Ceram Disc	91418	Type TA		C1		27929
C2	Capacitor,.05UFD 25V Ceramic Disc	72982	5855000Y5U0503Z		C2		27357
C3	Capacitor,.47UFd 50V Redcap	72982	8131050651474M		C3		28337
C4	Capacitor,.02UFD 25V Ceramic Disc	72982	5835000Y5U0203Z		C4,C5,C6,C7,C8 C9,C10,C11,C12, C13		26913
C5	Same as C4						
C6	Same as C4						
C7	Same as C4						
C8	Same as C4						
C9	Same as C4						
C10	Same as C4						
C11	Same as C4						
C12	Same as C4						
C13	Same as C4						
1J1	Connector,Control 24 Pin	71468	MS3102R-24-28P	MS	1J1		75348
1J2	Connector,Audio 5 Pin	71468	MS3102R-145-2P	MS	1J2		75348
1J3	Connector,R/T Output BNC	13511	1094/U	RG	1J3		74374
1J4	Connector,Handset H-189/GR	13511	U-183/U	U-183/U	1J4		75331
1XA1	Connector,P.C. Board 18 Pin	13511	143-018-01		1XA1,1XA2,1XA3		74972
1XA2	Same as 1XA1				1XA4,1XA5,1XA6		
1XA3	Same as 1XA1						
1XA4	Same as 1XA1						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) Chassis Electrical Parts

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
1XA5	Same as 1XA1						
1XA6	Same as 1XA1						
1XA7	Connector,P.C. Board 15 Pin	13511	143-015-01		1XA7		75379
1XK1	Socket, Relay for 4PDT	29238	6-1313-11		1XK1		66638
	Bulb,Panel 14VT-1 3/4	71744	Type 382		(3 used per unit)		84091
	Midflange						
DS1	Illumination Lamp (Red)	08730	7012-14-P1		DS1		84090
DS3	Dimmer Light (Amber)	08730	7010-11-P3		DS3		84089
DS2	Dimmer Light (Red)	08730	7010-11-P1		DS2		84088
M1	Meter,R.F. Power Out,Rec Sig	81030	100W		M1		87668-1
R1	Resistor,Carbon 1/2W±10%						
	680 ohms		RC20GF681K		R1		16750
R2	Potentiometer,Audio	97979	RV6NAYSD103A		R2, R3, R4		33928-1
R3	Same as R2 (Squelch)						
R4	Same as R2 (Noise Limiter)						
R5	Potentiometer,Illumination	90201	MR250B		R5		34610
K1	Relay Transmit-Receive	29238	670P-D-4C5		K1		66444
1S1	Switch,Toggle On-Off	09353	7203SD2P		1S1		34614
1S2	Switch,Toggle Spkr On-Off	09353	7101SD2P		1S2		34615
1S3	Switch,Channel Selector	81840	34612		1S3		34612
		1A1 R.F. AMPLIFIER, BAL. MIXER					
	1A1 Complete with Components	12338	99584		1A1		99584
	P.C. Board Only	12338	10659A				10659A

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A1-R.F. Amplifier, Bal. Mix.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C1	Capacitor .05UFD 25V Ceram						
	Disc	72982	585000Y5U0503Z		C1,C2,C13,C19,		27357
					C20,C21,C22,C23		
					C24,C41,C46		
C2	Same as C1						
C3	Capacitor,Dipped Mica 510pf	14655	CD7FA511J03		C3		28194
	±5% 100V						
C4	Capacitor,Dipped Mica 130pf	14655	CD7FC131J03		C4		28703
	±5% 500V						
C5	Capacitor,Dipped Mica 620pf	14655	CD7FA621J03		C5		28387
	±5% 100V						
C6	Capacitor,Dipped Mica 390pf	14655	CD7FA391J03		C6		28189
	±5% 100V						
C7	Capacitor,Tantalum 68 mfd	06751	TS05-15-686		C7		28038
	15V						
C8	Capacitor,Dipped Mica	14655	CD7FA361J03		C8		28727
	360pf ±5% 100V						
C9	Capacitor,Dipped Mica	14655	CD7FA122J03		C9		28867
	1200pf ±5% 100V						
C10	Capacitor,Dipped Mica 1500pf	14655	CD7FA152J03		C10,C11,C12,C15		28196
	±5% 100V				C17		
C11	Same as C10						
C12	Same as C10						
C13	Same as C1						
C14	Capacitor,Dipped Mica	14655	CD7FA102J03		C14		28195
	1000pf ±5% 100V						
C15	Same as C10				C15		
C16	Capacitor,Dipped Mica	14655	CD7FC201J03		C16,C18, C33		28715
	200pf ±5% 300V						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A1-R.F. Amplifier, Bal. Mix.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C17	Same as C10						
C18	Same as C16						
C19	Same as C1						
C20	Same as C1						
C21	Same as C1						
C22	Same as C1						
C23	Same as C1						
C24	Same as C1						
C25	Capacitor,.02ufd, 25V,Disc Ceram.	72982	5835000Y5U0203Z		C25,C42,C43		26913
C26	Capacitor,Dipped Mica 47pf ±5% 500V	14655	CD6ED470J03		C26		28698
C27	Capacitor,Dipped Mica 12pf ±5% 500V	14655	CD6CD120J03		C27		28648
C28	Capacitor,Dipped Mica 75pf ±5% 500V	14655	CD6ED750J03		C28		28466
C29	Capacitor,Dipped Mica 39pf ±5% 500V	14655	CD6ED390J03		C29		28183
C30	Capacitor,Dipped Mica 180pf ±2% 500V	14655	CD7FD181G03		C30, C40		28105
C31	Capacitor,Dipped Mica 680pf ±5% 100V	14655	CD7FA681J03		C31		28428
C32	Capacitor,Dipped Mica 150pf ±2% 500V	14655	CD7FD151G03		C32		28090
C33	Same as C16						
C34	Capacitor,Dipped Mica, 270pf ±5% 300V	14655	CD7FC271J03		C34		28863
C35	Capacitor,Dipped Mica 36pf ±5% 500V	14655	CD6ED360J03		C35		28521

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A1-R.F. Amplifier, Bal. Mix.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C36	Capacitor,Dipped Mica	14655	CD6FC121J03		C36		28088
	120pf ±5% 500V						
C37	Capacitor,Dipped Mica	14655	CD7FA431J03		C37		28454
	430pf ±5% 100V						
C38	Capacitor,Dipped Mica	14655	CD6ED101J03		C38		28545
	100pf ±5% 300V						
C39	Capacitor,Dipped Mica	14655	CD7FD161J03		C39		28186
	160pf ±5% 500V						
C40	Same as C30						
C41	Same as C1						
C42	Same as C25						
C43	Same as C25						
C44	Capacitor,Variable, 9-35 pf	72982	538-006D9-35		C44		28201
C45	Capacitor,Dipped Mica	14655	CD6CD200J03		C45		28674
	20pf ±5% 500V						
C46	Same as C1						
L1	Choke,R.F. Molded 150 uHy	99800	1025-72		L1, L12		65919
	±10%						
L2	Choke, R.F. Molded .82 uHy	99800	1537-10		L2		65103
	±5%						
L3	Choke, R.F. Molded .56 uHy	99800	1537-07		L3		66652
	±5%						
L4	Choke, R.F. Molded 4.7 uHy	99800	1537-28		L4		64965
	±5%						
L5	Choke, R.F. Molded 6.8 uHy	99800	1537-32		L5		65012
	±5%						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A1-R.F. Amplifier, Bal. Mixer

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
L6	Choke, R.F. Molded 8.2 uHy ±5%	99800	1537-34		L6		64824
L7	Choke, R.F. Molded 5.6 uHy ±5%	99800	1537-30		L7		65139
L8	Choke, R.F. Molded .68 uHy ±5%	99800	1537-08		L8		65177
L9	Choke, R.F. Molded 1.2 uHy ±5%	99800	1025-22		L9		66391
L10	Choke, R.F. Molded 47 uHy ±5%	99800	1537-60		L10		65323
L11	Choke, R.F. Molded 75 uHy ±10%	99800	1537-70		L11		65347
L12	Same as L1						
CR1	Diode,Silicon, 1N914B	25403	1N914B		CR1,CR2,CR3,CR4		40510
CR2	Same as CR1						
CR3	Same as CR1						
CR4	Same as CR1						
R1	Resistor,Carbon ½W±10% 1000 ohms		RC07GF102K		R1		17156
R2	Resistor,Carbon ½W ±10% 4.7K		RC07GF472K		R2, R4		17077
R3	Resistor,Carbon ½W ±10% 560 ohms		RC07GF561K		R3, R6		18320
R4	Same as R2						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A1 R.F. Amplifier, Bal. Mixer

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R5	Resistor,Carbon ¼W ±10% 220 ohms		RC07GF221K		R5, R8, R13		17132
R6	Same as R3						
R7	Resistor,Carbon ¼W ±10% 6.8K		RC07GF682K		R7		17481
R8	Same as R5						
R9	Resistor,Carbon ¼W±10% 47K		RC07GF473K		R9, R10		17106
R10	Same as R9						
R11	Resistor,Carbon,¼W±10% 82 ohms		RC07GF820K		R11		18461
R12	Resistor,Carbon ¼W±10% 2.2K		RC07GF222K		R12		17807
R13	Same as R5						
R14	Resistor,Carbon ¼W ±10% 470 ohms		RC07GF471K		R14		17261
R15	Resistor,Carbon ¼W±10% 3.9K		RC07GF392K		R15		17883
R16	Resistor,Carbon,¼W±10% 100K		RC07GF104K		R16		17039
R17	Resistor,Carbon ¼W ±10% 15 ohms		RC07GF150K		R17, R18		18174
R18	Same as R17						
R19	Potentiometer 1K	21030	62PA1K		R19		34207
Q1	Transistor,PNP,Silicon 2N4249	07263	2N4249		Q1		44678
Q2	Transistor,NPN, Silicon MPS2925	04713	MPS2925		Q2		44434
Q3	Transistor, FET 3N141	49671	3N141		Q3,Q4,Q5		44829
Q4	Same as Q3						
Q5	Same as Q3						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A1-R.F. Amplifier, Bal. Mixer

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
T1	Transformer, R.F. Input	12338	49179		T1		49179
	50:200 ohms						
T2	Transformer, R.F. Output	12338	49202		T2		49202
	2K:500 ohms						
T3	Transformer, R.F. Mixer	12338	49173		T3		49173
	Output						
T4	Transformer, Osc Injection	12338	49185		T4		49185
TP1	Test Point Jack Red	83330	Type 430		TP1		75381
TP2	Test Point Jack Yellow	83330	Type 430		TP2		75383
TP3	Test Point Jack Green	83330	Type 430		TP3		75382
		1A2 - TRANSMIT AUDIO BAL. MOD.					
	1A2 Complete	12338	99585		1A2		99585
	P.C. Board Only	12338	10657A				10657A
C1	Capacitor,Ceram Disc	72982	5855000Y5U0503Z		C1, C17		27357
	.05Ufd 25V						
C2	Capacitor,Tantalum, 2.2Ufd	06751	TSD1-15-225		C2, C5		24472
	15V						
C3	Capacitor, Tantalum	06751	TSD3-15-226		C3,C6,C28,C29		27412
	22UFD 15V						
C4	Capacitor, Tantalum	06751	TS05-15-686		C4,C7,C11		28038
	68UFD 15V						
C5	Same as C2						
C6	Same as C3						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A2- Transmit Audio Bal. Mod.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C7	Same as C4						
C8	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C8,C10,C19,C22		26913
	.02UFD 25V				C25,C27,C30,C31		
C9	Capacitor,Dipped Mica	14655	CD6CD180J03		C9		28662
	18pf ±5% 500V						
C10	Same as C8						
C11	Same as C4						
C12	Capacitor, Tantalum	06751	TSD1-15-685		C12,C13,C20,C21		28753
	6.8UFD 15V						
C13	Same as C12						
C14	Capacitor,Ceramic Disc	72982	835000X5V0502		C14		27333
	.005UFD 100V						
C15	Capacitor,Tantalum 1mfd 35V	06751	TSD1-15-105		C15		28363
C16	Capacitor,Ceramic Disc	72982	565000Y5F0104M		C16, C24		27010
	.1 UFD 12V						
C17	Same as C1						
C18	Capacitor,Ceramic Disc	72982	805000X5E301K		C18		28143
	300pf ±10% 100V						
C19	Same as C8						
C20	Same as C12						
C21	Same as C12						
C22	Same as C8						
C23	Capacitor,Dipped Mica	14655	CD6ED750J03		C23		28466
	75 pf ±5% 500V						
C24	Same as C16						
C25	Same as C8						
C26	Capacitor,Ceramic Disc	72982	805024X5E0391K		C26		28155
	390pf ±10% 100V						
C27	Same as C8						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A2-Transmit Audio Bal. Mod.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C28	Same as C3						
C29	Same as C3						
C30	Same as C8						
C31	Same as C8						
L1	Choke, R.F. Molded 10 uHy±5%	99800	1537-36		L1		65024
CR1	Diode,Silicon,1N914B	25403	1N914B		CR1		40510
CR2	Diode,Germanium,1N54A	72982	1N54A		CR2,CR3		40139
CR3	Same as CR2						
CR4	Diode,Silicon,1N914	01295	1N914		CR4		44290
R1	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R1,R32		17156
R2	Resistor,Carbon ¼W±10% 2.2K		RC07GF222K		R2,R30		17807
R3	Resistor,Carbon ¼W±10% 10K		RC07GF103K		R3,R36		17041
R4	Resistor,Carbon ¼W±10% 1.5K		RC07GF152K		R4		17247
R5	Resistor,Carbon ¼W±10% 1.8K		RC07GF182K		R5,R19		17819
R6	Resistor,Carbon ¼W±10%		RC07GF151K		R6,R11,R16		17273
	150 ohms						
R7	Resistor,Carbon ¼W±10% 6.8K		RC07GF682K		R7,R8		17481
R8	Same as R7						
R9	Resistor,Carbon ¼W±10% 4.7K		RC07GF472K		R9,R17,R25		17077
					R31,R37		
R10	Resistor,Carbon ¼W±10%		RC07GF221K		R10,R35		17132
	220 ohms						
R11	Same as R6						
R12	Resistor,Carbon ¼W±10%		RC07GF821K		R12,R28		17821
	820 ohms						
R13	Resistor,Carbon ¼W±10%		RC07GF331K		R13,R14		17091
	330 ohms						
R14	Same as R13						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A2-Transmit Audio Bal. Mod.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R15	Resistor,Carbon ¼W±10%		RC07GF101K		R15,R29,R33		17118
	100 ohms						
R16	Same as R6						
R17	Same as R9						
R18	Resistor,Carbon ¼W±10% 33K		RC07GF333K		R18,R20		17792
R19	Same as R5						
R20	Same as R18						
R21	Resistor,Carbon ¼W±10% 5.6K		RC07GF562K		R21,R22,R24		18306
R22	Same as R21						
R23	Potentiometer 1K	21030	62PA1K		R23,R38		34207
R24	Same as R21						
R25	Same as R9						
R26	Resistor,Carbon,¼W±10%		RC07GF470K		R26		17936
	47 ohm						
R27	Potentiometer 10K	94271	502-725-10K		R27		34441
R28	Same as R12						
R29	Same as R15						
R30	Same as R2						
R31	Same as R9						
R32	Same as R1						
R33	Same as R15						
R34	Resistor,Carbon,¼W±10%		RC07GF561K		R34		18320
	560 ohms						
R35	Same as R10						
R36	Same as R3						
R37	Same as R9						
R38	Same as R23						
R39	Resistor,Carbon ¼W±10% 1.2K		RC07GF122K		R39		18186
R40	Resistor,Carbon ¼W±10% 2.7K		RC07GF272K		R40		18667

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A2-Transmit Audio Bal. Mod.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
Q1	Transistor,Silicon NPN	07263	2N3563		Q1,Q3		44329
	2N3563						
Q2	Transistor,Silicon NPN	04713	MPS2925		Q2		44434
	MPS2925						
Q3	Same as Q1						
U1	Integrated Circuit CA3045	49671	CA3045		U1		44830
U2	Integrated Circuit MC1596G	04713	MC1596G		U2		44831
TP1	Test Point Red	83330	Type 430		TP1		75381
	1A3-	USB AND AM FILTERS					
	1A3 Complete with Components	12338	99586		1A3		99586
	PC Board Only	12338	10660				10660
C1	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C1,C2,C3,C4,C5		26913
	.02UFD 25V				C6,C7,C8,C9,C10,		
					C11,C12,C13,C14		
					C15,C16,C17,C18		
					C19,C20,C21		
C2	Same as C1						
C3	Same as C1						
C4	Same as C1						
C5	Same as C1						
C6	Same as C1						
C7	Same as C1						
C8	Same as C1						
C9	Same as C1						
C10	Same as C1						
C11	Same as C1						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A3-USB And AM Filters

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C12	Same as C1						
C13	Same as C1						
C14	Same as C1						
C15	Same as C1						
C16	Same as C1						
C17	Same as C1						
C18	Same as C1						
C19	Same as C1						
C20	Same as C1						
C21	Same as C1						
CR1	Diode, Silicon 1N914	01295	1N914		CR1,CR2,CR3,CR4		44290
					CR5,CR6,CR7		
CR2	Same as CR1						
CR3	Same as CR1						
CR4	Same as CR1						
CR5	Same as CR1						
CR6	Same as CR1						
CR7	Same as CR1						
FL1	Filter,10.7 mHz, AM	**	10.7-6/4		FL1		81831
FL2	Filter,10.7 mHz, USB	**	10.7-2.2/4		FL2		81832

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A3-USB and AM Filters

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R1	Resistor,Carbon, ¼W±10% 2.2K		RC07GF222K		R1,R2,R15,R16		17807
R2	Same as R1						
R3	Resistor,Carbon ¼W±10% 1.5K		RC07GF152K		R3,R4		17247
R4	Same as R3						
R5	Resistor,Carbon ¼W±10% 1.8K		RC07GF182K		R5,R6,R11,R12,		17819
					R13		
R6	Same as R5						
R7	Resistor,Carbon ¼W±10%		RC07GF221K		R7,R8,R9,R10		17132
	220 ohms				R14,R19		
R8	Same as R7						
R9	Same as R7						
R10	Same as R7						
R11	Same as R5						
R12	Same as R5						
R13	Same as R5						
R14	Same as R7						
R15	Same as R1						
R16	Same as R1						
R17	Resistor,Carbon ¼W±10% 10K		RC07GF103K		R17		17041
R18	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R18		17156
R19	Same as R7						
Q1	Transistor,Silicon NPN	07263	2N3563		Q1,Q2,Q3,Q4		44329
	2N3563						
Q2	Same as Q1						
Q3	Same as Q1						
Q4	Same as Q1						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A3-USB And AM Filters

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
TP1	Test Point Jack (Red)	83330	Type 430		TP1		75381
TP2	Test Point Jack (Green)	83330	Type 430		TP2		75382
	1A4-I.F. AMPLIFIER NOISE LIMITER						
	1A4 Complete	12338	99587		1A4		99587
	P.C. Board Only	12338	10661A				10661A
C1	Capacitor,Ceramic Disc	91418	500pf No.JF-¼"		C1,C7,C28,C31		25098
	500pf ±10% 1000V				C40		
C2	Capacitor,Tantalum 22ufd 15V	06751	TSD3-15-226		C2,C29		27412
C3	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C3,C4,C5,C6,C11		26913
	.02 ufd 25V				C14,C15,C19,C33		
					C35,C39		
C4	Same as C3						
C5	Same as C3						
C6	Same as C3						
C7	Same as C1						
C8	Capacitor,Variable,9-35pf	72982	538-00609-35		C8,C16		28201
C9	Capacitor,Dipped Mica	14655	CD6CD200J03		C9, C17		28674
	20pf ±5% 500V						
C10	Capacitor,Dipped Mica	14655	CD6ED360J03		C10		28521
	36pf ±5% 500V						
C11	Same as C3						
C12	Capacitor,Ceramic Disc	72982	805000X5V0103Z		C12,C20,C22,C23		27321
	.01UFD 100V				C26,C27,C32,C38		
C13	Capacitor,Ceramic Disc	72982	5855000Y5U0503Z		C13,C21,C25,C37		27357
	.05UFD 25V						
C14	Same as C3						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A4-I.F. Amplifier Noise Limiter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C15	Same as C3						
C16	Same as C12						
C17	Same as C9						
C18	Capacitor,Tantalum 15UFD 35V	06751	TSD5-35-156		C18		27400
C19	Same as C3						
C20	Same as C8						
C21	Same as C13						
C22	Same as C12						
C23	Same as C12						
C24	Capacitor,Tantalum	06751	TSD1-20-224		C24		28351
	.22 UFd 20V						
C25	Same as C13						
C26	Same as C12						
C27	Same as C12						
C28	Same as C1						
C29	Same as C2						
C30	Capacitor,Ceramic .47UFD 50V	72982	8131050651474M		C30		28337
C31	Same as C1						
C32	Same as C12						
C33	Same as C3						
C34	Capacitor,Dipped Mica	14655	CD6CD070G03		C34		28858
	7 pf ±2% 500V						
C35	Same as C3						
C36	Capacitor,Ceramic Disc	91418	.001UFD Type		C36		25684
	.001Ufd 500V		JLX5F				
C37	Same as C13						
C38	Same as C12						
C39	Same as C3						
C40	Same as C1						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A4-I.F. Amplifier Noise Limiter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C41	Capacitor,Tantalum .47UFD	06751	TSD1-35-474		C41		27917
	35V						
CR1	Diode,Germanium 1N54A	72982	1N54A		CR1,CR2,CR3,CR4		40139
CR2	Same as CR1						
CR3	Same as CR1						
CR4	Same as CR1						
CR5	Diode,Silicon 1N914	01295	1N914		CR5,CR6,CR7,CR8		44290
CR6	Same as CR5						
CR7	Same as CR5						
CR8	Same as CR5						
L1	Choke,R.F. Molded 4.7uHy±10%	82142	4436-8K		L1, L2		56425
L2	Same as L1						
L3	Choke,R.F. Molded 15uHy±10%	99800	1025-48		L3		65907
R1	Resistor,Carbon ¼W±10%		RC07GF331K		R1,R18,R19,R45		17091
	330 ohm				R48		
R2	Resistor,Carbon,¼W±10% 10K		RC07GF103K		R2,R8,R22,R26		17041
					R30,R35		
R3	Resistor,Carbon ¼W±10% 2.2K		RC07GF222K		R3,R14,R34,R52		17807
R4	Resistor,Carbon ¼W±10%		RC07GF150K		R4,R6,R16		18174
	15 ohm						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A4-I.F. Amplifier Noise Limiter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R5	Resistor,Carbon ¼W±10% 220 ohm		RC07GF221K		R5,R17		17132
R6	Same as R4						
R7	Resistor,Carbon,¼W±10% 47K		RC07GF473K		R7,R21,R38		17106
R8	Same as R2						
R9	Resistor,Carbon ¼W±10% 8.2K		RC07GF822K		R9, R23		18162
R10	Resistor,Carbon ¼W±10% 27K		RC07GF273K		R10,R11,R24,R25 R42,R44		17120
R11	Same as R10						
R12	Resistor,Carbon ¼W±10% 68 ohm		RC07GF680K		R12		18796
R13	Resistor,Carbon ¼W±10% 1.2K		RC07GF122K		R13,R37		18186
R14	Same as R3						
R15	Resistor,Carbon ¼W±10% 15K		RC07GF153K		R15,R51		17235
R16	Same as R4						
R17	Same as R5						
R18	Same as R1						
R19	Same as R1						
R20	Resistor,Carbon ¼W±10% 330K		RC07GF334K		R20,R36		17467
R21	Same as R7						
R22	Same as R2						
R23	Same as R9						
R24	Same as R10						
R25	Same as R10						
R26	Same as R2						
R27	Resistor,Carbon ¼W±10% 150K		RC07GF154K		R27		17675
R28	Resistor,Carbon ¼W±10% 33K		RC07GF33K		R28,R41,R54		17792
R29	Resistor,Carbon ¼W±10% 4.7K		RC07GF472K		R29		17077
R30	Same as R2						
R31	Resistor,Carbon ¼W±10% 33 ohms		RC07GF330K		R31		18253

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A4-I.F. Amplifier Noise Limiter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R32	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R32,R33		17156
R33	Same as R32						
R34	Same as R3						
R35	Same as R2						
R36	Same as R20						
R37	Same as R13						
R38	Same as R7						
R39	Resistor,Carbon ¼W±10% 68K		RC07GF683K		R39		17352
R40	Resistor,Carbon ¼W±10% 10 ohm		RC07GF100K		R40		17716
R41	Same as R28						
R42	Same as R10						
R43	Resistor,Carbon ¼W±10% 560 ohm		RC07GF561K		R43		18320
R44	Same as R10						
R45	Same as R1						
R46	Resistor,Carbon ¼W±10% 5.6K		RC07GF562K		R46		18306
R47	Resistor,Carbon ¼W±10% 470 ohm		RC07GF471K		R47		17261
R48	Same as R1						
R49	Resistor,Carbon ¼W±10% 3.3K		RC07GF332K		R49		17089
R50	Resistor,Carbon ¼W±10% 56K		RC07GF563K		R50		17144
R51	Same as R15						
R52	Same as R3						
R53	Potentiometer 10K	94271	502-725-10K		R53		34441
R54	Same as R28						
R55	Resistor,Carbon ¼W±10% 3.9K		RC07GF392K		R55,R56		17883
R56	Same as R55						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A4-I.F. Amplifier Noise Limiter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
Q1	Transistor,Silicon NPN	04713	MPS2925		Q1,Q2,Q3		44434
	MPS2925						
Q2	Same as Q1						
Q3	Same as Q1						
Q4	Transistor,Silicon PNP	07263	2N4249		Q4		44678
	2N4249						
U1	Integrated Circuit CA3045	49671	CA3045		U1,U2,U3		44830
U2	Same as U1						
U3	Same as U1						
TP1	Test Point Jack (Red)	83330	Type 430		TP1		75381
TP2	Test Point Jack (Green)	83330	Type 430		TP2		75382
	1A5-BALANCED	MIXER, L.P.F,		ALC AMPLI	FIER		
	1A5 Complete	12338	99588		1A5		99588
	P.C. Board Only	12338	10658				10658
C1	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C1,C2,C20,C21		26913
	.02Ufd 25V				C22,C23,C31		
C2	Same as C1						
C3	Capacitor,Ceramic Disc	72982	5855000Y5U0503Z		C3,C9,C24,C28		27357
	.05UFD 25V				C30		

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A5-Balanced Mixer, L.P.F.,ALC Amp.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C4	Capacitor,Dipped Mica	14655	CD7FD151G03		C4		28090
	150pf ±2% 500V						
C5	Capacitor,Dipped Mica	14655	CD7FD181G03		C5		28105
	180pf ±2% 500V						
C6	Capacitor,Dipped Mica,	14655	CD7FC271J03		C6,C25		28863
	270pf ±5% 300V						
C7	Capacitor,Dipped Mica	14655	CD6CD560G03		C7		28129
	56pf ±2% 500V						
C8	Capacitor,Dipped Mica	14655	CD7FC221J07		C8		28325
	220pf ±5% 300V						
C9	Same as C3						
C10	Capacitor,Dipped Mica	14655	CD6ED220J03		C10		28507
	22pf ±5% 500V						
C11	Capacitor,Ceramic Disc	91418	1.5pf 500V NPO		C11		25701
	1.5pf 500V						
C12	Capacitor,Dipped Mica	14655	CD6ED330J03		C12		28686
	33pf ±5% 500V						
C13	Capacitor,Dipped Mica	14655	CD6CD080D03		C13		28140
	8pf ±1/2pf 500V						
C14	Capacitor,Dipped Mica,	14655	CD6ED270J03		C14		28519
	27pf ±5% 500V						
C15	Capacitor,Dipped Mica	14655	CD6CD120J03		C15		28648
	12pf ±5% 500V						
C16	Capacitor,Dipped Mica	14655	CD6CD300J03		C16		28182
	30pf ±5% 500V						
C17	Capacitor,Dipped Mica	14655	CD6CD050C03		C17		28857
	5pf ±1pf 500V						
C18	Capacitor,Dipped Mica	14655	CD6CD200J03		C18		28674
	20pf ±5% 500V						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A5-Balanced Mixer, L.P.F.,ALC Amp.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C19	Capacitor,Tantalum 22UFD 15V	06751	TSD3-15-226		C19		27412
C20	Same as C1						
C21	Same as C1						
C22	Same as C1						
C23	Same as C1						
C24	Same as C3						
C25	Same as C6						
C26	Capacitor,Ceramic Disc	91418	.001UFD Type		C26,C29		25684
	.001UFD 1KV		JLX5F				
C27	Capacitor,Ceramic Disc	72982	805000X5E301J		C27		28143
	300pf ±5% 100V						
C28	Same as C3						
C29	Same as C26						
C30	Same as C3						
C31	Same as C1						
CR1	Diode,Silicon 1N914	01295	1N914		CR1		44290
L1	Choke,R.F. Molded .22uHy±10%	99800	1025-04		L1		65062
L2	Choke,R.F. Molded .33uHy±5%	99800	1025-08		L2		65282
L3	Choke,R.F. Molded 27uHy ±5%	99800	1537-48		L3		65311
L4	Choke,R.F. Molded 18 uHy±5%	99800	1537-42		L4,L5		65294
L5	Same as L4						
L6	Choke,R.F. Molded 22 uHy±5%	99800	1537-44		L6		65309

PARTS LIST							
Receiver-Transmitter RT-1099/SRC-42(V)				1A5-Balanced Mixer, L.P.F.,ALC Amp.			
REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R1	Resistor,Carbon ¼W±10%		RC07GF560K		R1, R37		17429
	56 ohm						
R2	Resistor,Carbon ¼W±10% 1.2K		RC07GF122K		R2, R10		18186
R3	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R3,R7,R9,R20		17156
R4	Resistor,Carbon ¼W±10%		RC07GF180K		R4,R5		18459
	18 ohm						
R5	Same as R4						
R6	Potentiometer 100 ohm	21030	62 Par 100		R6		34613
R7	Same as R3						
R8	Resistor,Carbon ¼W±10%		RC07GF101K		R8,R27		17118
	100 ohms						
R9	Same as R3						
R10	Same as R2						
R11	Resistor,Carbon ¼W±10% 10K		RC07GF103K		R11,R13		17041
R12	Resistor,Carbon ¼W±10% 2.2K		RC07GF222K		R12		17807
R13	Same as R11						
R14	Resistor,Carbon ¼W±10%		RC07GF471K		R14,R17,R26,R32		17261
	470 ohm						
R15	Resistor,Carbon ¼W±10% 6.8K		RC07GF682K		R15,R16		17481
R16	Same as R15						
R17	Same as R14						
R18	Resistor,Carbon ¼W±10%		RC07GF100K		R18,R36		17716
	10 ohm						
R19	Resistor,Carbon ¼W±10% 15K		RC07GF153K		R19,R22,R23		17235
R20	Same as R3						
R21	Resistor,Carbon,¼W±10% 8.2K		RC07GF822K		R21		18162
R22	Same as R19						
R23	Same as R19						
R24	Resistor,Carbon ¼W±10% 2.7K		RC07GF272K		R24		18667

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A5-Balanced Mixer, L.P.F., ALC Amp.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R25	Resistor,Carbon ¼W±10% 47 Ohm		RC07GF470K		R25,R30		17936
R26	Same as R14						
R27	Same as R8						
R28	Resistor,Carbon ¼W±10% 1.5K		RC07GF152K		R28		17247
R29	Resistor,Carbon ¼W±10% 270 ohm		RC07GF271K		R29		17845
R30	Same as R25						
R31	Resistor,Carbon ¼W±10% 3.3K		RC07GF332K		R31		17089
R32	Same as R14						
R33	Resistor,Carbon ¼W±10% 15 ohm		RC07GF150K		R33		18174
R34	Resistor,Carbon ¼W±5% 1.5K		RC07GF152J		R34		19726
R35	Resistor,Carbon ¼W±5% 150 ohm		RC07GF151J		R35		19714
R36	Same as R18						
R37	Same as R1						
Q1	Transistor,Fet 3N141	49671	3N141		Q1,Q2		44829
Q2	Same as Q1						
Q3	Transistor,Silicon NPN 2N3646	07263	2N3646		Q3,Q4,Q5,Q6		44252
Q4	Same as Q3						
Q5	Same as Q3						
Q6	Same as Q3						
Q7	Transistor,Silicon NPN 2N3643	07263	2N3643		Q7,Q11		44331

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A5-Balanced Mixer, LPF, ALC Amp

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
Q8	Transistor, FET 2N5461	04713	2N5461		Q8		44616
Q9	Transistor,Silicon,NPN 2N3563	07263	2N3563		Q9,Q10		44329
Q10	Same as Q9						
Q11	Same as Q7						
T1	Transformer,R.F. Input	12338	49197		T1		49197
T2	Transformer,R.F. Mixer Output	12338	99693		T2,T3		99693
T3	Same as T2 (Amp Output)						
TP1	Test Point Jack (Red)	83330	Type 430		TP1		75381
TP2	Test Point Jack (Yellow)	83330	Type 430		TP2		75383
	1A6- AUDIO AND SQUELCH						
	1A6 Complete	12338	99589		1A6		99589
	P.C. Board Only	12338	10662A				10662A
C1	Capacitor,Ceramic Disc .1UFD 12V	72982	565000Y5F0104M		C1		27010
C2	Capacitor,Ceramic Disc .01UFD 100V	72982	805000X5V0103Z		C2		27321
C3	Capacitor,Tantalum 2.2UFD 15V	06751	TSD1-15-275		C3,C4,C7		24472
C4	Same as C3						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A6-Audio and Squelch

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C5	Capacitor,Ceramic Disc .0033UFD	72982	801000X5U0332M		C5		24422
C6	Capacitor,Tantalum 22UFD 15V	06751	TSD3-15-226		C6		27412
C7	Same as C3						
C8	Capacitor,Ceramic Disc .02UFD 25V	72982	5835000Y5U0203Z		C8		26913
C9	Capacitor,Tantalum 15UFD 35V	06751	TSD5-35-156		C9,C11,C12		27400
C10	Capacitor,Ceramic Disc .005UFD 100V	72982	835000X5V05022		C10		27333
C11	Same as C9						
C12	Same as C9						
C13	Capacitor,Electrolytic 100UFD 50V	71590	EA-50-100		C13		28014
C14	Capacitor,Electrolytic 200Ufd 35V	WIMA	200UFD 35V		C14		25816
CR1	Diode, Silicon 1N914	01295	1N914		CR1,CR2,CR3		44290
CR2	Same as CR1						
CR3	Same as CR1						
R1	Resistor,Carbon ¼W±10% 220K		RC07GF224K		R1		17778
R2	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R2,R4		17156
R3	Resistor,Carbon ½W±10% 1.2 ohm		RC20GF1R2K		R3		18849
R4	Same as R2						

PARTS LIST							
Receiver-Transmitter RT-1099/SRC-42(V)			1A6- Audio and Squelch				
REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R5	Resistor,Carbon ¼W±10% 15K		RC07GF153K		R5		17235
R6	Potentiometer 10K	94271	502-725-10K		R6		34441
R7	Resistor,Carbon ¼W±10% 2.2K		RC07GF222K		R7		17807
R8	Resistor,Carbon ½W±10% 100K		RC07GF104K		R8,R9		17039
R9	Same as R8						
R10	Resistor,Carbon ¼W±10% 5.6K		RC07GF562K		R10,R11		18306
R11	Same as R10						
R12	Resistor,Carbon ½W±10%		RC20GF820K		R12		18837
	82 ohm						
R13	Resistor,Carbon ¼W±10% 3.3K		RC07GF332K		R13		17089
R14	Resistor,Wirewound 50 ohm	44655	50 ohm 10WF111		R14		18851
	10W						
R15	Resistor,Carbon ½W±10% 2.2K		RC20GF222K		R15,R17		16736
R16	Resistor,Carbon ½W±10%		RC20GF121K		R16		18643
	120 ohm						
R17	Same as R15						
R18	Resistor,Carbon ¼W±10% 2.7K		RC07GF272K		R18		18667
Q1	Transistor,Silicon, NPN	04713	MPS2925		Q1,Q2,Q3,Q4		44434
	MPS2925						
Q2	Same as Q1						
Q3	Same as Q1						
Q4	Same as Q1						
Q5	Transistor,Silicon NPN	04713	2N4922		Q5		44549
	2N4922						
Q6	Transistor,Silicon PNP	04713	2N4919		Q6		44537
	2N4919						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A6-Audio and Squelch

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
U1	Integrated Circuit CA3020	49671	CA3020		U1		44460
T1	Transformer, Audio	***	299-W7		T1		49161
TP1	Test Point Jack (Yellow)	83330	Type 430		TP1		75383
TP2	Test Point Jack (Red)	83330	Type 430		TP2		75381
	Heat Sink, T05 Transistor	13103	NF205		1A6MP2		87187
1A6MP1	Brk, Heat Sink	12338	10716		1A6MP1		10716
	1A7 - OSCILLATOR OVEN ASSY.						
	1A7 Osc. Oven Assy	12338	99602		1A7		99602
	1A7A1 Complete Assy	12338	99590		1A7A1		99590
	P.C. Board Only	12338	10655B				10655B
C1	Capacitor,Variable .9-9pf	Mepco	C004CA/9E		C1,C2,C3,C4,C5		28200
		80031			C6,C20		
C2	Same as C1						
C3	Same as C1						
C4	Same as C1						
C5	Same as C1						
C6	Same as C1						
C7	Capacitor,Ceramic Disc	91418	NPO Type C		C7,C8,C9,C10		29173
	36pf ±5% 1KV				C11,C12		

PARTS LIST							
Receiver-Transmitter RT-1099/SRC-42(V)			1A7 Oscillator Oven Assy.				
REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C8	Same as C7						
C9	Same as C7						
C10	Same as C7						
C11	Same as C7						
C12	Same as C7						
C13	Capacitor,Dipped Mica	14655	CD6FC111G03		C13,C14,C15,C16		28131
	110pf ±2% 300V				C17,C18		
C14	Same as C13						
C15	Same as C13						
C16	Same as C13						
C17	Same as C13						
C18	Same as C13						
C19	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C19		26913
	.02UFD 25V						
C20	Same as C1						
C21	Capacitor,Ceramic Disc	72982	805000X5V0103Z		C21,C26		27321
	.01UFD 100V						
C22	Capacitor,Dipped Mica	14655	CD6CD200J03		C22		28674
	20pf ±5% 500V						
C23	Capacitor,Ceramic Disc	91418	Type CN750		C23		25048
	10pf ±.25pf 1000V						
C24	Capacitor,Dipped Mica	14655	CD6CD560G03		C24		28129
	56pf ±2% 500V						
C25	Capacitor,Dipped Mica	14655	CD7FA621J03		C25		28387
	620pf ±5% 100V						
C26	Same as C21						
C27	Capacitor,Dipped Mica	14655	CD7FD181G03		C27		28105
	180pf ±5%						
1A7P1	Connector,P.C. Board 15 Pin	13511	133-015-13		1A7P1		75373

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A7A1-Oscillator Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
Y1	Crystal,Freq.Determ.	12338	81903C		Y1		81903C
	12882 kHz						
Y2	Crystal,Freq.Determ.	12338	81903C		Y2		81903C
	13338 kHz						
Y3	Crystal,Freq.Determ.	12338	81903C		Y3		81903C
	13370 kHz						
Y4	Crystal,Freq.Determ.	12338	81903C		Y4		81903C
	13438 kHz						
Y5	Not Used						
Y6	Not Used						
Y7	Crystal,Freq.Determ.	12338	81902B		Y7		81902B
	10.7 mHz						
CR1	Diode,Silicon, 1N914	01295	1N914B		CR1,CR2,CR3,CR4		44290
					CR5,CR6,CR8,CR9		
CR2	Same as CR1						
CR3	Same as CR1						
CR4	Same as CR1						
CR5	Same as CR1						
CR6	Same as CR1						
CR7	Diode,Zener,5.1V±5% 1N5231B	04713	1N5231		CR7		40539
CR8	Same as CR1						
CR9	Same as CR1						
CR10	Diode,Silicon A23	25403	A23		CR10		40535

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A7A1-Oscillator Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R1	Resistor,Carbon ¼W±10% 3.3K		RC07GF332K		R1,R2,R3,R4		17089
					R5,R6		
R2	Same as R1						
R3	Same as R1						
R4	Same as R1						
R5	Same as R1						
R6	Same as R1						
R7	Resistor,Carbon ¼W±10% 5.6K		RC07GF562K		R7,R8,R9,R10		18306
					R11,R12		
R8	Same as R7						
R9	Same as R7						
R10	Same as R7						
R11	Same as R7						
R12	Same as R7						
R13	Resistor,Carbon ¼W±10% 100K		RC07GF104K		R13		17039
R14	Resistor,Carbon ¼W±10% 150K		RC07GF154K		R14		17675
R15	Resistor,Carbon ¼W±10% 8.2K		RC07GF822K		R15		18162
R16	Resistor,Carbon ¼W±10%		RC07GF221K		R16		17132
	220 ohms						
R17	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R17,R18		17156
R18	Same as R17						
R19	Resistor,Carbon ¼W±10%		RC07GF101K		R19		17118
	100 ohm						
R20	Resistor,Carbon ¼W±10% 4.7K		RC07GF472K		R20		17077
Q1	Transistor,Silicon NPN	07263	2N3563		Q1,Q2		44329
	2N3563						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A7A1-Oscillator Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
Q2	Same as Q1						
Q3	Transistor,Silicon, NPN	07263	2N3643		Q3		44331
	2N3643						
	Standoff, Solderable (2 ea)	06540	9522-BB-0348				50817
	Pin socket for .050 Pins	28385	45037220103				75384
	(14 ea)						
	Pin Socket for .040 Pins	28385	45033880103				75385
	(4 ea)						
	Terminal Stake (1 ea)	28385	2027-2				52558
	Eyelet, Brass (2 ea)	57771	A151				84092
	Standoff,Male Female (4 ea)	06540	9730SS0256				50819
1A7A1	MP1 P.C. Board	12338	10656A				10656A
	Shield Crystal	12338	10717				10717
	Oven,Proportional Control	31785	ISO-524				81833
	1A7A2- OSCILLATOR SUBASSEMBLY						
	1A7A2 Complete	12338	99591				99591
	P.C. Board Only	12338	10654A				10654A
C1	Capacitor,Dipped Mica	14655	CD7FD151G03		C1		28090
	150pf ±2% 500V						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) — 1A7A2-Oscillator Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C2	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C2,C4,C7		26913
	.02UFD 25V						
C3	Capacitor,Ceramic Disc	91418	Type C NPO		C3		25000
	2.2pf ±.25pf 1KV						
C4	Same as C2						
C5	Capacitor,Ceramic Disc	91418	Type C NPO		C5		25036
	6pf ±.25pf 1KV						
C6	Capacitor,Ceramic Disc	72982	500V Type 831		C6		26834
	10pf ±10% 500V						
C7	Same as C2						
C8	Capacitor,Ceramic Disc	72982	805000X5V0103Z		C8		27321
	.01UF 100V						
R1	Resistor,Carbon ¼W±10% 10K		RC07GF103K		R1,R7		17041
R2	Resistor,Carbon ¼W±10% 5.6K		RC07GF562K		R2		18306
R3	Resistor,Carbon ¼W±10% 2.7K		RC07GF272K		R3		18667
R4	Resistor,Carbon ¼W±10% 4.7K		RC07GF472K		R4,R8		17077
R5	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R5		17156
R6	Resistor,Carbon ¼W±10%		RC07GF471K		R6,R11		17261
	470 ohm						
R7	Same as R1						
R8	Same as R4						
R9	Resistor,Carbon ¼W±10%		RC07GF271K		R9		17845
	270 ohm						
R10	Resistor,Carbon ¼W±10%		RC07GF101K		R10,R12		17118
	100 ohm						
R11	Same as R6						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A7A2-Oscillator Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R12	Same as R10						
U1	Integrated Circuit CA3046	49671	CA3046		U1		44551
	Pin, Right Angle (4 ea)	28385	1521-02-03				50283
	1A8-	LOW PASS	FILTER				
	1A8 Complete	12338	99607				99607
	P.C. Board Only	12338	10727A				10727A
C1	Capacitor,Dipped Mica	14655	CD7FA152J03		C1,C4		28196
	1500pf ±5% 100V						
C2	Capacitor,Dipped Mica	14655	CD7FC301J03		C2		28864
	300pf ±5% 100V						
C3	Capacitor,Dipped Mica	14655	CD7FC331J03		C3		28865
	330pf ±5% 100V						
C4	Same as C1						
C5	Capacitor,Dipped Mica	14655	CD7FA511J03		C5		28194
	510pf ±5% 100V						
C6	Capacitor,Dipped Mica	14655	CD7FA102J03		C6		28195
	1000pf ±5% 100V						
C7	Capacitor,Dipped Mica	14655	CD7FA132J03		C7		28868
	1300pf ±5% 100V						

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) 1A8-Low Pass Filter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
L1	Choke,R.F. Molded 2.2uHy±5%	99800	1537-20		L1		64898
L2	Choke,R.F. Molded 1.5uHy±5%	99800	1025-24		L2		64927
	Terminal,stake	28385	2027-2				52558
	RECEIVER-TRANSMITTER MECHANICAL AND MISCELLANEOUS PARTS						
1MP1	Chassis,Receiver-Transmitter (1 ea)	12338	10686		1MP1		10686
1MP2	Panel,Front Rec-Tran. (1 ea)	12338	10684		1MP2		10684
1MP3	Cover,P.C. Modules (1 ea)	12338	10682		1MP3		10682
	Side,Module Case (12 ea)	12338	10680-1				10680-1
	Case, PCB Shield (12 ea)	12338	10681-1				10681-1
	Panel Rear (1 ea)	12338	10685				10685
	Rec-Transmitter Case Complete (1)	12338	97212				97212
	MECHANICAL AND MISCELLANEOUS						
	Name Plate (1 ea)	12338	10713				10713
	Knobs,Audio,Squelch,N.Lim (3 ea)	49956	70-2-1G				34607
	Knob,Illumination (1 ea)	23480	1D2B				34142
	Knob,Channel (1 ea)	49956	70B-2-2G				34608
	Boot for Toggle Switch (2 ea)	97539	N-5030L				53112
	Water Seal Nut (3 ea)	97539	N-9040-1/8				50824
	Water Seal Nut (2 ea)	97539	N-9030-1/4				53100
	Protective Cap,BNC (1 ea)	99017	EC-6				50826

PARTS LIST

Receiver-Transmitter RT-1099/SRC-42(V) Mechanical and Misc.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	Protective Cap,Handset Conn (1 ea)	99017	EC-10				50827
	Protective Cap, Control Conn (1 ea)	99017	EC-24				50830
	Protective Cap,Audio Conn. (1 ea)	99017	EC-14				50828
	Screw,Waterseal 6-32x3/8 (4 ea)	97539	Type R 6-32x3/8"				53370
	Screw,Waterseal 4-40 x 3/8 (4 ea)	97539	Type R 4-40 x 3/8"				53382
	Gasket, Connector (1 ea)	12338	10694				10694
	Gasket, Panel (2 ea)	12338	10693A				10693A
	Frequency Label (1 ea)	12338	10833				10833
	Fasteners	78553	C-7000-632-4				50976
	Gasket,Connector to Case (1 ea)	12338	10799				10799
	Clip,air dux (1 ea)	12338	50807				50807

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) Chassis Electrical Parts

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	AM-6560(P)/SRC-42(V) Complete	12338	99597				99597
C1	Capacitor,Ceramic .47UFD 50V	72982	8131050651474M		C1,C4		28337
C2	Capacitor,Ceramic Disc .1UFD 100V	91418	Type BT		C2,C5		24408
C3	Capacitor,Mylar 1UFD 100V	99515	P-1-105;1UFD 100V		C3		27230
C4	Same as C1						
C5	Same as C2						
C6	Capacitor,Electrolytic 1000UFD 75V	90201	CG13U75B1		C6		28199
2J1	Connector,Control, 24 Pin	71468	MS-3102R-24-28P	MS	2J1		75348
2J2	Connector,Ships Power 5 Pin	71468	MS-3102R-18-11P	MS	2J2		75374
2J3	Connector,BNC	13511	UG1094/U	UG	2J3,2J4,2J5		74374
2J4	Same as 2J3						
2J5	Same as 2J3						
2J6	Connector,Antenna Output	71002	4125		2J6		71035
2XA2	Connector,P.C. Board 18 pin	13511	143-018-01		2XA2		74972
2XA3	Connector,P.C. Board 10 pin	13511	143-010-01		2XA3		74817-2
2XA5	Connector,P.C. Board,Dual 6 Pin	13511	225-20621-101		2XA5		74817-1
2XK1	Socket,Relay for 4 PDT	29238	6-1313-11		2XK1		66638
2XK2	Socket,Relay for 2 PDT	29238	6-1313-10		2XK2		75375
2XF1	Fuse Holder 3AG Style	75915	342-001L		2XF1,2XF2		84244
2XF2	Same as 2XF2						
F1	Fuse,15A SloBlo for 125W	71400	MDL-15		F1		84850
F1	Fuse,10A SloBlo for 50W	71400	MDL-10		F1		84848

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) Chassis Electrical Parts

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
M1	Motor,12 volt DC 15RPM	05624	BYQM33510-31		M1		71294
K1	Relay,2 Pole D.T. 5A Contact	29238	67DP-D-2C5		K1		66444
K2	Relay,4 Pole D.T. 5A Contact	29238	67DP-D-4C5		K2		66468
2S1	Switch, Toggle D.P.D.T.	72653	34-092		2S1		32118
2S2A	Switch Wafer,Open Seeking	81840	Type F		2S2A		33538-1
2S2B	Switch Wafer,6 Position	81840	Type F		2S2B,2S2C		34611
	Dual Cont.						
2S2C	Same as 252B						
	Cable,Jumper,BNC 3" Long	12338	99572				99572
	2A1 -	ANTENNA	COUPLER				
	2A1 Antenna Coupler	12338	99592				99592
	P.C. Board Only	12338	10670				10670
C1	Capacitor,Padder 425-1260pf	02799	308M		C1,C2,C3,C4,C5		27084
					C6		
C2	Same as C1						
C3	Same as C1						
C4	Same as C1						
C5	Same as C1						
C6	Same as C1						
C7	Capacitor,Molded Mica		CM42E392JN3		C7		26755
	3900pf ±5% 500V						
C8	Capacitor,Molded Mica		CM20D302JN3		C8		24977
	3000pf ±5% 500V						
C9	Capacitor,Molded Mica		CM20D202JN3		C9		24903
	2000pf ±5% 500V						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A1-Antenna Coupler

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C10	Capacitor,Molded Mica 1000pf ±5%		CM20D102JN3		C10		24927
C11	Capacitor,150pf,3KV,N330 Type CJ	71590	DA-165-026CB		C11		25892
C12	Capacitor,100pf,3KV,N150 Type CJ	71590	DA-165-027CB		C12		25919
C13	Capacitor,50pf,3KV,NPO Type CJ	71590	3878003C0Z0500K		C13		25933
L1	Coil,Variable 5.2-7.2 uHy	12338	64068		L1,L2,L3,L4, L5,L6		64068
L2	Same as L1						
L3	Same as L1						
L4	Same as L1						
L5	Same as L1						
L6	Same as L1						
L7	Coil,Air Duct	12338	97213		L7		97213
R1	Resistor,Carbon 2W±10% 6.8M		RC42GF685K		R1		18722
2A1S1A	Switch Wafer,6 Position Dual Contact	81840	Type F		2A1S1A,2A1S1B 2A1S1C		34611
2A1S1B	Same as 2A1S1A						
2A1S1C	Same as 2A1S1A						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A1-Antenna Coupler

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
2A1S1D	Switch Wafer,High Voltage	71590	A8-6214		2A1S1D		34295
2A1MP1	L.C. Bracket	12338	10712		2A1MP1		10712
2A1MP2	Switch Mtg. Bracket	12338	10703		2A1MP2		10703
	Standoff,#3 (16 ea)	06540	9522-BB-0348				50817
	Terminal Stake (4 ea)	28385	2027-2				52558
	Clip, Air Dux (6 ea)	12338	50807				50807
	Standoff, Ceramic	83330	2646				50779
	2A2 - POWER SUPPLY						
	2A2 Power Supply Complete	12338	99593		2A2		99593
	2A2A1 Power Supply Subassy	12338	97803		2A2A1		97803
C1	Capacitor,Electrolytic	14655	Type NLW		C1		28197
	40UFD 100V						
C2	Capacitor,Ceramic Disc	91418	Type BT		C2,C3		24408
	.1UFD 100V						
C3	Same as C2						
C4	Capacitor,Electrolytic	14655	CDEBR50025		C4		29563
	500 UFD 25V						
CR1	Diode Bridge,100VPIV 25 Amp	14099	SCBA-1		CR1		40536
CR2	Diode Bridge 100VPIV 3.5 Amp	81483	50FBIL		CR2		40537
R1	Resistor,Wirewound	91637	CW-2B		R1		16932
	.25 ohm, 3W ±5%						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A2A1-Mechanical and Misc.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R2	Resistor,Wirewound	12463	BB-5		R2		17443
	100 ohms ±10% 5W						
T1	Transformer,DC-DC Converter	12338	49264		T1		49264
2A2MP1	Power Supply Chassis	12338	10704A		2A2MP1		10704A
2A2MP3	Heat Sink (2 ea)	12338	10722-1		2A2MP3		10722-1
	Terminal Strip,7 Contact	71785	354-21-07-001				53409
	Terminal Strip,4 Contact	71785	354-21-04-001				53411
	Screw,Fillister HD.8/32	73734	2264				53423
	x 3/8 (2 ea)						
	Screw,Flathead 8/32 x3/8	73734	16284				53629
	(2 ea)						
	2A2A2 -	POWER SUPPLY SUB ASSEMBLY					
	2A2A2 Complete	12338	97804				97804
C1	Capacitor,Electrolytic	80031	ET101X040A6		C1,C3,C8,C9		28198
	100UFD 40V						
C2	Capacitor,Ceramic .47UFD 50V	72982	8131050651474M		C2,C4,C5		28337
C3	Same as C1						
C4	Same as C2						
C5	Same as C2						
C6	Capacitor,Mylar 1mfd 100V	99515	D-1-105		C6,C7		27230
C7	Same as C6						
C8	Same as C1						
C9	Same as C1						
C10	Capacitor,Mylar .47UFD 300V	12406	ZD5204		C10		27228

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A2A2-Power Supply Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
2A2A2P1	Connector,Power Supply 18 Pin	13511	133-018-13		2A2A2P1		75376
	Socket,Transistor, TO-3(4 ea)	71785	2TS-1				76619
CR1	Diode,Silicon, 1N5400	05277	1N5400		CR1		40397
CR2	Diode,Silicon 10D4	81483	10D4		CR2		40165
CR3	Diode,Zener 1N2974B	81483	1N2974B		CR3		40538
K1	Relay,On-off SPST	85143	K03D12V		K1		66016
K2	Relay,Transmit-Rec 3PDT	85143	DMS-14DT-12VDC		K2		66690
R1	Resistor,Wirewound 1.5 ohm ±10% 3W	14841	3 watt 3x1.5		R1,R2,R3,R4		16243
R2	Same as R1						
R3	Same as R1						
R4	Same as R1						
R5	Resistor,Wirewound 300 ohm 5W	14841	5XM300		R5		16114
R6	Resistor,Carbon,2W±10% 10 ohms		RC42GF100K		R6,R7		16384
R7	Same as R6						
R8	Resistor,Wirewound 15 ohm 10W	91637	CP-10-7150		R8		19753
Q1	Transistor,Silicon NPN MJ802	04713	MJ802		Q1,Q2,Q3,Q4		44630
Q2	Same as Q1						
Q3	Same as Q1						
Q4	Same as Q1						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A2A2-Power Supply Subassembly

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
Q5	Transistor,Silicon NPN	49671	2N3054		Q5		44355
	2N3054						
	2A2A2 - MECHANICAL AND MISC.						
2A2MP2	Power Supply Subchassis	12338	10707		2A2MP2		10707
	Terminal Strip	12338	99670-6				99670-6
	Terminal Strip (2 ea)	83330	1070				85907
	Terminal Strip	12338	99670-4				99670-4
	Terminal Strip (2 ea)	12338	99670-5				99670-5
	Captive Screw,6/32 x 1/2"	73734	63610				50837
	(2 ea)						
	2A3 - RF POWER AMPLIFIER (125W)						
	2A3 Complete (125W)	12338	99603				99603
	P.C. Board Only	12338	10663B				10663B
C1	Capacitor,Dipped Mica		CM05FD131J03		C1		27486
	130pf ±5% 500V						
C2	Capacitor,Dipped Mica	14655	CD15FA122J03		C2		29381
	1200pf ±5% 100V						
C3	Capacitor,Ceramic Disc	91418	Type BT		C3,C7,C16		24408
	.1UFD 100V						
C4	Capacitor,Tantalum 15UFD 35V	06751	TSD5-35-156		C4,C5,C8		27400
C5	Same as C4						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-RF Power Amplifier (125W)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C6	Capacitor,Ceramic Disc .01UFD 100V	72982	805000X5V0103Z		C6		27321
C7	Same as C3						
C8	Same as C4						
C9	Capacitor,Ceramic Disc .1UFD 12V	72982	565000X5F0104M		C9,C10,C11,C12, C13,C14		27010
C10	Same as C9						
C11	Same as C9						
C12	Same as C9						
C13	Same as C9						
C14	Same as C9						
C15	Capacitor,Ceramic Disc .0022UFD 200V	72982	805030Z5F0222K		C15		27278
C16	Same as C3						
C17	Capacitor,Electrolytic 40 mfd 100V	14655	Type NLW		C17		28197
L1	Choke, Transformer	12338	49252		L1		49252
L2	Choke,R.F. Molded 10uHy±5%	99800	1537-36		L2		65024
2A3P1	Connector,P.C. Board 10 pin	13511	133-010-13		2A3P1		75377
	Socket,Transistor,TO-3(8 ea)	71785	2TS-1				76619
CR1	Diode,Silicon 1N1612	49671	1N1612		CR1,CR2		40513
CR2	Same as CR1						
R1	Potentiometer, 50 ohms 2W	11502	Circuitrim 500-50		R1		34580

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-R.F. Power Amplifier (125W)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R2	Resistor,Carbon ¼W±10%		RC07GF561K		R2		18320
	560 ohms						
R3	Resistor,Carbon ½W±10% 1.5K		RC20GF152K		R3		17730
R4	Resistor,Carbon ½W±10%		RC20GF121K		R4		18643
	120 ohms						
R5	Resistor,Wirewound 300 ohm	14841	5XM300		R5,R11		16114
	5W						
R6	Resistor,Carbon ½W±10%		RC20GF3R3K		R6,R12		18605
	3.3 ohm						
R7	Resistor,Carbon,½W±10%		RC20GF470K		R7		16798
	47 ohm						
R8	Resistor,Carbon ¼W±10%		RC07GF221K		R8		17132
	220 ohm						
R9	Resistor,Carbon ½W±5% 1 ohm		RC20GF1R0J		R9,R10		19477
R10	Same as R9						
R11	Same as R5						
R12	Same as R6						
R13	Resistor,Wirewound 30 ohm	12697	11 watt VC10F		R13		19740
	±10% 11W						
R14	Resistor,Carbon ½W±10%		RC20GF1R2K		R14		18849
	1.2 ohm						
R15	Resistor,Carbon ½W±10%		RC20GF101K		R15		17479
	100 ohm						
R16	Resistor,Non Inductive	56289	453E1R05		R16,R17,R18,R19		19752
	1 ohm 5W				R20,R21		
R17	Same as R16						
R18	Same as R16						
R19	Same as R16						
R20	Same as R16						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-R.F. Power Amplifier (125W)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R21	Same as R16						
Q1	Transistor,Silicon NPN 40081	49671	40081		Q1		44472
Q2	Transistor,Silicon NPN BDY60	25403	BDY60		Q2,Q3		44410
Q3	Same as Q2						
Q4	Transistor,Silicon, NPN	49671	2N5039		Q4,Q5,Q6,Q7		44828
	2N5039				Q8,Q9		
Q5	Same as Q4						
Q6	Same as Q4						
Q7	Same as Q4						
Q8	Same as Q4						
Q9	Same as Q4						
T1	Transformer,R.F. T1	12338	49214		T1		49214
T2	Transformer,R.F. T2	12338	49226		T2		49226
T3	Transformer,R.F. Output	12338	49240		T3		49240
	2A3 - R.F. POWER AMPLIFIER (125W)						
	MECHANICAL AND MISC.						
2A3MP1	Chassis,R.F. Amp (125W)	12338	10714		2A3MP1		10714
2A3MP3	Bracket,Transformer,H.S.	12338	10729		2A3MP2		10729
2A3MP2	Heat Sink,PA(3 ea)	12338	10722		2A3MP3		10722
	Terminal,Stake (4 ea)	28385	2027-2				52558
	Standoff (16 ea)	73734	110051				52302
	Standoff (4 ea)	46384	505-440-24				50820
	Heat Sink,Transistor TO-5	13103	2226B				87187

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-R.F. Power Amplifier (125W)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	Component Clip (2 ea)	91506	6002-17CC				50818
	Captive Screw,6/32x½ (2 ea)	73734	63610				50837
	Component Clip Mtg.Bracket	12338	10837				10837
	2A3 - R.F. POWER AMPLIFIER (50 WATT)						
	R.F. Power Amp. Complete (50W)	12338	99595				99595
	P.C. Board Only	12338	10663				10663
C1	Capacitor,Dipped Mica		CM05FD131J03		C1		27486
	130pf ±5% 500V						
C2	Capacitor,Dipped Mica	14655	CD15FA122J03		C2		29381
	1200pf ±5% 100V						
C3	Capacitor,Ceramic Disc	91418	Type BT		C3,C7		24408
	.1UFD 100V						
C4	Capacitor,Tantalum 15UFD 35V	06751	TSD5-35-156		C4,C5,C8		27400
C5	Same as C4						
C6	Capacitor,Ceramic Disc	72982	805000X5V0103Z		C6		27321
	.01UFD 100V						
C7	Same as C3						
C8	Same as C4						
C9	Capacitor,Ceramic Disc	72982	565000X5F0104M		C9,C10		
	.1UFD 12V						
C10	Same as C9						
C15	Capacitor,Ceramic Disc	72982	805030Z5F0222K		C15		27278
	.0022UFD 200V						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-R.F. Power Amplifier (50 Watt)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C17	Capacitor,Electrolytic	14655	Type NLW		C17		28197
	100 UFD 40V						
L1	Choke, Transformer	12338	49252		L1		49252
L2	Choke,R.F. Molded 10^{u}HY±5%	99800	1537-36		L2		65024
2A3P1	Connector,P.C. Board 10 Pin	13511	133-010-13		2A3P1		75377
	Socket,Transistor,TO-3 (4 ea)	71785	2TS-1				76619
CR1	Diode, Silicon 1N1612	49671	1N1612		CR1,CR2		
CR2	Same as CR1						
R1	Potentiometer, 50 ohms	11502	Circuitrim 500-50		R1		34580
R2	Resistor,Carbon ¼W±10%		RC07GF561K		R2		18320
	560 ohms						
R3	Resistor,Carbon ½W±10% 1.5K		RC20GF152K		R3		17730
R4	Resistor,Carbon ½W±10%		RC20GF121K		R4		18643
	120 ohm						
R5	Resistor,Wirewound 300 ohm	14841	5XM300		R5,R11		16114
	5W						
R6	Resistor,Carbon ½W±10%		RC20GF3R3K		R6,R12		18605
	3.3 ohm						
R7	Resistor,Carbon ½W±10%		RC20GF470K		R7		16798
	47 ohm						
R8	Resistor,Carbon ¼W±10%		RC07GF221K		R8		17132
	220 ohm						
R9	Resistor,Carbon ½W±5% 1 ohm		RC20GF1R0J		R9,R10		19477
R10	Same as R9						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-R.F. Power Amplifier (50W)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R11	Same as R5						
R12	Same as R6						
R13	Resistor,Wirewound 30 ohm	12697	11 watt VC10F		R13		19740
	±10%						
R14	Resistor,Carbon ½W±10%		RC20GF1R2K		R14		18849
	1.2 ohm						
R15	Resistor,Carbon ½W±10%		RC20GF101K		R15		17479
	100 ohm						
R16	Resistor,Non Inductive	56289	453E1R05		R16,R17		19752
	1 ohm 5W						
R17	Same as R16						
Q1	Transistor,Silicon,NPN	49671	40081		Q1		44472
	40081						
Q2	Transistor,Silicon,NPN	25403	BDY60		Q2,Q3		44410
	BDY60						
Q3	Same as Q2						
Q4	Transistor,Silicon NPN	49671	2N5039		Q4,Q5		44828
	2N5039						
Q5	Same as Q4						
T1	Transformer, R.F. T1	12338	49214		T1		49214
T2	Transformer, R.F. T2	12338	49226		T2		49226
T3	Transformer, R.F. T3 Output	12338	49238		T3		49238

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A3-R.F. Power Amplifier (50W)

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	MECHANICAL AND MISC.						
2A3MP1	Chassis, R.F. Amp (50W)	12338	10708		2A3MP1		10708
2A3MP2	Heat Sink (3 ea)	12338	10722		2A3MP2		10722
	Terminal, Stake (4 ea)	28385	2027-2				52558
	Standoff, (16 ea)	73734	110051				52302
	Standoff, (4 ea)	46384	505-440-24				50820
	Heat Sink,Transistor TO5	13103	2226B				87187
	Captive Screw 6/32x1/2" (2 ea)	73734	63610				50837
	2A4 - LOW PASS FILTER						
	2A4 Complete	12338	99596		2A4		99596
	2A4 P.C. Board Only	12338	10667A				10667A
C1	Capacitor,Molded Mica 430pf ±5% 500V		CM15FD431JN3		C1		28190
C2	Capacitor,Molded Mica 680pf ±5% 500V		CM20D681JN3		C2		25555
C3	Capacitor,Molded Mica 1200pf ±5% 500V		CM20D122JN3		C3		24965
C4	Capacitor,Molded Mica 160pf ±5% 500V		CM15FD161JN3		C4		28187
C5	Capacitor,Molded Mica 100pf ±5% 500V		CM15FD101JN3		C5		28185
C6	Capacitor,Molded Mica 56pf ±5% 500V		CM15FD560JN3		C6		28184

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A4-Low Pass Filter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C7	Capacitor,Molded Mica		CM20D561JN3		C7,C16		25531
	560pf ±5% 500V						
C8	Capacitor,Molded Mica		CM20D911JN3		C8		25581
	910pf ±5% 500V						
C9	Capacitor,Molded Mica		CM20D152JN3		C9		24939
	1500pf ±5% 500V						
C10	Capacitor,Molded Mica		CM20D821JN3		C10,C14,C21		25579
	820pf ±5% 500V						
C11	Capacitor,Molded Mica		CM15FD511JN3		C11,C20		28192
	510pf ±5% 500V						
C12	Capacitor,Molded Mica		CM15FD301JN3		C12,C19		28113
	300pf ±5% 500V						
C13	Capacitor,Molded Mica		CM15FD471JN3		C13		28191
	470pf ±5% 500V						
C14	Same as C10						
C15	Capacitor,Molded Mica		CM20D132JN3		C15		28171
	1300pf ±5% 500V						
C16	Same as C7						
C17	Capacitor,Molded Mica		CM15FD361JN3		C17		28188
	360pf ±5% 500V						
C18	Capacitor,Molded Mica		CM15FD221JN3		C18		28180
	220pf ±5% 500V						
C19	Same as C12						
C20	Same as C11						
C21	Same as C10						
L1	Coil, R.F. 1.05uHy ±5%	12338	64795-14		L1		64795-14
L2	Coil, R.F. 1.75uHy ±5%	12338	64795-11		L2		64795-11

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A4-Low Pass Filter

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
L3	Coil, R.F. 2.95uHy ±5%	12338	64795-8		L3		64795-8
L4	Coil, R.F. 1.92uHy ±5%	12338	64795-12		L4		64795-12
L5	Coil, R.F. 1.15uHy ±5%	12338	64795-9		L5		64795-9
L6	Coil, R.F. .69uHy ±5%	12338	64795-15		L6		64795-15
L7	Coil, R.F. .74 uHy ±5%	12338	64795-16		L7		64795-16
L8	Coil, R.F. 1.24uHy ±5%	12338	64795-13		L8		64795-13
L9	Coil, R.F. 2.07uHy ±5%	12338	64795-10		L9		64795-10
	2A4-LOW PASS FILTER MECHANICAL AND MISC.						
	Standoff #3 (6 ea)	06540	9522-BB-0348				50817
	2A5-ALC DETECTOR AND AMPLIFIER				2A5		
	2A5 Complete	12338	99599				99599
	P.C. Board Only	12338	10669B				10669B
C1	Capacitor,Ceramic Disc	91418	NPO		C1, C2		25701
	1.5pf 500V						
C2	Same as C1						
C3	Capacitor,Tantalum	06751	TSD1-15-225		C3, C9		24472
	2.2UFD 15V						
C4	Capacitor,Dipped Mica	14655	CD7FA911J03		C4		28866
	910pf ±5%						
C5	Capacitor,Ceramic Disc	91418	Type JLX5F		C5		25684
	1000pf 1000V						
C6	Capacitor,Ceramic Disc	72982	5855000Y5U0503Z		C6,C7,C8		27357
	.05UFD 25V						

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A5-ALC DETECTOR AND AMPLIFIER

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
C7	Same as C6						
C8	Same as C6						
C9	Same as C3						
C10	Capacitor,Ceramic Disc	72982	805024X5E0391K		C10		28155
	390pf ±10% 100V						
C11	Capacitor,Ceramic Disc	72982	5835000Y5U0203Z		C11		26913
	.02UFD 25V						
C12	Capacitor,Tantalum 6.8UFD	06751	TSD1-15-685		C12		28753
	15V						
C13	Capacitor,Ceramic .47UFD 50V	72982	8131050651474M		C13,C14		28337
C14	Same as C13						
CR1	Diode,Germanium 1N54A	72982	1N54A		CR1		40139
CR2	Diode,Silicon 1N914B	25403	1N914B		CR2		40510
CR3	Diode,Silicon 1N914	01295	1N914		CR3,CR4,CR5,CR6		44290
					CR7		
CR4	Same as CR3						
CR5	Same as CR3						
CR6	Same as CR3						
CR7	Same as CR3						
CR8	Diode,Zener 1N5237	04713	1N5237		CR8		40540
R1	Resistor,Carbon ½W±10% 4.7K		RC20GF472K		R1,R2		16920
R2	Same as R1						
R3	Potentiometer, 1K	21030	62PA1K		R3,R4		34207
R4	Same as R3						
R5	Resistor,Carbon ¼W±10% 10K		RC07GF103K		R5,R7,R11,R21		17041
R6	Resistor,Carbon ¼W±10% 22K		RC07GF223K		R6		17223
R7	Same as R5						
R8	Resistor,Carbon ¼W±10% 560 ohm		RC07GF561K		R8		18320
R9	Resistor,Carbon ¼W±10% 2.7K		RC07GF272K		R9,R19		18667

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) 2A5-ALC DETECTOR AND AMPLIFIER

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
R10	Resistor,Carbon ¼W±10% 27K		RC07GF273K		R10		17120
R11	Same as R5						
R12	Resistor,Carbon ¼W±10% 1K		RC07GF102K		R12,R15,R22		17156
R13	Resistor,Carbon ¼W±10% 1.5K		RC07GF152K		R13,R17		17247
R14	Resistor,Carbon ¼W±10% 33K		RC07GF333K		R14		17792
R15	Same as R12						
R16	Resistor,Carbon ¼W±10% 120K		RC07GF124K		R16		17510
R17	Same as R13						
R18	Resistor,Carbon ¼W±10% 2.2K		RC07GF222K		R18		17807
R19	Same as R9						
R20	Resistor,Carbon ¼W±10% 47K		RC07GF473K		R20		17106
R21	Same as R5						
R22	Same as R12						
R23	Resistor,Carbon ¼W±10% 56 ohm		RC07GF560K		R23		17429
Q1	Transistor,Fet 2N4303	16170	2N4303		Q1,Q2		44393
Q2	Same as Q1						
Q3	Transistor,Silicon NPN 2N3646	07263	2N3646		Q3		44252
Q4	Transistor,Silicon PNP 2N4249	07263	2N4249		Q4		44678
	CHASSIS MECHANICAL AND MISC.						
2MP1	Panel, Front Cast	12338	10701A		2MP1		10701A
2MP2	Panel Rear, Cast	12338	10702		2MP2		10702
2MP3	Chassis,AM-6560(P)/SRC-42(V)	12338	10696		2MP3		10696
2MP4	Cover,Antenna Coupler Shield	12338	10698B		2MP4		10698B
2MP5	Coupler Shield	12338	10697B		2MP5		10697B
2MP6	Case,Bottom,With Catches	12338	10709		2MP6		10709
2MP7	Case,Top with Catches	12338	10710		2MP7		10710
2MP8	Spark Gap Plate	12338	10726		2MP8		10726

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) Chassis Mechanical and Misc.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
2MP10	Bracket, Motor Mount	12338	10683		2MP10		10683
2MP11	Bracket, Relay Support	12338	10829		2MP11		10829
2MP12	Bracket, Relay Socket Mtg	12338	10705		2MP12		10705
2MP13	Switch Wafer Mounting Plate	12338	10832		2MP13		10832
2MP14	Bracket, Rear Switch Mtg	12338	10725		2MP14		10725
	Plate, Nomenclature (125W)	12338	10830				10830
	AM-6560(P)/SRC-42(V)						
	Plate, Nomenclature (50W)	12338	10711				10711
	AM-6560(P)/SRC-42(V)						
	Plate, Nomenclature (50W)	12338	10728				10728
	AN/SRC-42(V)						
	Plate, Nomenclature (125W)	12338	10831				10831
	AN/SRC-42(V)						
	Screw,Water Seal 6/32 x	97539	Pan Head TypeR				53370
	3/8" (4 ea)						
	Screw,Water Seal 4/40 x	97539	Pan Head Type R				53382
	3/8 (4 ea)						
	Shaft, Glass (1 ea)	12338	33253-2				33253-2
	Shaft Coupling (2 ea)	74970	104-264				32223
	O Ring Fuse	97539	301N030				50825
	Gasket, Interconnector	12338	10695				10695
	Catch	98003	SC-B-83314-2				52637
	Strike for SC-B-83314-2	98003					52652
	Clamp, Capacitor	90201	TH25				50295
	Shaft Spacer For Motor	00141	B6-13				84093
	Closed Cell Silicone Sponge	70485					84096
	PSA One Side (34")						
	(Gasket for PA/CPLR)						
	Protective Plastic Cap	99017	EC-6				50826

PARTS LIST

Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) Chassis Mechanical and Misc.

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	Protective Plastic Cap	99017	EC-18				50829
	Protective Plastic Cap	99017	EC-24				50830
	Captive Screw Fastener (4 ea)	46384					50838
	Water Seal Captive Screw	02310	SNT50037C08V10				50836
	#8 (9 ea)						
	Shaft, Glass	12338	33253-4				33253-4
	AN/SRC-42(V) INSTALLATION KIT						
	Complete Installation Kit	12338	99481				99481
	Cable, R.F. 25 ft Long	12338	58870				58870
	Cable, Control 25 ft. Long	12338	58873A				58873A
	Cable, Audio 10 ft. Long	12338	58871				58871
	Connector, Control 24 Pin	71468	CA06R-24-28S				75386
	Telescoping Bushing	71468	MS3420-16				700557
	Telescoping Bushing	71468	MS3420-12				700556
	Telescoping Bushing	71468	MS3420-10				700555
	Telescoping Bushing	71468	MS3420-8				700554
	Connector, BNC	13511	UG-88/U				74403
	Bracket, REC/TRANS Mounting	12338	10688				10688
	Knobs, REC/TRANS Mounting	75376	S-68-65				33930-3
	Handset Mounting Clips	12338	50812				50812
	Handset	16575	H-189/GR				87694
	Speaker	81501	MM-2				87735
	AN/SRC-42(V) MAINTENANCE KIT						
	Maintenance Kit Complete	12338	97218				97218

PARTS LIST

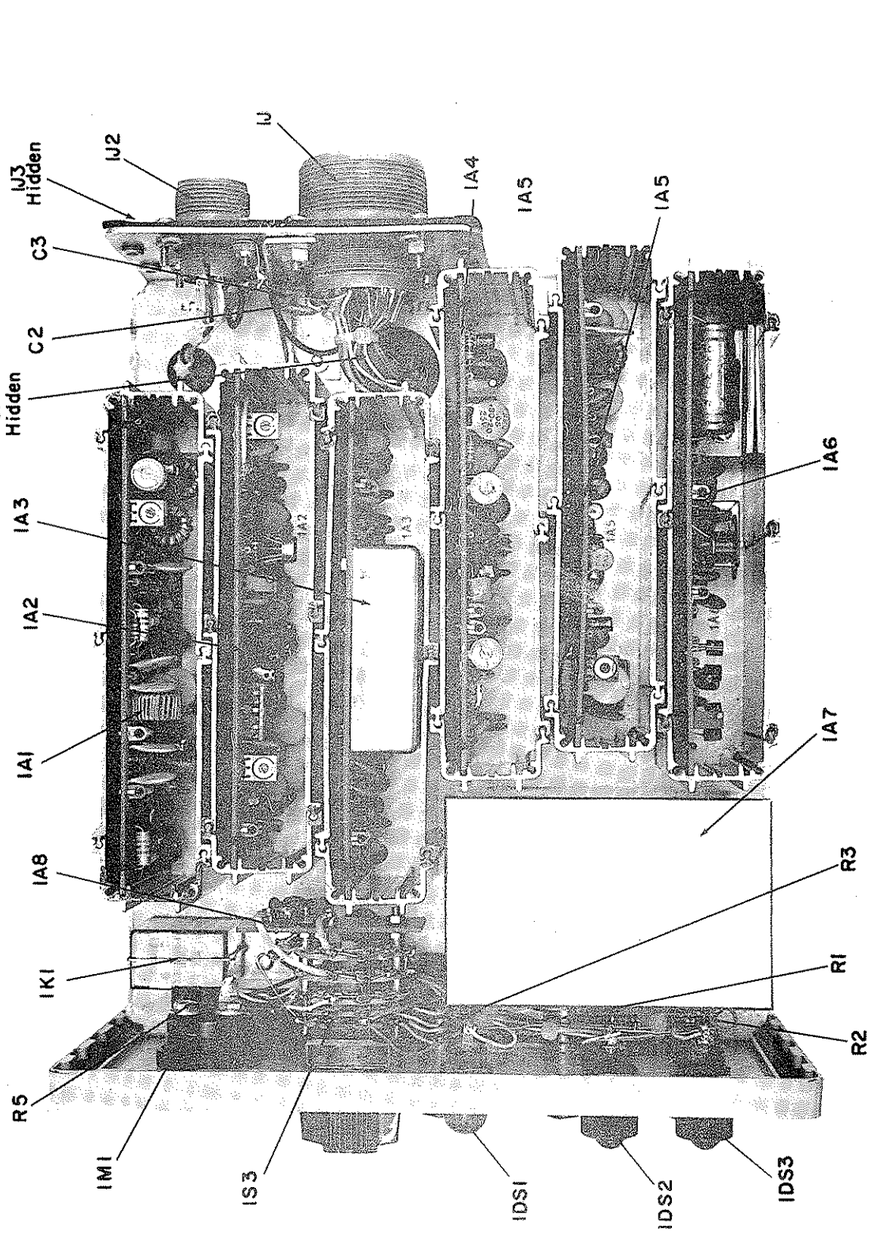
Amplifier-Antenna Coupler AM-6560(P)/SRC-42(V) AN/SRC-42(V) Maintenance Kit

REF. DES.	DESCRIPTION	MANU-FACTURER	MANUFACTURER'S PART NO.	JAN OR MIL TYPE	ALL REFERENCE DESIG. INVOLVED	REMARKS	SUNAIR P/N
	Card Extender 1A1-1A6	12338	97210				97210
	Test Cable 1A7	12338	97217				97217
	Test Cable 2A2	12338	97215				97215
	Test Cable 2A3	12338	97216				97216

FSCM	MANUFACTURER
00141	PIC Design Corp., P.O. Box 335, Benrus Center Ridgefield Ct., 06887
01295	Texas Instrument Inc., Semiconductor Components Div. 13500 North Central Expressway, Dallas, Texas 75231
02310	ABSCOA Industries 1071 W. Arbor Vitae St., Inglewood, California 90301
02799	ARCO/LPD 2725 Columbia St., Torrance, Calif. 90501
04713	Motorola Semiconductor Products Inc., 5005 East McDowell Rd., Phoenex, Arizona 85008
05277	Westinghouse Electric Corporation Semiconductor Dept., Youngwood, Pa. 15697
05624	Barber-Colman Co., 1300 Rock St., Rockford, Ill. 61101
06540	Amatom Electronic Hardward Division of Miter Corp., 446 Blake St., New Haven, Connecticut 06515
06751	Components Inc., Semcor Div., 3540 W. Osborn Rd., Phoenix, Arizona 85019
07263	Fairchild Semiconductor, A Division of Fairchild Camera and Instrument Corp., 464 Ellis St., Mountain View, California 94040
08730	Vemaline Products Co., Inc., P.O. Box 3 455 West Main St., Wyckoff, New Jersey 07481
09353	C & K Components Inc., 103 Morse Street, Watertown, Maine 02172
11502	TRW Electronic Components IRC Boone Div. Greenway Road, Boone, N. C. 28607
12338	Sunair Electronics, Inc., 3101 S.W. Third Ave., Fort Lauderdale, Florida 33315
12406	Elpac Inc. 18651 Von Karman Ave., Irvine, California 92664
12463	Omtronics MFG Inc., 2406 Leavenworth St., Omaha, Nebraska 68105
12697	Clarostat MFG Co., Inc. Lower Washington St., Dover, N. H. 03820
13103	Thermalloy Co., 8717 Diplomacy Row, Dallas, Texas 75247
13511	Bunker Ramo Corp., The Amphenol Cadre Div., P.O. Box 399 14600 Winchester Blvd., Los Gatos, California 95030
14099	Semtech Corp., 652 Mitchell Road, Newbury Park, California 91320
14655	Cornell Dubilier Electronics Div. of Federal Pacific Electric Co., Govt. Contracts Dept. 150 Ave. L, Newark, New Jersey 07101
14841	Ward Leonard, Hagerstown Div., Angstrom Precision Inc., P.O. Box 1827, Hagerstown, Md. 21740
16170	Teledyne Systems Co., Communications Div., 12930-64 Panama St., Los Angeles California 90066

16575	Sonetronics, Inc., 1718 H Street, West Bemar, New Jersey 07719
21030	Beckman Instruments Inc. Helipot Division, 901 Oxford Street, Toronto 18, Ontario Canada
23480	Electronic Hardware Corp. 180-08 Liberty Ave., Jamaica, N. Y. 11433
25403	Amperex Electronic Corp., Semiconductor and Receiving Tube Div., Providence Pike, Slatersville, R. I. 02876
28385	Cambridge Electronics Inc., 10 Birch Tree Dr., Fairchild TWP New Jersey 07007
29238	Hart Advance Relay Div., Oak Electro-Netics Corp., 201 W. Centralia St., Elkhorn, Wis. 53121
31785	Isotemp Research Inc., P.O. Box 3389, 1216 Harris St., Charlottesville, Va. 22901.
44655	Ohmite MFG Co., 3601 W. Howard St., Watertown, MA 10701
46384	Penn Engineering and MFG Corp., Old Easton Highway, Doylestown, Pa., 18901
49671	RCA Corp., 30 Rockefeller Plaza, New York, N. Y. 10020
49956	Ratheon Co., 141 Spring St., Lexington, Ma. 07631
56289	Sprague Electric Co., North Adams, Mass. 01247
57771	Stimpson, Edwin B. Co., Inc. 900 Sylvan Ave., Bayport, New York 11705
70485	Atlantic India Rubber Works, Inc., 571 W. Polk St., Chicago, Illinois 60607
71002	Birnback Co., Inc., 177 Hanse Ave., Freeport, Long Island, New York 11520
71400	Bussman MFG, Division of McGraw Edison Co., 2536 W. University St., St. Louis, Missouri 63017
71468	ITT Cannon Electric, 666 E Dyel Rd., Santa Ana, California 92702
71590	Centralab Electronics, Div. of Globe Union Inc., 5757 N. Green Bay Ave., Milwaukee, Wisconsin 53201
71744	Chicago Miniature Lamp Works, 4433 Ravenswood Ave., Chicago, Illinois 60640
71785	TRW Electronic Components Cinch Div. , 1501 Morse Ave. Elkgrove Village, Ill. 60007
72653	GC Electronics Co., A Division of Hydrometals, Inc., 400 S. Wyman St., Rockford, Illinois 61101
72982	Erie Technological Products Inc., 644 W. 12th Street, Erie, Pennsylvania 16512
73734	Federal Screq Products Inc., 3917 N. Kenzie Ave., Chicago, Illinois 60618
74970	Johnson EF Co., 299 10th Avenue S.W., Waseca, Minn. 56093
75376	Kurzkasch Inc., 1421 South Broadway, Dayton, Ohio 45401

75915	Littlefuse Inc., 800 E. Northeast Highway, Des Plaines, Illinois 60016
78553	Tinnerman Products, Inc., 8700 Brookpark Road, Cleveland, Ohio 44129
80031	Mepco/Electra Inc., A North American Phillips Co., Columbia Road, Morristown, N. J. 07960
81030	International Instruments, Div. of SIGMA Instruments Inc., 88 Marsh Hill Road, Orange, Conn. 06477
81483	International Rectifier Corporation, 9220 Sunset Blvd., Los Angeles, California 90069
81501	(87771) University Loudspeaker Div. of Ling Tempco Vought, Oklahoma City, Oklahoma
81840	Ledex Division, Ledex, Inc. 123 Webster St., Dayton, Ohio.
82142	Airco Speer Electronics Components, DuBois, Pa.
83330	Smith Herman H. Inc., 812 Snediker Ave., Brooklyn, N. Y. 11207
85143	Davis Electric Co., 230 N. Spring St., Cape Girardeau, Mo. 63701
90201	Mallory Capacitor Co., 3029 East Washington St., P.O. Box 372, Indianapolis, Indiana 46206
91418	Radio Materials Co., 4242 W. Bryn Mawr, Chicago, Illinois 60646
91506	Augot Inc., 33 Perry Ave., Attleboro, Mass. 02703
91637	Dale Electronics Inc., P.O. Box 609, Columbus, Nebraska 68601
94271	Weston Components Div., Weston Instruments Inc. , Westonarchbald Archbald, Pa. 18403
97539	APM-Hexseal Corp., 44 Noneck St., Englewood, New Jersey 07631
97979	Reon Resistor Corp., 155 Saw Mill River Road, Yonkers, New York 10701
98003	Nielson Hardware Corp., 770 Weathersfield Ave., Hartford, Conn. 06114
99017	Protective Closures Co., Inc., CA Plugs Div., 2207 Elmwood, Buffalo, New York 14216
99515	Marshall Industries, Capacitor Division, 1960 Walker Ave., Monrovia, California 91016
99800	American Precision Industries, Inc., Delevan Div., 270 Quaker Road, East Auroa, N. Y. 14052
**	Network Sciences, 339 West Van Buren, Phoenix, Arizona 85008
***	Deltona Transformer, 237 Enterprise Road, Deltona, Florida 32763



RCVR/XMTR TOP VIEW

FIGURE 6-1
RCVR/XMTR MODULE LOCATIONS

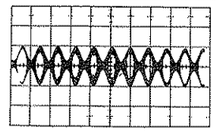
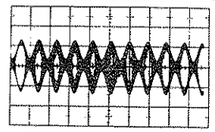
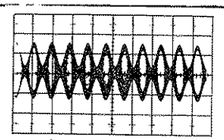
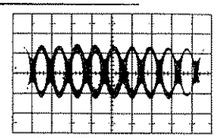
Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	*	**
Q1	EMITTER	5.0VDC	2.0VDC
	BASE	9.7VDC	1.4VDC
	COLLECTOR	0VDC	.65VDC
Q2	EMITTER	0VDC	0VDC
	BASE	0VDC	.65VDC
(TP1)	COLLECTOR	9.3VDC	8.5VDC
Q3	GATE 1	.73V	.73VDC
	GATE 2	4.7VDC	4.6VDC
	SOURCE	1.0VDC	1.0VDC
	DRAIN	7.3VDC	7.3VDC
Q4 (TP3)	GATE 1	0VDC	0VDC
	GATE 2	.42VDC	.42VDC
	SOURCE	.55VDC	.55VDC
	DRAIN	9.7VDC	9.7VDC
Q5 (TP3)	GATE 1	0VDC	0VDC
	GATE 2	.42VDC	.42VDC
	SOURCE	.72VDC	.72VDC
	DRAIN	9.7VDC	9.7VDC

All DC Voltages Measured With H.P.412A

All DC Voltages With Respect to Chassis Ground

* No Signal Input

** 200 u volt Input Signal at 1J3

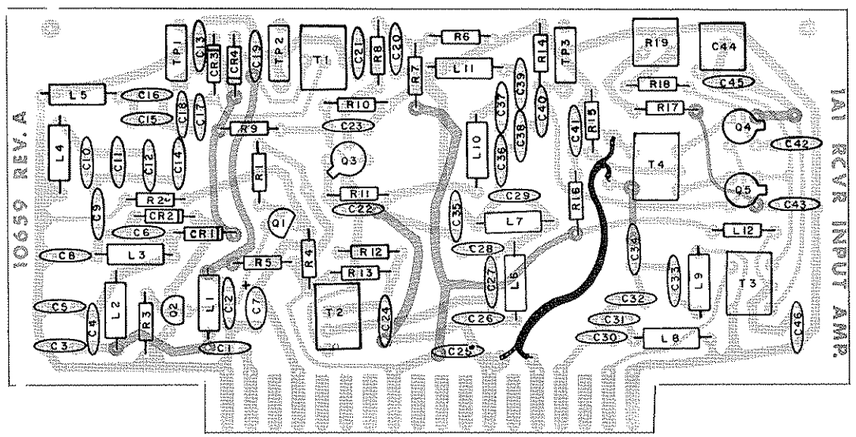
Test Point		AC Voltage And Wave Shape	Oscilloscope Setting
Transistor, FET or IC	Pin No.		
1XA1	D	.46V Rms (Chan.Osc)	
1XA7	E	.3V Rms (Chan. Osc)	
1XA1 ***	U		V=50 millivolts/cm. H= 1 millisecond/cm.
	TP2(Yel)		V=100 millivolt/cm. H= 1 millisecond/cm.
	TP3(Grn)		V= .5 Volt/cm. H= 1 millisecond/cm.
1XA1 ****	Pin B		V= .5 volt/cm. H=1.0 millisecond/cm.

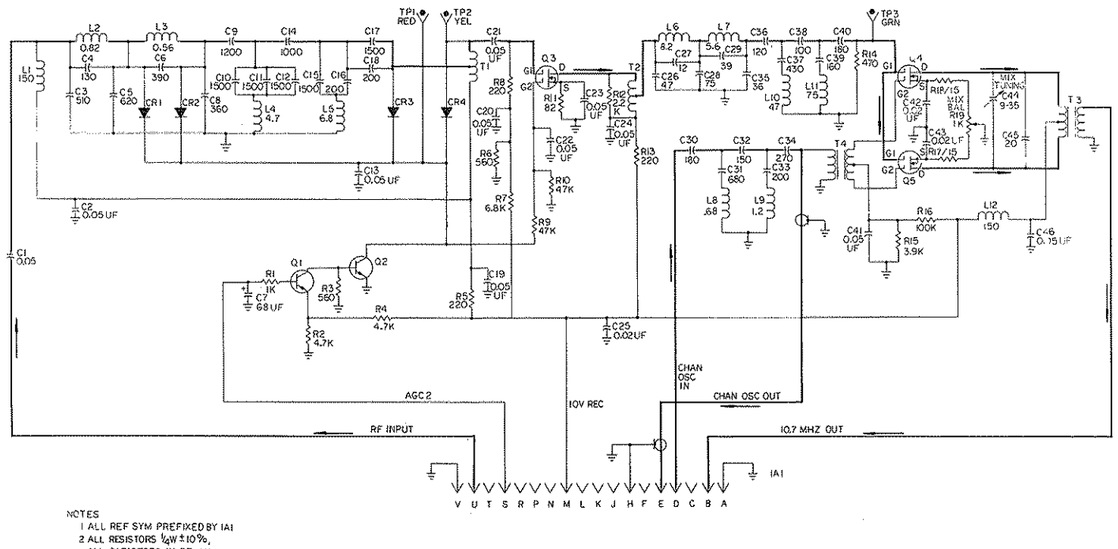
*** 1A4 Removed; No AGC; .02V Rms input
80% Modulation at 1J3

**** 10.7 MHz Desired output and channel oscillator, with 1A4 removed

Function of setting of R19

TABLE 6-1A
RECEIVE MODE 1A1
(R.f. AMP & BAL. MIX) AC & DC
VOLTAGES WITH WAVEFORMS.





NOTES
1 ALL REF SYM PREFIXED BY 1A1
2 ALL RESISTORS ½W ±10%, ALL CAPACITORS IN PF, AND ALL INDUCTORS IN UHY UNLESS OTHERWISE NOTED.

1A1 RF AMP & BAL MIXER

DIODES

CR1,CR2,CR3,CR4-1N914B

TRANSISTORS

Q1-2N4249
Q2-MPS2925
Q3,Q4,Q5-FET 3N141

FIGURE 6-1 1A1 SCHEMATIC DIAGRAM AND PARTS LAYOUT.

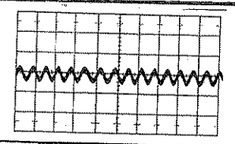
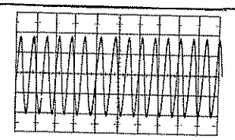
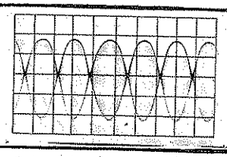
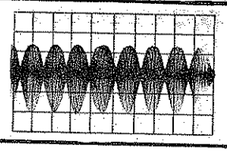
Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB	AM
U1	1		.55
	2		0
	3		2.6
	4		3.4
	5		6.2
	6		5.8
	7		5.0
	8		8.4
	9		1.1
	10		.4
	11		5.6
	12		1.4
	13		.8
	14		2.6
U2	1	(TP1)	2.0
	2		1.3
	3		1.3
	4		2.0

Test Point		DC Vol
Transistor, FET or IC	Pin No.	SSB
U2	5	
	6	
	7	
	8	
	9	
	10	
Q1	EMITTER	
	BASE	
	COLLECTOR	
Q2	EMITTER	
	BASE	
	COLLECTOR	
Q3	EMITTER	
	BASE	
	COLLECTOR	

CHANNEL 1- INPUT MODULATIC
1500Hz 8 Milliv
input modulatic

TABLE 6-2
1A2 (TRANSMIT AUDIO
AND BALANCED MOD.)
AC & DC VOLTAGES WITH
WAVEFORMS

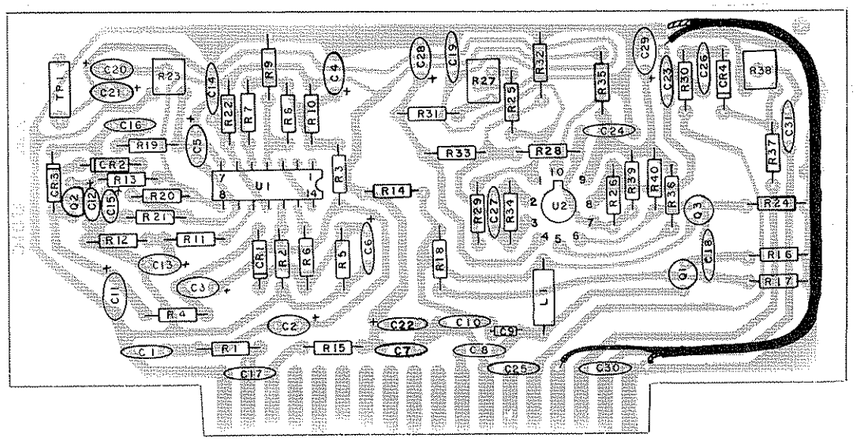
re ±10% AM
1.0
5.7
4.1
4.1
7.4
0
.17
.9
7.7
1.5
2.1
8.4
5.0
5.7
7.7

Test Point		AC Voltage And Wave Shape	Oscilloscope Setting
Transistor, FET or IC	Pin No.		
1XA2*	Pin U		V=.05 Volt/cm. H=1 millisecond/cm.
	TP1(RED)		V=.1 Volt/cm. H=1 millisecond/cm. Function of 1A2R23
1XA2*	Pin J		V=.5 Volt/cm. H=.2 millisecond/cm.
1XA2 **	Pin J		V=.5 Volt/cm. H=.5 millisecond/cm.

*1500 Hz modulation

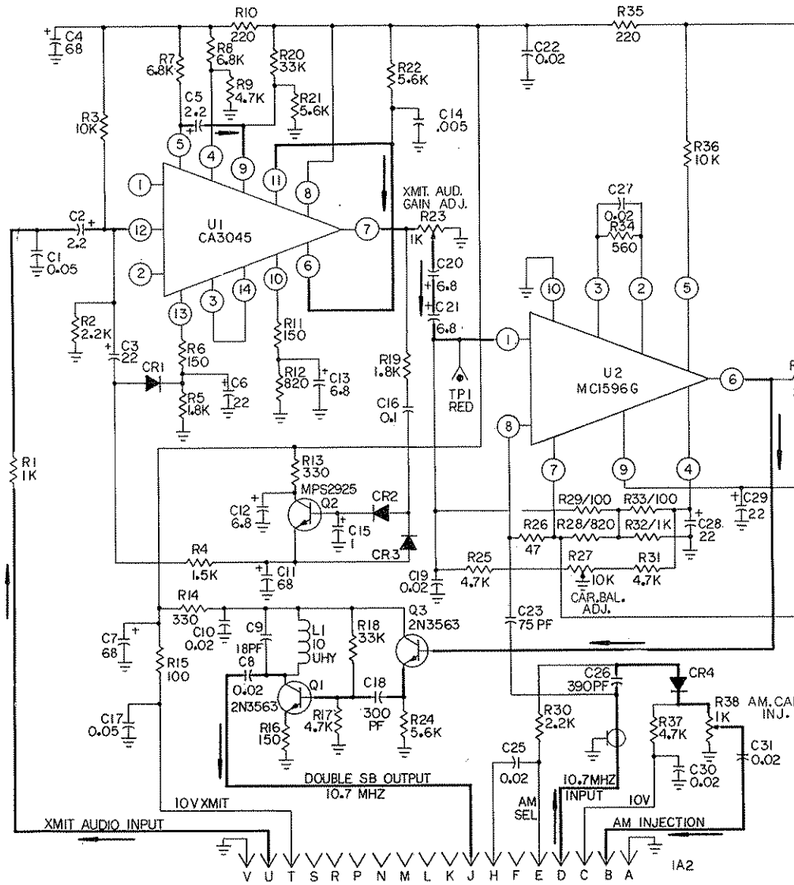
**2300 Hz and 700 Hz modulation, both tones equal .8 millivolts.

1J3 terminated with 50 ohm load



DIODES
CR1-1N914B
CR2,CR3-1N54A
CR4-1N914

TRANSISTORS
Q1,Q2,Q3,Q4-2N3563



NOTES
1. ALL REF SYM PREFIXED BY 1A2
2. ALL RESISTORS 1/4W ±10%
   ALL CAPACITORS IN UF AND,
   ALL INDUCTORS IN UH
   UNLESS OTHERWISE NOTED

FIGURE 6-2 1A2 SCHEMATIC DIAGRAM AND PARTS LAYOUT.

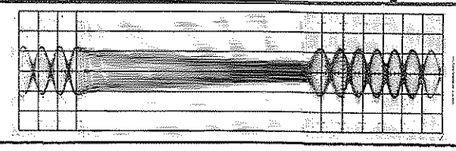
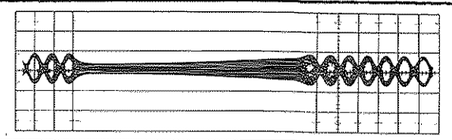
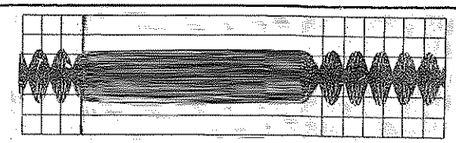
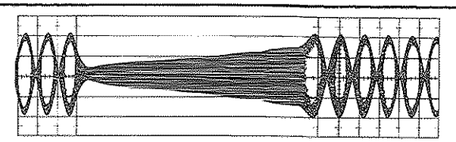
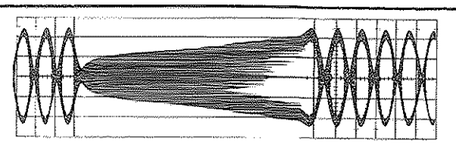
Test Point		DC Voltage ±20%	
Transistor, FET or IC	Pin No.	SSB	AM
Q1	EMITTER	2.7VDC	5.0VDC
	BASE	3.5VDC	5.6VDC
	COLLECTOR	2.7VDC	6.5VDC
Q2	EMITTER	4.8VDC	2.6VDC
	BASE	5.6VDC	3.5VDC
	COLLECTOR	8.3VDC	2.7VDC
Q3	EMITTER	2.5VDC	1.9VDC
	BASE	3.2VDC	2.6VDC
	COLLECTOR	9.7VDC	9.7VDC
Q4	EMITTER	.71	.55VDC
	BASE	1.5VDC	1.3VDC
	COLLECTOR	.55VDC	1.8VDC
(1)	TP1 (RED)	5.6VDC	5.7VDC
(2)	TP2 (GRN)	3.1VDC	2.5VDC
CR3	ANODE (PIN L)	0 VDC	7.1VDC
CR4	ANODE (PIN R)	8.8VDC	0 VDC
RECEIVE MODE-SB AND AM NO INPUT SIGNAL.			

1J3 TERMINATED WITH 50 OHM LOAD

Test Point		DC Vo
Transistor, FET or IC	Pin No.	SSB
Q1	EMITTER	2.7
	BASE	3.5
	COLLECTOR	2.8
Q2	EMITTER	4.9
	BASE	5.6
	COLLECTOR	5.7
Q3	EMITTER	.4
	BASE	1.2
	COLLECTOR	8.3
Q4	EMITTER	2.0
	BASE	2.9
PHOTO	COLLECTOR	8.8
(3)	TP1 (RED)	5.7
(4)	TP2 (GRN)	2.9
CR3	ANODE	0
CR4	ANODE	8.6
TRANSMIT MODE 2 Tone Input 2300 Hz and		

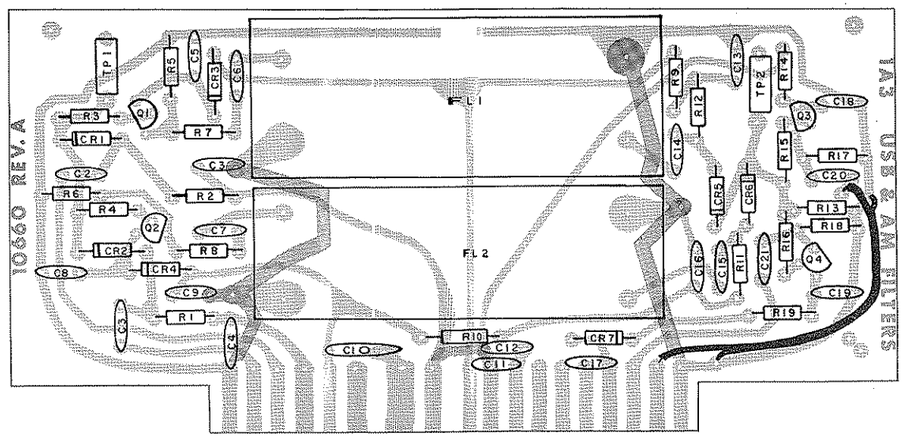
1J3 Terminated with 50 o

TABLE 6-3
1A3 (USB & AM FILTERS)
AC & DC VOLTAGES AND WAVEFORMS

: Point stor, IC	Pin No.	AC Voltage And Wav[illegible]e Shape	Oscilloscope Setting
	TP1		V=.5 Volts/cm. H=1 millisecond/cm.
	TP2		V=.5 Volts/cm. H=1 millisecond/cm.
	TP1		V=.5 Volts/cm. H=.5 millisecond/cm.
	TP2		V=.1 Volts/cm. H=.5 millisecond/cm. Function of setting of 1A2R23
	C		V=.1 Volts/cm. H=.5 millisecond/cm. Function of setting of 1A2R23

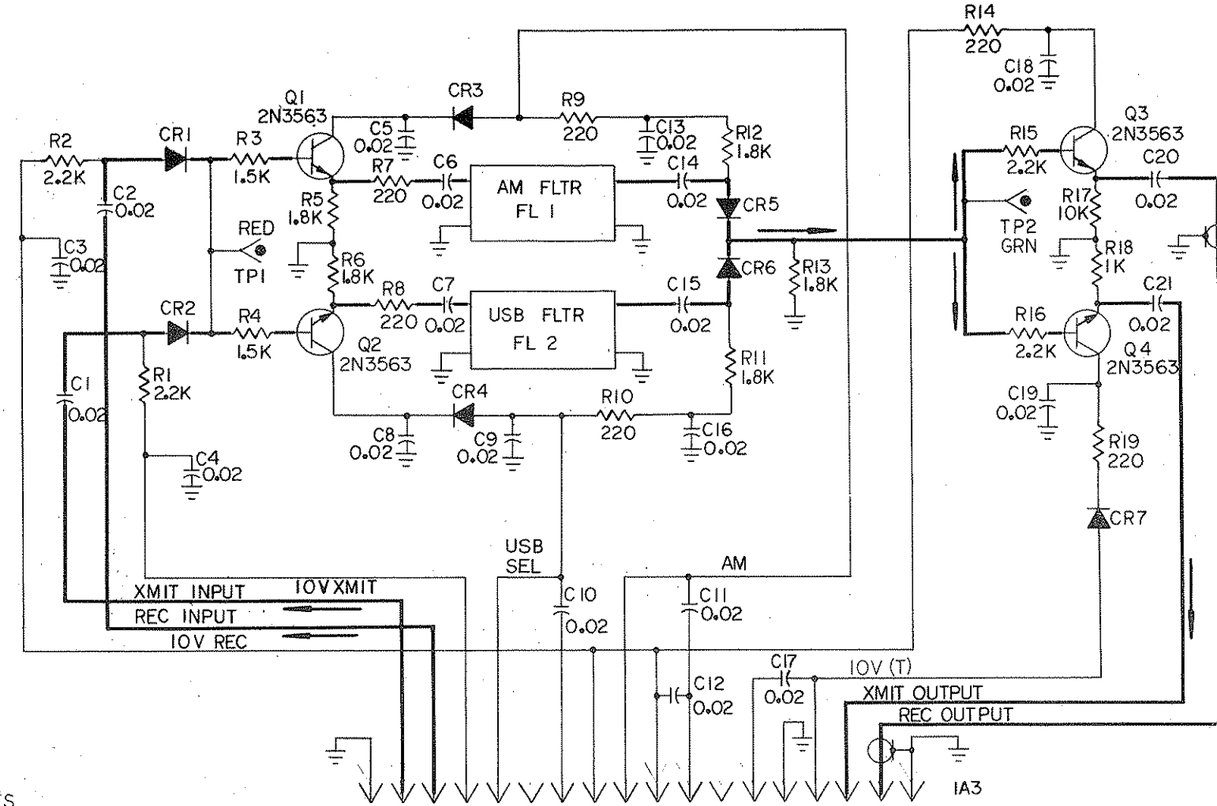
* AM RCVE mode-1A4 re[illegible]oved, No AGC INPUT
.02V RMS 80% mod[illegible]lation at 1J3.

**Transmit mode 2 to[illegible]e input
2300 Hz and 700 [illegible]z



DIODES
CR1, CR2, CR3, CR4
CR5, CR6, CR7-1N914

TRANSISTORS
Q1, Q2, Q3, Q4-2N3563



NOTES
1 ALL REF SYM PREFIXED BY 1A3
2 ALL RESISTORES 1/4W ±10%, AND ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED

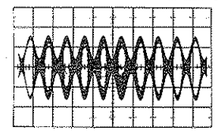
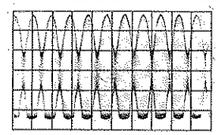
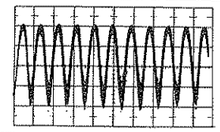
FIGURE 6-3 1A3 SCHEMATIC DIAGRAM AND PARTS LAYOUT

Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB*	AM*
U1	1		7.8VDC
	2		3.4VDC
	3		2.8VDC
	4		3.5VDC
	5		7.8VDC
	6		3.4VDC
	7		2.9VDC
	8	SAME	7.8VDC
	9	AS	1.4VDC
	10	AM	.65VDC
	11		2.7VDC
	12		0V
	13		0V
	14		0V
U2	1		8VDC
	2		3.4VDC
	3		2.8VDC
	4		3.5VDC
	5		8.0VDC
	6		3.5V
	7		2.8V
	8		7.9V
	9		.2V
	10		.19V
	11		9.7V
	12		.95V
	13	SAME AS	.31V
	14	AM	2.8

Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB*	AM*
U3	1	9.2	9VDC
	2	3.5	2.6VDC
	3	2.8	1.9VDC
	4	3.4	2.6VDC
	5	5.6	1.9VDC
	6	.19	.19VDC
	7	0	0V
	8	9.6	9.7VDC
	9	1.1	1.1V
	10	.50	.47V
	11	2.8	1.9
	12	0	0V
	13	0	0V
	14	9.6	9.7V
Q1	EMITTER		.29
	BASE		.9V
	COLLECTOR	SAME	5.7
Q2	EMITTER	AS	.29
	BASE	AM	1.1V
	COLLECTOR		.39
Q3	EMITTER		0
	BASE		.26
Q3**	COLLECTOR		0
Q4	EMITTER	SAME	0
	BASE	AS AM	.19V
	COLLECTOR		.8V
	TP1 (RED)		.95V
	TP2 (GRN)		.2V

*DC Voltage measurements taken with no AC input and 1A3 removed - 1A4 on card extender.

**Measured with Simpson 260 VOM.

Test Point		AC Voltage And Waveform	Oscilloscope Setting
Transistor, FET or IC	Pin No.		
*	TP1 (RED)		V=.1 Volt/cm. H=1 millisecond/cm.
**	C31-CR3 JUNCTION		V=.5 Volts/cm. H=1 millisecond/cm.
1XA4 ***	PIN J		V=.05 Volt/cm. H=1 millisecond/cm.

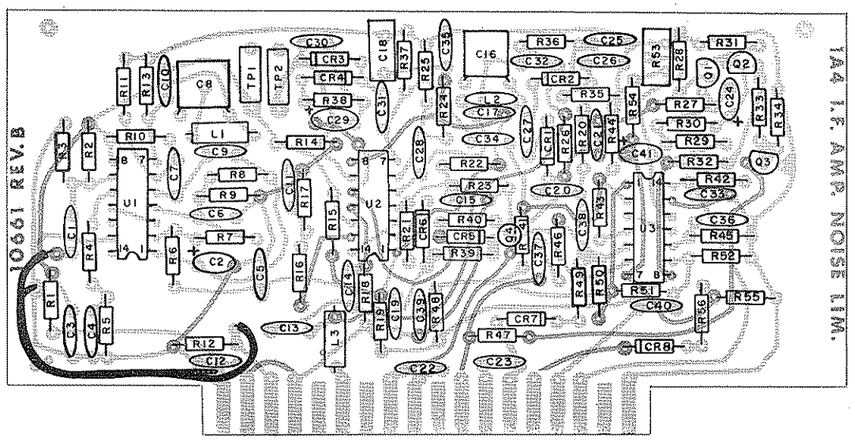
AC Voltage measurements taken with 1A3 in Radio. 1A4 TP2 shorted to ground to disable AGC. Signal generator input to 1J3. 1A4 in module shield - Do not use extender card for checking AC gain.

*Input signal 200 microvolts. 80% 1 kHz modulation.

**Input signal 20 microvolts 80% 1 kHz modulation.

***Input signal 2 microvolts 80% 1 kHz modulation.

TABLE 6-4
1A4 AC & DC VOLTAGES
WITH WAVEFORMS



DIODES

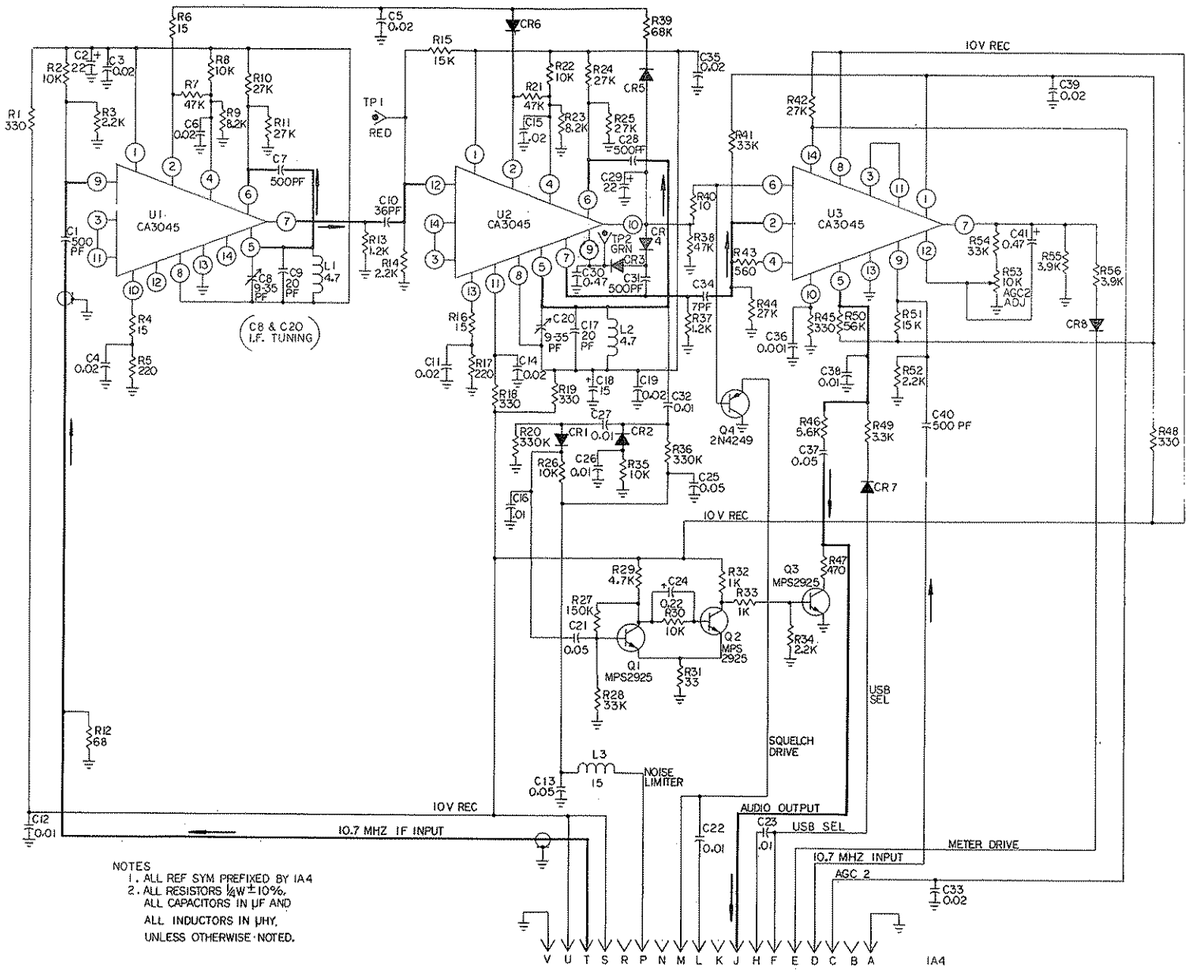
CR1,CR2,CR3,CR4- 1N54A
CR5,CR6,CR7,CR8- 1N914

TRANSISTORS

Q1,Q2,Q3- MPS2925
Q4- 2N4249

INTEGRATED CIRCUITS

U1,U2,U3 - CA3045



NOTES
1. ALL REF SYM PREFIXED BY 1A4
2. ALL RESISTORS ½W ±10%, ALL CAPACITORS IN µF AND ALL INDUCTORS IN µHY, UNLESS OTHERWISE NOTED.

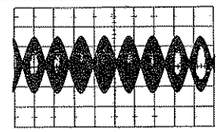
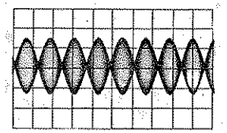
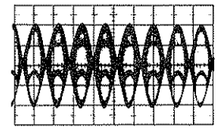
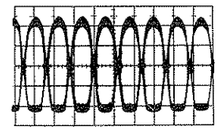
FIGURE 6-4. 1A4 SCHEMATIC DIAGRAM AND PARTS LAYOUT

Test Point		DC Voltage ±10%	
Transistor FET or IC	Pin No.	SSB	AM
Q1	GATE 1	0	
	GATE 2	4.5	
*	SOURCE	.22	
	DRAIN	8.0	SAME
Q2	GATE 1	0	AS
	GATE 2	4.5	SSB
*	SOURCE	.47	
	DRAIN	8.0	
Q3	EMITTER	0	0
	BASE	.7	.08
	COLLECTOR	0	1
Q4	EMITTER	0	0
	BASE	0	.74
	COLLECTOR	.7V	.08
Q5	EMITTER	0	0
	BASE	.7	.78
	COLLECTOR	0	.11
Q6	EMITTER	0	0
	BASE	0	.11
	COLLECTOR	9.3	9.2

*Function of setting of R6
1J3 terminated with 50 ohm load

Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB	AM
Q7	EMITTER	8.5	8.5
	BASE	9.3	9.2
	COLLECTOR	9.7	9.7
**Q8	GATE	0	
	DRAIN	0	
	SOURCE	.17	
Q9	EMITTER	.35	
	BASE	1.1	
	COLLECTOR	5.0	
Q10	EMITTER	.48	SAME AS
	BASE	1.3	SSB
	COLLECTOR	3.7	
Q11	EMITTER	.28	
	BASE	.93	
	COLLECTOR	8.5	
	TP1(RED)	0	
	TP2(YEL)	5.0	
1XA5	PIN U	Waveform 1	
1XA5	PIN B	Waveform 4	

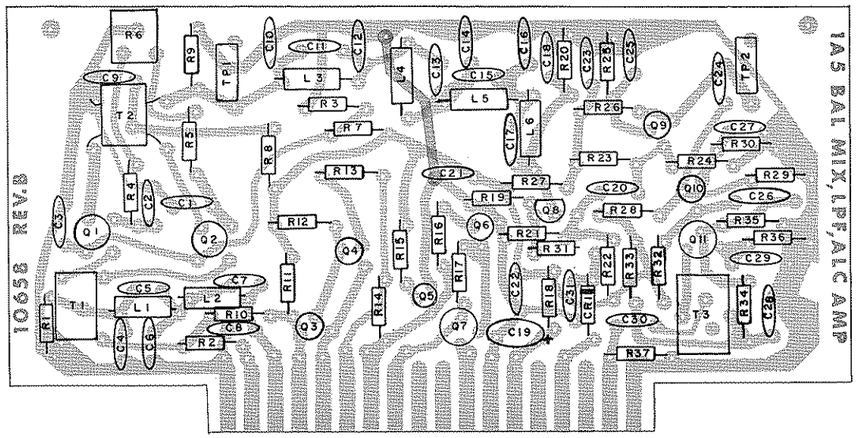
**No ALC input from PA.

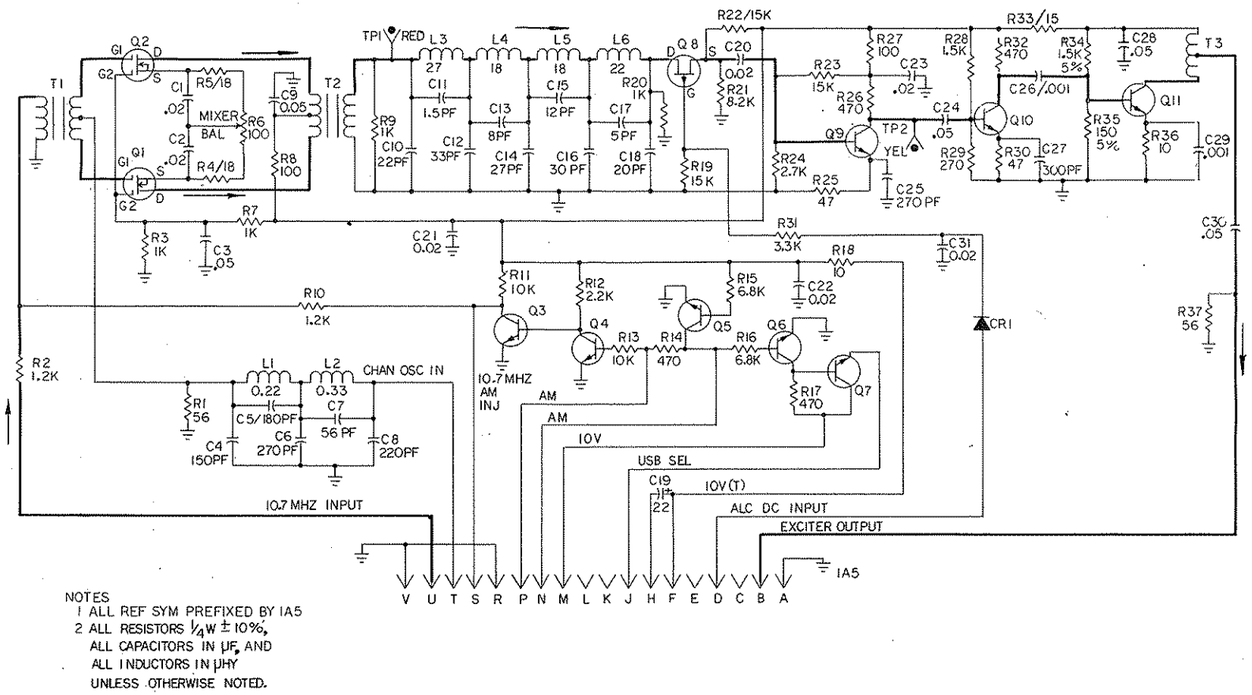
Test Point		A.C. Voltage And Waveform	Oscilloscope Setting
Transistor, FET or IC	Pin No.		
1XA5 *	PIN U		V=.2 Volt/cm. H=.5 millisecond/cm.
*	TP1 (RED)		V=.5 Volt/cm. H=.5 millisecond/cm.
*	TP2 (YEL)		V=.2 Volt/cm. H=.5 millisecond/cm.
1XA5 *	PIN B		V= 1 Volt/cm. H=.5 millisecond/cm.

Waveforms taken on channel 4 A3J
2300 Hz and 700 Hz modulation,
.8 millivolts audio input.

*Function of setting of 1A2R23

TABLE 6-5 TRANSMIT MODE
1A5 (BAL.MIX.,LPF & ALC AMP)
AC & DC VOLTAGES AND WAVEFORMS





NOTES
1 ALL REF SYM PREFIXED BY IA5
2 ALL RESISTORS 1/4W ±10%, ALL CAPACITORS IN μF, AND ALL INDUCTORS IN μHY UNLESS OTHERWISE NOTED.

DIODES

CR1- 1N914

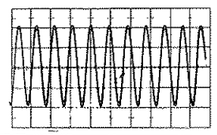
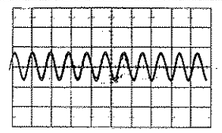
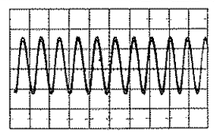
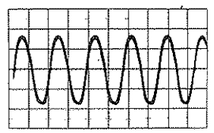
TRANSISTORS

Q1,Q2- FET 3N141
Q3,Q4,Q5,Q6- 2N3646
Q7,Q11- 2N3643
Q8- FET 2N5461
Q9,Q10- 2N3563

FIGURE 6-5 1A5 SCHEMATIC DIAGRAM AND PARTS LAYOUT

Test Point		DC Voltage ±20%	
Transistor, FET or IC	Pin No.	SSB	AM
U1	1		4.2
	2		1.0
TP2	3		1.0
	4		9.7V
	5		.07
	6		.07
	7		9.7V
	8	SAME AS	9.6
	9	AM	9.6
TP1	10		4.9
	11		2.0
	12		0
Q1	EMITTER		7.7
	BASE		8.3
	COLLECTOR		9.6
Q2	EMITTER		.66
	BASE		1.4
	COLLECTOR		.7

Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB	AM
Q3	EMITTER		.18
	BASE		.67
	COLLECTOR		9.6
Q4	EMITTER		.66
	BASE	SAME AS	.1
	COLLECTOR	AM	2.0
Q5	EMITTER		13.
	BASE		14
	COLLECTOR		26.5
Q6	EMITTER		13
	BASE		13.5
	COLLECTOR		0

Test Point		AC Voltage And Waveform	Oscilloscope Setting
Transistor, FET or IC	Pin No.		
	TP1 (YEL) *		V=.1 Volt/cm. H=1 millisecond/cm.
	TP2 (RED)		V=.05 Volt/cm. H=1 millisecond/cm.
1XA6	PIN F		V=5 Volts/cm. H=1 millisecond/cm.
1XA6	PIN B		V=10 Volts/cm. H=.5 millisecond/cm.

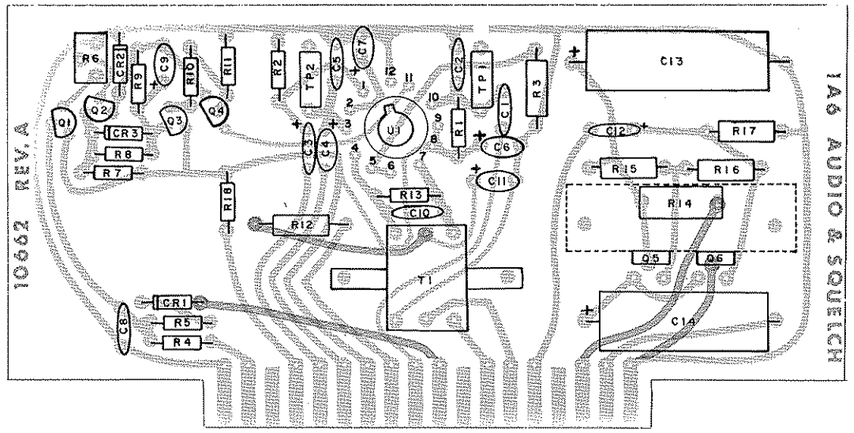
*Function of gain of 1A1, 1A3, 1A4
Typical .2V to .5V PP

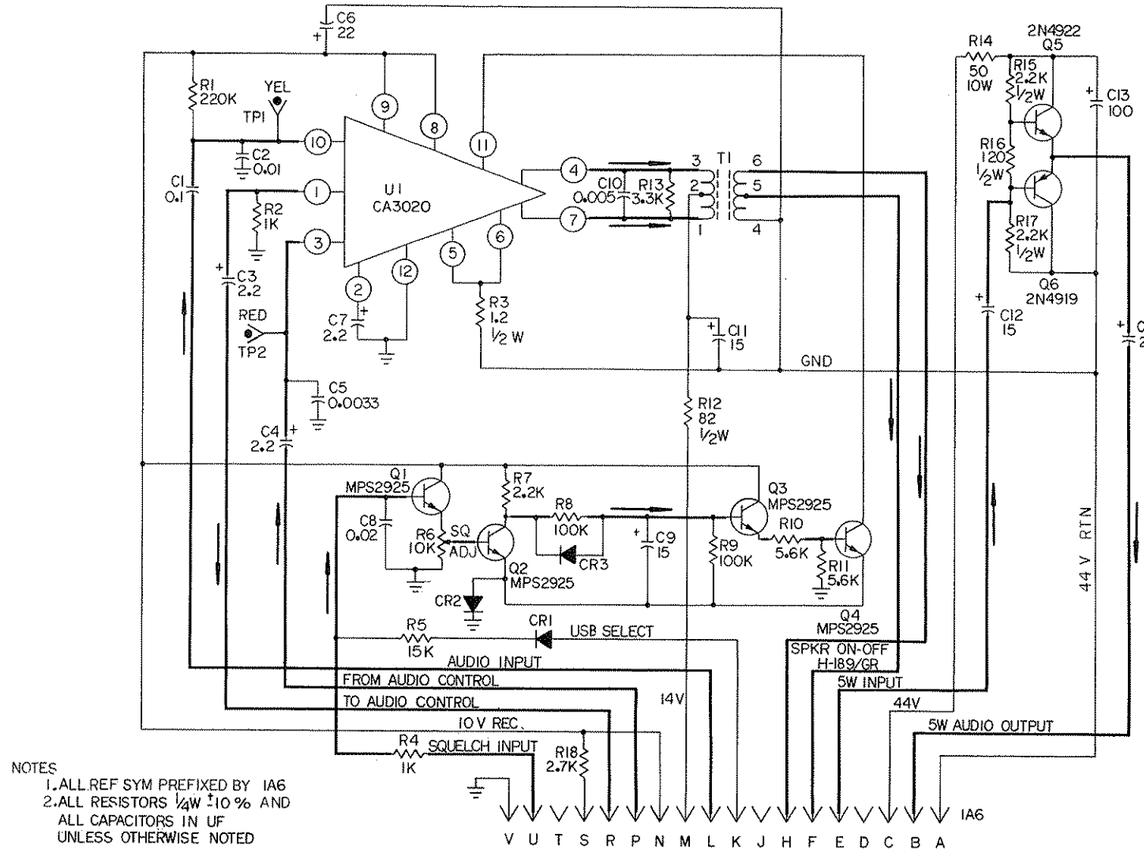
TABLE 6-6
AUDIO AND SQUELCH
1A6 AC & DC VOLTAGES AND WAVEFORMS

CAUTION

Do not operate 1A6 on extender card for prolonged periods to avoid thermal runaway and possible damage to 1A6 Q5 and 1A6 Q6

All measurements with 5 microvolts input to receiver (1J3) delivering 5 watts to 16 ohm speaker (8.9 RMS across 16 ohms)





NOTES
1. ALL REF SYM PREFIXED BY 1A6
2. ALL RESISTORS 1/4W ±10% AND ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED

DIODES
CR1,CR2,CR3- 1N914

TRANSISTORS
Q1,Q2,Q3,Q4- MPS2925
Q5- 2N4922
Q6- 2N4919

INTEGRATED CIRCUITS
U1- CA3020

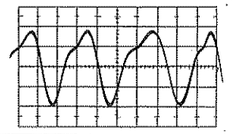
FIGURE 6-6 1A6 SCHEMATIC DIAGRAM AND PARTS LAYOUT

Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB	AM
Q1	EMITTER	3.4	
	BASE	2.7	
	COLLECTOR	5.3	
Q2	EMITTER	2.7	
	BASE	3.4	0V
	COLLECTOR	5.3	
Q3	EMITTER	1.9	
	BASE	2.6	
	COLLECTOR	7.7	
CR1-CR6	CATHODE	4.0	

1A7A1 DC VOLTAGES TRANSMIT AND RECEIVE

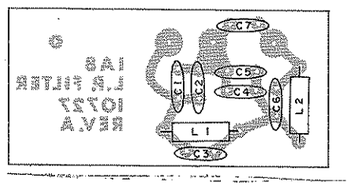
Test Point		DC Voltage ±10%	
Transistor, FET or IC	Pin No.	SSB	AM
U1	1	8.3	
	2	4.2	
	3	3.5	
	4	4.1	
	5	6.0	SAME AS
	6	3.2	SSB
	7	2.5	
	8	9.8	
	9	6.0	
	10	5.3	
	11	8.4	
	12	2.8	
	13	2.1	
	14	3.5	

1A7A2 DC Voltages

Test Point		AC Voltage And Waveform	Oscilloscope Setting
Transistor, FET or IC	Pin No.		
1XA7	PIN K		V=.5 Volts/cm.
1XA7	PIN D *		H-.02 microsecond/cm.

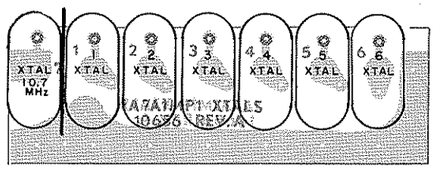
Channel 4 - Oscillator frequency 14.4875 MHz.

*The 10.7 MHz output on pin D should be approximately 50 millivolts during SSB receive mode and rises to approximately .5 volt peak to peak during transmit on AME or SSB.

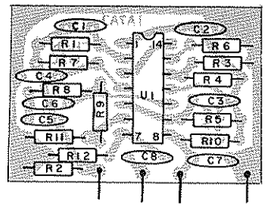


1A8 Parts Layout

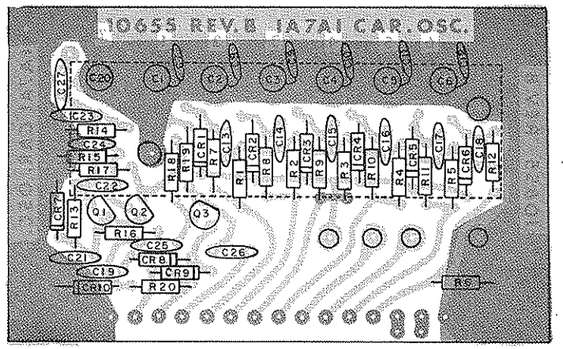
TABLE 6-7
OSCILLATOR OVEN ASSEMBLY
1A7 AC & DC Voltages and Waveforms
1A8 Parts Layout (Low Pass Filter)



1A7A1MP1



1A7A2



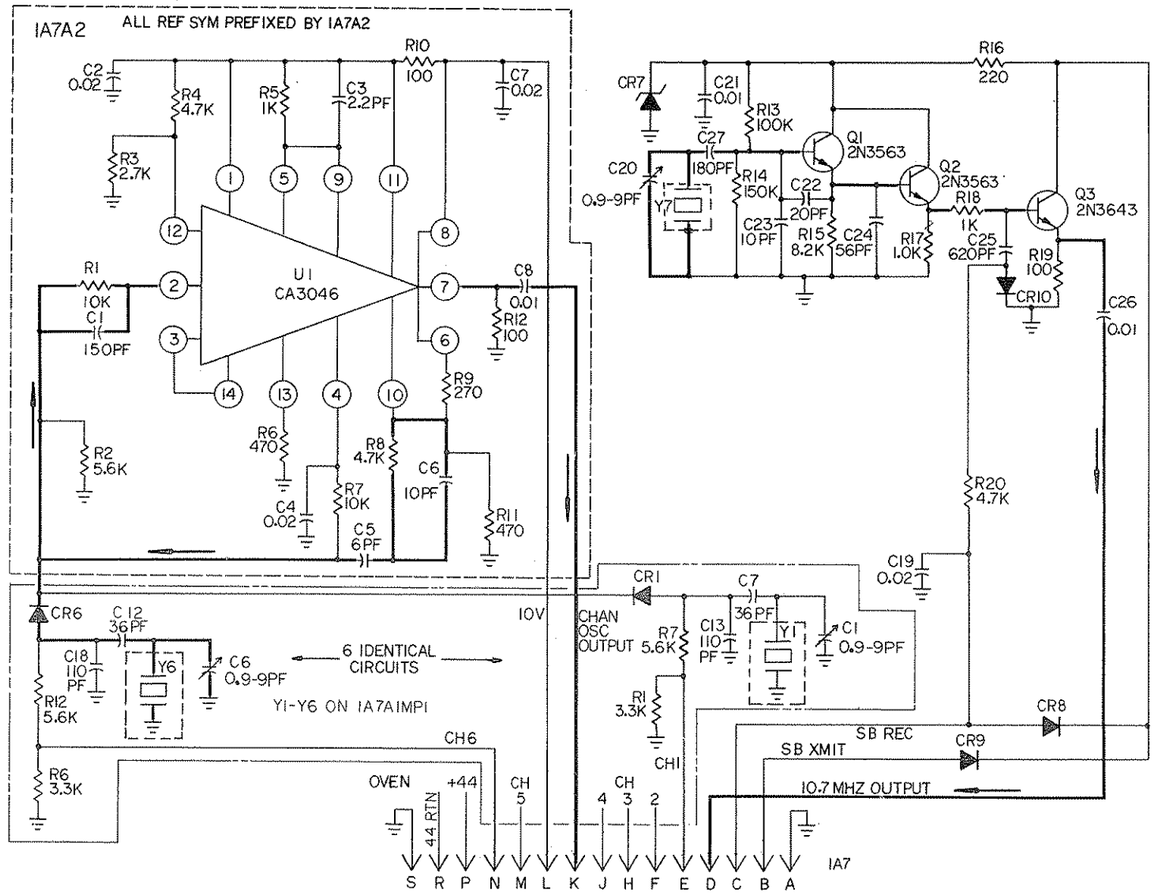
1A7A1

1A7A1

DIODES
CR1,CR2,CR3,CR4
CR5,CR6,CR8,CR9- 1N914
CR7 ----- Diode, Zener 5.1V
1N5231B
CR10----- Diode, Silicon A23

TRANSISTORS
Q1,Q2 -----2N3563
Q3 --------2N3643

1A7A2
U1 ------- CA3046



NOTES.
1. ALL REF. SYM. PREFIXED BY 1A7A1
2. ALL RESISTORS 1/4W ± 10% AND ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED
3. 1A7A1, 1A7A1MP1 & 1A7A2 ARE ENCLOSED IN OVEN

FIGURE 6-7. 1A7 SCHEMATIC DIAGRAM AND PARTS LAYOUT.

Test Point		Operating Voltage		Measurement
Transistor, FET or IC	Pin No.	26.4	13.2V	Conditions ±20%
Q1,Q2	COLLECTOR	26.4	13.2	*
Q1	BASE	-2	-2.2	*
Q2	BASE	-2	-2.2	*
Q3,Q4	COLLECTOR	26.4	13.2	*
Q3	BASE	-2	-2.2	*
Q4	BASE	-2	-2.2	*
TB-A	TERMINAL 7	44	44	***
2A2A1R1-C2	JUNCTION	14	15	***
Q5	BASE	10.5	10.5	***
	EMITTER	10	10	***
	COLLECTOR	14	15	***
Q1	BASE	2.6V Rms	2.5V Rms	**
Q2	BASE	2.6V Rms	2.5V Rms	**
Q3	BASE	3.6V Rms	3.0V Rms	**
Q4	BASE	3.6V Rms	3.0V Rms	**

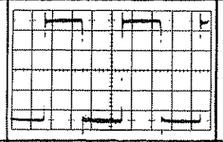
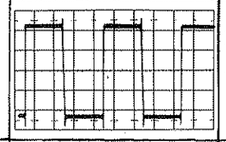
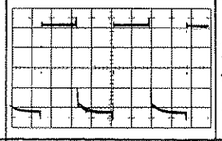
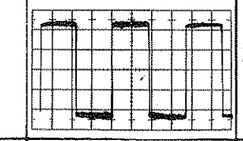
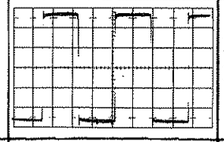
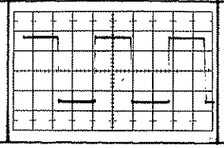
* Measured with respect to (-) ships power.

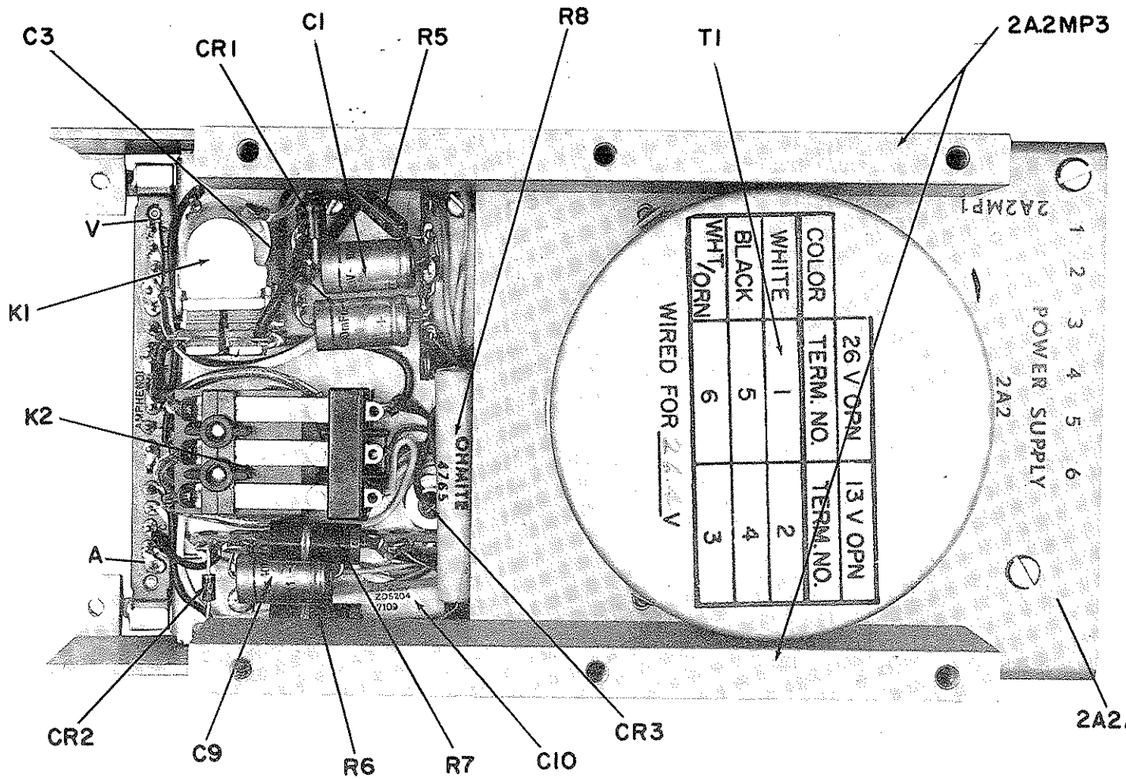
** K2 energized (XMIT MODW) PA delivering 50 watts output 80% modulation AM, measured with respect to (-) ships power.

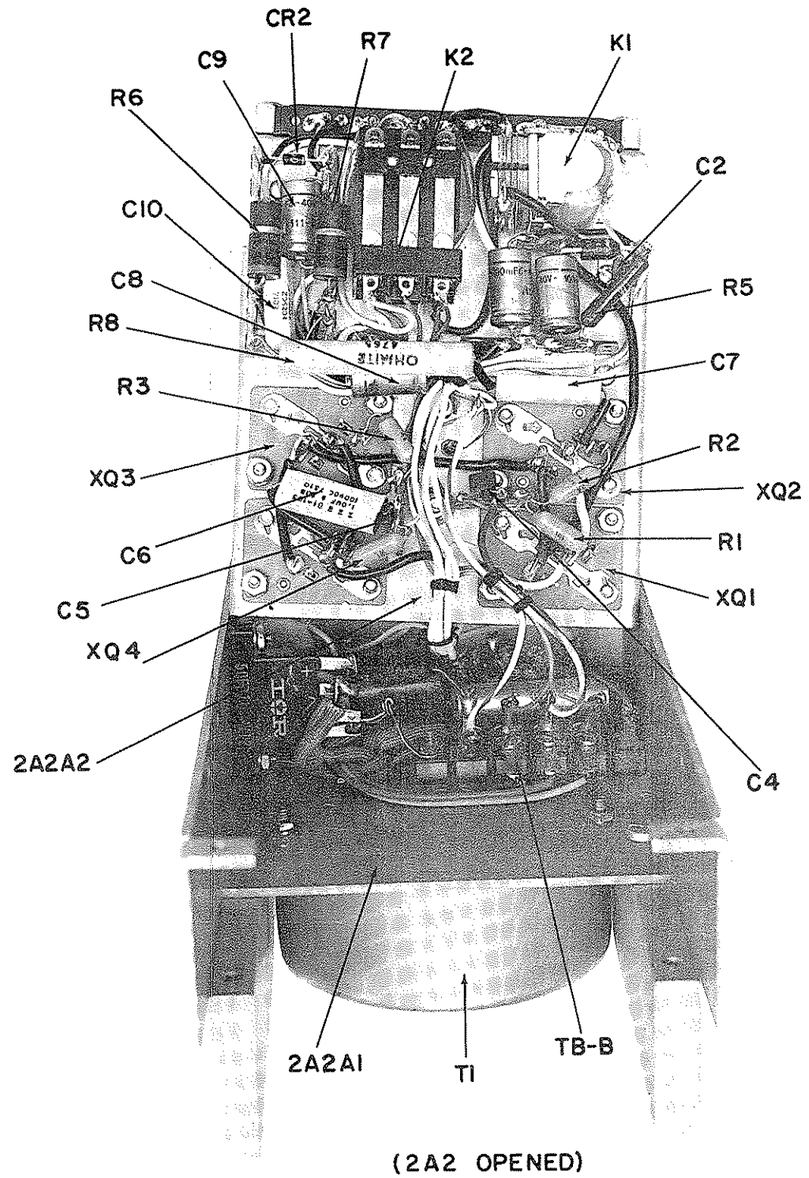
*** Measured with respect to chassis ground.

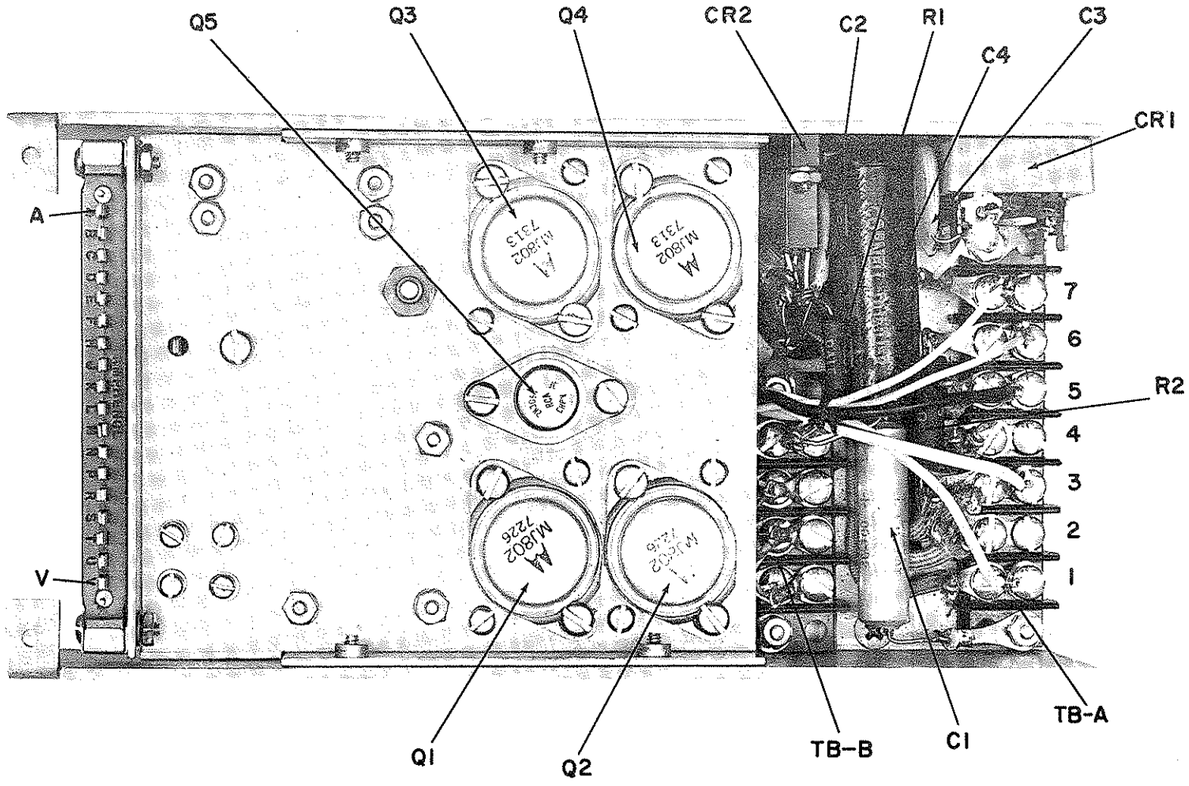
All measurements using VTVM or VOM.

TABLE 6-9
POWER SUPPLY
2A2 AC & DC Voltages and Waveforms

Test Point		Operating Voltage	A.C. Voltage And Waveform	Measurement Conditions	Oscilloscope Settings
Transistor, FET or IC	Pin No.				
Q1,Q2	COLLECTOR	26.4V		Load 50 watts average 80% mod.	V=10 Volts/cm. H=.2 milli-seconds/cm.
Q1	BASE	26.4V		Load REC/ XMTR	V=2 volts/cm. H=.2 milli-seconds/cm.
Q1	BASE	26.4V		Load 50 watts avg. 80% mod.	V=2 volts/cm. H=.2 milli-seconds/cm.
CR1	SECONDARY WINDING	26.4V		Load REC/XMTR	V=10 Volts/cm. H=.2 milli-seconds/cm.
Q1,Q2	COLLECTOR			Load REC/XMTR	V=10 Volts/cm H=.2 milli-seconds/cm.
CR2	SECONDARY WINDING			Load REC/XMTR	V=5 volts/cm. H=.2 milli-seconds/cm.







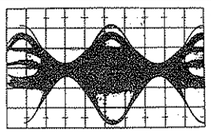
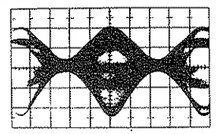
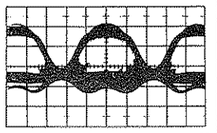
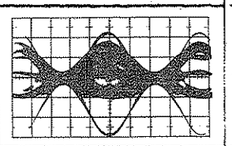
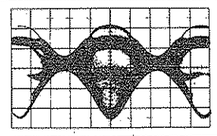
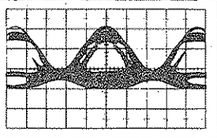
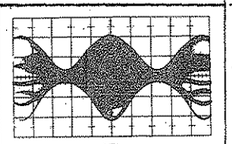
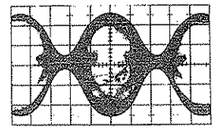
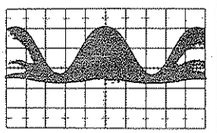
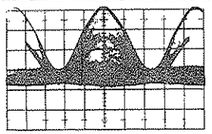
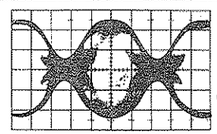
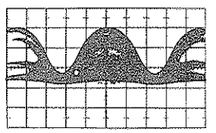
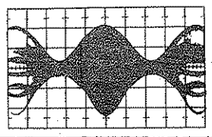
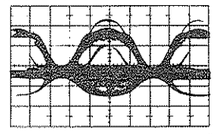
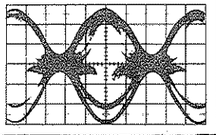
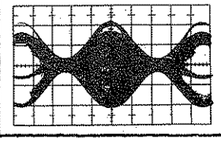
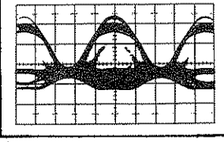
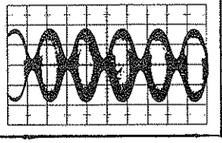
(2A2 OPENED)

FIGURE 6-10 2A2
POWER SUPPLY PARTS LAYOUT

Test Point Transistor, FET or IC	Pin No.	DC Voltage ±20% With Drive	No Drive
Q1	EMITTER	5.6V	5.5V
	BASE	6.2	6.2V
	COLLECTOR	23.5	23V
Q2	EMITTER	.11	32mv
	BASE	.60	0.61V
	COLLECTOR	40	40V
Q3	EMITTER	.11	30mv
	BASE	.59	0.61V
	COLLECTOR	40	40V
Q4,Q8,Q9	BASE	.42	0.52V
	COLLECTOR	40	41V
Q5,Q6,Q7	BASE	.4	0.52V
	COLLECTOR	40	41V
Q4	EMITTER	.48	17mv
Q5	EMITTER	.42	24mv
Q6	EMITTER	.42	18mv
Q7	EMITTER	.4	15mv
Q8	EMITTER	.68	19mv
Q9	EMITTER	.52	20mv

All measurements made with HP-412A
All voltages measured with respect to chassis ground. With drive, PA delivering 40 watts avg. with 80% modulation.

A.C. Voltage Measurements

Test Point	A.C. Voltage	Oscilloscope Setting	Test Point	A.C. Voltage	Oscilloscope Setting	Test Point	A.C. Voltage	Oscilloscope Setting
Q1 Emitter		V=.2 Volt/cm.	Q5,Q6,Q7 Base		V=2 Volt/cm.	Q17 Emitter		V=1 Volt/cm.
Q1 Base		V=.2 Volt/cm.	Q4,Q8,Q9 Base		V=2 Volt/cm.	Q4 Emitter		V=1 Volt/cm.
Q1 Collector		V=2 Volt/cm.	Q5,Q6,Q7 Collector		V=10 Volt/cm.	Q8 Emitter		V=1 Volt/cm.
Q2 & Q3 Emitter		V=.2 Volt/cm.	Q4,Q8,Q9 Collector		V=10 Volt/cm.	Q9 Emitter		V=1 Volt/cm.
Q2 & Q3 Base		V=.5 Volt/cm.	Q5 Emitter		V=1 Volt/cm.	2XA2 Pin J		V=.2 Volt/cm.
Q2 & Q3 Collector		V=5 Volt/cm.	Q6 Emitter		V=1 Volt/cm.	2XA2 Pin B		V=50 Volt/cm. H=.5 milli-second/cm.

TEKTRONIX 543B Oscilloscope used. Horizontal sweep adjusted to .2 milliseconds/cm. unless otherwise specified.

All waveforms taken at 2,670 kHz driving PA with signal generator with 1 kHz 80% AM modulation. 2A3 test cable from maintenance kit used. PA output terminated with 50 ohm noninductive load.

NOTE- Waveforms will vary from unit to unit.

TABLE 6-10
2A3 125 watt P.A.
AC & DC Voltages and Waveshapes

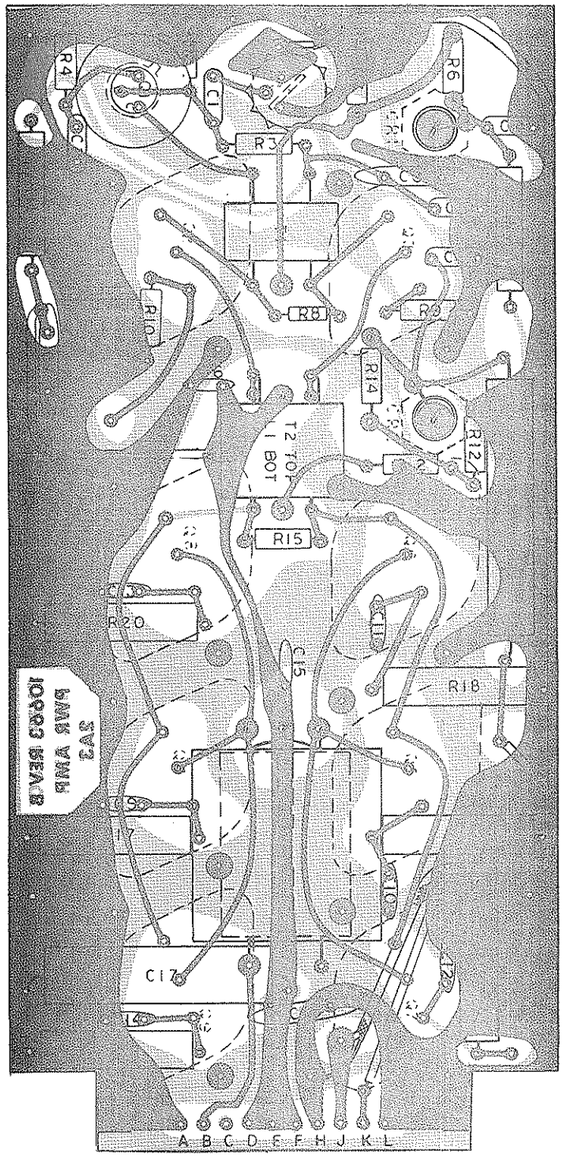


FIGURE 6-11
2A3-125 WATT P.A. PARTS LAYOUT
(BOTTOM VIEW)

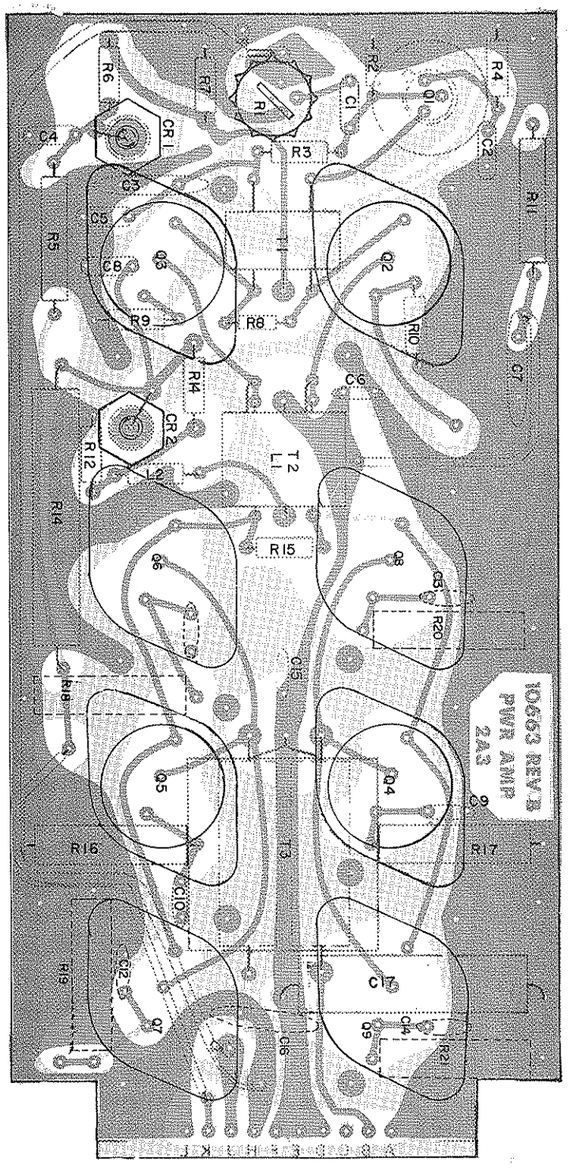


FIGURE 6-11A
2A3 125 WATT P.A. PARTS LAYOUT
(TOP VIEW)

Test Point		DC Voltage ±20%	
Transistor, FET or IC	Pin No.	With Drive	No Drive
Q1	EMITTER	5.5V	5.5V
	BASE	6.0V	6.2V
	COLLECTOR	22.5V	22.5V
Q2	EMITTER	.075V	.018V
	BASE	59V	.6V
	COLLECTOR	40V	40V
Q3	EMITTER	.08V	.023V
	BASE	59V	.6V
	COLLECTOR	40V	40V
Q4,Q5	BASE	.5V	.55V
	COLLECTOR	40V	40V
Q4	EMITTER	.8V	.028V
Q5	EMITTER	.95V	.031V
CR1	ANODE	.63V	.63V
CR2	ANODE	.73V	.73V

PA Output terminated with 50 ohm noninductive load. Delivering 20 watts average power AM with 1 kHz 80% modulation. PA driven with an HP606 Signal generator at 2.670 MHz. DC measurements taken with HP412A VTVM.

NOTE: Refer to Table 6-10 for AC Waveforms.

TABLE 6-11
2A3 (50 WATT PA)
AC & DC VOLTAGES

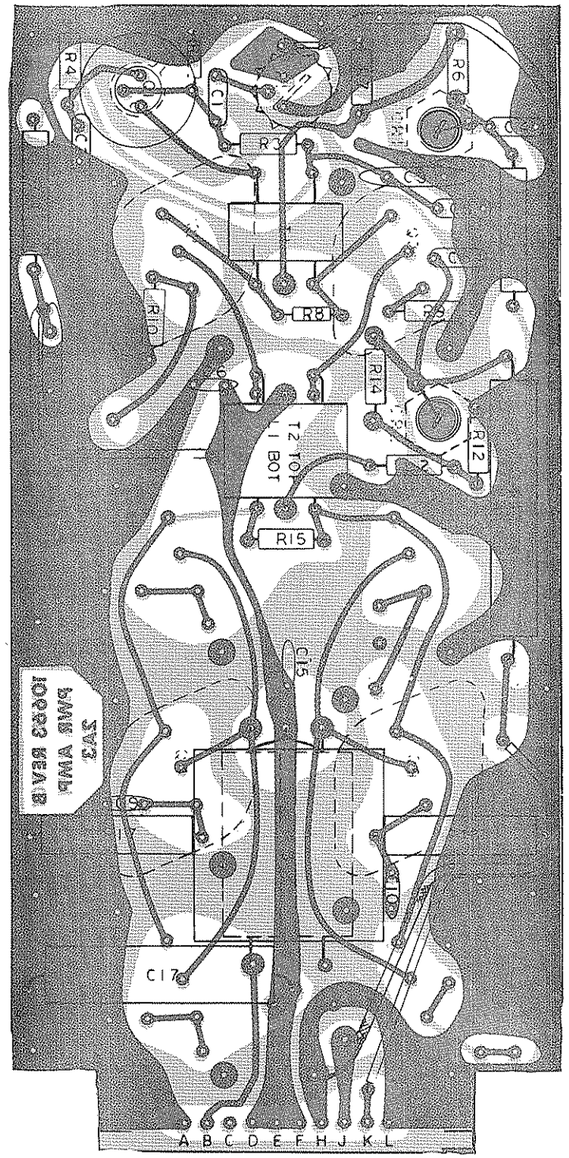


FIGURE 6-12
2A3 50 WATT P.A. PARTS LAYOUT
(BOTTOM VIEW)

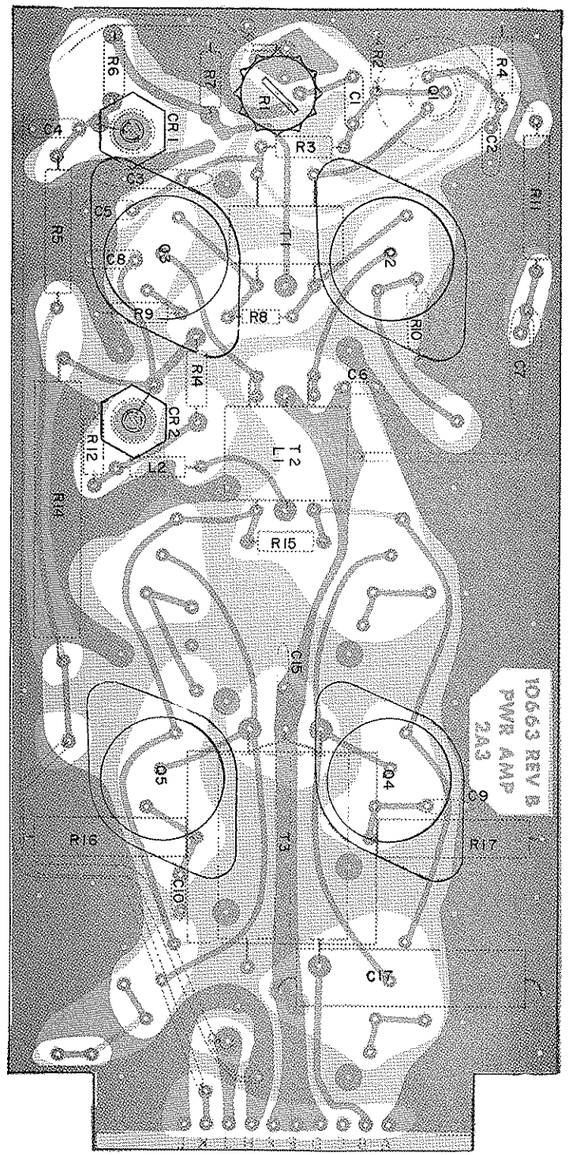


FIGURE 6-12A
2A3 50 WATT P.A. PARTS LAYOUT
(TOP VIEW)

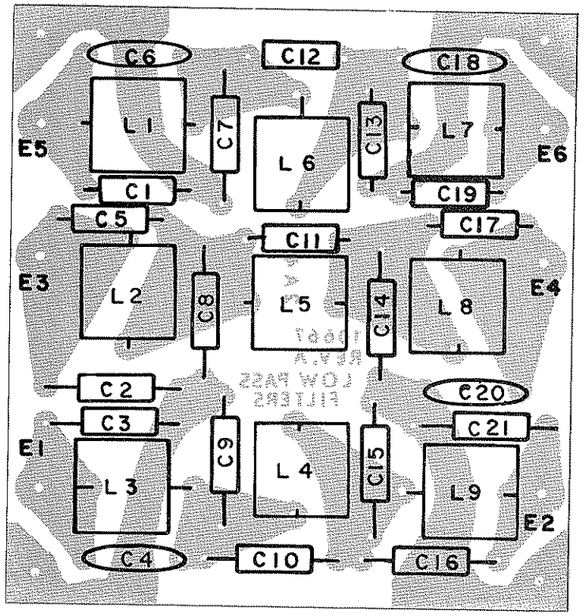
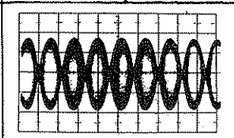
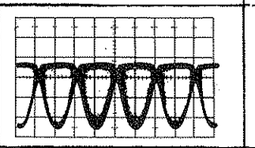


FIGURE 6-13
2A4 PARTS LAYOUT

Test Point		TRANSMIT MODE DC Voltage ±10%		RECEIVE MODE Signal Voltage & Waveform	
Transistor, FET or IC	Pin No.	SSB	AM	SSB	AM
CR3	CATHODE	0	0		
CR4	CATHODE	0	0		
Q1	GATE	0	0		
	SOURCE	3.5VDC	3.5VDC		
	DRAIN	8.3VDC	8.3VDC		
Q2	GATE	0	0		
	SOURCE	3.5VDC	3.5VDC		
	DRAIN	8.5VDC	9.0VDC	0	
Q3	EMITTER	0	0	0	
	BASE	0	0	.7VDC	
	COLLECTOR	8.5VDC	9.0VDC	0	
Q4	EMITTER	8.5VDC	8.5VDC	7.3VDC	
	BASE	8.5VDC	9.0VDC	6.6VDC	
	COLLECTOR	0	0	7.3VDC	
CR5	CATHODE	0	0	0	
2A5	PIN 5	0	0		
CR4	ANODE			2 tone mod. 2300Hz & 700Hz SSB	V=2 volts/cm. H=.5 milli-second/cm. 1K
CR3	ANODE			AM 1 kHz mod.	V=5 volts/cm. H=.5 milli-second/cm.

DC Voltage measurements made with no AC signal.
Waveforms measured in transmit mode with R3 and R4 adjusted for normal operation with 125 watt module.

TABLE 6-12 2A5 (ALC DET & AMP)
AC & DC VOLTAGES AND WAVEFORMS

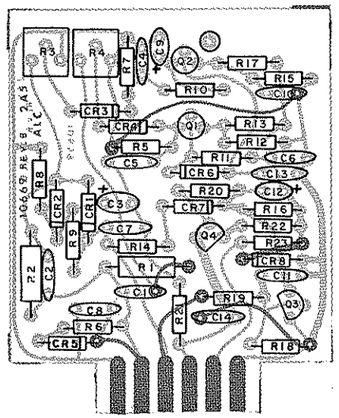


FIGURE 6-14
2A5 ALC DETECTOR AND AMPLIFIER
PARTS LAYOUT

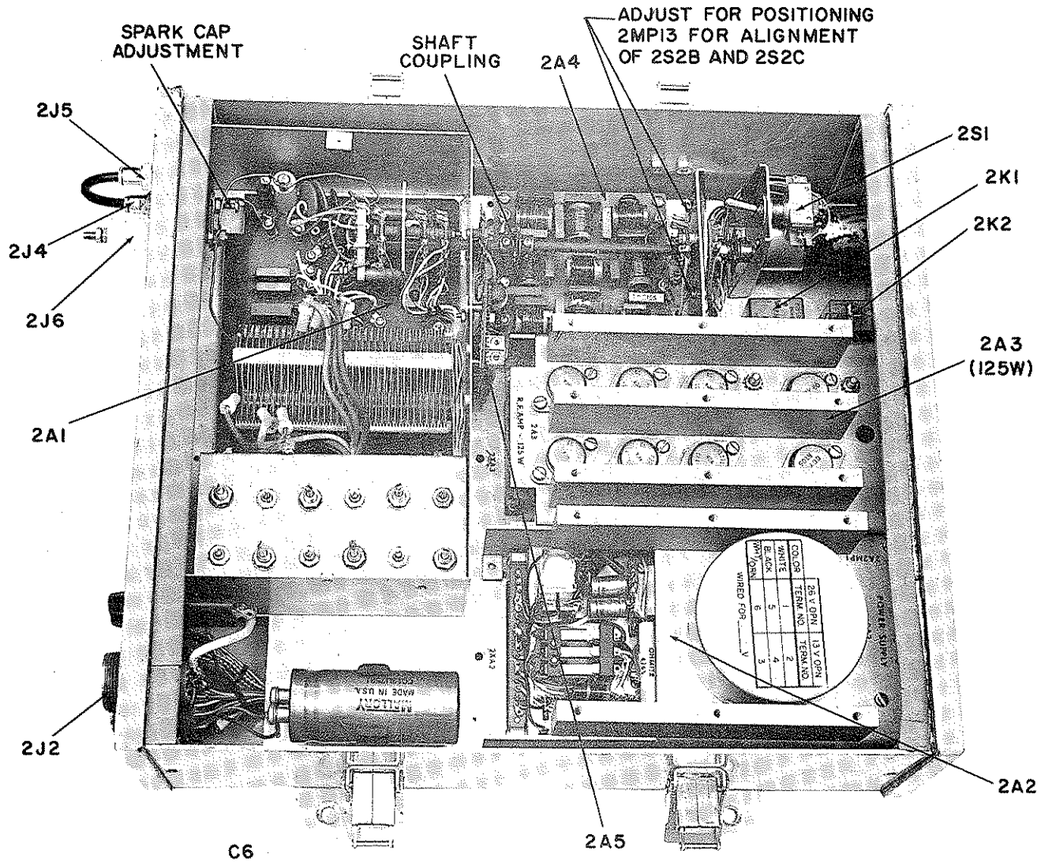
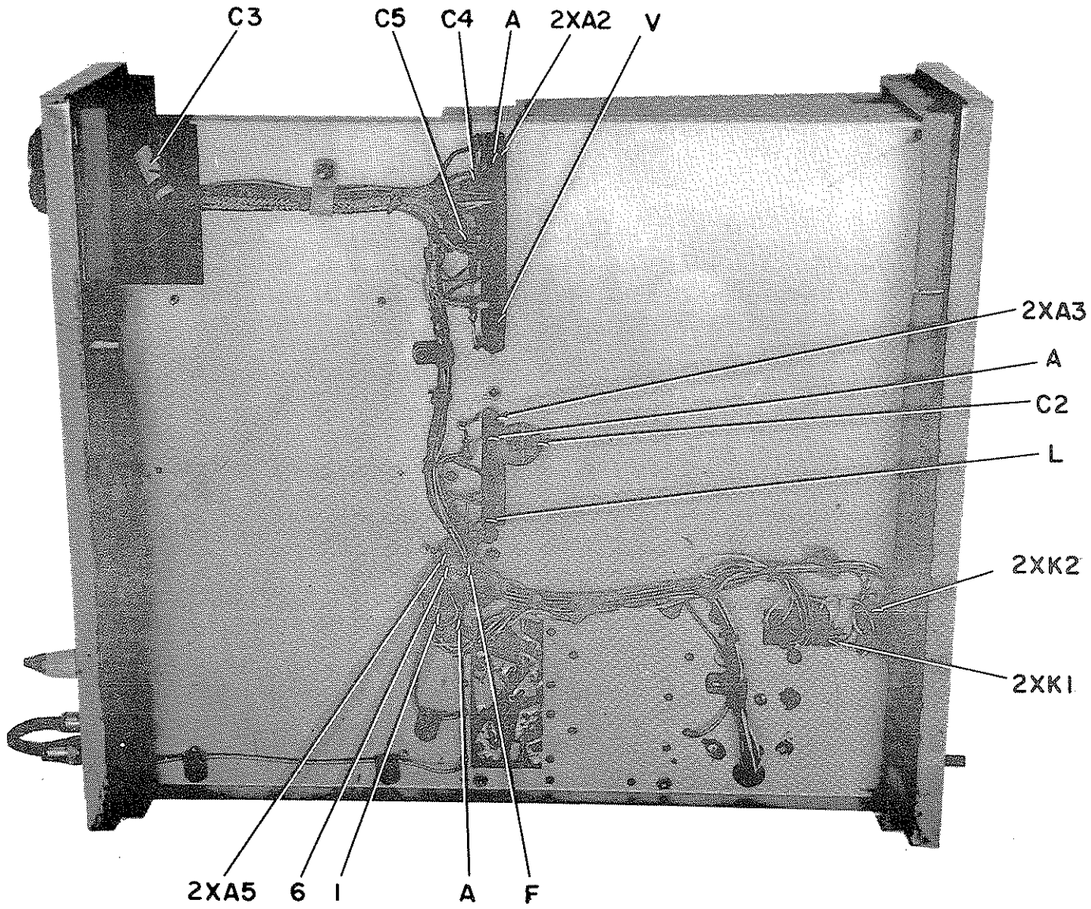


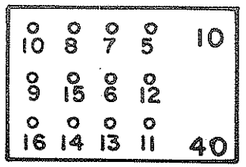
FIGURE 6-16 PA/CPLR
TOP VIEW



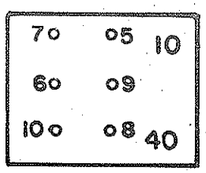
2XA2
A-Ground
B-Ground
C-On-Off
D-14V
E-10V
F-
H-
J-Xmit 44V
K-
L- -13.2VDC
M- -- OR
N- -26.4VDC
P-Ptt Line
R-
S- +13.2VDC
T- -- OR
U- +26.4VDC
V-

2XA3
A-Ground
B-RF Output (Coax)
C-Spare
D-
E- Xmit 44V
F-
H-Ground
J-RF Input (Coax)
K-Xmit 14V
L-Ground

2XA5
Ground-6 F-Ground
(Coax) RF Input-5 E-Meter Drive
AM Sel-4 D-RCVE 14V
(Coax) ALC Output-3 C-Spare
10V-2 B-Spare
Ground-1 A-Ground



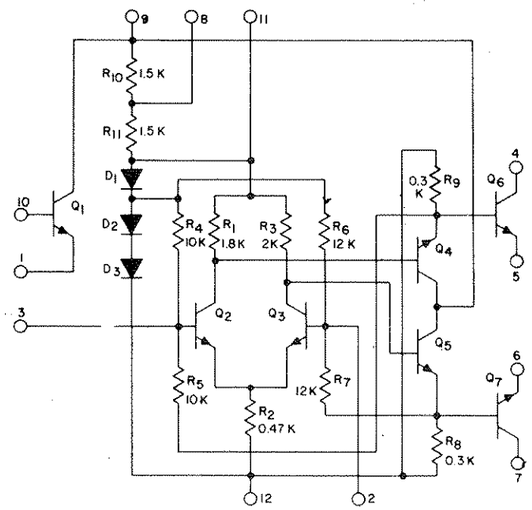
2XK1
1-14V From 2XK2
2-Blank
3-Blank
4-PTT Line
5-To 2XK1-11
6-Coax to 252B
7-Boax to PA Output
8-To ALC
9-14VDC
10-To PA
11-To 2XK1-5
12-Coax to 2J3
13-Coax to PA Input
14-Spare
15-Spare
16-Spare



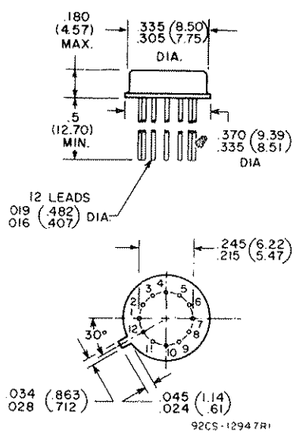
2XK2
1-14V
2-Blank
3-Blank
4-To 2S2A
5-To 2XK2-9
6-Motor
7-Ground
8-14V to 2XK1
9-To 2XK2-5

FIGURE 6-17 PA/CPLR BOTTOM VIEW

SCHEMATIC DIAGRAM FOR CA3020 AND CA3020A



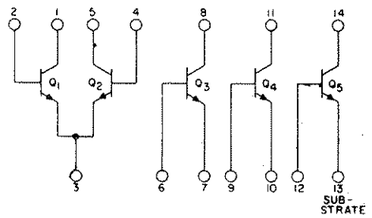
DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES AND MILLIMETERS

Dimensions in parentheses are in millimeters and are derived from the basic inch dimensions as indicated.

FIGURE 6-18
Schematic Diagram and Outline Drawing CA3020



DIMENSIONAL OUTLINE CA3045

14-Lead Dual In-Line
Ceramic Package **JEDEC TO-116**

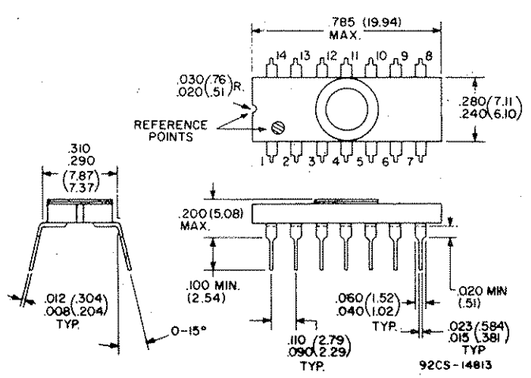
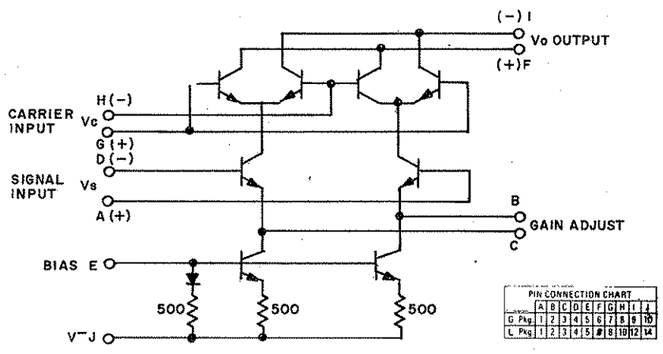


FIGURE 6-19
Schematic Diagram and Outline Drawing CA3045

CIRCUIT SCHEMATIC



PIN CONNECTION CHART

	A	B	C	D	E	F	G	H	I	J
G Pkg	1	2	3	4	5	6	7	8	9	10
L Pkg	1	2	3	4	5	#	8	10	12	14

CASE 602A
G Suffix **Weight ≈ 0.918 gram**
Metal Package

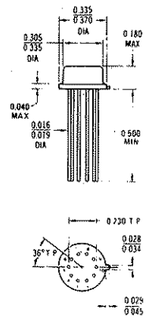
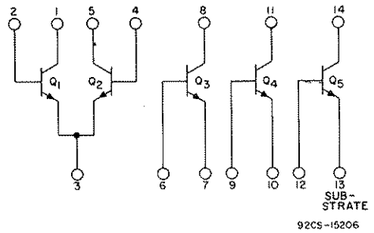


FIGURE 6-20
Schematic Diagram and Outline Drawing MC1596G



Schematic diagram.

DIMENSIONAL OUTLINE CA3046

14-Lead Dual In-Line
Plastic Package JEDEC TO-116

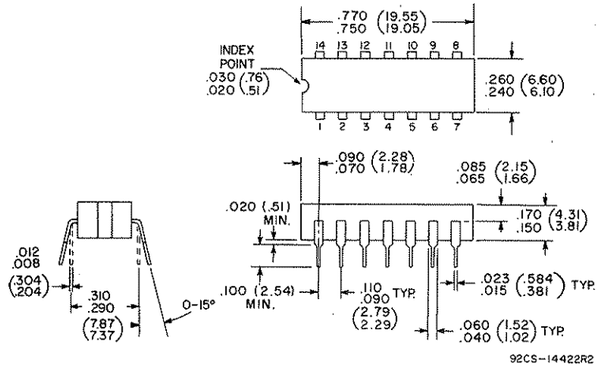
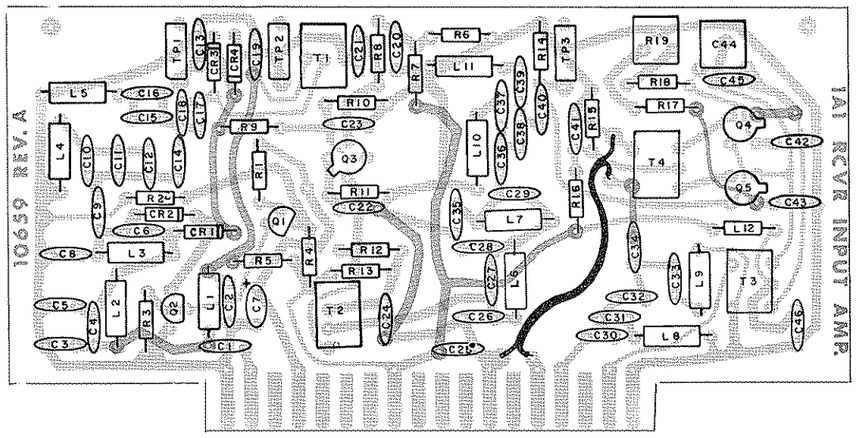
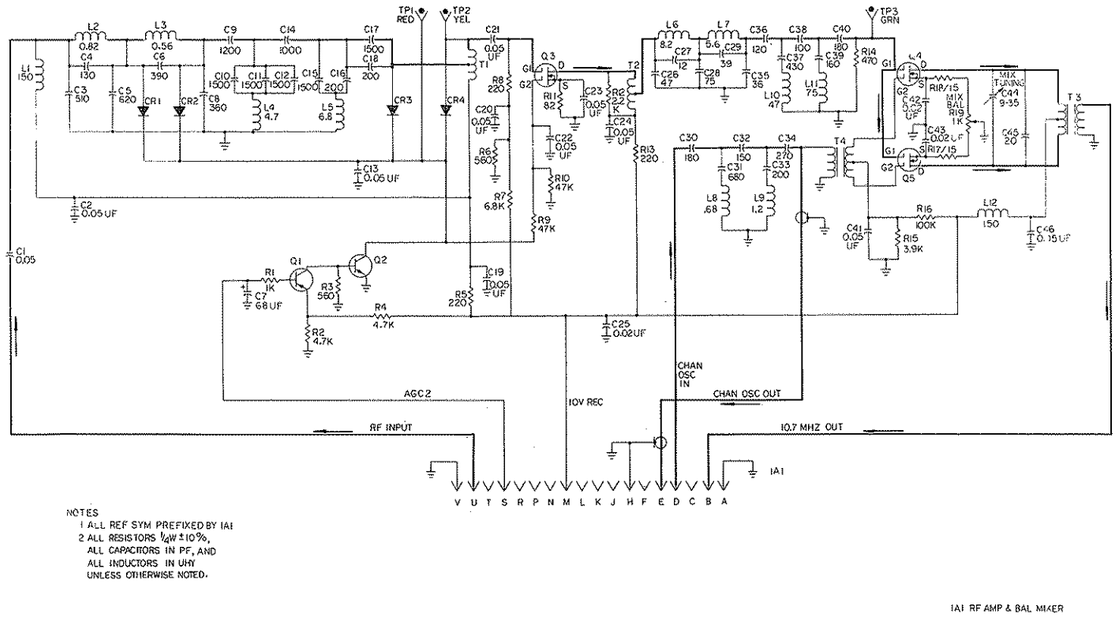


FIGURE 6-21
SCHEMATIC DIAGRAM AND OUTLINE
DRAWING CA3046





NOTES
1 ALL REF SYM PREFIXED BY 1A1
2 ALL RESISTORS 1/4W ±10%, ALL CAPACITORS IN PF, AND ALL INDUCTORS IN UHY UNLESS OTHERWISE NOTED.

1A1 RF AMP & BAL MIXER

DIODES

CR1,CR2,CR3,CR4-1N914B

TRANSISTORS

Q1-2N4249
Q2-MPS2925
Q3,Q4,Q5-FET 3N141

FIGURE 6-1 1A1 SCHEMATIC DIAGRAM AND PARTS LAYOUT.

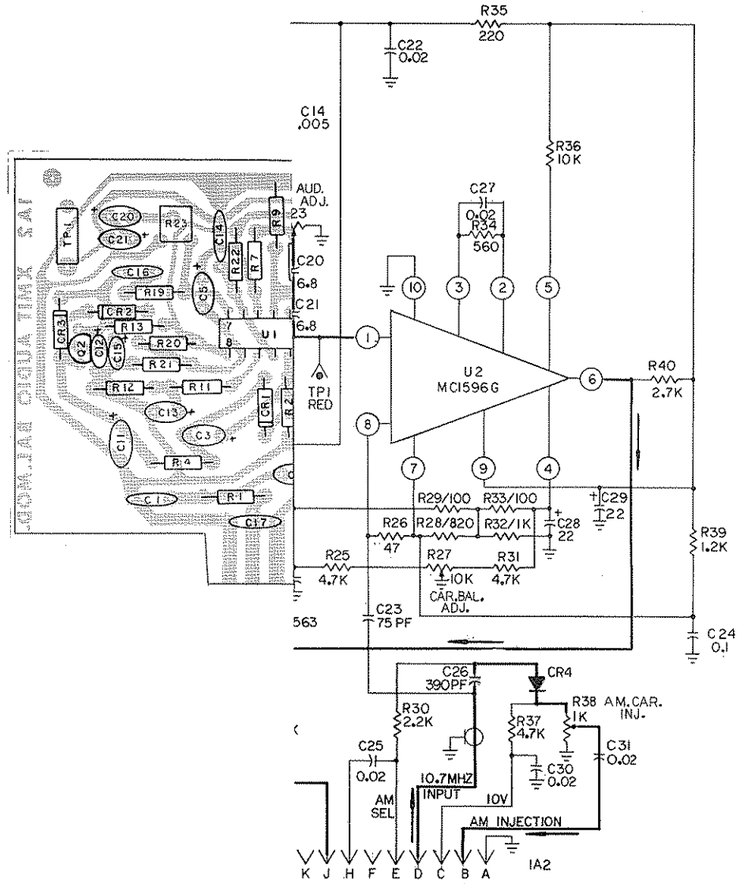
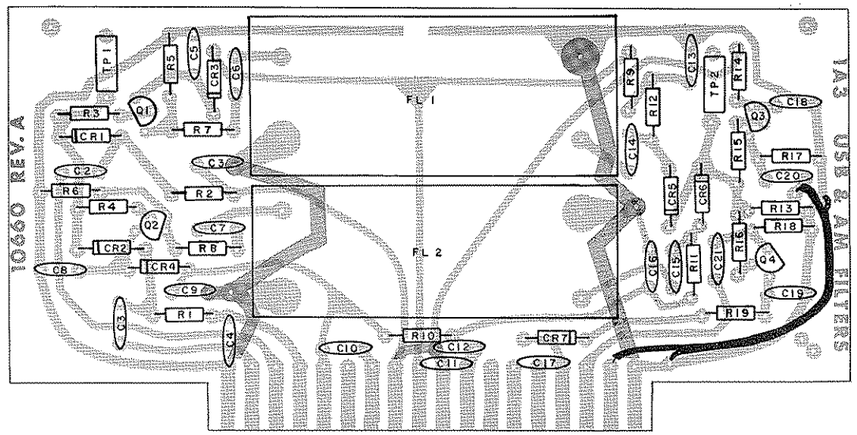


FIGURE 6-2 1A2 SCHEMATIC DIAGRAM AND PARTS LAYOUT.



DIODES

CR1,CR2,CR3,CR4
CR5,CR6,CR7-1N914

TRANSISTORS

Q1,Q2,Q3,Q4-2N3563

NOTES

1 ALL REF SYM PREFIXED BY 1A3
2 ALL RESISTORES 1/4W ±10%, AND ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED

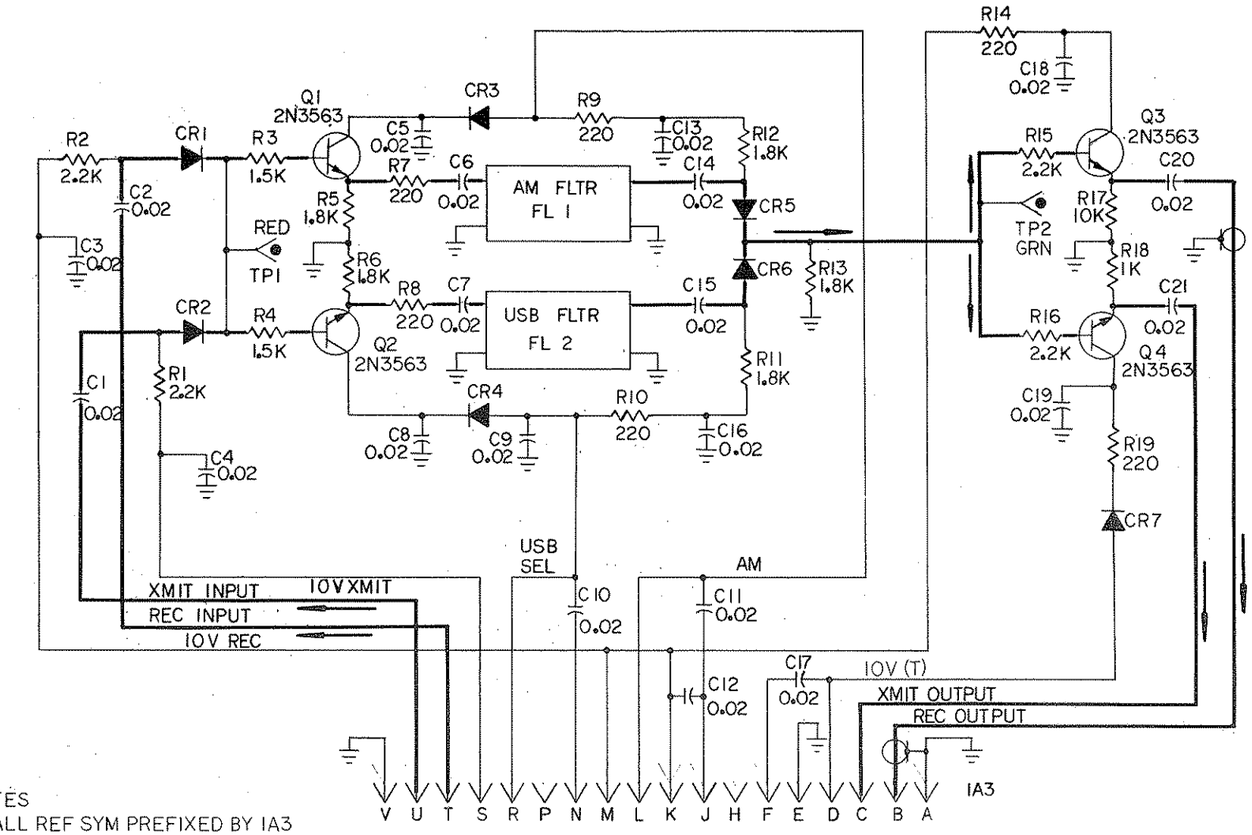
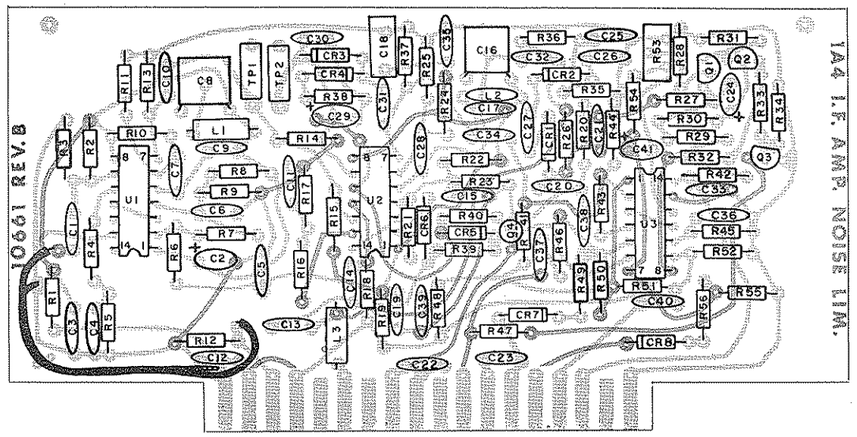


FIGURE 6-3 1A3 SCHEMATIC DIAGRAM AND PARTS LAYOUT



DIODES

CR1,CR2,CR3,CR4- 1N54A
CR5,CR6,CR7,CR8- 1N914

TRANSISTORS

Q1,Q2,Q3- MPS2925
Q4- 2N4249

INTEGRATED CIRCUITS

U1,U2,U3 - CA3045

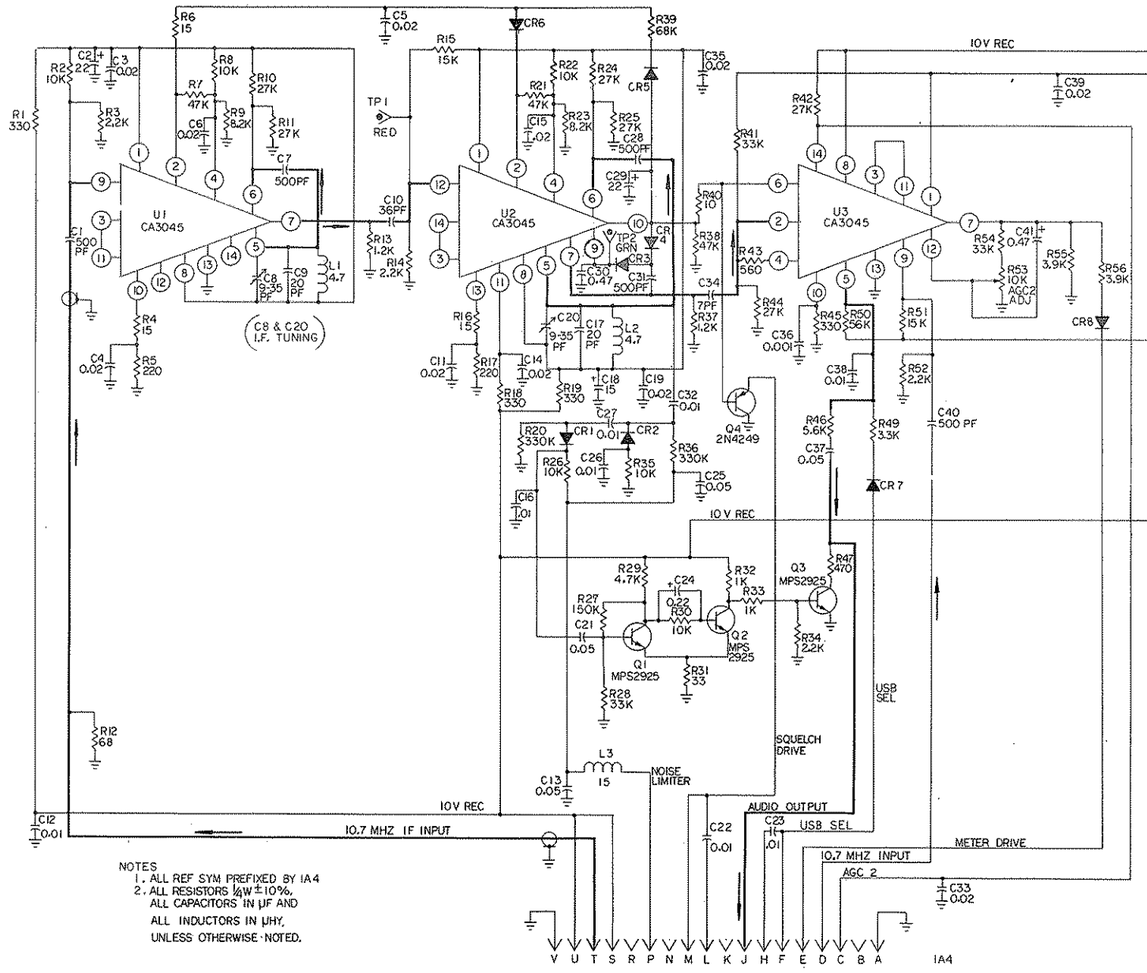
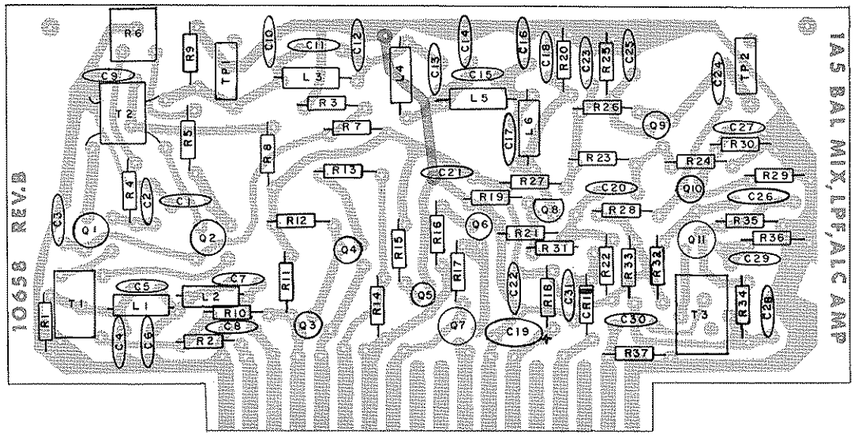
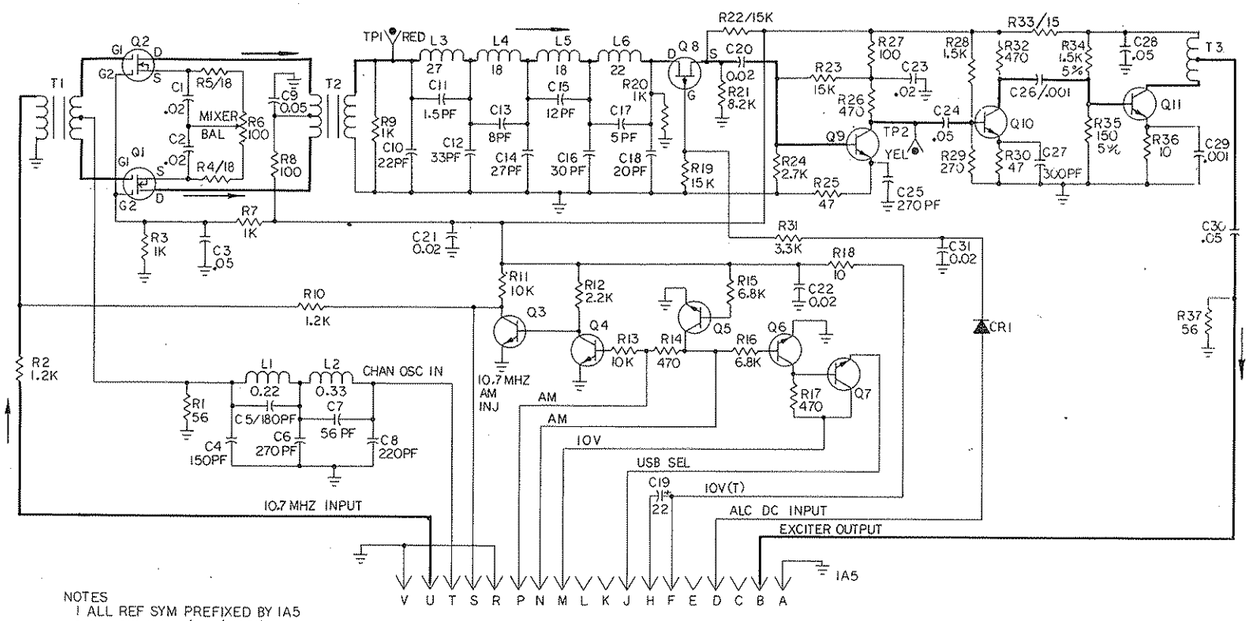


FIGURE 6-4. 1A4 SCHEMATIC DIAGRAM AND PARTS LAYOUT





NOTES
1 ALL REF SYM PREFIXED BY 1A5
2 ALL RESISTORS 1/4W ±10%, ALL CAPACITORS IN μF, AND ALL INDUCTORS IN μHY UNLESS OTHERWISE NOTED.

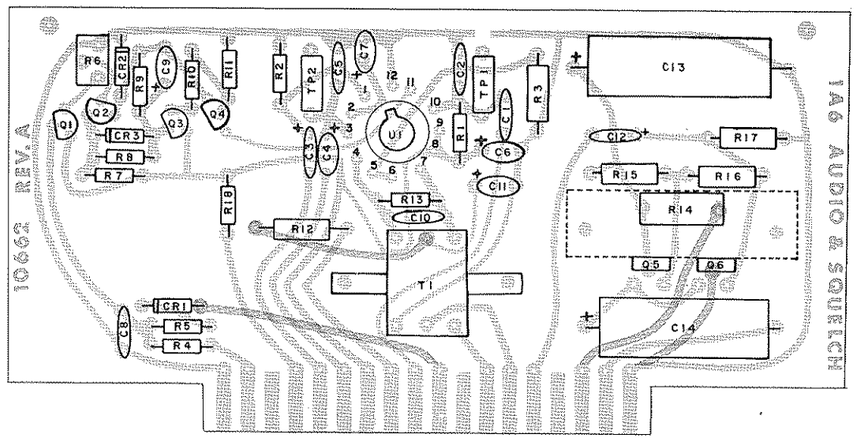
DIODES

CR1- 1N914

TRANSISTORS

Q1,Q2- FET 3N141
Q3,Q4,Q5,Q6- 2N3646
Q7,Q11- 2N3643
Q8- FET 2N5461
Q9,Q10- 2N3563

FIGURE 6-5 1A5 SCHEMATIC DIAGRAM AND PARTS LAYOUT



DIODES

CR1,CR2,CR3- 1N914

TRANSISTORS

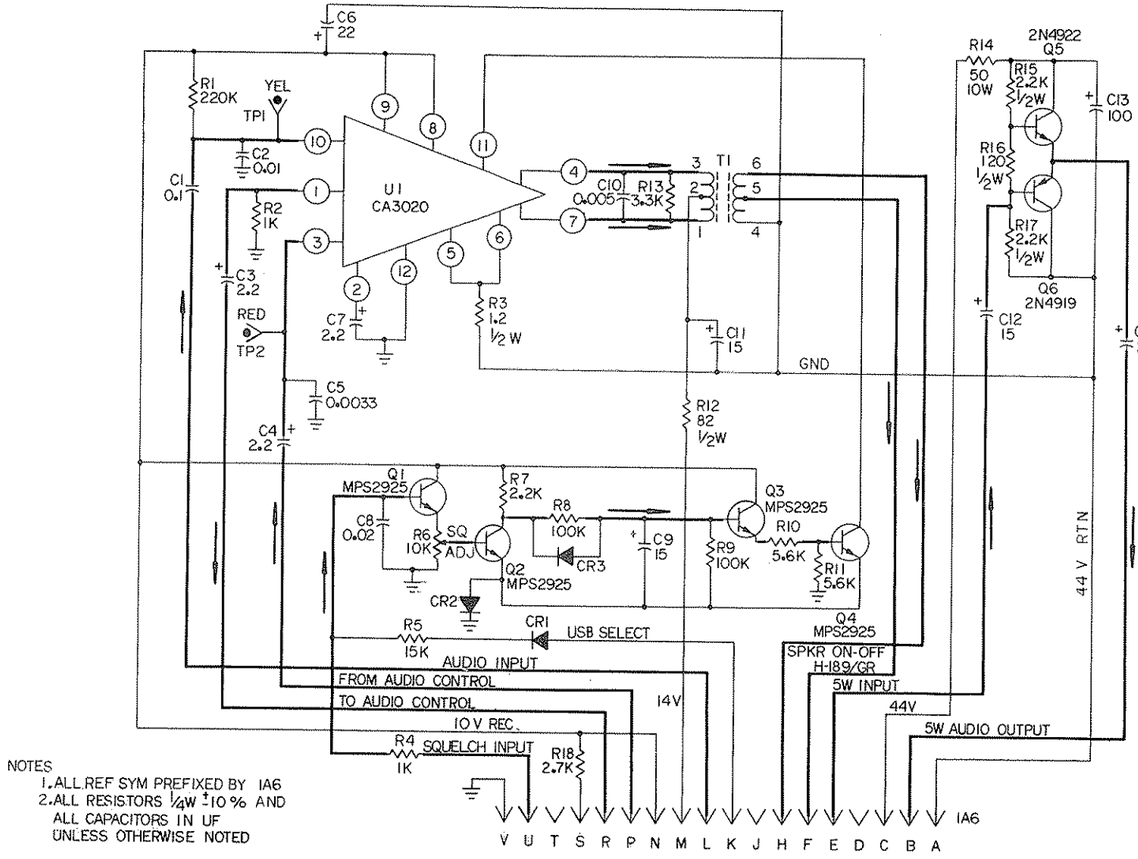
Q1,Q2,Q3,Q4- MPS2925

Q5- 2N4922

Q6- 2N4919

INTEGRATED CIRCUITS

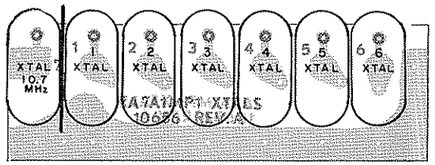
U1- CA3020



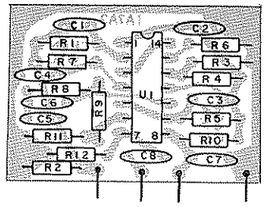
NOTES

1. ALL REF SYM PREFIXED BY 1A6
2. ALL RESISTORS ¼W ±10% AND ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED

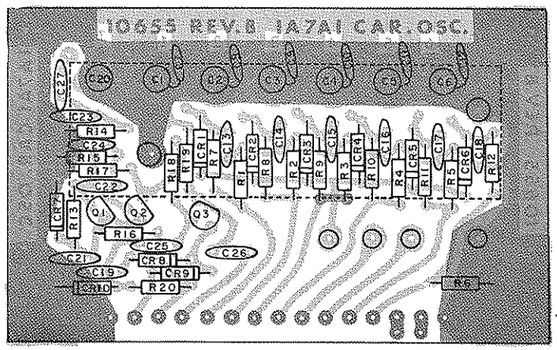
FIGURE 6-6 1A6 SCHEMATIC DIAGRAM AND PARTS LAYOUT



1A7A1MP1



1A7A2



1A7A1

1A7A1

DIODES

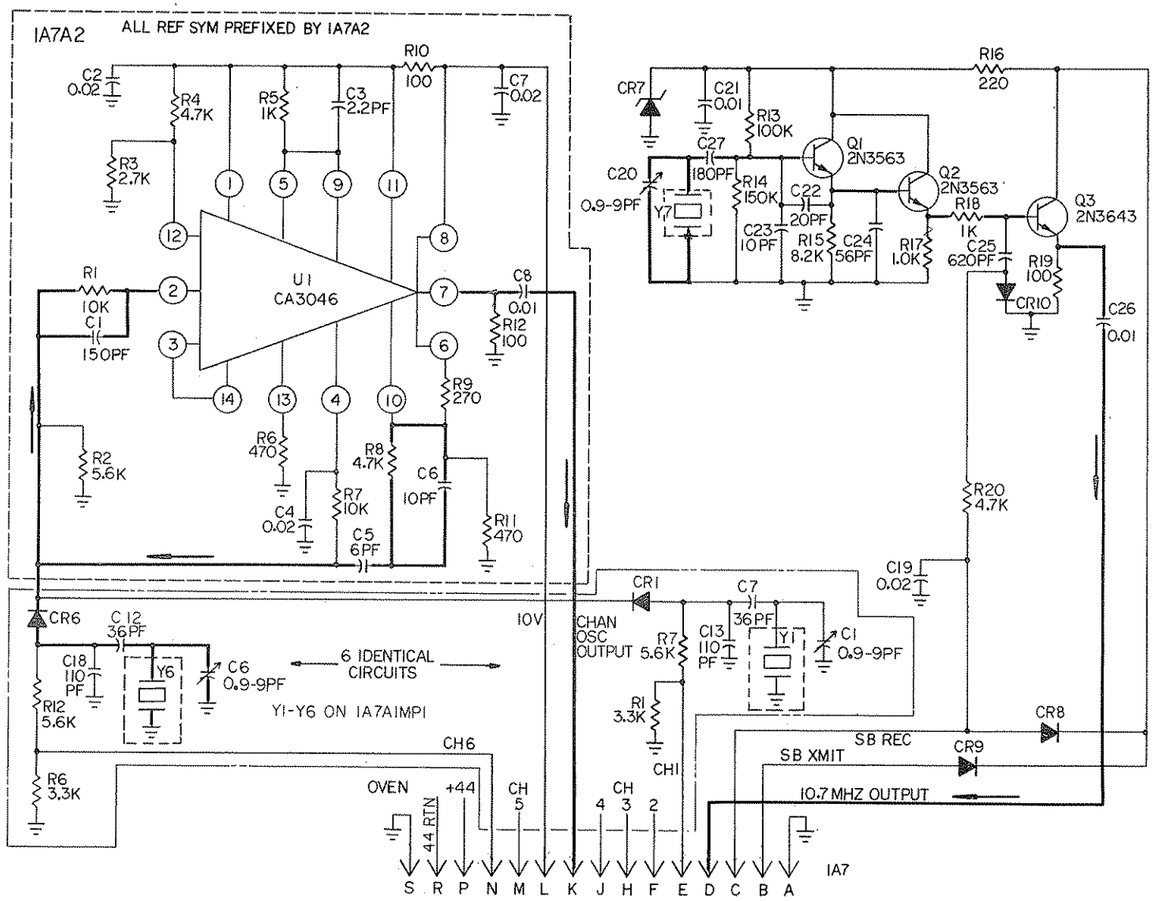
CR1,CR2,CR3,CR4
CR5,CR6,CR8,CR9- 1N914
CR7 ----- Diode, Zener 5.1V
1N5231B
CR10----- Diode, Silicon A23

TRANSISTORS

Q1,Q2 -----2N3563
Q3 --------2N3643

1A7A2

U1 ------- CA3046



NOTES.
1. ALL REF. SYM. PREFIXED BY 1A7A1
2. ALL RESISTORS $\frac{1}{4}$W ± 10% AND ALL CAPACITORS IN UF UNLESS OTHERWISE NOTED
3. 1A7A1, 1A7A1MP1 & 1A7A2 ARE ENCLOSED IN OVEN

FIGURE 6-7. 1A7 SCHEMATIC DIAGRAM AND PARTS LAYOUT.