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**INSTRUCTION MANUAL
FOR
WJ-8718 SERIES HF RECEIVERS**



WATKINS-JOHNSON



INSTRUCTION MANUAL
FOR
WJ-8718 SERIES HF RECEIVER

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SECTION I
GENERAL DESCRIPTION

FIGURE 1-1

WJ-8718 SERIES HF RECEIVER

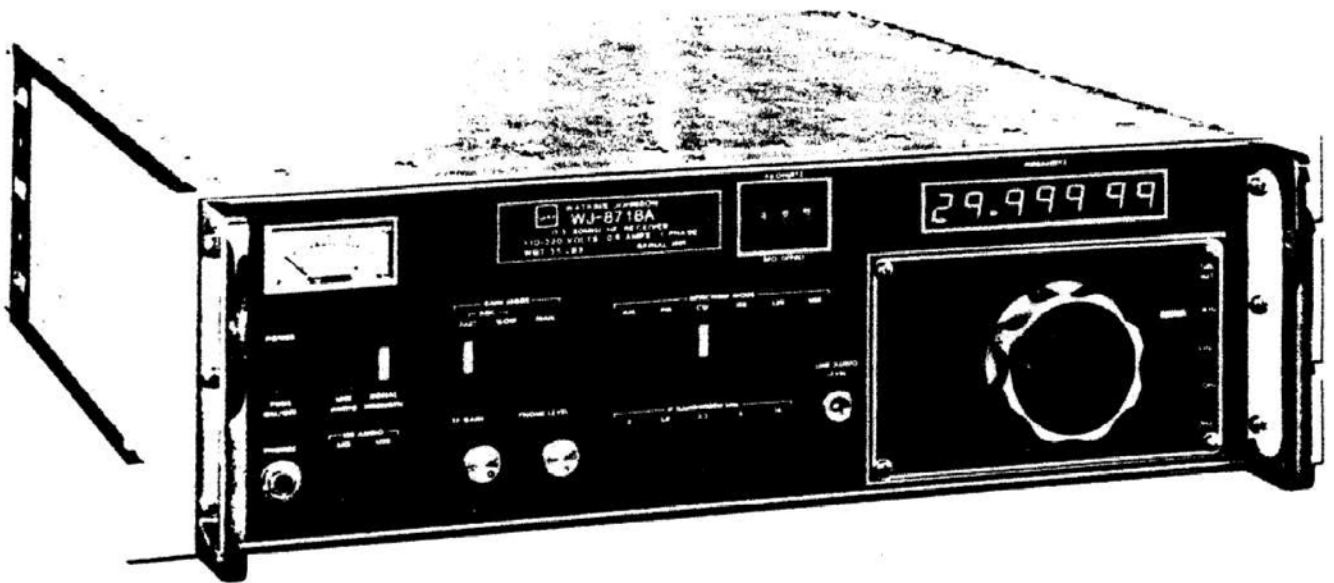


Figure 1-1. WJ-8718 Series HF Receiver

SECTION I

GENERAL DESCRIPTION

1.1 ELECTRICAL CHARACTERISTICS

The WJ-8718 Series HF Receiver (**Figure 1-1**) detects AM, FM, CW, USB, LSB, and ISB signals emissions over the frequency range of 5 kHz to 29.99999 MHz. Receiver functions may be controlled manually through the front panel, or remotely through the rear panel remote input connector. In the manual mode, operating parameters are selected by depressing appropriate pushbutton/indicators. The depressed button indicates the operators selection by a brightly colored display behind the transparent front surface. Seven digits composed of light emitting diodes (LED's) indicate the tuned frequency to a resolution of 10 Hz. The large tuning knob and four tuning rate pushbuttons provide frequency tuning capability. A tuning disable pushbutton locks the receiver to a specific frequency, thereby preventing accidental frequency changes. The remote control mode is enabled by one of two methods: depressing the TUNING DISABLE pushbutton, or a control change activated by the remote device. A jumper wire on the Manual Tuning Up/Down Counter card determines the method employed. In the remote mode, the receiver responds to parallel input data, consisting of frequency and bandwidth information, and is compatible with buffered CMOS levels.

Pushbutton-selectable parameters in addition to the operating modes are IF Bandwidths, Gain Mode and Meter Select. Selectable IF bandwidths of 0.3 kHz, 1.0 kHz, 3.2 kHz, 6 kHz, and 16 kHz operate in conjunction with the AM, FM, or CW detection modes. When the ISB, LSB, or USB detection modes are chosen, IF bandwidth selection is ineffective due to the automatic override by the detection mode control. RF gain is controlled manually or by Fast or Slow AGC. A dual-purpose meter indicates Signal Strength or Line Audio level.

Internal frequency tuning circuitry of the receiver includes the 1st, 2nd, and 3rd LO and BFO Synthesizers. The phase lock loop frequency synthesizers determine tuned frequency to a resolution of 10 Hz. The synthesized BFO tunes ± 8.9 kHz from 455 kHz in 100 Hz and 1 kHz steps. A non-volatile memory stores the tuned frequency for a minimum of 48 hours after power interruption (i.e., power failure or manually turning power off).

Rear panel features include BNC connectors for a 50 Ω RF input, a 455 kHz IF output and a 1 MHz reference input/output selected by a related slide switch. Two five-lug terminal boards provide audio outputs that include: a 600 Ω floating center-tapped ISB output (for the lower sideband), a single-ended phone output, a center-tapped line audio output and an FM/CW/SSB detector output for monitoring. Line voltage selection for high and low voltage conditions may be accomplished in a few seconds by inserting the printed circuit (PC) wafer in one of four positions in the line cord assembly.

Maintenance operations are straightforward due to clean mechanical packaging and placement of nearly all components on plug-in circuit boards. These circuit boards mount on motherboards which have all pins accessible from the bottom of the receiver. Removing the top cover exposes the assemblies, which may be unplugged from their sockets or freed from the main chassis by quick disconnect plugs. The dc power supplies are thermal and short circuit protected, requiring no adjustments, and are easily replaced. A printed circuit wafer, accessible on the rear panel, enables matching the power transformer to line voltages of 110 Vac ($\pm 15\%$) and 220 Vac ($\pm 15\%$).

GENERAL DESCRIPTION

WJ-8718 SERIES HF RECEIVER

1.2 MECHANICAL CHARACTERISTICS

The receiver mounts in a standard 19-inch equipment rack, occupies 5.25 inches of vertical space, and extends 19.6 inches into the rack. The main chassis, front, rear, top, and internal compartment panels are constructed of aluminum. Side panels are cast aluminum, the front panel is a 0.19-inch thick aluminum plate, and the rear panel, main deck, and internal partitions are stamped aluminum. The side panels, top and bottom covers are perforated allowing flow-through ventilation. All operating controls and indicators are on the front panel, while all input and output cables are connected to the rear panel (except for the phone jack). This package meets the radiation specification of MIL-STD-461A.

The front panel is overlaid with a black bezel etched with control markings. All pushbuttons are mounted on a printed circuit card positioned behind the front panel, and extend through cutouts in the front panel. The remaining controls and line audio/signal strength meter are mounted directly on the front panel. The tuned frequency numeric display is mounted on a card positioned behind a cutout in the front panel, over which a polarized filter is installed. The audio phones jack, RF gain control and phone level controls are also mounted on the front panel. The WJ-8718A Line Audio control is also mounted on the front panel.

The rear panel mounts all input, output, and accessories, except for the phones jack. BNC connectors are supplied for the RF input, IF output and 1 MHz reference input/output. The INT/EXT clock switch for selecting internal or external timebase reference is located next to the 1 MHz reference input/output. Two terminal blocks supply an output for Line Audio, Phone Audio, ISB Audio, and FM Audio. Two fuseholders are found on the rear panel. The circular fuseholder holds the alternate line voltage fuse, while the rectangular fuseholder has the additional functions of line filter, voltage selection and ac line cord receptacle. Also on the rear panel are +15 V, -15 V, and +5 V heat sinked regulators, and 37-pin female connectors for remote control. The WJ-8718 and 8718-9 Line Audio controls are also mounted on the rear panel.

Loosening 34 quarter-turn fasteners allows the top cover to be lifted from the receiver exposing four main compartments. A power distribution circuit, input converter and optional preselector mount in one compartment and three synthesizer boards mount in another. The IF modules and the digital control circuits are in separate compartments for mechanical support and shielding purposes.

Removing the bottom cover via 34 quarter-turn fasteners, exposes three motherboards that mount a total of 27 modules and the components mounted on the front panel. All connections to the motherboards are push-on plugs so replacement of a motherboard consists of removing less than 10 screws and the plugs.

1.3 EQUIPMENT SUPPLIED

The equipment supplied consists of the receiver and a detachable line cord.

1.4

EQUIPMENT REQUIRED BUT NOT SUPPLIED

Select equipment from the following general classifications to obtain full use of the receiver.

- Antenna, 50 Ω
- Audio monitoring equipment such as the following: (for monitoring ISB signals, two units will be required except for headphones, which monitors both sidebands.)
 - a) Speaker panel, 600 Ω
 - b) Stereo headphones, 600 Ω
 - c) Tape recorder
- Wideband tape recorder for 455 kHz IF amplifier predetection output.
- IF-to-tape converter for 455 kHz-to-video signal conversion.
- Remote Input Interface - for receivers utilizing remote control operation. Refer to the **Installation Section** of this manual for definitions of the input lines.

1.5

OPTIONAL EQUIPMENT

The following optional equipment is available for use with the WJ-8718 Series HF Receiver. For additional information concerning these options and others, contact Watkins-Johnson Company, Gaithersburg, Maryland, or your Watkins-Johnson representative.

● 10 Hz BFO Synthesizer	WJ-8718/B10
● Built-in Test Equipment	WJ-8718/BITE
● Command Input	WJ-8718/COM
● Carrier Operated Relay	WJ-8718/COR
● Dual Diversity Combiner	WJ-8718/DDC
● Frequency Extender	WJ-8718/FE
● Frequency Shift Keying	WJ-8718/FSK
● Green LED Frequency Display	WJ-8718/GRN
● Low Level Audio	WJ-8718/LLA
● Microprocessor Front Panel	WJ-8718/MFP
● Monitor Output	WJ-8718/MON
● Sub-Octave Preselector	WJ-8718/PRE
● Independent Sideband (ISB) (WJ-8718 only)	WJ-8718/ISB

GENERAL DESCRIPTION

WJ-8718 SERIES HF RECEIVER

- | | |
|--|---------------|
| ● Red LED Frequency Display | WJ-8718/RED |
| ● Signal Monitor Output | WJ-8718/SMO |
| ● 1 Hz Tuning | WJ-8718/1 Hz |
| ● RS-232 Interface (Talk/Listen) | WJ-8718/232 |
| ● IEEE-488 Bus Interface (Talk/Listen) | WJ-8718/488-2 |

Table 1-1. Type WJ-8718 Series HF Receiver, Specifications

Tuning Range	5 kHz to 29.99999 MHz.
Detection Modes	Standard: AM, FM, CW.
Optional: LSB, USB, ISB.	
Frequency Display	7 digit, LED's.
Frequency Resolution/Readout	10 Hz.
Frequency Stability	6×10^{-8} per day, 2×10^{-6} per year.
Input Impedance	50 Ω , unbalanced, nominal.
Antenna Input Protection	The antenna input withstands the effects of RF power to +15 dBm and static build-up.
IF Bandwidths (3 dB)	Standard: 0.3, 1, 3.2, 6, and 16 kHz.
IF Shape Factor	IF BW 60 dB: 3 dB, Typical
	0.3 kHz 7.0:1
	1 kHz 4.5:1
	3.2 kHz 2.5:1
	6 kHz 2.3:1
	16 kHz 2.0:1
Sensitivity	(0.2-30 MHz, see CW Sensitivity for extended frequency range)
AM Sensitivity	
(6 kHz IF Bandwidth)	A 1.7 μ V signal 50% AM modulated at a 400 Hz rate produces at least a 10 dB (S+N)/N ratio at the audio output.
FM Sensitivity	
(16 kHz IF Bandwidth)	A 2.5 μ V signal FM modulated at a 400 Hz rate to a 4.8 kHz peak deviation produces at least a 17 dB (S+N)/N ratio at the audio output.
CW Sensitivity	
(0.3 kHz IF Bandwidth)	
200 kHz-30 MHz	A 0.4 μ V signal produces a 16 dB (S+N)/N ratio at the audio output.
50 kHz-200 kHz	A 0.63 μ V signal produces a 16 dB (S+N)/N ratio at the audio output.
15 kHz-50 kHz	A 1.4 μ V signal produces a 16 dB (S+N)/N ratio at the audio output.
5 kHz-15 kHz	A 63 μ V signal produces a 16 dB (S+N)/N ratio, typically at the audio output.
ISB, (USB, LSB) Sensitivity	
(3 kHz SSB Bandwidth)	A 0.56 μ V signal produces a 10 dB (S+N)/N ratio at the audio output.
Gain Control Modes	Manual, Fast AGC, Slow AGC.
AGC and Manual Range	100 dB, minimum.
AGC Threshold	3.0 μ V, typical.
AGC Attack Time	15 ms, maximum.
AGC Release Time	Fast AGC: 25 ms, maximum. Slow AGC: 4 sec, maximum.

Table 1-1. Type WJ-8718 Series HF Receiver, Specifications (Continued)

Audio Outputs:	
ISB Output	100 mW, maximum across 600 Ω .
Line Audio	1 W minimum, across 600 Ω for an input signal of 3 μ V, 30% AM modulated at a 400 Hz ratio.
Headphone Output*	30 mW, minimum, for an input signal of 3 μ V, 30% AM modulated at a 400 Hz rate.
Audio Distortion	Less than 5% at rated audio output.
Audio Frequency Response	± 1.5 dB from 100 Hz to 8 kHz, 1 kHz reference frequency.
Final IF Output	20 mV, minimum, into 50 Ω for input signals greater than 3.0 μ V.
Frequency Control	Manual or Remote options.
Synthesizer Lock-Up Time	3 ms, typical; 10 ms, maximum.
Synthesized BFO	455 kHz ± 8.9 kHz in 100 Hz steps.
IF Rejection	Greater than 90 dB.
Image Rejection	Greater than 90 dB.
Intermodulation Distortion:	
3rd Order Input Intercept Point	+20 dBm, minimum for signals separated by 30 kHz, (performance may degrade below 3 MHz).
Unwanted Sideband Rejection	50 dB at 350 Hz into unwanted sideband.
Reciprocal Mixing	With a desired signal of 25 μ V in the 3.2 kHz IF bandwidth, the desired signal-to-noise ratio is greater than 20 dB, when an undesired signal 70 dB higher in amplitude and 30 kHz removed in frequency is present.
Cross Modulation	With a desired signal of 10 μ V an undesired signal 70 dB higher, 30% AM modulated produces less than 10% cross modulation for frequency separation of greater than 50 kHz in the 1 kHz IF bandwidth.
Antenna Conducted Oscillator Radiation	-87 dBm, maximum.
Signal Meter	Indicates carrier level or line audio level.
Operating Temperature Range	0 $^{\circ}$ C to 50 $^{\circ}$ C.
Power Consumption	0.6 A at 115 Vac, approximately.
Power Requirements	110/220 Vac $\pm 15\%$ 48-420 Hz.
Power Interrupt	With Manual Control Module option, storage of frequency data automatically occur. Upon restoration of power, the receiver returns to the previously tuned frequency.

WJ-8718 SERIES HF RECEIVER

TABLE 1-1
FIGURE 1-2

Table 1-1. Type WJ-8718 Series HF Receiver, Specification (Continued)

Size	5.25 inches high, 19 inches wide and 19.4 inches deep.
Weight	35 pounds (15.75 kilograms), approximately.

* **Note:** The stereo headphone output provides 30 mW for each output on on stereo phone plug. Refer to **Figure 1-2**.

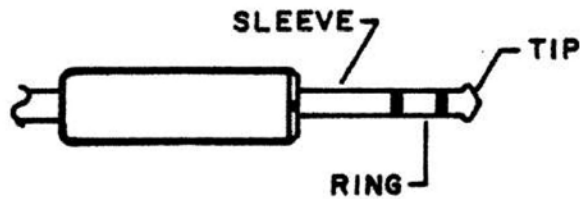


Figure 1-2. Tip-Ring-Sleeve Plug Outline Drawing.

Courtesy of <http://BlackRadios.terryo.org>

SECTION II
INSTALLATION AND OPERATION

FIGURE 2-1

WJ-8718 SERIES HF RECEIVER

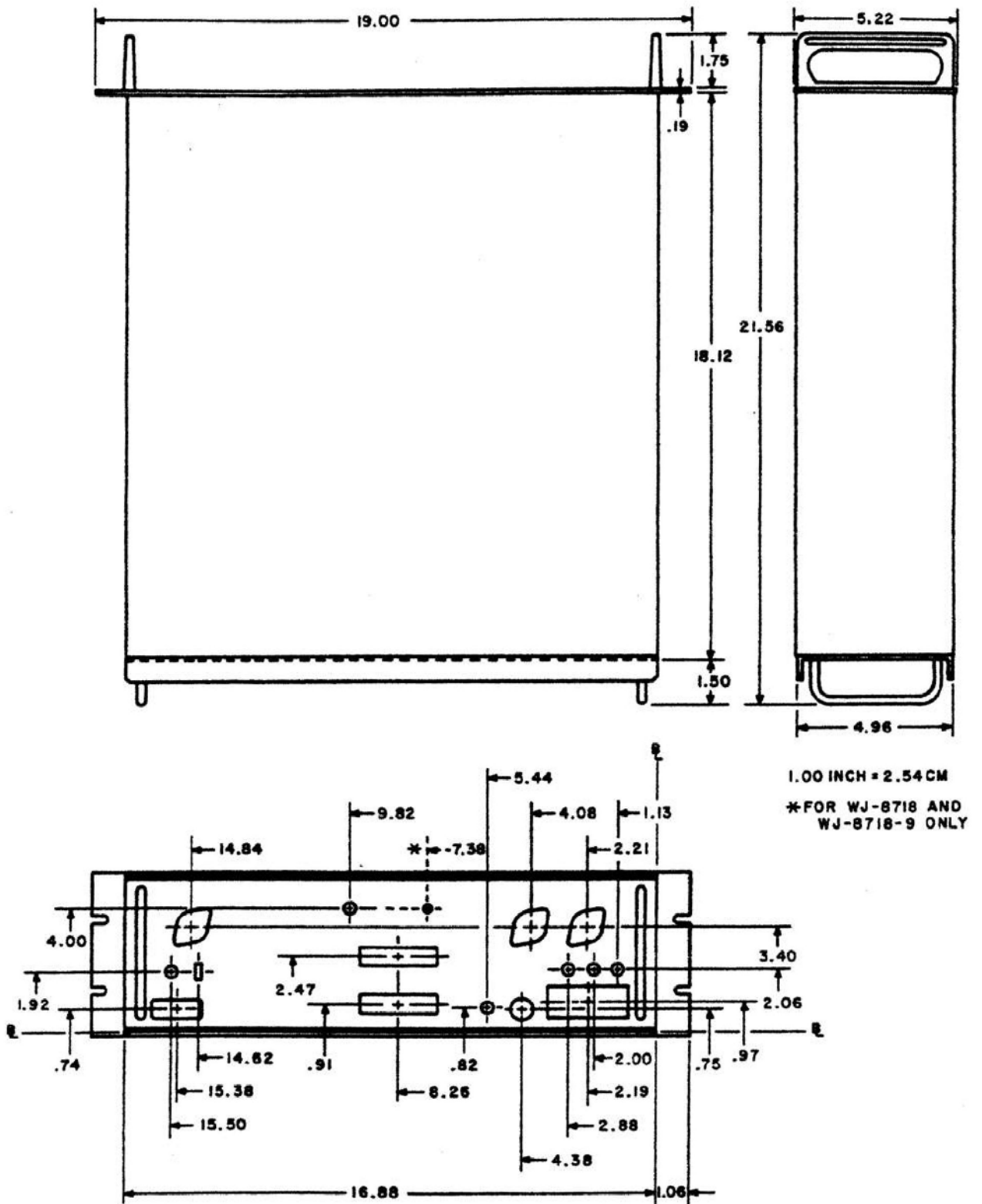


Figure 2-1. WJ-8718 Series Receiver, Critical Dimensions

SECTION II

INSTALLATION AND OPERATION

2.1 UNPACKING AND INSPECTION

Examine the shipping carton for damage prior to unpacking the equipment. If the carton appears to be damaged, try to have the carrier's agent present when the equipment is unpacked. If this is not possible, retain all packaging material and shipping containers for the carrier's inspection to verify damage to the equipment after unpacking. Also verify that the equipment shipped corresponds to the packing slip. Contact the Watkins-Johnson Company, CEI Division, or your Watkins-Johnson representative for any discrepancies or shortages.

The unit was thoroughly inspected and factory adjusted for optimum performance prior to shipment. It is, therefore, ready for use upon receipt. After uncrating and checking contents against the packing slip, visually inspect all exterior surfaces for dents and scratches. If external damage is visible, remove the dust covers and inspect the internal components for apparent damage. Then check the internal cables for loose connections, and plug-in items such as printed wiring boards, which may have been loosened from their receptacles.

2.2 PREPARATION FOR RESHIPMENT AND STORAGE

If the receiver must be prepared for reshipment, the packaging methods should follow the pattern established in the original shipment. If retained, the original materials can be reused to a large extent or at least provide guidance for the repackaging effort. Conditions during storage and shipment should be limited as follows:

Maximum humidity: 95% (no condensation)

Temperature range: -30°C to 85°C

2.3 INSTALLATION

Rack mounting equipment, manufactured by Watkins-Johnson Company, is designed for assembly in 19 inch racks in accordance with MIL-STD-189 or E.I.A. Standard No. RS-310. It is recommended that chassis slides be added to the racks for ease of assembly, access to the unit, and to provide adequate support for general installations. Mobile installation of the equipment should be evaluated on an individual basis.

Watkins-Johnson equipment is designed for operational temperatures between 0°C and 50°C (32°F - 122°F). Equipment installation should provide for free-flowing air circulation around and through ventilated units. Multiple stacking, in particular close adjacent stacking of electronic equipment in a standard console, can produce an appreciable increase in operating temperature for all equipment contained within the console. Forced-air ventilation may be necessary to maintain proper air circulation and temperature for efficient operation of the equipment.

Access to the rear panel should be allowed so that input and output connections can be conveniently made or changed if desired. **Figures 2-2 through 2-7** are photographs of the front and rear panels depicting connector locations for the WJ-8718, 8718A and 8718-9 receivers. A description of the functions and input/output parameters of each connector follows.

2.3.1 VOLTAGE SELECTOR/FUSE BLOCK AND LINE CORD RECEPTACLE (FL1J1)

This assembly should be inspected before installing the receiver in a new location. With the line cord unplugged, the clear plastic window can be slid over the three male power receptacle prongs. This exposes the line fuse and a hinged, plastic FUSE PULL lever.

Swinging of the FUSE PULL lever to the left ejects the fuse from the holder and frees a line-voltage-select PC wafer found at the bottom of the assembly. Looking down on the PC wafer at a slight angle on the left side shows the selected line voltage for the receiver, either 100, 120, 220, or 240 Vac. If the voltage shown does not match the available line voltage, remove the PC wafer and reinstall it so that the closest line voltage is visible with the PC wafer in position; the PC wafer should be set in the voltage position closest to the line voltage used. Then install the fuse suitable for the line voltage: 1 A, slow-blow for 100 Vac and 120 Vac, or 1/2 A, slow-blow for 220 Vac and 240 Vac. Install the other fuse in the alternate fuseholder.

Slide the clear plastic window back over the fuse and PC wafer portion of the assembly holder and insert the line cord in the receptacle.

2.3.2 RF INPUT (A2J1)

This BNC connector is the RF signal input for the receiver. Nominal input impedance is 50 Ω . The input is protected against signals exceeding +15 dBm (1.25 V rms) and static build-up.

2.3.3 ALTERNATE FUSEHOLDER (XF2)

This fuseholder provides convenient storage of the fuse for the line voltage not in use. There is no electrical connection to the fuseholder.

2.3.4 IF OUTPUT (J12)

This BNC connector supplies a 455 kHz IF output. The level will be 20 mV, minimum, into 50 Ω in AGC mode, for RF input signals greater than 3 μ V.

2.3.5 TERMINAL BOARD (TB1)

Two audio outputs are available on this board. They will be described separately.

- LINE AUDIO. These three terminals provide a floating, 600 Ω , center tapped audio output. This output will drive a 600 Ω load

WJ-8718 SERIES HF RECEIVER

FIGURE 2-2

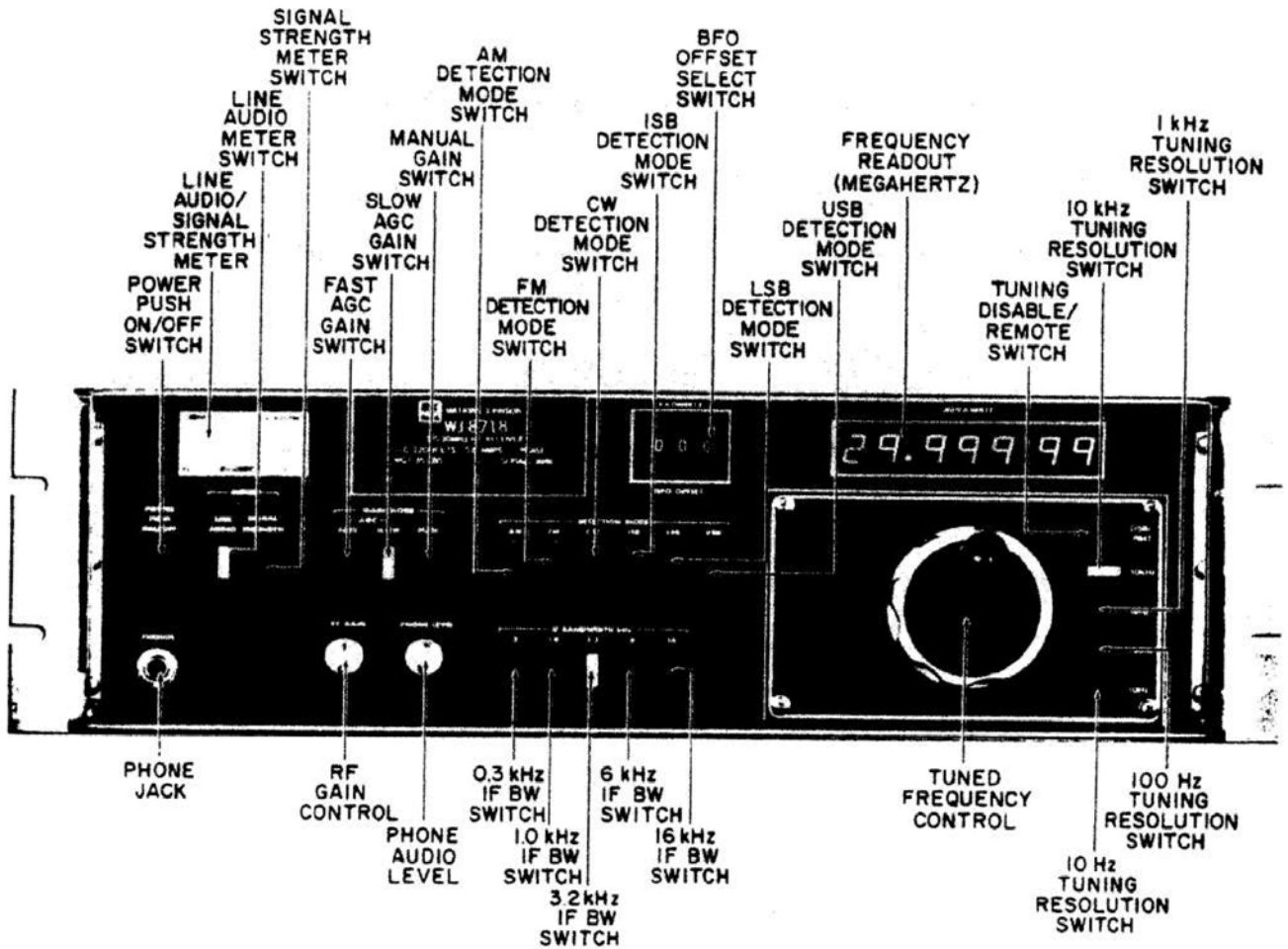


Figure 2-2. WJ-8718 Series HF Receiver, Front Panel View

FIGURE 2-3

WJ-8718 SERIES HF RECEIVER

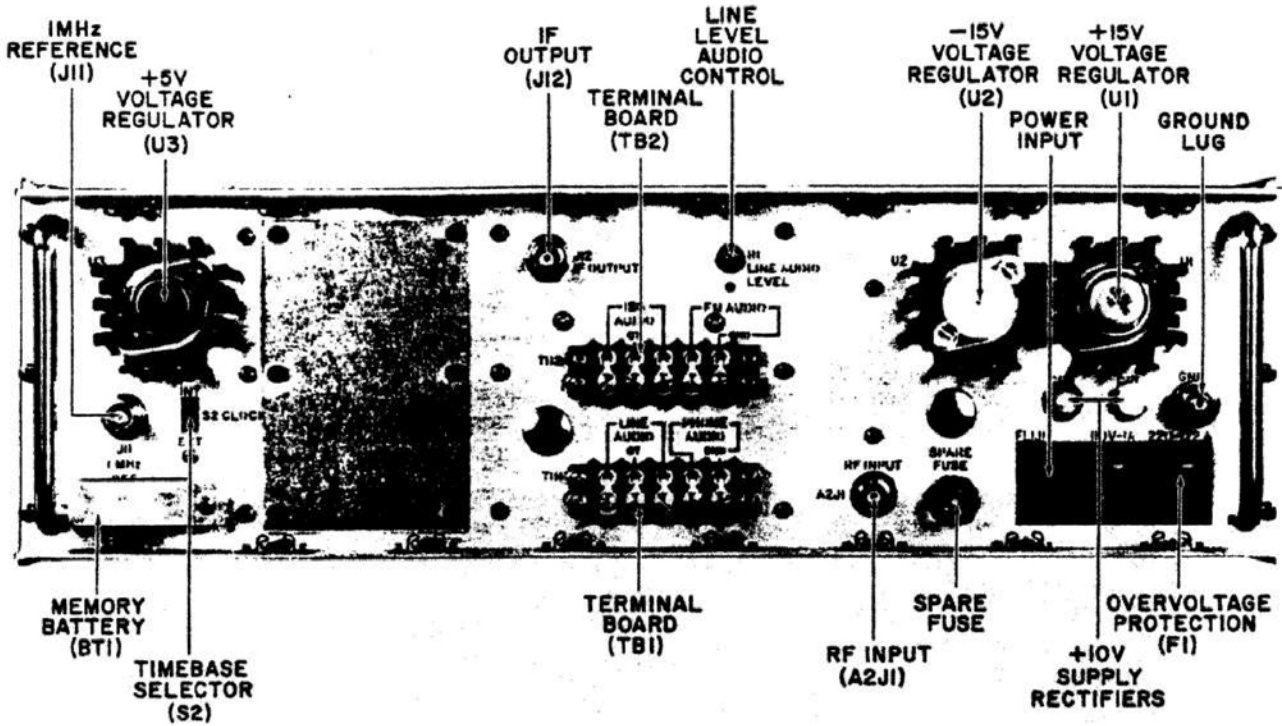


Figure 2-3. WJ-8718 Series Receiver, Rear Panel View

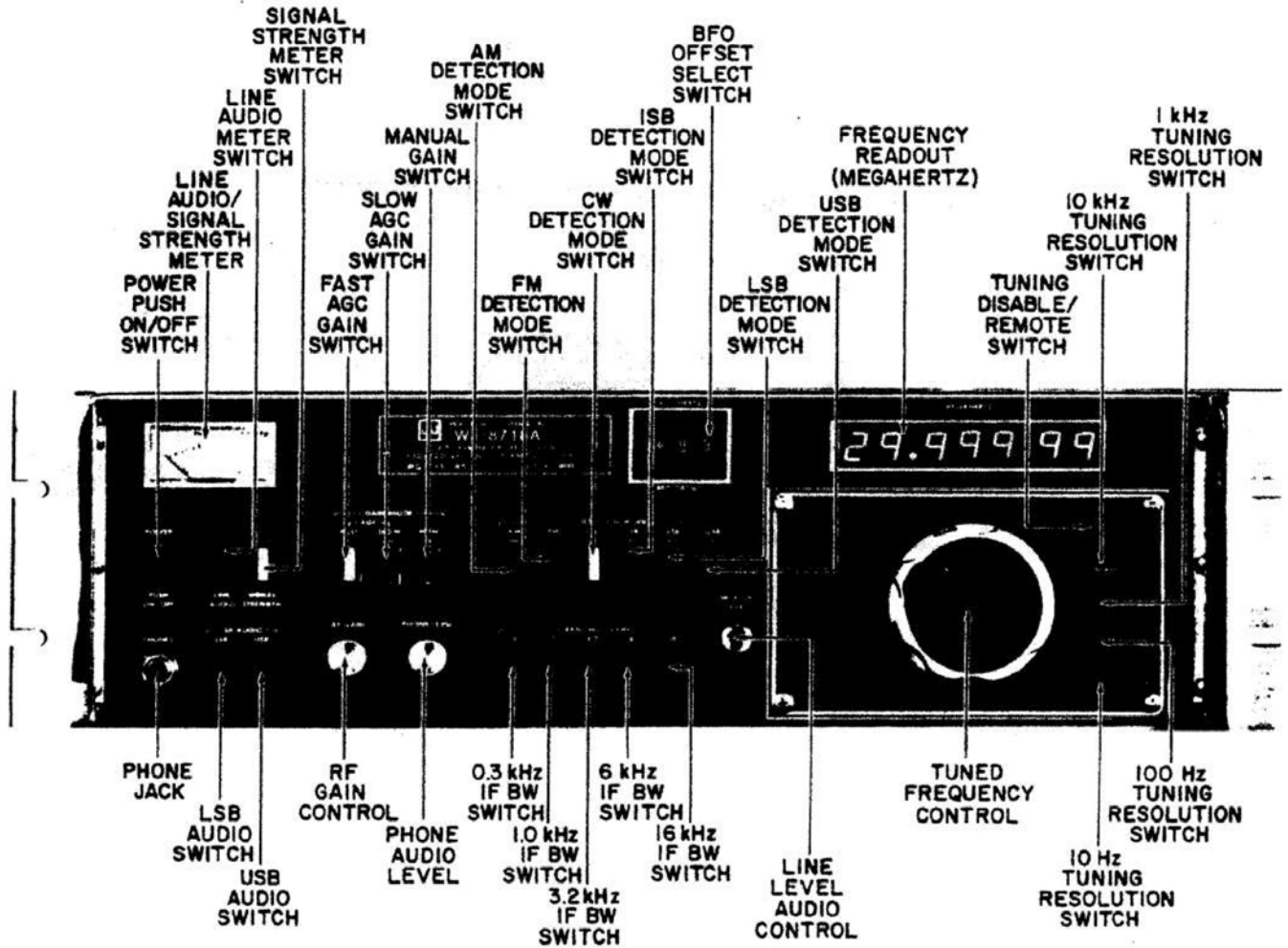


Figure 2-4. WJ-8718A HF Receiver, Front Panel View

FIGURE 2-5

WJ-8718 SERIES HF RECEIVER

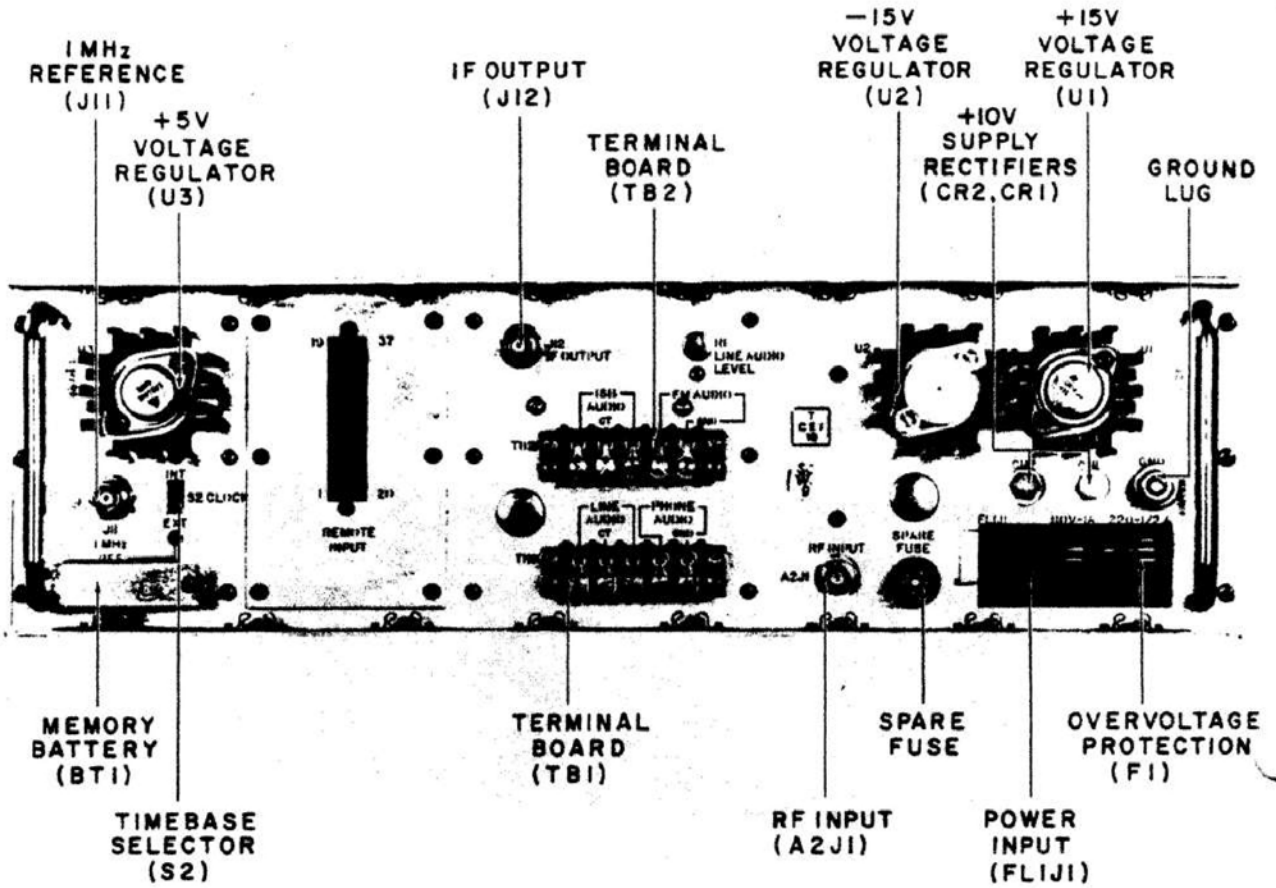


Figure 2-5. WJ-8718A HF Receiver, Rear Panel View

WJ-8718 SERIES HF RECEIVER

FIGURE 2-6

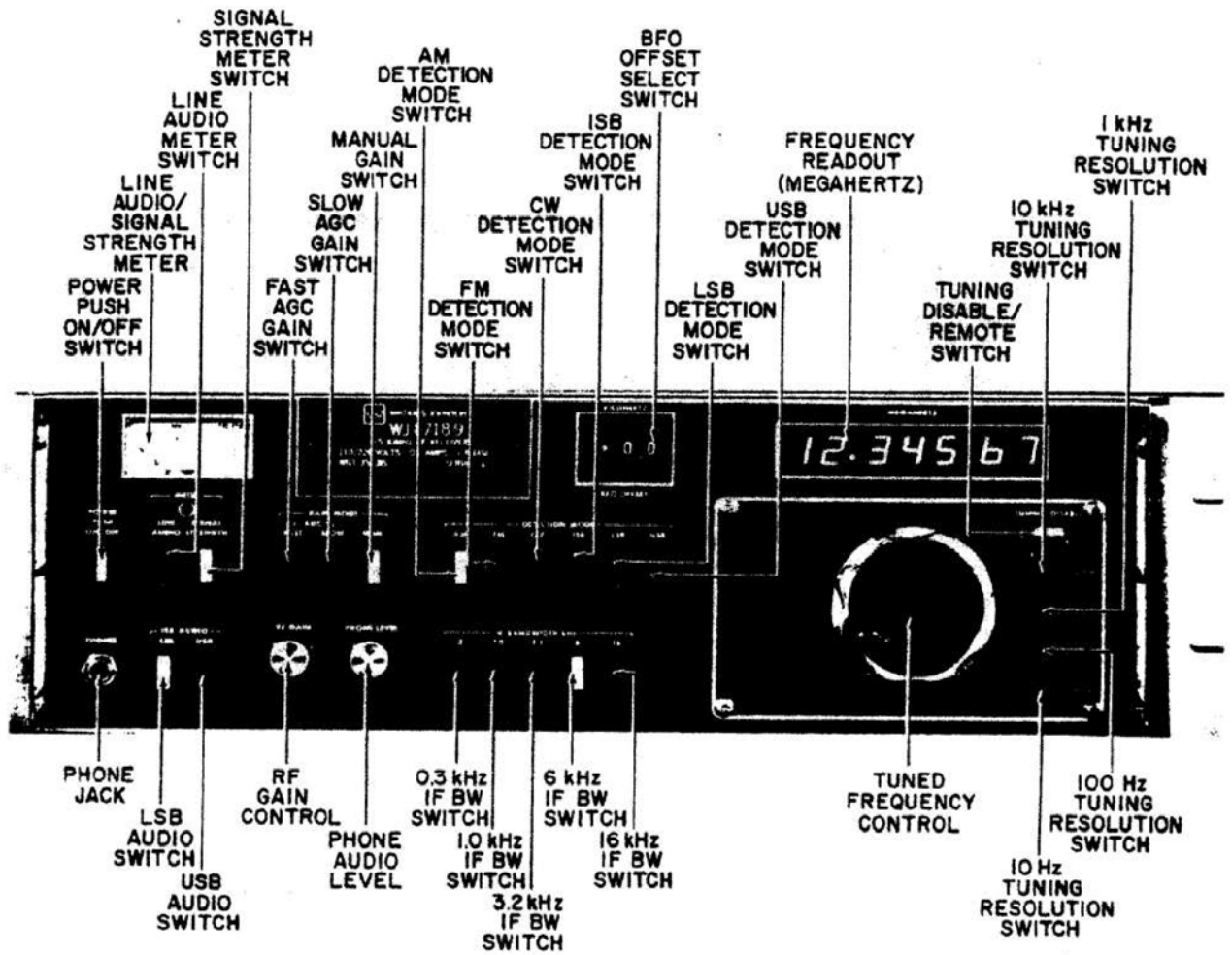


Figure 2-6. WJ-8718-9 HF Receiver, Front Panel View

FIGURE 2-7

WJ-8718 SERIES HF RECEIVER

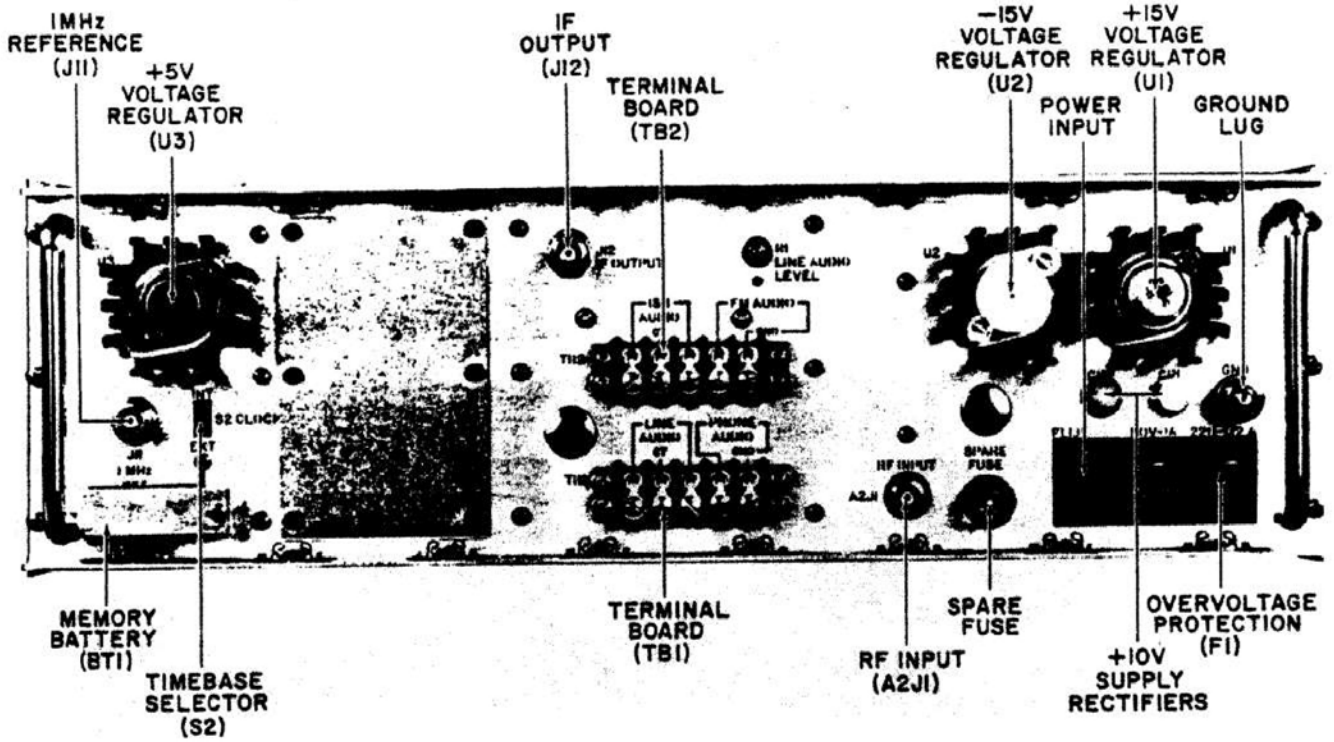


Figure 2-7. WJ-8718-9 HF Receiver, Rear Panel View

from zero (0) W to a minimum 1 W (0 V to 24.5 V rms). Actual level is determined by the setting of the LINE AUDIO LEVEL potentiometer R1. This line level is monitored by the front panel meter when the LINE AUDIO METER switch is engaged.

- PHONE AUDIO. This single ended output is parallel with the front panel PHONES jack and will drive a 600 Ω load. The front panel PHONE LEVEL potentiometer controls the output level to a maximum of 7.8 Vrms.

2.3.6 TERMINAL BOARD (TB2)

These outputs will be described separately.

- ISB AUDIO. Three of the terminals on this board provide a floating, center tapped, balanced output for driving a 600 Ω load. When in the ISB mode, only the LSB signal is available from this output. No other signal is available from these terminals. Audio level may be set to a maximum of 100 mW (7.75 V rms) using a potentiometer on printed circuit card A4A8. The USB signal for the ISB mode appears at the LINE AUDIO terminals of TB1.
- FM AUDIO. This is the audio output voltage from the FM/CW/SSB detector, A4A9. Measure with a high impedance voltmeter.

2.3.7 CLOCK SWITCH (S2)

Setting this switch to the INT position selects the internal time base for the receiver and provides the internal 1 MHz reference output at J11. Setting this switch to the EXT position deactivates the internal reference so that an external signal may be applied to J11.

2.3.8 1 MHz REF (J11)

When the CLOCK switch is in the INT position, this BNC connector provides a 1 MHz, 100 mV rms output into 50 Ω . When the switch is set in the EXT position, a 1 MHz reference signal of at least 50 mV rms into 50 Ω must be applied to J11 to provide a time base for the receiver.

2.3.9 PHONES JACK (J13)

This output is intended to drive a 600 Ω , or greater, stereo headphone set. When operating in the ISB mode, both USB and LSB information are monitored separately in the WJ-8718A/8718-9 receivers, and simultaneously in the WJ-8718.

2.3.10 REMOTE INPUT (A6A1J1)

This 37-pin input connector feeds remote control signals to the Manual Tuning Up/Down Counter, A6A1. Remote tuning is enabled by manually pressing the TUNING DISABLE pushbutton, or internally by connecting a jumper wire in Manual Tuning Up/Down Counter A6A1, as described in Note 4 of **Figure 6-19**. Frequency tuning and IF bandwidth can be remotely selected in AM, FM, or CW modes. Other modes automatically determine IF bandwidth. Identification of the Remote Input lines is shown in **Table 2-1**.

2.4 OPERATION

All front panel controls and indicators are described here. The pushbuttons have a mechanical interlock arrangement so that only one button of any group may be in at a time. Partial depression of a button in the out position releases any button previously depressed. A depressed button will be indicated by a brightly colored display behind the clear front surface. If no button has been depressed in any functional grouping, that particular mode will be inactive. For an explanation of front panel features, refer to the following paragraphs.

2.4.1 PUSH ON/OFF POWER (S1)

Press this button in to energize the receiver. During initial installation, be sure the line-voltage-select PC wafer on the rear panel matches the available line voltage before energizing the receiver. Refer to **paragraph 2.3.1** for the voltage selection procedure.

2.4.2 METER (M1)

The meter contains two scales of which one is a signal strength scale with a relative scale range of 0 to 110. This signal strength scale contains a MAN SET mark on the scale to indicate proper signal strength in the MAN gain mode. The other scale on the meter indicates the audio level of the LINE AUDIO output in dB above 1 mW, referenced to 600 Ω .

2.4.3 METER SWITCHES

These switches determine what function the meter will indicate with:

- **LINE AUDIO.** This position monitors the level of the rear panel LINE AUDIO output terminals. The meter scale indicates levels from 0 to 2 W (+33 dBm). Normal indication is 1 W.
- **SIGNAL STRENGTH.** This position provides a logarithmic indication of signal strength in AGC Mode, and a linear indication in MAN Mode. The meter indicates relative signal strength from 0 to 110. Normal indication would be at or near the MAN SET mark.

Table 2-1. Remote Input Lines Identification

Up/Down Counter Board A6A1		Remote Input A6A1J1
E20		Pin- 9 3.2 kHz
E12		Pin- 5 0.3 kHz
E32		Pin-15 1.0 kHz
E24		Pin-11 6.0 kHz
E28		Pin-13 16 kHz
E16		Pin-33 BW enable
E39	2^0	Pin-37 } Pin-32 } 10^1 Pin-14 } Pin-18 }
E29		
E30		
E38	2^3	
E37	2^0	Pin-36 } Pin-16 } 10^2 Pin-34 } Pin-35 }
E34		
E33		
E35	2^3	
E26	2^0	Pin-12 } Pin-24 } 10^3 Pin- 6 } Pin-30 }
E13		
E14		
E25	2^3	
E22	2^0	Pin-10 } Pin- 8 } 10^4 Pin-26 } Pin-28 }
E18		
E17		
E21	2^3	
E10	2^0	Pin- 4 } Pin- 3 } 10^5 Pin- 1 } Pin-22 }
E08		
E04		
E09	2^3	
E06	2^0	Pin- 2 } Pin-23 } 10^6 Pin-25 } Pin-20 }
E11		
E15		
E5	2^3	
E36	2^0	Pin-17 } Pin-19 } 10^7
E40	2^1	
E7		Pin-21 } Load
E19		Pin-27 } }
E23		Pin-29 } Ground
E27		Pin-31 } lines

2.4.4 GAIN MODE

These switches establish the receiver gain mode.

- **FAST AGC.** The 15 ms response time provided is useful for AM and FM signals. SLOW AGC gives a 15 ms attack time and 2 sec decay time suitable for CW, ISB, and SSB signals.
- **MAN GAIN.** This mode activates the RF GAIN control which was inoperative in AGC modes. If the AM detector is overloaded in the MAN gain mode, switching to the SLOW AGC mode results in a recovery time several times longer than expected for the SLOW AGC mode.

2.4.5 RF GAIN CONTROL

When in the MAN gain mode, rotating the RF GAIN control clockwise approximates a logarithmic increase in receiver gain. With the METER switches in the Signal Strength mode, this control should be set for an indication at the MAN SET mark on the meter.

2.4.6 DETECTION MODE

One of the following six detection switches must be depressed to establish a detection mode. If the AM, FM, or CW switch is selected, an IF BANDWIDTH kHz switch also must be selected. Selection of optional ISB, USB, or LSB switches automatically activates other bandwidth filters related to these modes of operation.

- **AM MODE.** The Line Audio, Phone Audio, and front panel PHONES audio are taken from the AM detector in this mode.
- **FM MODE.** The Line Audio, Phone Audio, LINE AUDIO, PHONE AUDIO, and front panel PHONES audio are taken from the FM detector in this mode. A dc-coupled monitor voltage from the detector appears at the FM AUDIO terminals of TB2 for test purposes.
- **CW MODE.** Selection of this mode enables the BFO and the BFO OFFSET switch. The Line Audio, Phone Audio, and front panel PHONES audio are taken from the CW/SSB product detector in this mode.
- **USB MODE.** Selection of this mode overrides the front panel IF bandwidth switches and activates the independent IF filter for upper sideband reception. Audio is available at the front panel PHONES jack, and at the Audio Line terminals and Phone Audio terminals of TB1 on the rear panel. The BFO is enabled but fixed in frequency at 455 kHz. The frequency readout indicates the corresponding suppressed carrier frequency.

- **LSB MODE.** Except for the sideband selected, this mode is functionally identical to the USB mode.
- **ISB MODE.** Selection of this detection mode automatically activates separate IF filters independent of the front panel IF bandwidth selection. Both upper and lower sidebands are separately and simultaneously demodulated.

On the rear panel, lower sideband information will be available at the ISB Audio terminals of TB2. Upper sideband information will be available at the Line Audio terminals of TB1.

2.4.7 **IF BANDWIDTH (kHz)**

One of the following IF bandwidth switches must be selected during AM, FM, or CW detection modes; in the three SSB detection modes the IF bandwidth switches are inoperative. Available bandwidths are: 0.3 kHz, 1.0 kHz, 3.2 kHz, 6 kHz, and 16 kHz.

2.4.8 **BFO OFFSET**

These thumbwheel switches are activated only in the CW detection mode. The BFO offset is ± 8.9 kHz (from 455 kHz) in steps of 100 Hz. The BFO signal is injected after the IF bandwidth filters, ensuring that pitch is independent of the IF bandwidth. Switching to "0" of the "+, 0, -" section of the switch automatically tunes the BFO to 455 kHz, regardless of the setting of the numerical sections.

2.4.9 **TUNED FREQUENCY READOUT**

This seven-digit readout displays the tuned frequency of the receiver. Each digit is a seven-segment LED with intensity controlled by a single potentiometer located inside the receiver. The least-significant digit, at the far right, indicates 10's of Hz. Tuned frequency is displayed for both local and remote control of the receiver.

2.4.10 **TUNING KNOB**

Rotating the knob clockwise increases tuned frequency; counterclockwise rotation decreases tuned frequency. Continuing to tune past the end of the range causes the receiver to step to the opposite end of the band and to continue tuning in the same increasing or decreasing frequency direction. The receiver tunes from 00.00000 MHz to 29.99999 MHz, useable above 5 kHz.

2.4.11 **TUNING RESOLUTION (A7)**

- **TUNING DISABLE.** Engaging this button locks the receiver to the frequency currently being displayed. Any other tuning-related button engaged will be released and the tuning knob disabled. Also, by engaging this button, the receiver may be tuned remotely, if this option is installed. Depressing any tuning button slightly releases all buttons and also disables tuning.
- **10 kHz BUTTON.** With this button engaged, only the four most-significant digits of the readout can be varied by the tuning knob. The 1 kHz, 100 Hz, and 10 Hz digits will be locked to the frequency indicated when the 10 kHz button was engaged.
- **1 kHz BUTTON.** With this button engaged, the five most-significant digits of the readout can be varied by the tuning knob. The two least-significant digits will be locked to a fixed frequency.
- **100 Hz BUTTON.** With this button engaged, only the 10 Hz digit is locked to frequency. All others are available for tuning.
- **10 Hz BUTTON.** With this button engaged, all digits are available for tuning.

2.4.12 **LINE AUDIO LEVEL (R1) (WJ-8718A only)**

This potentiometer adjusts the level of audio signals on the LINE AUDIO terminals of TB1. The front panel meter monitors this output when the related LINE AUDIO switch is engaged. Rotating this control fully clockwise provides a 1 W audio output (24.5 V rms/+30 dBm) into 600 Ω .

2.4.13 **PHONE LEVEL CONTROL**

Rotating the front panel PHONE LEVEL control clockwise increases the output of both Phone Audio terminals at TB2 and the stereo PHONES jack on the front panel.

2.4.14 **ISB AUDIO SWITCH (WJ-8718A/8718-9 only)**

With the USB Switch depressed, USB audio is fed to both earphones. With the LSB Switch depressed, LSB audio is fed to the earphones. With neither switch depressed, USB audio is fed to one earphone and LSB audio is fed to the other earphone.

SECTION IV

MAINTENANCE

4.1 GENERAL

This section provides detailed procedures to perform preventive and corrective maintenance on the WJ-8718 Series HF Receiver. Preventive maintenance helps prevent malfunctions or breakdowns. Corrective maintenance includes procedures for returning a malfunctioning receiver to operating condition.

4.2 PREVENTIVE MAINTENANCE

Preventive maintenance consists of visual inspection, cleaning and lubrication. Although the WJ-8718 Series HF Receiver is designed for extended operation with little or no routine servicing, optimum long-term performance can only be achieved by a periodic preventive maintenance schedule.

4.2.1 VISUAL INSPECTION

A visual inspection of the receiver should be performed every 1200 hours of operation or less. The inspection should be performed thoroughly to uncover existing or potential component malfunctions. At a minimum, the following items should be checked.

1. Inspect the equipment covers and front panel for condition of finish and panel markings.
2. Inspect for dents, punctures, or warped areas.
3. Inspect quarter-turn fasteners and receptacles.
4. Inspect the external surfaces for loose or missing screws or washers.
5. Inspect the receptacles for conditions of pins, contacts, and mountings.
6. Inspect the internal components for signs of deterioration, discoloration, or charring. Check for melted insulation and damaged, cracked, or broken components.
7. Inspect the printed circuit boards for damaged tracks, loose connections, corrosion, or other signs of deterioration.
8. Inspect the PC connectors, interface connectors, and chassis wiring for excessive wear, looseness, misalignment, corrosion, or other signs of deterioration.

4.2.2 CLEANING

Receiver cleaning should be performed every 1200 hours of operation. Complete removal of dust, grease and other contamination is of prime importance in maintaining the reliability and useful life of the receiver. At a minimum, the following items should be cleaned.

CAUTION

Avoid the use of chemical cleaning agents containing benzene, toluene, xylene, acetone, or similar solvents. These chemicals may damage the plastics used in this receiver.

1. Exterior - Dust the cabinet off with a soft cloth. Dust the front panel controls with a small soft-bristled paint brush. Dirt clinging to the cabinet may be removed with a clean, lint-free cloth dampened with a mild detergent and water solution. Avoid using abrasive cleaners. They will scratch the front panel.
2. Interior - Dust in the interior of the unit should be removed before it builds up enough to cause arcing and short circuits during periods of high humidity. Dust is best removed by dry, low-pressure air. Dirt clinging to surfaces may be removed with a soft-bristled paint brush or a clean, lint-free cloth dampened with a mild detergent and water solution. Use a cotton-tipped applicator for cleaning in narrow spaces and on the circuit boards.
3. Switch Contacts - When maintenance is necessary due to accumulated dirt and dust on the contacts, observe the following precautions: Clean the switch contacts with isopropyl alcohol or a mild detergent solution. Avoid cleaning solutions containing benzene, acetone, or similar solvents.

4.2.3 LUBRICATION

The optical encoder assembly shaft requires lubrication every 720 hours of operation to prevent excessive wear. The other rotating assemblies in the receiver are sealed and do not require lubrication. To lubricate the encoder assembly shaft, perform the following steps:

CAUTION

Excessive lubrication of the encoder shaft may destroy the optical characteristics of the encoder wheel.

1. Place the receiver in a vertical position and remove the encoder knob.

2. Apply one (1) drop of SAE 5W-20W oil to the encoder shaft at the retaining ring.
3. Reassemble the encoder assembly knob and rotate the knob several times to distribute the lubricant.

4.3 CORRECTIVE MAINTENANCE

4.3.1 GENERAL

Corrective maintenance procedures consist of testing, troubleshooting, repairing and alignment information necessary to restore a malfunctioning receiver to normal operation. Maintenance information provided in this paragraph is divided into the following categories.

1. Checkout procedures to generate receiver fault symptoms (**Table 4-2**).
2. Troubleshooting procedures keyed to the checkout procedures to locate a malfunctioning module within the receiver (**Table 4-3**).
3. Individual module checkout and troubleshooting procedures to locate a defective component on a malfunctioning module (**Paragraph 4.3.5**).
4. Receiver alignment procedures to be performed after module or component replacement (**Paragraph 4.3.7**).

A receiver will normally require corrective maintenance for one of the following reasons:

1. Failure to pass any initial inspection testing.
2. Failure to meet minimum performance standards tested by the Receiver Checkout Procedure, **Table 4-2**.
3. Operator-observed malfunctions during normal operation of the receiver.

4.3.2 TEST EQUIPMENT REQUIRED

Table 4-1 lists the test equipment required for corrective maintenance of the WJ-8718 Series HF Receiver. Equivalent equipment may be used.

Table 4-1. Test Equipment Required

Instrument Type	Required Characteristics	Recommended Instrument
Signal Generator	AM, FM, CW, RF output, from -111 dBm to 0 dBm	HP8640B
Oscilloscope	dc to 50 MHz	HP180C
RF Voltmeter	1 mV to 3.0 V; -50 dBm to +20 dBm	Boonton 92B
Digital Counter	0 to 500 MHz	HP5303A
AC Voltmeter	1 mV to 300 V, full scale	HP-400E
Digital Voltmeter	dc ranges; 1% or better	Fluke 8100A
Dummy Load, 600 Ω	4-W dissipation	Two 1200 Ω , 2-W resistors in parallel
Dummy load, 600 Ω	1/2-W dissipation	Two 1200 Ω , 1/4 - or 1/2-W resistors in parallel
Headphones	Stereo, 600 Ω impedance, or Mono	Telex 325-02 or Telex 820-4
Sweep Generator	100 kHz to 11.0 MHz	HP8601A

4.3.3 RECEIVER CHECKOUT PROCEDURES

The checkout procedures test the receiver's ability to meet the minimum performance standards necessary for satisfactory receiver operation. The procedures are to be used to isolate and identify malfunctioning modules within the receiver and to verify receiver performance after module or component replacement. They may also be used as an "Operational Quick Check" of receiver performance as part of a periodic maintenance schedule.

Checkout procedures for the receiver are contained in **Table 4-2**. **Figure 4-1** details the overall connections between the receiver and the test equipment.

4.3.3.1 Procedure Guidelines

The checkout procedures in **Table 4-2** are keyed to troubleshooting tables in **paragraph 4.3.4** by a step number in the IF INDICATION IS ABNORMAL column. To properly check out and troubleshoot a receiver, the following guidelines should be utilized:

1. Perform the preliminary set up procedure in **paragraph 4.3.3.2**.
2. Beginning with Step 1 in **Table 4-2**, perform each of the check-out procedures. Continue until a malfunction is encountered.
3. At the step where the malfunction is encountered, refer to the IF INDICATION IS ABNORMAL column. This column refers to a corresponding step in **Table 4-3, Troubleshooting Procedures**, listing the probable cause and additional test steps necessary to locate the defective receiver module.
4. Locate the step in **Table 4-3** referred to from the IF INDICATION IS ABNORMAL column in **Table 4-2**. Perform the additional test steps indicated for the fault. Replace the receiver module(s) indicated in the CORRECTIVE ACTION column and perform any required alignment(s).
5. Following module replacement, verify corrective action by reperforming the Checkout Procedure in **Table 4-2** that identified the malfunction. Additional troubleshooting will be necessary if the receiver still fails to produce the required NORMAL INDICATION.
6. Proceed to the next Checkout Procedure step in **Table 4-2** only after obtaining the required response as indicated in the NORMAL INDICATION column.
7. Defective receiver modules removed in Step 4 above may be repaired by referring to the appropriate module checkout and troubleshooting procedure in **Paragraph 4.3.4**.

4.3.3.2 PRELIMINARY SET-UP PROCEDURE

Prior to performing the Checkout Procedures in **Table 4-2**, perform the following Preliminary Setup Procedure.

1. With the receiver deenergized, connect the test equipment as shown in **Figure 4-1**. Remove receiver top and bottom covers.
2. Set the receiver input voltage selector to match the available AC line voltage.

FIGURE 4-1

WJ-8718 SERIES HF RECEIVER

3. Set the receiver to AM Detection Mode, 16 kHz Bandwidth and MAN Gain Mode. Rotate the PHONE LEVEL, RF GAIN and LINE AUDIO controls fully CCW.
4. Energize the receiver and test equipment. Allow 30 minutes for warm-up before proceeding to the Checkout Procedure.

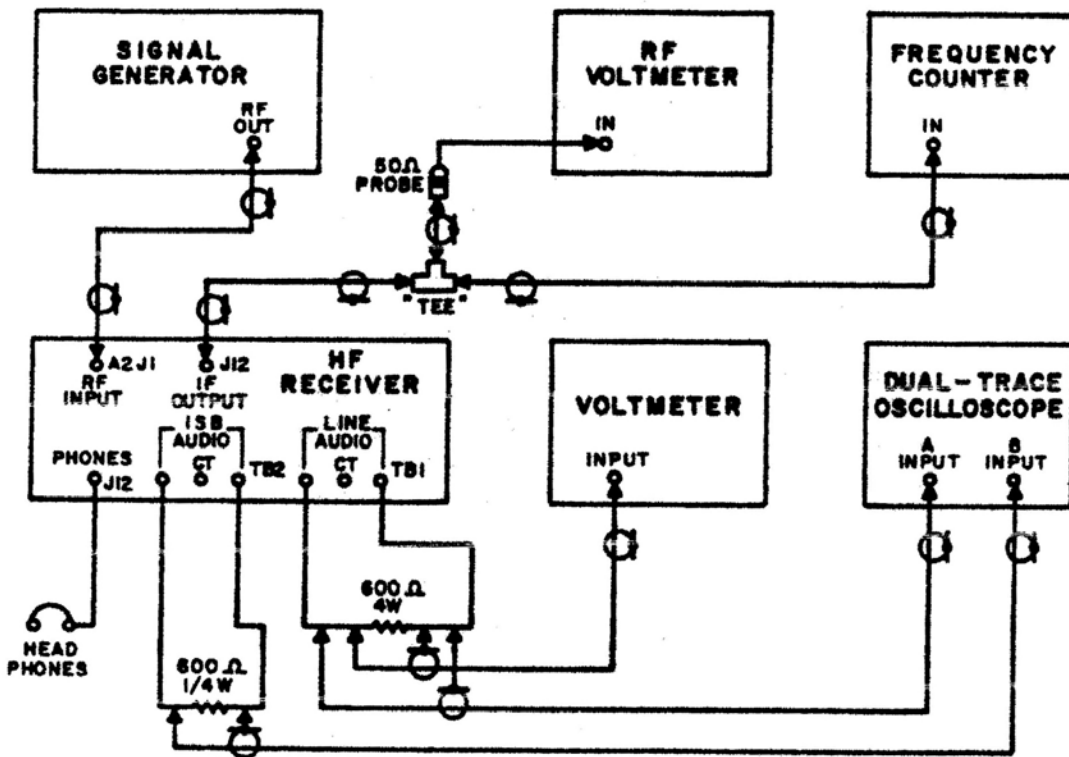


Figure 4-1. Receiver Checkout Procedure, Test Setup.

Table 4-2. WJ-8718 Series HF Receiver Checkout Procedure.

Step	Test Equipment	Control Settings and Instructions	Normal Indication	IF Indication is Abnormal
1. Preliminary		a. After power-up in Par. 4.3.3.2, observe Freq. Display for brightness. b. Tune receiver to 15.00500 MHz using all Tuning Res. positions.		Refer to Table 4-3, Steps 1a, 1b. Refer to Table 4-3, Steps 1c, 1d, 1e.
2. Power Supply	Fluke 8100A	a. Refer to Fig. 5-4 for location of Power Supply Test Points. b. Measure Voltage at E1. c. Measure Voltage at E2. d. Measure Voltage at E3. e. Measure Voltage at C8 (WJ-8718A/8718-9 only)	All digits must increment smoothly +15Vdc ±0.75 -15Vdc ±0.75 +10Vdc (min.) +12Vdc ±0.75	Refer to Table 4-3, step 2a Refer to Table 4-3, step 2b Refer to Table 4-3, step 2c Refer to Table 4-3, step 2d
3. IF Gain	HP8640B Boonton 92B	a. Set Sig. Gen. to 15.00500 MHz, -97dBm, Set RF Voltmeter to -10 dBm range b. Adjust receiver RF Gain for -15 dBm on RF Voltmeter c. Depress 6 kHz, 3.2 kHz, 1.0 kHz and 0.3 kHz BW Switches. Read RF V.M. indication at each B.W. d. Increase Sig. Gen to 15.00650 MHz. Depress USB Mode Switch. Read RF V.M. indication.	-15 dBm -15 dBm ±4 -15 dBm ±4	Refer to Table 4-3, step 3a, 3b, 3c Refer to Table 4-3, step 3a, 3b, 3c Refer to Table 4-3, step 3d

Table 4-2. WJ-8718 Series HF Receiver Checkout Procedure. (Cont'd)

Step	Test Equipment	Control Settings and Instructions	Normal Indication	IF Indication is Abnormal
3. IF Gain (Cont'd)		<p>e. Depress ISB Mode Switch. Read RF V.M. indication.</p> <p>f. Decrease Sig. Gen. to 15.00350 MHz. Depress LSB Mode Switch. Read RF V.M. indication.</p>	<p>-15 dBm \pm4</p> <p>-15 dBm \pm4</p>	<p>Refer to Table 4-3, step 3e</p> <p>Refer to Table 4-3, step 3f.</p>
4. Detection Mode	HP8640B HP400-EL HP180C Boonton 92B	<p>a. Set Sig. Gen. to 15.00500 MHz, -97dBm, 30% AM at 400 Hz. Set receiver to AM Mode, 16 kHz BW. On WJ-8718A/8718-9 Receivers, ensure that USB and LSB Audio buttons are deenergized. Set AC V.M. to 50 Vac range. Set HP180C A-input to 20 V/cm, B-input to 5 V/cm, time base to 1 msec. Set RF Gain for -15 dBm on RF V.M.</p> <p>b. Rotate PHONE LEVEL control until 400 Hz is heard in headphones.</p> <p>c. Rotate LINE AUDIO LEVEL control until AC V.M. indicates 24.5 Vrms.</p> <p>d. Depress A-Input switch on oscilloscope and observe Line Audio waveform.</p> <p>e. Turn off Sig. Gen. modulation. Set receiver to CW mode, 1 kHz BW, -0.4 kHz BFO offset. Monitor Headphone.</p>	<p>Clear, distinct tone, no distortion.</p> <p>24.5 Vrms</p> <p>Clean sine wave, no clipping.</p> <p>Clear, distinct 400 Hz tone, no distortion.</p>	<p>Refer to Table 4-3, step 4a.</p> <p>Refer to Table 4-3, step 4b.</p> <p>Refer to Table 4-3, step 4c.</p> <p>Refer to Table 4-3, step 4d.</p>

Table 4-2. WJ-8718 Series HF Receiver Checkout Procedure. (Cont'd)

Step	Test Equipment	Control Settings and Instructions	Normal Indication	IF Indication is Abnormal
4. Detection Mode (Cont'd)		<p>f. Increase Sig. Gen. to 15.00540 MHz. Depress USB and ISB Mode Switches. Monitor headphones in both modes.</p> <p>g. Decrease Sig. Gen. to 15.00460 MHz. Depress LSB Mode Switch. Monitor headphones.</p> <p>h. Depress ISB Mode switch. Depress B-input switch on oscilloscope and observe ISB Audio Waveform.</p>	<p>Clear, distinct 400 Hz tone, no distortion</p> <p>Clear, distinct 400 Hz tone,</p> <p>22 Vpp minimum at 400 Hz, no clipping.</p>	<p>Refer to Table 4-3, step 4e.</p> <p>Refer to Table 4-3, step 4g</p> <p>Refer to Table 4-3, step 4g</p>
5. SNR	HP8640B HP400-EL	<p>a. Set Sig. Gen. to 15.00500 MHz, -97 dBm, 50% AM at 400 Hz. Set RF Gain for -15 dBm on RF V.M. Set AC V.M. for convenient meter indication and note level.</p> <p>b. Turn off Gen. modulation and note reduction in AC V.M. indication.</p>	<p>>10 dB reduction</p>	<p>Refer to Table 4-3, step 5a</p>
6. MAN/AGC Operation	HP8640B HP400-EL Boonton 92B	<p>a. Set Sig. Gen. to 15.00500 MHz, -97 dBm, 30% AM at 400 Hz. Set receiver to AM Mode, 6 kHz BW, MAN GAIN mode. Set RF GAIN for -15 dBm on RF V.M.</p> <p>b. Increase Sig. Gen. output to +3 dBm. Reduce RF GAIN setting until RF V.M. indicates -15 dBm or less.</p>	<p>MAN GAIN reduction >100 dB.</p>	<p>Refer to Table 4-3, step 6a</p>

Table 4-2. WJ-8718 Series HF Receiver Checkout Procedure. (Cont'd)

Step	Test Equipment	Control Settings and Instructions	Normal Indication	IF Indication is Abnormal
6. MAN/AGC Operation (Cont'd)		<p>c. Reduce Sig. Gen. output to -87 dBm. Set receiver to AGC Mode. Note AC V.M. reading.</p> <p>d. Increase Sig. Gen. output to -7 dBm. Note increase in AC V.M. indication.</p>	<6 dB increase, no clipping.	Refer to Table 4-3, step 6b
7. Freq. Tuning Accuracy	HP8640B Boonton 92B HP5303A	<p>a. Set Sig. Gen. to 00.50000 MHz, -60 dBm, unmodulated. Set receiver to 00.50000 MHz AM Mode, 1 kHz BW, MAN GAIN Mode. Set RF GAIN control for -15 dBm on RF V.M.</p> <p>b. Read IF Frequency on Freq. Counter.</p> <p>c. Increase both Sig. Gen. and receiver to 29.99990 MHz.</p> <p>d. Read IF Frequency on Freq. Counter.</p>	<p>455.000 kHz ±0.100 kHz</p> <p>455.000 MHz ±0.100 kHz</p>	<p>Refer to Table 4-3, step 7a</p> <p>Refer to Table 4-3, step 7a</p>

4.3.4 RECEIVER TROUBLESHOOTING PROCEDURES

The troubleshooting procedures contained in Table 4-3 are to be used in conjunction with the Receiver Checkout Procedures in Table 4-2. The checkout procedures are keyed to the troubleshooting procedures when a malfunction of the receiver is indicated. The troubleshooting procedures provide a listing of specific malfunctions that will result in failure to obtain the specific test results called for in the checkout procedures. Probable causes of the malfunctions and necessary corrective action are also listed. When a malfunction can be caused by more than a single source, the procedures give additional test steps that will permit more positive identification of the trouble.

Table 4-3 will aid the location of a defective module in the receiver. To locate a defective component on a module known to be defective, refer to paragraph 4.3.5 for individual module testing and troubleshooting.

Table 4-3. WJ-8718 Series HF Receiver Troubleshooting Procedures.

Step	Fault	Probable Cause	Additional Test	Corrective Action
1.	a. No display brightness	Misadjusted Display brightness control.		Adjust A8R2 for proper brightness.
	b. Same	Defective Frequency Display		Replace A8.
	c. Display will not increment	Up/Down Counter circuit malfunctioning.	Check CLOCK and DIR outputs from Encoder U5.	Replace U5 if incorrect. Replace A6A1 if correct.
	d. Same	Tuning Res. Faulty		Check or replace A7
	e. Not all Freq. digits increment.	Faulty Up/Down Counter or Display.	Check BCD data on lines corresponding to faulty digit.	IF data increments replace A8. IF not, replace A6A1.
2.	a. Incorrect +15 V at E1	Faulty U1	Check for +24 V at A1J7	IF correct, replace U1. If not, check components on A1.
	b. Incorrect -15 V at E2	Faulty U2	Check for -24 V at A1J12	IF correct, replace U2. If not, check components on A1.
	c. Incorrect +10 V at E3.	Faulty CR1, CR3		Check CR1 and CR3
	d. Incorrect voltage at C8.	Faulty U4 (8718A/8718-9)		Replace U4
3.	a. IF output dead on all	Faulty LO signals	Check 1st LO at A1J2: 57.91 MHz at +20 dBm.	Check BCD presets to A5A1. If correct, replace A5A1. If not replace A6A1

Table 4-3. WJ-8718 Series HF Receiver Troubleshooting Procedures. (Cont'd)

Step	Fault	Probable Cause	Additional Test	Corrective Action
3.		<p>Faulty A4A7</p> <p>Faulty A4A2</p> <p>Faulty A3</p>	<p>Check 2nd LO at A2J1: 32.20500 MHz at 0 dBm.</p> <p>Check 3rd LO at A4A2-13: 11.155 MHz at -6 dBm.</p> <p>Check A4A7-47 for 0 Vdc.</p> <p>Check A3C1 for 0 Vdc.</p>	<p>Check BCD presets to A5A2. If correct, replace A5A2. If not replace A6A1.</p> <p>If incorrect replace A5A1.</p> <p>If correct, replace A4A7, repeat step 3b Table 4-2. If not, check or replace A4A6.</p> <p>Replace A4A2. Repeat step 3b, Table 4-2</p> <p>If correct, replace A3, repeat step 3b Table 4-2. If not, check or replace A4A6.</p>
	b. If output dead on 1 or more BWs.	Faulty Filter Switch A4A1 or A4A3.	Check BW Select voltages, pins 15, 17, 19 or A4A1 and A4A3: +3 Vdc for selected BW.	If correct, replace A4A1 or A4A3, repeat Step 3b, 3c, Table 4-2. If not, check or replace A6A2.
	c. IF output level out of limits on 1 or more BWs.	Incorrect Alignment.		Perform A4A1 Alignment, Para. 4.3.7.3.2 and A4A7 Alignment, Para. 4.3.7.3.4.
	d. Incorrect USB IF output in USB Mode.	Faulty A4A4	Check USB Select voltage at A4A4-49: +3 Vdc in USB Mode.	If correct, replace A4A4, repeat step 3d, Table 4-2. If not, check or replace A6A2.
		Incorrect Alignment		Adjust A4A4R23 for -15 dBm IF output level.

Table 4-3. WJ-8718 Series HF Receiver Troubleshooting Procedures. (Cont'd)

Step	Fault	Probable Cause	Additional Test	Corrective Action
4.	e. Incorrect USB IF output in ISB Mode.	Faulty A6A2		Check or replace A6A2.
	f. Incorrect LSB IF output in LSB Mode.	Faulty A4A5	Check LSB Select voltage at A4A5-49: +3 Vdc in LSB Mode.	If correct, replace A4A5, repeat step 3f, Table 4-2. If not, check or replace A6A2.
	a. No 400 Hz tone in earphone (AM Mode)	Faulty A4A10	Check signal at A4A10-51: 0.7 Vrms at 400 Hz.	If incorrect, replace A4A7. If correct, perform next test.
			Check signal at A4A10-55: 0.7 Vrms at 400 Hz.	If incorrect replace A4A10. If correct, check Headphone Amp. A10A2U1.
	b. No Line Audio Output (AM Mode)	Faulty A4A10	Check signal at A4A10-11, 13 with R1 at max CW: 3 Vrms at 400 Hz	If incorrect, replace A4A10. If correct, replace T2.
	c. Line Audio Output distorted. (AM Mode)	Faulty A4A10		Replace A4A10. If problem not corrected, replace T2.
d. No 400 Hz tone in earphone (CW Mode)	Faulty A4A9	Check Audio Signal at A4A9-57. 0.7 Vrms at 400 Hz.	If correct, replace A4A10. If correct, perform next test.	
		Check BFO Signal at A4A9-17: 454.600 kHz at 40 mV.	If incorrect, check or replace A5A3. If correct, perform next test.	
		Check CW/SSB Select voltage, A4A9-43: 3 Vdc in CW mode.	If incorrect, check or replace A6A2. If correct, replace A4A9.	

Table 4-3. WJ-8718 Series HF Receiver Troubleshooting Procedures. (Cont'd)

Step	Fault	Probable Cause	Additional Test	Corrective Action
4.	e. No 400 Hz tone in earphone (USB, ISB)	Faulty A6A2	Check SSB Select Voltages at A4A4-49 (USB), A4A4-51 (ISB), A4A9-43 (SSB): 3 Vdc in selected modes.	If incorrect, check or replace A6A2. If correct, perform next test.
		Faulty A5A3	Check BFO Signal at A4A9-17: 455.000 kHz at 40 mV.	If incorrect, check or replace A5A3. If correct, check A4A9.
	f. No 400 Hz tone in earphone, (LSB Mode)	Faulty A6A2		Check or replace A6A2.
	g. No ISB Line Audio Output.	Faulty A4A8		Check or replace A4A8.
5.	a. Low SNR.	Faulty RF Filter		Check or replace RF Filter.
		Faulty A3	Check 1st and 2nd LO signals for adequate levels: 1st LO: +20 dBm 2nd LO: 0 dBm	If incorrect, replace A5A1 or A5A2. If correct, substitute new A3 and repeat Step 5, Table 4-2.
6.	a. MAN GAIN range is 100 dB	Faulty A4A6	Check AGC outputs for correct swing as RF Gain is rotated CCW to CW: A4A6-47, 0 to -3.5 V, A4A6-19, 0 to +0.8 V.	If either output is incorrect check or replace A4A6. If both outputs are correct, check A3, then check A4A7.
	b. AGC control range is 80 dB.	Faulty A4A6	Check input to AGC at A4A6-51: 2 Vdc.	If correct, replace A4A6. If incorrect, receiver gain is low. Repeat step 3, Table 4-2.

Table 4-3. WJ-8718 Series HF Receiver Troubleshooting Procedures. (Cont'd)

Step	Fault	Probable Cause	Additional Test	Corrective Action
7.	a. IF output freq. error $>\pm 100$ Hz.	Time Base misadjusted.	With receiver and sig. gen. tuned to 29.99990 MHz, adjust A5A1U14 for 0 Hz error in IF output. Repeat step 7, Table 4-3.	If receiver still fails test, check BCD presets to A5A1 and A5A2 at 00.50000 and 29.99990 MHz receiver tuned frequencies. If correct, replace A5A1 or A5A2. If incorrect, replace A6A1.

4.3.5 MODULE TROUBLESHOOTING PROCEDURES

Module troubleshooting procedures consist of checkout, fault-isolation and repair information necessary to restore a malfunctioning module to normal operation. Troubleshooting information provided in this paragraphs consists of the following categories:

1. Module checkout procedures to verify module fault symptoms.
2. Fault isolation tables to help isolate defective components on the modules. Semiconductor voltage tables are also provided to help locate defective transistors and integrated circuits.
3. A Parts Replacement Guide, Paragraph 4.3.6, to assist in repairing a defective module.

In addition to using the information provided in this paragraph, reference to the Circuit Description in Section III and Schematic Diagrams in Section VI is essential for efficient module troubleshooting.

4.3.5.1 Procedure Guidelines

To properly check-out and troubleshoot a defective module, the following guidelines should be utilized:

1. Allow the test equipment a 30 minute warm-up before any check out.
2. Refer to the Testing and Troubleshooting paragraph for the desired module. Configure the receiver and test equipment as stated in the Checkout Procedure for the desired module.

3. Perform the Checkout Procedure in the sequence given. If any desired result is not obtained, refer to the Fault Isolation paragraph for the module to locate the defective component.
4. Refer to the Parts Replacement Guide, **Paragraph 4.3.6**, to assist in replacing any components found to be defective. Following component replacement, re-perform the Module Checkout Procedure. If the module still fails, additional troubleshooting using the Circuit Descriptions in Section III and Schematic Diagrams in Section VI is necessary.

4.3.5.2 **RF Filter Testing And Troubleshooting**

RF Filter Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator, an RF Voltmeter, and a Digital Voltmeter (see **Table 4-1**) are required to perform the tests outlined below.

4.3.5.2.1 **RF Filter Checkout Procedure**

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.2.2** for fault isolation.

1. Disconnect A2P1 from A3A1J1 on the Input Converter.
2. Connect an RF Voltmeter and 50 Ω adapter to A2P1.
3. Connect the output of a Signal Generator to A2J1 on the rear panel of the receiver.
4. Set the RF Voltmeter to the 0 dBm range.
5. Set the Signal Generator output frequency to 1.0 MHz and output level to 0 dBm.
6. The RF Voltmeter should indicate a level between 0 dBm and -1.0 dBm.
7. Tune the Signal Generator to 10 MHz and 20 MHz, and 30 MHz successively, maintaining the output level at 0 dBm for each frequency. The filter output level should not be less than -3.0 dBm for each frequency.
8. Disconnect the test equipment from the receiver.
9. Reconnect A2P1 to A3A1J1.

4.3.5.2.2 RF Filter Fault Isolation

1. Remove the filter from the receiver and remove the filter's protective cover.
2. Check all capacitors and the two Zener diodes for leakage to ground.
3. Check all inductors for continuity.
4. Field realignment of the filter is not practical.

4.3.5.3 Input Converter Testing And Troubleshooting

Input Converter Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an RF Voltmeter (see Table 4-1) are required to perform the tests outlined below.

4.3.5.3.1 Input Converter Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.3.2 for fault isolation.

1. Deenergize the receiver.
2. Disconnect A2P1 from A3A1J1 and P28 from A3A2J2. Terminate A3A2J2 with 50 Ω .
3. Set the receiver front panel controls as follows:
 - a. Gain Mode - Manual
 - b. RF Gain - Maximum Clockwise
4. Connect the RF Voltmeter to connector A3A2J2 using a short coaxial cable (a "TEE" connector should be used to maintain 50 Ω termination).
5. Connect the Signal Generator to connector A3A1J1 using a short coaxial cable. Set the Generator output frequency to 15.00500 MHz and output level to -7 dBm.
6. Energize the receiver and tune to 15.00500 MHz.
7. The RF Voltmeter should display a level of 350 mV.

8. Deenergize the receiver and disconnect test equipment, if no further tests are to be performed.

4.3.5.3.2 Input Converter, A3, Fault Isolation

Table 4-4, Input Converter Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in Paragraph 4.3.5.3.1 and check the Test Points given in Table 4-4 with an RF Voltmeter and high impedance probe. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in Paragraph 4.3.5.3.1. Table 4-5, Input Converter Voltage Table, and Figure 6-2, Input Converter Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-4. Input Converter Fault Isolation Chart

Test Point	Normal Signal	Key Components	Comments
A1J2	1.8 V at 57.91 MHz	Check 1st LO	1st LO Signal
U1-8	74 mV at 42.905 MHz	U1	1st IF
FL1-IN	200 mV at 42.905 MHz	U2	
FL1-OUT	80 mV at 42.905 MHz	FL1	
A2Q2-S	40 mV at 42.905 MHz	Input Matching Network	
A2Q2-D	500 mV at 42.905 MHz	A2Q2, T1, C16, CR2	
A2J1	260 mV at 32.205 MHz	Check 2nd LO	2nd LO Signal
A2Q6-B	500 mV at 32.205 MHz	A2Q5	
A2Q6-C	1.3 V at 32.205 MHz	A2Q6	
A201-3	130 mV at 10.7 MHz	A2U1	2nd IF
A2Q3-C	1.3 V at 10.7 MHz	Q3, Q4, T2	
A252	350 mV at 10.7 MHz	FL1	

Table 4-5. Input Converter Voltage Table

TRANSISTOR PIN		VOLTAGE	TRANSISTOR PIN		VOLTAGE
A2Q1	E	+ 0.45	A2Q4	E	+ 1.25
	B	+ 1.1		B	+ 1.95
	C	+ 1.9		C	+ 7
A2Q2	S	+ 1.95	A2Q5	E	- 12
	G	0.0		B	- 11
	D	+ 15		C	0.0
A2Q2	S	+ 1.95	A2Q6	E	- 10
	G	+ 1.1		B	- 9.5
	C	+ 1.9		C	0.0
A2Q3	E	+ 8	A2Q6	E	- 10
	B	+ 8.8		B	- 9.5
	C	+ 14		C	0.0

4.3.5.4 **10.7 MHz Filter Switch Testing and Troubleshooting**

10.7 MHz Filter Switch Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an RF Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.4.1 **10.7 MHz Filter Switch Checkout Procedure**

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.4.2 for fault isolation.

1. Deenergize the receiver.
2. Disconnect connector P19 from A4XA1.
3. Place PC board A4A1 in an extender.
4. Depress the receiver 3.2 kHz BW button.

TABLE 4-6

5. Connect the RF Voltmeter to A4XA1 pin 57 using a short coaxial cable with clip leads on one end.
6. Connect the Signal Generator to A4XA1 pin 13 using a short coaxial cable with clip leads on one end. Set the Generator output frequency to 10.7 MHz and output level to -27 dBm.
7. Energize the receiver. The RF Voltmeter should display a level of 50 mV.
8. Depress the 6 kHz BW button and then the 16 kHz BW button. The RF Voltmeter should display a level of 50 mV in both BW position.
9. Deenergize the receiver and disconnect test equipment if no further tests are to be performed.

4.3.5.4.2 10.7 MHz Filter Switch, A4A1, Fault Isolation

Table 4-6, 10.7 MHz Filter Switch Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in paragraph 4.3.5.4.1 and check the Test Points given in Table 4-6 with an RF Voltmeter and high impedance probe. When faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in paragraph 4.3.5.4.1. Table 4-7, 10.7 MHz Filter Switch Voltage Table, and Figure 6-4, 10.7 MHz Filter Switch Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-6. 10.7 MHz Filter Switch Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
C1/L1 junction	33 mV at 10.7 MHz	C1, L1	All BW positions
Q1-C	110 mV at 10.7 MHz	Q1	Depress 3 kHz BW
FL1-OUT	65 mV at 10.7 MHz	FL1	
Q4-B	12 mV at 10.7 MHz	R26, Q4	
Q2-C	120 mV at 10.7 MHz	Q2	Depress 6 kHz BW
FL2-OUT	65 mV at 10.7 MHz	FL2	
Q5-B	10 mV at 10.7 MHz	R28, Q5	
Q3-C	90 mV at 10.7 MHz	Q3	Depress 16 kHz BW
Q6-B	10 mV at 10.7 MHz	R30, Q6	
A1-57	50 mV at 10.7 MHz	Q4, Q5, Q6, U1, U2	All BW positions

Table 4-7. 10.7 MHz Filter Switch Voltage Chart

PIN	Bandwidth (kHz)			PIN	Bandwidth (kHz)		
	16	6	3.2		16	6	3.2
Q1 C	+15.26	+15.26	+14.50	Q4 C	+15.32	+15.32	+15.29
Q1 B	- 2.38	- 2.38	+ 2.68	Q4 B	- 2.24	- 2.24	+ 2.48
Q1 E	0.00	0.00	+ 2.04	Q4 E	0.00	0.00	+ 1.83
Q2 C	+15.26	+14.49	+15.26	Q5 C	+15.32	+15.29	+15.32
Q2 B	- 2.53	+ 2.85	- 2.53	Q5 B	- 2.21	+ 2.44	- 2.21
Q2 E	0.00	+ 2.19	0.00	Q5 E	0.00	+ 1.78	0.00
Q3 C	+15.17	+15.25	+15.26	Q6 C	+15.29	+15.32	+15.32
Q3 B	+ 2.76	- 2.36	- 2.36	Q6 B	+ 2.50	- 2.23	- 2.23
Q3 E	+ 2.01	0.00	0.00	Q6 E	+ 1.88	0.00	0.00

4.3.5.5 10.7 MHz/455 kHz Converter Testing and Troubleshooting

10.7 MHz/455 kHz Converter Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an RF Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.5.1 10.7 MHz/455 kHz Converter Checkout Procedure

Perform the following in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.5.2 for fault isolation.

1. Deenergize the receiver.
2. Place PC board A4A2 on an extender. Remove PC board A4A1.
3. Connect the RF Voltmeter to A4XA2 pin 19 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
4. Connect the Signal Generator RF output to A4XA2 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. Set the Generator output frequency to 10.7 MHz and output level to -27 dBm.

TABLE 4-8
TABLE 4-9

5. Energize the receiver. The Oscilloscope should display a level of 22 mV.
6. Deenergize the receiver and disconnect Test Equipment if no further tests are to be performed. Replace A4A1.

4.3.5.5.2 10.7 MHz/455 kHz Converter, A4A2, Fault Isolation

Table 4-8, 10.7 MHz/455 kHz Converter Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in paragraph 4.3.5.5.1 and check the Test Points given in Table 4-7 with an RF Voltmeter and high impedance probe. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in paragraph 4.3.5.5.1. Table 4-9, 10.7 MHz/455 kHz Converter Voltage Table, and Figure 6-5, 10.7 MHz/455 kHz Converter Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-8. 10.7 MHz/455 kHz Converter Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
A4A2-13	150 mV at 11.155 MHz	Check 3rd LO	3rd LO Signal
Q1-C	2.5 V at 11.155 MHz	Q1	
U1-2	350 mV at 11.155 MHz	L2, C6, C7, C8	
U1-4	5 mV at 455 kHz	U1	3rd IF Signal
A4A2-19	22 mV at 455 kHz	L3, L4, C9, C10, C11	

Table 4-9. 10.7 MHz/455 kHz Converter Voltage Table.

A2Q1	EMITTER	+ 3.24
	BASE	+ 3.96
	COLLECTOR	+14.8

4.3.5.6 455 kHz Filter Switch Testing and Troubleshooting

455 kHz Filter Switch Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an RF Voltmeter (Table 4-1) are required to perform the following tests.

4.3.5.6.1 455 kHz Filter Switch Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.6.2** for fault isolation.

1. Deenergize the receiver.
2. Remove PC board A4A2. Place PC board A4A3 on an extender.
3. Depress the receiver 3.2 kHz BW button.
4. Connect the RF Voltmeter input to A4XA3 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
5. Connect the Signal Generator RF output to A4XA3 pin 13 using a short coaxial cable with clip leads on one end. Terminate the generator with a 50 Ω load. Connect cable shield to the IF Motherboard ground plane. Set the Generator output frequency to 455 kHz and output level to -27 dBm.
6. Energize the receiver. The RF Voltmeter should display a level of 25 mV.
7. Depress the 1.0 kHz BW button and then the 0.3 kHz BW button. The RF Voltmeter should display no less than 20 mV in both BW positions.
8. Deenergize the receiver and disconnect test equipment if no further tests are to be performed.

4.3.5.6.2 455 kHz Filter Switch, A4A3, Fault Isolation

Table 4-10, 455 kHz Filter Switch Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in **paragraph 4.3.5.6.1** above and check the Test Points given in **Table 4-10** with an RF Voltmeter and high impedance probe. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in **paragraph 4.3.5.6.1**. **Table 4-11**, 455 kHz Filter Switch Voltage Table, and **Figure 6-6**, 455 kHz Filter Switch Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

TABLE 4-10
TABLE 4-11

Table 4-10. 455 kHz Filter Switch Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
Q5-C	23 mV at 455 kHz	Q5	Depress 3.2 kHz BW
Q3-C	27 mV at 455 kHz	Q3	Depress 1.0 kHz BW
Q4-B	17 mV at 455 kHz	FL2, Q4	
Q1-C	19 mV at 455 kHz	Q1	Depress 0.3 kHz BW
Q2-B	17 mV at 455 kHz	FL1, Q2	
A4A3-57	25 mV at 455 kHz	Q2, Q4, Q6	3.2 kHz BW
A4A3-57	20 mV at 455 kHz	Q2, Q4, Q6	1.0, 0.3 kHz BW

Table 4-11. 455 kHz Filter Switch Voltage Table

BANDWIDTH (kHz)

	PIN	16/6/3.2	1.0	0.3
U1	1	- 12.9	+ 13.5	- 12.9
	3	0.0	+ 4.6	0.0
	5	+ 4.4	0.0	0.0
	7	+ 13.6	- 13	- 13
	11	- 14	- 14	- 14
	12	0.0	0.0	+ 4.6
	13	+ 2.7	+ 2.7	+ 2.7
	14	- 13	- 13	+ 13.6
Q1	E	0.0	0.0	0.0
	B	- 1.8	- 1.8	+ 1.8
	C	+ 14.9	+ 14.9	+ 14.9
Q2	E	0.0	0.0	+ 0.9
	B	- 1.5	- 1.5	+ 1.5
	C	14	14	14
Q3	E	0.0	+ 2.3	0.0
	B	- 3	+ 3	- 3
	C	14.9	14.3	14.8
Q4	E	0.0	0.8	0.0
	B	- 1.4	+ 1.4	- 1.4
	C	14	14	14

Table 4-11. 455 kHz Filter Switch Voltage Table (Cont'd)

		BANDWIDTH (kHz)		
	PIN	16/6/3.2	1.0	0.3
Q5	E	1.25	0.0	0.0
	B	+ 1.9	- 1.9	- 1.9
	C	+ 14.7	+ 14.7	+ 14.7
Q6	E	+ 0.8	0.0	0.0
	B	+ 1.4	- 1.4	- 1.4
	C	+ 14	+ 14	+ 14

4.3.5.7 USB Filter Switch Testing and Troubleshooting

USB Filter Switch Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an RF Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.7.1 USB Filter Switch Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.7.2** for fault isolation.

1. Deenergize the receiver.
2. Remove PC board A4A2. Place PC board A4A4 on an extender board.
3. Connect the RF Voltmeter Input to A4XA4 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
4. Connect the Signal Generator RF output to A4XA4 pin 13 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. Terminate the generator with a 50 Ω load. Set the Generator output frequency to 456.8 kHz and output level to -27 dBm.
5. Energize the receiver and depress the USB and then the ISB Mode buttons. The RF Voltmeter should display a level of 25 mV in both modes.
6. Deenergize the receiver and disconnect test equipment if no further tests are to be performed.

TABLE 4-12
TABLE 4-13

4.3.5.7.2 USB Filter Switch, A4A4, Fault Isolation

Table 4-12, USB Filter Switch Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in paragraph 4.3.5.7.1 and check the Test Points given in Table 4-12 with an RF Voltmeter and high impedance probe. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in paragraph 4.3.5.7.1. Table 4-13, USB Filter Switch Voltage Table, and Figure 6-7, USB Filter Switch Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-12. USB Filter Switch Fault Isolation.

Test Point	Normal Signal	Key Components	Comments
Q1-C	38 mV at 456.8 kHz	Q1, L1, CR1, U1	Depress USB Switch
Q2-B	14 mV at 456.8 kHz	FL1, Q2	Depress USB Switch
Q2-C	28 mV at 456.8 kHz	Q2, L2	Depress USB Switch
Q2-C	28 mV at 456.8 kHz	CR2	Depress ISB Switch

Table 4-13. USB Filter Switch, A4A4, Voltage Table

PIN		USB MODE	OTHER MODE
Q1	C	+ 14.69	+ 15.38
	B	+ 2.34	- 2.15
	E	+ 1.68	0.00
Q2	C	+ 14.78	+ 15.38
	B	+ 1.80	- 1.76
	E	+ 1.14	0.00

4.3.5.8 ISB/LSB Filter Switch Testing and Troubleshooting

ISB/LSB Filter Switch Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an RF Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.6.1 ISB/LSB Filter Switch Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.8.2 for fault isolation.

1. Deenergize the receiver.
2. Remove PC boards A4A2, A4A3, A4A4, A4A7, and A4A8.
3. Connect the Oscilloscope Vertical Input to A4XA5 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
4. Connect the Signal Generator RF output to A4XA5 pin 13 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. Set the Generator output frequency to 453.5 kHz and output level to -36 dBm.
5. Energize the receiver and depress the LSB Mode button. The Oscilloscope should display a level of 500 mV p-p at 453.5 kHz. The waveform should be a clean sine wave.
6. Move the Oscilloscope clip lead to pin A4XA5-53 and depress the ISB Mode button. The Oscilloscope should display a level of 200 mV p-p at 453.5 kHz.
7. Deenergize the receiver and disconnect test equipment.
8. Replace PC boards A4A2, A4A3, A4A4, A4A7, and A4A8.

Table 4-14. ISB/LSB Filter Switch Voltage Table

	PIN	LSB MODE ACTIVE	ISB MODE ACTIVE	OTHER MODES ACTIVE
Q1	1	* 14.4	+ 14.4	+ 15
	2	+ 4.2	+ 4.2	0.0
	3	+ 2.2	+ 2.2	+ 2.0
	4	+ 2.7	+ 2.7	+ 2.0
Q2	1	+ 14.6	+ 15	+ 15
	2	+ 4.2	0.0	0.0
	3	+ 1.6	+ 1.3	+ 1.3
	4	+ 2.9	+ 2.0	+ 2.0
Q3	1	+ 15	+ 14.7	+ 15
	2	0.0	+ 4.2	0.0
	3	+ 1.4	+ 1.6	+ 1.4
	4	+ 2.0	+ 2.8	+ 2.0

TABLE 4-15

Table 4 – 15- ISB/ LSB Filter Switch A4A5 Voltage Table

Pin		LSB Mode	ISB Mode	Other Mode
Q1	C	*14.65	*14.67	15.37
	B	* 2.18	+ 2.19	- 1.26
	E	+ 1.53	• 154	0.00
Q2	C	14.57	+15.02	+15.37
	B	+ 2.25	- 2.2 J	- 2.18
	E	* 1.59	0.00	0.00
Q3	C	*14.99	14.64	+15.37
	B	- 2.23	* 2.11	- 2.21
	E	0.00	• 145	0.00

4.3.5.9 455 kHz AMPLIFIER/AM DETECTOR TESTING AND TROUBLESHOOTING

455 kHz Amplifier/AM Detector Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and a wideband Oscilloscope are required to perform the tests outlined below.

4.3.5.9.1 455 kHz Amplifier /AM Detector Checkout Procedure

Perform the following procedure in the sequence given.

1. Deenergize the receiver and remove the PC boards.
2. Connect the Oscilloscope Vertical Input to A4XA7 pin 17 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
3. Connect the Signal Generator RF output to A4XA7 pin 57 using a short coaxial cable with clip leads on one end.
4. Connect cable shield to the IF Motherboard ground plane. Set the Generator output frequency to 455 kHz and output level to -74 dBm.
5. Energize the receiver. The Oscilloscope should display a level of 60 mV p-p at 455 kHz. The waveform should be a clean sine wave.

6. Move the RF Voltmeter clip lead to A4XA7 pin 13. The Oscilloscope should display a level of 20 mV.
7. Turn on the Signal Generator AM Modulation and set it for 50% modulation at 400 Hz.
8. Connect the Oscilloscope vertical input to A4XA7 pin 51 using a coaxial with clip leads on one end. The Oscilloscope should display a level of 1.0 V p-p at \approx 400 Hz superimposed on a dc level of + 3.8 Vdc.
9. Deenergize the receiver and disconnect test equipment if no further tests are to be done.

4.3.5.9.2 455 kHz Amplifier/AM Detector, A4A7, Fault Isolation

Table 4-16, 455 kHz Amplifier/AM Detector Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in paragraph 4.3.5.9.1 and check the Test Points given in Table 4-16 with an oscilloscope or RF Voltmeter with high impedance probe, as indicated. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in paragraph 4.3.5.9.1. Table 4-17, 455 kHz Amplifier/AM Detector Voltage Table, and Figure 6-10, 455 kHz Amplifier/AM Detector Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-16. Amplifier/AM Detector Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
Q1-1	12 mV at 455 kHz	Q1, CR1, L1	No Gen. Modulation
Q2-1	19 mV at 455 kHz	Q2, CR2, L2, R7	
Q3-E	20 mV at 455 kHz	Q3, L3	
Q4-C	300 mV at 455 kHz	Q4, T1	
A4A7-17	90 mV at 455 kHz	T1	
Q5-B	1 V at 455 kHz	Q5	
CR3/L6 junction	3.1 V at 455 kHz	Q5, L5	
Q6-B	4.6 Vdc/1 Vpp - 400 Hz	CR3, Q6	Turn on Gen. Modulation; use oscilloscope.
A4A7-51	3.8 Vdc/1 Vpp - 400 Hz	Q6, L7	Turn on Gen. Modulation; use oscilloscope.

Table 4-17. 455 kHz Amplifier/AM Detector Voltage Table.

	PIN	VOLTAGE		PIN	VOLTAGE
Q1	1	+ 13.7	Q4	E	+ 3.5
	2	+ 3.75		B	+ 4.1
	3	+ 0.87		C	+ 14.4
	3	+ 0.87		C	+ 14.4
	4				
Q2	1	+ 15	Q5	E	- 0.7
	2	+ 3.8		B	- 0.1
	3	+ 0.9		C	+ 14.2
	4	+ 1.4			
Q3	E	- 0.5	Q6	E	+ 3.3
	B	0.0		B	+ 0.95
	C	+ 15.0		C	+ 15.0

NOTE

Above readings taken in Fast AGC Mode with no RF input signal.

4.3.5.10 FM/CW/SSB Detector Testing and Troubleshooting

FM/CW/SSB Detector Testing and Troubleshooting includes a CW/SSB Detector Checkout procedure, an FM Detector Checkout Procedure and fault isolation information. A Signal Generator, RF Voltmeter and an Oscilloscope (Table 4-1) are required to perform the tests outlined below.

4.3.5.10.1 CW/SSB Detector Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.10.3 for fault isolation.

1. Deenergize the receiver.
2. Remove PC board A4A7. Place PC board A4A9 on an extender.
3. Connect the Oscilloscope Vertical Input to A4XA9 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.

4. Connect the Signal Generator RF output to A4XA9 pin 13 using a short coaxial cable with clip leads on one end. Connect cable shield to the ground plane. Terminate the generator with a $50\ \Omega$ load. Set the Generator output frequency to 455.4 MHz and output level to -33 dBm.
5. Energize the receiver and depress the USB Mode button. The Oscilloscope should display a level of 0.5 V p-p at 400 Hz. The waveform should be a clean sine wave.
6. Deenergize the receiver and disconnect test equipment if no further tests are to be done.

4.3.5.10.2 FM Detector Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.10.3** for fault isolation.

1. Deenergize the receiver.
2. Remove PC board A4A7. Place PC board A4A9 on an extender.
3. Connect the Oscilloscope Vertical Input to A4XA9 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
4. Connect the Signal Generator RF output to A4XA9 pin 13 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. Terminate the generator with a $50\ \Omega$ load. Set the generator output frequency to 455 kHz and output level to -33 dBm. Set the Generator for FM Modulation at 400 Hz and 4.8 kHz deviation.
5. Energize the receiver and depress the FM Mode button. The Oscilloscope should display a level of 1 V p-p at 400 Hz. The waveform should be a clean sine wave.
6. Deenergize the receiver and disconnect test equipment if no further tests are to be done.

4.3.5.10.3 FM/CW/SSB Detector, A4A9, Fault Isolation

Table 4-18, FM/CW/SSB Detector Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in **paragraph 4.3.5.10.1** and check the Test Points given in **Table 4-18** with an oscilloscope or RF Voltmeter with high impedance probe, as indicated. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in **paragraph 4.3.5.10.1**. **Table 4-19**, FM/CW/SSB Detector Voltage Table, and **Figure 6-12**, FM/CW/SSB Detector Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

TABLE 4-18
TABLE 4-19

Table 4-18. FM/CW/SSB Detector Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
U2-8	200 mV at 455 kHz	Check BFO	Depress CW Switch
U3-5	4 Vpp at 400 Hz	U2, Q3, Q4	Depress CW Switch Use oscilloscope
A4A9-57	0.5 Vpp at 400 Hz	U3	Depress CW Switch Use oscilloscope
U1-5	2 V at 455 kHz	U1, Q1, Q2	Depress FM Switch
U3-3	4 Vpp at 400 Hz	CR1, CR2, T1	Turn on FM Modulation. Use Oscilloscope.
A4A9-57	1 Vpp at 400 Hz	U3	Turn on FM Modulation. Use Oscilloscope.

Table 4-19. FM/CW/SSB Detector Voltage Table

Component Pin	AM	FM	CW & SB	Component Pin	AM	FM	CW & SB
Q1 E	9.6	8.1	9.2	U2 1	- 1.6	- 1.6	- 1.6
Q1 B	9.5	7.3	9.2	U2 3	- 1.7	- 1.7	- 1.7
Q1 C	0.0	8.0	0.0	U2 4	- 1.6	- 1.6	- 1.6
Q2 E	0.0	2.0	0.0	U2 5	- 3.8	- 3.8	- 3.8
Q2 B	0.0	0.62	0.0	U2 6	- 0.7	- 0.7	3.8
Q2 C	9.9	0.0	9.2	U2 7	0.0	0.0	0.0
Q3 E	9.6	8.7	9.0	U2 8	- 0.1	- 0.1	0.0
Q3 B	9.6	8.7	8.4	U2 9	- 0.0	0.0	0.0
Q3 C	-1.8	-1.8	9.0	U2 12	- 0.7	- 0.7	4.0
Q4 E	0.0	0.0	0.0	U2 13	- 0.7	- 0.7	4.0
Q4 B	0.0	0.0	0.7	U2 14	-13.0	-13.0	-13.0
Q4 C	9.6	8.8	0.0	U3 1	0.0	0.3	0.0
U1 1	0.0	2.0	0.0	U3 2	0.0	0.63	0.0
U1 2	0.0	2.0	0.0	U3 3	0.0	0.64	0.0
U1 3	0.0	2.0	0.0	U3 4	14.0	12.5	13.5
U1 4	0.0	2.0	0.0	U3 5	0.0	0.0	0.0
U1 5	0.0	5.6	0.0	U3 6	0.0	0.0	0.0
U1 6	0.0	0.0	0.0	U3 7	0.0	0.0	0.0
U1 7	0.0	0.0	0.0	U3 8	0.0	- 0.0	0.0
U1 8	0.0	0.0	0.0	U3 9	0.0	0.0	0.0
U1 9	0.0	0.8	0.0	U3 10	0.0	0.0	0.0
U1 10	0.0	5.6	0.0	U3 11	-13.0	-13.0	-13.0
				U3 12	9.4	8.5	9.1
				U3 13	9.4	8.5	9.1

4.3.5.11 Audio Amplifier Testing and Troubleshooting

Audio Amplifier Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an Oscilloscope (Table 4-1) are required to perform the tests outlined below.

4.3.5.11.1 Audio Amplifier Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.11.2 for fault isolation.

1. Deenergize the receiver.
2. Remove PC boards A4A6, A4A7, and A4A9. Place PC board A4A10 on an extender.
3. Set the receiver Line Audio Level control to Maximum Clockwise and the Phone Level control to mid-range.
4. Connect the Oscilloscope Vertical Input to A4XA10 pin 55 using a short coaxial cable with clip leads on one end. Connect shield to IF Motherboard ground plane.
5. Connect the Signal Generator AM output to A4XA10 pin 51 using a short coaxial cable with clip leads on one end. Connect cable shield to IF Motherboard ground plane. Set the Signal Generator Modulation Frequency to 400 Hz, set Audio Output Level to 0.2 V rms and set AM switch to INT.
6. Energize the receiver and depress the AM Mode button. The Oscilloscope should display a level of 0.3 V p-p at 400 Hz. The waveform should be a clean sine wave.
7. Use the Oscilloscope lead to probe A4XA10 pin 13 and A4XA10 pin 11. The Oscilloscope should display a level of 15 V p-p at 400 Hz on each pin.
8. Connect the Oscilloscope clip lead to A4XA10 pin 41. The Oscilloscope should indicate a level of -10.8 Vdc.
9. Move the Oscilloscope clip lead to A4XA10 pin 19. The Oscilloscope should display a level of 7 V p-p at 400 Hz.
10. Deenergize the receiver and disconnect test equipment if no further tests are to be done.

TABLE 4-20
TABLE 4-21

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4.3.5.11.2 Audio Amplifier, A4A10, Fault Isolation

Table 4-20, Audio Amplifier Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in paragraph 4.3.5.11.2 and check the Test Points given in Table 4-20 with an oscilloscope. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in paragraph 4.3.5.11.2. Table 4-21, Audio Amplifier Voltage Table, and Figure 6-13, Audio Amplifier Schematic Diagram (Type 746001) should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-20. Audio Amplifier Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
Q1-D	0.45 Vpp at 400 Hz	Q1, U1, CR1	Select AM Mode
U1-14	0.3 Vpp at 400 Hz	U1	
C8, R18 junction	300 mVpp at 400 Hz	Line Audio Control	
U2-2, 13	15 Vpp at 400 Hz	U2	
R7, R8	20 mVpp at 400 Hz	Phone Level Control	
T1-5	7 Vpp at 400 Hz	U1, T1	

Table 4-21. Audio Amplifier Voltage Table

	PIN	AM MODE ACTIVE	OTHER MODES ACTIVE
Q1	S	0.0	0.0
	D	0.0	0.0
	G	0.0	- 13
U1	1	+ 14	- 14
	2	+ 1.6	+ 1.6
	3	+ 5	0.0
U2	2	+ 6	+ 6
	13	+ 6	+ 6
	14	+ 12	+ 12

4.3.5.12 ISB Detector/Audio Testing and Troubleshooting

ISB Detector/Audio Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator, an RF Voltmeter and an Oscilloscope (**Table 4-1**) are required to perform the tests outlined below.

4.3.5.12.1 ISB Detector/Audio Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.12.2** for fault isolation.

1. Deenergize the receiver.
2. Remove PC board A4A5. Place PC board A4A8 on an extender.
3. Connect the Oscilloscope Vertical Input to A4XA8 pin 41 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane.
4. Connect the Signal Generator RF output to A4XA8 pin 53 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. Terminate the generator with a 50 Ω load. Set the Generator output frequency to 454.6 kHz and output level to -47 dBm.
5. Energize the receiver and depress the ISB Mode button. The Oscilloscope should display a level of 0.7V p-p at 400 Hz. The waveform should be a clean sine wave.
6. Move the Oscilloscope clip lead to A4XA8 pin 44. Move shield clip lead to A4XA8 pin 48. Adjust A8R36 for an Oscilloscope reading of 8 V p-p at 400 Hz. The waveform should be a clean sine wave.
7. Move the Oscilloscope clip lead to A4XA8 pin 43. Connect cable shield to IF Motherboard ground plane. The Oscilloscope should display 0.0 Vdc.
8. Increase the Generator output level to -20 dBm. The level displayed on the Oscilloscope should increase to -6 Vdc.
9. Deenergize the receiver and disconnect the test equipment if no further tests are to be done..

4.3.5.12.2 ISB Detector/Audio, A4A8, Fault Isolation

Table 4-22, ISB Detector/Audio Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up the Test Equipment as stated in **paragraph 4.3.5.12.1** and check the Test Points given in **Table 4-22** with an oscilloscope or RF Voltmeter and high

impedance probe as indicated. When a faulty signal is encountered, replace the key components indicated and repeat the Checkout Procedure in **paragraph 4.3.5.12.1**. **Table 4-23**, ISB Detector/Audio Voltage Table, and **Figure 6-11**, ISB Detector/Audio Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-22. ISB Detector/Audio Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
Q1-1	3.5 mV at 455 kHz	Q1, CR1, L1	Use RF Voltmeter
Q2-3	0.9 mV at 455 kHz	R8	Use RF Voltmeter
Q2-1	9.5 mV at 455 kHz	Q2	Use RF Voltmeter
U1-8	200 mV at 455 kHz	Check BFO	BFO Signal
R33/C18 junction	50 mV at 400 Hz	U1	Use Oscilloscope
U3-1	4 Vpp at 400 Hz	U3	Use Oscilloscope
U2-7, 8	20 Vpp at 400 Hz	U2	Use Oscilloscope
A4A8-44 to 48	8 Vpp at 400 Hz	T1	Use Oscilloscope
U2-12	+2.1 Vdc	Q4, CR4	Increase Gen. to -20 dBm. Use Oscilloscope.
U3-14	-5.8 Vdc	U2, U3, Q3	Increase Gen. to -20 dBm. Use Oscilloscope.
U3-8	-3.35 Vdc	U3, Q5	Increase Gen. to -20 dBm. Use Oscilloscope.

Table 4-23. ISB Detector/Audio Voltage Table

	PIN	ISB	OTHER MODES		PIN	ISB	OTHER MODES	
U1	1	- 7.5	- 7.5	Q1	1	+ 14.5	+ 14.5	
	4	- 7	- 7		2	+ 3.3	+ 3.3	
	5	- 13.5	- 13.5		3	+ 0.9	+ 0.9	
	6	+ 1.3	- 0.8		4	+ 1	+ 1	
	12	+ 1	- 0.8		Q2	1	+ 14	+ 14
	14	+ 15	+ 15			2	+ 3.3	+ 3.3
U2	1	+ 14	- 13.5	3		+ 0.8	+ 0.8	
	2	+ 1.5	+ 1.5	4		+ 1	+ 1	
	3	+ 5	0.0	Q3	E	0.0	+ 7.5	
	4	+ 15	+ 15		B	+ 0.2	+ 0.2	
	11	- 15	- 15		C	0.0	0.0	
	12	0.0	0.0	Q4	E	0.0	0.0	
	13	+ 1	+ 5		B	0.0	0.0	
	14	+ 1	+ 5		C	+ 15	+ 15	
U3	4	+ 15	+ 15	Q5	E	0.0	0.0	
	8	0.0	0.0		B	+ 2.8	- .5	
	9	0.0	0.0		C	0.0	0.0	
	10	0.0	0.0					
	11	- 15	- 15					
	12	0.0	0.0					
	13	0.0	0.0					
	14	0.0	0.0					

4.3.5.13 **AGC Testing and Troubleshooting**

AGC Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and a Digital Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.13.1 **AGC Checkout Procedure**

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.13.2 for fault isolation.

1. Deenergize the receiver.
2. Remove PC boards A4A3, A4A4, A4A5, and A4A10.
3. Set the receiver Gain Mode to Fast AGC and Meter switch to Line Audio.

TABLE 4-24

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4. Connect the Digital Voltmeter input to A4XA6 pin 47 using a short cable with clip leads on one end. Connect the common lead to the IF Motherboard ground plane. Set the Digital Voltmeter to the 20 Vdc range.
5. Connect the Signal Generator output to A4XA7 pin 57 using a short coaxial cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. Set the Generator output frequency to 455 kHz and output level to -40 dBm.
6. Energize the receiver. The Digital Voltmeter should indicate -3.5 Vdc.
7. Select the receiver MAN Gain Mode. Adjust the RF Gain control until the Digital Voltmeter indicates the same level indicated in step 7.
8. Select the Fast AGC Mode.
9. Connect the Digital Voltmeter clip lead to A4XA6 pin 19. The Voltmeter should indicate +0.7 Vdc.
10. Connect the Digital Voltmeter clip lead to A4XA6 pin 41. The Voltmeter should indicate -3.0 Vdc.
11. Deenergize the receiver and disconnect test equipment if no further tests are to be done.

4.3.5.13.2 AGC, A4A6, Fault Isolation

Table 4-24, AGC Fault Isolation Chart, is used to isolate the module fault to a stage or circuit. Set up Test Equipment as stated in paragraph 4.3.5.13.2 and check the Test Points given in Table 4-24 with a Digital Voltmeter. When a fault signal is encountered, replace the key components indicated and repeat the Checkout Procedure in paragraph 4.3.5.13.2. Table 4-25, AGC Voltage Table, and Figure 6-9, AGC Schematic Diagram should be referred to if additional signal tracing/fault isolation is necessary.

Table 4-24. AGC Fault Isolation Chart.

Test Point	Normal Signal	Key Components	Comments
A4A6-51	+3.2 Vdc	Check A4A7	AGC Mode
Q1-E	+2.7 Vdc	Q1	
U1-1	+2.7 Vdc	U1	
Q2-C	+0.13 Vdc	CR9, Q2, Q6	
U2-7	-6.6 Vdc	U2	
U1-14	-3.5 Vdc	U1	
U2-10	-0.06 Vdc	Q5	
U2-8	-0.32 Vdc	U2	
U2-1	+1.07 Vdc	U2	

Table 4-25. AGC Voltage Table

TRANSISTOR		INPUT SIGNAL			NO SIGNAL		
		MAN	SLOW	FAST	MAN	SLOW	FAST
Q1	E	1.7	3.2	3.2	0.05	0.06	0.06
	B	2.0	2.7	2.7	+ 0.4	0.38	0.38
	C	14.3	14.3	14.4	14.4	14.3	14.4
Q2	E	0.77	0.77	0.77	0.06	0.06	0.06
	B	0.18	0.20	0.20	0.02	0.2	0.02
	C	0.0	0.13	0.13	0.0	0.0	0.0
Q3	E	0.0	0.0	0.0	0.0	0.0	0.0
	B	0.6	0.0	0.0	0.59	0.0	0.0
	C	0.0	0.0	0.0	0.01	0.0	0.0
Q4	E	0.0	0.0	0.0	0.0	0.0	0.0
	B	- 2.3	- 2.3	- 2.3	- 2.3	- 2.3	- 2.3
	C	- 0.06	- 0.6	- 0.6	0.0	0.0	0.0
Q5	E	- 2.9	- 2.8	- 2.8	- 0.50	0.07	0.07
	B	- 2.3	- 2.3	- 2.3	- 2.3	- 2.3	- 2.3
	C	- 0.6	- 0.6	- 0.6	0.0	0.0	0.0
Q6	E	0.0	0.0	0.0	0.0	0.0	
	B	0.58	0.0	0.54	0.0	0.0	
	C	0.05	0.13	0.13	0.01	0.0	0.0
Q7	E	0.0	0.0	0.0	0.0	0.0	0.0
	B	- 3.9	0.62	- 3.9	- 3.9	0.63	- 3.9
	C	N/A	N/A	N/A	N/A	N/A	N/A
U1	1	2.0	2.7	2.7	0.06	0.07	0.07
	2	2.0	2.7	2.7	0.06	0.07	0.07
	3	2.0	2.7	2.7	0.05	0.06	0.05
	4	14.3	14.3	14.4	14.4	14.3	14.4
	5	0.0	5.0	0.0	0.0	5.0	0.0
	6	1.5	1.7	1.7	1.7	1.7	1.7
	7	-12.6	12.9	-12.6	-12.9	12.9	-12.6
	8	- 2.0	- 2.2	- 2.2	- 0.05	- 0.05	- 0.05
	9	0.0	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0	0.0
	11	-13.8	-13.8	-13.8	-13.8	-13.9	-13.8
	12	- 3.5	- 3.5	- 3.5	- 0.5	0.07	0.07
	13	- 3.5	- 3.5	- 3.5	- 0.5	0.07	0.07
	14	- 3.5	- 3.5	- 3.5	- 0.5	0.07	0.07

Table 4-25. AGC Voltage Table (Concluded)

TRANSISTOR		INPUT SIGNAL			NO SIGNAL		
		MAN	SLOW	FAST	MAN	SLOW	FAST
U2	1	0.86	0.82	0.83	- 0.08	- 0.08	- 0.08
	2	0.86	0.82	0.83	- 0.08	- 0.8	- 0.8
	3	0.86	0.82	0.83	- 0.08	- 0.08	- 0.08
	4	14.3	14.4	14.4	14.3	14.3	
	5	0.0	0.0	0.0	0.0		
	6	0.0	0.0	0.0	0.0	0.0	0.0
	7	- 6.6	- 6.6	- 6.6	- 0.8	0.12	0.12
	8	- 0.32	- 0.32	- 0.32	0.03	0.03	0.03
	9	- 0.05	- 0.06	0.0	0.0	0.0	
	10	- 0.06	- 0.06	- 0.06	0.0	0.0	0.0
	11	-13.8	-13.8	-13.8	-13.8	-13.9	-13.8
	12	0.0	0.0	0.0	0.0	0.0	0.0
	13	0.0	0.0	0.0	0.0	0.0	0.0
	14	0.85	0.82	0.8	0.0	0.0	0.0

NOTE

Two sets of data are given: one with an input signal and one without. When using the input signal data, tune the receiver to 15.00500 MHz and inject an unmodulated signal of 15.00500 MHz at -40 dBm into RF Input jack A2J1. Nominal voltage values are given for each of the three gain modes: Manual, Fast AGC, and Slow AGC. The RF Gain Control must be set maximum clockwise while using Manual Mode No Signal data. To use data for Manual Mode with Input Signal, reduce gain control setting to achieve the same meter reading as in AGC Mode.

4.3.5.14 Front Panel Interconnect Testing and Troubleshooting

Front Panel Interconnect Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Digital Voltmeter (Table 4-1) is required to perform the tests outlined below.

4.3.5.14.1 Front Panel Interconnect Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.14.2 for fault isolation.

1. Deenergize the receiver.

2. Connect the common (-) input of the Digital Voltmeter to A6XA2 pin 5 using a short test lead.
3. Energize the receiver.
4. Refer to **Table 4-15** and depress the indicated Mode and BW pushbuttons in succession. For each Mode or BW selected, use the Digital Voltmeter positive (+) test lead to probe for high (>2.5 Vdc) or low (<0.5 Vdc) conditions as indicated.
5. Deenergize the receiver and disconnect test equipment.

Table 4-26. Front Panel Interconnect Voltage Table

Pin Nos.	AM	CW	FM	USB	LSB	ISB
A6XA2-5	LO	LO	LO	LO	HI	LO
A6XA2-3	LO	LO	LO	HI	LO	LO
A6XA2-1	LO	LO	LO	LO	LO	HI
A6XA2-18	LO	HI	LO	HI	HI	HI
A6XA2-16	LO	LO	HI	LO	LO	LO
A6XA2-48	HI	LO	LO	LO	LO	LO
A6XA2-58	HI	HI	HI	LO	LO	LO
A6XA2-60	HI	LO	HI	LO	LO	LO
A10J1-22	HI	HI	HI	LO	LO	LO
A10J1-37	HI	HI	HI	LO	LO	LO
A10J1-16	HI	HI	HI	LO	LO	LO
Pin Nos.	16 kHz	6 kHz	3 kHz	1 kHz	.3 kHz	USB/LSB/ISB
A6XA2-49	HI	HI	HI	LO	LO	LO
A6XA2-51	HI	LO	LO	HI	HI	HI
A6XA2-53	LO	HI	LO	LO	LO	LO
A6XA2-55	LO	LO	HI	LO	LO	LO
A6XA2-47	LO	LO	LO	HI	LO	LO
A6XA2-45	LO	LO	LO	LO	HI	LO

4.3.5.14.2 Front Panel Interconnect Fault Isolation

The following list of Supplementary Troubleshooting Data should be used to isolate the fault and locate the defective component or connection. After the fault has been

corrected, check the Front Panel Interconnect for normal operation by repeating the Checkout Procedure in **paragraph 4.3.5.14.1** above.

1. Figure 6-22. Front Panel Interconnect Schematic
2. Paragraph 3.4.24. Front Panel Interconnect Circuit Description

4.3.5.15 Lower Panel Control Testing and Troubleshooting

Lower Panel Control Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Signal Generator and an Oscilloscope (**Table 4-1**) are required to perform the tests outlined below. Procedures in this paragraph are applicable to both Type 791826 and Type 796054 Lower Panel Controls, except where noted.

4.3.5.15.1 Lower Panel Control Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.15.2** for fault isolation.

1. Deenergize the receiver. Select any mode other than ISB. On the WJ-8718A/8718-9 Receiver, ensure that USB and LSB Audio buttons are deenergized.
2. Remove the front panel and gently pull it out several inches from the receiver main chassis, being careful not to place any strain on the interconnecting cables.
3. Connect the Oscilloscope Vertical input to connector A10A2J3 using a short coaxial cable with clip leads on one end. Connect cable shield to terminal A10A2E1.
4. Connect the Signal Generator AM Output to terminal A10A2E3 using a short coaxial cable with clip leads on one end. Connect cable shield to terminal A10A2E1. Set the Signal Generator Modulation Frequency to 400 Hz, set Audio Output Level to 70 mV and set AM switch to INT.
5. Energize the receiver and rotate the Phone Level control fully clockwise. The Oscilloscope should display a level of >20 V p-p. The waveform should be a clean sine wave.
6. Move the Oscilloscope input lead to connector A10A2-J2. The Oscilloscope should display a level of >20 V p-p. The waveform should be a clean sine wave.
7. Deenergize the receiver and disconnect test equipment

4.3.5.15.2 Lower Panel Control Fault Isolation

The following list of Supplementary Troubleshooting Data should be used to isolate the fault and locate the defective component or connection. After the fault has been corrected, check the Lower Panel Control for normal operation by repeating the procedure in paragraph 4.3.5.15.1.

1. Figure 6-24. Lower Panel Control Schematic Diagram (Type 796054)
2. Figure 6-24. Lower Panel Control Schematic Diagram (Type 791826)
3. Paragraph 3.4.42. Lower Panel Control Circuit Description

4.3.5.16 1st LO Synthesizer Testing and Troubleshooting

1st LO Synthesizer Testing and Troubleshooting includes a checkout procedure and fault isolation. A Frequency Counter, wideband Oscilloscope and RF Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.16.1 1st LO Synthesizer Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.16.2 for Fault Isolation.

1. Deenergize the receiver.
2. Disconnect connector from A1J2.
3. Connect the Frequency Counter to W2P3.
4. Energize the receiver and tune it to 00.00000 MHz. The Frequency Counter should indicate 42.91 MHz.
5. Rotate the tuning knob counterclockwise and tune receiver to 29.99999 MHz. The Frequency Counter should indicate 72.90 MHz.
6. Disconnect the Frequency Counter and connect the RF Voltmeter and 50 Ω Probe to W2P3. The Voltmeter should indicate +20 dBm \pm 2dBm.
7. Deenergize the receiver and disconnect test equipment. Reconnect W2P3.

4.3.5.16.2 1st LO Synthesizer, P/O A5A1, Fault Isolation

1st LO Synthesizer Fault Isolation includes Troubleshooting Tests to aid in isolating a fault to a defective stage or circuit. Supplementary Troubleshooting Data is provided in

TABLE 4-27
TABLE 4-28

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paragraph 4.3.15.16.3 to aid in tracing the fault to a defective component or connection.

1. VCO Band Select Circuitry - Table 4-27 below checks for proper operation of U13, diodes CR8 through CR10, and Q1 through Q3, while dialing different frequencies on the front panel.

Table 4-27. VCO Band Select Code

TUNED FREQUENCY			BAND SELECT OUTPUT (Vdc)		
			E3	E2	E1
0.00	-	3.99 MHz	+ 15	+ 15	+ 15
4.00	-	7.99 MHz	+ 15	+ 15	- 12
8.00	-	11.99 MHz	+ 15	- 12	+ 15
12.00	-	15.99 MHz	+ 15	- 12	- 12
16.00	-	19.99 MHz	- 12	+ 15	+ 15
20.00	-	23.99 MHz	- 12	+ 15	- 12
24.00	-	27.99 MHz	- 12	- 12	+ 15
28.00	-	29.99 MHz	- 12	- 12	- 12

2. Divider Section - With a tuned frequency of 00.00000 MHz, or a 1st LO input to J1 of 171.64 MHz, the following frequencies in Table 4-28 should be found at the corresponding IC pins using a Digital Counter.

Table 4-28. 1st LO Frequency Chart

IC	PIN	FREQ (Hz)	IC	PIN	FREQ (Hz)
U1	7	17 MHz	U9	7	1.68 MHz
U1	9	3.4 MHz	U9	9	80 kHz
U1	10	40 kHz	U9	15	40 kHz
U2	12	3.4 MHz	U10	7	840 kHz
U3	7	40 kHz	U10	7	200 kHz
U3	9	40 kHz	U11	6	40 kHz
U6	3	40 kHz	U11	7	40 kHz
U8	7	340 kHz	U12	5	40 kHz
U9	1	40 kHz	U12	9	40 kHz

3. Phase Detector U5 - Check for 40 kHz signal at input pin 3 of U5. If signal is not present, troubleshoot Time Base Circuits.

Check for 40 kHz signal at pin 1 of U5. If not present, troubleshoot 1st LO counter circuits. Refer to Figure 4-2 to understand the function of the phase detector.

4. 1st LO VCO - The 1st LO VCO is located on the 1st and 3rd LO PC board. It is recommended to read the circuit description of the VCO before troubleshooting (paragraph 3.4.17). The frequency of the oscillator, Q1, is controlled by the band select code and the tuning voltage. The correct VCO output frequency can be found by adding 42.91 MHz to the tuned frequency in Table 4-28 and multiplying the result by 4.

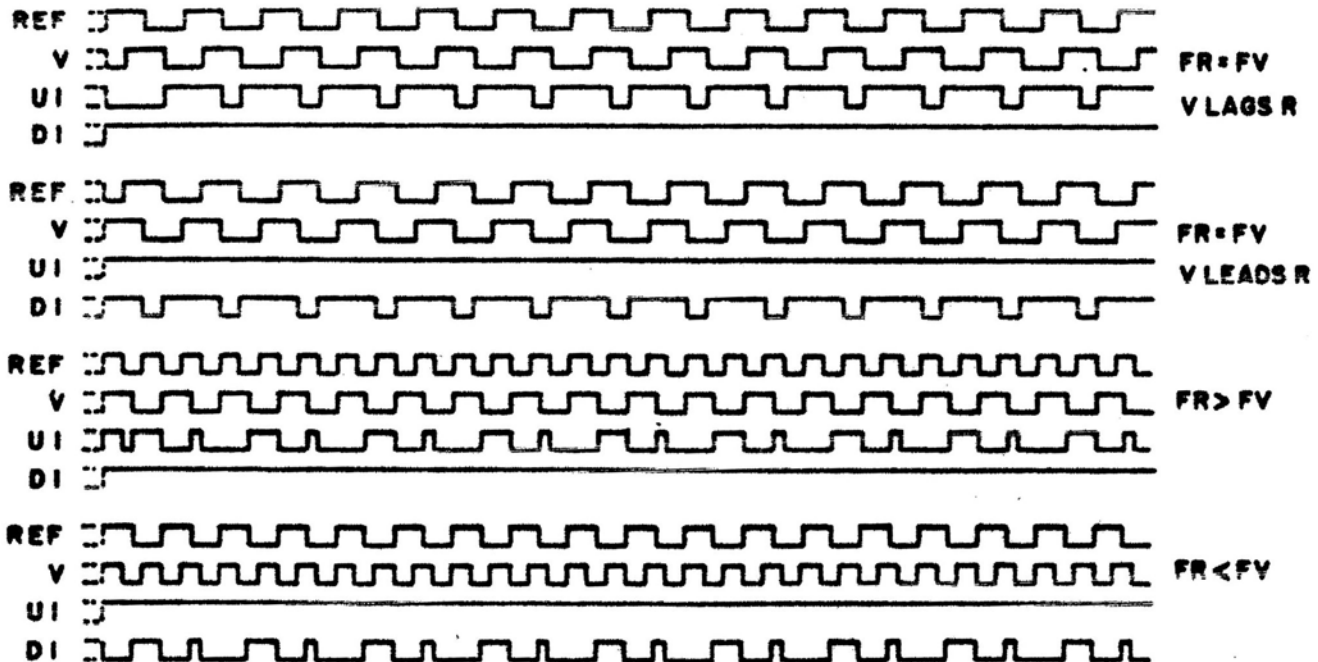


Figure 4-2. Phase Detector Timing Diagram

4.3.5.16.3 1st LO Synthesizer Supplementary Troubleshooting Data

The following Supplementary Troubleshooting Data is used in conjunction with the Troubleshooting Tests above as an aid in correcting 1st LO Synthesizer faults.

1. Figure 6-15. 1st LO Synthesizer Schematic Diagram
2. Paragraph 3.4.16. 1st LO Synthesizer Circuit Description
3. Paragraph 4.3.7.2.1. 1st LO Synthesizer Alignment

4.3.5.17 2nd LO Synthesizer Testing and Troubleshooting

2nd LO Synthesizer Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Frequency Counter, wideband Oscilloscope, and RF Voltmeter (Table 4-1) are required to perform the tests outlined below.

4.3.5.17.1 2nd LO Synthesizer Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.17.2** for fault isolation.

1. Deenergize the receiver.
2. Disconnect connector W4P4 from A2J1.
3. Connect the Frequency Counter to P4.
4. Energize the receiver and tune to 00.00000 MHz. The Frequency Counter should indicate 32.21 MHz.
5. Tune the receiver to 00.00999 MHz. The Frequency Counter should indicate 32.20001 MHz.
6. Disconnect the Frequency Counter and connect the RF Voltmeter and 50 Ω probe to W4P4. The Voltmeter should indicate 0 dBm \pm 2 dBm.
7. Deenergize the receiver and disconnect test equipment. Reconnect P4.

4.3.5.17.2 2nd LO Synthesizer, A5A2, Fault Isolation

2nd LO Synthesizer Fault Isolation includes Troubleshooting Tests to aid in isolating a fault to a defective stage or circuit. Supplementary Troubleshooting Data is provided in **paragraph 4.3.5.17.3** to aid in tracing the fault to a defective component or connection.

1. Determine which of the phase lock loops is causing the problem. When the problem loop is determined, troubleshoot as described below.
 - a. 32 MHz Loop - Proper operation of this loop is indicated by a 32.00000 MHz signal on the transistor case (or collector) of Q1. If not, proceed to Step 2 below.

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- b. Programmable Loop - Proper operation of this loop is indicated by a 200 kHz signal at pin 1 of U6 when the receiver is tuned to 15.00999 MHz and a 210 kHz signal at pin 1 of U6 when the receiver is tuned to 15.00000 MHz. Illumination of LED CR1 indicates a faulty loop. If a problem is not detected, proceed to step 3 below.
- c. Output Loop - Troubleshooting this loop is required when no problems exist in the two loops tested above and 32.20001 to 32.21 MHz is not seen at module pin B15. If this loop has failed, proceed to Step 4.

2. 32 MHz Loop

- a. U3 and U2 - U3 is a divide-by-2 counter. The time for two input waveforms at pin 3 of U3 equals the time for one output waveform at pin 5 of U3. If not, determine that the input levels are correct for TTL (low state less than 0.8 V, high state greater than 2.0 V). If these levels do exist and the output is not correct, replace U3. U2 is a divide-by-16 counter. The time for 16 input waveforms at pin 8 of U2 equals the time for one output waveform at pin 12 of U2. If not, replace U2.
- b. Verify proper operation of phase detector U1. Check 1 MHz reference at pin 1 of U1. If wrong or no signal, troubleshoot Time Base circuits. A working voltage may vary from 2.0 to 3.5 Vdc (at pin 8 of U1).
- c. Vary capacitor C51 (inside shielded unit) until 2.7 Vdc (nominal) is seen at test point E1, when the tuning tool is withdrawn from the shield.

3. Programmable Loop

- a. U19, U17 and U6 - The time for one waveform at pin 5 of U19 equals 10 waveforms at pin 6 of U19. If not, replace U19. The time for one waveform at pin 12 of U17 equals 10 waveforms at pin 8 of U17. If not, replace U17. The time for one waveform at pin 7 of U16 equals 10 waveforms at pin 15 of U16 (difficult to read with scope since frequency at pin 15 varies from 200 - 210 MHz). If not, replace U16.

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- b. Operation of 100/ 101 prescaler - Tune the receiver to 15.00999 MHz. The time for 10 input waveforms at pin 2 of U14 equals one output waveform at pin 11 of U14. If not, replace U14.
- c. Operation of Counters - Tune the receiver to 15.00000 MHz. This sets all inputs (A, B, C, and D) to U7, U8 and U9 with 0 Vdc. Using a frequency counter with an input impedance of greater than 1000 Ω , the frequencies in **Table 4-29** should be found at the corresponding pins. If not, replace that IC.
- d. Phase Detector U12 - Check for 10 kHz signal at Pin 1 of U12. If incorrect or no signal, troubleshoot Time Base Circuits. Compare inputs (pins 1 and 3) and outputs 2 and 13 to **Figure 4-2** of the 1st LO Troubleshooting Test.
- e. Tune the receiver to 15.00499 MHz. Spread or compress the turns of coil L8 until 4.0 Vdc is seen at test point E3. Recheck the voltage at test point E3 to be certain that it remains between +2.0 Vdc and 6.5 Vdc as the receiver is tuned from 15.00000 to 15.00999 MHz.
- f. If the problem appears to be in the VCO, read Section III, **paragraph 3.4.18** then troubleshoot.

4. Output Loop

- a. Measure the frequency of the output at module pin B15. If no signal is present, there is a problem in the VCO or its output amplifier. Check gate 1 of Q3 (pin 3) for signal. If there is none, the problem is with the VCO circuit of Q6. If the signal is there, the problem is in the circuit of amplifier Q3. If the signal is present at pin B15, adjust C61 to bring it as close as practical to 32.300 MHz.
- b. With the VCO very near 32.200 MHz, check the signals at pins 1 and 3 of U6. Both should be TTL level signals of approximately 200 kHz (that is low less than 0.8 V and high greater than 2.0 V). If the wrong signal is at pin 1, troubleshoot the programmable loop Step 3; if the wrong signal is at pin 3, proceed below.
- c. Check the base of Q2. The signal there should be roughly sinusoidal and about 0.5 V p-p. If so, the problem is in the circuits of U14 and U5.

Table 4-29. 2nd LO Frequency Chart

IC PIN	FREQUENCY	IC PIN	FREQUENCY
U7 Pin 14	2.09 MHz	U9 Pin 3	1.05 MHz
U7 Pin 13	100 kHz	U9 Pin 13	130 kHz
U8 Pin 4	100 kHz	U10 Pin 14	130 kHz
U8 Pin 13	10 kHz	U10 Pin 12	10 kHz
U9 Pin 14	2.09 MHz	U10 Pin 11	10 kHz

- d. Because of the low signal levels at the inputs of U4 and U5, signal tracing is difficult. The signal at U4 pin 1 should be 32.2 MHz, at U4 pin 7 should be 32.0 MHz, and at U5 pins 1 and 2 should be 200 kHz. Grounding of the scope probe is critical if the true signal is to be isolated. It is more likely that careful visual inspection of these circuits and a few voltage checks will be useful. The voltage at pins 1 and 2 of U15 will be approximately +5 V and must be equal within 0.2 Vdc. If they differ by more than this, replace U4. If the 200 kHz at pins 1 and 2 of U5 can be measured, the output at pin 6 should be amplified by about 10 times from that level. There may be some distortion present at the output of U5 which is reduced at the base of Q2.
- e. If the signals at Pins 1 and 3 of U6 both appear correct, compare its outputs at Pins 2 and 13 with those of **Figure 4-2**. If these appear correct the problem must be in the amplifier section of U6 pins 8 and 9 and its connection to the VCO.

4.3.5.17.3 2nd LO Synthesizer Supplementary Troubleshooting Data

The following Supplementary Troubleshooting Data is used in conjunction with the Troubleshooting Tests above as an aid in correcting 2nd LO Synthesizer faults:

1. Figure 6-18. 2nd LO Synthesizer Schematic Diagram
2. Paragraph 3.4.18. 2nd LO Synthesizer Circuit Description
3. Paragraph 4.3.7.2.2. 2nd LO Synthesizer Alignment

4.3.5.18 3rd LO Synthesizer Testing and Troubleshooting

3rd LO Synthesizer Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Frequency Counter, wideband Oscilloscope, and RF Voltmeter (**Table 4-1**) are required to perform the tests outlined below.

4.3.5.18.1 3rd LO Synthesizer Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.18.2** for fault isolation.

1. Deenergize the receiver.
2. Disconnect connector W6P10 from J7.
3. Connect the Frequency Counter to W6P10.
4. Energize the receiver. The Frequency Counter should indicate 11.155 MHz.
5. Disconnect the Frequency Counter and connect the RF Voltmeter and 50 Ω probe to W6P10. The Voltmeter should indicate -8 dBm minimum.
6. Deenergize the receiver and disconnect test equipment. Reconnect W6P10.

4.3.5.18.2 3rd LO Synthesizer, P/O A5A1, Fault Isolation

3rd LO Synthesizer Fault Isolation includes Troubleshooting Tests to aid in isolating a fault to a defective stage or circuit. Supplementary Troubleshooting Data is provided in **paragraph 4.3.5.18.3** to aid in tracing the fault to a defective component or connection.

1. Verify all inputs to the 3rd LO circuitry are correct. If not, troubleshoot Time Base circuits.
 - a. 50 kHz signal at pin 11 of U21.
 - b. 10 kHz signal at pin of U21.
2. Operation of U21 - The time for two input waveforms at Pin 3 of U21 equals one output waveform at pin 5 of U21. If not, replace U21.
3. Operation of U22 - Observe inputs (pins 1 and 3) and output voltage (pins 2 and 13) and compare to Figure 4-18. If a difference exists, replace U22. A normal value for the output (pin 8) is 2.0 to 3.0 Vdc.
4. Proper alignment of C33 is indicated by an approximate 2.75 Vdc at pin 8 of U22.
5. If problems lead to the VCO, read **paragraph 3.4.19** in the Circuit Description Section and troubleshoot.

4.3.5.18.3 3rd LO Synthesizer Supplementary Troubleshooting Data

The following Supplementary Troubleshooting Data is used in conjunction with the Troubleshooting Tests above as an aid in correcting 3rd LO Synthesizer faults.

1. Figures 6-17. 1st & 3rd LO Synthesizer Schematic Diagram
2. Paragraph 3.4.19. 3rd LO Synthesizer Circuit Description
3. Paragraph 4.3.7.2.4. 3rd LO Synthesizer Alignment

4.3.5.19 BFO Synthesizer Testing and Troubleshooting

BFO Synthesizer Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Frequency Counter and wideband Oscilloscope (Table 4-1) are required to perform the tests outlined below.

4.3.5.19.1 BFO Synthesizer Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to paragraph 4.3.5.19.2 for Fault Isolation.

1. Deenergize the receiver.
2. Disconnect connector W7P11 from J8.
3. Connect the Frequency Counter to W7P11.
4. Energize the receiver and select CW Mode. Set the BFO offset to +0.0 kHz. The Frequency Counter should read 455.000 kHz.
5. Set the BFO Offset first to +8.9 kHz and then to -8.9 kHz. The Frequency Counter should read 463.900 kHz and 446.1 kHz respectively.
6. Disconnect the Frequency Counter and reconnect W7P11 to J8.
7. Connect the Oscilloscope input to A4TP15 using a shielded cable with clip leads on one end. Connect cable shield to the IF Motherboard ground plane. The Oscilloscope should display a level of 120 mV p-p at 446.1 kHz.
8. Deenergize the receiver and disconnect test equipment.

4.3.5.19.2 BFO Synthesizer, A5A3, Fault Isolation

BFO Synthesizer Fault Isolation includes Troubleshooting Tests to aid in isolating a fault to a defective stage or circuit. Supplementary Troubleshooting Data is provided in

TABLE 4-30

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paragraph 4.3.5.19.3 to aid in tracing the fault to a defective component or connection.

1. Set front panel BFO thumbwheel switches to "+0.0".
2. Programmable Circuits - Use this procedure when a 1 kHz signal is not seen entering the phase detector, pin 3 of U9.
 - a. The frequencies in **Table 4-30** should be found at the corresponding IC pins. If a problem is detected, troubleshoot and/or replace the IC from which the signal originates.

Table 4-30. BFO Frequency Chart

IC	PIN	FREQ	IC	PIN	FREQ	IC	PIN	FREQ
U1	2	910 kHz	U2	2	91 kHz	U3	2	9 kHz
U1	3	2.275	U2	3	228 kHz	U3	3	23 kHz
U1	4	0	U2	4	455 kHz	U3	4	46 kHz
U1	6	455 kHz	U2	6	46 kHz	U3	6	5 kHz
U1	7	455 kHz	U2	7	46 kHz	U3	7	5 kHz
U1	11	1 kHz	U2	11	1 kHz	U3	11	1 kHz
U1	14	4.55 MHz	U2	14	4.55 MHz	U3	14	4.55 MHz
U4	2	1 kHz	U5	2	1 kHz	U6	10	27 kHz
U4	3	3 kHz	U5	4	1 kHz	U6	11	24 kHz
U4	4	5 kHz	U5	5	5 kHz	U6	12	12 kHz
U4	6	1 kHz	U5	6	5 kHz	U6	13	13 kHz
U4	7	1 kHz	U6	1	5 kHz	U7	1	455 kHz
U4	11	1 kHz	U6	2	46 kHz	U7	2	455 kHz
U4	14	4.55 MHz	U6	3	12 kHz	U7	4	910 kHz
U5	8	27 kHz	U6	4	228 kHz	U7	5	2.275 kHz
U5	9	9 kHz	U6	5	455 kHz	U7	6	455 kHz
U5	10	23 kHz	U6	6	24 kHz	U7	8	4.55 kHz
U5	12	46 kHz	U6	8	1 kHz	U7	9	4.55 kHz
U5	13	91 kHz	U6	9	1 kHz	U8	2	1 kHz

3. Phase Detector U9
 - a. 1 kHz signal should be seen at pin 1 of U9. If not, troubleshoot Time Base circuits.
 - b. A voltage level of roughly 1.25 Vdc should be seen at pin 10 of U9. If not, replace U9.
 - c. Adjust capacitor C8 until a 2.7 Vdc level is seen at module pin 7.

4. Amplifier Q2 and Sine Wave to TTL Converter Q3 should be checked when the signal from the VCO through capacitor C10 is not amplified at the collector of Q3. Refer to the circuit description for these circuits, Section 3.
5. Output Divider U10 - Use **Table 4-31** below to check the operation of U10 with the BFO thumbwheel settings set to "+0.0".

Table 4-31. Output Divider U10 Frequency Chart

IC	PIN	FREQ
U10	1	4.55 MHz
U10	11	910 kHz
U10	12	455 kHz
U10	14	910 kHz

4.3.5.19.3 BFO Synthesizer Supplementary Troubleshooting Data

The following Supplementary Troubleshooting Data is used in conjunction with the Troubleshooting Test above as an aid in correcting BFO Synthesizer Faults.

1. Figure 6-19. BFO Synthesizer Schematic Diagram
2. Paragraph 3.4.20. BFO Synthesizer Circuit Description
3. Paragraph 4.3.7.2.6. BFO Synthesizer Alignment

4.3.5.20 Time Base Testing and Troubleshooting

Time Base Testing and Troubleshooting includes a checkout procedure and fault isolation information. A Frequency Counter and a wideband Oscilloscope (Table 4-1) are required to perform the tests outlined below.

4.3.5.20.1 Time Base Checkout Procedure

Perform the following procedure in the sequence given. If any specified result is not obtained, refer to **paragraph 4.3.5.20.2** for Fault Isolation.

1. Deenergize the receiver.
2. Connect the Frequency Counter input to A5XA1 pin A9 using a short coaxial cable with clip leads on one end. Connect cable shield to Motherboard ground plane.

TABLE 4-32

WJ-8718 SERIES HF RECEIVER

3. Energize the receiver. The Frequency Counter should read 1.000000 MHz \pm 3 Hz.
4. Move the Frequency Counter clip lead to A5XA1 pin A47. The Frequency Counter should read 10.000 kHz \pm 1 Hz.
5. Move the Frequency Counter clip lead to A5XA1 pin A53. The Frequency Counter should read 1.000 kHz \pm 1 Hz.
6. Move the Frequency Counter clip lead to test point A5A1A2 pin E6. The Frequency counter should read 40.000 kHz \pm 1 Hz.
7. Deenergize the receiver and disconnect test equipment.

4.3.5.20.2 Time Base, P/O A5A1, Fault Isolation

Time Base Fault Isolation includes Troubleshooting Tests to aid in isolating a fault to a defective stage or circuit. Supplementary Troubleshooting Data is provided in paragraph 4.3.5.20.3 to aid in tracing the fault to a defective component or connection.

Using the internal frequency source, the frequencies in Table 4-32 should be found at the corresponding IC pins. A Digital Counter is the recommended method to check the frequencies, however, an Oscilloscope may be used remembering the time for one input waveform is proportional to the time for one output waveform by the dividing ratio of the IC.

Table 4-32. Time Base Frequency Chart

IC	PIN	FREQUENCY	IC	PIN	FREQUENCY
U15	5	1 MHz	U18	12	10 kHz
U15	6	1 MHz	U19	5	250 kHz
U15	8	2 MHz	U19	12	50 kHz
U15	12	200 kHz	U20	5	5 kHz
U17	12	40 kHz	U20	12	1 kHz
U18	5	500 kHz	U23	8	1 MHz
U18	8	1 MHz	U23	11	1 MHz

4.3.5.20.3 Time Base Supplementary Troubleshooting Data

The following list of Supplementary Troubleshooting Data is used as an aid in correcting Time Base faults.

1. Figures 6-15. 1st and 3rd LO Synthesizer/Time Base Schematic Diagram
2. Paragraph 3.4.21. Time Base Circuits Description
3. Paragraph 4.3.7.2.5. 2 MHz Time Base Alignment

4.3.6 PARTS REPLACEMENT GUIDELINES

This paragraph provides techniques to assist the Technician in replacing components on PC boards.

WARNING

To prevent electrical shock or damage to the receiver, always disconnect the receiver from the ac power source before soldering or replacing components.

4.3.6.1 **Soldering Techniques**

When removing components from a printed circuit board for inspection or replacement, be especially careful not to damage the track. The soldering iron power should be no larger than 40 W, and a solder sipper or wicking procedure should be employed when removing solder. Non-corrosive soldering flux should be used when removing solder by wicking. In returning components to the board, make sure that holes are clear and that leads do not catch the edge of the track and lift it from the board. A good grade of rosin core 60/40 solder should be used. Heat no longer than is necessary to achieve a good joint. A heat sink should be used where possible.

4.3.6.2 **Component Replacement**

Specific guidelines for replacing the various kinds of components are as follows.

1. When soldering or unsoldering diodes or resistors, solder quickly to allow as little heat conduction as possible. When wiring permits, use a heat sink between the soldering iron and the part.
2. When soldering or unsoldering transistors, use a low wattage iron and a heat sink. Solder as quickly as possible. The use of a circular soldering tip to heat all three or four joints simultaneously is recommended.
3. When soldering or unsoldering glass or ceramic capacitors, use a heat sink between the capacitor and the iron. Excessive heat will crack the capacitor body.
4. When any electronic part is removed, note the position of the part and its leads, and replace it the same way.

4.3.6.3 **Realignment**

Replacement of semiconductors or tuned circuit components may affect the alignment of the PC board being repaired. Realignment may be necessary to return the PC board to normal operation.

4.3.7 **ADJUSTMENT/ALIGNMENT PROCEDURES**

4.3.7.1 **General**

The following Adjustment and Alignment Procedures should not be performed on a routine basis, but instead, should be used as aids in troubleshooting and post-repair testing. Before alignment is attempted, the technician should first perform the relevant procedures to determine which module needs alignment. These procedures may be used for testing or aligning new and repaired modules.

4.3.7.2 **Synthesizer Alignment**

4.3.7.2.1 **1st LO Synthesizer Alignment**

The only alignment points for the 1st LO Synthesizer are in the 1st LO VCO (A5A1A1) which is a very sensitive circuit; care must be taken to ensure proper operation. This procedure should be performed only when a definite alignment is needed. **Table-4-33** lists the components and their parameters used in this alignment procedure.

1. Mount the 1st and 3rd LO on an extender card.
2. Remove the VCO front plate.
3. Connect a Digital Voltmeter to module pin B1.
4. Beginning at Band 0, align the 8 Vco Bands indicated in **Table 4-33**. Alignment is accomplished by monitoring the voltage at pin B1 and adjusting the indicated components. Note that L2, L3 and L4 will cause interaction between the alignment of several bands.
5. Check the 1st LO frequency band (test point E3 in the VCO) while dialing the tuned frequency in 10 kHz steps starting with 00.00000 MHz.

Table 4-33. VCO Alignment Parameters

VCO Band	1st LO FREQ BAND (MHz)	VOLTAGE Pin B1 (Typical)	ALIGNMENT COMPONENT
0	42.91-46.90	-8.5 to 6.0	C6*, L1
1	46.91-50.90	-7.5 to 4.1	L2
2	50.91-54.90	-7.2 to 2.8	L3
3	54.91-54.90	-5.3 to 3.9	L2, L3
4	58.91-62.90	-6.6 to 2.7	L4
5	62.91-66.90	-6.0 to 2.2	L4, L2
6	66.91-70.90	-6.2 to 0.4	L3, L4
7	70.91-72.90	-5.7 to -3.0	L4, L3, L2

* Factory Select Value

4.3.7.2.2 2nd LO Synthesizer Alignment (A5A2)

The 2nd LO Synthesizer procedure consists of a 32 MHz Loop Alignment, a Programmable Loop Alignment, and an Output Loop Alignment. Perform the procedure in the given sequence.

CAUTION

For optimum results, the 2nd LO Synthesizer Alignment should be performed in an ambient temperature of $+25^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

1. Preliminary Setup
 - a. Remove the top protective cover from the receiver.
 - b. Mount the 2nd LO Synthesizer board (A5A2) on an extender card.
 - c. Energize the receiver and allow 30 minutes warm-up time.
 - d. Using a Digital Voltmeter, verify that $+15\text{ Vdc} \pm 0.25\text{ Vdc}$ is present at pins B5, B41, and A59, and that $+5\text{ Vdc} \pm 0.25\text{ Vdc}$ is present at pins A1, B1, and B45.
 - e. Using a Frequency Counter, verify that the 1 MHz reference frequency at pin B49 is 1.000000 MHz and that the 10 kHz reference frequency at pin A57 is 10.000 kHz.

NOTE

If the two reference frequencies are not correct, perform the Time Base Adjustment Procedure before proceeding with the 2nd LO Synthesizer Alignment.

2. 32 MHz Loop Alignment
 - a. Connect the Digital Voltmeter to test point E1.
 - b. Adjust capacitor C51 until a Voltmeter reading of $+3.0\text{ Vdc}$ is observed with the alignment tool withdrawn from the VCO shield.
3. Programmable Loop Alignment
 - a. Connect the Digital Voltmeter to test point E3.

TABLE 4-34

WJ-8718 SERIES HF RECEIVER

- b. Tune the receiver to 00.00499 MHz.
 - c. Insert an alignment tool in the VCO shield opening and spread or squeeze the turns of L8 until a Voltmeter reading of +4.0 Vdc is observed with the alignment tool withdrawn from the VCO shield.
4. Output Loop Alignment
- a. Connect the Digital Voltmeter to test point E2.
 - b. Tune receiver to 00.00499 MHz.
 - c. Adjust capacitor C61 until a Voltmeter reading of +3.0 Vdc is observed with the alignment tool withdrawn from the VCO shield.
 - d. Using the Frequency Counter, verify that a frequency of 32.205010 MHz \pm 3 Hz is present at output pin B15.
5. Final Adjustments
- a. Deenergize the receiver.
 - b. Remove the 2nd LO Synthesizer board from the extender card and return it to the receiver.
 - c. Mount the top protective cover on the receiver (use only four fasteners to secure the top cover).
 - d. Energize the receiver and allow it to operate for a minimum of 30 minutes.
 - e. Tune the receiver to 00.00499 MHz.
 - f. With the receiver in operation, remove the bottom protective cover.
 - g. Using the Digital Voltmeter, check the Loop Test Point Voltages as indicated in **Table 4-34**.

Table 4-34. Loop Test Point Voltages

Parameter	Pin Number	Test Point Voltage
32 MHz Loop TP	A5XA2-B57	+3 Vdc \pm 0.1 Vdc
Programmable Loop TP	A5XA2-A51	+4 Vdc \pm 0.1 Vdc
Output Loop TP	A5XA2-A55	+3 Vdc \pm 0.1 Vdc

NOTE

Test Point Voltages may drift from initial settings. If any Test Point Voltage is not within tolerance, repeat the appropriate loop alignment procedure. Set the Test Point Voltage(s) high or low as required to compensate for any drift observed in Step g. Do not proceed to Step h until the voltages in **Table 4-34** are observed after the receiver has been in operation for 30 minutes with both covers in place.

- h. Using the Frequency Counter, verify that a frequency of 32.205010 MHz \pm 3 Hz is present at pin A5XA2-B15.
- i. Tune the receiver first to 00.00000 MHz and then to 00.00999 MHz. The appropriate Loop Test Point Voltages and the 2nd LO Output Frequency are given in **Table 4-35**.

Table 4-35. 2nd LO Synthesizer Tuning Parameters

Parameter	Pin Number	Receiver Tuned Frequency	
		00.00000 MHz	00.00999 MHz
32 MHz Loop TP	A5XA2-B57	+3 Vdc \pm 0.2 Vdc	+3 Vdc \pm 0.2 Vdc
Programmable Loop TP	A5XA2-A51	> 1.5 Vdc	< 7.0 Vdc
Output Loop TP	A5XA2-A55	+3 Vdc \pm 0.2 Vdc	+3 Vdc \pm 0.2 Vdc
2nd LO Frequency	A5XA2-B15	32.21000 MHz	32.20001 MHz

- j. Mount the top protective cover on the receiver.
- k. This completes the 2nd LO Synthesizer Alignment Procedure.

4.3.7.2.3 2nd LO Filter Adjustment

1. Deenergize the receiver.
2. Disconnect connector P4 from A2J1 of Input Converter (A3).
3. Connect the RF Voltmeter and 50 Ω adapter to P4.
4. Set Voltmeter to 0 dBm (0.3 mV) scale and energize the receiver.
5. Adjust A5C13 for maximum Voltmeter reading. A5C13 is located on the bottom side of the Synthesizer Motherboard (A5) near the front panel of the receiver.

4.3.7.2.4 3rd LO Synthesizer Alignment

1. Deenergize the receiver.
2. Mount the 1st and 3rd LO Synthesizer (A5A1A2) on extender cards and connect the Digital Voltmeter to Pin 8 of U22.
3. Energize the receiver. Adjust capacitor C33 until a reading of 3.0 Vdc is seen on the Voltmeter.
4. Deenergize the receiver and disconnect Digital Voltmeter.

4.3.7.2.5 2 MHz Time Base Adjustment

NOTE

Before performing the following adjustment, the receiver should have been in operation for at least one hour at normal operation temperature to allow the circuit to stabilize.

1. Deenergize the receiver.
2. Mount 1st and 3rd LO Synthesizer (A5A1A2) on extender cards.
3. Connect the Digital Counter to rear panel 1 MHz Ref connector J11.
4. Set the Clock switch S2 to INT position.
5. Energize the receiver. Allow at least a 5 minute warm-up to stabilize the circuits. (This assumes power was not off more than 5 minutes to make the cable connections.)
6. While observing the Counter display, adjust 2 MHz Crystal Oscillator (U14) for a reading of 1.000000 MHz \pm 3 Hz.
7. Deenergize the receiver and disconnect Digital Counter. Replace A5A1A2 board into the proper slots.

4.3.7.2.6 BFO Synthesizer Alignment

Two alignments are required for the BFO Synthesizer (A5A3). Capacitor C8 and resistor R1 are interdependent and must be aligned simultaneously.

1. Mount the BFO Synthesizer board on extender cards.
2. Adjust C8 until the closest reading to 3.0 Vdc is seen at module pin 7.

3. Adjust R1 until the voltage difference between gate to source of Q4 (Pins 3 and 2) is 0 Vdc. (The voltage from gate to ground and from source to ground will be approximately 1.2 Vdc.)
4. Adjust C8 again until the closer reading to 3.0 Vdc is seen at module pin 7.

4.3.7.3 Receiver Alignment

4.3.7.3.1 Input Converter Alignment

1. Deenergize the receiver and loosen the two (2) captivated screws holding the A3 module to the chassis. Pull the A3 module out and remove its cover. Connect test equipment as shown in Figure 4-3. Be careful that Input Converter does not short to the adjacent power supply circuitry.

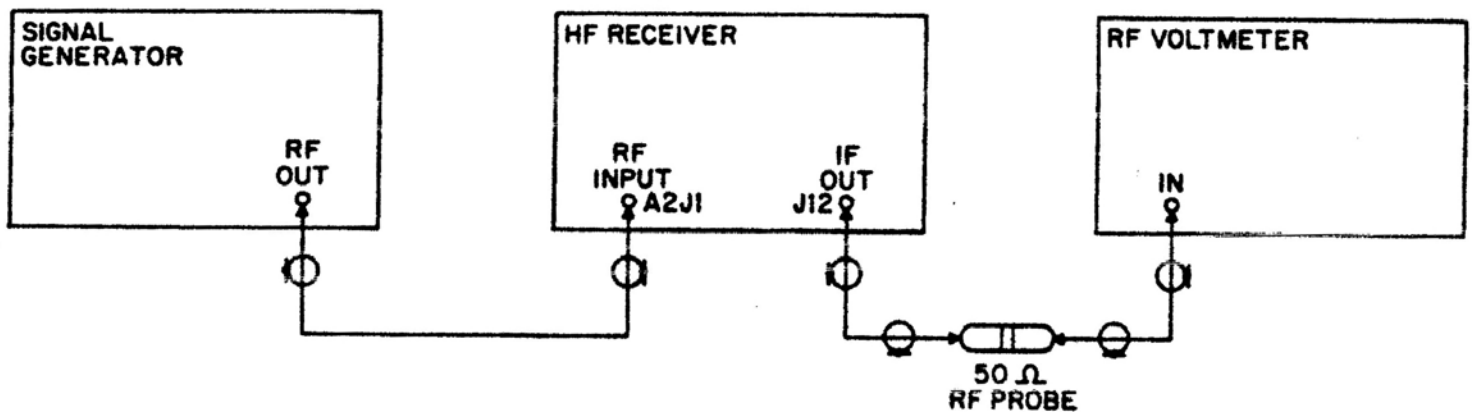


Figure 4-3. Input Converter Alignment Test Setup

2. Set receiver controls as follows:

a. Meter	-	Signal Strength
b. Gain Mode	-	Manual
c. Detection Mode	-	AM
d. RF Gain	-	Maximum Clockwise
e. Phone Level	-	N/A
f. IF Bandwidth	-	16 kHz
g. BFO offset	-	N/A

FIGURE 4-4

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3. Energize the receiver.
4. Set the Signal Generator to -97 dBm, unmodulated at 15.0050 MHz. Tune receiver to 15.00500 MHz.
5. While observing RF Voltmeter, adjust C3 of A3A1 and C1 of A3A2 for a maximum meter reading of approximately -15 dBm (40 mV).
6. Deenergize the receiver and disconnect test equipment.
7. Replace the cover on the Input Converter (A3). Install the Input Converter in chassis.

4.3.7.3.2 10.7 MHz Filter Switch Adjustment

1. Deenergize the receiver.
2. Connect the test equipment as shown in Figure 4-4. Set the Generator for 15.005 MHz, unmodulated, at -64 dBm.

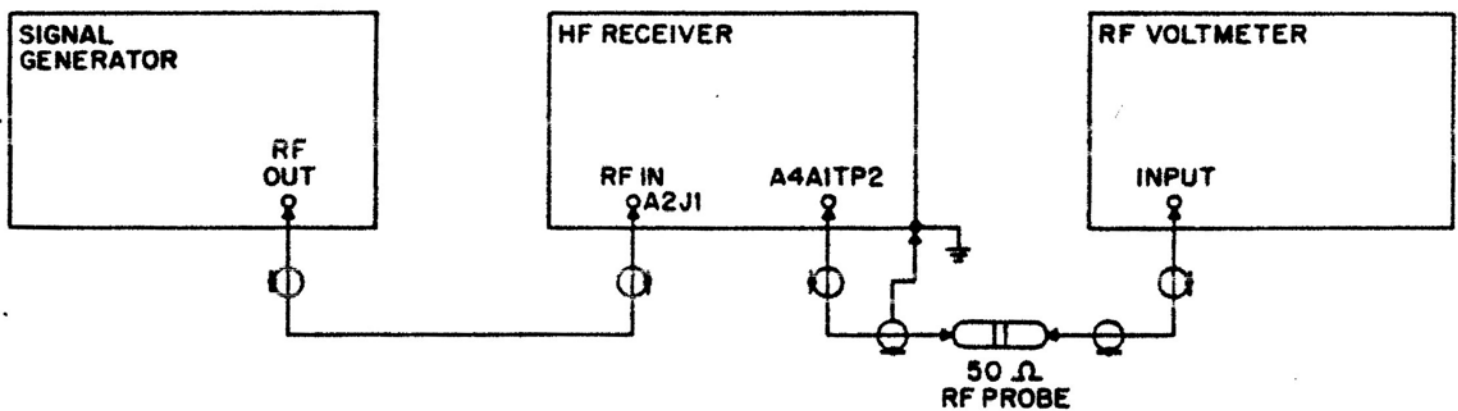


Figure 4-4. 10.7 MHz Filter Switch Adjustment, Test Setup

3. Remove A4A1 and A4A2 boards.

NOTE

A4A2 is removed to eliminate loading.

4. Place A4A1 on an extender card.
5. Energize the receiver and tune to 15.00500 MHz.

6. Depress the 3.2 kHz IF Bandwidth button and adjust A4A1R26 for a -36 dBm (3.5 mV) RF Voltmeter reading.

NOTE

If -36 dBm cannot be obtained, adjust for maximum dBm reading. Record this reading.

7. Depress the 6 kHz IF Bandwidth button and adjust A4A1R28 for the same dBm reading obtained in step 6.
8. Depress the 16 kHz IF Bandwidth button and adjust A4A1R30 for the same dBm reading obtained in step 6.
9. Deenergize the receiver and disconnect test equipment.
10. Install A4A2 and A4A1 into the proper slots.

4.3.7.3.3 455 kHz Amplifier/AM Detector Response Alignment

1. Deenergize the receiver.
2. Remove cards A4A3 and A4A10. Place A4A7 on an extender card.
3. Connect the test equipment as shown in **Figure 4-5**.
4. Set up the Sweep Generator as follows:

a.	Power	-	ON
b.	CW/Sweep	-	SYM
c.	Trig/Line/Free	-	Line
d.	Fast/Slow/Manual	-	Fast
e.	Crystal Cal	-	OFF
f.	Range	-	11
g.	Sym Sweep Width	-	.1/1
	Vernier		
h.	1 kHz Mod	-	OFF
i.	Output Level	-	-60 dBm
j.	Frequency	-	455 kHz
5. Set up the Marker Generator for a 455 kHz output, unmodulated, at -80 dBm.
6. Set the receiver controls as follows:

a.	Meter	-	N/A
b.	Gain Mode	-	Manual

FIGURE 4-5

WJ-8718 SERIES HF RECEIVER

- | | | | |
|----|--------------------|---|-------------------|
| c. | Detection Mode | - | N/A |
| d. | RF Gain | - | Maximum Clockwise |
| e. | Phone Level | - | N/A |
| f. | IF Bandwidth | - | N/A |
| g. | Receiver Frequency | - | N/A |
| h. | BFO offset | - | N/A |

- Energize the receiver. Adjust Sweep Generator Frequency control to center the response pattern on the Oscilloscope screen.

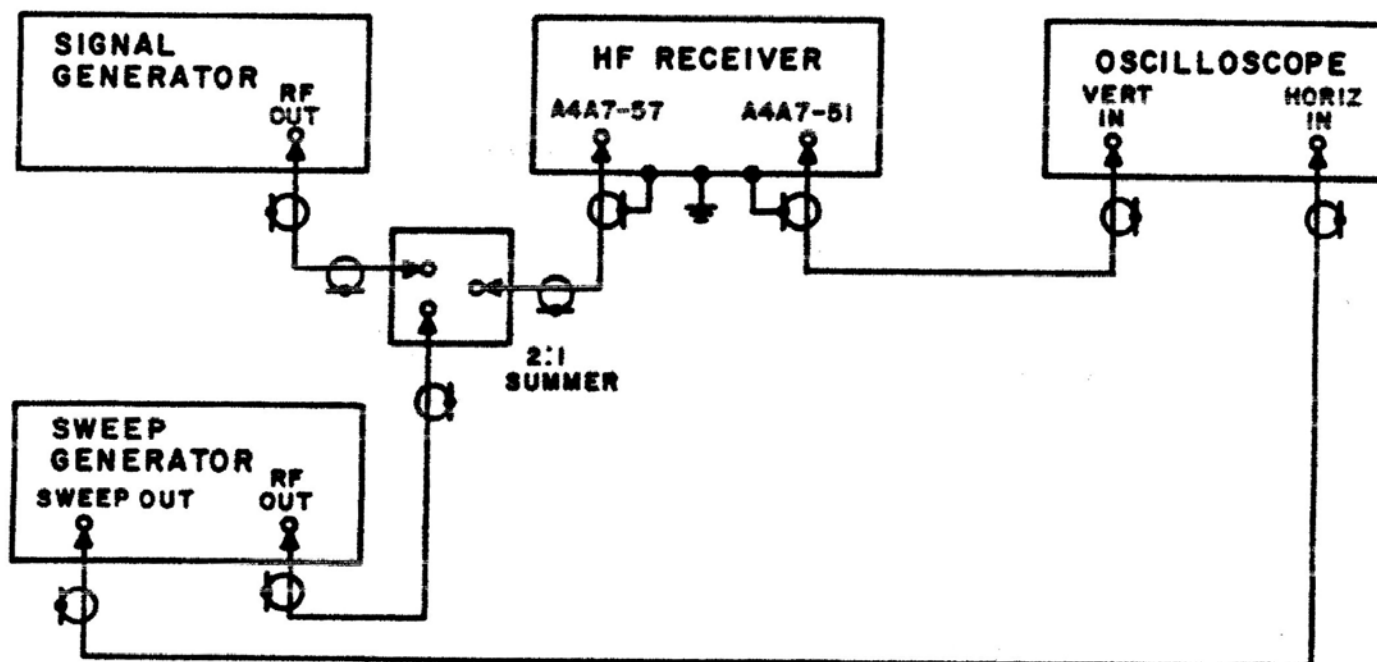


Figure 4-5. 455 kHz Amplifier/AM Detector Response Alignment, Test Setup

- Adjust A4A7L2 and A4A7L3 for an Oscilloscope waveform which has maximum amplitude and is symmetrical about the marker. See Figure 4-6 for a typical waveform.
- Deenergize the receiver and disconnect test equipment.
- Install A4A3 and A4A10 cards in the proper card slots.

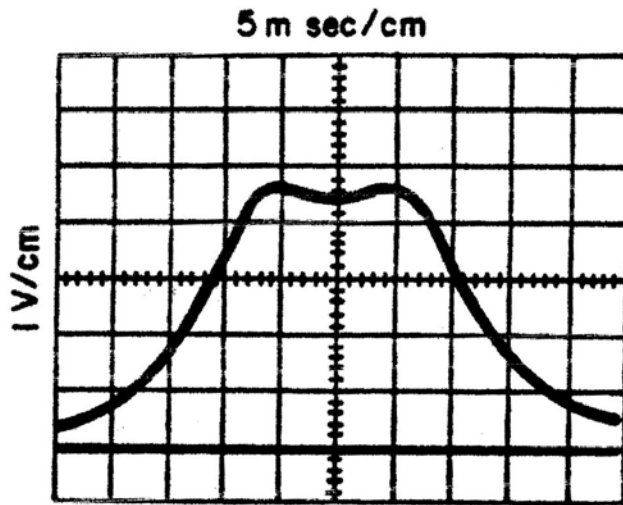


Figure 4-6. 455 kHz Amplifier/AM Detector Response Alignment, Typical Response

4.3.7.3.4 455 kHz Amplifier/AM Detector Gain Adjustment

1. Connect the test equipment as shown in Figure 4-7.
2. Set the receiver controls as follows:

a. Meter	-	Signal Strength
b. Gain Mode	-	Manual
c. Detection Mode	-	AM
d. RF Gain	-	Maximum Clockwise
e. Phone Level	-	N/A
f. IF Bandwidth	-	6 kHz
g. BFO offset	-	N/A

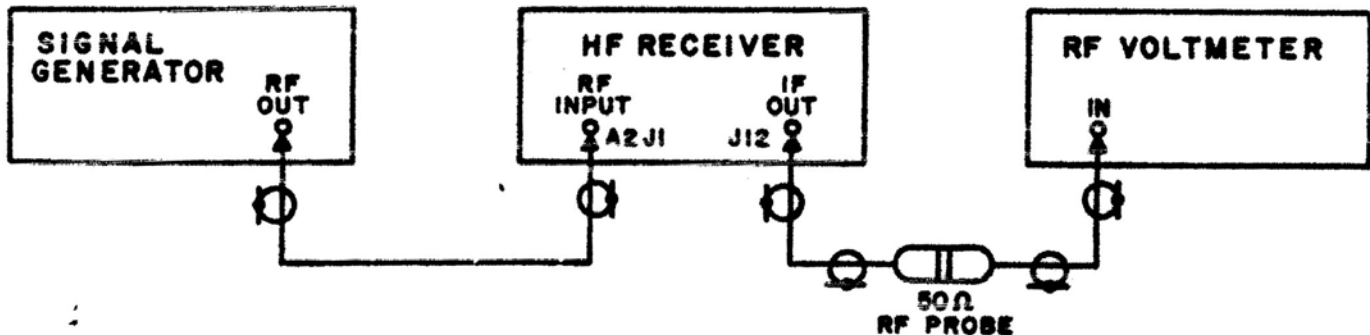


Figure 4-7. 455 kHz Amplifier/AM Detector Gain Adjustment, Test Setup

3. Energize the receiver.
4. Set the RF Voltmeter to the 100 mV scale.
5. Set the Signal Generator to 15.0050 MHz, unmodulated at -97 dBm (3 μ V). Also tune receiver to 15.00500 MHz.
6. Adjust A4A7R7 for a 40 mV reading on the RF Voltmeter.
7. Deenergize the receiver and disconnect test equipment.

4.3.7.3.5 USB Filter Switch and ISB/LSB Filter Switch Adjustment

The purpose of this adjustment is to equalize the output levels of A4A4 and A4A5.

1. Deenergize the receiver.
2. Connect the RF output of the Signal Generator to RF Input connector A2J1.
3. Put A4A5 on an extender card and A4A4 on two extender cards.
4. Set the receiver controls as follows:

a. Meter	-	Signal Strength
b. Gain Mode	-	Manual
c. Detection Mode	-	AM
d. RF Gain	-	Maximum Clockwise
e. Phone Level	-	Midway
f. IF Bandwidth	-	16 kHz
g. BFO offset	-	N/A
5. Energize the receiver.
6. Tune the receiver to 15.00500 MHz and set the Signal Generator to a 15.0050 MHz unmodulated signal.
7. Adjust the Signal Generator output level until the Signal Strength meter reads the SET level.
8. Change the Signal Generator frequency to 15.0054 MHz and receiver detection mode to USB.
9. Adjust potentiometer A4A4R23 until the meter reads the set level or until R23 is at its maximum setting, whichever occurs first. Record the meter level.
10. Change the Signal Generator frequency to 15.0046 MHz and receiver detection mode to LSB.

11. Adjust potentiometer A4A5R32 until the meter reads the level obtained in step 8. If the step 8 level cannot be obtained, set A4A5R32 at its maximum setting, record the meter reading, and perform steps 12 and 13.
12. Change the Signal Generator frequency to 15.0054 MHz and receiver detection mode to USB.
13. Adjust potentiometer A4A4R23 until the meter reads the level obtained in step 10.
14. Deenergize the receiver and disconnect test equipment.

4.3.7.3.6 **ISB Detector/Audio Adjustment** (Applies to WJ-8718/8718A/8718-9 Receivers)

1. Deenergize the receiver and connect the equipment as shown in Figure 4-8.

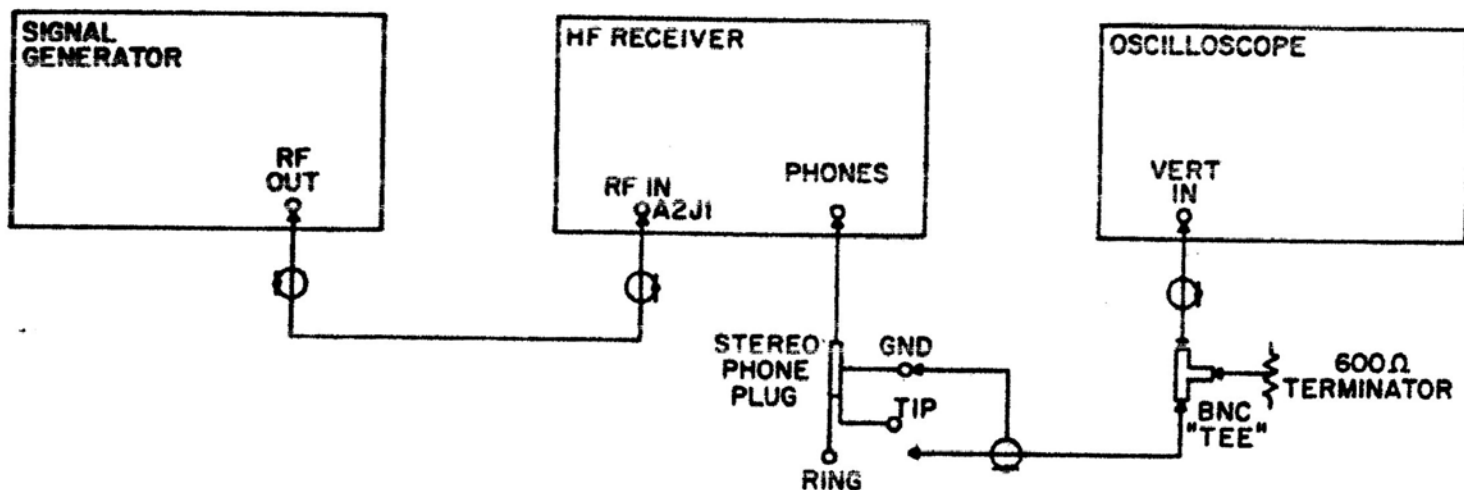


Figure 4-8. ISB Detector/Audio Adjustment, Test Setup

2. Set the receiver controls as follows:

a. Meter	-	N/A
b. Gain Mode	-	Manual
c. Detection Mode	-	ISB
d. RF Gain	-	Maximum Clockwise
e. Phone Level	-	Maximum Clockwise (Initial Setting)
f. IF Bandwidth	-	N/A
3. Energize the receiver. Connect oscilloscope to the "tip" on the phone plug. On WJ-8718A/8718-9 Receivers, ensure that USB and LSB Audio buttons are deenergized.
4. Set the Signal Generator to a -105 dBm unmodulated signal at 15.0054 MHz. Also tune the receiver to 15.00500 MHz.

5. With equipment connected properly, a 400 Hz audio output should be seen on the Oscilloscope.
6. Adjust the Phone Level gain control on the front panel for the maximum Oscilloscope waveform, without clipping or distortion present. Record this reading. This is the Upper Sideband signal.
7. Change the Signal Generator frequency to 15.0046 MHz.
8. Connect the Oscilloscope to the "ring" on the phone jack. This is the Lower Sideband signal.
9. Adjust A4A8R8 to obtain the same output obtained in step 5 above, or until output is at its maximum.
10. If the same level as in step 5 cannot be obtained, repeat steps 1 through 8, with the exception of increasing ISB IF gain via A4A5R32 slightly each time, so that step 5 (USB) and step 8 (LSB) waveforms are the same.
11. Deenergize the receiver and disconnect test equipment.

4.3.7.3.7 FM Discriminator Alignment

1. Deenergize the receiver.
2. Remove cards A4A7, A4A9, and A4A10.
3. Put A4A9 on an extender card.
4. Connect the test equipment as shown in **Figure 4-9**.
5. Set up the Sweep Generator as follows:

a.	Power	-	ON
b.	CW/Sweep	-	SYM
c.	Trig/Line/Free	-	Line
d.	Fast/Slow/Manual	-	Fast
e.	Crystal Cal	-	OFF
f.	Range	-	11
g.	Sym Sweep Width	-	.1/1
	Vernier		
h.	1 kHz Mod	-	OFF
i.	Output Level	-	-10 dBm
j.	Frequency	-	455 kHz
6. Set up the Marker Generator for a 455 kHz output, unmodulated, at -25 dBm.

7. Set the receiver controls as follows:

- | | | | |
|----|--------------------|---|-----|
| a. | Meter | - | N/A |
| b. | Gain Mode | - | N/A |
| c. | Detection Mode | - | FM |
| d. | RF Gain | - | N/A |
| e. | Phone Level | - | N/A |
| f. | IF Bandwidth | - | N/A |
| g. | Receiver Frequency | - | N/A |
| h. | BFO offset | - | N/A |

8. Energize the receiver. Adjust Sweep Generator Frequency control to center the response pattern on the Oscilloscope screen.

9. Adjust A4A9L1 and A4A9T1 for an Oscilloscope waveform which has maximum amplitude and is symmetrical and linear about the marker. See Figure 4-10 for a typical waveform.

10. Deenergize the receiver.

11. Disconnect the test equipment and install A4A7, A4A9, and A4A10 boards into the proper slots.

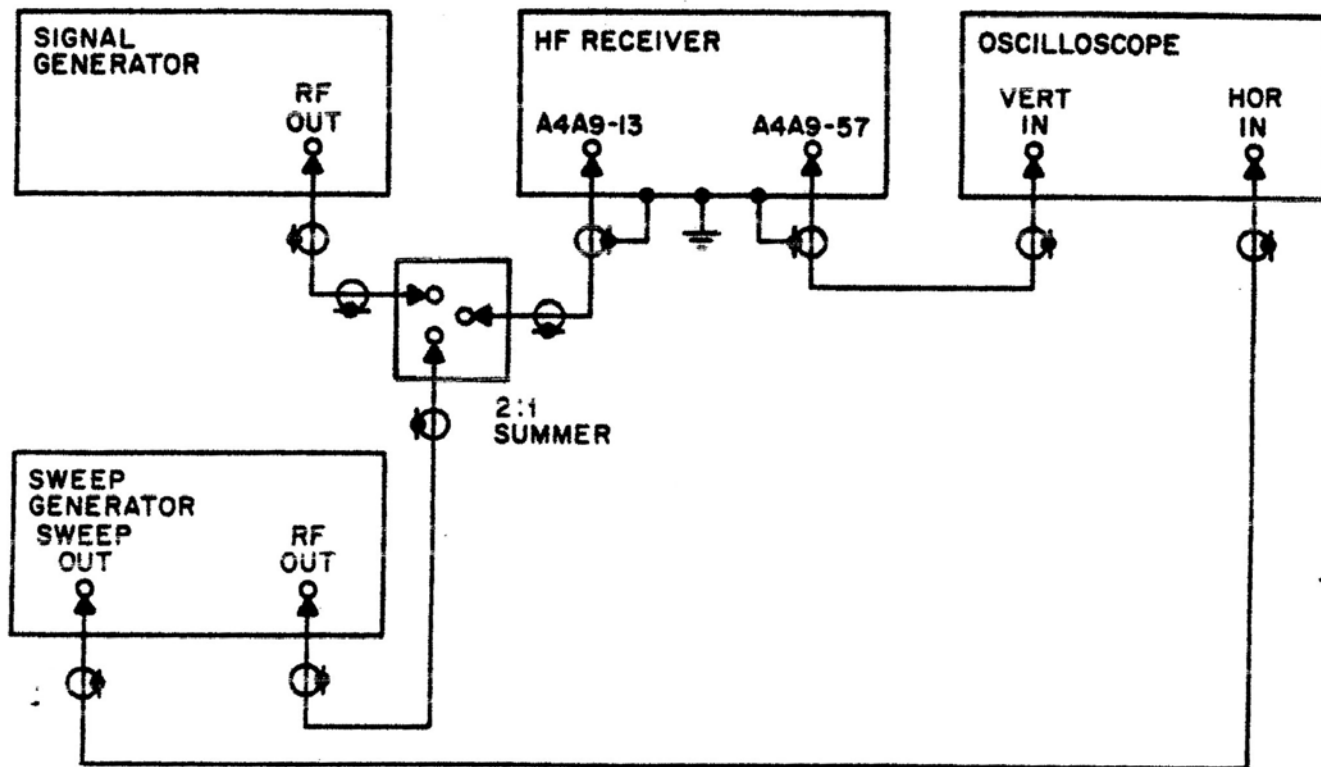


Figure 4-9. FM Discriminator Alignment, Test Setup

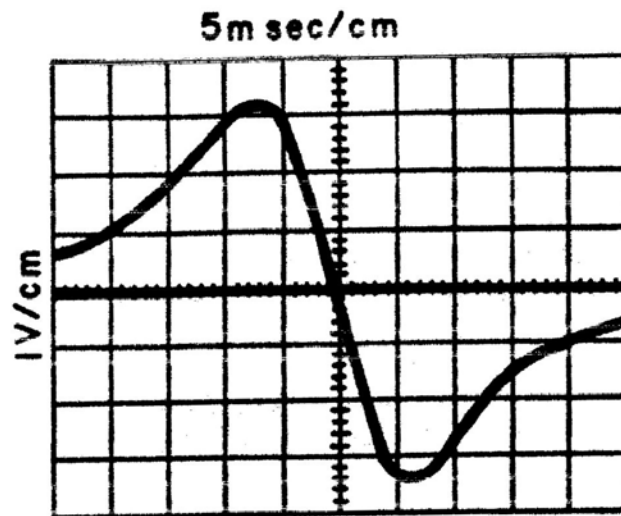


Figure 4-10. FM Discriminator Alignment, Typical Response

4.3.7.4 LED Intensity Adjustment

The intensity of the front panel Frequency Display can be varied by potentiometer R2, which is located inside the front panel on the left side of the Frequency Display LED's. Turning R2 clockwise increases the LED intensity.

SECTION V**REPLACEMENT PARTS LIST****5.1 UNIT NUMBERING METHOD**

The unit numbering method of assigning reference designations (electrical symbol numbers) has been used to identify assemblies, subassemblies (and modules) and parts. An example of the unit numbering method follows:

<u>Subassembly Designation</u>	<u>A1</u>	<u>R1</u>	<u>Class and No. of Item</u>
Identify from right to left as:		First (1) resistor (R) of first (1) subassembly (A)	

As shown on the main chassis schematic, components which are an integral part of the main chassis have no subassembly designation.

5.2 REFERENCE DESIGNATION PREFIX

Partial reference designations have been used on the equipment and on the illustrations in this manual. The partial reference designations consist of the class letter(s) and identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Reference Designation Prefixes are provided on drawings and illustrations in parentheses within the figure titles.

5.3 LIST OF MANUFACTURERS

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
00779	AMP, Incorporated P.O. Box 3608 Harrisburg, PA 17105	02735	RCA Corporation Solid State Division Route 202 Somerville, NJ 08876
01121	Allen-Bradley Company 1201 South 2nd Street Milwaukee, WI 53204	04013	Taurus Corporation 1 Academy Hill Lambertville, NJ 08530
01295	Texas Instruments, Inc. Semiconductor-Components Div. 15300 North Central Expressway Dallas, TX 75231	04713	Motorola Incorporated Semiconductor Products Div. 5005 East McDowell Road Phoenix, AZ 85008
02114	Ferroxcube Corporation P.O. Box 359 Mt. Marion Road Saugerties, NY 12477	06978	Vernitron Corp. AIE Div. 701 Murfreesboro Rd. Nashville, TN 37210

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
07263	Fairchild Camera & Instr. Corp. Semiconductor Division 464 Ellis Street Mountain View, CA 94040	17856	Siliconix, Inc. 2201 Laurelwood Road Santa Clara, CA 95050
07388	Toretel Incorporated 13402 South 71 Highway Grandview, MO 64030	18324	Signetics Corporation 811 East Arques Avenue Sunnyvale, CA 94086
09021	Airco Inc. Airco Electronics Bradford, PA 17055	18565	Chomerics Inc. Woburn, MA 01801
09353	C & K Components, Inc. 103 Morse Street Watertown, MA 02172	18714	RCA Corporation Solid State Division Fostoria Road Findlay, OH 45840
12498	Teledyne Crystalonics 147 Sherman Street Cambridge, MA 02140	19080	Robison Electronics Inc. 3580 Sacramento Dr. P.O. Box Y San Luis Obispo, CA 93406
13103	Thermalloy Company 2021 W. Valley View Lane Dallas, TX 75234	19209	General Electric Company Battery Business Department P.O. Box 114 Gainesville, FL 32602
14632	Watkins-Johnson Company 700 Quince Orchard Road Gaithersburg, MD 20878	19505	Applied Eng. Products, Co. Division of Samarious, Inc. 300 Seymour Avenue Derby, CT 06418
14655	Cornell-Dubilier Electronics Div. of Federal Pacific Electric Company 150 Avenue L Newark, NJ 07101	21604	The Buckeye Stamping Co. 555 Marion Road Columbus, OH 43207
15818	Teledyne Semiconductor Teledyne Inc. Company 1300 Tera Bella Ave. Mountain View, CA 94043	22526	Du Pont EI De Nemours and Co. Inc. Photo Products Dept. Berg Electronics Div. Route 83 New Cumberland, PA 17070
16428	Belden Corporation P.O. Box 1101 Richman, IN 47374	25088	Siemens America, Inc. 186 Wood Avenue S. Iselin, NJ 08830

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS LIST

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
27014	National Semi-Conductor Corp. 2950 San Ysidro Way Santa Clara, CA 95051	72982	Erie Technological Prod., Inc. 644 West 12th Street Erie, PA 16512
27956	Relcom 3333 Hillview Avenue Palo Alto, CA 94304	73138	Beckman Instruments, Inc. Helipot Division 2500 Harbor Boulevard Fullerton, CA 92634
28480	Hewlett-Packard Company Corporate Headquarters 1501 Page Mill Road Palo Alto, CA 94304	74306	Piezo Crystal Company 100 K Street Carlisle, PA 17013
31918	IEE/Schadow Incorporated 8081 Wallace Road Eden Prairie, MN 55343	74868	Bunker Ramo Corporation The Amphenol RF Division 33 East Franklin Street Danbury, CT 06810
33095	Spectrum Control, Inc. 152 E. Main Street Fairview, PA 16415	75042	TRW Electronic Components IRC Fixed Resistors 401 North Broad Street Philadelphia, PA 19108
52673	KSW Electronics Corp. Burlington, MA 01803	75915	Littlefuse, Incorporated 800 E. Northwest Highway Des Plaines, IL 60016
56289	Sprague Electric Company Marshall Street North Adams, MA 01247	80058	Joint Electronic Type Designation System
71279	Cambridge Thermionic Corp. 445 Concord Avenue Cambridge, MA 02138	80103	Lambda Electronics Corp. Div. of Veeco Instr., Inc. 51 Broad Hollow Road Melville, NY 11746
71400	Bussman Manufacturing Division of McGraw-Edison Co. 2536 W. University Street St. Louis, MO 63107	80131	Electronic Industries Assoc. 2001 Eye Street, N.W. Washington, DC 20006
71785	TRW Electronic Components Cinch Connector Operations 1501 Morse Avenue Elk Grove Village, IL 60007	81312	Winchester, Electronics Division of Litton Ind. Oakville, CT 06779
72136	Electro Motive Mfg. Co., Inc. South Park & John Streets Willimantic, CT 06226	81349	Military Specifications

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
81350	Joint Army-Navy Specifications	93332	Sylvania Elec. Products, Inc. Semiconductor Products Div. 100 Sylvan Road Woburn, MA 01801
82389	Switchcraft, Incorporated 5555 North Elston Avenue Chicago, IL 60630	93958	Republic Electronics Corp. 176 East 7th Street Paterson, NJ 07524
84411	TRW Electric Components TRW Capacitors 112 W. First Street Ogallala, NE 69153	95121	Quality Components, Inc. P.O. Box 113 St. Mary's, PA 15857
88245	Litton Industries USECO Division 13536 Saticoy Street Van Nuys, CA 91409	96733	San Fernando Electric Mfg. Co. San Fernando, CA 91341
91293	Johanson Manufacturing Co. P.O. Box 329 Boonton, NJ 07005	98291	Sealectro Corporation 225 Hoyt Mamaroneck, NY 10544
91418	Radio Materials Company 4242 West Bryn Mawr Avenue Chicago, IL 60646	98978	International Electronic Research Corporation 135 West Magnolia Blvd. Burbank, CA 91502
91984	Maida Development Co. 205 Libby P.O. Box 3529 Hampton, VA 23663	99800	American Precision Industries Delevan Electronics Division 270 Quaker Road East Aurora, NY 14052
92825	Whitso Incorporated 93330 Bryon Street Schiller Park, IL 60176	99848	Wilco Corporation 4030 West 10th Street P.O. Box 22248 Indianapolis, IN 46222

5.4 PARTS LIST

The parts list which follows contains all electrical parts used in the equipment and certain mechanical parts which are subject to unusual wear or damage. When ordering replacement parts from Watkins-Johnson Company, specify the type and serial number of the equipment and the reference designation and description of each part ordered. The list of manufacturers provided in paragraph 5.3 and the manufacturer's part number for components are included as a guide to the user of the equipment in the field. These parts may not necessarily agree with the parts installed in the equipment; however, the parts specified in this list will provide satisfactory operation of the equipment. Replacement parts may be obtained from any manufacturer as long as the physical and electrical parameters of the part selected agree with the original indicated part. In the case of components defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

NOTE

As improved semi-conductors become available, it is the policy of Watkins-Johnson to incorporate them in proprietary products. For this reason some transistors, diodes, and integrated circuits installed in the equipment may not agree with those specified in the parts list and schematic diagrams of this manual. However, the semi-conductors designated in the manual may be substituted in every case with satisfactory results.

5.5 ASSEMBLY REVISION LEVEL

The purpose of the Assembly Revision Level is to identify the "as built" configuration of an assembly or subassembly. The parts list and illustrations that follow, depict the revision levels of the assemblies and subassemblies at the time of preparation of the manual, which may or may not agree with the purchased equipment. However, they will serve as a guide for any necessary maintenance to be performed. Refer to Table 5-1 for the equipment assembly revision level record(s).

Table 5-1. Equipment Assembly Revision Level Record

TYPE NUMBER	REF DESIG	DESCRIPTION	ASSY. REV LEVEL
WJ-8718		HF Receiver, Main Chassis	E
WJ-8718-9		HF Receiver, Main Chassis	E
WJ-8718A		HF Receiver, Main Chassis	A
76240	A1	Power Distribution	B
791616-1	A2	RF Filter Assembly	A
280093	A2A1	30 MHz Low Pass Filter	A
791592-1	A3	Input Converter	B
370611-1	A3A1	1st Mixer/1st IF	A
370646-1	A3A2	2nd Mixer/2nd IF	A
791569-1	A4	IF Motherboard	A
791594-1	A4A1	10.7 MHz Filter Switch	C
71430-1	A4A2	10.7 MHz/455 kHz Converter	A
791595-1	A4A3	455 kHz Filter Switch	A
791596-1	A4A4	USB Filter Switch	A
791597-1	A4A5	ISB/LSB Filter Switch	B
78112-1	A4A6	AGC Amplifier	A
72488-1	A4A7	455 kHz Amplifier/Am Detector	A
791598-1	A4A8	ISB Detector/Audio	B
791599-1	A4A9	FM, CW and SSB Detector	B
746001-1	A4A10	Audio Amplifier	A
791570-1	A5	Synthesizer Motherboard	B
791630-1	A5A1	1st & 3rd LO Synthesizer/Timebase	C
791629	A5A1A1	1st LO/VCO Assembly	B
34750	A5A1A1A1	1st LO VCO P.C. Assembly	A
791600-1	A5A1A2	1st & 3rd LO Synthesizer	D
791601	A5A2	2nd LO Synthesizer	A
791576-1	A5A3	BFO Synthesizer	A
791580	A6	I/O Motherboard	B
791575-3	A6A1	Manual Tuning Up/Down Counter	A
791828-1	A6A2	Front Panel Interconnect	A
791874-1	A7	Manual Tuning Module	A
791589	A7A1	Tuning Resolution	A
791578-1	A8	Frequency Display	B
791827	A9	BFO Switch	A
791684-2	A10 (1)	Front Panel Control	A
796053	A10 (2)	Front Panel Control	A
791583	A10A1	Upper Panel Control	B
791826	A10A2 (1)	Lower Panel Control	B
796054	A10A2 (2)	Lower Panel Control	B

(1) WJ-8718
 (2) WJ-8718-9 and WJ-8718A

5.6 TYPES WJ-8718, WJ-8718-9 AND WJ-8718A HF RECEIVER, MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	Power Distribution	1	76240	14632	
A2	Input Filter	1	791616	14632	
A3	Input Converter	1	791592	14632	
A4	IF Motherboard	1	791569	14632	
A5	Synthesizer Motherboard	1	791570	14632	
A6	I/O Motherboard	1	791580	14632	
A7*	Manual Tuning Module (Not optional on WJ-8718A)	1	791874-1	14632	
A8	Frequency Display	1	791578	14632	
A9	BFO Switch	1	791827	14632	
A10	Front Panel Control (WJ-8178 only)	1	791684-2	14632	
A10	Front Panel Control (WJ-8718-9 and WJ-8718A only)	1	796053	14632	
BT1	Battery	1	41B901BD16G1	19209	
C1	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	4	34475-1	14632	
C2	Same as C1				
C3	Same as C1				
C4	Same as C1				
C5	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	2	34452-1	14632	
C6	Same as C5				
C7	Capacitor, Feedthru: 0.01 μ F, 20%, 600 V	6	F1A6103K	96733	
C8 Thru C12	Same as C7				
C13	Not Used				
C14	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V (WJ-8718-9 and WJ-8718A only)	1	34453-1	14632	
CR1	Diode	2	1N1614	80131	02735
CR2	Same as CR1				
E1	Terminal, Standoff	3	7A1A1	92825	
E2	Same as E1				
E3	Same as E1				
E4	Terminal, Standoff	1	160-2381-01-05-00	71279	
E5	Terminal, Feedthru (WJ-8718 and WJ-8718-9 only)	4	SFU16Y	04013	
E5	Terminal, Feedthru (WJ-8718A only)	7	SFU16Y	04013	
E6 Thru E8	Same as E5				
E9	Same as E5 (WJ-8718A only)				
E10	Same as E5 (WJ-8718A only)				
F1	Fuse Cartridge: 1 AMP, 3 AG Slow-blow	1	MDL1	71400	
F2	Fuse Cartridge: 1/2 AMP, 3 AG, Slow-blow	1	MDL1/2	71400	
	* Part of MCM-2 Option.				

FIGURE 5-1
FIGURE 5-2

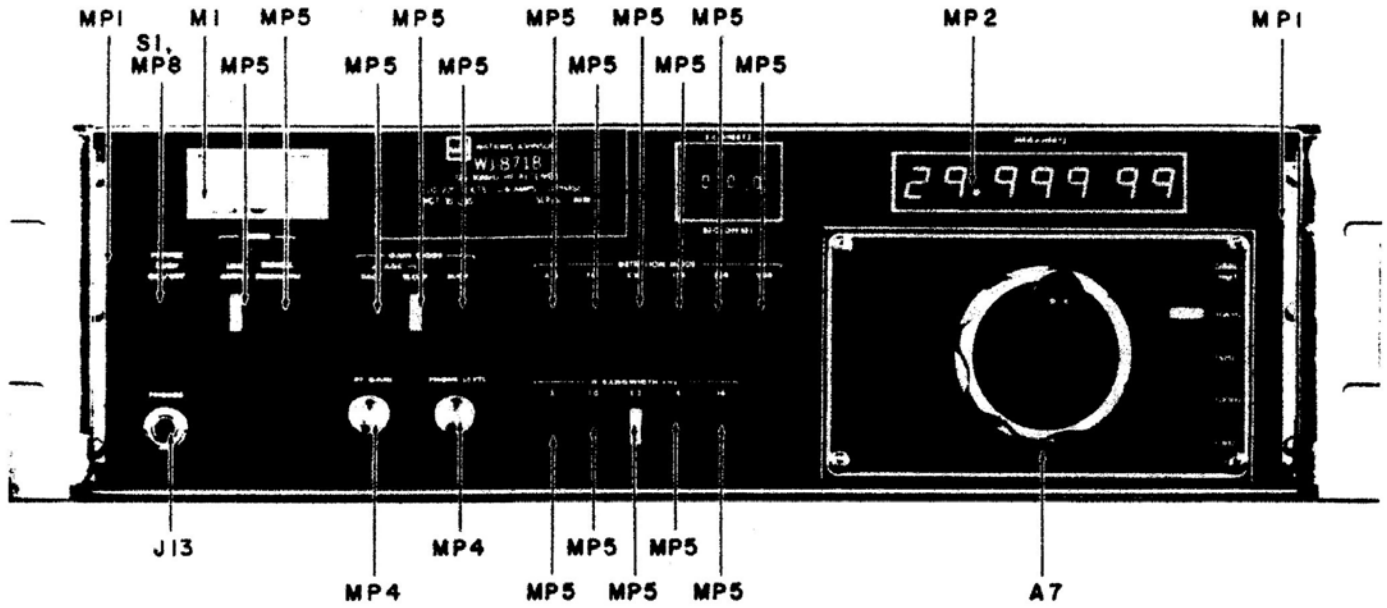


Figure 5-1. WJ-8718 HF Receiver, Front Panel, Location of Components

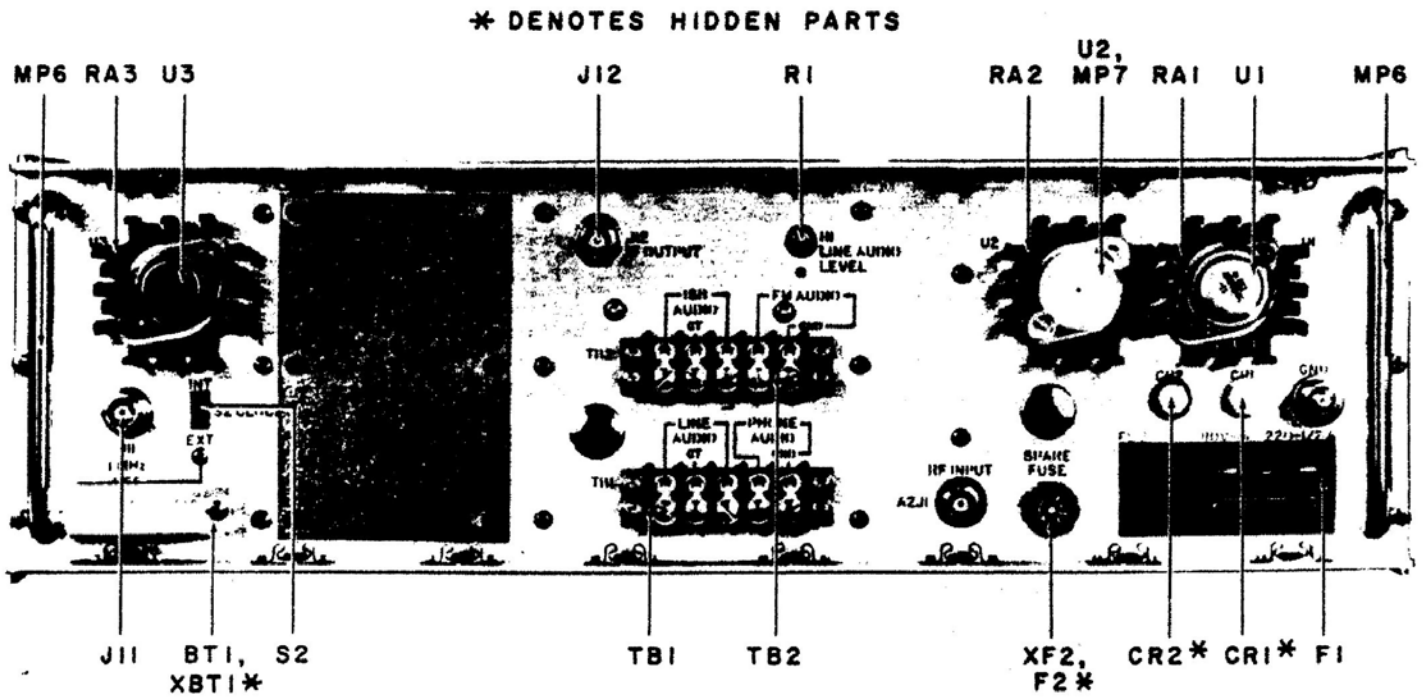


Figure 5-2. WJ-8718 HF Receiver, Rear Panel, Location of Components

WJ-8718 SERIES HF RECEIVER

FIGURE 5-3
FIGURE 5-4

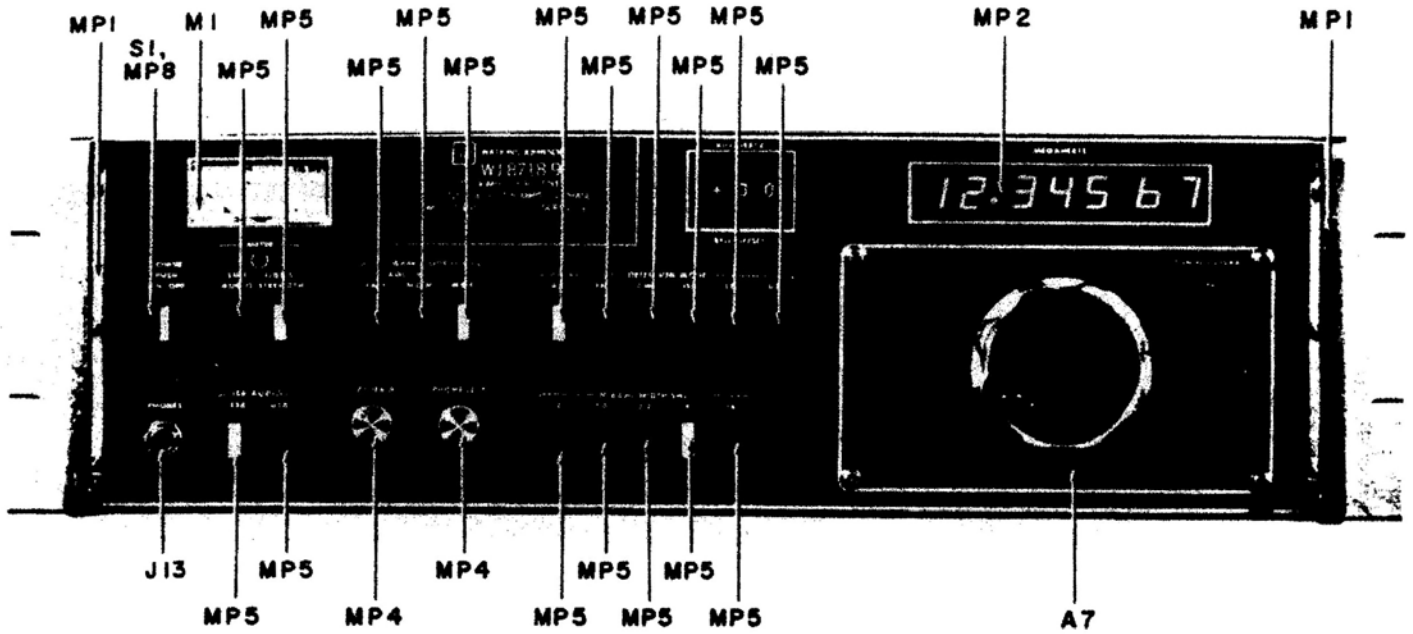


Figure 5-3. WJ-8718-9 HF Receiver, Front Panel, Location of Components

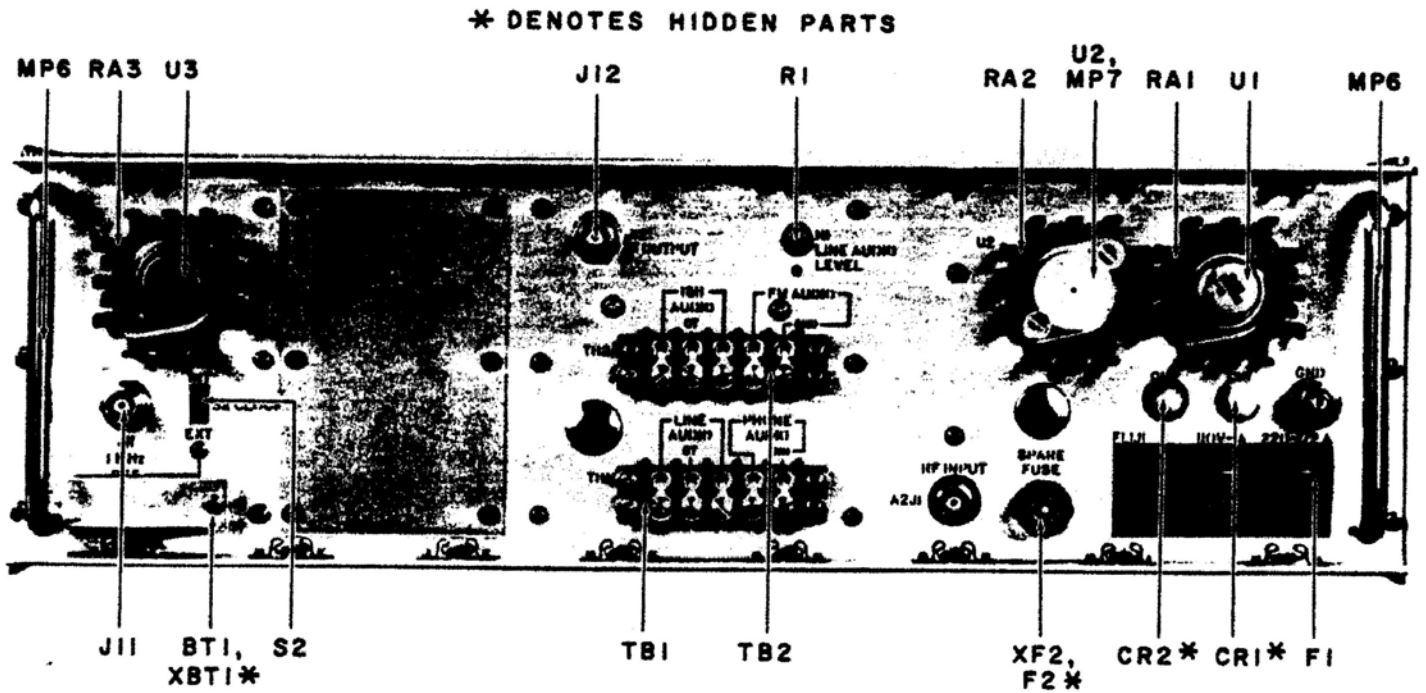


Figure 5-4. WJ-8718-9 HF Receiver, Rear Panel, Location of Components

FIGURE 5-5
FIGURE 5-6

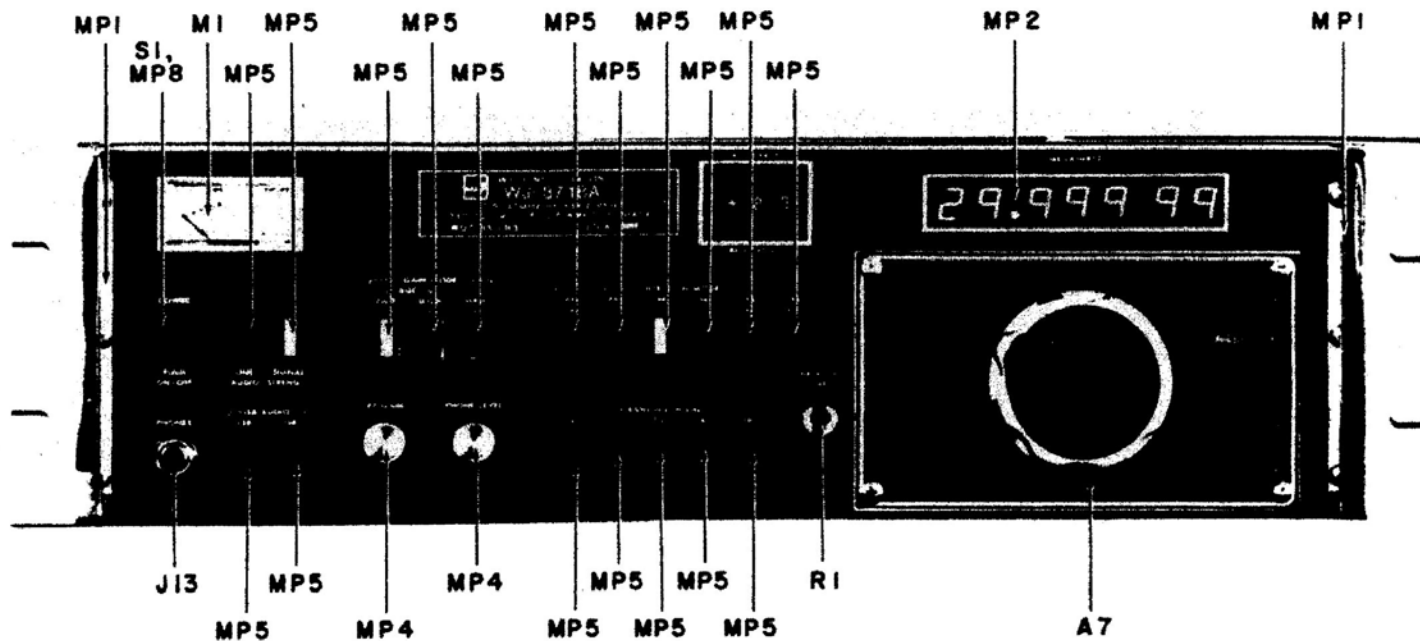


Figure 5-5. WJ-8718A HF Receiver, Front Panel, Location of Components

* DENOTES HIDDEN PARTS

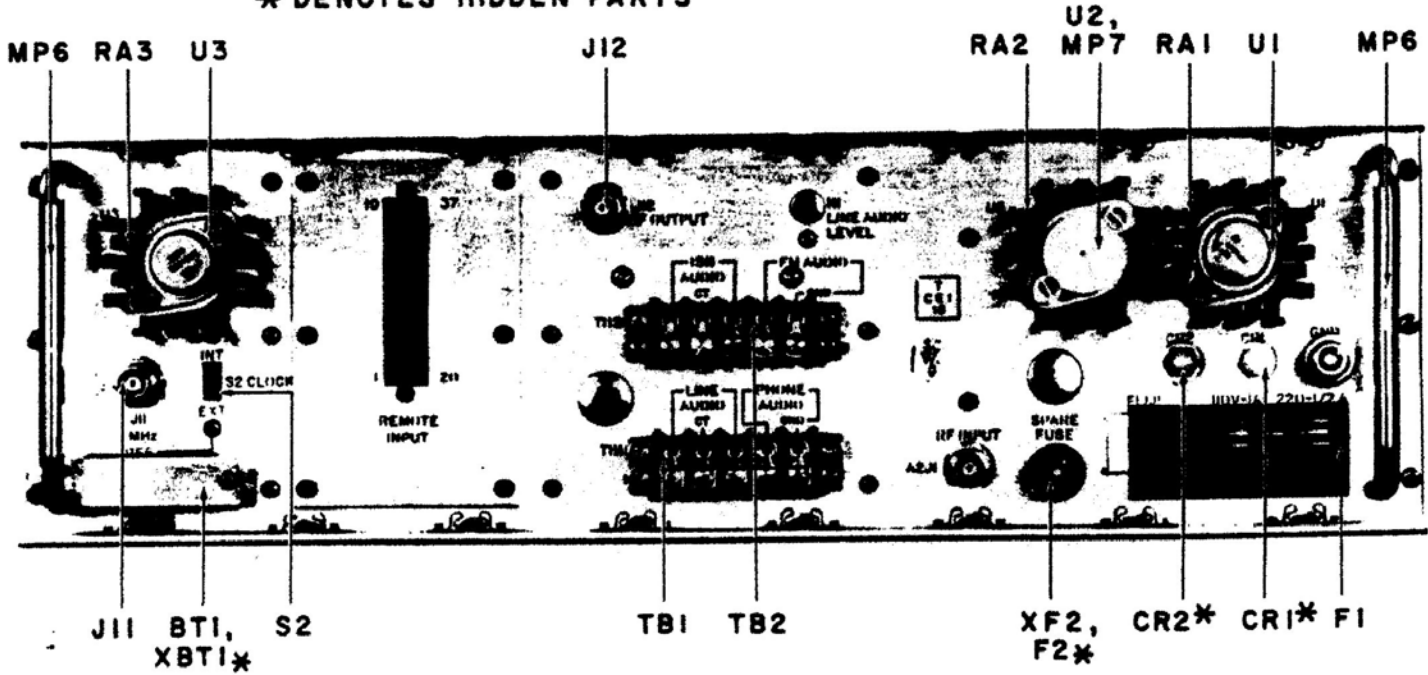


Figure 5-6. WJ-8718A HF Receiver, Rear Panel, Location of Components

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
FL1	Filter, Power	1	34505-1	14632	
FL2	Filter, Mono	1	92241	14632	
J1	Connector, Plug: SMC Series Part of W14	8	UG1468/U	80058	19505
J2	Connector, Receptacle	1	205203-1	00779	
J3	Same as J1 Part of W2				
J4	Same as J1 Part of W3				
J5	Same as J1 Part of W4				
J6	Not Used				
J7	Same as J1 Part of W12				
J8	Same as J1 Part of W13				
J9	Same as J1 Part of W9				
J10	Same as J1 Part of W10				
J11	Connector, Receptacle: BNC Series Part of W11	2	225398-7	00779	
J12	Same as J11 Part of W15				
J13	Connector, Phone Jack	1	L12B	82389	
M1	Meter	1	34455-1	14632	
MP1	Handle, Front Panel	2	32306-1	14632	
MP2	Display Window	1	18390-1	14632	
MP3	Housing, Receptacle (WJ-8718 and WJ-8718-9 only)	30	1-480417-0	00779	
MP3	Housing, Receptacle (WJ-8718A only)	31	1-480417-0	00779	
MP4	Knob, Round, Indicator Dot	2	PS70D1/B	21604	
MP5	Button, Black Shell with Yellow Indicator (WJ-8718)	16	FA101-BLK/YEL	31918	
MP5	Button, Black Shell with Yellow Indicator (WJ-8718A and WJ-8718-9 only)	18	FA101-BLK/YEL	31918	
MP6	Handle, Round, Rear Panel	2	B1012-12	88245	
MP7	Cover, Transistor	1	8903NW	13103	
MP8	Button, Black Shell with Red Indicator	1	FA101-BLK/RED	31918	
MP9	Cover Assembly, Top (WJ-8718 and WJ-8718-9 only)	1	580031-1	14632	
MP9	Cover Assembly, Top (WJ-8718A only)	1	580048-4	14632	
MP10	Cover Assembly, Bottom (WJ-8718 & WJ-8718-9 only)	1	580031-2	14632	
MP10	Cover Assembly, Bottom (WJ-8718A only)	1	580048-5	14632	
P1	Connector, Plug Part of W1				
P2	Connector, Plug Part of W1				
P3	Connector, Plug: SMC Series Part of W2	7	UG1466/U	80058	19505
P4	Same as P3 Part of W4				
P5	Same as P3 Part of W3				
P6	Faston, Receptacle (WJ-8718 and WJ-8718-9 only)	30	42236-1	00779	
P6	Faston, Receptacle (WJ-8718A only)	33	42236-1	00779	
P7	Same as P3 Part of W5				
P8	Same as P3 Part of W5				
P9	Connector, Plug: SMC Series Part of W6				

FIGURE 5-7

WJ-8718 SERIES HF RECEIVER

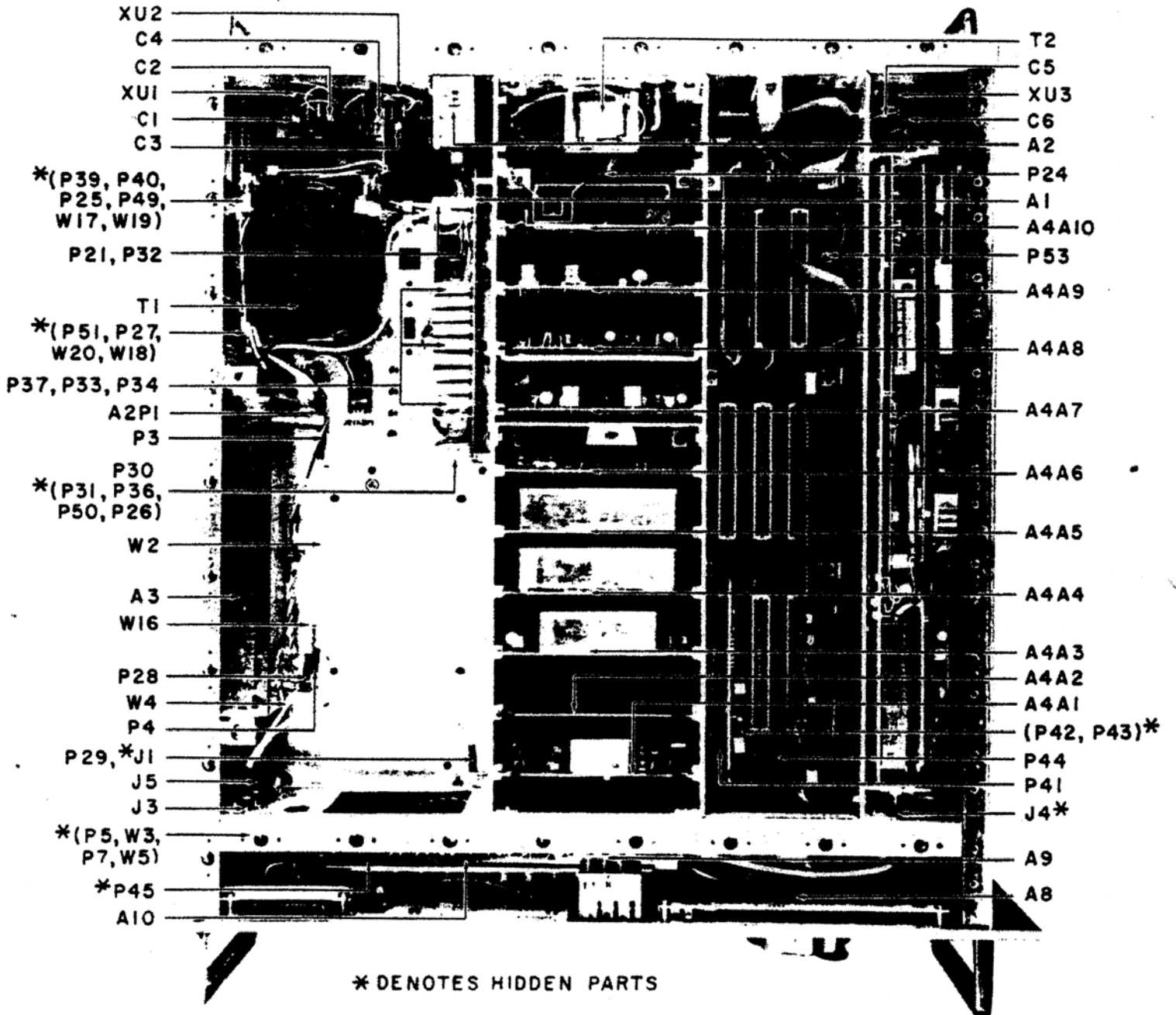


Figure 5-7. WJ-8718 Series HF Receiver. Top View. Location of Components

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
P10	Same as P9				
P11	Same as P9				
P12	Same as P9				
P13	Plug Assembly	1	34704-1	14632	
P14	Plug Assembly	1	87499-5	00779	
P15	Same as P14				
P16	Same as P14				
P17	Same as P14				
P18	Same as P14				
P19	Same as P14				
P20	Same as P14				
P21	Same as P6				
P22	Plug Assembly	1	34529-2	14632	
P23	Plug Assembly	1	34529-3	14632	
P24	Plug Assembly (WJ-8718 and WJ-8718-9 only)	1	43594-1	14632	
P24	Plug Assembly (WJ-8718A only)	1	470487-1	14632	
P25	Connector, Plug Faston	11	2-350804-2	00779	
P26	Same as P6				
P27	Same as P25				
P28	Same as P3				
P29	Same as P3				
P30	Same as P6				
P31	Same as P6				
P32	Same as P6				
P33 Thru P36	Same as P6				
P37	Not Used				
P38	Same as P6				
P39	Same as P25				
P40	Same as P25				
P41 Thru P47	Same as P6				
P48	Plug Assembly	1	34529-1	14632	
P49	Same as P25				
P50	Same as P6				
P51	Same as P25				
P52	Connector, Plug (WJ-8718A only)	1	1-87456-2	00779	
P53	Same as P6 (WJ-8718A only)				
P54	Plug Assembly (WJ-8718A only)	1	34529-4	16432	
P55	Same as P6 (WJ-8718A only)				
P56	Connector, MINI (WJ-8718A only)	1	65051-034	22526	

FIGURE 5-8

WJ-8718 SERIES HF RECEIVER

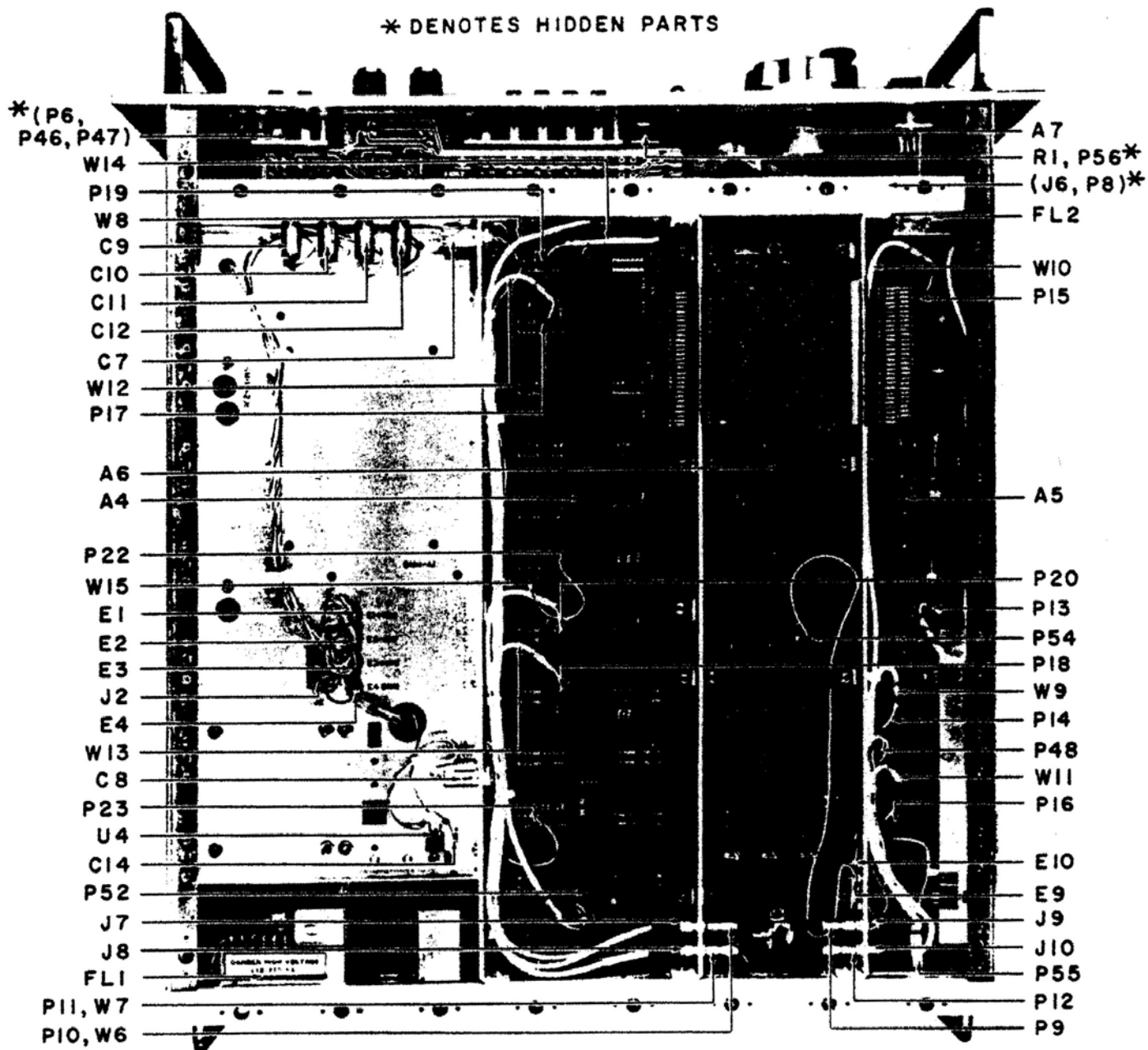


Figure 5-8. WJ-8718 Series HF Receiver. Bottom View, Location of Components

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R1	Resistor, Variable, Composition: 25 kΩ, 10%, 1 W	1	70A3L036L253A		
R2	Not Used				
RA1	Radiator, Heat	3	UP2-T03-CB	98978	
RA2	Same as RA1				
RA3	Same as RA1				
S1	Switch, Pushbutton	1	18542	14632	
S2	Switch, Slide	1	11A1211	82389	
T1	Transformer, Power	1	380083	14632	
T2	Transformer, Audio	1	841004	14632	
TB1	Terminal Board	2	353-18-05-001		
TB2	Same as TB1				
U1	Voltage Regulator (WJ-8718 and WJ-8718-9 only)	1	LAS15A15	80103	
U1	Voltage Regulator (WJ-8718A only)	1	LM340AKC15	27014	
U2	Voltage Regulator	1	LAS18A15	80103	
U3	Voltage Regulator	1	LAS1405	80103	
U4	Voltage Regulator	1	7812UC	07263	
W1	Cable Assembly, Power Line Cord	1	17250	16428	
W2	Cable Assembly	1	34701-1	14632	
W3	Cable Assembly	1	34701-2	14632	
W4	Cable Assembly	1	34701-3	14632	
W5	Cable Assembly	1	34701-4	14632	
W6	Cable Assembly	1	34701-5	14632	
W7	Cable Assembly	1	34701-6	14632	
W8	Not Used (WJ-8718 and WJ-8718-9 only)				
W8	Cable Assembly (WJ-8718A only)	1	370732	14632	
W9	Cable Assembly	1	34700-1	14632	
W10	Cable Assembly	1	34700-2	14632	
W11	Cable Assembly	1	34702-1	14632	
W12	Cable Assembly	1	34700-3	14632	
W13	Cable Assembly	1	34700-4	14632	
W14	Cable Assembly	1	34700-5	14632	
W15	Cable Assembly	1	34702-2	14632	
W16	Cable Assembly	1	34701-7	14632	
W17	Cable Assembly	1	380005-1	14632	
W18	Cable Assembly	1	380005-2	14632	
W19	Cable Assembly	1	380005-3	14632	
W20	Cable Assembly	1	380005-4	14632	
XBT1	Socket, Battery (WJ-8718A only)	1	794298	14632	
XF2	Fuseholder	1	342004	75915	

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
XU1	Socket Assembly	1	34506-1	14632	
XU2	Socket Assembly	1	34506-2	14632	
XU3	Socket Assembly	1	34506-3	14632	

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS LIST

5.6.1 TYPE 76240 POWER DISTRIBUTION

REF DESIG PREFIX A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Aluminum: 2200 μ F, -10 + 75%, 25 V	2	39D228G025HP4	56289	
C2	Same as C1				
C3	Capacitor, Electrolytic, Aluminum: 8000 μ F, -10 + 75%, 15 V	2	39D808G015JT4	56289	
C4	Same as C3				
CR1	Diode	3	1N4998	80131	04713
CR2 Thru CR4	Same as CR1				
J1	Connector, Receptacle: Faston Tab	20	62073-1	00779	
J2 Thru J14	Same as J1				
J15 Thru J18	Not Used				
J19 Thru J21	Same as C1				
J22 Thru J30	Not Used				
J31	Same as J1				
J32	Same as J1				
J33	Not Used				
J34	Not Used				
J35	Same as J1				

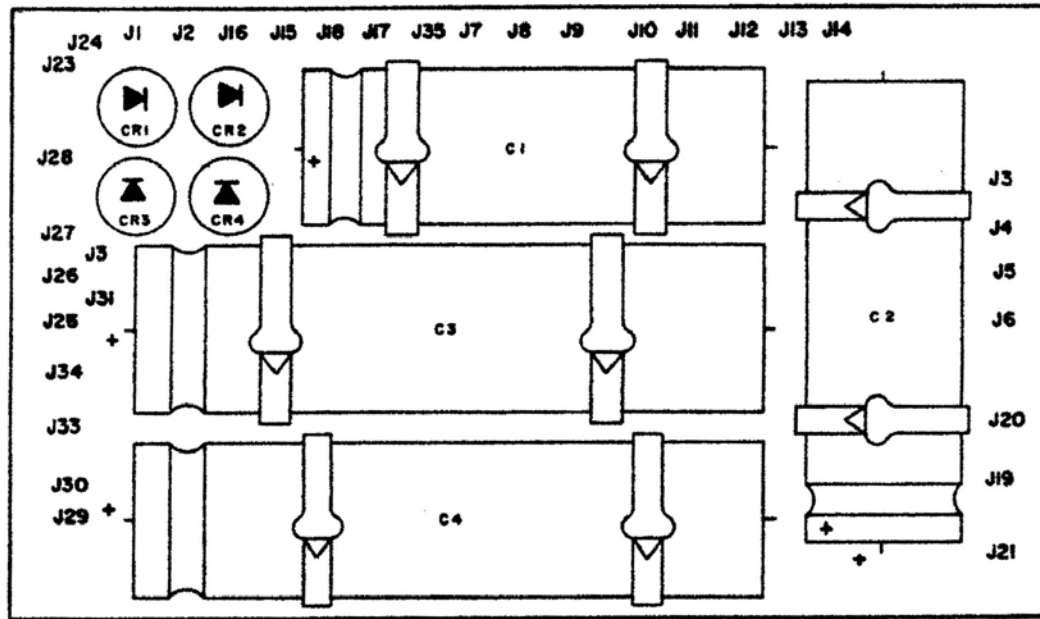


Figure 5-9. Type 76240 Power Distribution (A1),
Location of Components

5.6.2 TYPE 791616-1 RF FILTER

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	30 MHz Low Pass Filter	1	280093	14632	
J1	Connector, Receptacle: BNC Series	1	UG1094/U	80058	74868
L1	Coil, Toroidal	1	20681-208	14632	
MP1	Cover Assembly (Not Shown)	1	280091-1	14632	
R1	Resistor, Fixed, Composition: 8.2Ω, 5%, 1/8W	1	CF1/8-8.2 OHMS/J	09021	
R2	Resistor, Fixed, Composition: 560Ω, 5%, 1/8 W	2	CF1/8-560 OHMS/J	09021	
R3	Same as R2				

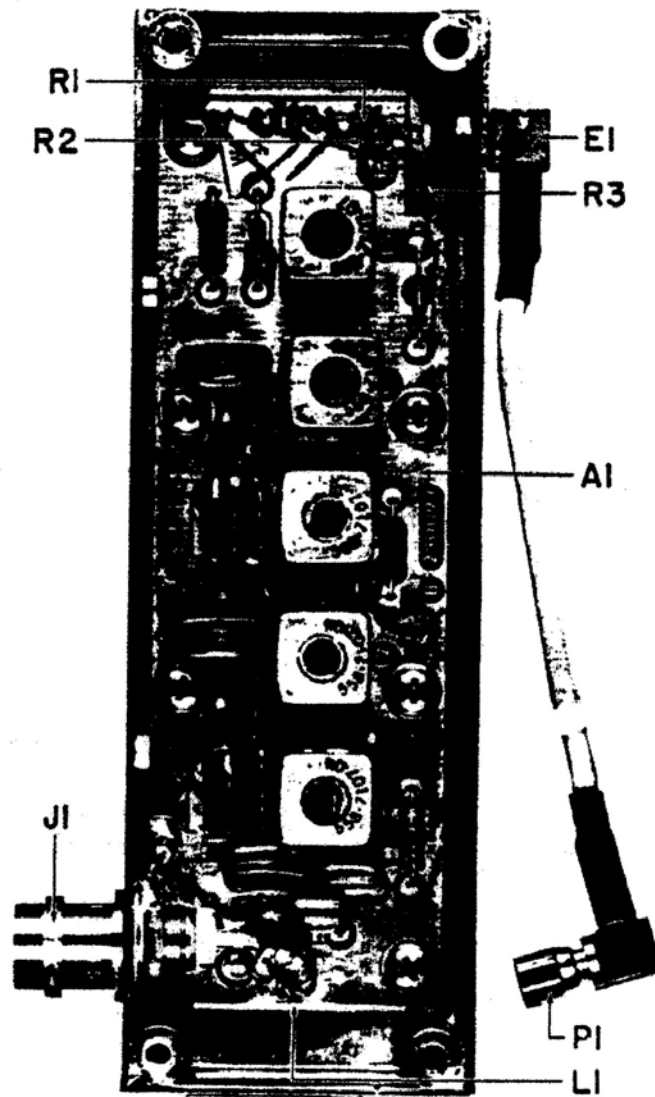


Figure 5-10. Type 791616-1 Input Filter (A2),
 Location of Components

FIGURE 5-11

5.6.2.1 Part 280093 30 MHz Low Pass Filter

REF DESIG PREFIX A2A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	2	34452-1	14632	
C2	Capacitor, Mica, Dipped: 120 pF, 2%, 500 V	1	CM05FD121G03	81349	72136
C3	Capacitor, Mica, Dipped: 10 pF, \pm 0.5 pF, 500 V	1	CM05CD100D03	81349	72136
C4	Capacitor, Mica, Dipped: 180 pF, 2%, 500 V	1	CM05FD181G03	81349	72136
C5	Capacitor, Mica, Dipped: 33 pF, 2%, 500 V	1	CM05ED330G03	81349	72136
C6	Capacitor, Mica, Dipped: 150 pF, 2%, 500 V	3	CM05FD151G03	81349	72136
C7	Capacitor, Mica, Dipped: 39 pF, 2%, 500 V	1	CM05ED390G03	81349	72136
C8	Same as C6				
C9	Capacitor, Mica, Dipped: 18 pF, 5%, 500 V	1	CM05CD180J03	81349	72136
C10	Same as C6				
C11	Same as C1				
C12	Capacitor, Ceramic, Disc: 47 pF, 5%, 100 V	1	8111-100-C0G0-470J	72982	
CR1	Diode	2	1N4449	80131	93332
CR2	Same as CR1				
L1	Coil, Variable: 0.351-0.429 μ H	4	558-7107-08	71279	
L2	Same as L1				
L3	Same as L1				
L4	Same as L1				
L5	Coil, Variable: 0.297-0.363 μ H	1	558-7107-07	71279	
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	1	CF1/4-10K/J	09021	
VR1	Diode, Zener: 6.2 V	2	1N753A	80131	04713

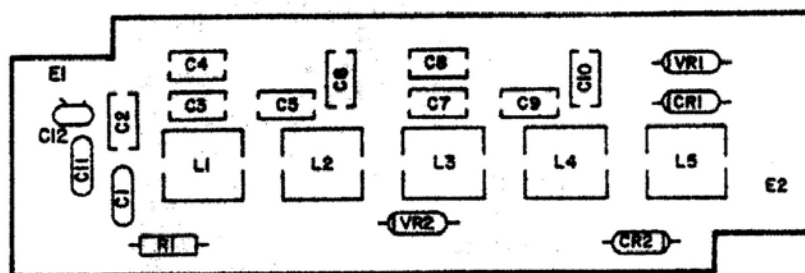


Figure 5-11. Part 280093 30 MHz Low Pass Filter (A2A1), Location of Components

5.6.3 TYPE 791592-1 INPUT CONVERTER

REF DESIG PREFIX A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	1st Mixer, 1st IF	1	370611-1	14632	
A2	2nd Mixer, 2nd IF	1	370646-1	14632	
C1	Capacitor, Ceramic, Feedthru: 1000 pF, GMV, 500 V	4	54-794-009-102W	33095	
C2 Thru C4	Same as C1				
C5	Capacitor, Ceramic, Disc: 68 pF, 5%, 100 V	1	8121-100-C0G0-680J	72982	
P1	Connector, Plug	1	205204-1	00779	

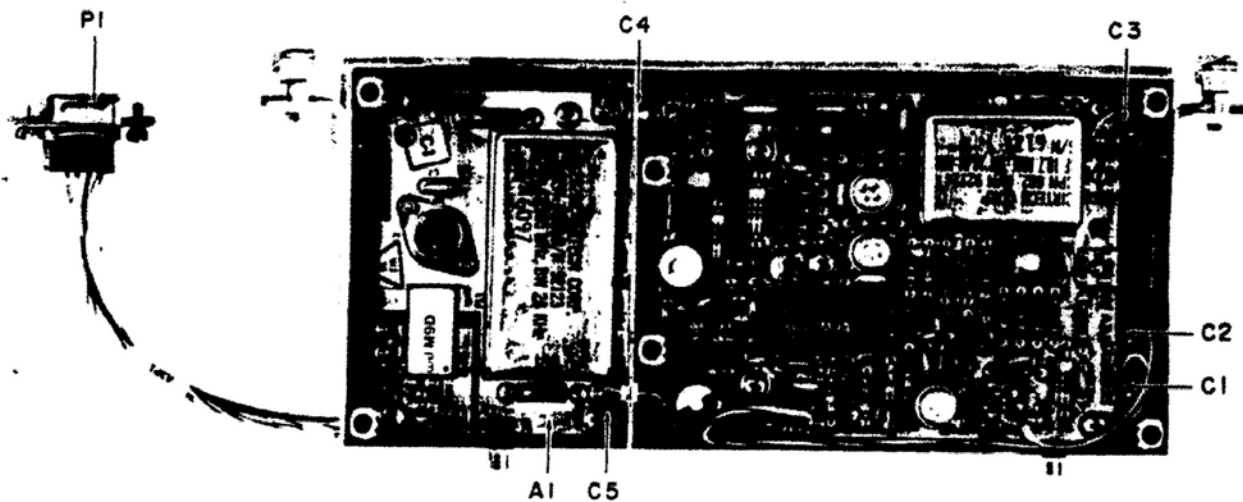


Figure 5-12. Type 791592-1 Input Converter (A3), Location of Components

FIGURE 5-13

WJ-8718 SERIES HF RECEIVER

5.6.3.1 Part 370611-1 1st Mixer, 1st IF

REF DESIG PREFIX A3A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	1	34453-1	14632	
FL1	Filter, Bandpass: 43 MHz	1	92123	14632	
J1	Connector, Receptacle: SMC Series	2	34520-1	14632	
J2	Same as J1				
L1	Coil, Fixed: 10 μ H	1	1537-36	99800	
L2	Coil, Fixed: 0.15 μ H	1	1537-00	99800	
U1	Mixer, Balanced	1	M9D	27956	
U2	Amplifier: 5-500 MHz	1	A58	27956	

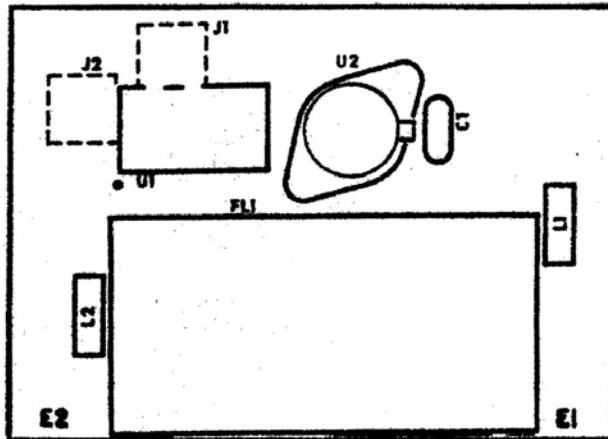


Figure 5-13. Part 370611-1 1st Mixer, 1st IF (A3A1),
Location of Components

5.6.3.2 Part 370646-1 2nd Mixer, 2nd IF

REF DESIG PREFIX A3A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Variable, Ceramic: 2.5-11 pF, 350 V	1	538-011B2.5-11	72982	
C2	Capacitor, Ceramic, Disc: 1000 pF, GMV, 500 V	2	B-GP1000PPF	91418	
C3	Same as C2				
C4	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	5	34453-1	14632	
C5 Thru C8	Same as C4				
C9	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C10	Capacitor, Ceramic, Disc: 470 pF, 20%, 1000 V	5	BHD470-20PCT	91418	
C11 Thru C13	Same as C10				
C14	Capacitor, Mica, Dipped: 47 pF, 2%, 500 V	1	CM05ED470G03	81349	72136
C15	Same as C10				
C16	Capacitor, Ceramic, Disc: 4.7 pF, \pm 0.25 pF, 100 V	1	8101-100-C0H0-479C	72982	
C17	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	1	34452-1	14632	
C18	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
C19	Capacitor, Variable, Ceramic: 9-35 pF, 350 V	1	538-011D9-35	72982	
CR1	Diode	1	1N4446	80131	93332
CR2	Diode	1	5082-3039	28480	
FB1	Ferrite Bead	3	56-590-65-4A	02114	
FB2	Same as FB1				
FB3	Same as FB1				
FL1	Filter, Bandpass: 10.7 MHz	1	92124	14632	
J1	Connector, Receptacle: SMC Series	2	34520-1	14632	
J2	Same as J1				
L1	Coil, Fixed: 10 μ H	4	1537-36	99800	
L2	Same as L1				
L3	Same as L1				
L4	Coil, Fixed: 0.56 μ H	1	202-11	99848	
L5	Same as L1				
L6	Coil, Fixed: 0.15 μ H	1	1537-00	99800	
L7	Coil, Fixed: 0.33 μ H	1	1537-04	99800	
L8	Coil, Fixed: 1.8 μ H	1	1537-18	99800	
MP1	Transipad	2	7717-89DAP	13103	
MP2	Transipad	2	7717-22DAP	13103	
MP3	Transipad	1	7717-46DAP	13103	
Q1	Transistor	1	2N2222A	80131	04713
Q2	Transistor	1	CP643	12498	
Q3	Transistor	3	2N5109	80131	02735
Q4	Same as Q3				
Q5	Transistor	1	2N2857/JAN	81350	

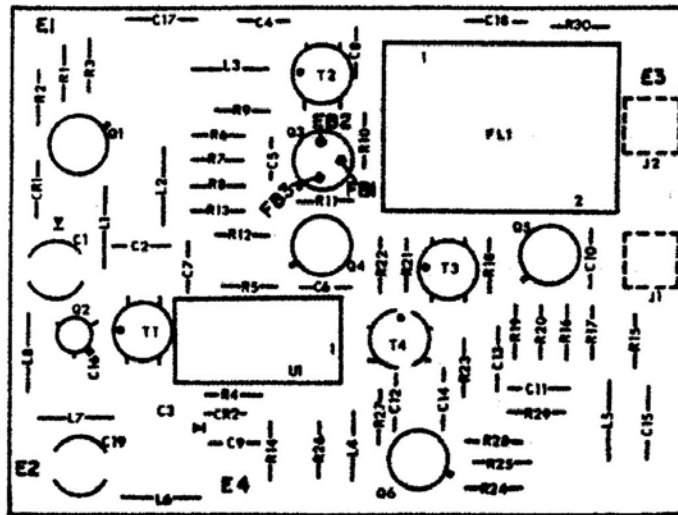


Figure 5-14. Part 370646-1 2nd Mixer, 2nd IF (A3A2),
Location of Components

REF DESIG PREFIX A3A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
Q6	Same as Q3				
R1	Resistor, Fixed, Composition: 2.2 k Ω , 5%, 1/4 W	2	CF1/4-2.2K/J	09021	
R2	Resistor, Fixed, Composition: 82 Ω , 5%, 1/4 W	1	CF1/4-82 OHMS/J	09021	
R3	Resistor, Fixed, Composition: 10 Ω , 5%, 1/4 W	5	CF1/4-10 OHMS/J	09021	
R4	Resistor, Fixed, Composition: 1.8 k Ω , 5%, 1/4 W	1	CF1/4-1.8K/J	09021	
R5	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	2	CF1/4-220 OHMS/J	09021	
R6	Resistor, Fixed, Composition: 3.3 k Ω , 5%, 1/4 W	1	CF1/4-3.3K/J	09021	
R7	Same as R1				
R8	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	3	CF1/4-1.0K/J	09021	
R9	Resistor, Fixed, Composition: 200 Ω , 5%, 1/4 W	1	CF1/4-200 OHMS/J	09021	
R10	Same as R3				
R11	Resistor, Fixed, Composition: 47 Ω , 5%, 1/4 W	1	CF1/4-47 OHMS/J	09021	
R12	Resistor, Fixed, Composition: 4.7 Ω , 5%, 1/4 W	1	CF1/4-4.7 OHMS/J	09021	
R13	Resistor, Fixed, Composition: 68 Ω , 5%, 1/4 W	2	CF1/4-68 OHMS/J	09021	
R14	Resistor, Fixed, Composition: 390 Ω , 5%, 1/4 W	1	CF1/4-390 OHMS/J	09021	
R15	Same as R13				
R16	Resistor, Fixed, Composition: 2.7 k Ω , 5%, 1/4 W	1	CF1/4-2.7K/J	09021	
R17	Same as R8				
R18	Same as R3				
R19	Resistor, Fixed, Composition: 22 Ω , 5%, 1/4 W	1	CF1/4-22 OHMS/J	09021	
R20	Same as R5				
R21	Resistor, Fixed, Composition: 560 Ω , 5%, 1/4 W	1	CF1/4-560 OHMS/J	09021	
R22	Resistor, Fixed, Composition: 150 Ω , 5%, 1/4 W	2	CF1/4-150 OHMS/J	09021	
R23	Resistor, Fixed, Composition: 15 Ω , 5%, 1/4 W	1	CF1/4-15 OHMS/J	09021	
R24	Same as R8				
R25	Resistor, Fixed, Composition: 470 Ω , 5%, 1/4 W	1	CF1/4-470 OHMS/J	09021	
R26	Resistor, Fixed, Composition: 330 Ω , 5%, 1/4 W	1	CF1/4-330 OHMS/J	09021	
R27	Same as R3				
R28	Resistor, Fixed, Composition: 12 Ω , 5%, 1/4 W	1	CF1/4-12 OHMS/J	09021	
R29	Same as R22				
R30	Same as R3				
RA1	Heatsink	1	1118C	13103	
T1	Transformer Assembly	1	22295-53	14632	
T2	Transformer Assembly	1	22295-54	14632	
T3	Transformer Assembly	1	22295-56	14632	
T4	Transformer Assembly	1	22295-55	14632	
U1	Mixer, Balanced: 0.05-200 MHz	1	M9A	27956	

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.4 TYPE 791569-1 IF MOTHERBOARD

REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	10.7 MHz Filter Switch	1	791594	14632	
A2	10.7 MHz/455 kHz Converter	1	71430	14632	
A3	455 kHz Filter Switch	1	791595	14632	
A4*	USB/LSB Filter Switch (Not Optional on WJ-8718A)	1	791596	14632	
A5*	ISB/LSB Filter Switch (Not Optional on WJ-8718A)	1	791597	14632	
A6	AGC Amplifier	1	78112	14632	
A7	455 kHz Amplifier/AM Detector	1	72488	14632	
A8*	ISB Detector/Audio (Optional on WJ-8718-9 only)	1	791598	14632	
A9	FM, CW and SSB Detector	1	791599	14632	
A10	Audio Amplifier	1	746001	14632	
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	29	34453-1	14632	
C2 Thru C29	Same as C1				
J1	Feedthru, Post	2	PE914031-2	00779	
L1	Ferrite Choke	2	VK200-10-38	02114	
L2	Same as L1				
--	Cable Assembly	1	34832	14632	
P1	Plug Assembly	1	88523-1	00779	
XA1	Connector, P.C. Board	11	MK30C-14-195-4381	81312	
XA2 Thru XA11	Same as XA1				
*	Part of ISB Option				

FIGURE 5-15

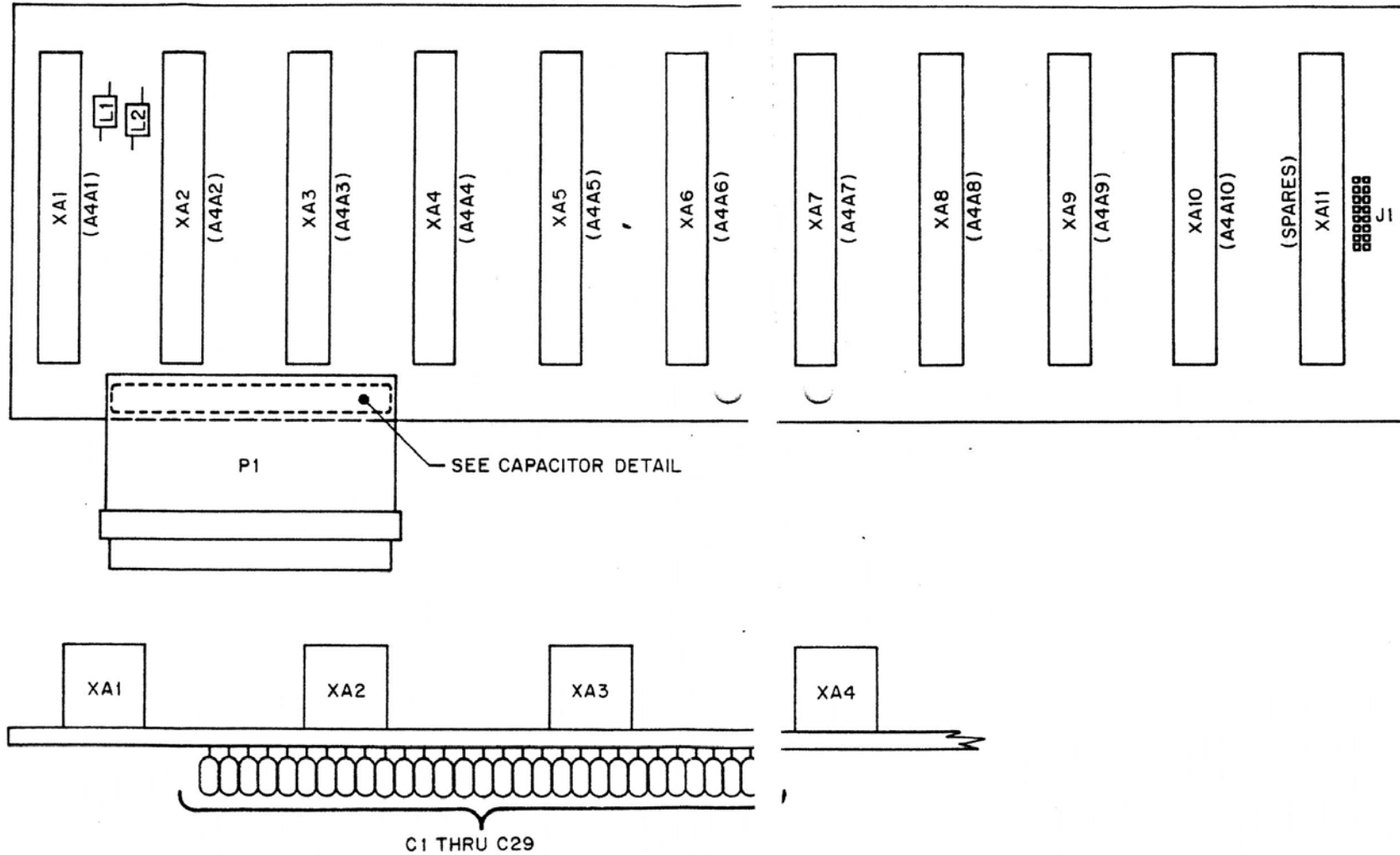


Figure 5-15. Type 791569-1 IF Motherboard (A4), Location of Components

5.6.4.1 Type 791594-1 10.7 MHz Filter Switch

REF DESIG PREFIX A4A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Mica, Dipped: 91 pF, 2%, 500 V	1	CM05FD910G03	81349	72136
C2	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	18	34453-1	14632	
C3 Thru C8	Same as C2				
C9	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	9	34475-1	14632	
C10	Same as C2				
C11	Same as C9				
C12	Same as C2				
C13	Same as C9				
C14	Same as C2				
C15	Same as C9				
C16	Same as C9				
C17	Same as C9				
C18 Thru C23	Same as C2				
C24 Thru C26	Same as C9				
C27	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	2	CS13BE156K	81349	56289
C28	Same as C2				
C29	Same as C2				
C30	Capacitor, Mica, Dipped: 130 pF, 2%, 500 V	1	CM05FD131G03	81349	72136
C31	Same as C27				
C32	Capacitor, Variable, Ceramic: 9-35 pF, 350 V	1	538-011D9-35	72982	
FL1	Filter, Bandpass	1	92126	14632	
FL2	Filter, Bandpass	1	92125	14632	
L1	Coil, Fixed, Molded: 1.5 μ H	1	1537-16	99800	
L2 Thru L4	Not Used				
L5	Coil, Fixed, Molded: 1.8 μ H	1	1537-18	99800	
Q1	Transistor	6	2N3904	80131	04713
Q2 Thru Q6	Same as Q1				
R1	Resistor, Fixed, Composition: 13 k Ω , 5%, 1/4 W	3	CF1/4-13K/J	09021	
R2	Resistor, Fixed, Composition: 3.0 k Ω , 5%, 1/4 W	3	CF1/4-3.0K/J	09021	
R3	Same as R1				
R4	Same as R2				
R5	Same as R1				
R6	Same as R2				
R7	Resistor, Fixed, Composition: 680 Ω , 5%, 1/4 W	3	CF1/4-680 OHMS/J	09021	

FIGURE 5-16

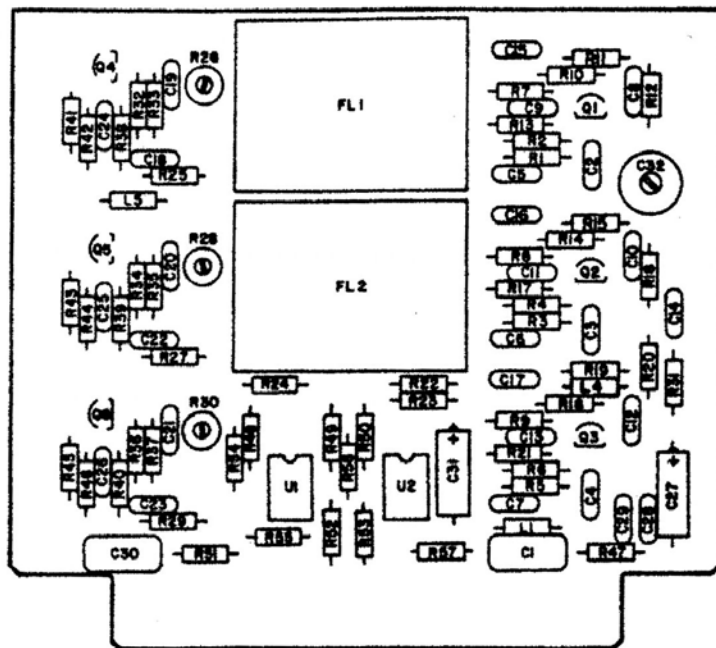


Figure 5-16. Type 791594-1 10.7 MHz Filter Switch (A4A1), Location of Components

REF DESIG PREFIX A4A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R8	Same as R7				
R9	Same as R7				
R10	Resistor, Fixed, Composition: 10Ω, 5%, 1/4 W	6	CF1/4-10 OHMS/J	09021	
R11	Resistor, Fixed, Composition: 220Ω, 5%, 1/4 W	3	CF1/4-220 OHMS/J	09021	
R12	Resistor, Fixed, Composition: 22Ω, 5%, 1/4 W	5	CF1/4-22 OHMS/J	09021	
R13	Resistor, Fixed, Composition: 33Ω, 5%, 1/4 W	5	CF1/4-33 OHMS/J	09021	
R14	Same as R10				
R15	Same as R11				
R16	Same as R12				
R17	Same as R13				
R18	Same as R10				
R19	Same as R11				
R20	Same as R12				
R21	Same as R13				
R22	Same as R13				
R23	Resistor, Fixed, Composition: 560Ω, 5%, 1/4 W	4	CF1/4-560 OHMS/J	09021	
R24	Same as R13				
R25	Resistor, Fixed, Composition: 100Ω, 5%, 1/4 W	7	CF1/4-100 OHMS/J	09021	
R26	Resistor, Variable, Film: 200Ω, 10%, 1/2 W	3	62PR200	73138	
R27	Same as R25				
R28	Same as R26				
R29	Same as R25				
R30	Same as R26				
R31	Same as R12				
R32	Resistor, Fixed, Composition: 22 kΩ, 5%, 1/4 W	3	CF1/4-22K/J	09021	
R33	Resistor, Fixed, Composition: 4.7 kΩ, 5%, 1/4 W	3	CF1/4-4.7K/J	09021	
R34	Same as R32				
R35	Same as R33				
R36	Same as R32				
R37	Same as R33				
R38	Same as R23				
R39	Same as R23				
R40	Same as R23				
R41	Same as R10				
R42	Resistor, Fixed, Composition: 12Ω, 5%, 1/4 W	3	CF1/4-12 OHMS/J	09021	
R43	Same as R10				
R44	Same as R42				
R45	Same as R10				
R46	Same as R42				
R47	Same as R12				

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A4A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R48	Same as R25				
R49	Same as R25				
R50	Same as R25				
R51	Resistor, Fixed, Composition: 56Ω, 5%, 1/4 W	1	CF1/4-56 OHMS/J	09021	
R52	Resistor, Fixed, Composition: 33 kΩ, 5%, 1/4 W	1	CF1/4-33K/J	09021	
R53	Resistor, Fixed, Composition: 6.2 kΩ, 5%, 1/4 W	1	CF1/4-6.2K/J	09021	
R54	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	3	CF1/4-10K/J	09021	
R55	Same as R54				
R56	Same as R54				
R57	Same as R25				
U1	Integrated Circuit	2	MC1458N	18324	
U2	Same as U1				

5.6.4.2 Type 71430-1 10.7 MHz/455 kHz Converter

REF DESIG PREFIX A4A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	6	34453-1	14632	
C2 Thru C6	Same as C1				
C7	Capacitor, Mica, Dipped: 68 pF, 2%, 500 V	1	CM05ED680G03	81349	72136
C8	Capacitor, Mica, Dipped: 360 pF, 2%, 500 V	1	CM05FD361G03	81349	72136
C9	Capacitor, Mica, Dipped: 3900 pF, 2%, 500 V	2	CM06FD392G03	81349	72136
C10	Same as C9				
C11	Capacitor, Mica, Dipped: 1600 pF, 2%, 500 V	1	CM06FD162G03	81349	72136
L1	Coil, Fixed: 100 μ H	1	1537-76	99800	
L2	Coil, Fixed: 3.3 μ H	1	1537-24	99800	
L3	Coil, Fixed: 12 μ H	1	1537-38	99800	
L4	Coil, Fixed: 82 μ H	1	1537-72	99800	
MP1	Transipad	1	7717-44DAP	13103	
Q1	Transistor	1	2N2708	80131	18714
R1	Resistor, Fixed, Composition: 56 Ω , 5%, 1/4 W	2	CF1/4-56 OHMS/J	09021	
R2	Same as R1				
R3	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	1	CF1/4-1.0K/J	09021	
R4	Resistor, Fixed, Composition: 12 k Ω , 5%, 1/4 W	1	CF1/4-12K/J	09021	
R5	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	1	CF1/4-4.7K/J	09021	
R6	Resistor, Fixed, Composition: 39 Ω , 5%, 1/4 W	1	CF1/4-39 OHMS/J	09021	
R7	Resistor, Fixed, Composition: 560 Ω , 5%, 1/4 W	1	CF1/4-560 OHMS/J	09021	
R8	Resistor, Fixed, Composition: 300 Ω , 5%, 1/4 W	2	CF1/4-300 OHMS/J	09021	
R9	Resistor, Fixed, Composition: 18 Ω , 5%, 1/4 W	1	CF1/4-18 OHMS/J	09021	
R10	Same as R8				
U1	Mixer, Balanced	1	M6A	27956	

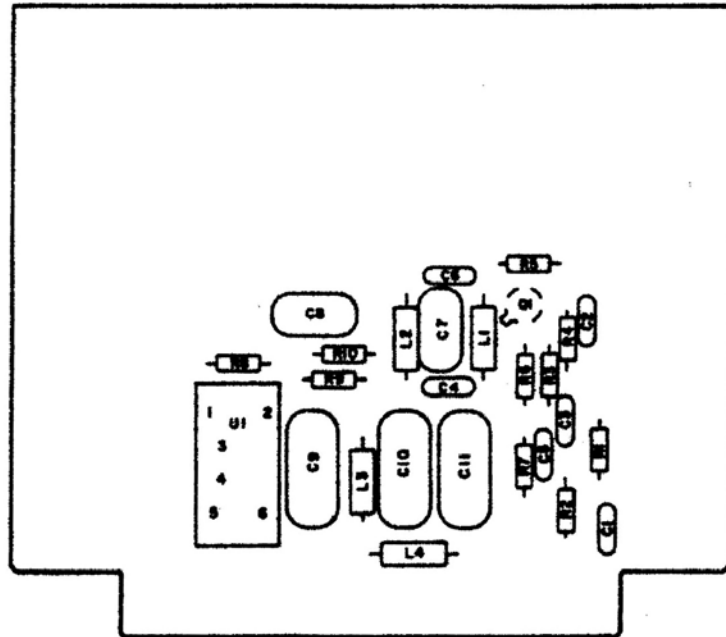


Figure 5-17. Type 71430-1 10.7 MHz/455 kHz Converter (A4A2),
Location of Components

5.6.4.3 Type 791595-1 455 kHz Filter Switch

REF DESIG PREFIX A4A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	19	34452-1	14632	
C2 Thru C7	Same as C1				
C8	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	1	CS13BE156K	81349	56289
C9 Thru C20	Same as C1				
FL1	Filter, Bandpass: 325 Hz BW	1	92128	14632	
FL2	Filter, Bandpass: 1 kHz BW	1	92127	14632	
L1	Coil, Fixed: 6.8 mH	3	553-3635-47	71279	
L2	Same as L1				
L3	Same as L1				
MP1	Transipad	6	7717-44DAP	13103	
Q1	Transistor	6	2N2222A	80131	04713
Q2 Thru Q6	Same as Q1				
R1	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	4	CF1/4-22K/J	09021	
R2	Resistor, Fixed, Composition: 3.9 k Ω , 5%, 1/4 W	3	CF1/4-3.9K/J	09021	
R3	Resistor, Fixed, Composition: 270 Ω , 5%, 1/4 W	2	CF1/4-270 OHMS/J	09021	
R4	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/4 W	3	CF1/4-1.2K/J	09021	
R5	Resistor, Fixed, Composition: 22 Ω , 5%, 1/4 W	3	CF1/4-22 OHMS/J	09021	
R6	Same as R5				
R7	Resistor, Fixed, Composition: 12 k Ω , 5%, 1/4 W	3	CF1/4-12K/J	09021	
R8	Resistor, Fixed, Composition: 1.5 k Ω , 5%, 1/4 W	3	CF1/4-1.5K/J	09021	
R9	Resistor, Fixed, Composition: 150 Ω , 5%, 1/4 W	3	CF1/4-150 OHMS/J	09021	
R10	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	2	CF1/4-220 OHMS/J	09021	
R11	Same as R5				
R12	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	5	CF1/4-10K/J	09021	
R13	Same as R1				
R14	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	7	CF1/4-100 OHMS/J	09021	
R15	Same as R14				
R16	Same as R12				
R17	Same as R1				
R18	Same as R2				
R19*	Resistor, Fixed, Composition: 240 Ω , 5%, 1/4 W	1	CF1/4-240 OHMS/J	09021	
R20	Same as R4				
R21	Same as R7				
R22	Same as R8				
*	Nominal value, final value factory selected.				

FIGURE 5-18

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A4A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R23	Same as R9				
R24	Same as R14				
R25	Same as R14				
R26	Same as R12				
R27	Same as R12				
R28	Same as R1				
R29	Same as R2				
R30	Same as R4				
R31	Same as R3				
R32	Same as R10				
R33	Same as R7				
R34	Same as R8				
R35	Same as R9				
R36	Same as R14				
R37	Same as R14				
R38	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	1	CF1/4-4.7K/J	09021	
R39	Same as R12				
R40	Same as R14				
U1	Integrated Circuit	1	MC1458N	18324	

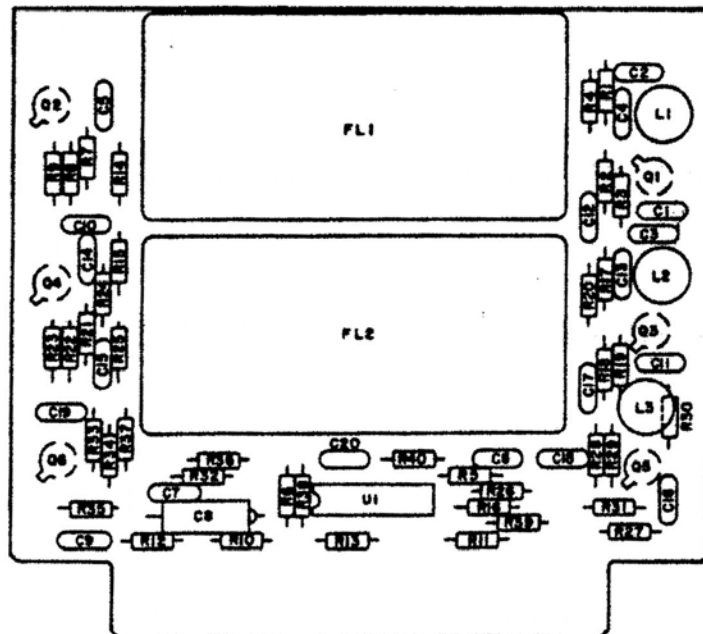


Figure 5-18. Type 791595-1 455 kHz Filter Switch (A4A3), Location of Components

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS I

5.6.4.4 Type 791596-1 USB Filter Switch
(Not Optional on WJ-8718A)

REF DESIG PREFIX A4A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDC
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	11	34452-1	14632	
C2 Thru C4	Same as C1				
C5	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	1	CS13BE156K	81349	5628
C6	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C7 Thru C13	Same as C1				
CR1	Diode	2	1N4449	80131	93332
CR2	Same as CR1				
FL1	Filter, Bandpass	1	92122	14632	
L1	Coil, Fixed, Molded: 100 μ H	1	2500-28	99800	
L2	Coil, Fixed: 6.8 mH	1	553-3635-47	71279	
MP1	Transipad	2	7717-44DAP	13103	
Q1	Transistor	2	2N2222A	80131	04713
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	4	CF1/4-10K/J	09021	
R2	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	2	CF1/4-4.7K/J	09021	
R3	Resistor, Fixed, Composition: 270 Ω , 5%, 1/4 W	1	CF1/4-270 OHMS/J	09021	
R4	Resistor, Fixed, Composition: 10 Ω , 50%, 1/4 W	2	CF1/4-10 OHMS/J	09021	
R5	Resistor, Fixed, Composition: 22 Ω , 5%, 1/4 W	3	CF1/4-22 OHMS/J	09021	
R6	Same as R5				
R7	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/4 W	2	CF1/4-1.2K/J	09021	
R8	Same as R7				
R9	Same as R4				
R10	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	5	CF1/4-100 OHMS/J	09021	
R11	Same as R5				
R12	Same as R1				
R13	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	2	CF1/4-22K/J	09021	
R14	Same as R10				
R15	Same as R1				
R16	Same as R1				
R17	Same as R2				
R18	Resistor, Fixed, Composition: 39 k Ω , 5%, 1/4 W	1	CF1/4-39K/J	09021	
R19	Same as R10				
R20	Same as R10				
R21	Same as R13				
R22	Resistor, Fixed, Composition: 3.9 k Ω , 5%, 1/4 W	1	CF1/4-3.9K/J	09021	
R23	Resistor, Variable, Film: 500 Ω , 10%, 1/2 W	1	62PR500	73138	
R24	Same as R10				
U1	Integrated Circuit	1	MC1458N	18324	

FIGURE 5-19

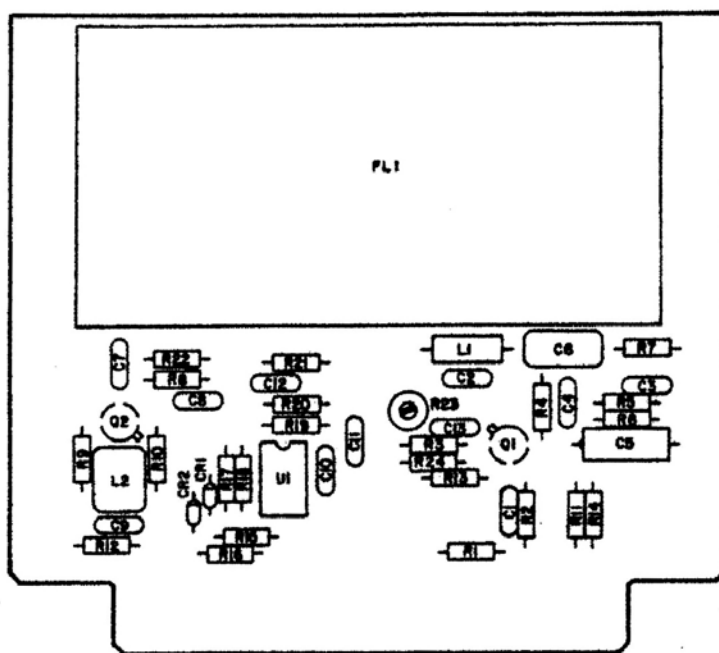


Figure 5-19. Type 791596-1 USB Filter Switch (A4A4),
Location of Components

5.6.4.5 Type 791597-1 ISB/LSB Filter Switch
(Not Optional on WJ-8718A)

REF DESIG PREFIX A4A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	15	34452-1	14632	
C2 Thru C4	Same as C1				
C5	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	1	CS13BE156K	81349	56289
C6	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C7 Thru C17	Same as C1				
CR1	Diode	3	1N4449	80131	93332
CR2	Same as CR1				
CR3	Same as CR1				
FL1	Filter, Bandpass	1	92121	14632	
L1	Coil, Fixed, Molded: 1000 μ H	1	2500-28	99800	
L2	Coil, Fixed: 6.8 mH	2	553-3635-47	71279	
L3	Same as L2				
MP1	Transipad	3	7717-89DAP	13103	
Q1	Transistor	3	2N2222A	80131	04713
Q2	Same as Q1				
Q3	Same as Q1				
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	6	CF1/4-10K/J	09021	
R2	Resistor, Fixed, Composition: 3.9 k Ω , 5%, 1/4 W	1	CF1/4-3.9K/J	09021	
R3	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	1	CF1/4-1.0K/J	09021	
R4	Resistor, Fixed, Composition: 10 Ω , 5%, 1/4 W	3	CF1/4-10 OHMS/J	09021	
R5	Resistor, Fixed, Composition: 270 Ω , 5%, 1/4 W	1	CF1/4-270 OHMS/J	09021	
R6	Resistor, Fixed, Composition: 22 Ω , 5%, 1/4 W	4	CF1/4-22 OHMS/J	09021	
R7	Same as R6				
R8	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/4 W	1	CF1/4-1.2K/J	09021	
R9	Resistor, Fixed, Composition: 2.4 k Ω , 5%, 1/4 W	2	CF1/4-2.4K/J	09021	
R10	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	3	CF1/4-4.7 K/J	09021	
R11	Same as R4				
R12	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	6	CF1/4-100 OHMS/J	09021	
R13	Same as R6				
R14	Same as R1				
R15	Resistor, Fixed, Composition: 15 k Ω , 5%, 1/4 W	1	CF1/4-15K/J	09021	
R16	Same as R1				
R17	Same as R6				
R18	Same as R12				
R19	Same as R1				
R20	Same as R12				
R21	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	2	CF1/4-22K/J	09021	
R22	Same as R1				

REF DESIG PREFIX A4A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R23	Same as R10				
R24	Resistor, Fixed, Composition: 24 k Ω , 5%, 1/4 W	1	CF1/4-24K/J	09021	
R25	Same as R12				
R26	Same as R21				
R27	Same as R9				
R28	Same as R10				
R29	Same as R12				
R30	Same as R4				
R31	Same as R1				
R32	Resistor, Variable, Film: 500 Ω , 10%, 1/2 W	1	62PR500	73138	
R33	Same as R12				
U1	Integrated Circuit	1	MC1458N	18324	

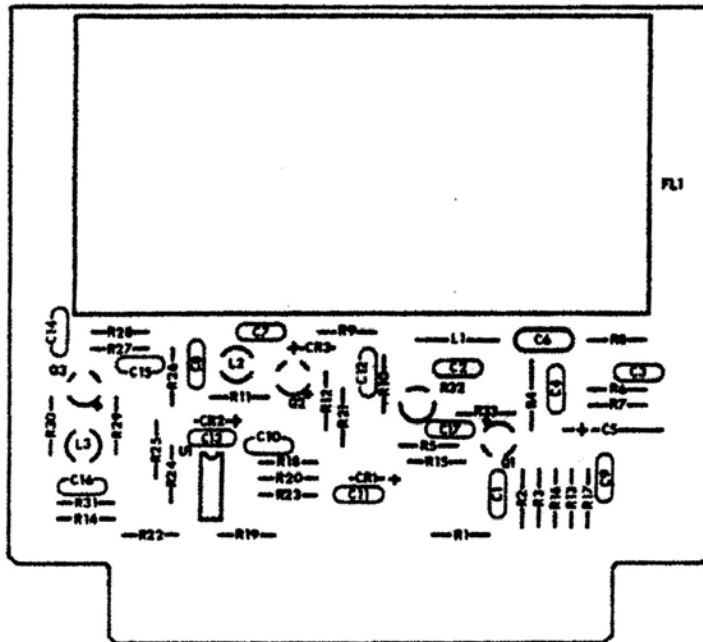


Figure 5-20. Type 791597-1 ISB, LSB Filter Switch (A4A5), Location of Components

5.6.4.6 Type 78112-1 AGC Amplifier

REF DESIG PREFIX A4A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 47 μ F, 10%, 20 V	2	CS13BE476K	81349	56289
C2	Not Used				
C3	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	2	34452-1	14632	
C4	Capacitor, Electrolytic, Tantalum: 33 μ F, 10%, 10 V	1	CS13BC336K	81349	56289
C5	Same as C3				
C6	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C7	Same as C1				
CR1	Not Used				
CR2	Diode, Zener: 5.6 V	1	1N752A	80131	04713
CR3	Not Used				
CR4	Not Used				
CR5	Diode	5	1N4449	80131	93332
CR6 Thru CR9	Same as CR5				
MP1	Transipad	7	7717-89DAP	13103	
Q1	Transistor	6	2N2222A	80131	04713
Q2	Transistor	1	2N2907/JAN	81350	
Q3 Thru Q7	Same as Q1				
R1	Resistor, Fixed, Composition: 100 k Ω , 5%, 1/4 W	4	CF1/4-100K/J	09021	
R2	Resistor, Fixed, Composition: 47 k Ω , 5%, 1/4 W	2	CF1/4-47K/J	09021	
R3	Resistor, Fixed, Composition: 470 k Ω , 5%, 1/4 W	2	CF1/4-470K/J	09021	
R4	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	5	CF1/4-100 OHMS/J	09021	
R5	Same as R1				
R6	Resistor, Fixed, Composition: 330 k Ω , 5%, 1/4 W	1	CF1/4-330K/J	09021	
R7	Resistor, Fixed, Composition: 6.8 k Ω , 5%, 1/4 W	4	CF1/4-6.8K/J	09021	
R8	Same as R4				
R9	Resistor, Fixed, Composition: 15 k Ω , 5%, 1/4 W	4	CF1/4-15K/J	09021	
R10	Resistor, Fixed, Composition: 150 k Ω , 5%, 1/4 W	1	CF1/4-150K/J	09021	
R11	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	5	CF1/4-10K/J	09021	
R12	Resistor, Fixed, Composition: 82 k Ω , 5%, 1/4 W	1	CF1/4-82K/J	09021	
R13	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	2	CF1/4-1.0K/J	09021	
R14	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/4 W	1	CF1/4-1.2K/J	09021	
R15	Same as R7				
R16	Same as R7				
R17	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	1	CF1/4-22K/J	09021	
R18	Resistor, Fixed, Composition: 270 k Ω , 5%, 1/4 W	1	CF1/4-270K/J	09021	
R19	Resistor, Fixed, Composition: 680 k Ω , 5%, 1/4 W	1	CF1/4-680K/J	09021	
R20	Same as R11				
R21	Same as R9				

FIGURE 5-21

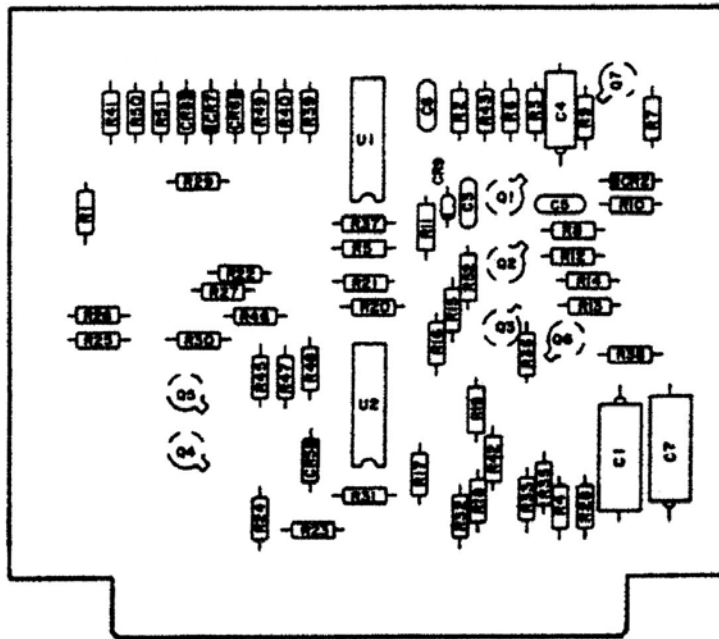


Figure 5-21. Type 78112-1 AGC Amplifier (A4A6),
Location of Components

REF DESIG PREFIX A4A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R22	Same as R9				
R23	Same as R3				
R24	Same as R9				
R25	Resistor, Fixed, Composition: 1.5 k Ω , 5%, 1/4 W	1	CF1/4-1.5K/J	09021	
R26	Resistor, Fixed, Composition: 2.2 k Ω , 5%, 1/4 W	1	CF1/4-2.2K/J	09021	
R27	Same as R11				
R28	Same as R4				
R29	Same as R4				
R30	Same as R11				
R31	Resistor, Fixed, Composition: 2.7 k Ω , 5%, 1/4 W	1	CF1/4-2.7K/J	09021	
R32	Resistor, Fixed, Composition: 390 Ω , 5%, 1/4 W	1	CF1/4-390 OHMS/J	09021	
R33	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	2	CF1/4-4.7K/J	09021	
R34	Not Used				
R35	Same as R33				
R36	Resistor, Fixed, Composition: 68 k Ω , 5%, 1/4 W	3	CF1/4-68K/J	09021	
R37	Same as R1				
R38	Same as R36				
R39	Same as R36				
R40	Same as R1				
R41	Same as R7				
R42	Same as R4				
R43	Same as R2				
R44	Not Used				
R45	Same as R11				
R46*	Resistor, Fixed, Composition: 39 k Ω , 5%, 1/4 W	1	CF1/4-39K/J	09021	
R47	Resistor, Fixed, Composition: 820 Ω , 5%, 1/4 W	2	CF1/4-820 OHMS/J	09021	
R48	Resistor, Fixed, Composition: 68 Ω , 5%, 1/4 W	1	CF1/4-68 OHMS/J	09021	
R49	Resistor, Fixed, Composition: 3.3 k Ω , 5%, 1/4 W	1	CF1/4-3.3K/J	09021	
R50*	Resistor, Fixed, Composition: 3.9 k Ω , 5%, 1/4 W	1	CF1/4-3.9K/J	09021	
R51*	Same as R47				
R52	Same as R13				
U1	Integrated Circuit	2	MC3403P	04713	
U2	Same as U1				
*	Nominal value, final value factory selected.				

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.4.7 Type 72488-1 455 kHz Amplifier/AM Detector

REF DESIG PREFIX A4A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	20	34452-1	14632	
C2	Same as C1				
C3	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	3	34453-1	14632	
C4	Not Used				
C5	Same as C1				
C6	Same as C1				
C7	Same as C3				
C8	Same as C1				
C9	Capacitor, Mica, Dipped: 3300 pF, 2%, 500 V	2	CM06FD332G03	81349	72136
C10	Capacitor, Mica, Dipped: 180 pF, 2%, 500 V	2	CM05FD181G03	81349	72136
C11	Same as C9				
C12 Thru C20	Same as C1				
C21	Not Used				
C22 Thru C25	Same as C1				
C26	Same as C10				
C27	Same as C1				
C28	Same as C3				
C29	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	1	CS13BE156K	81349	56289
C30	Same as C1				
CR1	Diode	5	1N4449	80131	93332
CR2 Thru CR5	Same as CR1				
L1	Coil, Fixed: 6.8 mH	5	553-3635-47	71279	
L2	Coil, Variable	2	558-7107-32	71279	
L3	Same as L2				
L4 Thru L7	Same as L1				
MP1	Transipad	6	7717-44DAP	13103	
Q1	Transistor	2	841001-1	14632	
Q2	Same as Q1				
Q3	Transistor	4	2N2222A	80131	04713
Q4 Thru Q6	Same as Q3				
R1	Resistor, Fixed, Composition: 33 k Ω , 5%, 1/4 W	1	CF1/4-33K/J	09021	
R2	Resistor, Fixed, Composition: 2.2 k Ω , 5%, 1/4 W	2	CF1/4-2.2K/J	09021	
R3	Resistor, Fixed, Composition: 3.9 k Ω , 5%, 1/4 W	2	CF1/4-3.9K/J	09021	
R4	Resistor, Fixed, Composition: 39 k Ω , 5%, 1/4 W	2	CF1/4-39K/J	09021	

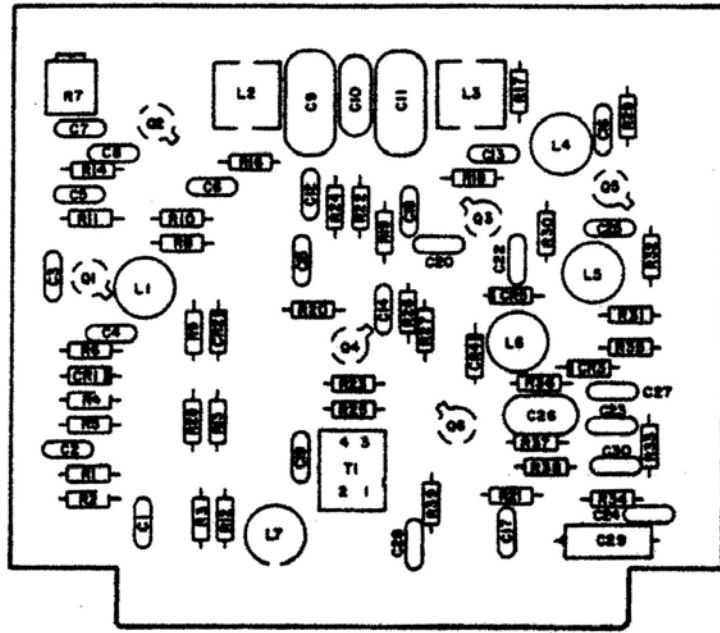


Figure 5-22. Type 72488-1 455 kHz Amplifier/AM Detector (A4A7),
Location of Components

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A4A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R5	Resistor, Fixed, Composition: 120 k Ω , 5%, 1/4 W	2	CF1/4-120K/J	09021	
R6	Resistor, Fixed, Composition: 270 Ω , 5%, 1/4 W	2	CF1/4-270 OHMS/J	09021	
R7	Resistor, Variable, Film: 5 k Ω , 10%, 1/2 W	1	62PAR5K	73138	
R8	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	2	CF1/4-220 OHMS/J	09021	
R9	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	6	CF1/4-100 OHMS/J	09021	
R10	Resistor, Fixed, Composition: 680 k Ω , 5%, 1/4 W	1	CF1/4-680K/J	09021	
R11	Resistor, Fixed, Composition: 47 k Ω , 5%, 1/4 W	2	CF1/4-47K/J	09021	
R12	Same as R3				
R13	Same as R4				
R14	Same as R6				
R15	Not Used				
R16	Resistor, Fixed, Composition: 47 Ω , 5%, 1/4 W	2	CF1/4-47 OHMS/J	09021	
R17	Resistor, Fixed, Composition: 8.2 k Ω , 5%, 1/4 W	1	CF1/4-8.2K/J	09021	
R18	Same as R9				
R19	Same as R9				
R20	Resistor, Fixed, Composition: 3.3 k Ω , 5%, 1/4 W	1	CF1/4-3.3K/J	09021	
R21	Same as R9				
R22	Resistor, Fixed, Composition: 12 k Ω , 5%, 1/4 W	1	CF1/4-12K/J	09021	
R23	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	1	CF1/4-4.7K/J	09021	
R24	Resistor, Fixed, Composition: 22 Ω , 5%, 1/4 W	1	CF1/4-22 OHMS/J	09021	
R25	Resistor, Fixed, Composition: 470 Ω , 5%, 1/4 W	1	CF1/4-470 OHMS/J	09021	
R26	Resistor, Fixed, Composition: 15 Ω , 5%, 1/4 W	1	CF1/4-15 OHMS/J	09021	
R27	Resistor, Fixed, Composition: 150 Ω , 5%, 1/4 W	1	CF1/4-150 OHMS/J	09021	
R28	Same as R5				
R29	Resistor, Fixed, Composition: 1.5 k Ω , 5%, 1/4 W	1	CF1/4-1.5K/J	09021	
R30	Same as R2				
R31	Same as R9				
R32	Same as R8				
R33	Resistor, Fixed, Composition: 1.8 k Ω , 5%, 1/4 W	1	CF1/4-1.8K/J	09021	
R34	Same as R9				
R35	Resistor, Fixed, Composition: 5.6 k Ω , 5%, 1/4 W	1	CF1/4-5.6K/J	09021	
R36	Same as R11				
R37	Same as R16				
R38	Resistor, Fixed, Composition: 6.8 k Ω , 5%, 1/4 W	1	CF1/4-6.8K/J	09021	
R39	Resistor, Fixed, Composition: 560 Ω , 5%, 1/4 W	1	CF1/4-560 OHMS/J	09021	
T1	Transformer, Wideband	1	70-130	06978	

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS LIST

5.6.4.8 Type 791598-1 ISB Detector/Audio
(Optional on WJ-8718-9 only)

REF DESIG PREFIX A4A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	18	34452-1	14632	
C2	Same as C1				
C3	Same as C1				
C4	Not Used				
C5 Thru C11	Same as C1				
C12	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	2	CS13BE156K	81349	56289
C13	Same as C12				
C14 Thru C17	Same as C1				
C18	Capacitor, Ceramic, Disc: 3300 pF, 10%, 200 V	1	CK06BX332K	81349	56289
C19	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 10%, 35 V	1	CS13BF475K	81349	56289
C20 Thru C22	Same as C1				
C23	Not Used				
C24	Not Used				
C25	Same as C1				
CR1	Diode	3	1N4449	80131	93332
CR2	Same as CR1				
CR3	Not Used				
CR4	Same as CR1				
FB1	Ferrite Bead	2	56-590-65-4A	02114	
FB2	Same as FB1				
L1	Coil, Fixed: 6.8 mH	2	553-3635-47	71279	
L2	Same as L1				
L3	Coil, Fixed: 47 mH	1	553-3635-57	71279	
MP1	Transipad	5	7717-89DAP	13103	
MP2	Shield ISB Detector	1	34983	14632	
Q1	Transistor	2	841001-1	14632	
Q2	Same as Q1				
Q3	Transistor	2	2N2907/JAN	81350	
Q4	Transistor	1	2N2222A	80131	04713
Q5	Same as Q3				
R1	Resistor, Fixed, Composition: 3.9 k Ω , 5%, 1/4 W	4	CF1/4-3.9K/J	09021	
R2	Resistor, Fixed, Composition: 120 k Ω , 5%, 1/4 W	2	CF1/4-120K/J	09021	
R3	Resistor, Fixed, Composition: 33 k Ω , 5%, 1/4 W	2	CF1/4-33K/J	09021	
R4	Resistor, Fixed, Composition: 2.2 k Ω , 5%, 1/4 W	3	CF1/4-2.2K/J	09021	
R5	Resistor, Fixed, Composition: 39 k Ω , 5%, 1/4 W	2	CF1/4-39K/J	09021	
R6	Resistor, Fixed, Composition: 10 Ω , 5%, 1/4 W	2	CF1/4-10 OHMS/J	09021	

FIGURE 5-23

WJ-8718 SERIES HF RECEIVER

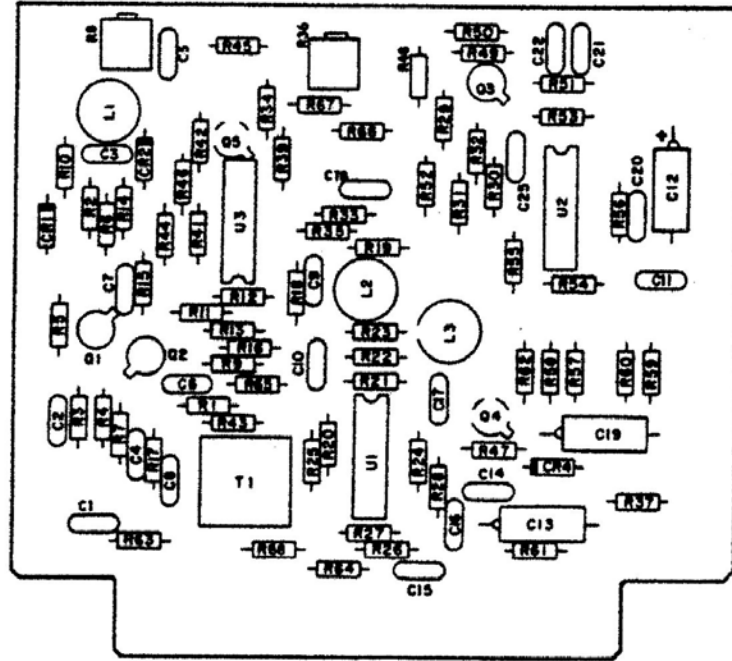


Figure 5-23. Type 791598-1 ISB Detector/Audio (A4A8),
Location of Components

REF DESIG PREFIX A4A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R7	Resistor, Fixed, Composition: 270Ω, 5%, 1/4 W	3	CF1/4-270 OHMS/J	09021	
R8	Resistor, Variable, Film: 5 kΩ, 10%, 1/2 W	1	62PAR5K	73138	
R9	Resistor, Fixed, Composition: 47Ω, 5%, 1/4 W	1	CF1/4-47 OHMS/J	09021	
R10	Same as R7				
R11	Same as R1				
R12	Same as R2				
R13	Resistor, Fixed, Composition: 680 kΩ, 5%, 1/4 W	2	CF1/4-680K/J	09021	
R14	Resistor, Fixed, Composition: 47 kΩ, 5%, 1/4 W	4	CF1/4-47K/J	09021	
R15	Same as R5				
R16	Same as R6				
R16	Same as R7				
R18*	Same as R4				
R19	Resistor, Fixed, Composition: 22Ω, 5%, 1/4 W	3	CF1/4-22 OHMS/J	09021	
R20	Resistor, Fixed, Composition: 6.8 kΩ, 5%, 1/4 W	2	CF1/4-6.8K/J	09021	
R21	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	6	CF1/4-10K/J	09021	
R22	Same as R21				
R23	Same as R20				
R24	Resistor, Fixed, Composition: 1.0 kΩ, 5%, 1/4 W	4	CF1/4-1.0K/J	09021	
R25	Same as R24				
R26	Resistor, Fixed, Composition: 15 kΩ, 5%, 1/4 W	3	CF1/4-15K/J	09021	
R27	Same as R1				
R28	Same as R1				
R29	Same as R14				
R30	Same as R4				
R31	Resistor, Fixed, Composition: 330 kΩ, 5%, 1/4 W	1	CF1/4-330K/J	09021	
R32	Same as R14				
R33	Resistor, Fixed, Composition: 12 kΩ, 5%, 1/4 W	1	CF1/4-12K/J	09021	
R34	Resistor, Fixed, Composition: 1.0 MΩ, 5%, 1/4 W	2	CF1/4-1.0M/J	09021	
R35	Same as R34				
R36	Resistor, Variable, Film: 25 kΩ, 10%, .50 W	1	62PAR25K	73138	
R37	Same as R19				
R38	Not Used				
R39	Same as R14				
R40	Not Used				
R41	Same as R21				
R42	Same as R26				
R43	Resistor, Fixed, Composition: 100Ω, 5%, 1/4 W	2	CF1/4-100 OHMS/J	09021	
*	Nominal value, final value factory selected.				

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A4A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R44	Same as R13				
R45	Same as R26				
R46	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	3	CF1/4-22K/J	09021	
R47	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	2	CF1/4-4.7K/J	09021	
R48	Resistor, Fixed, Composition: 82 k Ω , 5%, 1/4 W	1	CF1/4-82K/J	09021	
R49	Same as R24				
R50	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/4 W	1	CF1/4-1.2K/J	09021	
R51	Same as R21				
R52	Resistor, Fixed, Composition: 3.3 M Ω , 5%, 1/4 W	1	CF1/4-3.3M/J	09021	
R53	Same as R3				
R54	Resistor, Fixed, Film: 18.2 k Ω , 1%, 1/10 W	1	RN55C1822F	81349	75042
R55	Resistor, Fixed, Film: 82.5 k Ω , 1%, 1/10 W	1	RN55C8252F	81349	75042
R56	Resistor, Fixed, Film: 100 k Ω , 1%, 1/10 W	1	RN55C1003F	81349	75042
R57	Same as R21				
R58	Resistor, Fixed, Composition: 150 Ω , 5%, 1/4 W	2	CF1/4-150 OHMS/J	09021	
R59	Same as R58				
R60	Same as R21				
R61	Same as R19				
R62	Same as R24				
R63	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	1	CF1/4-220 OHMS/J	09021	
R64	Same as R46				
R65	Same as R43				
R66	Resistor, Fixed, Composition: 68 k Ω , 5%, 1/4 W	1	CF1/4-68K/J	09021	
R67	Same as R46				
R68	Same as R47				
T1	Transformer	1	LL010	07338	
U1	Integrated Circuit	1	MC1496P	04713	
U2	Integrated Circuit	2	MC3403P	04713	
U3	Same as U2				

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS LIST

5.6.4.9 Type 791599-1 FM, CW, and SSB Detector/Audio

REF DESIG PREFIX A4A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	8	34452-1	14632	
C2 Thru C5	Same as C1				
C6	Capacitor, Mica, Dipped: 470 pF, 2%, 500 V	1	DM15-471G	72136	
C7	Capacitor, Mica, Dipped: 330 pF, 2%, 500 V	2	CM05FD331G03	81349	72136
C8	Capacitor, Mica, Dipped: 390 pF, 2%, 500 V	1	CM05FD391G03	81349	72136
C9	Capacitor, Ceramic, Disc: 150 pF, 5%, 50 V	1	1U150RJ	93958	
C10	Same as C7				
C11	Capacitor, Plastic, Tubular: 0.015 μ F, 5%, 100 V	1	663UW153-5-1W	84411	
C12	Same as C1				
C13	Capacitor, Electrolytic, Tantalum: 18 μ F, 10%, 20 V	1	196D186X9020KE3	56289	
C14	Same as C1				
C15	Same as C1				
C16	Capacitor, Ceramic, Disc: 1 μ F, 20%, 50 V	1	8131-050-651-105M	72982	
C17	Capacitor, Mica, Dipped: 2700 pF, 2%, 500 V	1	CM06FD272G03	81349	72136
C18	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	1	CS13BE156K	81349	56289
C19	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
FB1	Ferrite Bead	2	56-590-65-4A	02114	
FB2	Same as FB1				
L1	Coil, Variable	1	30312-258	14632	
L2	Not used				
L3	Coil, Fixed: 47 mH	1	553-3635-57	71279	
MP1	Transipad	4	7177-115DAP	13103	
Q1	Transistor	2	2N2907/JAN	81350	
Q2	Transistor	2	2N2222A	80131	04713
Q3	Same as Q1				
Q4	Same as Q2				
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	4	CF1/4-10K/J	09021	
R2	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	3	CF1/4-10.K/J	09021	
R3	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	1	CF1/4-220 OHMS/J	09021	
R4	Resistor, Fixed, Composition: 47 Ω , 5%, 1/4 W	3	CF1/4-47 OHMS/J	09021	
R5	Resistor, Fixed, Composition: 68 k Ω , 5%, 1/4 W	3	CF1/4-68K/J	09021	
R6	Resistor, Fixed, Composition: 47 k Ω , 5%, 1/4 W	3	CF1/4-47K/J	09021	
R7	Resistor, Fixed, Composition: 56 k Ω , 5%, 1/4 W	1	CF1/4-56K/J	09021	
R8	Resistor, Fixed, Composition: 4.7 k Ω , 5%, 1/4 W	2	CF1/4-4.7K/J	09021	
R9	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	1	CF1/4-2.2K/J	09021	
R10	Resistor, Fixed, Composition: 560 k Ω , 5%, 1/4 W	1	CF1/4-560K/J	09021	
R11	Resistor, Fixed, Composition: 470 k Ω , 5%, 1/4 W	1	CF1/4-470K/J	09021	
R12	Resistor, Fixed, Composition: 15 k Ω , 5%, 1/4 W	3	CF1/4-15K/J	09021	
R13	Same as R12				

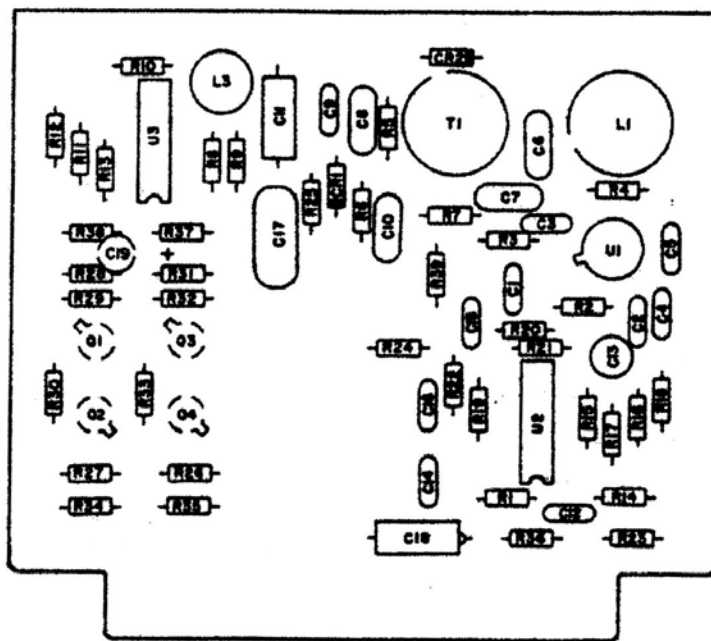


Figure 5-24. Type 791599-1 FM, CW and SSB Detector (A4A9),
Location of Components

REF DESIG PREFIX A4A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R14	Resistor, Fixed, Composition: 6.8 kΩ, 5%, 1/4 W	4	CF1/4-6.8K/J	09021	
R15	Same as R1				
R16	Same as R1				
R17	Same as R14				
R18	Same as R2				
R19	Same as R2				
R20	Same as R12				
R21	Resistor, Fixed, Composition: 3.9 kΩ, 5%, 1/4 W	2	CF1/4-3.9K/J	09021	
R22	Same as R21				
R23	Resistor, Fixed, Composition: 100Ω, 5%, 1/4 W	2	CF1/4-100 OHMS/J	09021	
R24	Resistor, Fixed, Composition: 150Ω, 5%, 1/4 W	1	CF1/4-150 OHMS/J	09021	
R25	Resistor, Fixed, Composition: 5.6 kΩ, 5%, 1/4 W	1	CF1/4-5.6K/J	09021	
R26	Same as R5				
R27	Same as R6				
R28	Same as R4				
R29	Resistor, Fixed, Composition: 82 kΩ, 5%, 1/4 W	2	CF1/4-82K/J	09021	
R30	Same as R14				
R31	Same as R4				
R32	Same as R29				
R33	Same as R14				
R34	Same as R6				
R35	Same as R5				
R36	Same as R23				
R37	Same as R8				
R38	Same as R1				
R39	Resistor, Fixed, Composition: 470Ω, 5%, 1/4 W	1	CF1/4-470 OHMS/J	09021	
T1	Transformer	1	30312-257	14632	
U1	Integrated Circuit	1	CA3012	02735	
U2	Integrated Circuit	1	MC1496P	04713	
U3	Integrated Circuit	1	MC3403P	04713	

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.4.10 Type 746001-1 Audio Amplifier

REF DESIG PREFIX A4A10

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	6	34452-1	14632	
C2	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C3	Same as C1				
C4	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 10%, 35 V	2	CS13BF475K	81349	56289
C5	Not Used				
C6	Same as C1				
C7	Capacitor, Ceramic, Disc: 1 μ F, 20%, 50 V	1	8131-050-651-105M	72982	
C8	Same as C1				
C9	Same as C1				
C10	Same as C4				
C11	Not Used				
C12	Capacitor, Electrolytic, Tantalum: 15 μ F, 10%, 20 V	2	CS13BE156K	81349	56289
C13	Same as C12				
C14	Same as C1				
C15	Not Used				
C16	Not Used				
C17	Capacitor, Ceramic, Disc: 5000 pF, 20%, 500 V	1	B-GP5000PFM	91418	
C18	Capacitor, Electrolytic, Tantalum: 47 μ F, 10%, 35 V	2	CS13BF476K	81349	56289
C19	Same as C18				
C20	Not Used				
C21	Capacitor, Mica, Dipped: 24 pF, 5%, 500 V	1	CM05ED240J03	81349	72136
CR1	Diode	1	1N4449	80131	93332
CR2	Diode	2	1N198A	80131	93332
CR3	Same as CR2				
Q1	Transistor	1	U1899E	15818	
R1	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/4 W	3	CF1/4-22K/J	09021	
R2	Resistor, Fixed, Composition: 330 k Ω , 5%, 1/4 W	1	CF1/4-330K/J	09021	
R3	Resistor, Fixed, Composition: 47 k Ω , 5%, 1/4 W	2	CF1/4-47K/J	09021	
R4	Same as R3				
R5	Resistor, Fixed, Composition: 2.2 M Ω , 5%, 1/4 W	1	CF1/4-2.2M/J	09021	
R6	Resistor, Fixed, Composition: 20 k Ω , 5%, 1/4 W	1	CF1/4-20K/J	09021	
R7	Resistor, Fixed, Composition: 100 k Ω , 5%, 1/4 W	5	CF1/4-100K/J	09021	
R8 Thru R10	Same as R7				
R11	Same as R1				
R12	Resistor, Fixed, Composition: 12 k Ω , 5%, 1/4 W	1	CF1/4-12K/J	09021	
R13	Resistor, Fixed, Composition: 27 k Ω , 5%, 1/4 W	1	CF1/4-27K/J	09021	
R14	Resistor, Fixed, Composition: 6.8 k Ω , 5%, 1/4 W	2	CF1/4-6.8K/J	09021	
R15	Not Used				
R16	Not Used				

REF DESIG PREFIX A4A10

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R17	Resistor, Fixed, Composition: 18 k Ω , 5%, 1/4 W	1	CF1/4-18K/J	09021	
R18	Same as R7				
R19	Resistor, Fixed, Film: 2.0 k Ω , 1%, 1/10 W	1	RN55C2001F	81349	75042
R20	Resistor, Fixed, Film: 100 k Ω , 1%, 1/10 W	2	RN55C1003F	81349	75042
R21	Same as R20				
R22	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	2	CF1/4-100 OHMS/J	09021	
R23	Same as R1				
R24	Same as R14				
R25	Not Used				
R26	Not Used				
R27	Same as R22				
RA1	Heatsink	1	24566-1	14632	
T1	Transformer	1	LL010	07388	
U1	Integrated Circuit	1	MC3403P	04713	
U2	Integrated Circuit	1	LM378N	27014	

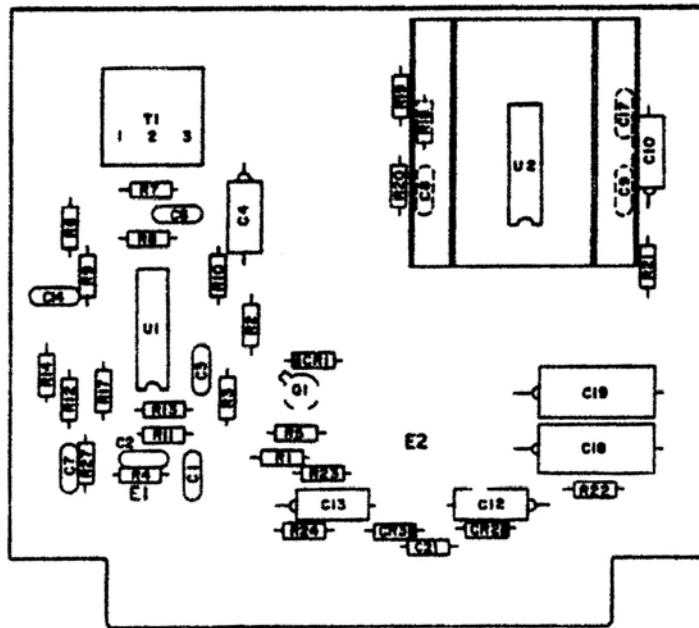


Figure 5-25. Type 746001-1 Audio Amplifier (A4A10), Location of Components

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.5 TYPE 791570-1 SYNTHESIZER MOTHERBOARD

REF DESIG PREFIX A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	1st and 3rd LO, Timebase	1	791630	14632	
A2	2nd LO Synthesizer	1	791601	14632	
A3	BFO Synthesizer	1	791576	14632	
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	58	34453-1	14632	
C2 Thru C58	Same as C1				
C59	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	4	34452-1	14632	
C60 Thru C62	Same as C59				
J1	Faston Tab	3	62073-1	00779	
J2	Same as J1				
J3	Same as J1				
L1	Ferrite Choke	4	VK200-10-3B	02114	
L2 Thru L4	Same as L1				
MP1	Not Used				
MP2	Insulator	2	60-11-5791-1674	18565	
--	Cable Assembly	1	34832-1	14632	
P1	Plug Assembly	1	88523-1	00779	
--	Cable Assembly	1	34832-2	14632	
P2	Plug Assembly	1	88524-1	00779	
RA1	Heatsink	1	270921	14632	
U1	Voltage Regulator	2	7805UC	07263	
U2	Same as U1				

FIGURE 5-26

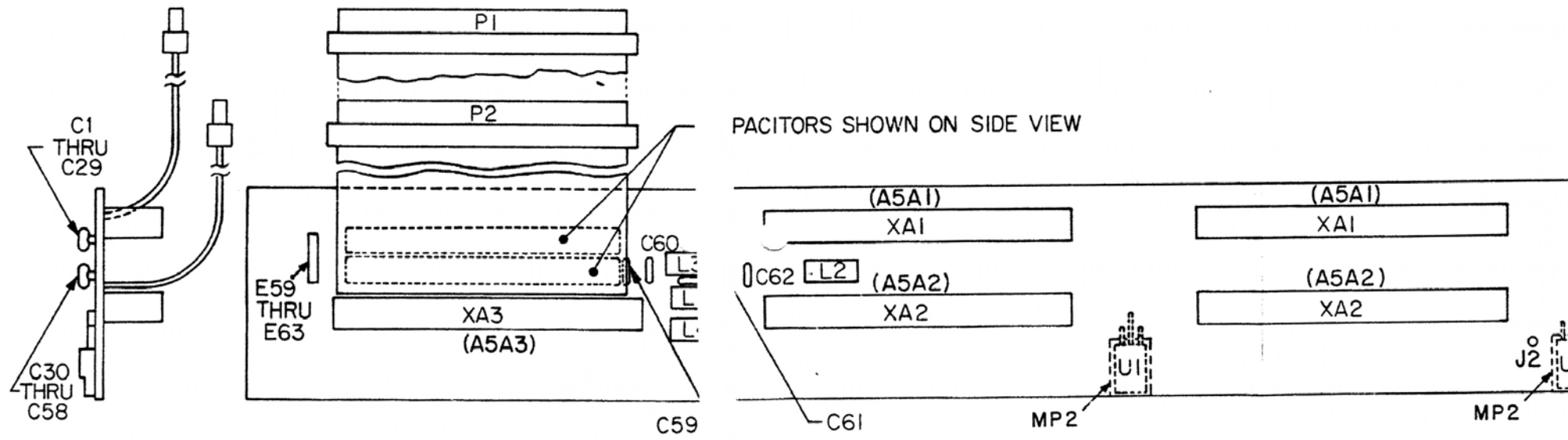


Figure 5-26. Type 791570-1 Synthesizer Module
Location of Components

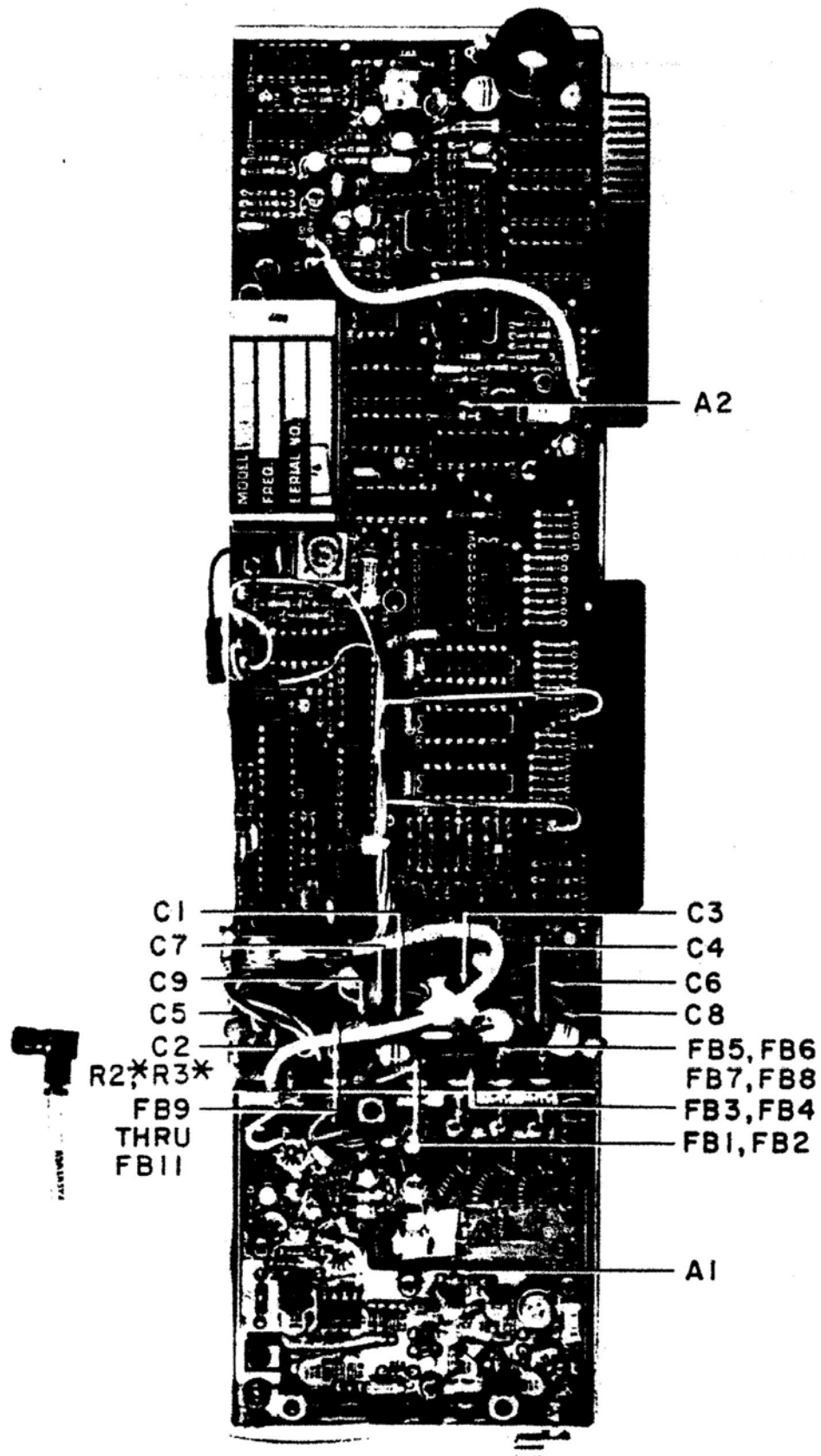
5.6.5.1 Type 791630-1 1st and 3rd LO Synthesizer

REF DESIG PREFIX A5A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	1st LO VCO Assembly	1	791629	14632	
A2	1st and 3rd LO Synthesizer	1	791600	14632	
C1	Capacitor, Mica, Dipped: 1600 pF, 2%, 500 V	2	CM06FD162G03	81349	72136
C2	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	2	8131M100-651-474M	72982	
C3	Same as C1				
C4	Capacitor, Ceramic, Disc: 0.05 μ F, 20%, 100 V	2	C023B101R503M	56289	
C5	Capacitor, Electrolytic, Tantalum: 47 μ F, 20%, 20 V	2	196D476X0020PE4	56289	
C6	Same as C2				
C7	Same as C5				
C8	Same as C4				
C9	Capacitor, Electrolytic, Tantalum: 2.2 μ F, 20%, 35 V	1	196D225X0035JE3	56289	
FB1	Ferrite Bead	17	56-590-65-4A	02114	
FB2 Thru FB17	Same as FB1				
L1	Coil, Fixed: 10 mH	2	553-3635-49	71279	
L2	Coil, Fixed: 0.82 μ H	1	1537-10	99800	
L3	Same as L1				
L4	Coil, Fixed: 4.7 mH	1	553-3635-45	99800	
MP1	Terminal	20	S0S1	04013	
MP2	Insulator	1	60-11-5791-1674	18565	
R1	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	1	CF1/4-100 OHMS/J	09021	
R2	Resistor, Fixed, Film: 10 k Ω , 1%, 1/10 W	1	RN55C1002F	81349	75042
R3	Resistor, Fixed, Film: 1.0 k Ω , 1%, 1/10 W	1	RN55C1001F	81349	75042
R4	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	1	CF1/4-1.0K/J	09021	
R5	Resistor, Fixed, Film: 1.82 k Ω , 1%, 1/10 W	1	RN55C1821F	81349	75042
VR1	Voltage Regulator	1	MC7912CP	04713	

FIGURE 5-27

WJ-8718 SERIES HF RECEIVER



* DENOTES HIDDEN PART

Figure 5-27. Type 791630-1 1st and 3rd LO Synthesizer/Timebase (A5A1), Location of Components (Sheet 1 of 2)

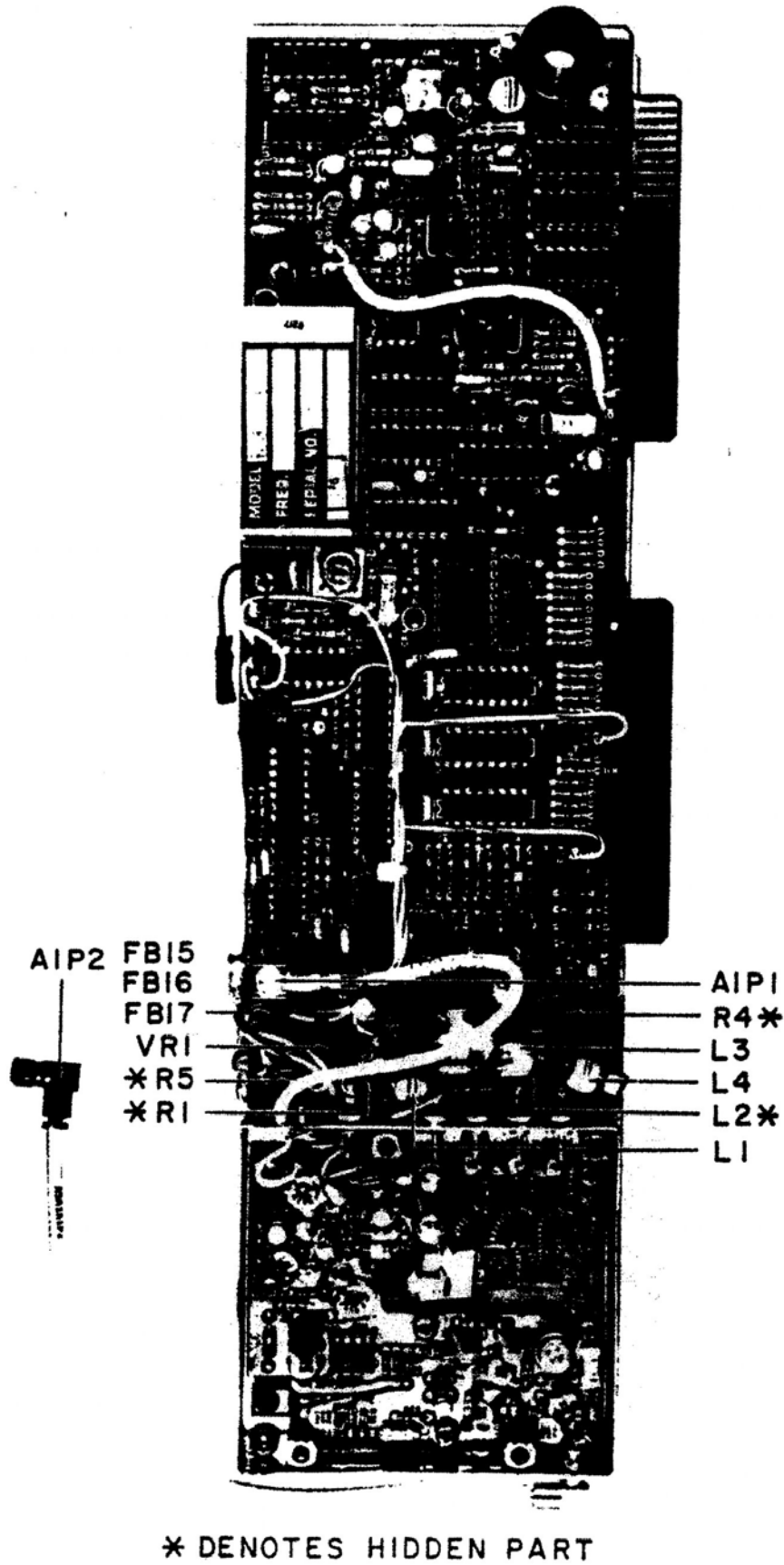


Figure 5-27. Type 791630-1 1st and 3rd LO Synthesizer/Timebase (A5A1),
Location of Components (Sheet 2 of 2)

FIGURE 5-28

5.6.5.1.1 Type 791629 1st LO VCO Assembly

REF DESIG PREFIX A5A1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	1st LO Voltage Controlled Oscillator	1	34750	14632	
C1	Capacitor, Ceramic, Feedthru: 1000 pF, GMV, 500 V	5	54-794-009-102W	33095	
C2 Thru C4	Same as C1				
C5	Capacitor, Electrolytic, Tantalum: 68 μ F, 20%, 15 V	1	183DR686X0015F	56289	
C6	Same as C1				
C7	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	1	34452-1	14632	
C8	Capacitor, Ceramic, Disc: 6.8 pF, \pm 0.25 pF, 100 V	1	8101-100-C0H0-689C	72982	
E1	Connector, Termination	1	144/188	19505	
MP1	Cover Assembly	1	24085-1	14632	
P1	Connector, Plug: SMC Series	1	UG1465/U	80058	19505
P2	Connector, Plug: SMC Series	1	UG1466/U	80058	19505
R1	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/8 W	3	CF1/8-1.2K/J	09021	
R2	Same as R1				
R3	Same as R1				
R4	Resistor, Fixed, Composition: 47 Ω , 5%, 1/8 W	1	CF1/8-47 OHMS/J	09021	

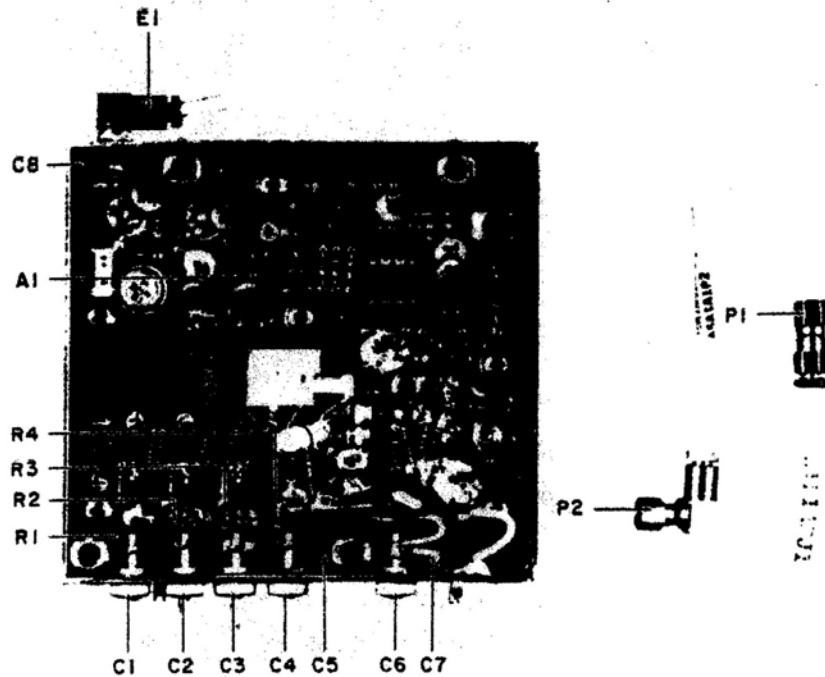


Figure 5-28. Type 791629 1st LO VCO Assembly (A5A1A1), Location of Components

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS LIST

5.6.5.1.1.1 Part 34750 1st LO Voltage Controlled Oscillator

REF DESIG PREFIX A5A1A1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Chip: 200 pF, 50%, 500 V	10	32-257578-40	91984	
C2 Thru C4	Same as C1				
C5	Capacitor, Ceramic, Chip: 3 pF, ± 0.25 pF, 500 V	1	603C0G3R0C	91984	
C6*	Capacitor, Ceramic, Tubular: 5.1 pF, ± 0.5 pF, 500 V	2	301-000C0H0-519D	72982	
C7	Capacitor, Composition, Tubular: 2.7 pF, 10%, 500 V	1	QC2.7PFK	95121	
C8	Same as C1				
C9	Capacitor, Composition, Tubular: 1.0 pF, 10%, 500 V	1	QC1.0PFK	95121	
C10	Same as C1				
C11	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C12	Same as C1				
C13	Same as C1				
C14	Capacitor, Ceramic, Disc: 470 pF, 20%, 1000 V	7	BHD470-20PCT	91418	
C15	Capacitor, Mica, Dipped: 100 pF, 2%, 500 V	1	CM04FD101G03	81349	72136
C16	Same as C1				
C17	Same as C1				
C18	Capacitor, Electrolytic, Tantalum: 2.2 μ F, 10%, 20 V	1	CS13BE225K	81349	56289
C19 Thru C21	Same as C14				
C22	Not Used				
C23	Same as C14				
C24	Not Used				
C25	Same as C14				
C26	Capacitor, Ceramic, Disc: 5000 pF, 20%, 100 V	2	C023B101E502M	56289	
C27	Same as C26				
C28	Same as C6				
C29	Same as C14				
CR1	Diode, Pin Switching	3	MPN3401	04713	
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Diode, Tuning VHF and UHF	1	U11-3102	52673	
FB1	Ferrite Bead	1	56-590-65-4A	02114	
L1	Coil, Air	1	24592-1	14632	
L2	Coil, Air	2	24593-1	14632	
L3	Same as L2				
L4	Coil, Air	1	24593-2	14632	
L5	Coil, Fixed: 0.56 μ H	1	202-11	99848	
*	Nominal value, final value factory selected.				

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A5A1A1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
MP1	Transipad	4	7717-46DAP	13103	
MP2	Transipad	1	7717-22DAP	13103	
Q1	Transistor	1	U310	17856	
Q2	Transistor	2	2N2857/JAN	81350	
Q3	Same as Q2				
Q4	Transistor	1	2N4918	80131	04713
Q5	Transistor	1	2N3251	80131	04713
Q6	Not used				
Q7	Transistor	1	2N5109	80131	02735
R1	Resistor, Fixed, Composition: 33 k Ω , 5%, 1/8 W	2	CF1/8-33K/J	09021	
R2	Resistor, Fixed, Composition: 12 k Ω , 5%, 1/8 W	1	CF1/8-12K/J	09021	
R3	Resistor, Fixed, Composition: 22 k Ω , 5%, 1/8 W	1	CF1/8-22K/J	09021	
R4	Resistor, Fixed, Composition: 470 Ω , 5%, 1/8 W	4	CF1/8-470 OHMS/J	09021	
R5	Resistor, Fixed, Composition: 100 k Ω , 5%, 1/8 W	1	CF1/8-100K/J	09021	
R6	Resistor, Fixed, Composition: 8.2 k Ω , 5%, 1/8 W	2	CF1/8-8.2K/J	09021	
R7	Resistor, Fixed, Composition: 5.6 k Ω , 5%, 1/8 W	2	CF1/8-5.6K/J	09021	
R8	Resistor, Fixed, Composition: 300 Ω , 5%, 1/8 W	2	CF1/8-300 OHMS/J	09021	
R9	Resistor, Fixed, Composition: 220 Ω , 5%, 1/8 W	1	CF1/8-220 OHMS/J	09021	
R10	Resistor, Fixed, Composition: 68 Ω , 5%, 1/8 W	2	CF1/8-68 OHMS/J	09021	
R11	Resistor, Fixed, Composition: 180 Ω , 5%, 1/8 W	1	CF1/8-180 OHMS/J	09021	
R12	Same as R10				
R13	Same as R6				
R14	Same as R7				
R15	Resistor, Fixed, Composition: 47 Ω , 5%, 1/8 W	4	CF1/8-47 OHMS/J	09021	
R16	Same as R8				
R17	Resistor, Fixed, Composition: 150 Ω , 5%, 1/8 W	1	CF1/8-150 OHMS/J	09021	
R18	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/8 W	2	CF1/8-1.0K/J	09021	
R19	Resistor, Fixed, Composition: 390 Ω , 5%, 1/8 W	1	CF1/8-390 OHMS/J	09021	
R20	Resistor, Fixed, Composition: 10 Ω , 5%, 1/4 W	1	CF1/4-10 OHMS/J	09021	
R21	Same as R4				
R22	Same as R4				
R23	Resistor, Fixed, Composition: 10 Ω , 5%, 1/8 W	1	CF1/8-10 OHMS/J	09021	
R24	Resistor, Fixed, Composition: 33 Ω , 5%, 1/8 W	1	CF1/8-33 OHMS/J	09021	
R25	Resistor, Fixed, Composition: 270 Ω , 5%, 1/8 W	1	CF1/8-270 OHMS/J	09021	
R26	Same as R15				
R27	Same as R1				
R28	Same as R15				
R29	Resistor, Fixed, Composition: 22 Ω , 5%, 1/8 W	1	CF1/8-22 OHMS/J	09021	
R30	Same as R15				
R31 Thru R33	Not Used				

REF DESIG PREFIX A5A1A1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R34	Resistor, Fixed, Composition: 15Ω, 5%, 1/8 W	1	CF1/8-15 OHMS/J	09021	
R35	Resistor, Fixed, Composition: 560Ω, 5%, 1/8 W	1	CF1/8-560 OHMS/J	09021	
R36	Same as R18				
R37	Same as R4				
R38	Not Used				
R39	Not Used				
R40	Resistor, Fixed, Composition: 51Ω, 5%, 1/4 W	1	CF1/4-51 OHMS/J	09021	
T1	Part of P.C. Board				
T2	Transformer, Toroidal	2	21278-23	14632	
T3	Same as T2				
T4	Transformer, Toroidal	2	21278-27	14632	
T5	Not Used				
T6	Same as T4				
U1	Integrated Circuit	1	MC1697L	04713	

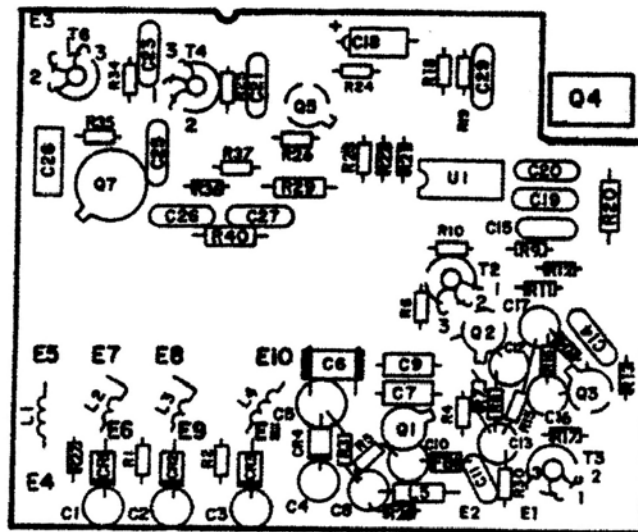


Figure 5-29. Part 34750 1st LO Voltage Controlled Oscillator (A5A1A1A1), Location of Components

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.5.1.2 Type 791600-1 1st and 3rd LO Synthesizer

REF DESIG PREFIX A5A1A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Mica, Dipped: 47 pF, 2%, 500 V	2	CM04ED470G03	81349	72136
C2	Same as C1				
C3	Capacitor, Ceramic, Disc: 470 pF, 2%, 1000 V	2	BHD470-20PCT	91418	
C4 Thru C6	Not Used				
C7	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	13	34453-1	14632	
C8 Thru C15	Same as C7				
C16	Capacitor, Electrolytic, Tantalum: 22 μ F, 20%, 15 V	5	196D226X0015KE3	56289	
C17	Same as C3				
C18	Capacitor, Fixed, Plastic: 4700 pF, 10%, 100 V	1	WMF1D47	14655	
C19	Not Used				
C20	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 100 V	2	8131M100-651-104M	72982	
C21	Same as C7				
C22	Capacitor, Ceramic, Disc: 1000 pF, GMV, 500 V	1	B-GP1000PPF	91418	
C23	Capacitor, Mica, Dipped: 820 pF, 5%, 300 V	1	DM15-821J	72136	
C24	Not Used				
C25	Same as C16				
C26	Capacitor, Electrolytic, Tantalum: 22 μ F, 20%, 35 V	2	196D226X0035PE4	56289	
C27	Not Used				
C28	Capacitor, Ceramic, Tubular: 47 pF, 5%, 500 V	1	308-000C0G0-470J	72982	
C29	Capacitor, Electrolytic, Tantalum: 100 μ F, 20%, 10 V	1	196D107X0010PE4	56289	
C30	Capacitor, Electrolytic, Tantalum: 2.2 μ F, 20%, 35 V	1	196D225X0035JE3	56289	
C31	Same as C16				
C32	Same as C20				
C33	Capacitor, Variable, Ceramic: 2-8 pF, 350 V	1	538-006A2-8	72982	
C34	Capacitor, Mica, Dipped: 220 pF, 2%, 500 V	2	CM05FD221G03	81349	72136
C35	Same as C34				
C36	Same as C7				
C37	Same as C7				
C38	Same as C16				
C39	Same as C26				
C40	Not used				
C41	Same as C7				
C42	Same as C16				
C43*	Capacitor, Mica, Dipped: 15 pF, 5%, 500 V	1	CM04CD150J03	81349	72136
*	Nominal value, final value factory selected.				

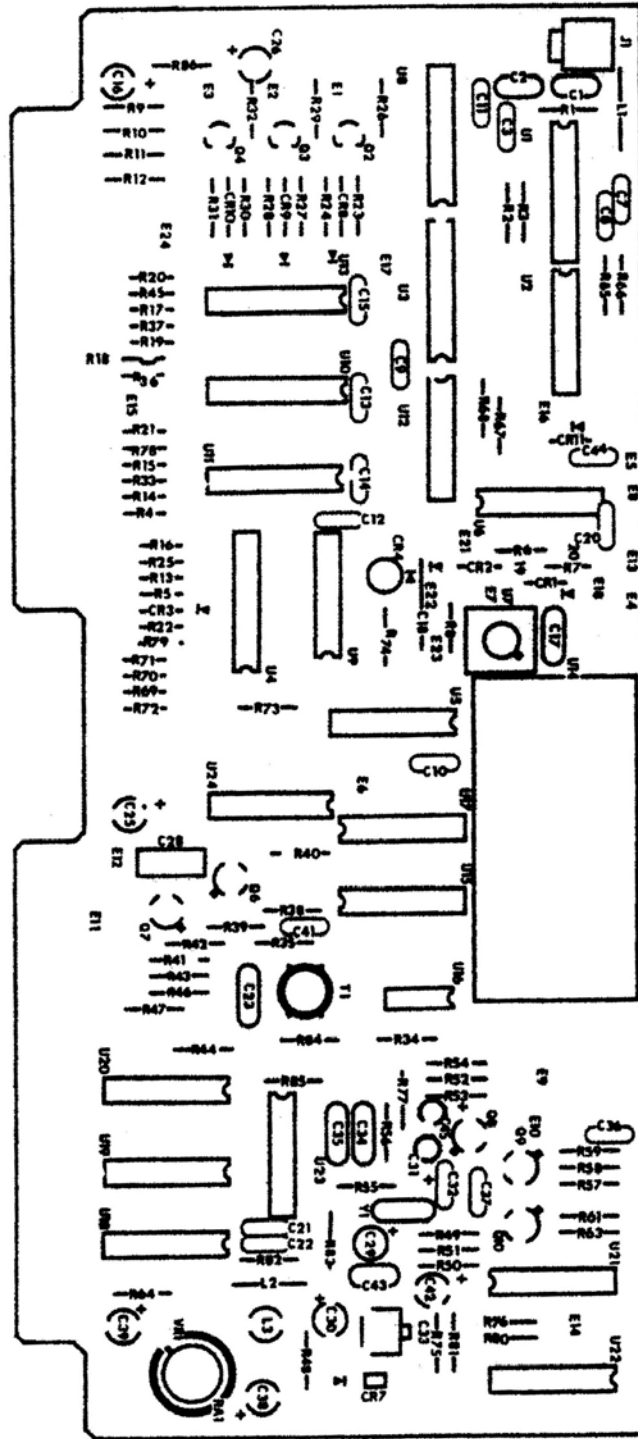


Figure 5-30. Type 791600-1 1st and 3rd LO Synthesizer (A5A1A2), Location of Components

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A5A1A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C44	Capacitor, Mica, Dipped: 330 pF, 2%, 500 V	1	CM05FD331G03	81349	72136
C45	Capacitor, Electrolytic, Tantalum: 22 μ F, 20%, 10 V	1	196D226X0010JE3	56289	
CR1	Diode	4	5082-2800	28480	
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Diode: LED	1	HLMP-1301	28480	
CR5	Not Used				
CR6	Not Used				
CR7	Diode, Tuning VHF and UHF	1	U11-3102	52673	
CR8	Diode, Zener: 15 V	3	1N965B	80131	04713
CR9	Same as CR8				
CR10	Same as CR8				
CR11	Same as CR1				
J1	Connector, Receptacle: SMC Series	1	50-053-0000	98291	
L1	Coil, Fixed: 0.24 μ H	1	200-11	99848	
L2	Coil, Fixed: 8.2 μ H	1	1537-34	99800	
L3	Coil, Fixed: 100 μ H	1	553-3635-25	71279	
MP1	Transipad	5	7717-89DAP	13103	
MP2	Insulator	1	RCT05145-8	19080	
MP3	Transipad	1	7717-44DAP	13103	
Q1	Not Used				
Q2	Transistor	3	2N4401	80131	04713
Q3	Same as Q2				
Q4	Same as Q2				
Q5	Not Used				
Q6	Transistor	3	2N706	80131	04713
Q7	Same as Q6				
Q8	Transistor	2	2N2222A	80131	04713
Q9	Same as Q8				
Q10	Same as Q6				
R1	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	6	CF1/4-100 OHMS/J	09021	
R2	Resistor, Fixed, Composition: 470 Ω , 5%, 1/4 W	4	CF1/4-470 OHMS/J	09021	
R3	Same as R2				
R4	Resistor, Fixed, Composition: 82 k Ω , 5%, 1/8 W	4	CF1/8-82K/J	09021	
R5	Same as R4				
R6*	Resistor, Fixed, Composition: 6.8 k Ω , 5%, 1/4 W	2	CF1/4-6.8K/J	09021	
R7*	Same as R6				
R8*	Resistor, Fixed, Composition: 100 k Ω , 5%, 1/4 W	1	CF1/4-100K/J	09021	
*	Nominal value, final value factory selected.				

REF DESIG PREFIX A5A1A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R9 Thru R12	Same as R1				
R13	Resistor, Fixed, Composition: 100Ω, 5%, 1/8 W	10	CF1/8-100 OHMS/J	09021	
R14 Thru R22	Same as R13				
R23	Resistor, Fixed, Composition: 2.2 kΩ, 5%, 1/4 W	6	CF1/4-2.2K/J	09021	
R24	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	7	CF1/4-10K/J	09021	
R25	Same as R4				
R26	Resistor, Fixed, Composition: 20 kΩ, 5%, 1/4 W	3	CF1/4-20K/J	09021	
R27	Same as R23				
R28	Same as R24				
R29	Same as R26				
R30	Same as R23				
R31	Same as R24				
R32	Same as R26				
R33	Same as R4				
R34	Resistor, Fixed, Composition: 5.6 kΩ, 5%, 1/4 W	2	CF1/4-5.6K/J	09021	
R35	Same as R34				
R36	Resistor, Fixed, Composition: 27 kΩ, 5%, 1/8 W	3	CF1/8-27K/J	09021	
R37	Same as R36				
R38	Resistor, Fixed, Composition: 1.2 kΩ, 5%, 1/4	1	CF1/4-1.2K/J	09021	
R39	Same as R23				
R40	Resistor, Fixed, Composition: 270Ω, 5%, 1/4 W	5	CF1/4-270 OHMS/J	09021	
R41	Same as R23				
R42	Same as R23				
R43	Resistor, Fixed, Composition: 1.0 kΩ, 5%, 1/4 W	14	CF1/4-1.0K/J	09021	
R44	Same as R2				
R45	Same as R36				
R46	Same as R40				
R47	Same as R40				
R48	Same as R43				
R49	Resistor, Fixed, Composition: 330Ω, 5%, 1/4 W	1	CF1/4-330 OHMS/J	09021	
R50	Same as R24				
R51	Same as R43				
R52	Same as R43				
R53	Same as R24				
R54	Resistor, Fixed, Composition: 22Ω, 5%, 1/4 W	3	CF1/4-22 OHMS/J	09021	
R55	Resistor, Fixed, Composition: 27Ω, 5%, 1/4 W	1	CF1/4-27 OHMS/J	09021	
R56	Same as R40				

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A5A1A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R57	Same as R54				
R58	Resistor, Fixed, Composition: 150 Ω , 5%, 1/4 W	2	CF1/4-150 OHMS/J	09021	
R59	Same as R58				
R60	Not Used				
R61	Same as R24				
R62	Not Used				
R63	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	1	CF1/4-220 OHMS/J	09021	
R64	Resistor, Fixed, Composition: 3.3 Ω , 5%, 1/4 W	1	CF1/4-3.3 OHMS/J	09021	
R65 Thru R68	Same as R43				
R69	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/8 W	4	CF1/8-1.0K/J	09021	
R70 Thru R72	Same as R69				
R73	Same as R24				
R74	Same as R2				
R75	Same as R43				
R76	Same as R43				
R77	Same as R54				
R78	Resistor, Fixed, Composition: 47 k Ω , 5%, 1/8 W	2	CF1/8-47K/J	09021	
R79	Same as R78				
R80	Same as R43				
R81	Same as R43				
R82	Resistor, Fixed, Composition: 47 Ω , 5%, 1/4 W	1	CF1/4-47 OHMS/J	09021	
R83	Same as R1				
R84	Same as R43				
R85	Same as R43				
R86	Same as R40				
RA1	Heatsink	1	2225B	13103	
T1	Transformer Assembly	1	22295-69	14632	
U1	Integrated Circuit	1	MC12013L	04713	
U2	Integrated Circuit	1	SN74S196J	01295	
U3	Integrated Circuit	1	MC12014L	04713	
U4	Integrated Circuit	1	841013	14632	
U5	Integrated Circuit	2	MC4044P	04713	
U6	Integrated Circuit	1	867400	14632	
U7	Integrated Circuit	1	CA6741T	02735	
U8	Integrated Circuit	3	SN74LS190N	01295	
U9	Integrated Circuit	6	SN74LS196N	01295	
U10	Same as U8				
U11	Same as U8				

REF DESIG PREFIX A5A1A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U12	Integrated Circuit	1	SN7S74N	01295	
U13	Integrated Circuit	1	SN74184N	01295	
U14	Integrated Circuit	1	841043	14632	
U15	Same as U9				
U16	Integrated Circuit	1	SN75140N	01295	
U17 Thru U20	Same as U9				
U21	Integrated Circuit	1	SN74LS74N	01295	
U22	Same as U5				
U23	Integrated Circuit	1	SN74125N	01295	
U24	Integrated Circuit	1	SN74LS02N	01295	
VR1	Voltage Regulator	1	78M05HC	07263	
Y1	Crystal, Quartz: 11.155 MHz	1	CR64U/11.155MHz	80058	

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.5.2 Type 791601 2nd LO Synthesizer

REF DESIG PREFIX A5A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	3	34452-1	14632	
C2	Same as C1				
C3	Capacitor, Electrolytic, Tantalum: 47 μ F, 20%, 20 V	3	196D476X0020PE4	56289	
C4	Capacitor, Electrolytic, Tantalum: 22 μ F, 20%, 10 V	7	196D226X0010JE3	56289	
C5	Capacitor, Electrolytic, Tantalum: 1 μ F, 20%, 35 V	2	196D105X0035HE3	56289	
C6	Capacitor, Ceramic, Disc: 2200 pF, 10%, 200 V	1	CK06BX222K	81349	72136
C7	Same as C4				
C8	Same as C3				
C9	Capacitor, Mica, Dipped: 12 pF, 5%, 500 V	1	CM05CD120J03	81349	72136
C10	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	2	34475-1	14632	
C11	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	17	34453-1	14632	
C12	Same as C11				
C13	Same as C10				
C14	Capacitor, Electrolytic, Tantalum: 22 μ F, 20%, 35 V	2	196D226X0035PE4	56289	
C15	Same as C4				
C16	Capacitor, Ceramic, Disc: 470 pF, 20%, 1000 V	3	BHD470-20PCT	91418	
C17	Capacitor, Electrolytic, Tantalum: 150 μ F, 20%, 6 V	1	196D157X0006PE4	56289	
C18	Same as C5				
C19 Thru C21	Same as C11				
C22	Capacitor, Ceramic, Tubular: 10 pF, \pm 0.5 pF, 500 V	1	301-000C0H0-100D	72982	
C23	Capacitor, Mica, Dipped: 220 pF, 2%, 500 V	1	CM05FD221G03	81349	72136
C24	Same as C11				
C25	Same as C3				
C26 Thru C28	Same as C4				
C29	Capacitor, Plastic, Tubular: 0.022 μ F, 5%, 100 V	1	663UW223-5-1W	84411	
C30	Capacitor, Fixed, Plastic: 4700 pF, 10%, 100 V	1	WMF1D47	14655	
C31	Not Used				
C32	Same as C4				
C33	Same as C16				
C34	Same as C16				
C35	Same as C11				
C36	Capacitor, Ceramic, Disc: 1000 pF, GMV, 500 V	7	B-GP1000PFP	91418	
C37	Same as C14				
C38	Same as C36				
C39	Same as C36				
C40	Same as C11				
C41	Same as C36				

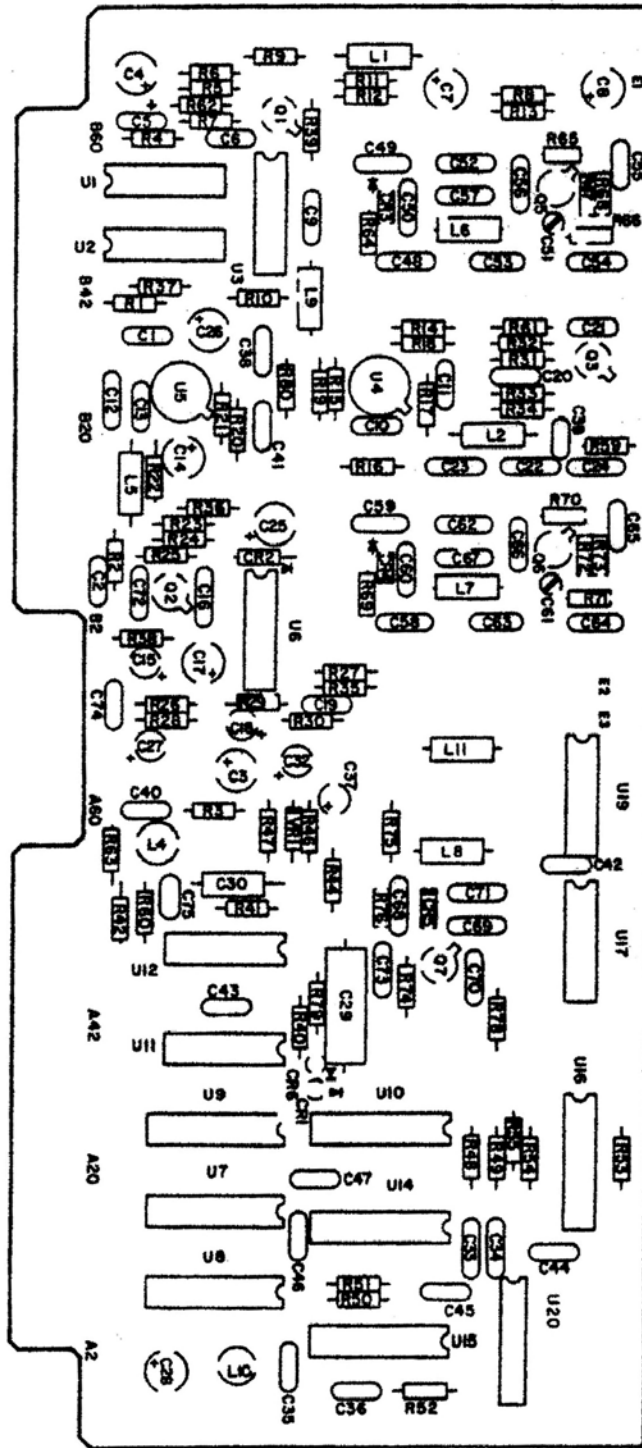


Figure 5-31. Type 791601 2nd LO Synthesizer (A5A2), Location of Components

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A5A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C42 Thru C49	Same as C11				
C50	Capacitor, Ceramic, Tubular: 27 pF, 5%, 500 V	1	308-000C0G0-270J	72982	
C51	Capacitor, Variable, Air: .4-2.5pF, 500 V	2	7283	91293	
C52	Capacitor, Ceramic, Tubular: 6.8 pF, ±0.25 pF, 500 V	2	301-000C0H0-689C	72982	
C53	Capacitor, Ceramic, Tubular: 47 pF, 5%, 500 V	5	308-000C0G0-470J	72982	
C54	Same as C53				
C55	Same as C36				
C56	Capacitor, Ceramic, Tubular: 8.2 pF, ±0.5 pF, 500 V	1	301-000C0H0-829D	72982	
C57*	Capacitor, Ceramic, Tubular: 5.6 pF, ±0.5 pF, 500 V	1	301-000T2J0-569D	72982	
C58	Same as C11				
C59	Capacitor, Ceramic, Tubular: 33 pF, 5%, 500 V	1	308-000C0G0-330J	72982	
C60	Same as C53				
C61	Same as C51				
C62	Same as C52				
C63	Same as C53				
C64	Same as C53				
C65	Same as C36				
C66*	Capacitor, Ceramic, Tubular: 2.7 pF, ±0.25 pF, 500 V	1	301-000C0J0-279C	72982	
C67	Capacitor, Ceramic, Tubular: 5.6 pF, ±0.5 pF, 500 V	1	301-000U2J0-569D	72982	
C68	Capacitor, Mica, Dipped: 150 pF, 2%, 500 V	1	CM05FD151G03	81349	72136
C69	Capacitor, Ceramic, Tubular: 4.7 pF, ±0.1 pF, 500 V	1	301-000C0H0-479B	72982	
C70	Capacitor, Ceramic, Tubular: 2.2 pF, ±0.25 pF, 500 V	1	301-000C0J0-229C	72982	
C71	Capacitor, Ceramic, Tubular: 15 pF, 5%, 500 V	1	301-000C0G0-150J	72982	
C72	Capacitor, Mica, Dipped: 1000 pF, 5%, 100 V	1	DM15-102J	72136	
C73	Same as C36				
C74	Same as C1				
C75	Capacitor, Mica, Dipped: 100 pF, 2%, 500 V	1	CM04FD101G03	81349	72136
CR1	Diode, LED	2	HLMP-1301	28480	
CR2	Diode	1	1N4446	80131	93332
CR3	Diode, Varicap	3	BB109-YELLOW	25088	
CR4	Same as CR3				
CR5	Same as CR3				
CR6	Same as CR1				
L1	Coil, Fixed, Molded: 0.47 μH	1	1537-06	99800	
L2	Coil, Fixed, Molded: 1.5 μH	1	1537-16	99800	
L3	Not Used				
*	Nominal value, final value factory selected.				

REF DESIG PREFIX A5A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L4	Coil, Fixed: 22 mH	1	553-3635-53	71279	
L5	Coil, Fixed, Molded: 680 μ H	1	2500-20	99800	
L6	Coil, Fixed: 0.82 μ H	2	1537-10	99800	
L7	Same as L6				
L8	Inductor	1	21210-183	14632	
L9	Coil, Fixed: 2.2 μ H	1	1025-28	99800	
L10	Coil, Fixed: 10 μ H	1	553-3635-13	71279	
L11	Coil, Fixed: 100 μ H	1	1537-76	99800	
MP1	Transipad	3	7717-44DAP	13103	
MP2	Transipad	3	7717-46DAP	13103	
MP3	Cover Assembly	1	24469-1	14632	
MP4	Cover Assembly	1	24469-2	14632	
MP5	Cover Assembly	1	24469-3	14632	
MP6	2nd LO Shield Assembly	1	34844-1	14632	
Q1	Transistor	3	2N2857/JAN	81350	
Q2	Transistor	1	2N2222A	80131	04713
Q3	Transistor	1	841001-1	14632	
Q4	Not used				
Q5	Same as Q1				
Q6	Same as Q1				
Q7	Transistor	1	U310	17856	
R1	Resistor, Fixed, Composition: 22 Ω , 5%, 1/4 W	4	CF1/4-22 OHMS/J	09021	
R2	Same as R1				
R3	Same as R1				
R4	Resistor, Fixed, Composition: 1.8 k Ω , 5%, 1/4 W	1	CF1/4-1.8K/J	09021	
R5	Resistor, Fixed, Composition: 10 Ω , 5%, 1/4 W	7	CF1/4-10 OHMS/J	09021	
R6	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	13	CF1/1-1.0K/J	09021	
R7	Resistor, Fixed, Composition: 1.2 k Ω , 5%, 1/4 W	1	CF1/4-1.2K/J	09021	
R8	Same as R5				
R9	Same as R6				
R10	Resistor, Fixed, Composition: 5.6 Ω , 5%, 1/4 W	1	CF1/4-5.6 OHMS/J	09021	
R11	Resistor, Fixed, Composition: 5.1 k Ω , 5%, 1/4 W	1	CF1/4-5.1K/J	09021	
R12	Same as R6				
R13	Same as R5				
R14	Same as R6				
R15	Resistor, Fixed, Composition: 47 Ω , 5%, 1/4 W	8	CF1/4-47 OHMS/J	09021	
R16 Thru R18	Same as R15				
R19	Resistor, Fixed, Composition: 820 Ω , 5%, 1/4 W	1	CF1/4-820 OHMS/J	09021	
R20	Resistor, Fixed, Composition: 2.2 k Ω , 5%, 1/4 W	2	CF1/4-2.2K/J	09021	

REF DESIG PREFIX A5A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R21	Same as R20				
R22	Resistor, Fixed, Composition: 100Ω, 5%, 1/4 W	1	CF1/4-100 OHMS/J	09021	
R23	Resistor, Fixed, Composition: 18 kΩ, 5%, 1/4 W	1	CF1/4-18K/J	09021	
R24	Same as R6				
R25	Same as R6				
R26	Same as R5				
R27	Resistor, Fixed, Composition: 2.7 kΩ, 5%, 1/4 W	2	CF1/4-2.7K/J	09021	
R28	Same as R5				
R29	Same as R6				
R30	Resistor, Fixed, Composition: 270Ω, 5%, 1/4 W	1	CF1/4-270 OHMS/J	09021	
R31	Resistor, Fixed, Composition: 1.0 MΩ, 5%, 1/4 W	1	CF1/4-1.0M/J	09021	
R32	Resistor, Fixed, Composition: 820 kΩ, 5%, 1/4 W	1	CF1/4-820K/J	09021	
R33	Resistor, Fixed, Composition: 100 kΩ, 5%, 1/4 W	1	CF1/4-100K/J	09021	
R34	Resistor, Fixed, Composition: 360Ω, 5%, 1/4 W	1	CF1/4-360 OHMS/J	09021	
R35	Same as R27				
R36	Same as R5				
R37	Resistor, Fixed, Composition: 4.7Ω, 5%, 1/4 W	1	CF1/4-4.7 OHMS/J	09021	
R38	Same as R5				
R39	Resistor, Fixed, Composition: 56Ω, 5%, 1/4 W	1	CF1/4-56 OHMS/J	09021	
R40	Resistor, Fixed, Composition: 470Ω, 5%, 1/4 W	5	CF1/4-470 OHMS/J	09021	
R41	Same as R6				
R42	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	4	CF1/4-10K/J	09021	
R43	Not Used				
R44	Resistor, Fixed, Composition: 47 kΩ, 5%, 1/4 W	1	CF1/4-47K/J	09021	
R45	Not Used				
R46	Resistor, Fixed, Composition: 1.5 kΩ, 5%, 1/4 W	1	CF1/4-1.5K/J	09021	
R47	Resistor, Fixed, Composition: 750Ω, 5%, 1/4 W	1	CF1/4-750 OHMS/J	09021	
R48	Same as R15				
R49	Same as R15				
R50	Same as R40				
R51	Same as R40				
R52	Same as R6				
R53	Same as R6				
R54	Same as R40				
R55	Same as R40				
R56	Not Used				
R57	Not Used				
R58	Not Used				
R59	Same as R15				
R60	Same as R6				

REF DESIG PREFIX A5A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R61	Same as R6				
R62	Same as R42				
R63	Same as R42				
R64	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/8 W	3	CF1/8-10K/J	09021	
R65	Resistor, Fixed, Film: 18.2 kΩ, 1%, 1/10 W	4	RN55C1822F	81349	75042
R66	Same as R65				
R67	Resistor, Fixed, Composition: 22Ω, 5%, 1/8 W	2	CF1/8-22 OHMS/J	09021	
R68	Resistor, Fixed, Film: 3.92 kΩ, 1%, 1/10 W	2	RN55C3922F	81349	75042
R69	Same as R64				
R70	Same as R65				
R71	Same as R65				
R72	Same as R67				
R73	Same as R68				
R74	Resistor, Fixed, Composition: 220Ω, 5%, 1/4 W	1	CF1/4-220 OHMS/J	09021	
R75	Same as R1				
R76	Same as R64				
R77	Not Used				
R78	Same as R15				
R79	Same as R42				
R80	Same as R6				
U1	Integrated Circuit	3	MC4044P	04713	
U2	Integrated Circuit	1	SN74177N	01295	
U3	Integrated Circuit	1	SN74S74N	01295	
U4	Integrated Circuit	1	796HC	07263	
U5	Integrated Circuit	1	N5733K	18324	
U6	Same as U1				
U7	Integrated Circuit	1	SN74LS190N	01295	
U8	Integrated Circuit	3	SN74LS191N	01295	
U9	Same as U8				
U10	Same as U8				
U11	Integrated Circuit	2	SN74LS00N	01295	
U12	Same as U11				
U13	Not Used				
U14	Integrated Circuit	1	SN74LS168N	01295	
U15	Integrated Circuit	2	MC12013P	04713	
U16	Same as U15				
U17	Integrated Circuit	2	SN74LS196N	01295	
U18	Not Used				
U19	Same as U17				
U20	Same as U11				
VR1	Diode, Zener: 8.2 V	1	1N756A	80131	04713

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

5.6.5.3 Type 791576-1 BFO Synthesizer

REF DESIG PREFIX A5A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 3.3 μ F, 20%, 35 V	1	196D335X0035JE3	56289	
C2	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 50 V	1	34475-1	14632	
C3	Capacitor, Electrolytic, Tantalum: 47 μ F, 20%, 20 V	3	196D476X0020PE4	56289	
C4	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	1	34452-1	14632	
C5	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	9	34453-1	14632	
C6	Capacitor, Ceramic, Tubular: 33 pF, 5%, 500 V	1	308-000C0G0-330J	72982	
C7	Capacitor, Ceramic, Tubular: 47 pF, 5%, 500 V	1	308-000C0G0-470J	72982	
C8	Capacitor, Variable, Ceramic: 2-8 pF, 350 V	1	538-006A2-8	72982	
C9	Same as C5				
C10	Capacitor, Mica, Dipped: 10 pF, \pm 0.5 pF, 500 V	2	CM04CD100D03	81349	72136
C11	Capacitor, Ceramic, Disc: 1000 pF, GMV, 500 V	2	B-GP1000PPF	91418	
C12	Same as C11				
C13	Same as C5				
C14	Same as C10				
C15	Not Used				
C16	Same as C3				
C17 Thru C21	Same as C5				
C22	Same as C3				
C23	Same as C5				
CR1	Diode, Varicap:	1	BB109-YELLOW	25088	
L1	Coil, Fixed: 27 μ H	1	1537-48	99800	
L2	Coil, Fixed, Molded: 330 μ H	1	2500-04	99800	
L3	Coil, Fixed: 0.82 μ H	1	1537-10	99800	
MP1	Transipad	4	7717-89DAP	13103	
MP2	Shield, BFO	1	34982-1	14632	
Q1	Transistor	1	2N2857/JAN	81350	
Q2	Transistor	1	841001-2	14632	
Q3	Transistor	1	2N706	80131	04713
Q4	Transistor	1	3N128	80131	02735
R1	Resistor, Variable, Film: 500 Ω , 10%, 1/2 W	1	62PAR500	73138	
R2	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	15	CF1/4-1.0K/J	09021	
R3	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	3	CF1/4-10K/J	09021	
R4	Same as R2				
R5	Resistor, Fixed, Composition: 10 Ω , 5%, 1/4 W	3	CF1/4-10 OHMS/J	09021	
R6	Same as R2				
R7	Same as R3				
R8	Resistor, Variable, Film: 4.22 k Ω , 1%, 1/10 W	1	RN55C4221F	81349	75042
R9	Resistor, Variable, Film: 17.8 k Ω , 1%, 1/10 W	2	RN55C1782F	81349	75042
R10	Same as R9				

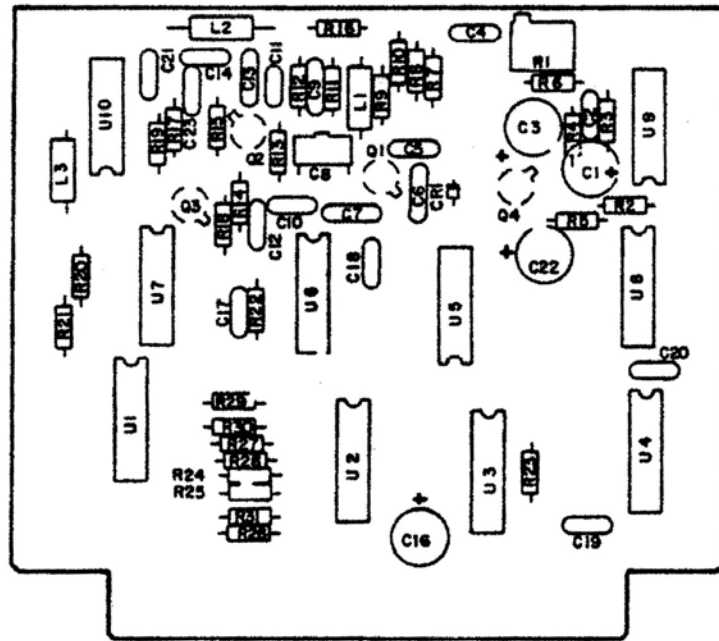


Figure 5-32. Type 791576-1 BFO Synthesizer (A5A3),
Location of Components

REPLACEMENT PARTS LIST

WJ-8718 SERIES HF RECEIVER

REF DESIG PREFIX A5A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R11	Same as R5				
R12	Resistor, Fixed, Composition: 560Ω, 5%, 1/4 W	1	CF1/4-560 OHMS/J	09021	
R13	Resistor, Fixed, Composition: 100 kΩ, 5%, 1/4 W	1	CF1/4-100K/J	09021	
R14	Resistor, Fixed, Composition: 1.0 MΩ, 5%, 1/4 W	1	CF1/4-1.0M/J	09021	
R15	Resistor, Fixed, Composition: 820 kΩ, 5%, 1/4 W	1	CF1/4-820K/J	09021	
R16	Same as R5				
R17	Same as R3				
R18	Same as R2				
R19	Same as R2				
R20	Resistor, Fixed, Composition: 220Ω, 5%, 1/4 W	1	CF1/4-220 OHMS/J	09021	
R21	Resistor, Fixed, Composition: 62Ω, 5%, 1/4 W	1	CF1/4-62 OHMS/J	09021	
R22 Thru R31	Same as R2				
U1	Integrated Circuit	4	SN74LS190N	01295	
U2 Thru U4	Same as U1				
U5	Integrated Circuit	2	SN7425N	01295	
U6	Integrated Circuit	1	SN74LS11N	01295	
U7	Same as U5				
U8	Integrated Circuit	1	867474	14632	
U9	Integrated Circuit	1	MC4044P	04713	
U10	Integrated Circuit	1	SN74LS90N	01295	

FIGURE 5-33

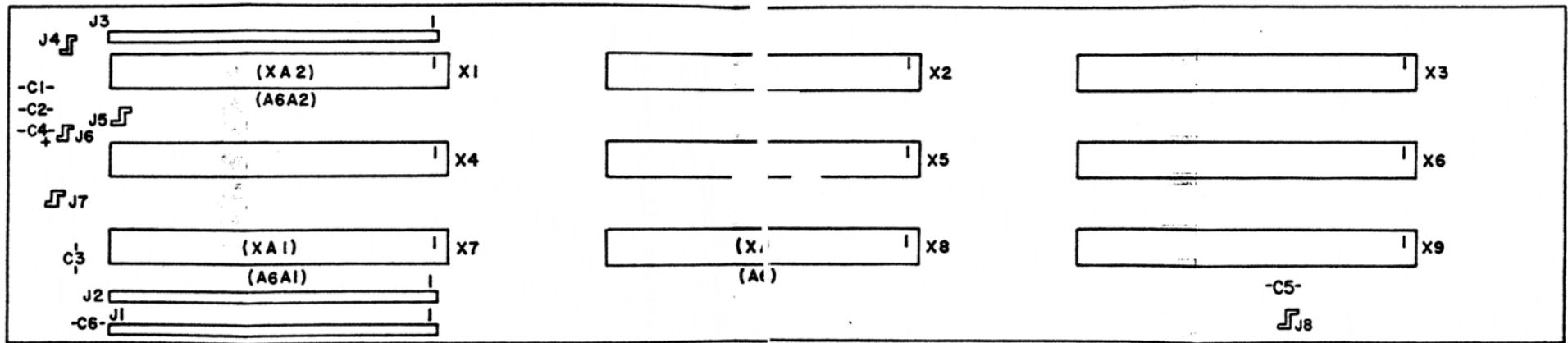


Figure 5-33. Type 791580 I/O Motherboard (A6), Location of Components

5.6.6 TYPE 791580 I/O MOTHERBOARD

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1*	Manual Tuning Up/Down Counter (Not optional on WJ-8718A)	1	791575-3	14632	
A2	Front Panel Interconnect	1	791828	14632	
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	5	34452-1	14632	
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Electrolytic, Tantalum: 100 μ F, 20%, 20 V	1	196D107X0020TE4	56289	
C5	Same as C1				
C6	Same as C1				
J1	Post, Feedthru	3	PE7-14045	00779	
J2	Same as J1				
J3	Same as J1				
J4	Faston Tab	5	62073-1	00779	
J5 Thru J8	Same as J4				
X1	Connector, P.C. Board	9	MK30C-14-195-4381	81312	
X2 Thru X9	Same as X1				
*	Part of MCM-2 Option.				

FIGURE 5-34

WJ-8718 SERIES HF RECEIVER

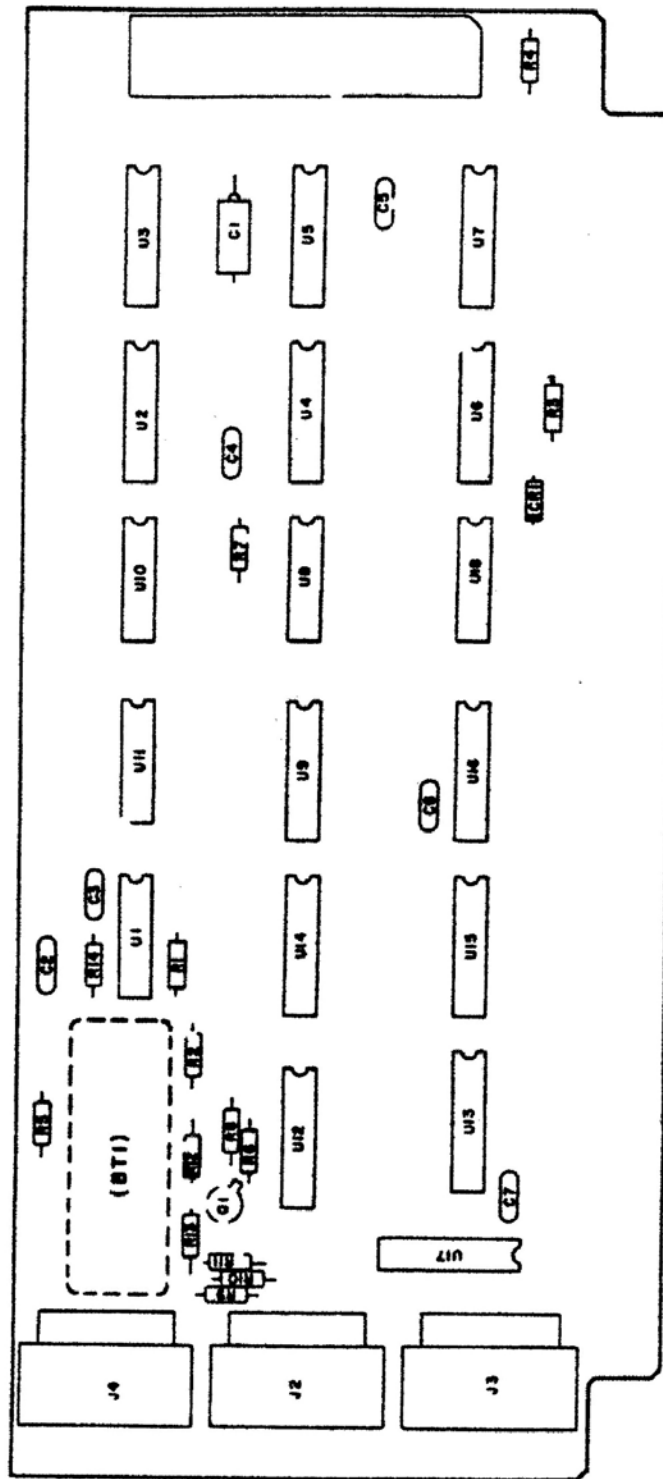


Figure 5-34. Type 791575-3 Manual Tuning Up/Down Counter (A6A1), Location of Components

WJ-8718 SERIES HF RECEIVER

REPLACEMENT PARTS LISTS

5.6.6.1 Type 791575-3* Manual Tuning Up/Down Counter

REF DESIG PEFIX A6A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 22 μ F, 10%, 15 V	1	CS13BD226K	81349	56289
C2	Capacitor, Ceramic, Disc: 470 pF, 20%, 1000 V	1	BHD470-20PCT	91418	
C3	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	5	34453-1	14632	
C4 Thru C7	Same as C3				
CR1	Diode	1	5082-2900	28480	
J1	Not Used				
J2	Connector, Receptacle	3	87567-4	00779	
J3	Same as J2				
J4	Same as J2				
MP1	Socket, Battery (791575-2 only)	4	09-9017-1-06	18310	
MP1	Not Used (791575-3 only)				
MP2	Transipad	1	7717-44DAP	13103	
Q1	Transistor	1	2N2222A	80131	04713
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	8	CF1/4-10K/J	09021	
R2	Same as R1				
R3	Resistor, Fixed, Composition: 4.7 Ω , 5%, 1/4 W	1	CF1/4-4.7 OHMS/J	09021	
R4 Thru R8	Same as R1				
R9	Resistor, Fixed, Composition: 820 Ω , 5%, 1/4 W	1	CF1/4-820 OHMS/J	09021	
R10	Same as R1				
R11	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	2	CF1/4-1.0K/J	09021	
R12	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	1	CF1/4-100 OHMS/J	09021	
R13	Same as R11				
R14	Resistor, Fixed, Composition: 470 k Ω , 5%, 1/4 W	1	CF1/4-470K/J	09021	
U1	Integrated Circuit	1	MM74C14N	27014	
U2	Integrated Circuit	6	MC14510BCP	04713	
U3 Thru U7	Same as U2				
U8	Integrated Circuit	3	MC14081BCP	04713	
U9	Integrated Circuit	1	MC14027BCP	04713	
U10	Integrated Circuit	1	MC14070BCP	04713	
U11	Same as U8				
U12	Integrated Circuit	4	MC14512CP	04713	
U13 Thru U15	Same as U12				
U16	Integrated Circuit	1	MC14520BCP	04713	
U17	Integrated Circuit	1	MC14050BCP	04713	
U18	Same as U8				

*Part of MCM-2 Option.

FIGURE 5-35

WJ-8718 SERIES HF RECEIVER

5.6.6.2 Type 791828-1 Front Panel Interconnect

REF DESIG PREFIX A6A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 50 V	1	34452-1	14632	
CR1	Diode	10	1N995	80131	04713
CR2 Thru CR10	Same as CR1				
J1	Connector, Receptacle	1	1-87567-6	00779	
MP1	Transipad	1	7717-22DAP	13103	
Q1	Transistor	1	2N4037	80131	02735
R1	Resistor, Fixed, Composition: 620 Ω , 5%, 1/4 W	1	CF1/4-620 OHMS/J	09021	
R2	Resistor, Fixed, Composition: 100 Ω , 5%, 1/4 W	1	CF1/4-100 OHMS/J	09021	
R3	Resistor, Fixed, Composition: 2.7 k Ω , 5%, 1/4 W	1	CF1/4-2.7K/J	09021	
R4	Resistor, Fixed, Composition: 100 k Ω , 5%, 1/4 W	1	CF1/4-100K/J	09021	
R5	Resistor, Fixed, Composition: 22 Ω , 5%, 1/2 W	1	RCR20G220JS	81349	01121
R6	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	4	CF1/4-10K/J	09021	
R7 Thru R9	Same as R6				
U1	Integrated Circuit	2	MC14053BCP		
U2	Same as U1				

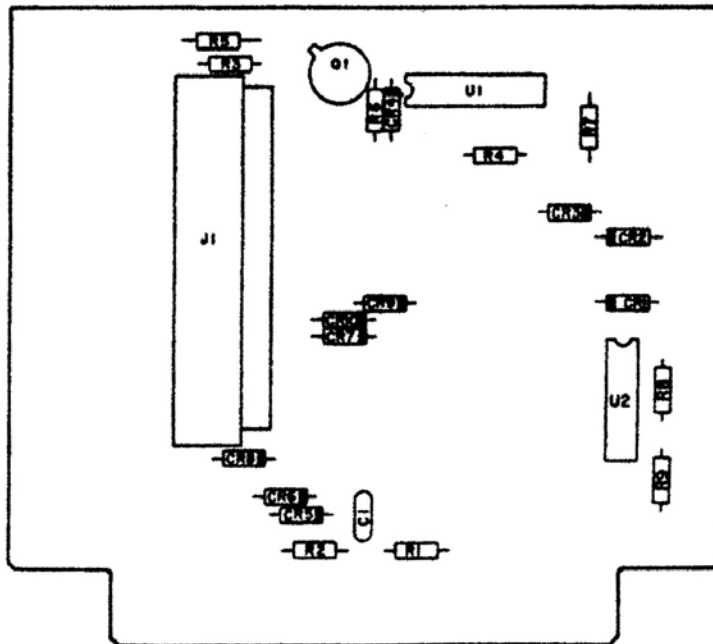


Figure 5-35. Type 791828-1 Front Panel Interconnect (A6A2), Location of Components

WJ-8718 SERIES HF RECEIVER

FIGURE 5-36

5.6.7 TYPE 791874-1 MANUAL TUNING MODULE*

REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	Tuning Resolution	1	791589	14632	
MP1	Knob Assembly	1	280064-1	14632	
MP2	Button: Black Shell with Green Indicator	5	FA101-BLK W/GRN	31918	
U1	Encoder Assembly	1	34836-1	14632	
*	Part of MCM-2 Option.				

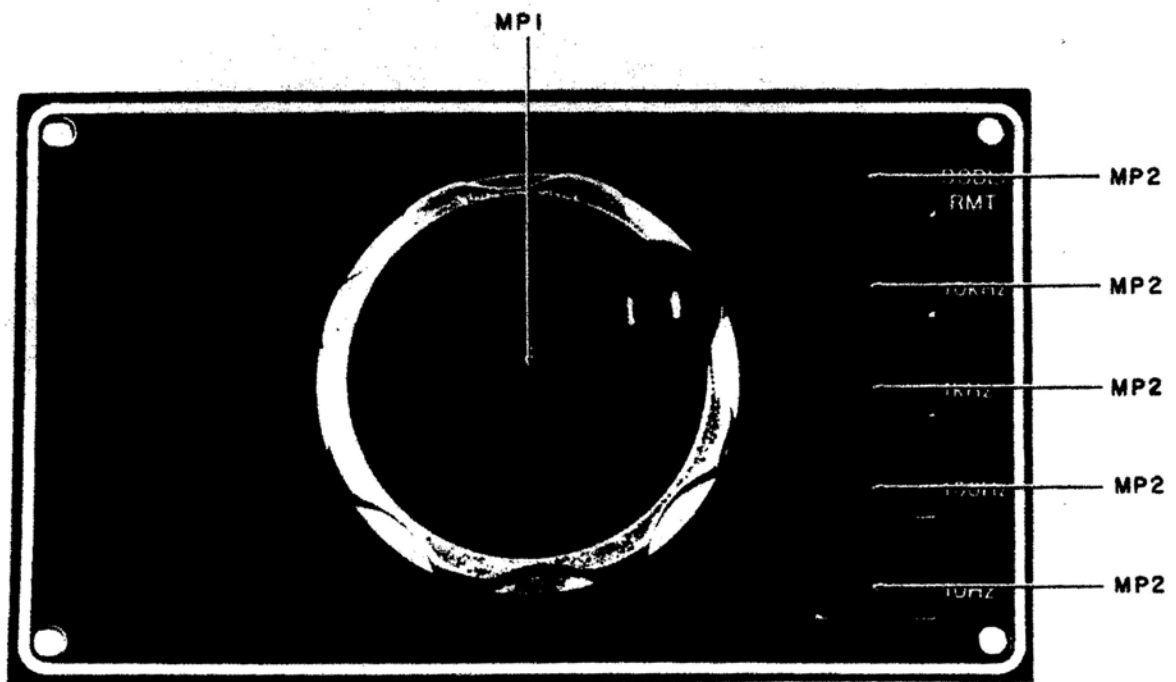


Figure 5-36. Type 791874-1 Manual Tuning Module (A7), Location of Components

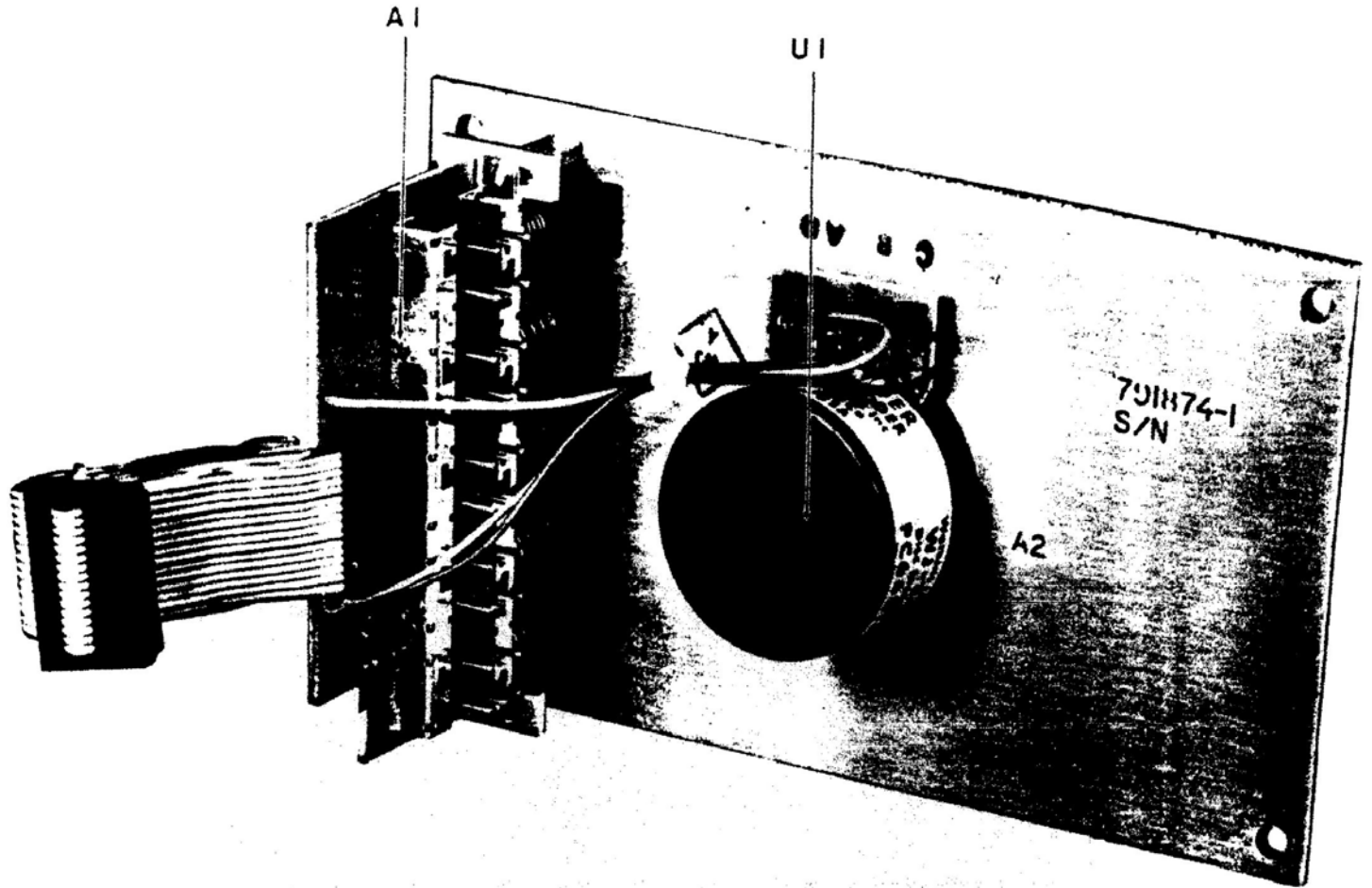


Figure 5-37. Type 791874-1 Manual Tuning Module (A7), Rear View, Location of Components

5.6.7.1 **Type 791589 Tuning Resolution**

REF DESIG PREFIX A7A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
S1	Switch, Pushbutton	1	18488	14632	
--	Cable Assembly	1	380140-1	14632	

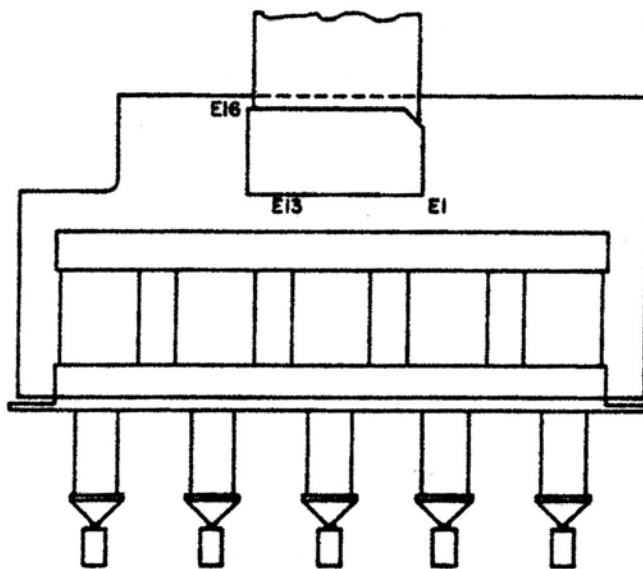


Figure 5-38. Type 791589 Tuning Resolution (A7A1),
Location of Components

FIGURE 5-39

WJ-8718 SERIES HF RECEIVER

5.6.8 TYPE 791578-1 FREQUENCY DISPLAY

REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	2	34453-1	14632	
C2	Same as C1				
CR1	Diode: LED	1	5082-4150	28480	
MP1	Insulator	1	60-11-5791-1674	18565	
Q1	Transistor	1	TIP29	01295	
R1	Resistor, Fixed, Composition: 150 Ω , 5%, 1/4 W	1	CF1/4-150 OHMS/J	09021	
R2	Resistor, Variable, Film: 100 Ω , 10%, 3/4 W	1	89PR100	73138	
R3	Resistor, Fixed, Composition: 820 Ω , 5%, 1/4 W	1	CF1/4-820 OHMS/J	09021	
R4	Resistor, Fixed, Composition: 200 Ω , 5%, 1/4 W	1	CF1/4-200 OHMS/J	09021	
U1	Display, LED	7	5082-7663	28480	
U2 Thru U7	Same as U1				
U8	Integrated Circuit	1	DS8857N	27014	
U9	Integrated Circuit	1	CD4028AE	02735	
U10	Integrated Circuit	1	DS8863N	27014	
--	Cable Assembly	1	380140-2	14632	

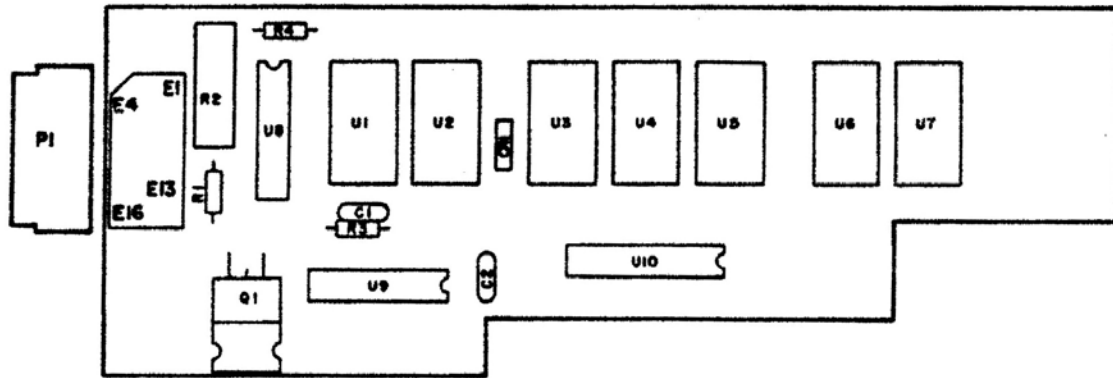


Figure 5-39. Type 791578-1 Frequency Display (A8), Location of Components

5.6.9 TYPE 791827 BFO SWITCH

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
--	Cable Assembly	1	34524-1	14632	
P1	Part of Cable Assembly	--			
P2	Plug Assembly	1	34477-19	14632	
S1	Switch, Thumbwheel	1	339910490-00226	09353	

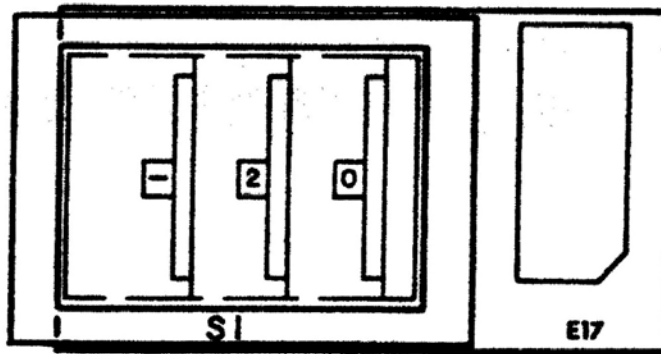


Figure 5-40. Type 791827 BFO Switch (A9),
Location of Components

FIGURE 5-41

WJ-8718 SERIES HF RECEIVER

5.6.10 TYPES 791684-2(1) and 796053(2)
FRONT PANEL CONTROL

REF DESIG PREFIX A10

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	Upper Panel Control	1	791583	14632	
A2	Lower Panel Control (791684-2 only)	1	791826	14632	
A2	Lower Panel Control (796053 only)	1	796054	14632	
--	Cable Assembly	1	34528	14632	
	(1) WJ-8718 (2) WJ-8718-9 & WJ-8718A				

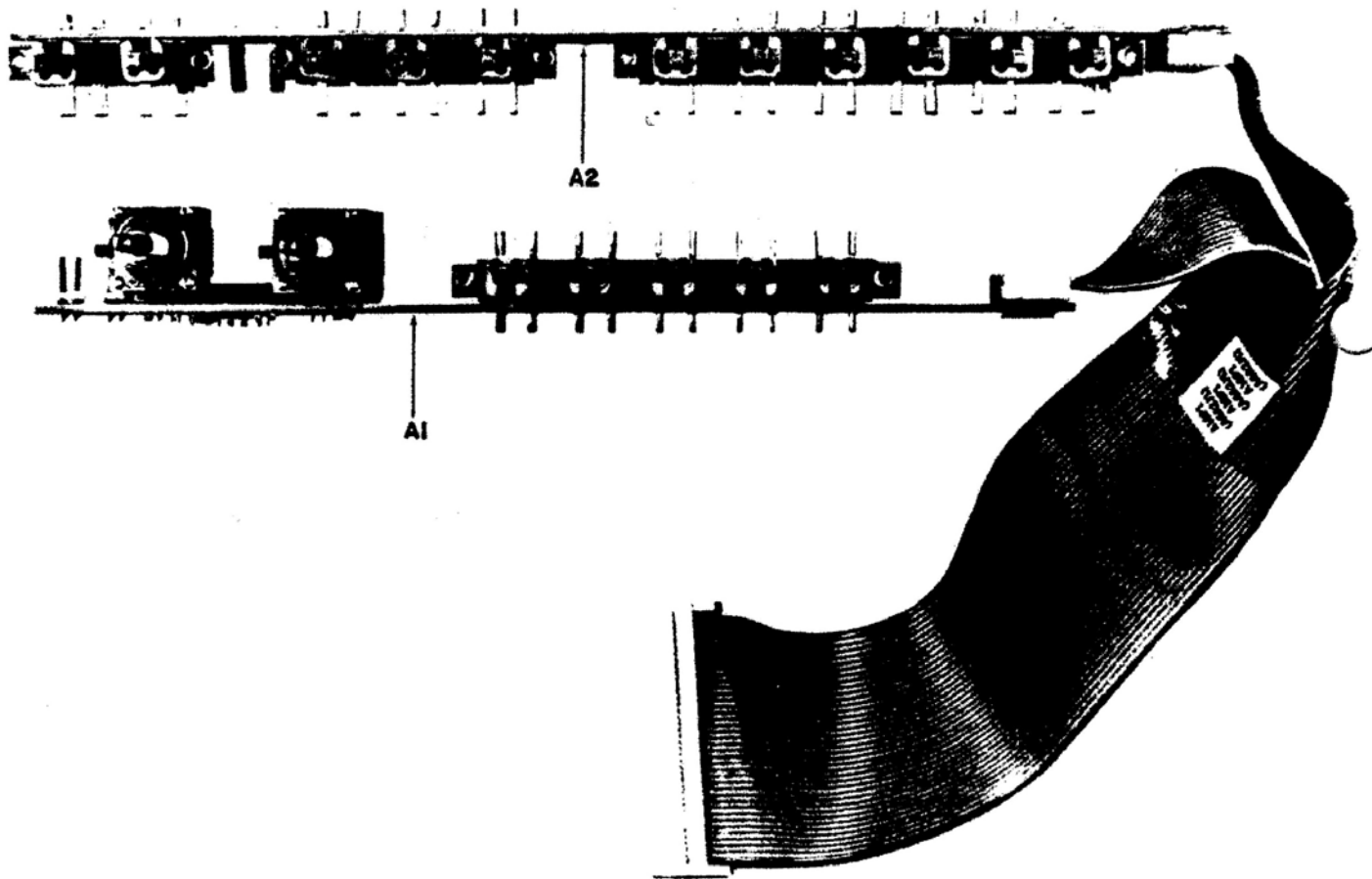


Figure 5-41. Type 791684-2 Front Panel Control (A10),
Location of Components (WJ-8718 only)

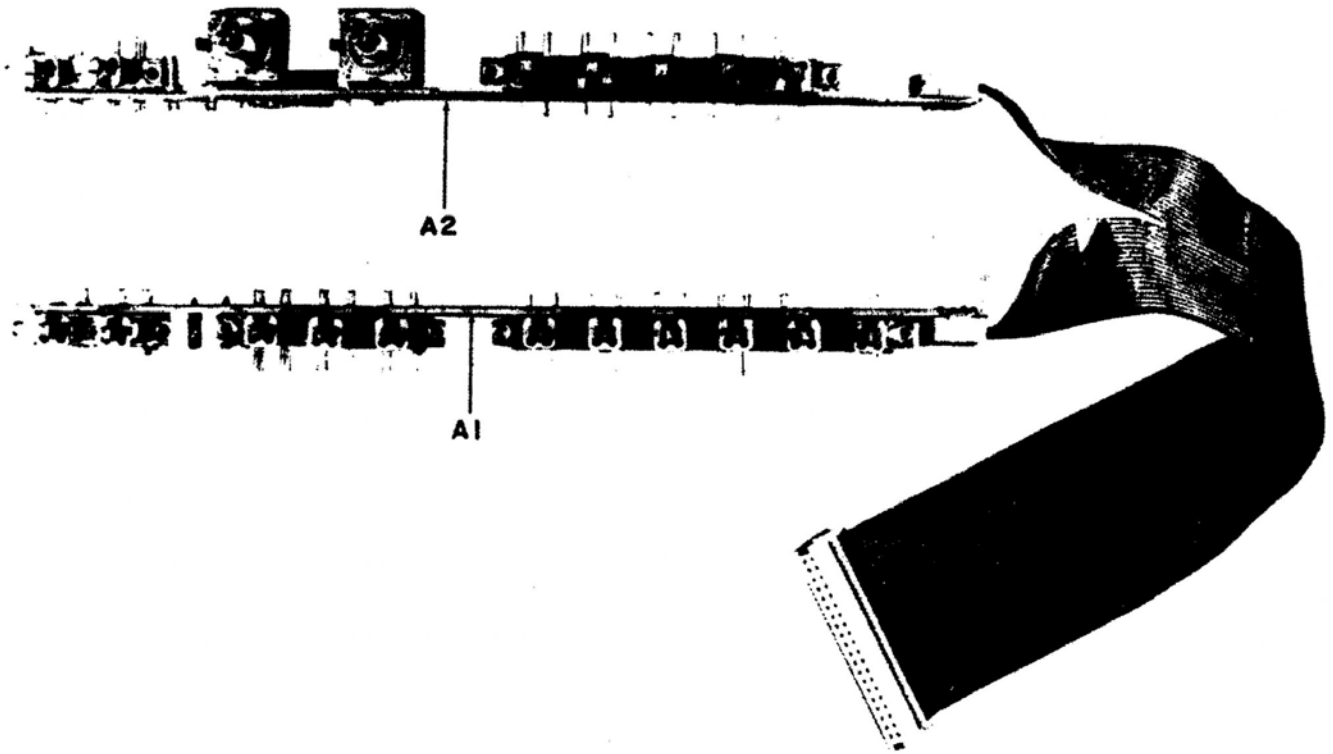


Figure 5-42. Type 796053 Front Panel Control (A10),
Location of Components (WJ-8718-9 & WJ-8718A)

FIGURE 5-43

WJ-8718 SERIES HF RECEIVER

5.6.10.1 Type 791583 Upper Panel Control

REF DESIG PREFIX A10A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
J1	Faston Tab	1	62073-1	00779	
S1	Switch, Pushbutton	1	18485	14632	
S2	Switch, Pushbutton	1	18486	14632	
S3	Switch, Pushbutton	1	18487	14632	

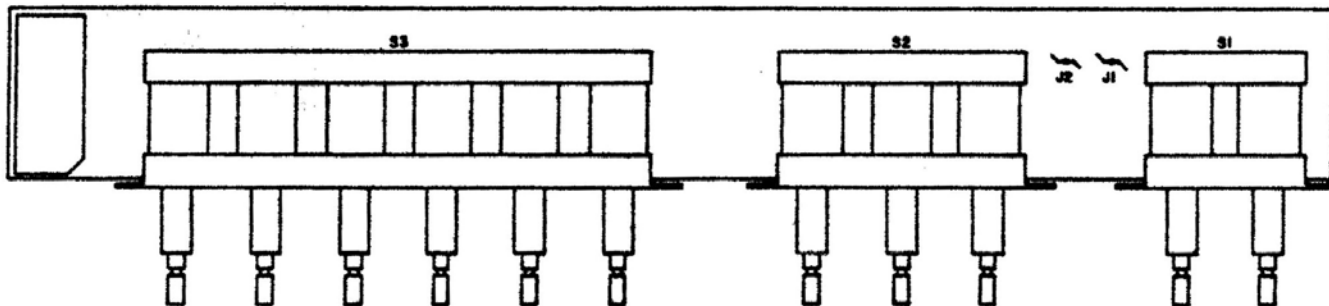


Figure 5-43. Type 791583 Upper Panel Control (A10A1),
Location of Components

WJ-8718 SERIES HF RECEIVER

5.6.10.2 Types 791826(1) and 796054(2)
Lower Panel Control

REF DESIG PREFIX A10A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 50 V	1	34453-1	14632	
J1	Faston Tab	4	62073-1	00779	
J2 Thru J4	Same as J1				
R1	Resistor, Variable, Composition: 25 k Ω , 10%, 1 W	1	70M3N056L253U	01121	
R2	Resistor, Variable, Composition: 25 k Ω /25 k Ω , 10%, 1 W	1	70P3N056L253A	01121	
R3	Resistor, Fixed, Composition: 220 Ω , 5%, 1/4 W	2	CF1/4-220 OHMS/J	09021	
R4	Same as R3				
R5	Resistor, Fixed, Composition: 100 k Ω , 5%, 1/4 W	2	CF1/4-100K/J	09021	
R6	Resistor, Fixed, Composition: 1.0 k Ω , 5%, 1/4 W	2	CF1/4-1.0K/J	09021	
R7	Same as R5				
R8	Same as R6				
S1	Switch, Pushbutton	1	18488	14632	
S2	Switch, Pushbutton (796054 only)	1	18485	14632	
U1	Integrated Circuit	1	MC3403P	04713	

(1) WJ-8718
(2) WJ-8718-9 and WJ-8718A

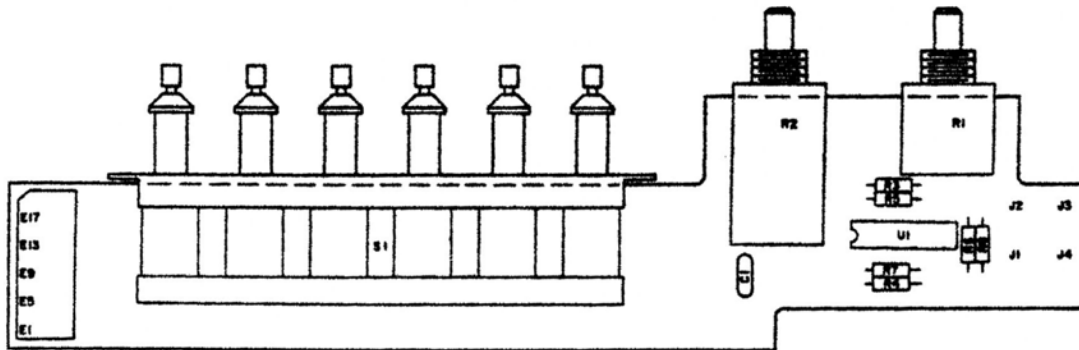


Figure 5-44. Type 791826 Lower Panel Control (A10A2), Location of Components (WJ-8718 only)

FIGURE 5-45

WJ-8718 SERIES HF RECEIVER

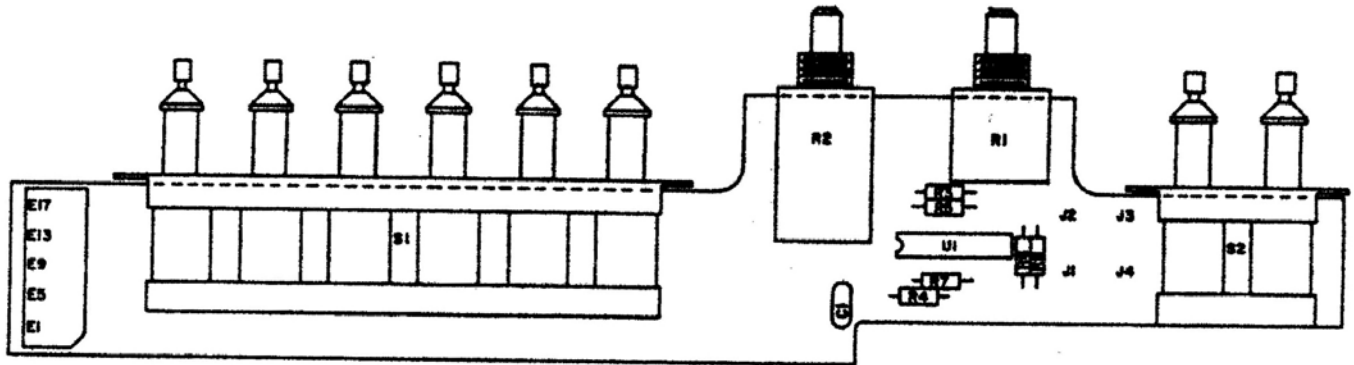


Figure 5-45. Type 796054 Lower Panel Control (A10A2),
Location of Components (WJ-8718-9 & WJ-8718A)

SECTION VI
SCHEMATIC DIAGRAMS

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 a.) RESISTANCE IS IN OHMS $\pm 5\%$, 1/4W
 b.) CAPACITANCE IS IN pF

DASH NO.	R1	R2	R3
-1	8.2 1/8 W	560 1/8 W	560 1/8 W
-2	NOT USED (JUMPER)	NOT USED	NOT USED

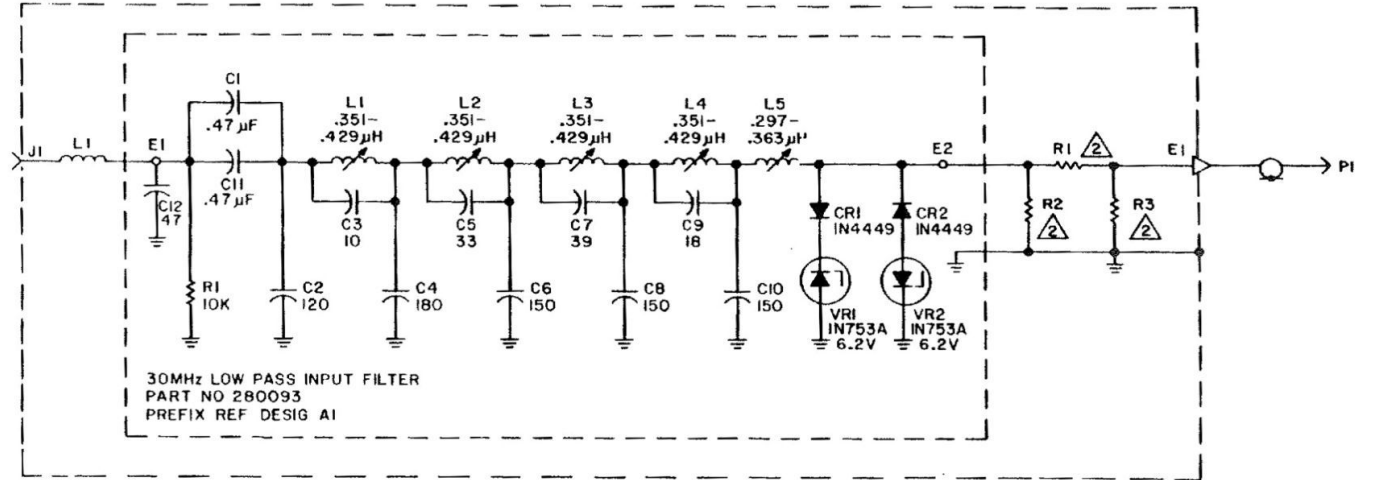
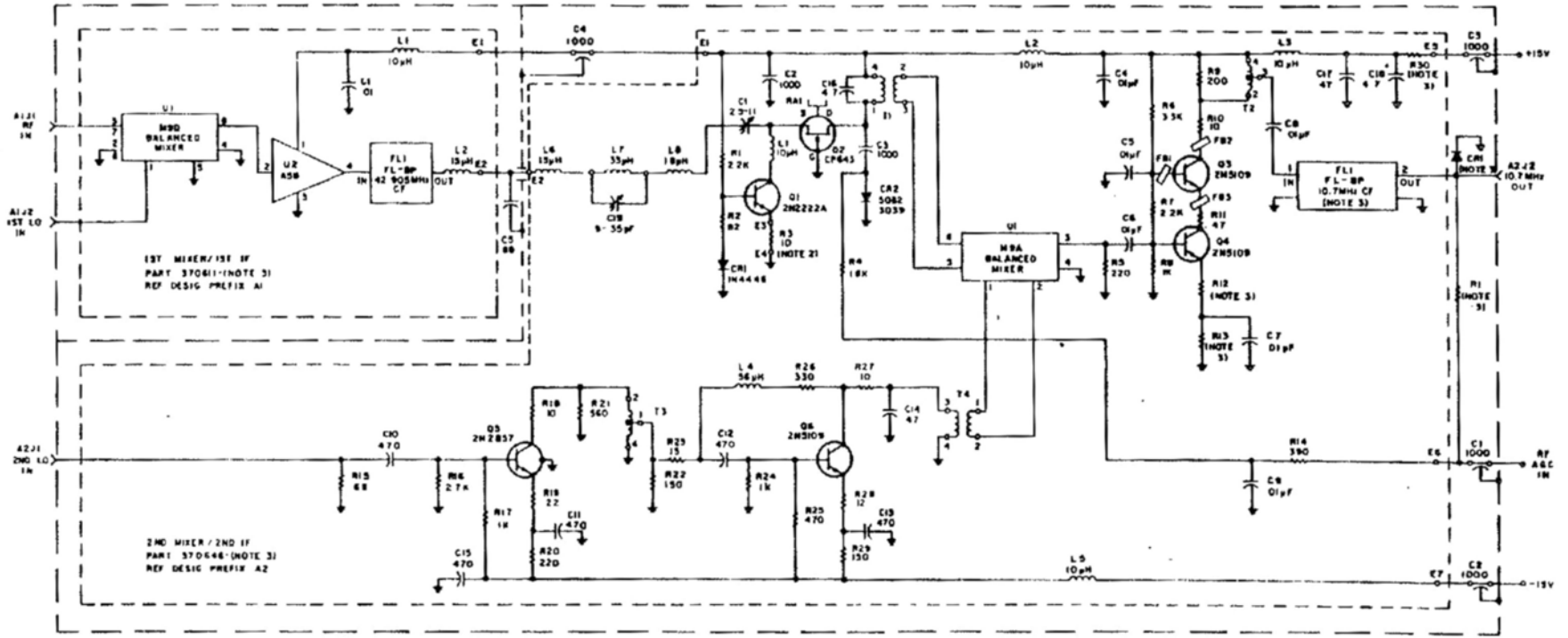


Figure 6-1. Type 791616-1 Input Filter (A2)
 Schematic Diagram 380082

Courtesy of <http://BlackRadios.terryo.org>



- NOTES:
 1 UNLESS OTHERWISE SPECIFIED
 a) RESISTANCE IS IN OHMS, 5% 1/4W
 b) CAPACITANCE IS IN pF
 2 NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.
 3 DIFFERENCE BETWEEN TYPES ARE SHOWN IN TABLE A.

TABLE A

TYPE	A1	A2	A1P1	SR	A2P1	SR	AER12	CR1	R1	AER13	AER30
791592-1	370611-1	370646-1	92123	26 kHz	92124	16 kHz	4.7	NOT USED	NOT USED	68	10
791592-2	370611-1	370646-1	92123	26 kHz	92124	16 kHz	4.7	9062-3039	1K	68	10
791592-3	370611-2	370646-2	92195	64 kHz	92196	40 kHz	12.0	NOT USED	NOT USED	68	10
791592-4	370611-4	370646-3	92221	100 kHz	SEE DETAIL A	4.7	NOT USED	NOT USED	68	10	
791592-5	370611-5	370646-4	92212	40 kHz	92211	30 kHz	13	NOT USED	NOT USED	22	22
791592-6	370611-6	370646-5	92248	80 kHz	92247	100 kHz	4.7	NOT USED	NOT USED	68	10
791592-7	370611-6	370646-6	92248	150 kHz	92246	58 kHz	4.7	NOT USED	NOT USED	68	10

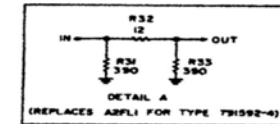
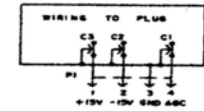
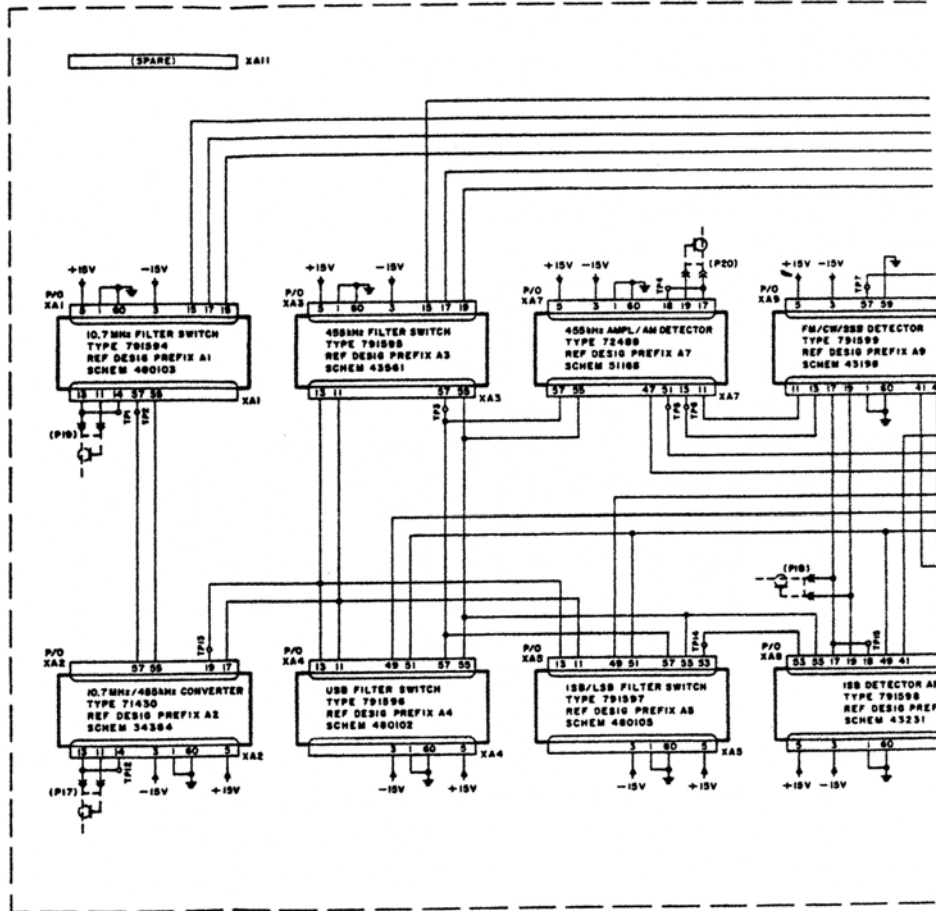


Figure 6-2. Type 791592-1 Input Converter (A3) Schematic Diagram 576202



NOTES:
 1. CAPACITANCE IS IN μ F.
 2. SPARE "E" NOS. AND CAPACITORS ARE NOT SHOWN. EACH CAPACITOR REFERENCE NUMBER IS IDENTICAL TO EACH "E" NO.; C3 ON E3, C26 ON E26, ETC.
 3. MOST MODULE PINS ARE NOT SHOWN DUE TO UNNECESSARY LINE DUPLICATIONS AND COMPLEXITY. SEE EACH MODULE'S OWN FOR CLARITY.
 4. PLUGS SHOWN IN DASH LINES ARE PART OF NEXT ASSEMBLY AND NOT OF THIS MODULE.

TEST POINTS DESCRIPTIONS:
 TP1 10.7MHz INPUT
 TP2 10.7MHz FILTER SW OUTPUT
 TP3 455kHz FILTER SW IF OUTPUT
 TP4 455kHz AMPLIFIER IF OUTPUT
 TP5 DETECTED AM
 TP6 IF INPUT TO FM/CW/SSB DETECTOR
 TP7 FM/CW AUDIO
 TP8, TP9 LINE AUDIO
 TP10 PHONE AUDIO
 TP11 LINE LEVEL AUDIO
 TP12 3RD LO INPUT TO 10.7MHz/455kHz CONVERTER
 TP13 10.7MHz/455kHz CONVERTER IF OUTPUT
 TP14 15B IF INPUT
 TP15 8FO INPUT
 TP16, TP17, TP18 15B AUDIO
 TP19 IF AGC
 TP20 AFD
 TP21 15B AGC
 TP22 RF AGC

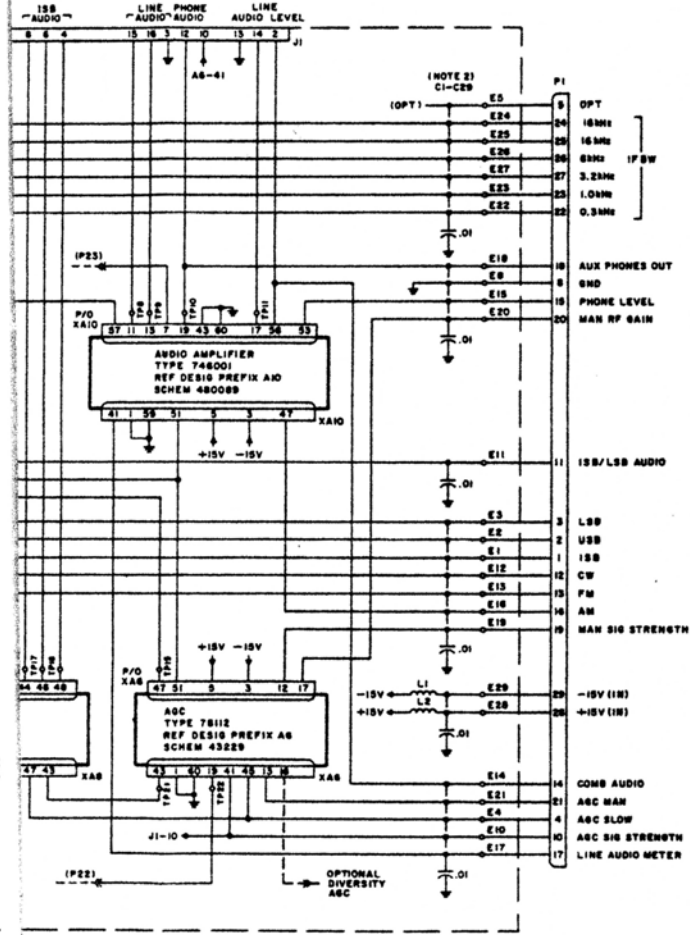
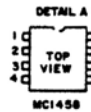


Figure 6-3. Type 791569 IF Motherboard (A4) Schematic Diagram 570191

NOTES.

1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, ± 5%, 1/4W.
 b) CAPACITANCE IS IN μF.
2. PIN CONFIGURATION SHOWN IN DETAIL A.
3. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE I.



TYPE	R19	R46	C17	FL1		FL2		FL3	L4	R22	R23	R24
				PART	BW	PART	BW					
791594-1	220	12	0.1	92126	3.2 kHz	92125	6.0 kHz	NOT USED	NOT USED	33	560	33
791594-2	220	12	0.1	92229	4.0 kHz	92125	6.0 kHz	NOT USED	NOT USED	33	560	33
791594-3	1.2K	47	27 pF	92220	8.0 kHz	92219	40 kHz	SFE10.7MA-5RED	10 μH	NOT USED	510	510
791594-4 MCH ONLY	220	12	0.1	92126	3.2 kHz	92125	6.0 kHz	NOT USED	NOT USED	33	560	33

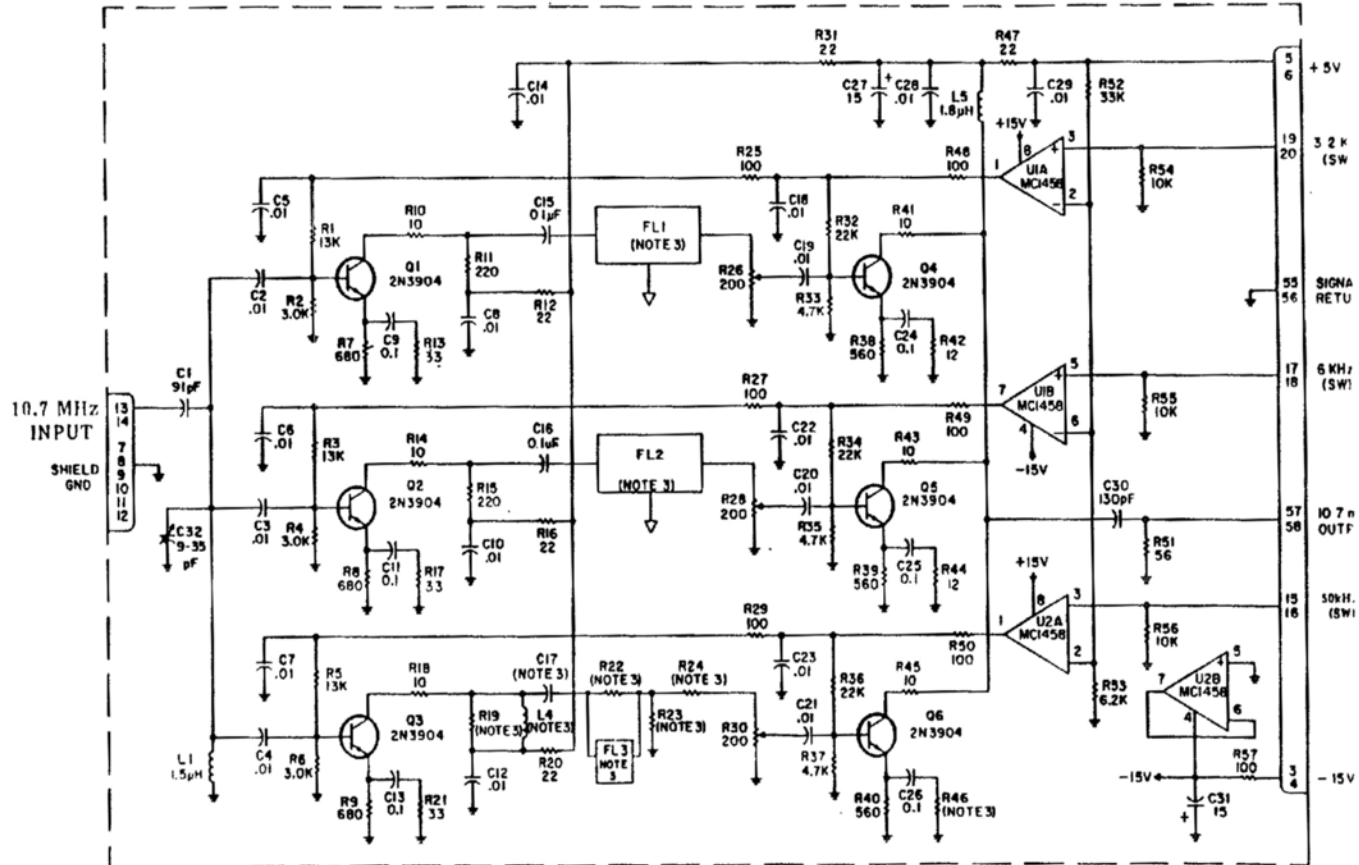
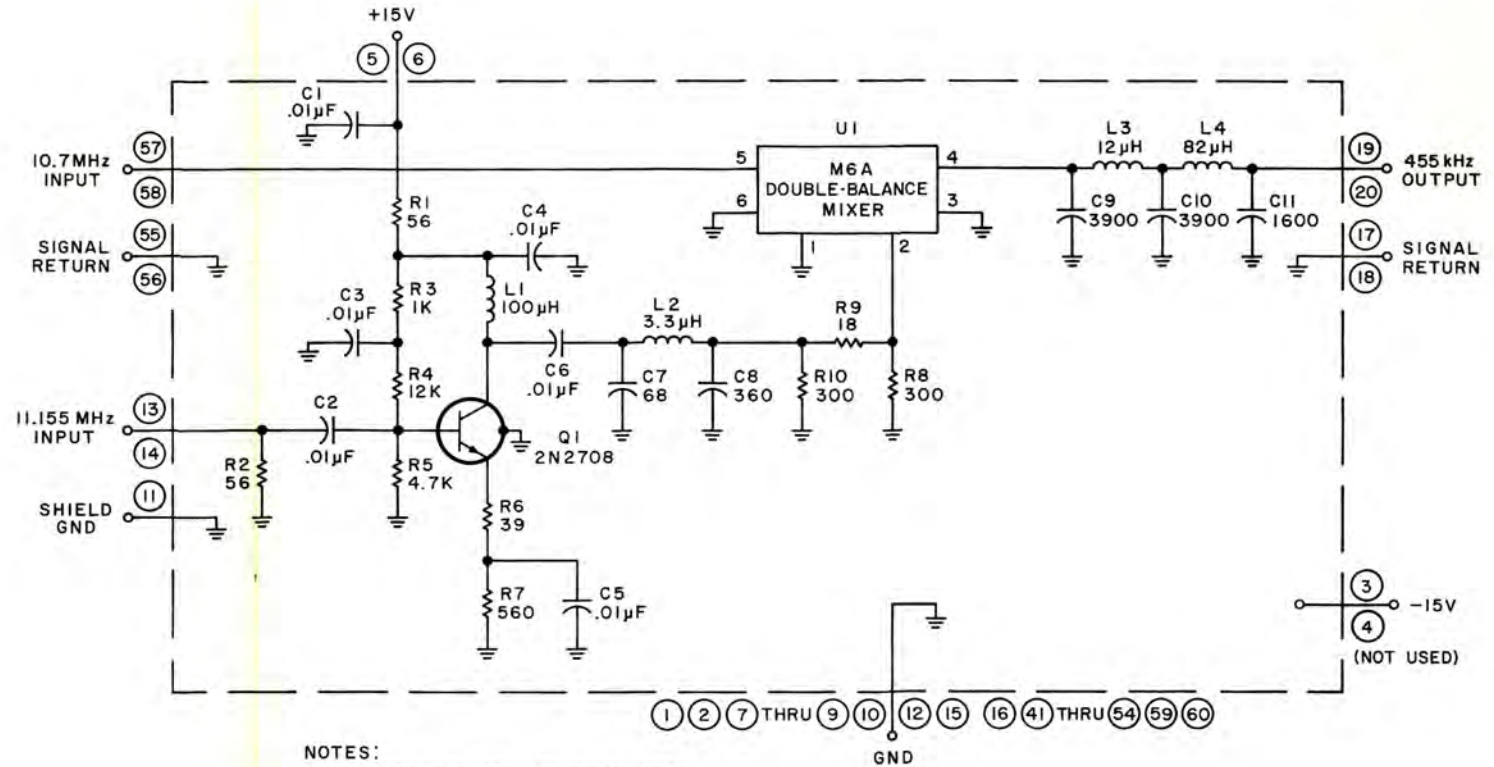


Figure 6-4. Type 791594 10.7 MHz Filter Switch (A4A1) Schematic Diagram 480103

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4 W.
b) CAPACITANCE IS IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PINS.
3. DIFFERENCE BETWEEN TYPES IS MECHANICAL ONLY.



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4 W.
b) CAPACITANCE IS IN pF.

Figure 6-5.

Type 71430 10.7 MHz/455 kHz Converter (A4A2)
Schematic Diagram 34384

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS $\pm 5\%$, 1/4W.
 b) CAPACITANCE IS IN μF .
2. ENCIRCLED NUMBERS ARE MODULE PINS.
3. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE I.
4. IF DIFFICULTY OF PROCUREMENT EXISTS FOR PART MC3403P PART LM348N MAY BE USED AS ALTERNATE IN THIS APPLICATION.
5. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.

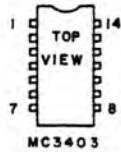


TABLE I

TYPE	FL1	FL2	R32		
791595-1	92126	325 Hz	92127	1 kHz	220
791595-2	20611	100 Hz	92127	1 kHz	220
791595-3	92210	300 Hz	92209	1 kHz	220
791899-4	92126	325 Hz	92127	1 kHz	NOTE B
790890-5	92127	1 kHz	92209	3.2 kHz	NOTE B
791895-6	92128	325 Hz	92127	1 kHz	220

MECH ONLY

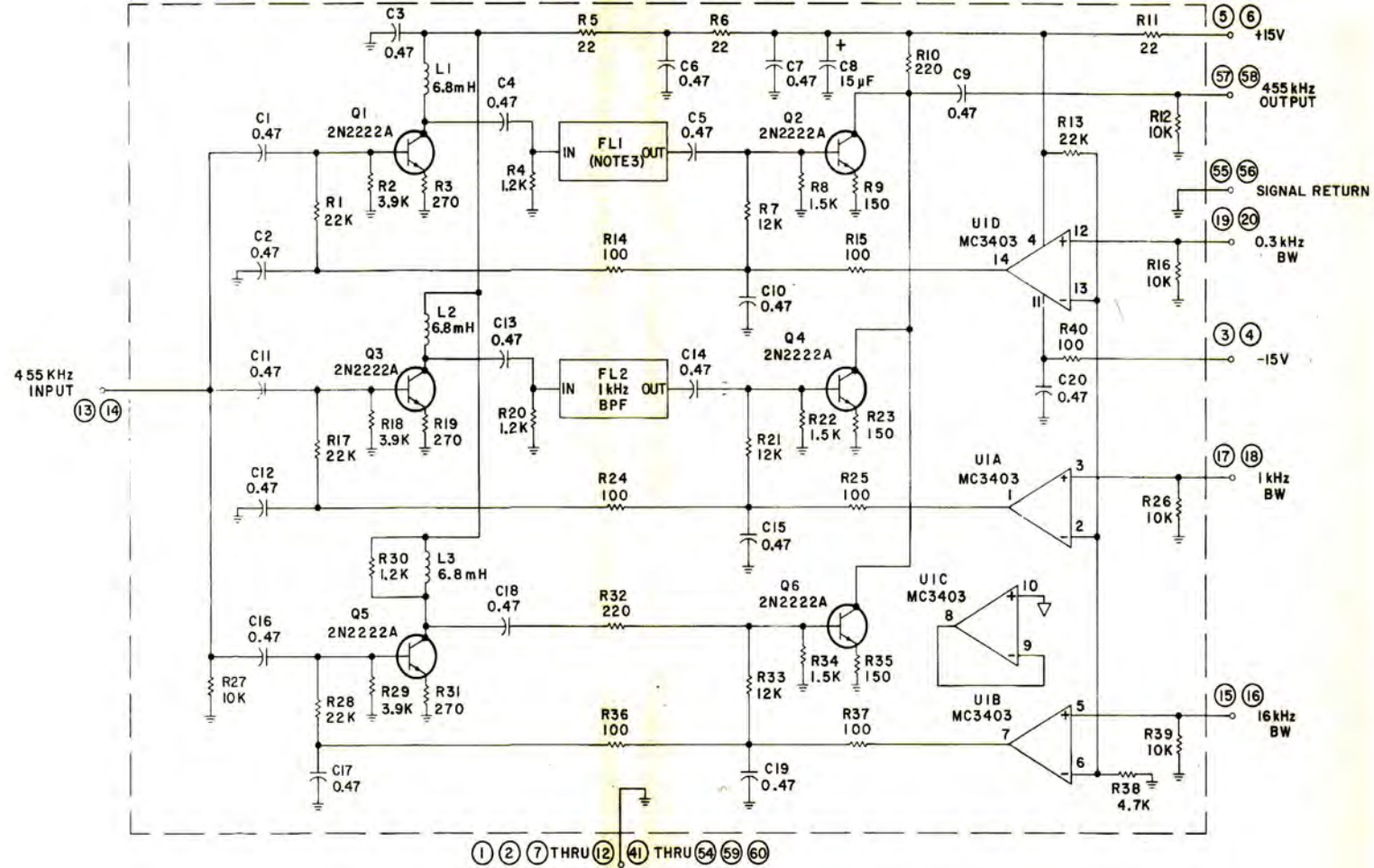


Figure 6-6.

Type 791595 455 kHz Filter Switch (A4A3)
Schematic Diagram 43561

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
 b) CAPACITANCE IS IN μ F.
2. PIN CONFIGURATION IS SHOWN IN
 DETAIL A
3. DIFFERENCE BETWEEN TYPES IS
 SHOWN IN TABLE A

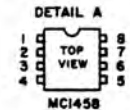


TABLE A

TYPE	FLI
791596-1	92122
791596-2	92194
791596-3 (MECH. ONLY)	92122

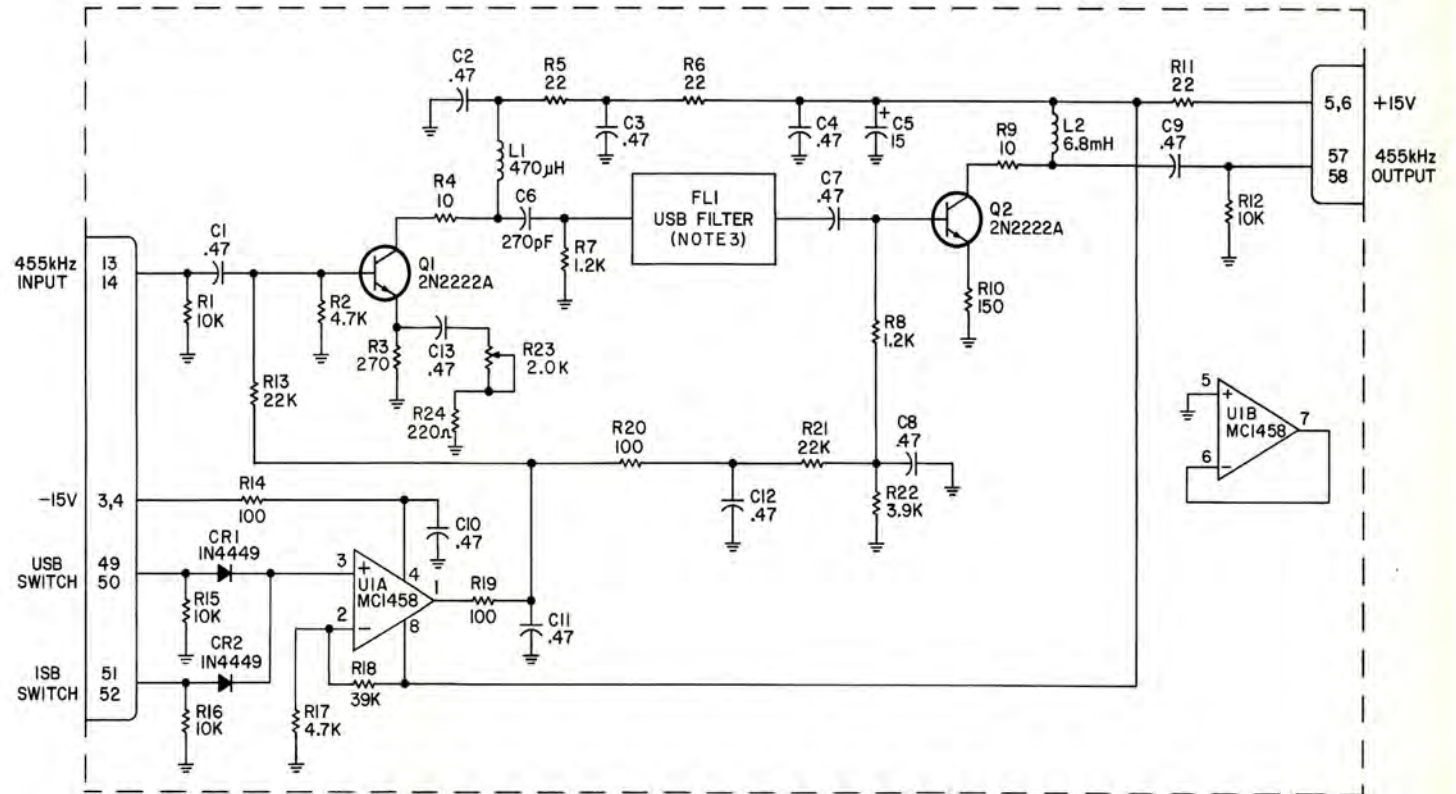


Figure 6-7. Type 791596 USB Filter Switch (A4A4) Schematic Diagram 480102

- NOTES:
 1. UNLESS OTHERWISE SPECIFIED
 a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W
 b) CAPACITANCE IS IN μ F
 2. PIN CONFIGURATION IS SHOWN
 IN DETAIL A.
 3. DIFFERENCE BETWEEN TYPES
 IS SHOWN IN TABLE A



TYPE	FLI
791597-1	92121
791597-2	92193
791597-3	92121

(MECH ONLY)

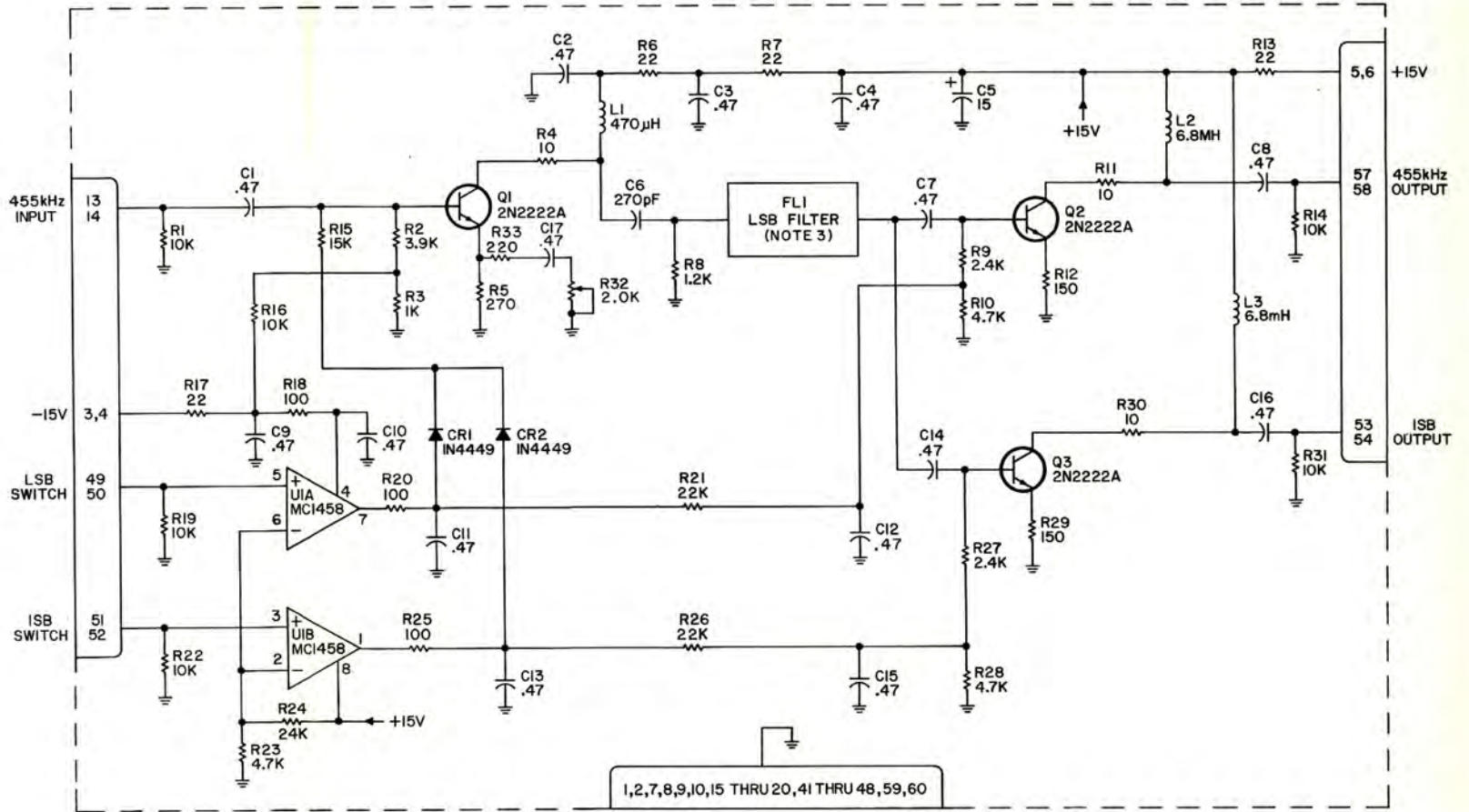
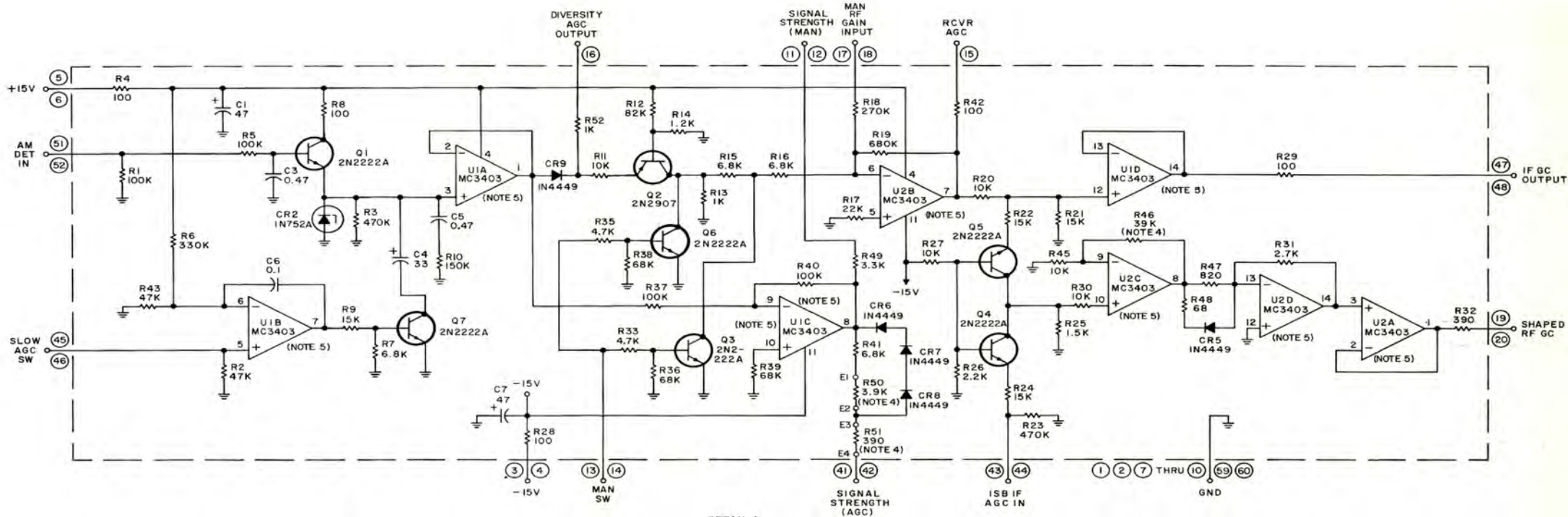


Figure 6-8. Type 791597 ISB/LSB Filter Switch (A4A5) Schematic Diagram 480105



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
 b) CAPACITANCE IS IN μF .
2. ENCIRCLED NUMBERS ARE MODULE PINS.
3. U1, U2 LEAD ARRANGEMENT—DETAIL A.
4. NOMINAL VALUE; FINAL VALUE FACTORY SELECTED.
5. LM348N MAY BE USED AS AN ALTERNATIVE FOR MC3403 (SHOULD A DIFFICULTY IN PROCURING MC3403 ARISE) AT U1 AND U2 IN THIS APPLICATION.

DETAIL A

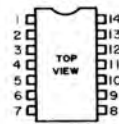


Figure 6-9. Type 78112 AGC Amplifier (A4A6) Schematic Diagram 43229

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
 b) CAPACITANCE IS μF .
2. ENCIRCLED NUMBERS (LETTERS) ARE MODULE PIN NUMBERS.
3. CW ON R7 INDICATES FULL CLOCKWISE POSITION OF ACTUATOR.
4. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE A.

TABLE A

TYPE NO	C9	C10	C11	C16	L1	L3	L7	USED ON
72488-1	3300pF	180pF	3300pF	180pF	39 μH	39 μH	6.8 mH	9J-871B
72488-2	910pF	110pF	910pF	180pF	150mH	20mH	4.7 mH	9J-871B
72488-3 (SPECIAL ONLY)	3300pF	180pF	3300pF	180pF	39 μH	39 μH	6.8 mH	9J-871B

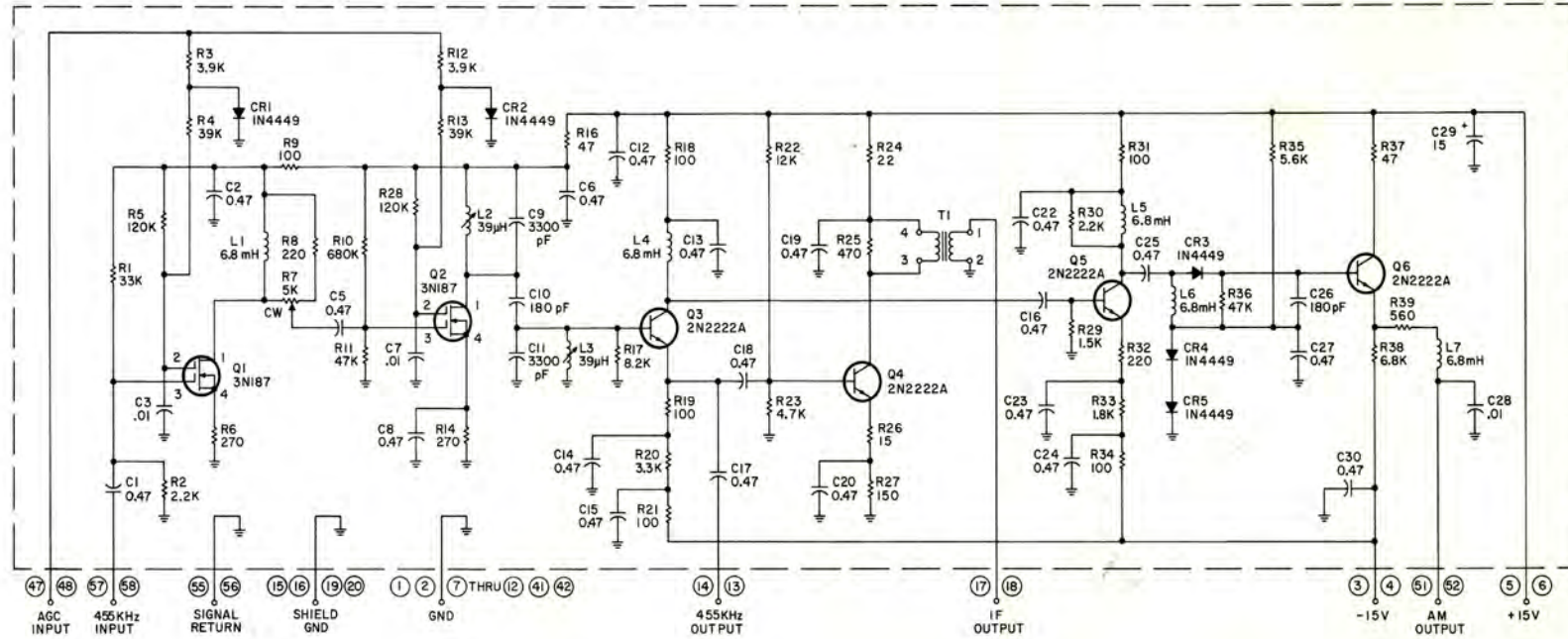
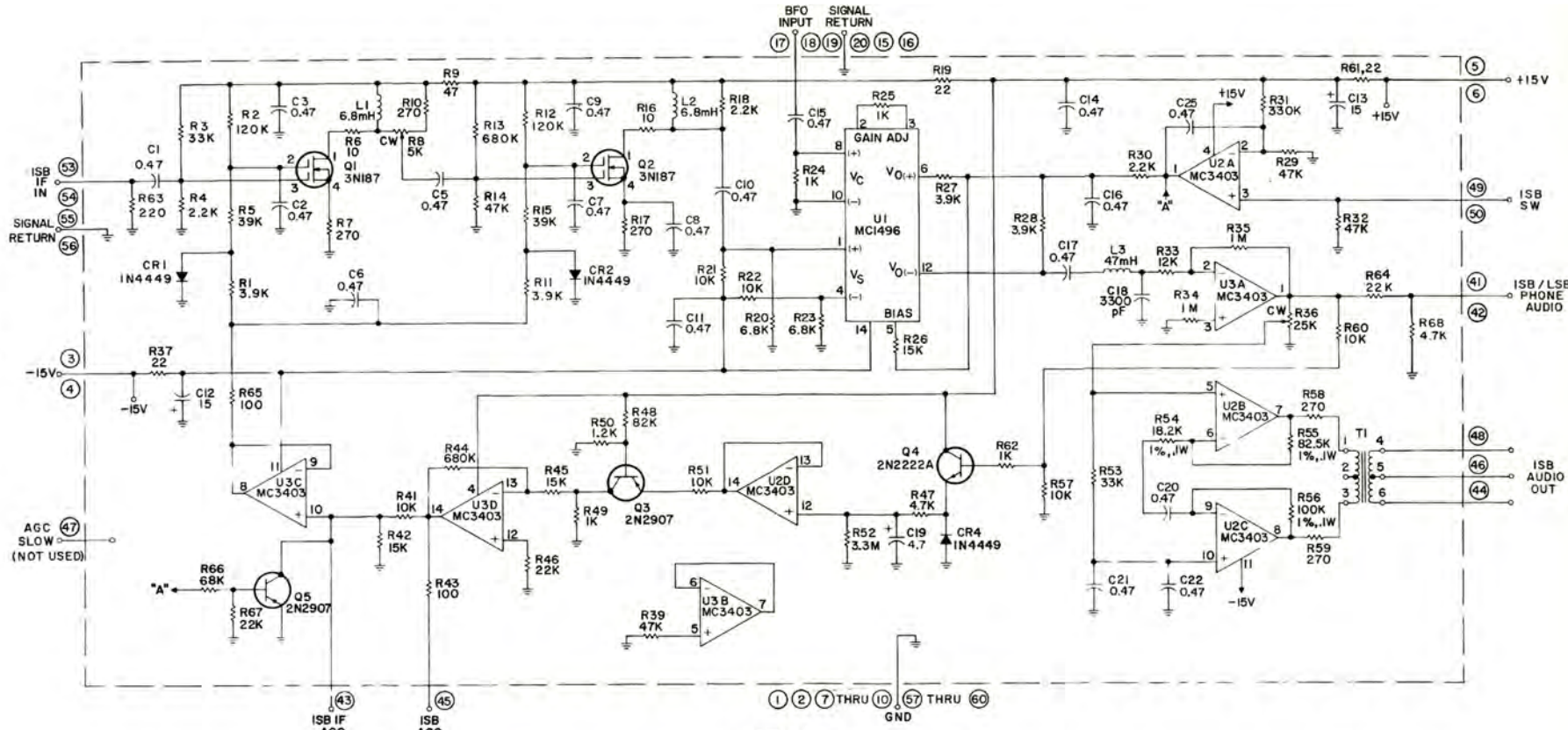


Figure 6-10.

Type 72488 455 kHz Amplifier/AM Detector (A4A7)
 Schematic Diagram 51168

NOTES

- 1 UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
 b) CAPACITANCE IS IN μF
- 2 ENCIRCLED NUMBERS ARE MODULE PINS.
- 3 U1, U2, U3 LEAD ARRANGEMENT - DETAIL A
4. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.
5. DIFFERENCE BETWEEN TYPES IS MECHANICAL ONLY.



NOTES

- 1 UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
 b) CAPACITANCE IS IN μF
- 2 ENCIRCLED NUMBERS ARE MODULE PINS.
- 3 U1, U2, U3 LEAD ARRANGEMENT - DETAIL A

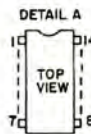
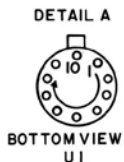
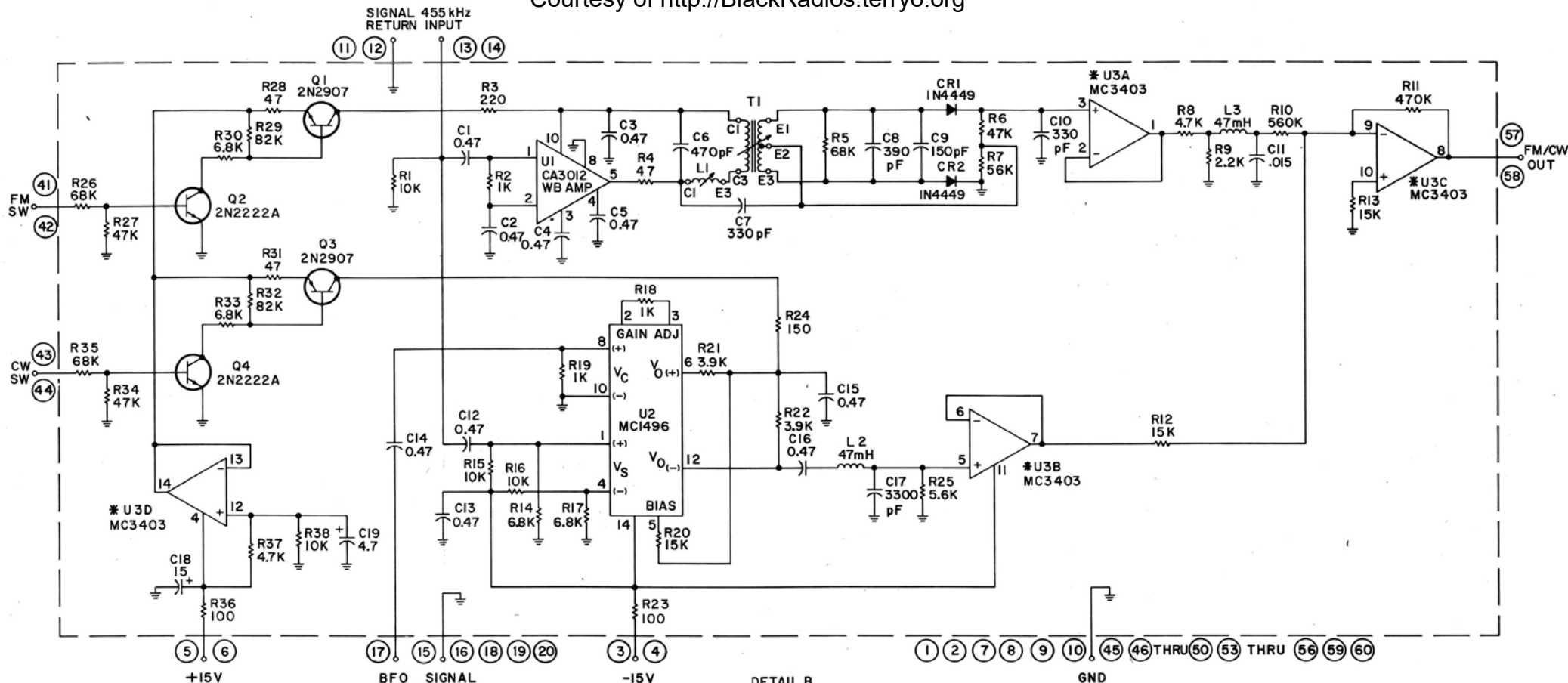


Figure 6-11. Type 791598 ISB Detector/Audio (A4A8) Schematic Diagram 43231



- NOTES:
1. UNLESS OTHERWISE SPECIFIED
 - a) RESISTANCE IS IN OHMS, ± 5%, 1/4W.
 - b) CAPACITANCE IS IN μF.
 2. ENCIRCLED NUMBERS ARE MODULE PINS.
 3. LEAD ARRANGEMENT OF IC'S-DETAIL A, B
 - * 4. IF DIFFICULTY OF PROCUREMENT EXISTS FOR PART MC3403P, PART LM 348N MAY BE USED AS ALTERNATE IN THIS APPLICATION.

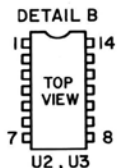


Figure 6-12 Type 791599 FM/CW/SSB Detector (A4A9), Schematic Diagram 43198

Courtesy of <http://BlackRadios.terry.org>

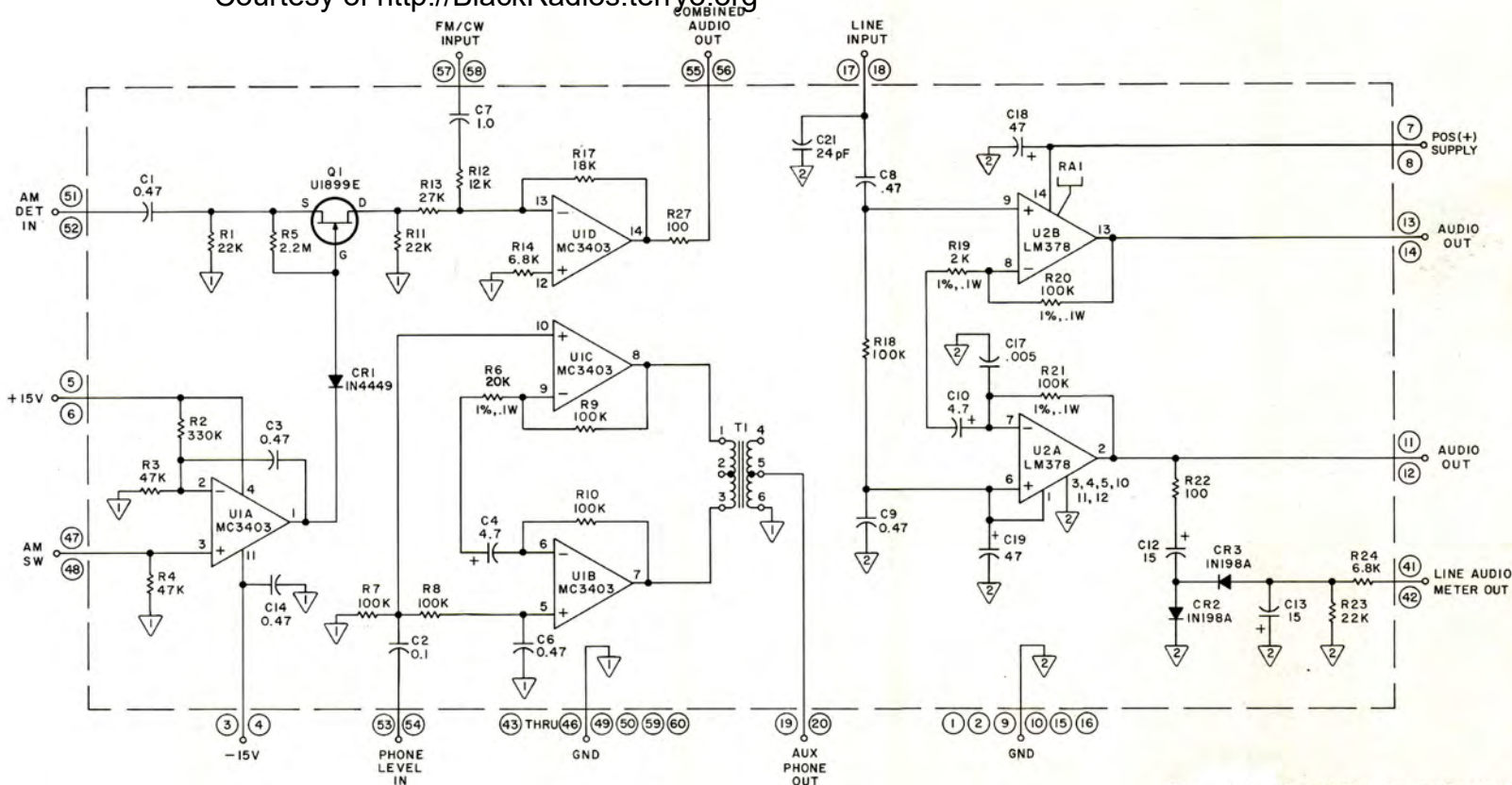


Figure 6-13 Type 746001 Audio Amplifier (A4A10), Schematic Diagram 480089

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
 b) CAPACITANCE IS IN μF .
2. ENCIRCLED NUMBERS ARE MODULE PINS.
3. U1, U2 LEAD ARRANGEMENT - DETAIL A.

DETAIL A



Courtesy of <http://BlackRadios.terryo.org>

- NOTES:
1. MOST MODULE PINS ARE NOT SHOWN DUE TO UNNECESSARY LINE DUPLICATIONS. OPTIONAL PINS ON SOME MODULES ARE NOT SHOWN BECAUSE OF COMPLEXITY (SEE EACH OPTION DWG FOR CLARITY).
 2. PLUGS A7P1, A8P1, A9P1, A10P1 ARE FOR REF ONLY, AND ARE NOT OF THIS ASSEMBLY.
 3. TEST POINT DESCRIPTIONS:
- | | |
|------|----------|
| TP1 | AS SHOWN |
| TP2 | |
| TP3 | |
| TP4 | |
| TP5 | |
| TP6 | |
| TP7 | |
| TP8 | |
| TP9 | |
| TP10 | |
| TP11 | |
| TP12 | |
| TP13 | AS SHOWN |
| TP14 | |
| TP15 | |
| TP16 | |
| TP17 | |
| TP18 | |
| TP19 | |
| TP20 | |

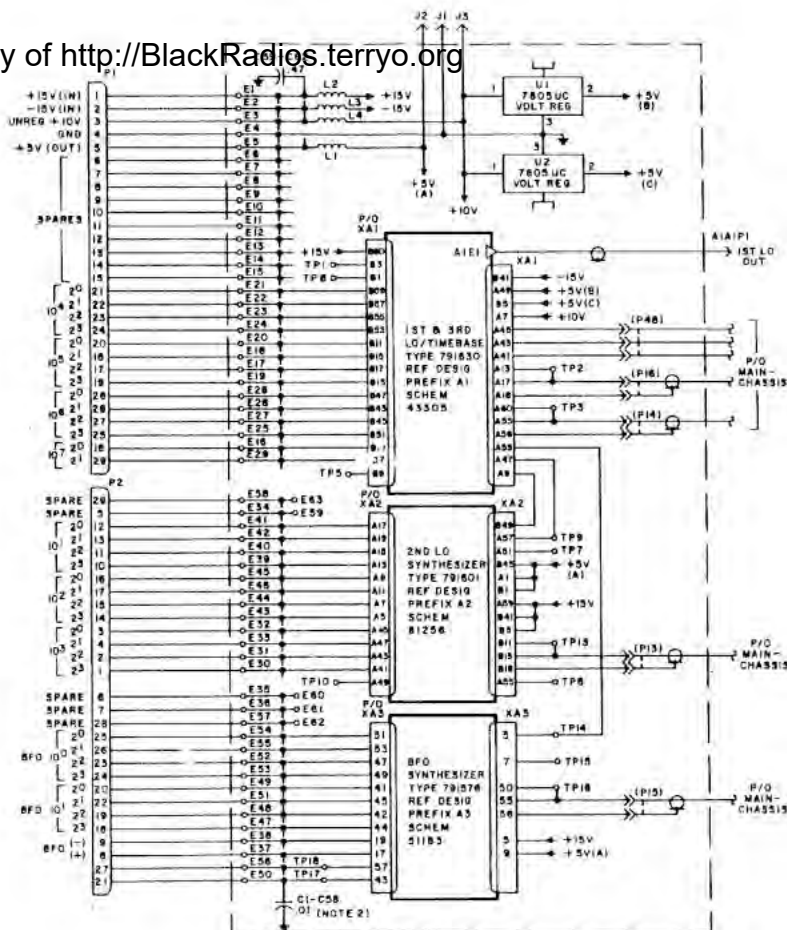
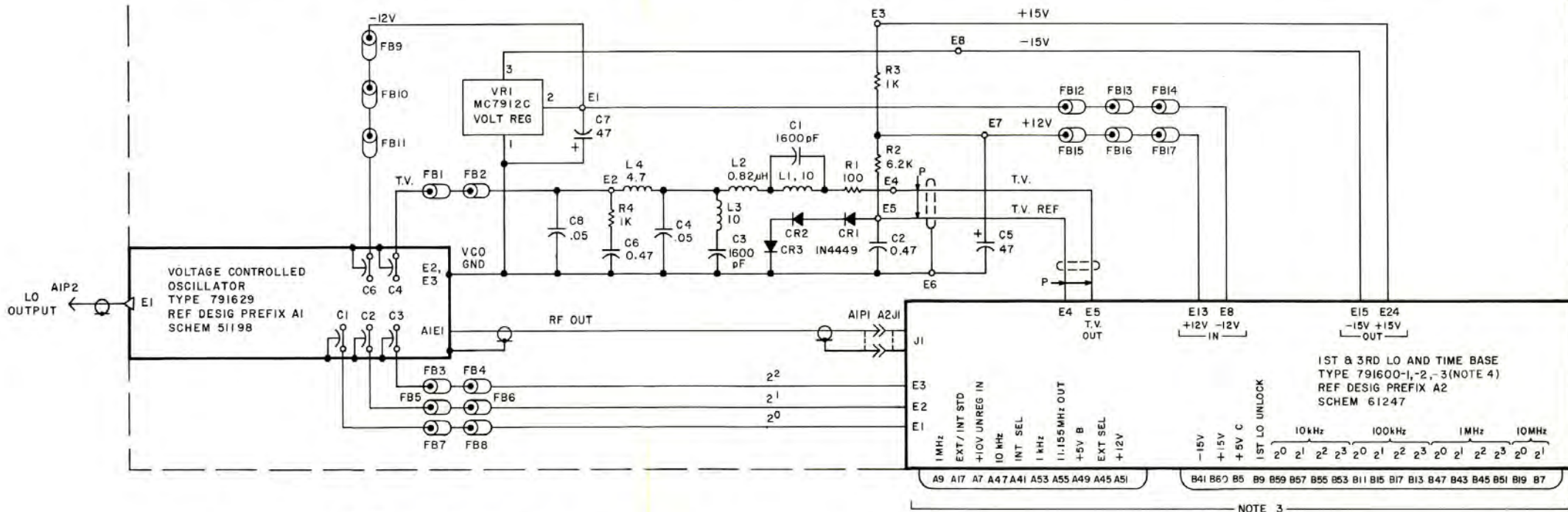


Figure 6-14 Type 791570 Synthesizer Motherboard (A3)

Schematic Diagram 470518



NOTES:

1. UNLESS OTHERWISE SPECIFIED
 - a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W
 - b) CAPACITANCE IS IN μF .
 - c) INDUCTANCE IS IN mH.
2. LEAD ARRANGEMENT FOR VR1 IS SHOWN IN DETAIL A.
3. LETTERS (NUMBERS) ARE MODULE (A2) PINS. GND PINS FOR GND₁, GND₂, GND₃, ARE LISTED IN TABLE A.
4. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE B.

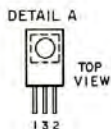


TABLE A

GND	MODULE PIN
GND ₁	A48, 50, 52, 54, 56, 58, 60
GND ₂	A2, 4, 6, 8, 10, 14, 16, 18, 20, 42, 44, 46
GND ₃	B2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 42, 44, 46, 48, 50, 52, 54, 56, 58

TABLE B

TYPE	A2
791630-1	791600-1
791630-2	791600-2
791630-3	791600-3

Figure 6-15 Type 791630-1 1st & 3rd LO Synthesizer/Time Base (A5A1) Schematic Diagram 470518

Courtesy of <http://BlackRadios.terryo.org>

- NOTES:
 1 UNLESS OTHERWISE SPECIFIED
 a) RESISTANCE IS IN OHMS $\pm 5\%$, 1/8W
 b) CAPACITANCE IS IN pF.
 2. NOMINAL VALUE; FINAL VALUE FACTORY SELECTED.

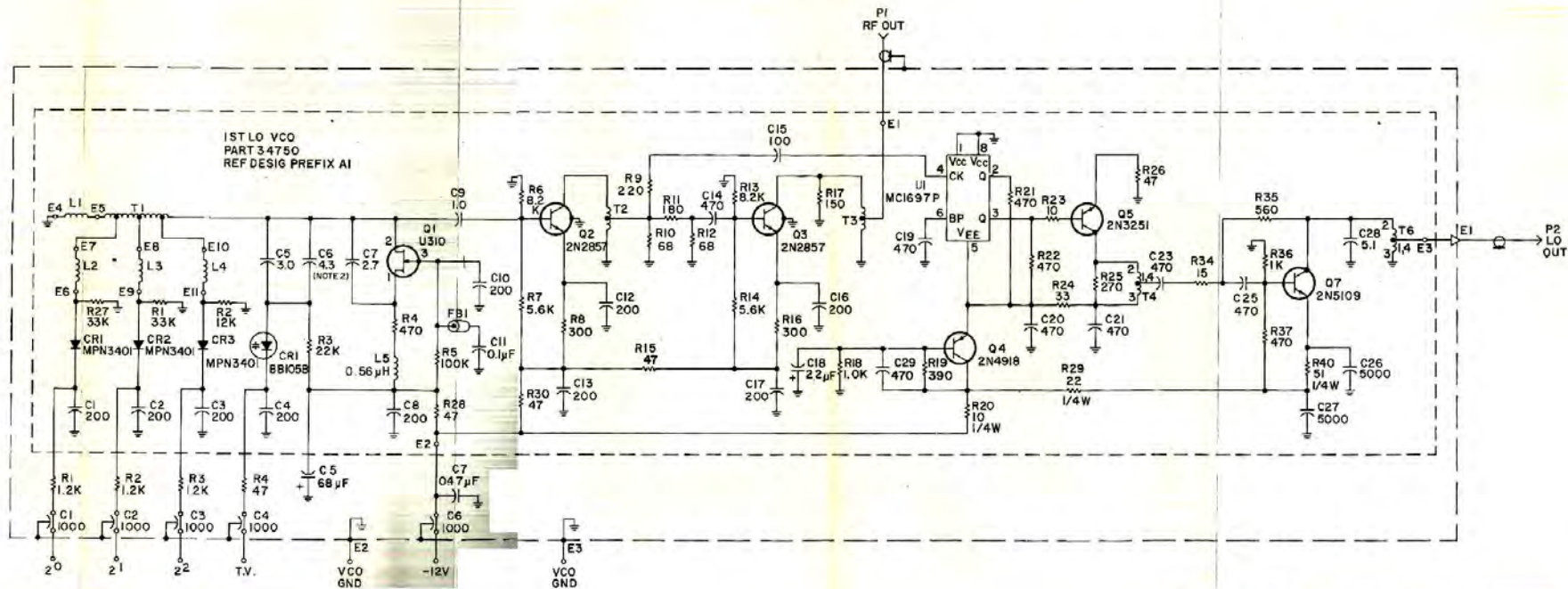
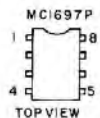


Figure 6-16 Type 791629 Voltage Controlled Oscillator (A5A1A1).
 Schematic Diagram 5198

Courtesy of <http://BlackRadios.terryo.org>

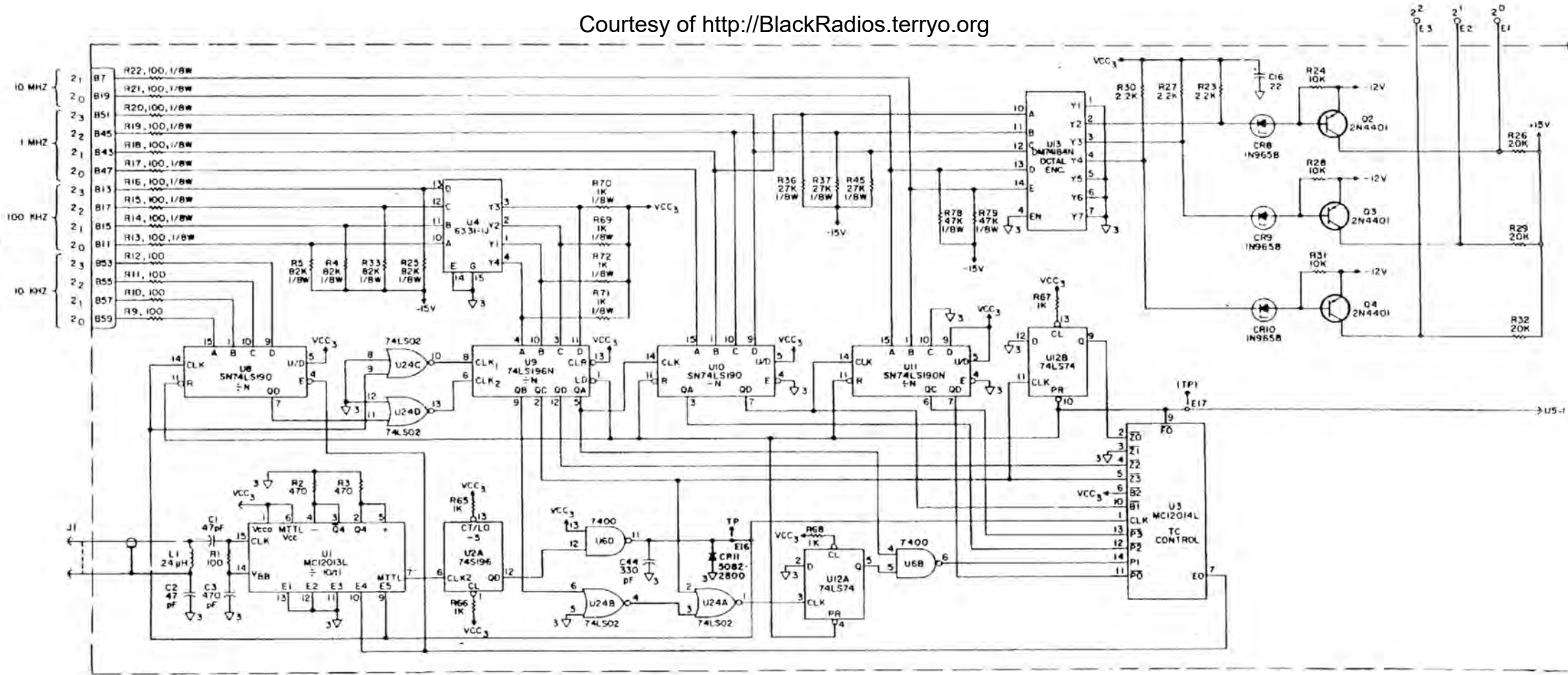


Figure 6-17 Type 791600 1st and 3rd LO Synthesizer/Time Base (A5A1A2), Schematic Diagram 61247 (Sheet 1 of 2)

NOTES

- 1. UNLESS OTHERWISE SPECIFIED:
- a) RESISTANCE IS IN OHMS, 25%, 1/W.
- b) CAPACITANCE IS IN μ F.
- 2. VCC, GND PINS OF IC'S ARE SHOWN IN TABLE A.
- 3. LEAD ARRANGEMENT FOR IC'S ARE SHOWN IN TABLE A.
- 4. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.
- 5. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE B.
- 6. GROUND LEVEL PINS ARE LISTED BELOW.
- a) PIN NOS. OF GND LEVEL ONE ARE A49, A50, A52, A54, A58 & A59.
- b) GND LEVEL TWO ARE A2, A4, A6, A8, A10, A12, A14, A16, A18, A20, A42, A44, A46.
- c) GND LEVEL THREE ARE B2, B4, B6, B8, B10, B12, B14, B16, B18, B20, B42, B44, B46, B48, B50, B52, B54, B56 & B58.

TABLE A

IC	REF	VCC	GND			DTL	VCC ₂
	DESIG	1	2	3	1	2	(FIL)
MC4044P	U5		14		7	B	
MC4044P	U22				7	B	14
MC12013L	U1		16		B	A	
MC12014L	U3		16		B	A	
SN74LS196N	U9		14		7	B	
SN74LS196	U2		14		7	B	
SN74LS00	U6		14		7	B	
B2S123	U4		16		B	A	
SN74LS190	U8, U10		16		B	A	
SN74S174	U11		16		B	A	
SN74184	U13		16		B	A	
SN75140	U18		8		4	C	
74LS174	U21		14		7	B	14
B2S192	U15, U17		14		7	B	
B2S2	U15, U17		14		7	B	
741	U7						C
SN74LS74	U12		14		7	B	
SN74125	U23		14		7	B	
SN74LS02	U24		14		7	B	

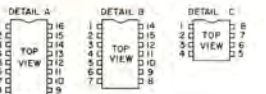


TABLE B

TYPE	C56	L3	W1	U4
791600-1	AS SHOWN	AS SHOWN	NOT USED	92083-1
791600-2	NOT USED	NOT USED	AS SHOWN	92083-1
791600-3	AS SHOWN	AS SHOWN	NOT USED	841036

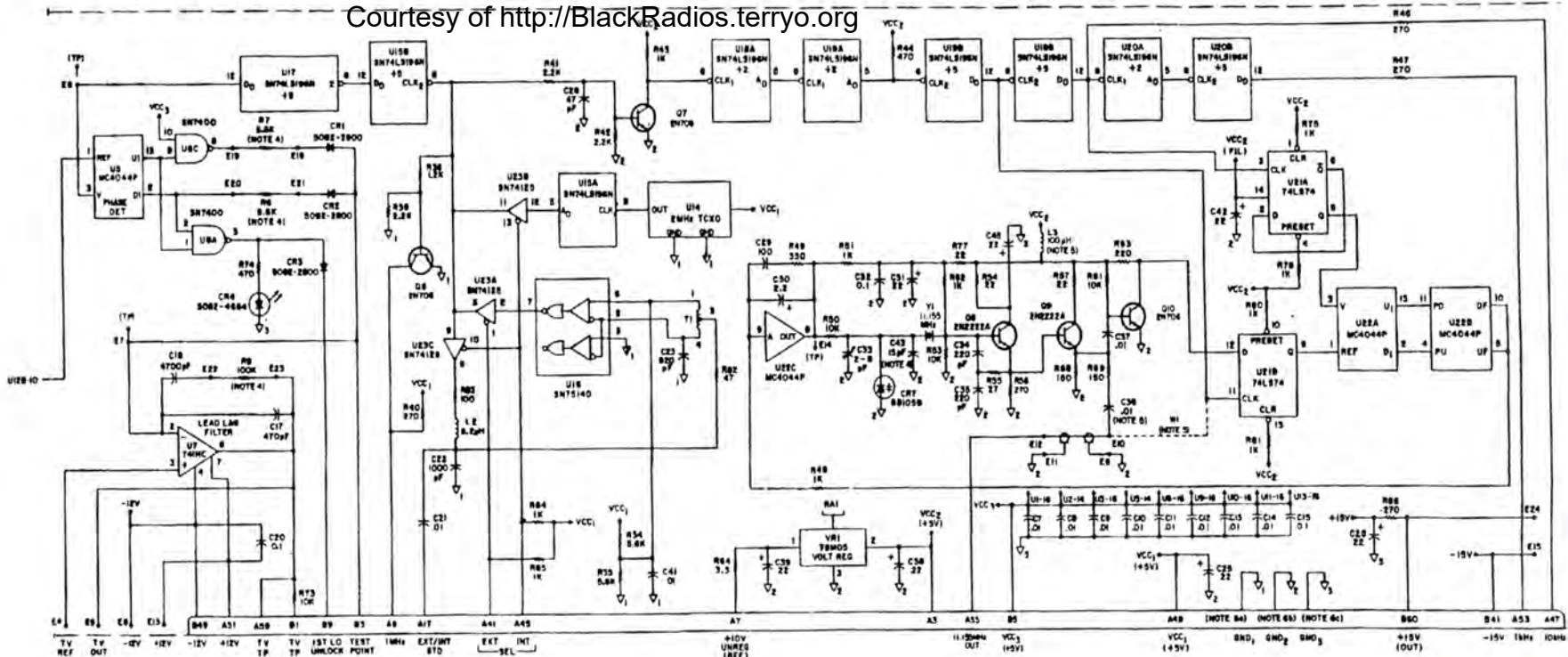
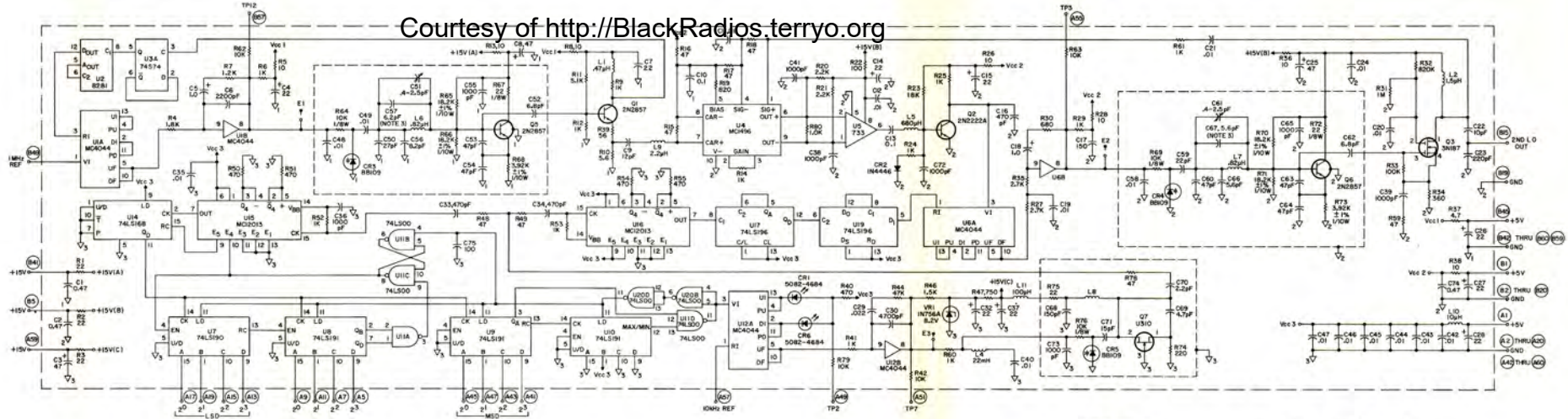


Figure 6-17 Type 791600 1st and 3rd LO Synthesizer/Time Base (ASA1A2), Schematic Diagram 61247 (Sheet 2 of 2)

Courtesy of <http://BlackRadios.terryo.org>

NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, 5% 1/4W.
 b) CAPACITANCE IS IN μ F.
 2. PIN ARRANGEMENTS & POWER CONNECTIONS FOR IC'S ARE GIVEN IN TABLE 1.
 3. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.



IC TYPE	REF DESIG	DETAIL	Vcc PIN	Vcc PIN	Vcc PIN	V ₁	V ₂	V ₃
MC4044	U1	B	14	16	7			
8281	U2	B	14	7				
74574	U3	B	14	7				
794	U4	C						
733	U5	C						
MC4044	U6	B	14	7				
74LS190	U7, U8	A	16	8				
74LS191	U9, U10	A	16	8				
74LS00	U11	B	14	7				
MC4044	U12	B	14	7				
74LS168	U13	A	16	8				
MC12013	U15	A	16	8				
MC12013	U16	A	16	8				
74LS196	U17, U19	B	14	7				

REF DESIG	HIGHEST NOT USED
C29	C31
E3	
U11	
U7	
R80	R39, R43
U19	U15, U18
VRI	

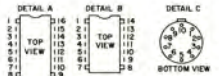


Figure 6-18 Type 791601 2nd LO Synthesizer (ASA2), Schematic Diagram 61256

Courtesy of <http://BlackRadios.terryo.org>

- NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
 b) CAPACITANCE IS IN μF .
 c) INDUCTANCE IS IN μH .
 2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
 3. FOR 1/C PIN ARRANGEMENTS SEE DETAILS A & B.
 4. FOR PIN NOS. OF Vcc & GND SEE TABLE A.

TABLE A

I/C	REF DESIG	Vcc	GND
74LS190	U1,U2,U3,U4	16	8
7425	U5,U7	14	7
74LS11	U6	14	7
7474	U8	14	7
MC4044P	U9	14	7
74LS90	U10	14	7

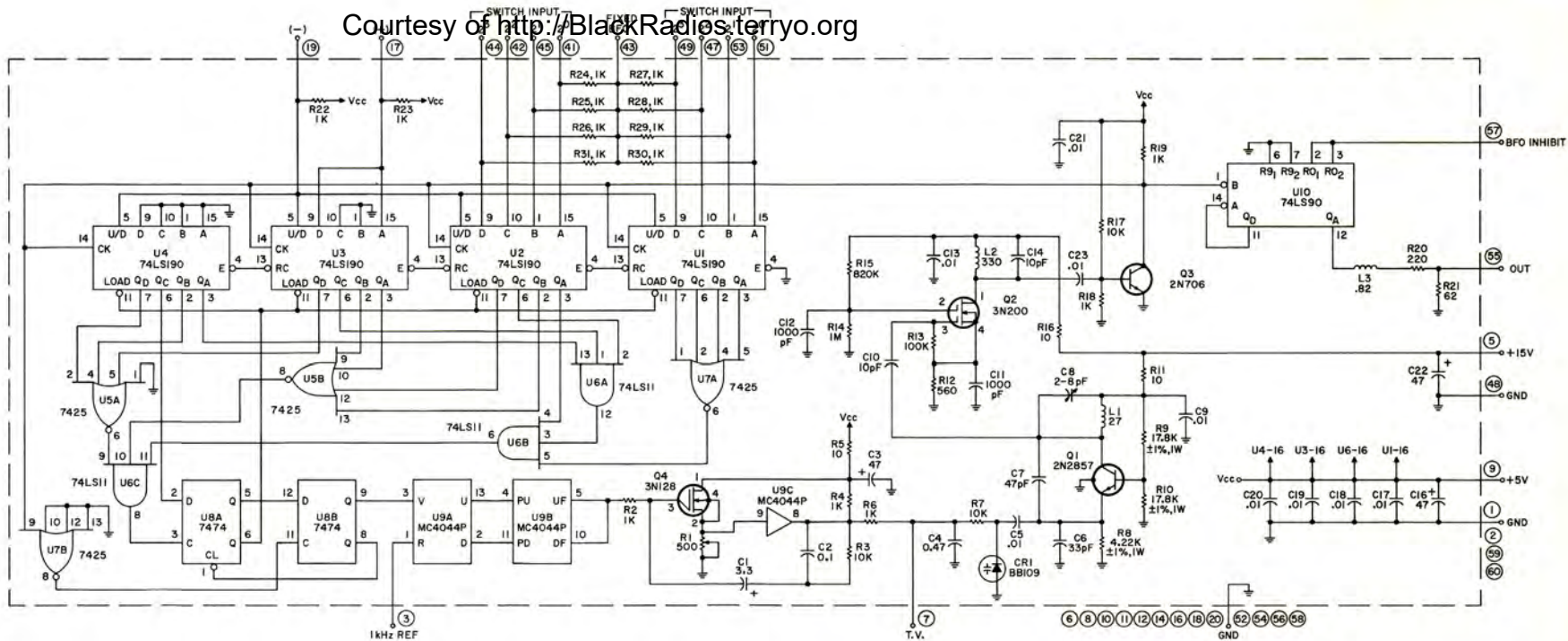
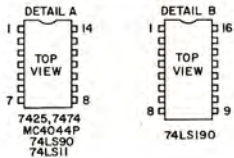


Figure 6-19 Type 791576 BFO Synthesizer (A5A3), Schematic Diagram 51183

NOTES:

1. MOST MODULE PINS ARE NOT SHOWN DUE TO UNNECESSARY LINE DUPLICATIONS. OPTIONAL PINS ON SOME MODULES ARE NOT SHOWN BECAUSE OF COMPLEXITY (SEE EACH OPTION DWG FOR CLARITY).
2. PLUGS AT P1, ABP1, ASPI, AIOPI ARE FOR REF ONLY, AND ARE NOT OF THIS ASSEMBLY.
3. TEST POINTS DESCRIPTIONS:

- TP1
- TP2
- TP3
- TP4
- TP5
- TP6
- TP7
- TP8
- TP9
- TP10 AS SHOWN
- TP11
- TP12
- TP13
- TP14
- TP15
- TP16
- TP17
- TP18
- TP19
- TP20

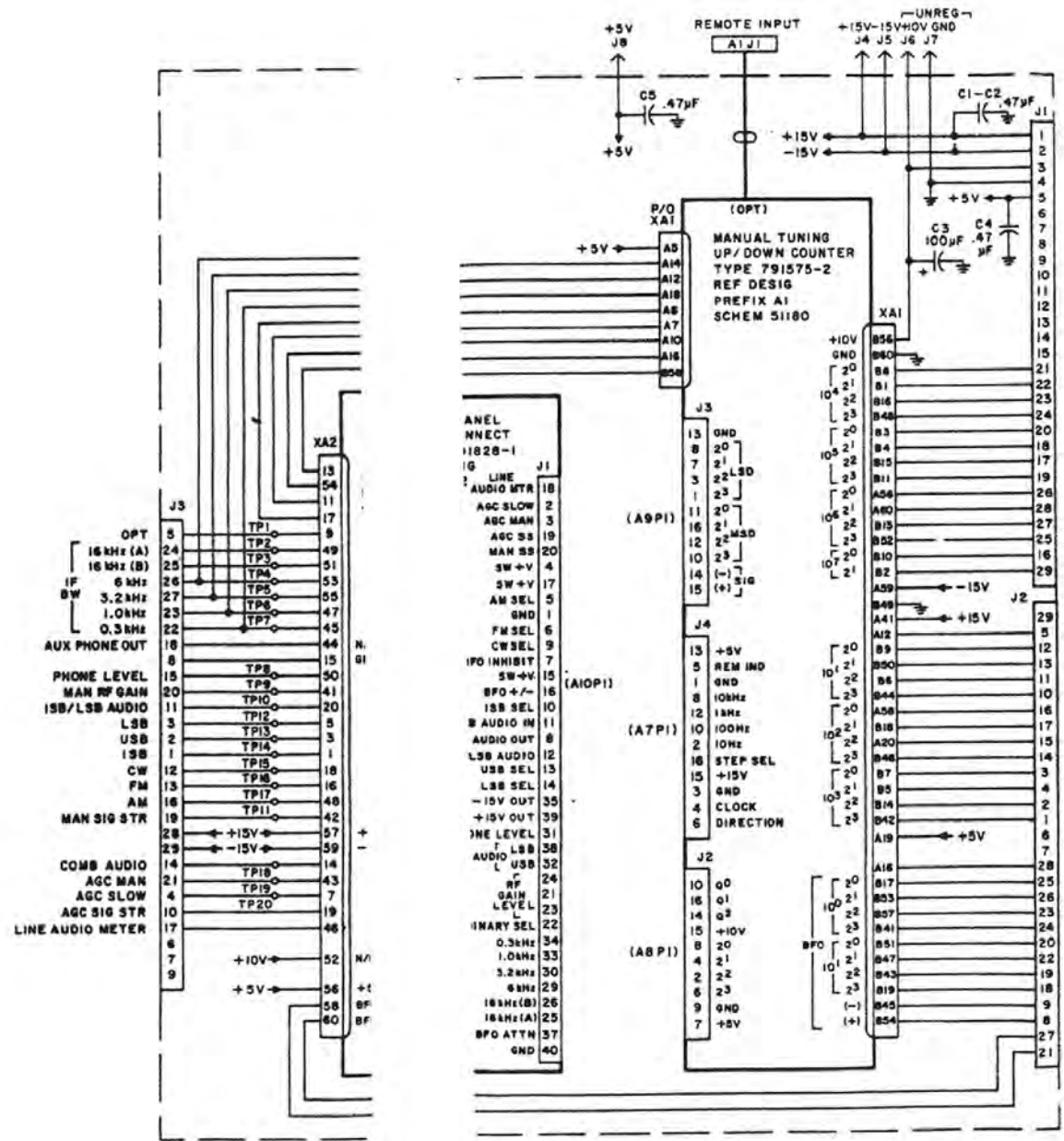


Figure 6-20 Type 791580 I/O Motherboard (A6)
Schematic Diagram 470233

NOTE:
UNLESS OTHERWISE SPECIFIED:
R) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
C) CAPACITANCE IS IN μF .

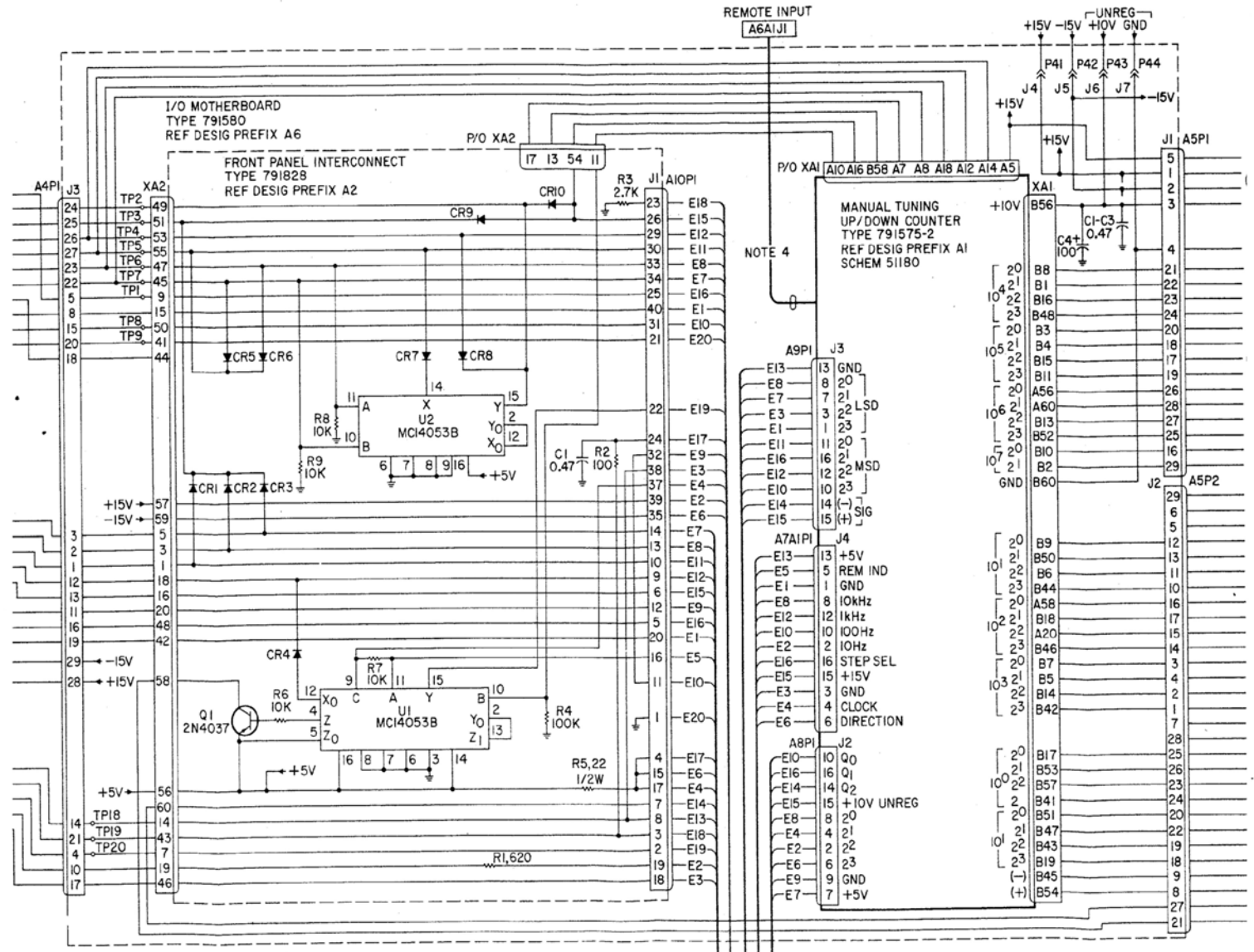
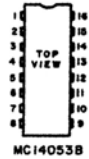


Figure 6-22.

Type 791828 Front Panel Interconnect (A6A2)
Schematic Diagram 470522

- NOTES:
 1. UNLESS OTHERWISE SPECIFIED, RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
 2. UIO PIN 18 IS +5V; UIO PIN 9 IS GND.
 3. PIN ARRANGEMENT FOR ICs IS SHOWN IN DETAILS A-C.

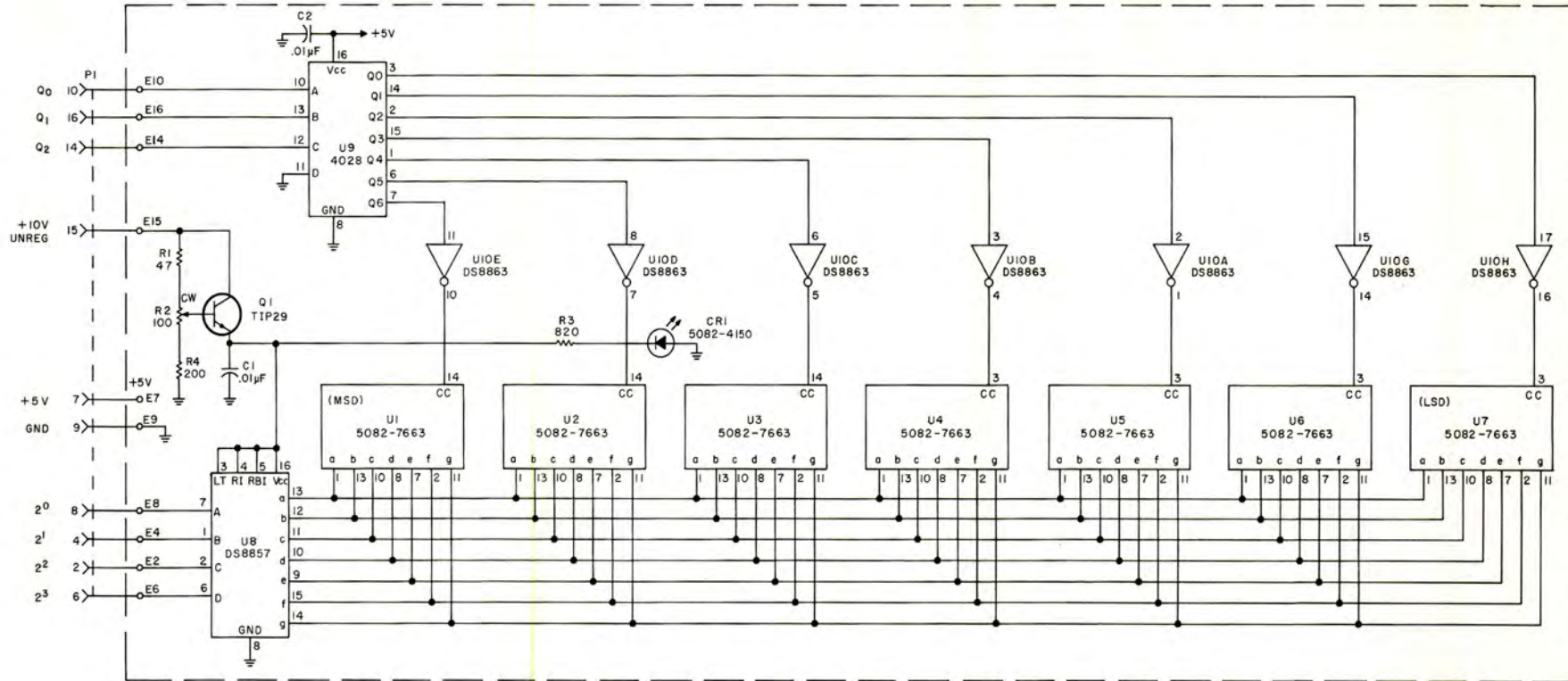
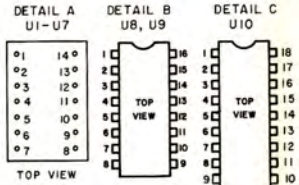


Figure 6-23. Type 791578 Frequency Display (A8) Schematic Diagram 43242

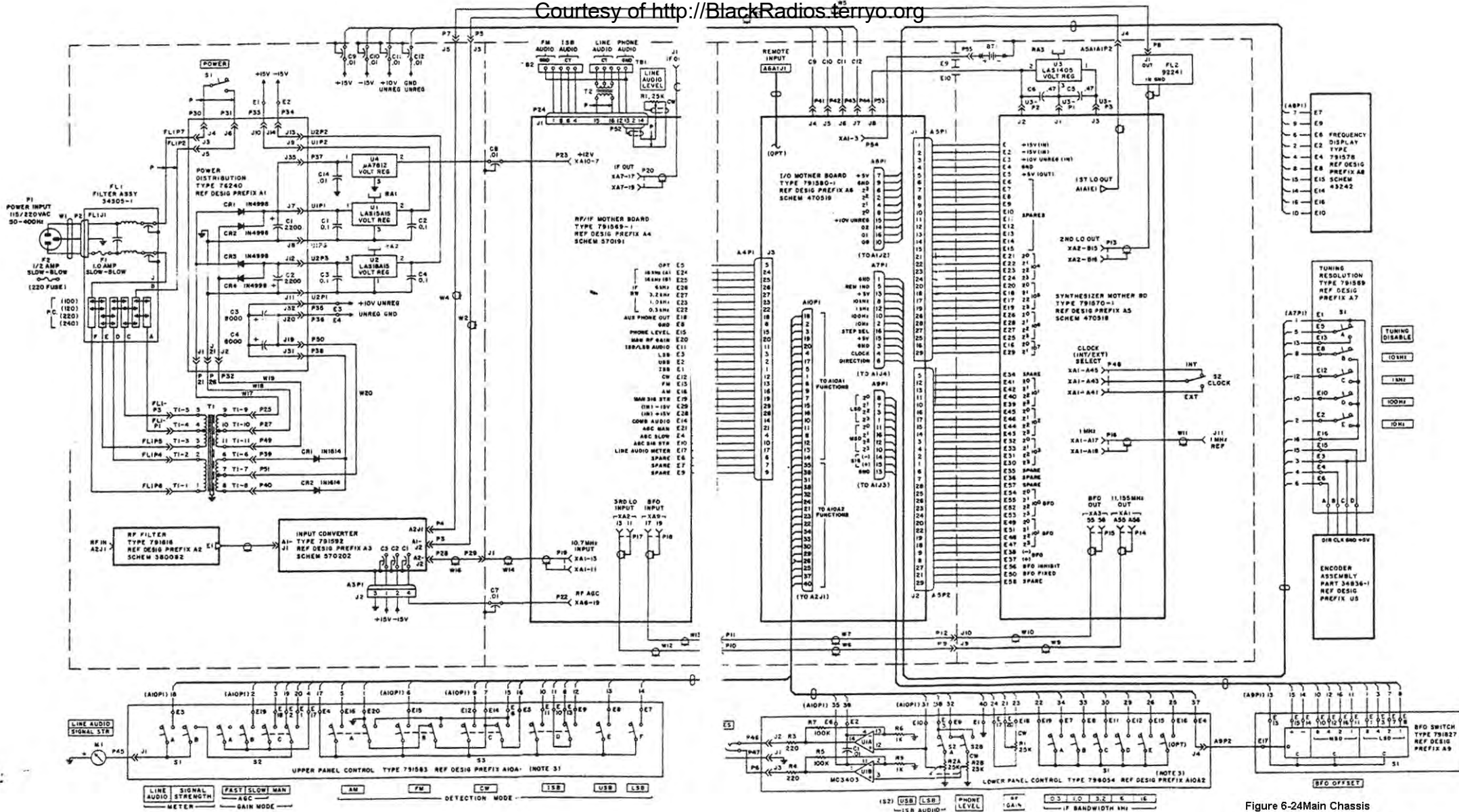


Figure 6-24 Main Chassis Schematic Diagram 670058

**INSTRUCTION SUPPLEMENT
FOR
WJ-8716 HF RECEIVER**

INTRODUCTION

The WJ-8716 HF Receiver is a modified version of the WJ-8718 HF Receiver. An outline of the electrical and mechanical differences as well as supplemental parts list and schematic diagrams are included in this supplement. This manual supersedes previous supplements of the WJ-8716. All other technical information in the WJ-8718 HF Receiver Instruction Manual also pertains to the WJ-8716 HF Receiver.

**WATKINS—JOHNSON COMPANY
700 Quince Orchard Road
Gaithersburg, Maryland 20878**

Revision I 8/79

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7.4	Replacement Parts List and Schematic Diagrams	7-1

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WJ-8716 DESCRIPTION

7.1 General

The WJ-8716 is a modified version of the WJ-8718 HF receiver. It has increased EMI protection and better shielding of the front panel phone jack and of the rear panel audio outputs. It is also provided with an internal attenuator circuit that decreases the level of the output audio signal.

Some units were also equipped with the early version (Type 796010 instead of the Type 791616-1) of the A2 RF Filter.

7.2 Electrical Differences

The only electrical differences are due to the EMI filters added to the front panel phone jack, to the addition of the audio attenuator circuit to the rear outputs (and to the different A2 RF Filter eventually).

7.3 Mechanical Differences

The mechanical differences consist in the four BNC audio outputs that were used in the rear panel of the receiver instead of the screw terminals, in the presence of the audio attenuator PCB and in the use of a fully shielded phone jack assembly.

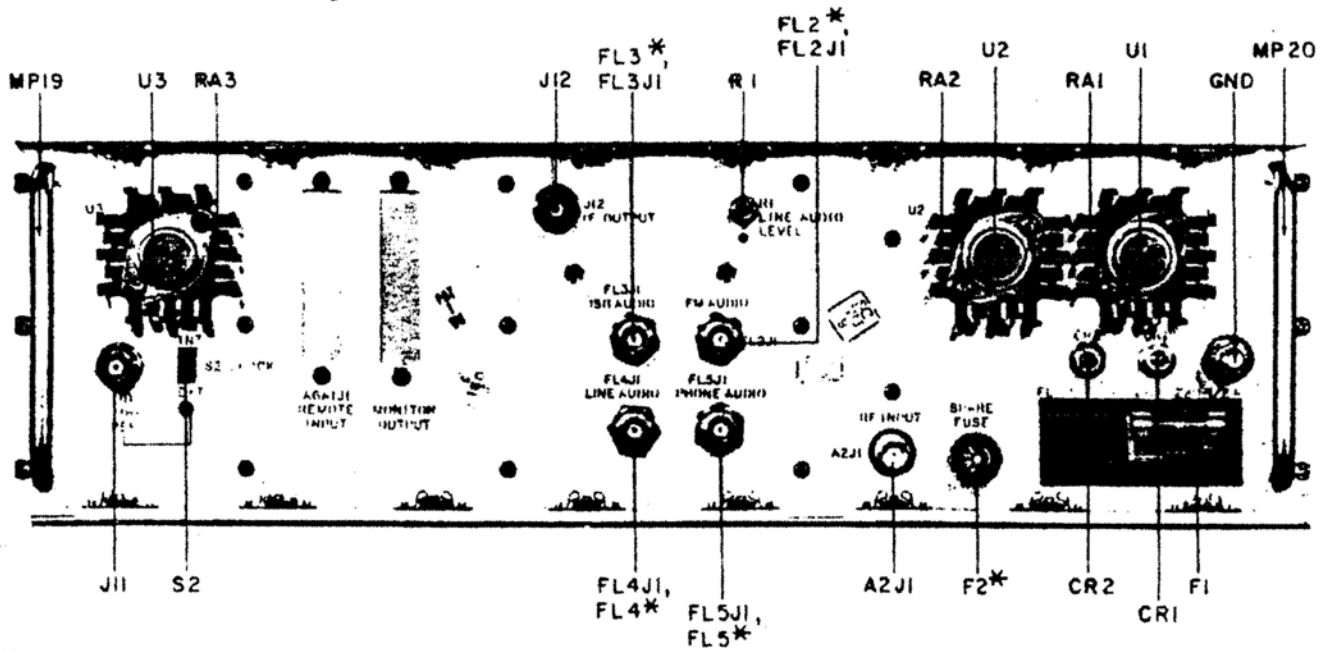
7.4 Replacement Parts List and Schematic Diagrams

The replacement part lists are shown in some pages of this manual supplement.

<u>Mfr.</u> <u>Code</u>	<u>Name and Address</u>
04013	Taurus Corporation 1 Academy Hill Lambertville, NJ 08530

7.5 TYPE WJ-8716 HF RECEIVER, MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
	With the exception of those items listed below, the WJ-8716 HF Receiver is electrically identical to the WJ-8718 HF Receiver.				
A2	RF Filter	1	796010	14632	
A10	Front Panel Control	1	791684-3	14632	
A11	Phone Jack Assembly	1	796011	14632	
A12	Audio Attenuator	1	280017	14632	
E5	Terminal, Feedthru	4	SFU16Y	04013	
E6	Same as E5				
E7	Same as E5				
E8	Same as E5				
FL2	Filter, LP	4	52-713-301	33095	
FL3	Same as FL2				
FL4	Same as FL2				
FL5	Same as FL2				
J13	Not Used				
P21	Faston Receptacle	6	42236-1	00779	
P25	Connector, Plug, Receptacle	4	2-350804-2	00779	
P26	Same as P21				
P27	Same as P25				
P28	Same as P21				
P29	Same as P21				
P32	Same as P21				
P49	Same as P25				
P50	Same as P21				
P51	Same as P25				
T1	Transformer	1	SCD34518	14632	
T2	Not Used				
TB1	Not Used				
TB2	Not Used				



* DENOTES HIDDEN PART

Figure 7-1. WJ-8716 Main Chassis Rear Panel View
Location of Components

7.5.1 TYPE 796010 RF FILTER

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	2	8131M100-651-474M	72982	
C2	Same as C1				
C3	Capacitor, Mica, Dipped: 20 pF, 5%, 500 V	1	CM05ED200J03	81349	72136
C4	Capacitor, Mica, Dipped: 68 pF, 2%, 500 V	1	CM05ED680G03	81349	72136
C5	Capacitor, Mica, Dipped: 10 pF \pm 0.5 pF, 500 V	2	CM05CD100D03	81349	72136
C6	Capacitor, Mica, Dipped: 180 pF, 2%, 500 V	3	CM05FD181G03	81349	72136
C7	Same as C5				
C8	Same as C6				
C9	Capacitor, Mica, Dipped: 27 pF, 2%, 500 V	1	CM05ED270G03	81349	72136
C10	Same as C6				
C11	Capacitor, Mica, Dipped: 15 pF, 5%, 500 V	2	CM05CD150J03	81349	72136
C12	Capacitor, Mica, Dipped: 200 pF, 2%, 500 V	2	CM05FD201G03	81349	72136
C13	Capacitor, Mica, Dipped: 220 pF, 2%, 500 V	1	CM05FD221G03	81349	72136
C14	Same as C11				
C15	Same as C12				
C16	Capacitor, Mica, Dipped: 120 pF, 2%, 500 V	1	CM05FD121G03	81349	72136
C17	Capacitor, Mica, Dipped: 47 pF, 2%, 500 V	2	CM05ED470G03	81349	72136
C18	Same as C17				
CR1	Diode	2	1N4449	80131	93332
CR2	Same as CR1				
E1	Terminal, Forked	1	140-1941-02-01	71279	
J1	Connector, Receptacle	1	UG1094/U	80058	74868
L1	Coil, Torroidal	2	20681-186	14632	
L2	Coil, Torroidal	1	20681-187	14632	
L3	Same as L1				
L4	Coil, Torroidal	2	20681-188	14632	
L5	Coil, Torroidal	2	20681-189	14632	
L6	Same as L5				
L7	Same as L4				
L8	Inductor	1	21209-37	14632	
L9	Coil, Torroidal	1	20681-202	14632	
P1	Connector, Plug	1	UG1466/U	80058	19505
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	1	RCR07G103JS	81349	01121
VR1	Diode, Zener: 6.2 V	2	1N753A	80131	04713
VR2	Same as VR1				

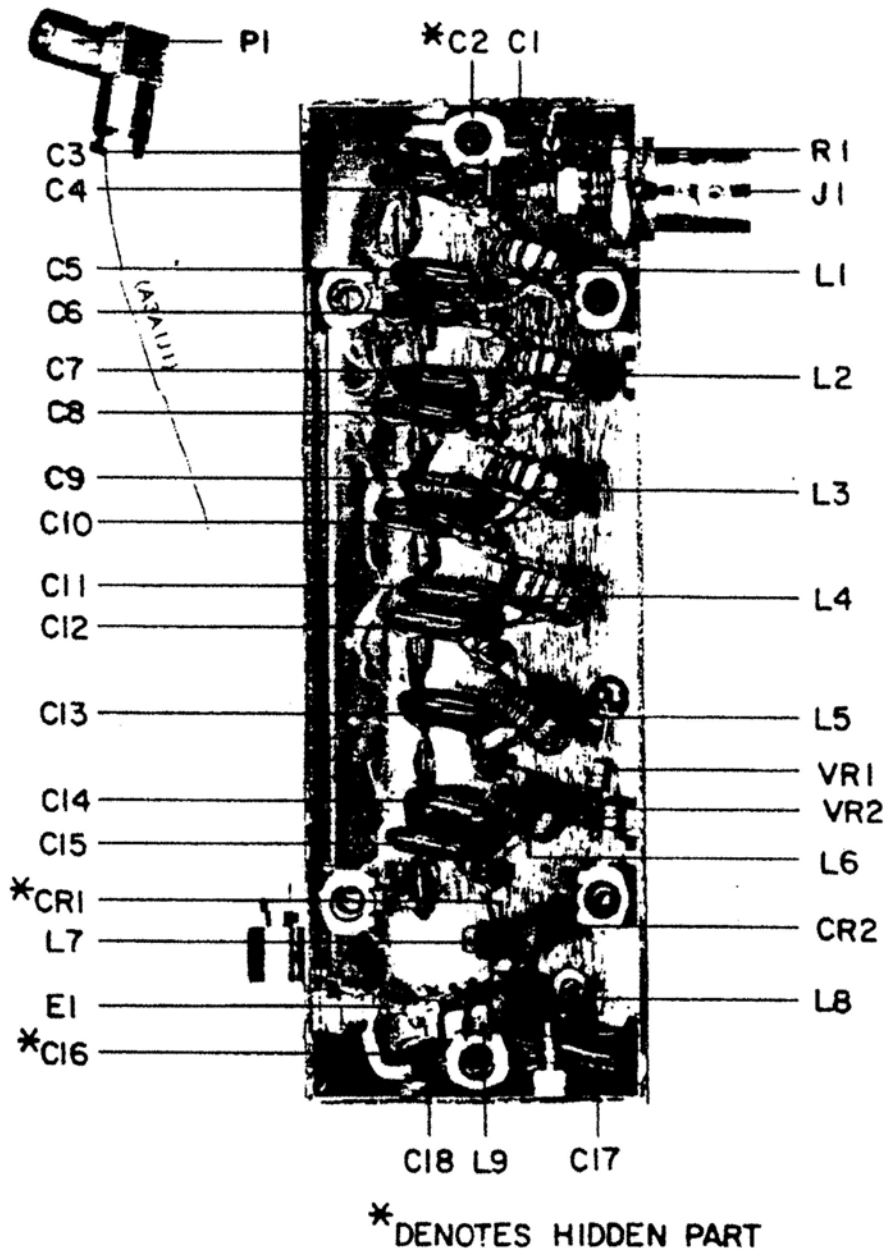


Figure 7-2. Type 796010 RF Filter,
Location of Components

7.5.2 TYPE 791684-3 FRONT PANEL CONTROL

REF DESIG PREFIX A10

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
	With the exception of the item listed below, type number 791684-3 is electrically identical to type number 791684-2 designated as A10 in the WJ-8718 HF Receiver.				
A2	Lower Panel Control	1	791826-2	14632	

7.5.2.1 Type 791826-2 Lower Panel Control

REF DESIG PREFIX A10A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
	With the exception of those items listed below, type number 791826-2 is electrically identical to type number 791826-1 designated as A10A2 in the WJ-8718 HF Receiver.				
R3	Resistor, Fixed, Composition: 620 Ω , 5%, 1/4 W	2	RCR07G621JS	81349	01121
R4	Same as R3				
R5	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	2	RCR07G103JS	81349	01121
R7	Same as R5				

7.5.3 TYPE 796011 PHONE JACK ASSEMBLY

REF DESIG PREFIX A11

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	Diode (Not Shown)	4	1N4449	80131	93332
CR2	Same as CR1 (Not Shown)				
CR3	Same as CR1 (Not Shown)				
CR4	Same as CR1 (Not Shown)				
E1	Terminal, Standoff: Ground	1	160-2380-01-05-00	71279	
FL1	Filter, EMI	2	51-353-314	33095	
FL2	Same as FL1				
J1	Connector, Phone Jack	1	L12B	82389	

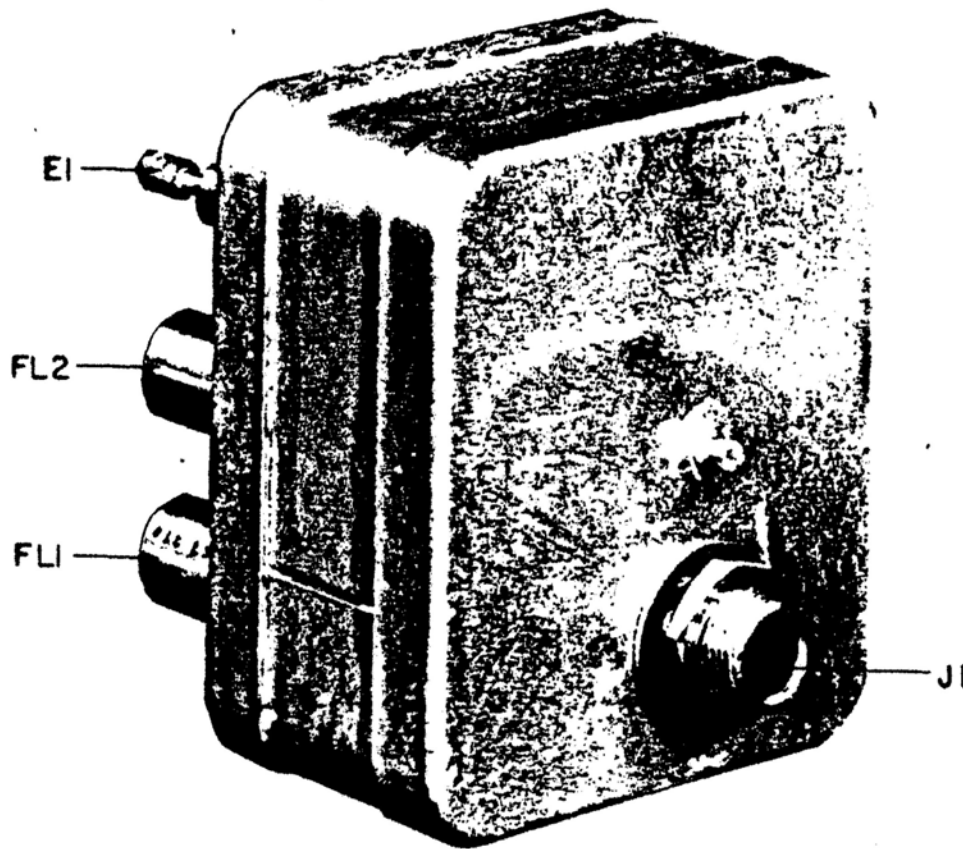


Figure 7-3. Phone Jack Assembly,
Location of Components

7.5.4 TYPE 280017 AUDIO ATTENUATOR

REF DESIG PREFIX A12

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 10%, 35 V	1	CS13BF475K	81349	56289
E1	Terminal	10	140-1941-02-01	71279	
E2 Thru E10	Same as E1				
R1	Resistor, Fixed, Composition: 750 Ω , 5%, 1/4 W	6	RCR07G751JS	81349	01121
R2	Resistor, Fixed, Composition: 560 Ω , 5%, 1/4 W	3	RCR07G561JS	81349	01121
R3	Same as R1				
R4	Same as R1				
R5	Same as R2				
R6	Same as R1				
R7	Same as R1				
R8	Same as R2				
R9	Same as R1				
R10	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	1	RCR07G103JS	81349	01121

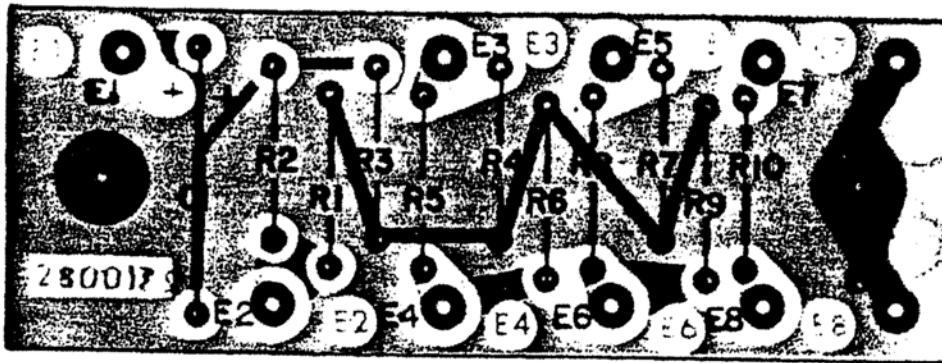


Figure 7-4. Type 280017 Audio Attenuator, Location of Components

WJ-8718

CHANGE 1

**WJ-8718 SERIES HF RECEIVER
CHANGE 1**

TITLE: INSTRUCTION MANUAL FOR THE WJ-8718 SERIES HF RECEIVER

MANUAL DATE: October 1983

**CHANGE 1
DATE:** July 1990

APPLICABILITY: All units.

**CHANGES/ERRATA
INFORMATION:** Changes refer to updates of the manual to cover design modifications. Errata refer to corrections and clarifications of information in the manual.

**CHANGE
SUMMARY:** This change covers a correction to Section IV of the manual regarding measured signal levels in the RF Filter assembly. It also reflects minor, non-electrical modifications to schematic diagram 51198 for the Type 791629 Voltage-Controlled Oscillator, A5A1A1.

ERRATA: Paragraph 4.3.5.2.1, step 6, correct the sentence to read as follows:

6. The RF Voltmeter should indicate a level between 0 dBm and -2.0 dBm.

CHANGES: Replace Figure 6-16, Type 791629 1st LO VCO Assembly (A5A1A1), with the attached drawing.

REVISION
WJ-8718 SERIES HF RECEIVER

TITLE: INSTRUCTION MANUAL FOR WJ-8718 SERIES RECEIVER

INSTRUCTION MANUAL
DATE: OCTOBER 1983

REVISION DATE: AUGUST 1, 1988

APPLICABILITY: All WJ-8718 Series Receivers

CHANGE
INFORMATION: Modification of the 3rd LO Output Level

CHANGE: Change the second sentence of step number 5 of paragraph
4.3.5.18.1, on page 4-50 of the WJ-8718 HF Receiver
Instruction Manual

FROM:

"The voltmeter should indicate -6 dBm +/-2 dB."

TO:

"The voltmeter should indicate -8 dBm minimum".

ERRATA: None

PURPOSE OF ADDENDUM

The information in this addendum is provided to correct and update the WJ-8718 Series HF Receiver Instruction Manual.

Specifically, this addendum replaces a previously issued Field Bulletin, dated February 8, 1985, concerning spare parts for the WJ-871X VCO Assembly 791629. The field bulletin delineated four possible replacement parts for IC U1 (divide-by-4) on the 1st LO VCO P.W.A., depending on the board revision level and on-hand availability of the replacement part.

This addendum describes a direct replacement part for U1, Part No. SP8610A. This 14-pin chip directly fits the 1st LO VCO P.W.A., regardless of its board revision level and without the need of a transition board. This information should be incorporated in the parts list of the WJ-8718 Series HF Receiver Instruction Manual as indicated below.

1.1 Paragraph 5.6.5.1.1.1, page 5-63, Part 34750 parts list should be corrected as follows:

1. **From:** U1, Integrated Circuit, Qty 1, Part No. MC197L, Mfr.
Code 04713

To: U1, Integrated Circuit, Qty 1, Part No. SP8610A, Mfr.
Code 52648

The information in this addendum is provided to correct and update the WJ-8718 Series HF Receiver Instruction Manual.

1.1 Paragraph 5.6.8, Type 791578-1 Frequency Display parts list, page 5-90, should be corrected as follows:

From: U8, Integrated Circuit, Qty 1, Part No. DS8857N, Mfr.
Code 27014

To: U8, Integrated Circuit, Qty 1, Part No. MM74C48N, Mfr.
Code 27014

1.2 Revise Type 791578-1 Frequency Display (A8) schematic diagram, page 6-49, as shown.

From:

U8
DS8857

To:

U8
MM74C48N

