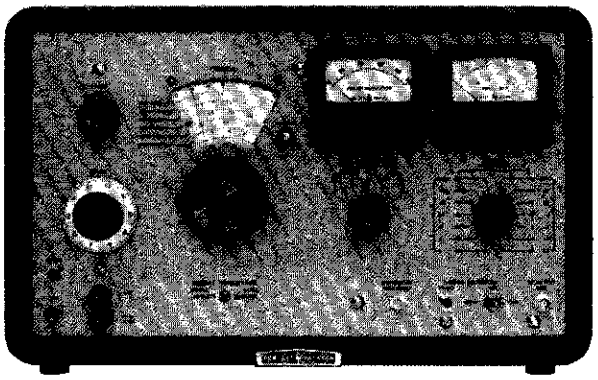
OPERATING AND SERVICE MANUAL

SIGNAL GENERATOR

606A



HEWLETT hp PACKARD

HIGH FREQUENCY SIGNAL GENERATOR

606A

SERIAL PREFIX: 0960A

This manual applies directly to HP Model 606A High Frequency Signal Generators having serial prefix number 0960A.

SERIAL PREFIXES NOT LISTED

For serial prefixes above 0960A, a "Manual Changes" sheet is included with this manual. For serial prefixes below 0960A, see Appendix I at the back of this manual.

Manual Part No. 00606-90013
Microfiche Part No. 00606-90014

Printed: May 1971

HEWLETT hp PACKARD

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

Table 1-1. Specifications

FREQUENCY RANGE:
50 kHz to 65 MHz in 6 bands

50 - 170 kHz	1.76 - 6.0 MHz
165 - 560 kHz	5.8 - 19.2 MHz
530 - 1800 kHz	19.0 - 65.0 MHz

FREQUENCY ACCURACY: Within ±1%

FREQUENCY CALIBRATOR:
Crystal oscillator provides check points at 100-kHz (useful to 6 MHz) and 1-MHz intervals accurate within 0.01% from 0° to 50° C.

RF OUTPUT LEVEL:
Continuously adjustable from 0.1 μV to 3 volts into a 50-ohm resistive load. Calibration is in volts and dbm (0 dBm is 1 milliwatt).

OUTPUT ACCURACY:
Within ±1 dB into 50-ohm resistive load

FREQUENCY RESPONSE:
Within ±1 dB into 50 ohms resistive load over entire frequency range at any output level setting and below.

OUTPUT IMPEDANCE:
50 ohms, SWR less than 1.2 on 0.3 volt attenuator range.

SPURIOUS HARMONIC OUTPUT: Less than 30 dB below the carrier.

LEAKAGE:
Negligible; permits receiver sensitivity measurements down to at least 0.1 microvolt

AMPLITUDE MODULATION:
Continuous adjustable from 0 to 100%. Indicated by a panel meter. Modulation level is constant within ±1/2 dB regardless of carrier frequency and output level changes.

INTERNAL MODULATION:
0 to 100% sinusoidal modulation at 400 Hz ±5% or 1000 Hz ±5%

MODULATION BANDWIDTH:
DC to 20 kHz maximum, depends on carrier frequency, f_c, and percent modulation as shown in the following table:

Max. Mod. Frequency:

30% Mod.	70% Mod.	Squarewave Mod.
$0.06\ f_c$	$0.02\ f_c$	$0.003\ f_c$ (3 kHz max.)

EXTERNAL MODULATION:
0 to 100% sinusoidal modulation dc to 20 kHz, 4.5 volts peak produces 100% modulation at modulating frequencies from dc to 20 kHz. Input impedance is approximately 600 ohms. May also be modulated by square waves and other complex signals.

ENVELOPE DISTORTION:
On the 1-volt and lower ranges, less than 1% at 30% modulation using internal 400 or 1000 Hz source, less than 3% from 0 to 70% modulation.

MODULATION METER ACCURACY:
Within ±5% of full scale (from 0 to 90% modulation) for modulation frequencies to 10 kHz; within 10% of full scale from 10 to 20 kHz.

INCIDENTAL FM:
On the 1-volt and lower ranges and 30% modulation: 25 parts in 10^{-6}.

RESIDUAL FM:
Less than 1 part in 10^{-6}.

RESIDUAL AM:

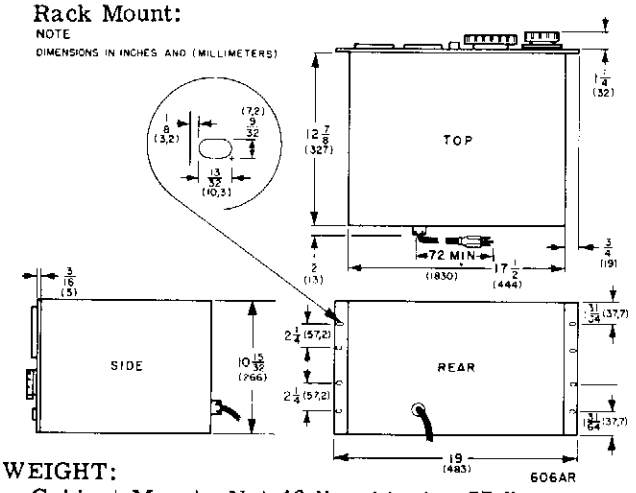
Hum and noise sidebands are 70 dB below carrier down to thermal level of 50-ohm output system

FREQUENCY DRIFT:
(Attenuator on 1 volt range and below) Less than 50 parts in 10^6 (or 5 cycles, whichever is greater) per 10 minute period after 2 hour warmup. Less than 10 minutes to restabilize after changing frequency.

POWER:
115 or 230 volts ±10%, 50 to 1000 Hz, 135 watts

DIMENSIONS:
Cabinet Mount: 20-3/4 in. wide, 12-1/2 in. high, 14-3/4 in. deep

Rack Mount:



WEIGHT:
Cabinet Mount: Net 46 lb, shipping 57 lb
Rack Mount: Net 43 lb, shipping 58 lb

ACCESSORIES AVAILABLE:
11507A Output Termination. Three positions, 50 ohms, for use into high impedance; 5 ohms (10:1 voltage division); IRE Standard Dummy Antenna (driven from 10:1 divider)

10503A Cables
10514A/B Double Balance Mixer

11509A Fuseholder, type N connectors. Protects output attenuator.

SECTION I
GENERAL INFORMATION

1-1. GENERAL DESCRIPTION.

1-2. The Hewlett-Packard Model 606A is a general-purpose signal generator with a frequency range of 50 kHz to 65 MHz. The instrument has a direct reading frequency dial calibrated to an accuracy of 1%. Output is held constant within ±1 dB and is continuously adjustable from .01 microvolt to 3 volts into a 50 ohm resistive load. An internal crystal calibrator provides check points at 100 kHz and 1 MHz intervals with an error of less than 0.01%. A front-panel meter accurately indicates the percent amplitude modulation for frequencies within the modulation bandwidth of the signal generator.

1-3. The Model 606A has a highly refined amplitude modulation system which allows modulation up to 90% with low distortion and incidental FM. This feature makes possible precision distortion checks of receivers from antenna to output. The instrument can be internally modulated at 400 or 1000 Hz. It can be externally modulated from dc to 20 kHz or more, depending on RF frequency in use. Complex waveforms, square waves, and dc voltages may be used to modulate the Model 606A for testing and evaluating filters, networks, amplifiers, and receivers.

1-4. DIFFERENCES BETWEEN INSTRUMENTS.

1-5. The Model 606A carries a five-digit serial number with a three-digit prefix (000-00000). The prefix changes only when a change is made in the instrument. The prefix, then, is an identifier, and it appears on the title page of this manual to indicate to which instrument this manual directly applies. A supplement may be included with this manual to indicate the necessary changes to be made in the manual to make it apply directly to instruments which carry a different serial number prefix.

1-6. UNPACKING AND INSPECTION.

1-7. Unpack and inspect the Model 606A as soon as possible after receipt. Save all packing materials until inspection is complete. These materials may be required for reshipment should you discover any damage.

1-8. Inspect the instrument first for signs of physical damage such as scratched or abraded panel, broken knobs, etc. If possible, energize the instrument and check it electrically. Operation check is described in paragraph 4-56. If there is any indication of damage, notify the carrier and your Hewlett-Packard sales and service office immediately.

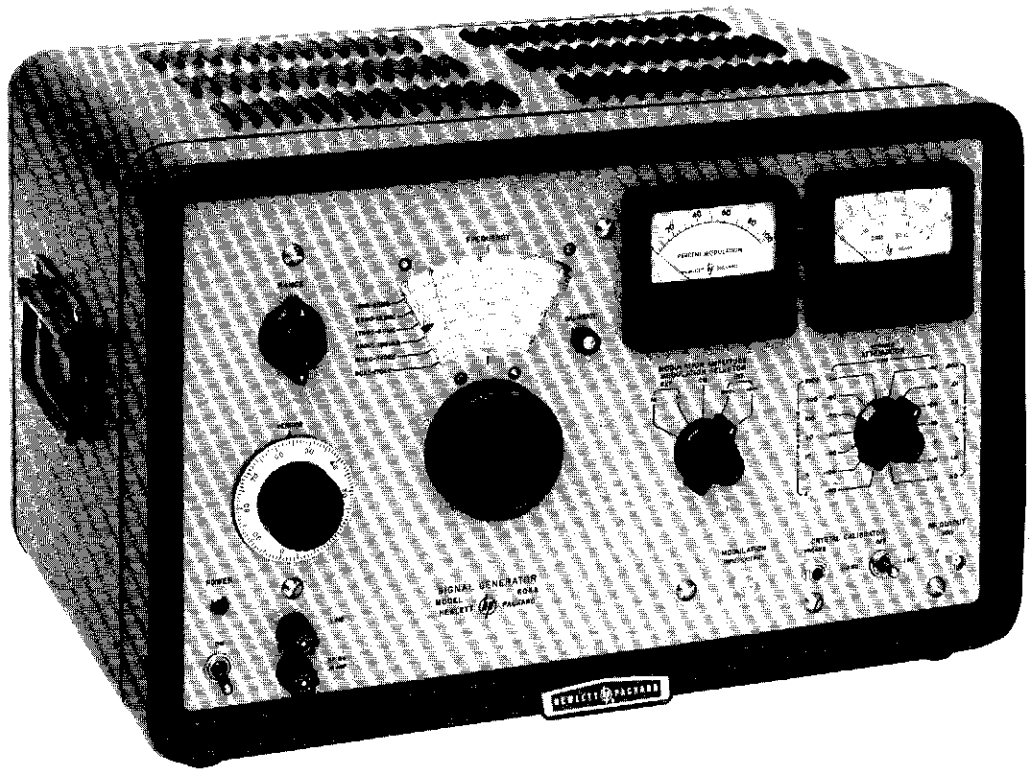


Figure 1-1. Model 606A High Frequency Signal Generator

1-9. POWER REQUIREMENTS.

1-10. The Model 606A can be operated from a 115- or 230-volt, 50- to 1000- Hz source. A two-position slide switch to the rear inside the instrument, on the panel next to the RF cover, selects AC operation mode. The line voltage at which the instrument is set to operate appears on the slider of the switch. A 2-ampere slo-blow fuse is used for 115-volt operation; a 1-ampere slo-blow fuse is used for 230-volt operation.

1-11. INSTALLATION INSTRUCTIONS.

1-12. The Model 606A should not be operated in an ambient temperature greater than +50°C. Do not install the rack-mount model near other equipment discharging hot air around the Model 606A.

1-13. POWER CABLE.

1-14. To protect operating personnel, the National Electrical Manufacturers' Association (NEMA) recommends that instrument panel and cabinet be grounded. This instrument is equipped with a three-conductor power cable which, when plugged into an appropriate receptacle, grounds the instrument. The offset round pin on the power cable connector is the ground pin.

1-15. To preserve the protection feature when operating the instrument from a two-contact outlet, use a three-prong to two-prong adapter, and connect the green pigtail on the adapter to ground.

1-16. ACCESSORIES AVAILABLE.

1-17. **HP 11507A** OUTPUT TERMINATION. The 606A-34A provides the following:

a) 50 ohm termination reduces the source impedance to 25 ohms.

b) 20 **dB** attenuator (10:1 voltage divider) which reduces the source impedance to 5 ohms.

c) Simulates IRE standard dummy antenna (10:1 voltage division) for precision measurements on receivers.

1-18. **HP 11509A** FUSED ATTENUATOR PROTECTOR. Prevents the Model 606A output attenuator from burning out when working with transceiver type equipment. If the transmitter is accidentally keyed the **11509A** prevents power from being applied to the RF OUTPUT jack of the Model 606A. (Requires two BNC to type "N" adapters UG-201A/U and UG-349A/U. Not furnished.)

SECTION II
OPERATING INSTRUCTIONS

2-1. OUTPUT TERMINATION.

2-2. The Model 606A output level is calibrated only when terminated with a 50-ohm resistive load. For use into any other load the HP 11507A output termination is recommended (see paragraph 1-17).

2-3. A coaxial cable of 50 ohms nominal impedance with BNC male connectors is suitable for use with the Model 606A. Single braid shield types are suitable for use from maximum output to approximately -80 dbm (30 microvolts). Double braid or solid types are recommended for use over the entire attenuation range. A good general purpose cable is 3 feet of RG-55U (double braid shield) with UG-88C/U BNC connectors on each end. See figure 2-3, External Output Termination, for information concerning output cable termination.

2-4. The output jack on the HP 11507A has been provided as a BNC connector for maximum shielding. Clip-lead connection may be provided easily by inserting a UG-290U connector with soldered-on clip leads into the output jack of the Output Termination. Keep the length of the clip leads as short as possible.

2-5. SETTING THE CURSOR.

2-6. Set the cursor (movable index) with the CALIBRATE knob so that it is aligned with the line under the engraving reading FREQUENCY before setting the frequency. The FREQUENCY dial is calibrated only after this operation is performed.

2-7. OUTPUT ATTENUATOR.

CAUTION

Damage to output attenuator may be incurred if: 1) Output is shorted in the 3-volt range, 2) External voltage is applied to the attenuator output.

2-8. The output attenuator contains resistors which can be burned out by careless usage. If the output is shorted out in the 3-volt range or if voltage is fed into the attenuator accidently, these resistors may be burned out or heated up so that they are no longer calibrated. This may occur while measuring the sensitivity of the receiver in a mobile transmitter-receiver installation when the transmit button is pushed accidently. An attenuator fuse is available as an accessory when it is desired to use this generator under conditions where the attenuator may be burned out (see paragraph 1-21). The resistors in the attenuator are NOT field replaceable. Do not open the attenuator to check these resistors as placement of the resistors is critical. The attenuator may be removed from the instrument and returned separately to the factory for repair.

2-9. USE OF THE 3-VOLT RANGE.

2-10. The unusually high output range of 3 volts is useful for driving RF bridges or other equipment requiring a calibrated high-level high-frequency voltage. This useful range is obtained at the expense of operating the power amplifier stage near the overload point. You will obtain best life from these tubes by not leaving the generator on the 3 VOLT range any longer than necessary to make your measurement. Never leave it on this range while warming up or during standby operation.

2-11. EXTERNAL MODULATION.

2-12. Take care when using external modulation with direct coupling. The dc level of the signal will affect the average RF level. If only the ac component of the modulating signal is desired, switch the MODULATION SELECTOR to EXT. AC. Do not apply more than 10 volts dc or ac to the MODULATION jack. Overloading will shorten life of the MODULATION AMPLITUDE control.

2-13. EXTERNAL SYNCHRONIZATION SIGNAL.

2-14. When the Model 606A is modulated internally a signal is available at the MODULATION INPUT-OUTPUT jack for synchronization purposes. This signal is fed from the same oscillator which modulates the carrier. It is of approximately ≅ 3Vrms amplitude from a high impedance source. Since the signal comes from a high impedance source use it only as a voltage source and do not attempt to draw current.

2-15. B+ FUSE.

2-16. The regulated B+ voltage is fused on the front panel. If excessive modulation is accidentally applied to the instrument the tuned circuits may flash over from excessive peak RF voltage. This will blow the B+ fuse. The instrument will have no output and the output level meter will be pinned to the left of zero. If this happens, the fuse must be replaced to restore operation.

2-17. MODULATION DATA.

2-18. Figure 2-1 shows the modulation limits for various types of modulation over the operating frequency range.

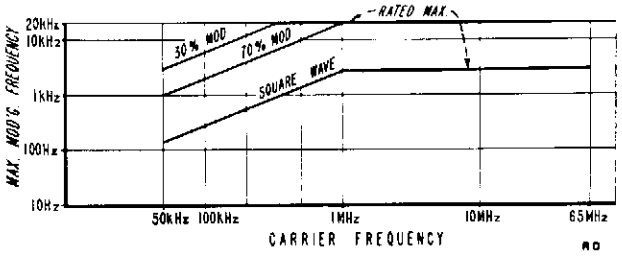
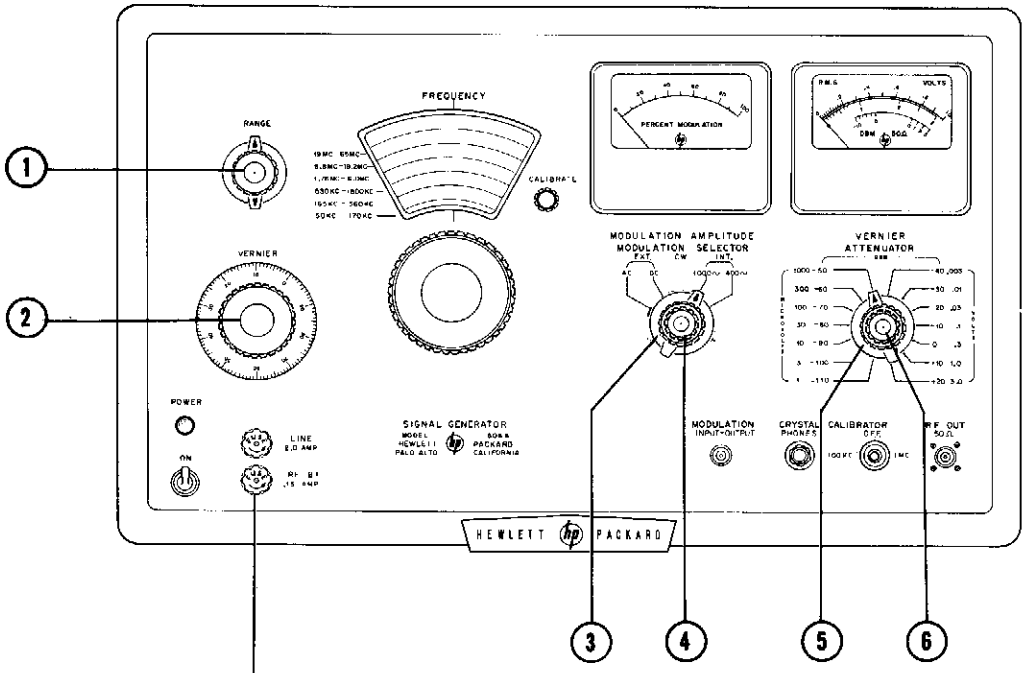


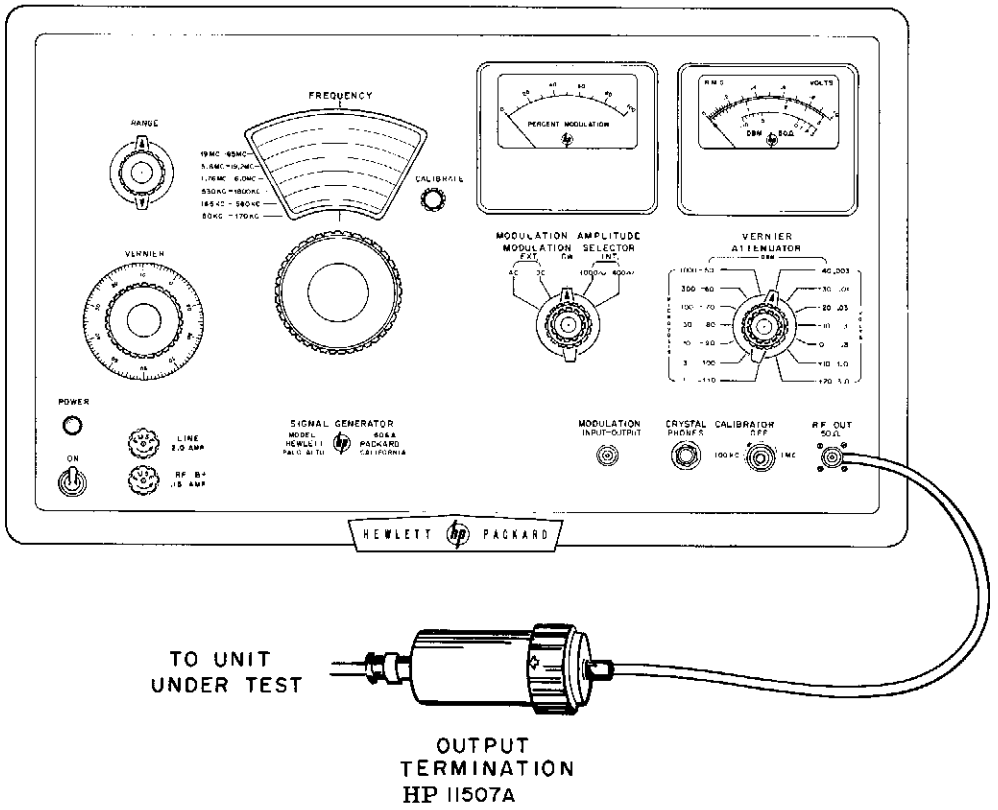
Figure 2-1. Modulating vs Carrier Frequency



B+ FUSE NO R.F. OUTPUT AND OUTPUT METER PINNED TO LEFT IF BLOWN.

1. Rotate RANGE switch to select desired band.
2. Rotate FREQUENCY control to desired frequency. Read frequency on scale indicated by pointer.
3. Rotate MODULATION SELECTOR to INT (either 400 Hz or 1000 Hz modulation is available).
4. Set modulation level as read on PERCENT MODULATION meter with MODULATION AMPLITUDE control.
5. Rotate ATTENUATOR to select output voltage level desired.
6. Rotate ATTENUATOR VERNIER to desired output level. Read range of output meter on ATTENUATOR switch and value on meter.

Figure 2-2. General Operation



The attenuator on the Model 606A Signal Generator is calibrated only when used with a load of 50 ohms. For high impedance loads or receiver inputs the output termination **(HP 11507A)** is recommended. This output termination is designed for use at the end of a 50 ohm shielded cable, and to operate into a high impedance (500 ohms or greater) load.

The **HP 11507A** has three positions as the rear shell is rotated clockwise as follows:

a. DUMMY ANTENNA. Output impedance varies as per IRE Standard Dummy Antenna* at an output level 20 dB below the input level (10:1 voltage division ratio).

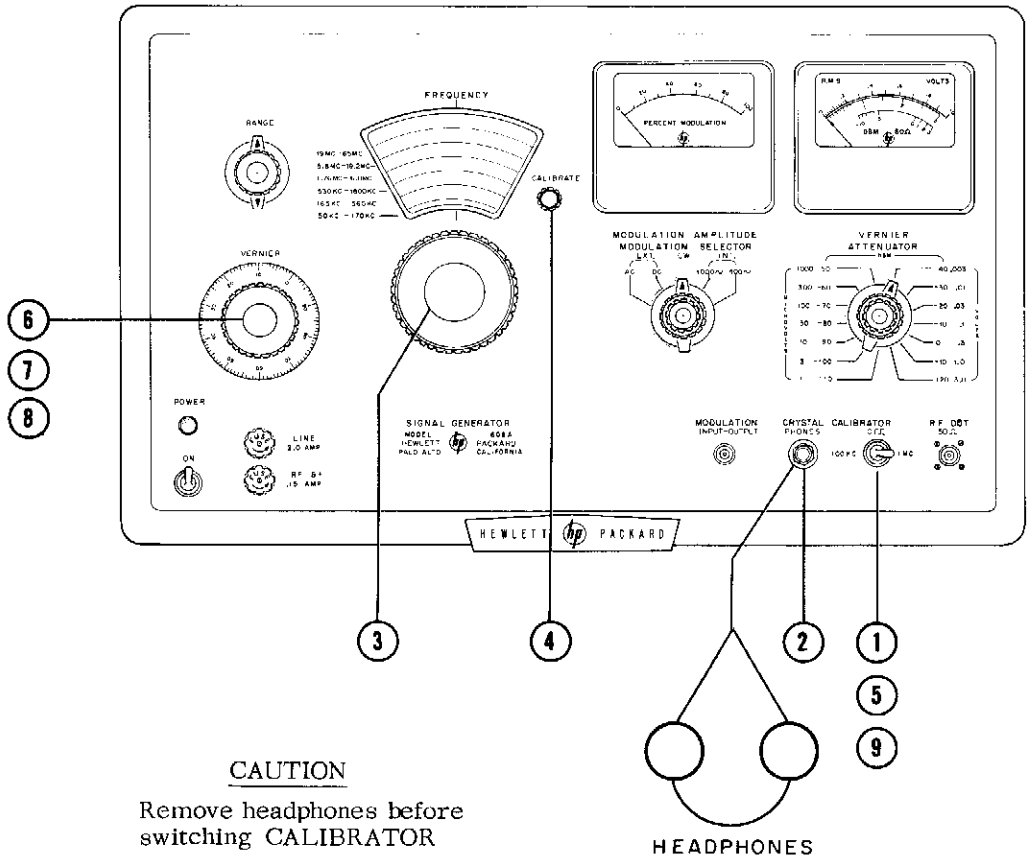
b. ZERO DB ATTENUATION. 25 ohms output impedance (1:1 voltage ratio).

c. TWENTY DB ATTENUATION. 5 ohms output impedance (10:1 voltage division).

Note: Maximum permissible input power to probe is 180 milliwatts (3 volts across 50 ohms).

* See "Standards on Radio Receivers", Institute of Radio Engineers, 1938; and Terman, "Radio Engineers Handbook", any edition -- section entitled "Measurements on Radio Receivers".

Figure 2-3. External Output Termination



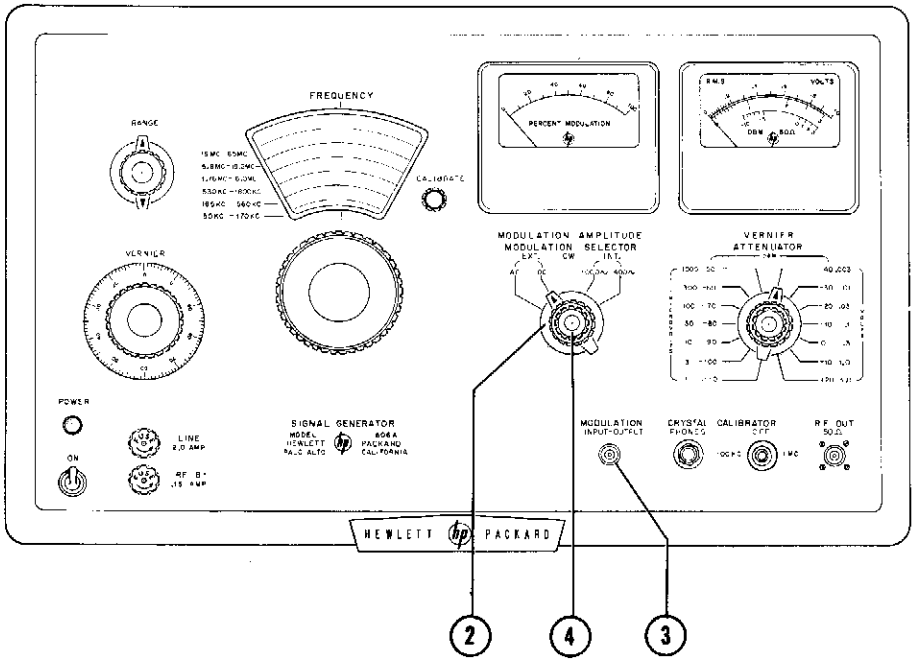
CAUTION

Remove headphones before switching CALIBRATOR

HEADPHONES

1. Switch CRYSTAL CALIBRATOR to 1 MC.
2. Plug a set of high impedance headphones into PHONES jack.
3. Zero-beat nearest even megacycle division to desired frequency.
4. Set the cursor exactly on the megacycle mark.
5. Switch CRYSTAL CALIBRATOR switch to 100 KC (lower frequencies only).
6. Turn VERNIER dial toward desired frequency while counting **100 kHz beats.** This procedure will set the frequency within **100 kHz.** If the frequency is desired with greater accuracy follow the remaining steps:
7. Determine number of scale divisions on VERNIER dial between zero-beat of the two **100 kHz** beats on either side of the desired frequency.
8. Set VERNIER dial to proportional number of divisions from nearest **100 kHz** beat to the desired frequency.
9. Turn CRYSTAL CALIBRATOR to OFF.

Figure 2-4. Calibration



1. Perform procedure for CW operation (**Figure 2-2**)
2. Set MODULATION SELECTOR to EXT (AC or DC coupling).
3. Connect modulating signal (3 volts or more adjustable) to MODULATION terminal.
4. Turn MODULATION AMPLITUDE fully clockwise.
5. Increase signal from external generator until a reading of 100% is obtained on the PERCENT MODULATION meter.
6. Reduce the percent modulation to the desired level with the MODULATION AMPLITUDE control.

The limits of modulation frequency depend upon the maximum tolerable envelope distortion. For three percent envelope distortion the limits in terms of the carrier frequency, f_c, are:

	30% Mod.	70% Mod.	Square-Wave Mod.
$f_{mod.\ max}$ =	$.06\ f_c$	$.02\ f_c$	$.003\ f_c$
absolute $f_{mod.\ max}$ =	20 kHz	20 kHz	3 kHz

Applying these formulas, typical bandwidths are:

Carrier Freq. Frequency	Modulation Frequency 30% Mod.	70% Mod.	Square Wave
50 kHz	3 kHz	1 kHz	150 Hz
200 kHz	12 kHz	4 kHz	600 Hz
500 kHz	20 kHz	10 kHz	1500 Hz
1 MHz and above	20 kHz	20 kHz	3 kHz

NOTE: On the 3 VOLT output range and between 19 - 65 MHz in frequency, modulation beyond 30% is not recommended.

Figure 2-5. External Modulation

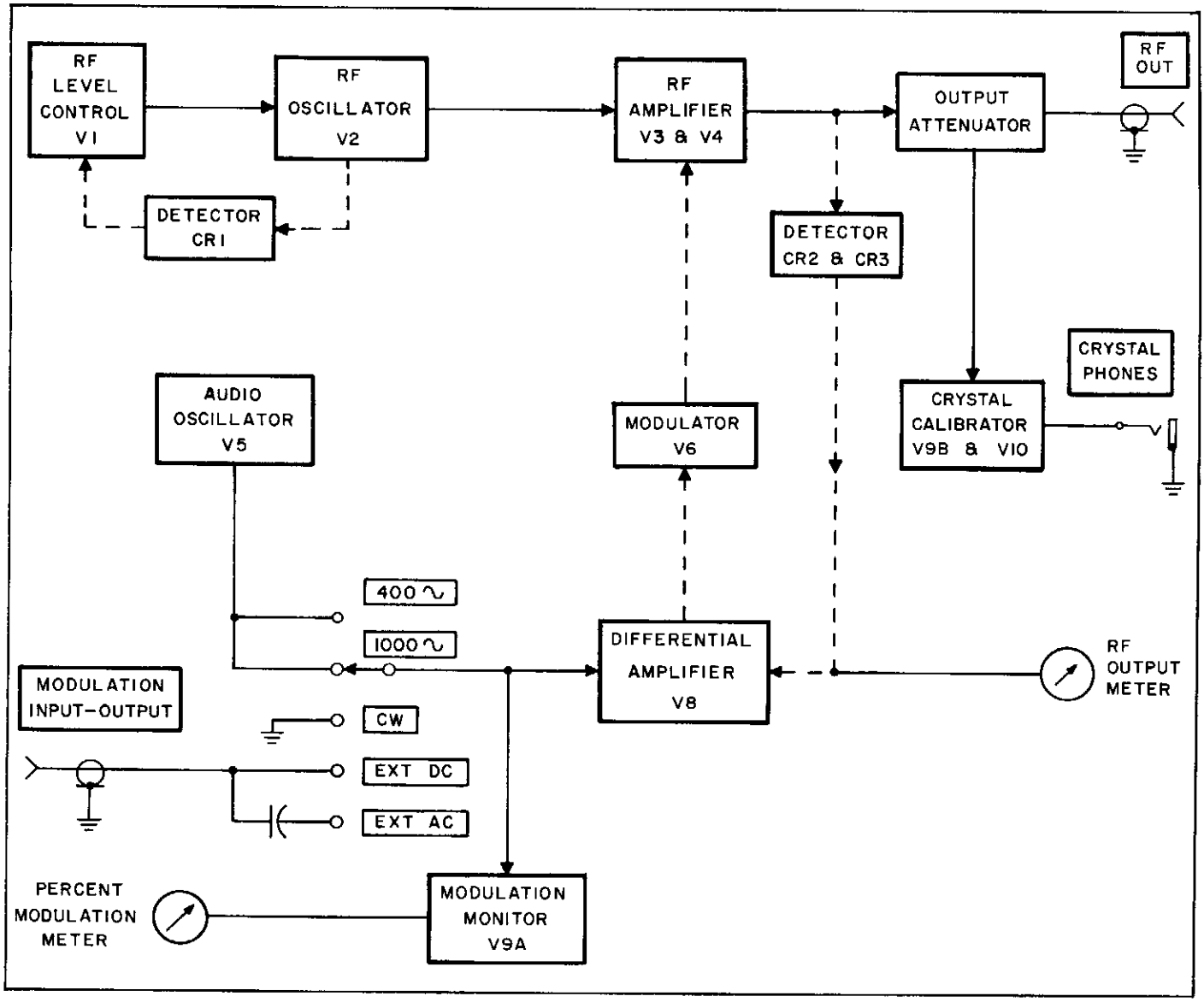


Figure 3-1. Model 606A Block Diagram

SECTION III
THEORY OF OPERATION

3-1. OVERALL OPERATION.

3-2. Refer to the block diagram, Figure 3-1. The level of the RF oscillator is stabilized by a feedback circuit from the RF oscillator to the oscillator level control tube. In a similar way the RF output and modulation levels are held constant by a feedback loop from the RF output through the differential amplifier to the modulator. The rest of the block diagram represents standard circuitry for signal generators.

3-3. CIRCUIT DESCRIPTION.

3-4. RF OSCILLATOR AND LEVEL CONTROL. The RF oscillator is a tuned-plate push-pull oscillator. The pentode section of V1 acts as a variable cathode resistor for V2 to control the oscillator level. The control grid of this pentode receives a rectified portion of the oscillator signal. This voltage decreases the current through V1 when the oscillator level rises and vice versa. Since this current is also the cathode current of the RF oscillator, the level of oscillation will be held constant. The triode section of V1 is a cathode follower which provides bias voltage for the grids of the oscillator and amplifier.

3-5. RF AMPLIFIER. The RF oscillator signal is fed to the control grids of the push-pull RF amplifier stage, V3 and V4. The screen grids are connected directly to +300 volts. The amplifier cathode current is controlled by V6, which acts as a variable cathode resistor. See the next paragraph for an explanation.

3-6. MODULATOR. Triode V6 is inserted in the cathode circuit of the RF amplifier to obtain cathode modulation. The internal resistance of the triode changes according to the applied modulation signal at the control grid. Thus cathode current of the RF amplifier is varied which, in turn, amplitude modulates the RF level.

3-7. RF FEEDBACK AND LEVEL CONTROL CIRCUIT. The modulated RF output signal is sampled at the secondary winding of the RF output transformer and rectified by crystal diodes CR2 and CR3. The time constant of the RC filter is determined by the position of the frequency RANGE selector. This time constant is selected to bypass the RF component but not the modulation or dc level. The demodulated RF signal is then fed to the control grid, pin 7, of the differential amplifier.

3-8. This demodulated signal is dc-coupled and thus has a dc component equal to the CW level of the output plus an ac component corresponding to the modulation. The demodulated RF signal also passes thru an RF filter R36, C37, C38, and L6 which minimizes leakage. At the output of this filter a dc current is obtained which is proportional to the CW RF level. This current is then fed to the RF output meter.

3-9. A two-position attenuator, which controls the amount of feedback, is inserted between the crystal detectors and the differential amplifier. In the 1 VOLT and lower output positions the feedback is obtained thru the divider R25 and R36. Only in the 3 VOLT position is R36 (in feedback loop) shunted by R26. This raises the current through the RF amplifier by 10 dB. This switching is done automatically be relay K1 whenever the ATTENUATOR selector is switched to the 3 VOLT position.

3-10. RF ATTENUATOR. The RF output signal is tapped off the secondary winding of the output RF transformer and fed to the input of the output attenuator. This attenuator provides a maximum attenuation of 120 dB in 10 dB ranges. The output level may be varied between ranges by changing the input to the attenuator with the ATTENUATOR VERNIER control. Input is monitored by the RF level meter. The 3 VOLT RF output is obtained by reducing the demodulator RF feedback.

3-11. CALIBRATOR ASSEMBLY. The Calibrator Assembly consists of a Crystal Oscillator, a Frequency Divider (Q1 and Q2), Mixer/Amplifier. Q6, Beat-Frequency Amplifier V9B, and associated circuits. A small signal coupled from the RF Attenuator and the output signal of the Crystal Oscillator are mixed and applied to the base of Mixer/Amplifier transistor Q6. The output signal from Q6 is applied to the control grid of the Beat-Frequency Amplifier V9B, which amplifies and applies the signal to the PHONES output jack.

3-12. When CRYSTAL CALIBRATOR switch S1 is set to 100KC or 1 MC, crystal Y1 provides 1-MHz oscillations for the calibration signal, which appears at the collector of transistor Q2. This signal is applied to the base of Driver Transistor Q5. Transistor Q5 amplifies and applies the signal to the mixer stage where it is mixed with the signal coupled from RF attenuator. This combined signal is applied to the base of transistor Q6. The frequency of the signal applied to Q6 is controlled by Crystal Calibrator switch S1. With switch S1 set at 100KC, Frequency Divider transistors Q3 and Q4 are biased into conduction, dividing the 1 MHz output frequency of the oscillator by ten, which provides a signal frequency of 100 kHz. With switch S1 set to 1MC, transistors Q3 and Q4 are cut off, and the signal frequency is that of crystal Y1, 1MHz.

3-13. AUDIO OSCILLATOR. The audio oscillator is a modified Wien bridge oscillator with amplitude stabilization. The feedback signal is taken from the secondary winding of the output transformer. Two oscillator frequencies (400 and 1000 Hz) can be selected by switching different resistors in the Wien bridge. The level of oscillation is set by the Modulation Oscillator Adjustment (R51) which controls the feedback to lamp RT1. Increased feedback causes the

lamp to heat up, increasing its resistance. The increased resistance causes more degeneration in the cathode of V5, limiting the gain.

3-14. In the INT. position the modulating voltage is available at the front panel MODULATION INPUT-OUTPUT jack. This voltage is supplied for synchronization purposes. It has a source impedance of 82K ohms.

3-15. PERCENT MODULATION METER CIRCUIT. The modulating signal goes to pin 2 of V9A, a cathode-follower. This tube feeds shunt diode CR5 which rectifies the signal. A dc voltage corresponding to the modulation is fed to the PERCENTAGE MODULATION meter. Clamp diode CR4 prevents the cathode of V9 from going negative to protect capacitor C56, whose voltage rating is 25 volts. This point would otherwise go toward -200 volts if V9 was removed or was weak.

3-16. The modulating signal also goes to pin 2 of V8. The signal level to V8 can be controlled by the ATTENUATOR VERNIER. When the signal level is varied the output modulation is varied, as explained in the following paragraph. This circuit is also used to reduce the voltage on the RF amplifier during switching. As soon as the RANGE switch is rotated out of the detent position, S7 disconnects the +300 volt power supply, hence grid voltage of V8 drops to ground potential. The B+ is not reconnected until after the turret has made contact in its new position. This action keeps the amplifier tubes from drawing excessive screen current when the turret is disengaged from the plate circuit. When the +300 volt dc supply is disconnected, R64 is substituted as a load to keep the power supplies in regulation.

3-17. DIFFERENTIAL AMPLIFIER. The external modulation signal fed into the MODULATION jack is combined with the dc reference level in the same manner as the internal modulation. Either of those signals is applied to a resistive network consisting of R57, R62 and R68 and is added to the dc reference voltage. The combined voltages appear at the ATTENUATOR VERNIER (R63). This control varies the dc, which controls the carrier, and the modulation signal at the same rate. Thus the percentage of modulation remains constant regardless of carrier level.

3-18. The dc (carrier level) and ac (modulation) signals are fed through an RF filter to pin 2, grid of the triode section of V8, as a reference signal to be compared to a signal from the output which is fed to the pentode grid (pin 7). This triode plus the pentode section of the same tube form a differential amplifier. The ac level of both of these signals is proportional to the modulation. The modulating signal is the reference voltage and the actual modulation of the output is compared to this reference. The dc level of the output (proportional to the RF) is compared to a reference dc level that is proportional to the desired RF level, as set by the ATTENUATOR VERNIER control.

3-19. Since the cathodes of V8 are connected together, the reference signal applied to the triode section will also appear on the cathode of the pentode section. This signal will be compared to the signal from the output which is applied to the grid. Any deviation from a fixed voltage difference between these two signals results in an output signal which has a polarity such as to reduce this difference. Thus the original conditions are restored. For example, if the RF level drops, the voltage on pin 7 of V8 will become more negative. This will reduce the amount of current flowing through this tube so the plate will become more positive. The grid voltage of V6 is proportional to the plate voltage of V8. As this grid voltage becomes more positive the current through V6 will increase. But this current is also the cathode current for the RF amplifier, so the output will increase until the original conditions are restored. By this action the output is stabilized and is constant to better than ±1 dB over the entire frequency range. The RF level can be changed by varying the ATTENUATOR VERNIER (R63) which will change the reference bias. In a similar way the modulation is held constant. Since the crystal detector circuit has a time constant fast enough to follow the modulation envelope, the output modulation is compared to the modulating frequency and distortion is minimized.

3-20. BIAS SUPPLY. One half of V7 is used as a constant voltage source to furnish the plate potential needed for the triode section of the differential amplifier. The other half of V7 supplies the screen potential for the pentode section of the differential amplifier. The screen potential is adjusted for RF amplifier cut-off when both grids of the differential amplifier are at ground potential. This establishes the zero point of the ATTENUATOR VERNIER control.

SECTION IV
MAINTENANCE

4-1. INTRODUCTION.

4-2. This section contains instructions for adjusting and servicing the Model 606A Signal Generator. In addition it contains a performance check suitable for incoming or quality-control inspection. The performance check does not require cabinet removal or internal adjustments.

4-3. CABINET REMOVAL.

a. Disconnect line cord from receptacle.

b. Remove the screw attaching the power inlet bracket to rear panel.

c. Remove the four screws on the rear cover of the cabinet and remove the rear cover.

d. Tip the instrument on its back.

e. Loosen the two screws on the bottom of the cabinet which clamp the cabinet to the front panel. (Do not remove any screws from the front panel.)

f. Lift the cabinet off the instrument.

CAUTION

When the cabinet is removed, dangerous voltages are exposed. Take adequate safety precautions.

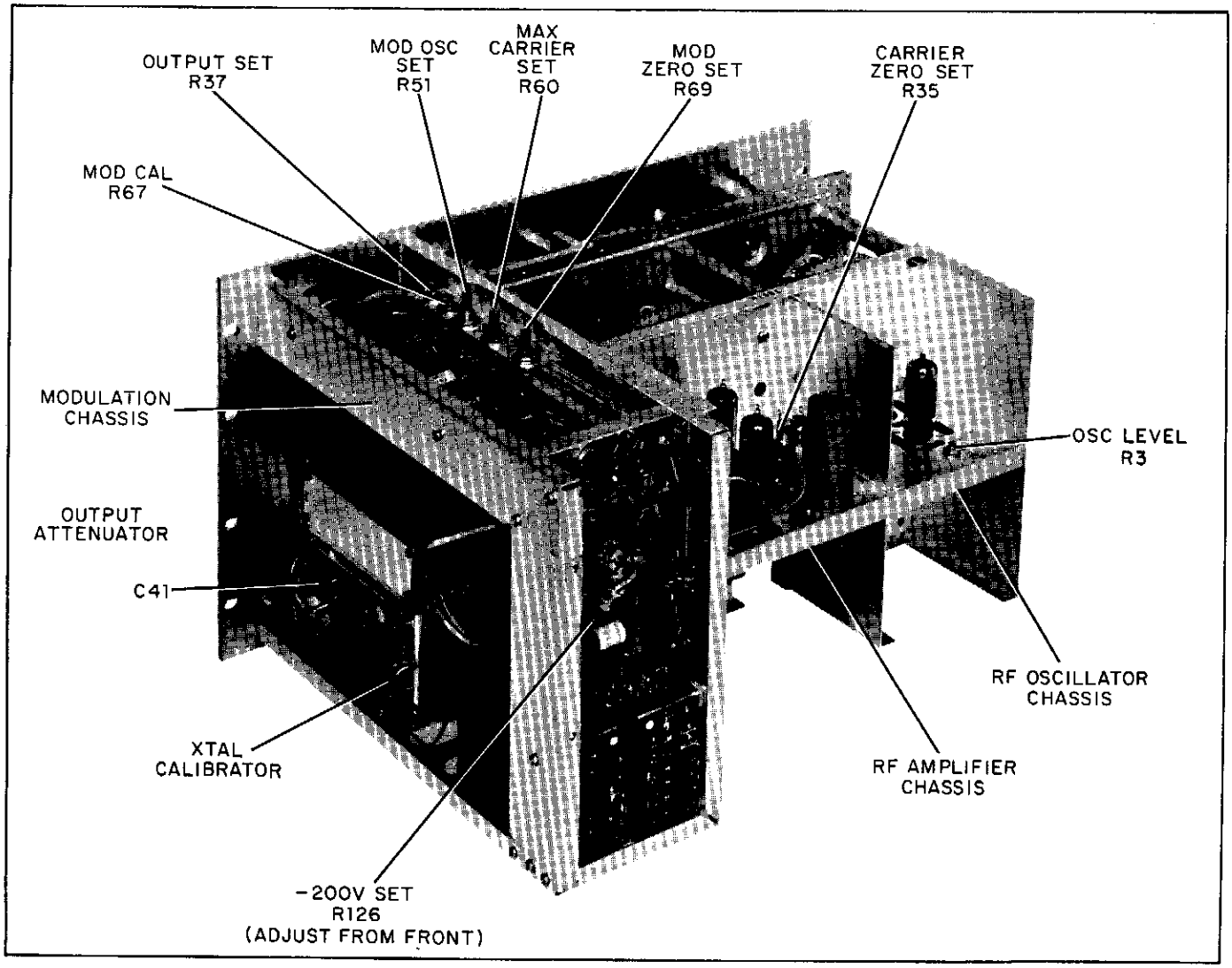


Figure 4-1. Location Diagram Model 606A

4-4. RF SHIELD REMOVAL.

a. Remove the two screws holding the inlet bracket and allow bracket to hang free.

b. Remove all screws holding the RF shield (use Allen wrench clipped on top of the shield to remove cap screws).

c. Hold inlet bracket to one side and remove the RF shield by pulling it to the rear.

4-5. TEST EQUIPMENT REQUIRED.

4-6. The following equipment is required to test the Model 606A:

a. VTVM accurate to ±3% with a high frequency probe, such as the HP Model 410B Vacuum Tube Voltmeter.

b. AC voltmeter accurate to ±2%, such as the HP Model 400D/H/L Vacuum Tube Voltmeter.

c. Clip-on dc milliammeter, such as the HP Model 428A/B Clip-On DC Milliammeter or a conventional 300 mA milliammeter.

d. Electronic counter, such as HP Model 5248L.

e. Oscilloscope, such as HP Model 180A with Model 1802A/1822A plug-ins.

f. Variable transformer continuously adjustable over the range 100 to 130 volts, equipped with a monitor voltmeter accurate within 1 volt.

g. Square-wave generator, such as the HP Model 211A Square Wave Generator.

4-7. TUBE REPLACEMENT.

4-8. In many cases instrument malfunction can be corrected by replacing a weak or defective tube. Before changing the setting of any internal adjustment check the tubes. Adjustments made in an attempt to restore operation when the cause is a defective tube will often complicate the repair problem.

4-9. Check tubes by substitution rather than using a "tube checker". The results obtained from the "tube checker" can be misleading. Before removing a tube, mark it so that if the tube is good it can be returned to the same socket. Replace only those tubes proved to be weak or defective.

4-10. Any tube with corresponding standard EIA characteristics can be used as replacement. Where variations in tube characteristics will affect circuit performance an adjustment is provided. Table 4-1 lists the tests to make and the adjustments that may be necessary if such tubes are replaced.

Table 4-1. Tube Replacement

Circuit Ref.	Tube Type	Function	Tests and/or Adjustments	Par. Ref.
V1	6AW8	Oscillator Level Control	Set Maximum Oscillator Current	4-45
V2	12AT7	RF Oscillator	Set Maximum Oscillator Current	4-45
V3, 4	6CL6	RF Amplifier	Carrier Zero Set Maximum Carrier Set RF Output Meter	4-46 4-47 4-49
V5	12AT7	Audio Oscillator	Audio Oscillator Mod. Zero Set Modulation Meter	4-42 4-47 4-48
V6	12B4	Modulator	Maximum Carrier Set Mod. Zero Set RF Output Meter Modulation Meter	4-47 4-47 4-49 4-48
V7	12AT7	Cathode Follower	Carrier Zero Set Maximum Carrier Set Mod. Zero Set RF Output Meter Modulation Meter	4-46 4-47 4-47 4-49 4-48
V8	6AW8	Differential Amplifier	Same as V7	
V9	12AT7	Modulation Monitor and Beat Frequency Output	Mod. Zero Set Modulation Meter Crystal Calibrator	4-47 4-48 4-43
V10	6AW8	Crystal Oscillator and Mixer	Crystal Oscillator	4-43
V101, 2, 3, 4, 5	12B4A	Regulators	Power Supplies	4-36
V106	6AW8	Amplifier		
V107	12B4A	Regulator		
V108	6AW8	Amplifier		
V109	5651A	Voltage Reference		

4-11. FRONT PANEL OPERATION CHECK.

4-12. The following in-cabinet procedures are simple checks to be performed first whenever difficulty is encountered in operation of the signal generator. These checks will isolate the trouble to either the signal generator or associated equipment and if the trouble is in the signal generator will isolate it to a particular section.

4-13. PRELIMINARY CHECK.

4-14. Always perform these checks before attempting to isolate the trouble within the instruments.

a. Turn unit on with no load and allow to warm up five minutes or more.

b. If output meter is off scale in the negative direction, check for blown B+ fuse.

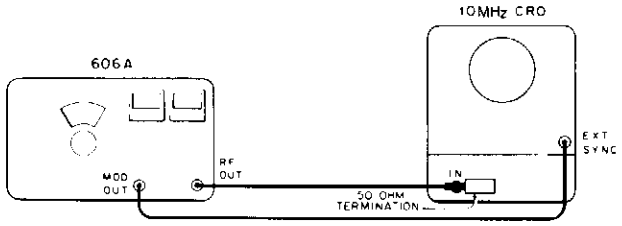


Figure 4-2. Modulation Meter Calibration

4-15. MODULATION METER CALIBRATION.

a. Connect the unit to a 10 MHz oscilloscope as shown in **Figure 4-2.**

b. Set RANGE switch to 530-1800 **kHz band.**

c. Set FREQUENCY control to 1000 **kHz.**

d. Set MODULATION SELECTOR to CW.

e. Set ATTENUATOR to 1 VOLT.

f. Adjust vertical sensitivity of oscilloscope to get 4 cm of deflection.

g. Set MODULATION SELECTOR switch to 1000 ∿.

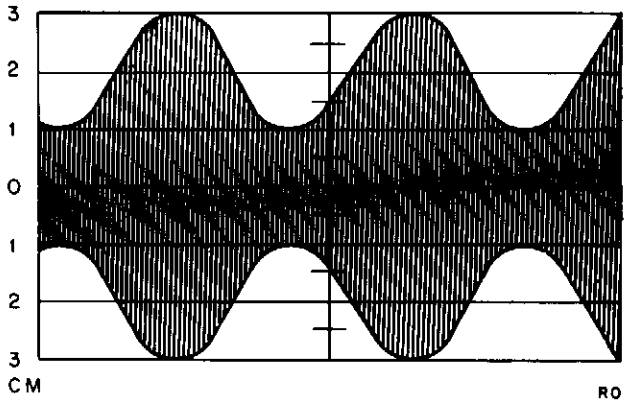


Figure 4-3. Waveform for 50% Modulation

h. Adjust MODULATION SELECTOR control until maximum deflection is exactly 6 cm high (see figure 4-3). Modulation meter should be reading between 45 and 55%.

i. Check modulation meter calibration from 0 to 90%. It should be accurate within ± 5% of full scale.

4-16. FREQUENCY CALIBRATION.

4-17. The easiest way to check frequency calibration is with a counter, such as the HP Model 5248L. If a counter is not available, proceed as follows:

a. Allow both a receiver capable of receiving WWV and the Model 606A to warm up for fifteen minutes.

b. Tune in WWV on 5, 10, or 15MHz, whichever gives best reception.

c. Lightly couple a single wire from the RF OUT jack of the Model 606A to the antenna as shown in **Figure 4-4.**

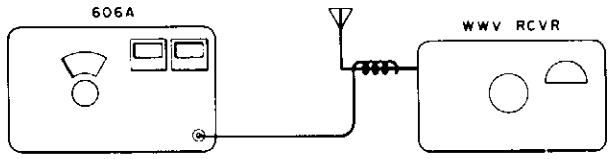


Figure 4-4. Frequency Calibration

d. Tune the RANGE and FREQUENCY controls of the Model 606A to the frequency of the incoming WWV signal. The MODULATION SELECTOR switch should be on CW (no modulation).

e. Adjust the output level to be about the same as WWV (use S meter on receiver if it has one). Too much signal will block the receiver and obscure the beat-note.

f. Zero-beat the frequency of the Model 606A to the WWV signal during a time that WWV has no modulation. Do not disturb the FREQUENCY dial after this adjustment. Set CALIBRATE adjustment to align window.

g. Listen to 1 MC CALIBRATOR with headphones. If beat-note is a low audio tone, less than 1 **kHz** crystal calibrator is within specifications.

h. Repeat step g using 100 KC CALIBRATOR.

i. With the CALIBRATOR on 1 MC check all megacycle marks on the dial on all bands. Beat-note should be within 1% of the dial reading.

4-18. OUTPUT LEVEL FREQUENCY RESPONSE.

a. Connect **ac probe of HP** Model 410B High Frequency VTVM to 11507A Output Termination as shown in figure 4-5. Solder tip of Model 410B ac probe to center conductor of UG-290/U connector. Clip ground lead

of probe to skirt of connector. Insert connector into OUTPUT connector of Output Termination.

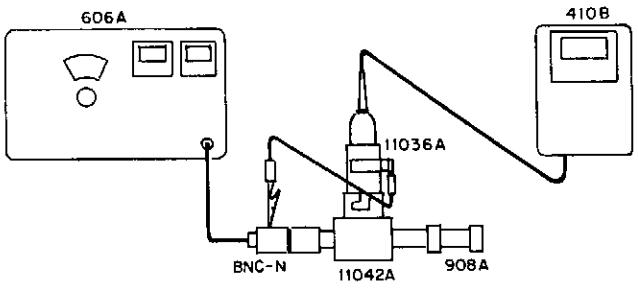


Figure 4-5. Output Level Frequency Response

b. Set the output to 0.9 volt on the 530-1800 kHz band and run the FREQUENCY dial and RANGE switch throughout all bands. The voltage should not vary more than ±11% (1 dB) at any output level setting.

4-19. TROUBLESHOOTING.

4-20. In general, internal controls have only a limited range and are designed to compensate for minor variations in tubes and/or circuit components. If a major section or the complete instrument is inoperative adjustment of internal controls will seldom, if ever, restore operation. To avoid complications and reduce "down time" locate and correct the cause of a dead instrument before you make internal adjustments. Refer to paragraph 4-7 before making internal adjustments.

4-21. When a section shows up faulty, refer to the appropriate section of table 4-2 and perform the recommended tests. If the trouble is in the output termination or attenuator you may return them separately to the factory for repair. They are not field repairable.

4-22. A good starting point when repairing a dead instrument is with the power supply. Check line cord, both fuses, and the power supply output voltages. BE SURE TO CHECK THE B+ FUSE IN ADDITION TO THE MAIN FUSE, ESPECIALLY IF THE OUTPUT METER IS PINNED TO THE LEFT. If you find a dead power supply tube, tube replacement will normally restore instrument operation without any internal adjustments. However, check the output voltages of each supply to see if the output is within limits. If the output is within the limits given in the power supply section do not attempt to refine the adjustments.

4-23. IF THE INSTRUMENT IS INOPERATIVE, FIRST TRY BLOWING OUT THE PLATES OF THE TUNING CAPACITOR WITH A LOW VELOCITY AIR STREAM SUCH AS THAT FROM A VACUUM CLEANER. Blow out these plates every time you remove the instrument from the cabinet for maintenance.

4-24. TROUBLESHOOTING CHART, TABLE 4-2. Since the operation of many sections in this generator is dependent upon the proper operation of other sections, troubleshooting in this instrument must be done in proper sequence. After determining in which section the trouble lies, refer to the appropriate section of this chart and perform the tests indicated. Also, if the trouble cannot be found by any other means, go through table 4-2 from the beginning. Once the trouble has been found and fixed do not continue with the tests in this table.

4-25. If output is obtained, troubleshoot the particular section giving difficulty by referring to the appropriate part of table 4-2.

4-26. If no output is obtained, the trouble may be anywhere in the feedback loop. Refer to table 4-3, Troubleshooting the Feedback Loop, for instructions.

Table 4-2. Troubleshooting Chart

Measure	Normal Indication	Possible Cause of Malfunction
A. -200 VDC SUPPLY PREPARATION: Disable +300 Vdc supply by disconnecting R101 (5 ohm 5 watt wirewound resistor found just above rectifier terminal boards at rear of instrument). Temporarily connect a 1 megohm 1 watt resistor between pins 2 and 9 of V107. Measure the voltage to ground at the following points:		
1. C105B filter cap.	-200 vdc ±5%	Open or shorted C105 C108 open or shorted, also disconnect load and remeasure
2. Transform.sec.(blue)	143 volts rms ±10%	Open or shorted secondary
3. C105 unregulated dc	+195 Vdc ±10% (one side)	V107 (12B4) defective. Check heater (6.3 vrms)
4. V109 pins 1, 5 (plate)	-110 Vdc (nominal) ±20%	V109 (5651) defective. Check for orange glow.
5. V108 pins 1, 6 (cathode)	-112 Vdc (nominal) ±20%	V108 or associated components defective; check heater (6.3 volt rms).

Table 4-2. Troubleshooting Chart (Cont'd)

Measure	Normal Indication	Possible Cause of Malfunction
B. +300 VDC SUPPLY		
PREPARATION: The -200 Vdc supply is assumed to be operating (remove 1 megohm resistor and reconnect +300 volt supply if these temporary changes were made to troubleshoot -200 Vdc supply). Adjust line to 115 volts rms.		
1. C104 filter cap	+300 Vdc ± 5%	Also measure with RANGE switch between ranges; this will isolate a defective tuning capacitor in RF OSC. or AMP.
2. Transf.sec.(red) R101	+175 volts rms ± 10%	Open or shorted turns in transformer
3. C101 and C102	250 Vdc across each	C101, 102, and 104 or CR101, 102, 103 and 104 open or shorted.
4. V101 pin 9 (plate)	+500 Vdc	C101, 102 or CR101, 102, 103 and 104 open or shorted. Check V101, 102, 103, 104, 105 and 106.
5. V106		
pin 9 (plate)	+270 Vdc	V106, R102, 103 and 104
pin 8 (screen)	+ 38 Vdc	V106, CR103, R110, R111 and -200 volts
pin 6 (cathode)	+ 3.6 Vdc	V106, R113 and -200 volt supply
C. RF OSCILLATOR		
PREPARATION: This procedure assumes the power supply is operating correctly. Use a clip-lead to short across R30 (caution -200 volts) to disable RF Amplifier temporarily while measuring the following voltages: (Measure voltage to ground.)		
1. V2 pin 9 (tie point)	+26 Vdc ± 10%	Check voltage at RF filter
		Check voltage at junction of CR110 and 112
pin 5 to 9	6.3 Vdc ± 10%	Open heater-check for visible glow
2. V1 pin 5	+26 Vdc ± 10%	Same as step 1, V2 pin 9
pin 4 to 5	6.3 Vdc	Same as step 1, V2 pin 5 to 9
pin 3	+295 Vdc (nominal)	Check B+ fuse, detent micro-switch S7, RF filter (C8, 10ABC, 11, 16, 32 and 33 for shorts, L4 for open circuit). Turn range switch between ranges-should be no change
pin 2	+99 Vdc	Check R1, 2, 3 and C1
pin 1	+100 Vdc	Check R19, V1 or RF lead to 6CL6's
3. V2 pin 1 & 6 (plates)	+295 Vdc (nominal)	Check R9, and C4, 5 and 7 for shorts
pin 2 & 7 (grids)	+100 Vdc	Check V1 and associated components
pin 3 & 8 (cathode)	+110 Vdc	Check V1, 2, CR1 or associated components
pin 2 & 7 (grids)	6 volt rms (nom.) to 19 MHz 3 to 5 rms to 65 MHz (meas. with HP 410B-AC Probe).	Check V2, CR1, C4, 5, 7, T2 (tank coil) and grid line to 6CL6's.
4. R9 (turn off and measure resistance)	100 ohms ± 10%	Check C4, 5 or V1 or V2 for shorts
D. RF AMPLIFIER		
PREPARATION: This procedure assumes the power supply and oscillator are operating. (Disconnect short across R30, if installed in step C.) Measure voltage at:		
1. C111	+27 Vdc ± 10%	C109, C110, C111, R132, V1 to 4, and V6 to 8
2. V3, 4, 7 & 8 (acr.htrs)	6.3 Vdc ± 10%	Same as above
V6	12.6 Vdc ± 10%	Same as above

Table 4-2. Troubleshooting Chart (Cont'd)

Measure	Normal Indication	Possible Cause of Malfunction
	D. RF AMPLIFIER (CONT'D)	
3. R15 at tank term.	+295 Vdc ± 10%	R15 open, C10C, 11 shorted
4. V8 (6AW8) pin 2	0 to 3.5 Vdc as R63 is rotated	R31, 53, 57, 60, 61, 62, 64, 65 and 68
pin 6	+4.1 Vdc (nominal)	C29, R32, 33, 34, 35, V7, 8
pin 9	+76 Vdc (nominal)	R20, 22, 23, 29, 30, V8
pin 3	+150 Vdc (nominal)	R28, 29, R33, 34, 35, V7
pin 8	+54 Vdc (nominal)	Same as pin 3
pin 7	0 to +3.4 Vdc as R63 is rotated	C23, 24, 25, CR2, 3, R17, 24, 25, 26, 36, V8
5. V6 (12B4) pin 2, 7	-10 to -25 Vdc as R63 is rotated	C19, R20, 22, 23, 29, 30, V7 or 8
pin 9	+110 Vdc (nominal)	R10, 38, V3, 4, 6
6. V3 and 4 (6CL6's)		
pin 6	+295 Vdc (nominal)	Shorted C12,14,15, open T3 or contacts on turret
pin 3, 8	+295 Vdc (nominal)	Check C10, 11, 14, 15, 16, R10, 15
pin 2, 9	+100 Vdc (nominal). If this voltage is incorrect the RF oscillator is not functioning properly	R11, 12 triode section of V1
pin 1	+112 Vdc (nominal)	R13, 14, check voltage on pin 9 V6
7. CR2, anode	6 volt rms (nominal) with 1 VOLT output level. Varies 0 to 6 volt rms as ATTENUATOR VERNIER is turned	Check V3 and 4 plate voltage and output voltage as given in table 4-4

Symptom	Possible Cause
8. Fuse F1, (0.15 amp) burns out	Defective C8, 10ABC, 32, 33, 53 and L1, 4 Foreign material across tuning capacitors: C4, 5, 7, 14, 15 and 18 Defective microswitch S7 Feedback system defective
9. Sharp drop (hole) in power output level, or a sharp increase (peak) in oscillator or amplifier current as frequency dial is tuned	Check shorting fingers in turret. This prevents next lower band coil from resonating and absorbing power
10. R15 (100 ohms) burns out	Shorted tuned capacitor C14, 15 or 18 Open or shorted CR2, 3 Shorted C23, 24, 25 or S3 If this condition affects one band only, check the turret contact and coil for that one band. Also check switch S3 (on RF deck) for shorts This condition persists on all bands see table 4-3

E. AUDIO OSCILLATOR

Most troubles can be found easily by measuring the voltages in the circuit as follows:
Set MODULATION SELECTOR to INT. 1000 ∿
MODULATION AMPLITUDE to 100%

V5 (12AT7)	pin 1	3.7 volts rms	+180 Vdc (approximate voltages)
	pin 2	6.6 volts rms	0 Vdc
	pin 3	6.2 volts rms	+2.6 Vdc
	pin 6	80 volts rms	+292 Vdc
	pin 7	3.8 volts rms	0 Vdc
	pin 8	1.88 volts rms	+4.8 Vdc
T1 leads	green	20 volts rms	0 Vdc (approximate voltages)
	yellow	3 volts rms	0 Vdc
	blue	80 volts rms	+292 Vdc

Table 4-2. Troubleshooting Chart (Cont'd)

F. MODULATION MONITOR

Most troubles can be found easily by measuring the voltages in the circuit as follows:
Set MODULATION SELECTOR to INT. 1000 ∿
MODULATION AMPLITUDE to 100%

V9A (1/2 12AT7)		
pin 2	2.8 volts rms	0 **Vdc** (approximate voltages)
pin 3	2.8 volts rms	+3.9 **Vdc**

Diode CR4 (1N90) prevents a high negative voltage developing at the cathode of V9A during warmup. Such a high voltage of reversed polarity would damage electrolytic capacitor C56. The high negative voltage could also be developed if the heater of V9 burned out or if the instrument were turned on with V9 removed.

Diode CR5 (1N90) is the detector for the modulation meter.

Both diodes can be measured only out of the circuit. Forward resistance should be approximately 500 ohms. Back resistance should be greater than 100K ohms.

G. CRYSTAL CALIBRATOR

Most troubles can be found easily by measuring the voltages in the circuit as follows:
Set CRYSTAL CALIBRATOR to either 100 KC or 1 MC as indicated.

	100 KC		1 MC		
V10 (6AW8A)	DC	AC	DC	AC	
pin 1	0 **Vdc**	0 volt rms	0 **Vdc**	0 volt rms	
pin 2	-58 **Vdc**	41 volts rms	-34 **Vdc**	23 volts rms	
pin 3	+71 **Vdc**	0.44 volt rms	+196 **Vdc**	0.1 volt rms	all
pin 6	0 **Vdc**	0 volt rms	0 **Vdc**	0 volt rms	voltages
pin 7	-82 **Vdc**	60 volts rms	-35 **Vdc**	23 volts rms	approximate
pin 8	+108 **Vdc**	31 volts rms	+122 **Vdc**	7.5 volts rms	
pin 9	+240 **Vdc**	41 volts rms	+222 **Vdc**	22 volts rms	

Table 4-3. Troubleshooting the Feedback Loop

SYMPTOM. No output on all ranges, or R15 (100 ohms) burns out on all ranges.

PREPARATION. This procedure assumes that:

a) The -200 volt and +300 volt supplies are functioning properly.

b) All heater voltages in the **RF** chassis measure the correct value.

c) All tubes have been checked.

d) The oscillator is working properly on all bands and gives approximate voltages and currents as listed in table 4-4.

e) The tuning capacitor or its leads are not short circuited.

PROCEDURE. Unless otherwise noted all measurements are made at 115 volts rms, 60 cycle line, with the Model 606A on CW.

Proceed from step to step. Rectify any troubles before proceeding to the next step.

Measurements are made with an **HP** Model 410B VTVM and Model 428A Clip-On Milliammeter, or other milliammeter.

E = dc voltages; e = ac voltages; I = current.

Procedure	Observe or Measure
1. Disable the feedback by connecting pin 2. V6 (12B4) to -200 volts by shorting R30 (220K).	This bias should cutoff V6 and provide no current for V3 or V4. There should be no current through R15. Check with **HP** Model 428A.

Table 4-3. Troubleshooting the Feedback Loop (Cont'd)

Procedure	Observe or Measure			
2. Connect a series combination of 5K, 5W, fixed and a 2K, 2W variable resistor from pin 9 of V6 (12B4) to ground. Terminate output with 50 ohm load. Adjust 2K pot. to obtain 1 volt at 1 MHz.	V6 (12B4)	pin 1 to ground	I_k is approx.	19 mA
	R10 (33K)		I_k is approx.	5.6 mA
	R38 (33K)	bands 1 to 5	I_k is approx.	5.6 mA
		band 6	" "	0 mA
	V3 or V4 (6CL6)	pin 6 to ground	e is approx.	7.8 Vrms
		pin 1 to ground	" "	2.0 Vrms
		pin 1 to 2	E is approx.	-14 Vdc
		pin 6 to ground	" "	+295 Vdc
		pin 8 to ground	" "	+295 Vdc
		pin 7 to ground	" "	+110 Vdc
	Drop across R13 or 14 (39 ohms)		E is approx.	0.15 Vdc
	CR2 (anode)		e is approx.	5.7 Vrms
	CR3 (cathode)		E is approx.	7.1 Vdc
	V8 (6AW8)	pin 7 to ground	E is approx.	3.1 Vdc
		pin 7 to ground	e "	0 Vrms
	R18 (50 ohms)	input voltage	is approx.	2 Vrms
		output voltage	"	1 Vrms
3. Repeat for bands 1, 2, 4, 5 and 6	Check with data on table 4-4. Data for CR2, CR3 and V8 for this test are same as listed in item 2			
4. Adjust the 2K variable resistor until 3.1 Vdc appears on pin 7 of V8 (6AW8A). Set R63 (ATTENUATOR VERNIER) fully counterclockwise (zero ohms).	V8 (6AW8)	pins 1 and 6	E is approx.	+3.9 Vdc
		pin 2	" "	0 Vdc
		pin 3	" "	+143 Vdc
		pin 4	" "	+19.5 Vdc
		pin 5	" "	+13 Vdc
		pin 7	" "	+3.1 Vdc
		pin 8	" "	+54 Vdc
		pin 9	" "	+10 Vdc
	V7 (12AT7)	pins 1 and 6	E is approx.	+295 Vdc
		pin 2	" "	+50 Vdc
		pin 3	" "	+54 Vdc
		pins 4 and 5	" "	+19.5 Vdc
		pin 7	" "	+135 Vdc
		pin 8	" "	+143 Vdc
		pin 9	" "	+13 Vdc
5. Turn R63 (ATTENUATOR VERNIER) fully clockwise (5K).	V8 (6AW8)	pins 1 and 6	E is approx.	+4.5 Vdc
		pin 2	" "	+3.3 Vdc
		pin 3	" "	+138 Vdc
		pin 6	" "	+4.5 Vdc
		pin 7	no voltage change as R63 is rotated	
		pin 8	E is approx.	+54 Vdc
		pin 9	" "	+42 Vdc
6. Disconnect jumper from pin 2 V6 to -200 volts. Remove 5K and 2K resistor.	The unit should be working properly.			
7. Realign the RF oscillator and amplifier sections if any tubes or components have been replaced or altered.	See section on Max. Carrier Set, Mod. Zero Set, Carrier Zero Set, Percentage Mod. and Carrier Output Meters.			

Table 4-4. Typical Voltage(1). Oscillator and Amplifier Current Output
1 Volt into 50 Ohms, CW

FREQ. (6)	I_o (2)	e_{go} V2 pin 2, 7	e_{po} V2 pin 1 or 6	e_{ko} @C4/ C5	I_a (3)	e_{ga} V3 or 4 pin 2	e_{pa} V3 or 4 pin 6	e_{ka} @C14/ C15	e_{out} term. (5)	e_{fb} term. (4)	I_k 12B4 V6 pin 1
94 kHz	1.3 mA	7.1 V	92 V	209 V	5.7 mA	7.1 V	9.3 V	58 V	2.0 V	5.5 V	19 mA
310 kHz	2.8	7.0	70	150	4.9	7.1	9.8	31	2.0	5.3	19
1 MHz	4.8	5.9	130	130	6.4	5.9	7.8	19	2.0	5.7	19
3.33 MHz	5.3	6.7	93	93	7.6	6.8	19	19	2.0	5.5	26
10.9 MHz	4.6	6.9	55	55	4.0	6.85	15.5	15.5	2.0	5.5	17
36.3 MHz	14.0	6.6	24.5	25	9.4	5.3	6.8	6.8	2.0	5.5	26

Notes:
(1) Measured by DC VTVM, such as HP Model 410B
(2) Measured by HP Model 428A Clip-On Milliammeter at red-green wire loop between B+ and R9 (beneath RF oscillator stator turret contacts).
(3) Measured by HP Model 428A Clip-On Milliammeter at red-green wire loop between B+ and R15 (beneath RF amplifier stator turret contacts).
(4) Feedback voltage terminal (4) next to diode detector CR2.
(5) Output voltage terminal (5) next to generator terminating resistor, R18.
(6) Leave dial set at 1 MC, rotate range switch only to desired band.

Explanation of symbols:
e = voltage
I = current
g = grid
o = oscillator
k = cathode
a = amplifier
f = filament
p = plate

4-27. TURN-ON PROCEDURE AFTER REPAIR.

4-28. Be sure to check for shorts in tuning capacitors C4 and C5, C14 and C15 with an ohmmeter after repair and before turning on the instrument. Solder splashes may occur which short these capacitors when repairing other parts of the instrument. If the instrument is turned on with these capacitors shorted, resistors R9 or R15 may be damaged.

4-29. MECHANICAL ADJUSTMENT OF METER ZERO.

4-30. When meter is properly zero-set, pointer rests over the zero calibration mark on the meter scale when instrument is: 1) at normal operating temperature, 2) in its normal operating position, and 3) turned off. Zero-set as follows to obtain best accuracy and mechanical stability:

a. Allow the instrument to operate for at least 20 minutes; this allows meter movement to reach normal operating temperature.

b. Turn instrument off and allow 30 seconds for all capacitors to discharge.

c. Rotate mechanical zero-adjustment screw clockwise until meter pointer is to left of zero and moving upscale toward zero.

d. Continue to rotate adjustment screw clockwise; stop when pointer is right on zero. If pointer overshoots zero, repeat steps c and d.

e. When pointer is exactly on zero, rotate adjustment screw approximately 15 degrees counterclockwise. This is enough to free adjustment screw from the meter suspension. If pointer moves during this step you must repeat steps c through e.

4-31. GENERAL TEST AND ALIGNMENT.

4-32. Usually the instrument will not need complete test and adjustment. This is particularly true when repair has been accomplished without changing any internal adjustments. BEFORE MAKING ANY INTERNAL ADJUSTMENTS, SEE PARAGRAPH 4-7. If unnecessary adjustments are eliminated you will often save time by being able to finish a repair without completing the entire test and adjustment procedure.

4-33. The procedures are listed in a recommended sequence for a complete test and adjustment operation. Test instrument recommendations are given in paragraph 4-5. The test frequencies and voltages are based upon the use of these recommended instruments. If other equipment is substituted, you may have to alter the procedures accordingly. When other equipment or methods are used, it is important to select components and techniques which have equal or greater accuracy. Any instrument can be adjusted for optimum performance at a particular frequency or voltage, or the most commonly used range.

4-34. The specifications for the Model 606A are given in the front of this manual. The test procedures contain extra checks to help you analyze the instrument. These extra checks and the data they include are not to be considered as specifications.

4-35. A ten to fifteen minute warmup at normal line voltage (nominally 115 or 230 volts) and power supply output voltage measurements are always recommended before making any other tests or adjustments. Refer to paragraph 4-36 before making any power supply adjustments.

4-36. POWER SUPPLIES.

4-37. The power supplies in this instrument are extremely stable and will require infrequent adjustment. The output voltages may be measured at regular intervals or as a first troubleshooting step but unnecessary adjustment should be avoided. A defective tube or component may overload the power supply and lead you to believe that the power supply is not functioning properly.

4-38. As long as the power supply regulator is functioning properly, you need not know the absolute values of the power supply output voltages. However, when power supply adjustment is necessary, you should use a voltmeter with a known calibration accuracy.

4-39. Regulation of the power supply can be checked by varying the power line voltage between 103 and 127 volts. The output voltage will vary only slightly, if at all, from the value measured with a 115 volt line. Loss of power supply regulation is most easily detected, as a sudden large increase in power supply ripple as the line voltage is raised and lowered ±10% from 115 volts.

4-40. When the power supply output voltages are within limits with the line voltage at 115 volts, adjustment is not necessary. Do NOT adjust in attempt to refine the existing control settings.

4-41. To test the power supplies proceed as follows:

a. Measure power supply outputs. They should be within the limits shown in table 4-5.

b. If the voltage is outside the limits in the table adjust R126 (-200 volt set) for -200 volts. This control is in the center of the power supply deck with access only from the front side of the chassis.

c. You may wish to check the regulation of each power supply as the line voltage is varied between 103 and 127 volts. All regulated voltages should remain within ±1% over this range of line voltage.

d. Measure the ripple voltage on the various supplies. They should approximate the values indicated in table 4-5 with the power line voltage set at 115 or 230 volts.

Table 4-5. Regulated Power Supply Tolerances

Nominal Voltage	Nominal Ripple at 115/230 Vrms Input	Output Voltage Range
-200 (violet wire)	10 mV	200 ±8 volts
+300 (red wire)	10 mV	300 ±12 volts
+27 (brown-orange wire)	---	unregulated

4-42. AUDIO OSCILLATOR.

a. Set RANGE 530 KC-1800KC
MODULATION SELECTOR . . . . . INT 400 ∿

b. Turn POWER switch to ON.

c. Connect an **HP** Model 400D AC VTVM to output tap on audio transformer (yellow lead on signal tie point behind **RF** output meter). Connect ground lead of voltmeter to ground.

d. Set Mod.Osc.Adj (R51) potentiometer for 3.2 volts. This control is the middle one in the row of five potentiometers on top of the modulation deck.

4-43. CRYSTAL CALIBRATOR.

a. Set CRYSTAL CALIBRATOR to 100 KC.

b. Connect an electronic counter to pin 2 of the crystal oscillator tube (V10).

c. Adjust trimmer (C41) for exactly **100.000 kHz.** This trimmer is the ceramic capacitor on the right side (as viewed from the front) of the instrument under the modulation deck.

d. Set CRYSTAL CALIBRATOR to 1 MC and read counter. Reading should be between 999.900 and 1000.100 **kHz.**

e. Set CRYSTAL CALIBRATOR to 100 KC and read counter. Reading should be between 99.990 and 100.010 **kHz.**

f. Set trimmer C41 to best compromise between the above limits.

g. Turn CRYSTAL CALIBRATOR to OFF.

4-44. TUNE OSCILLATOR AND AMPLIFIER.

Note

This procedure should be performed only if there is a definite indication that the oscillator is off frequency. It should NOT be done on a routine basis.

a. Set CALIBRATE cursor to align with FREQUENCY centerline
ATTENUATOR . . . . . .3 VOLT
MODULATION SELECTOR. . . . . CW
FREQUENCY dial. . . . . .low end of one of the bands (except highest frequency)

b. Connect **RF OUT** terminal to an electronic counter, such as the HP Model 5248L.

c. If the frequency as read on the low end of the dial is off more than 1%, adjust the slug in the oscillator coil to correct. This slug can be reached by removing the cabinet and the shield (see paragraphs 4-3 and 4-4). Clockwise rotation of the slug will decrease the frequency.

d. Shift the frequency to the high end of the band. If the frequency as read on the FREQUENCY dial is off more than 1% adjust the trimmer capacitor across the oscillator coil to correct. Always use a plastic screwdriver when making this adjustment.

e. Repeat steps c and d until no further adjustment is necessary.

f. Repeat steps b through e on the other bands. On the highest frequency band adjust the slug with a plastic allen wrench (#8). If any adjustment is necessary check maximum oscillator current as in paragraph 4-45.

g. Connect the probe of an oscilloscope to the cathode of CR3. This point can be found on the pink-white wire between the amplifier stator turret terminal block and the tie-point for the 33K resistor R25.

h. Set the MODULATION SELECTOR to EXT.DC.

i. Connect a square-wave generator, such as the HPModel 211A set to 1 KC to the MODULATION INPUT-OUTPUT connector. Feed in sufficient square-wave signal so that the carrier is cut off for at least part of the cycle.

j. Tune throughout all bands and check the pattern on the oscilloscope for squegging (low frequency oscillations). Reduce the frequency of the external modulation to 300 Hz on the lowest frequency band to keep from overmodulating. If squegging is found, tune the amplifier.

k. Measure the **RF** amplifier plate current with HPModel 428A/B Clip-On Milliammeter clipped over the red-green lead going to the 100 ohm resistor R15 on the turret stator contact terminal block (beneath **RF** amplifier chassis). If a Model 428A/B is not available, unsolder the red-green lead on the B+ side and insert a conventional 300 **mA** dc milliammeter. Bypass the point between the 100 ohm resistor and the meter with a 0.1 μf capacitor.

m. Tune inner slug in the amplifier coil from the top for a plate current dip at the low end of one band.

n. Tune trimmer capacitor for a plate current dip at the high end of the same band. This adjustment is made through a hole in the chassis between V3 and V4 underneath the amplifier turret shaft. Use a plastic screwdriver for this adjustment. In addition, if this tool has a metal tip, slide a tiny piece of tubing over the metal tip to prevent the trimmer shorting to ground when making this adjustment.

p. Recheck squegging as in step j.

q. Repeat steps j through p on all bands.

4-45. SET MAXIMUM OSCILLATOR CURRENT.

a. Set MODULATION SELECTOR . . . . . CW
RANGE . . . . . 19 MC-65 MC

b. Measure RF oscillator plate current with HP Model 428B Clip-On Milliammeter clipped over red-green lead going to the 100 ohm resistor R9 on turret stator contact terminal block (beneath oscillator chassis). If a Model 428B is not available, unsolder the red-green lead on the B+ side and insert a conventional 300 **mA** dc milliammeter. Bypass the point between 100 ohm resistor and meter with a 0.1 μf capacitor.

c. Tune FREQUENCY dial throughout the 19 MC - 65 MC band while noting the current.

d. Adjust Osc. Level control (R3) on the oscillator chassis for a maximum current of 25 ma at the frequency of maximum current. If this adjustment is made, check the following:

(1) Paragraph 4-46, Carrier Zero Set

(2) Paragraph 4-47, Maximum Carrier Set and Modulation Zero Set

(3) Paragraph 4-48, Set Percentage Modulation Meter.

4-46. CARRIER ZERO SET.

a. Set RANGE . . . . . 50 KC - 170 KC
ATTENUATOR . . . . . 1 VOLT
ATTENUATION VERNIER . . . . . fully ccw
Carrier Output Zero (R35) . . . . . fully ccw
MOD. SELECTOR . . . . . EXT DC with no input
MODULATION VERNIER . . . . . fully ccw

b. Connect oscilloscope to output of the Output Termination.

c. Zero-set the carrier output meter with the instrument off as explained in paragraph 4-29.

d. Turn on and allow 5 minutes warmup.

e. Slowly turn Carrier Zero Set control (R35) on the **RF** amplifier chassis clockwise until there is some output on the oscilloscope. Then adjust carrier zero set until the indication on the oscilloscope, set to the most sensitive range, just collapses. Set the sweep on the oscilloscope for a free-running condition so that the indication will not disappear for lack of synchronizing signal.

f. Check for zero output across the band on each range. Bands 5.8 MC-19.2 MC and 19.2 MC-65 MC typically have a minimum output of 0.03 volt rms. If this adjustment is made, check the following:

(1) Paragraph 4-47, Maximum Carrier Set and Modulation Zero Set

(2) Paragraph 4-48, Set Percentage Modulation Meter.

4-47. MAXIMUM CARRIER SET AND MODULATION ZERO SET.

a. Set ATTENUATOR VERNIER pot . . fully cw
MODULATION SELECTOR . . . . . EXT AC

b. Connect Model 410B ac probe to end of output termination. Solder tip of 410B ac probe to center conductor of a UG-290/U connector. Clip ground end of probe to skirt of connector. Insert connector into OUTPUT connector of output termination.

c. Set RANGE switch to band 1 (see box on schematic for band frequency ranges) and turn FREQUENCY dial over the band at moderate speed, noting the minimum output voltage read on the Model 410B.

d. Repeat step c on bands 2,3,4,5; and repeat on band 6 but turn much more slowly.

e. Set Model 606A to the range and frequency having lowest output voltage. Set MODULATION SELECTOR switch to CW, adjust Max. Carrier Set (R60) for 1.05 volt **RF** output on Model 410B. This control is fourth from the front in the row of five potentiometers on the top of the modulation deck.

f. Switch MODULATION SELECTOR from CW to EXT AC while noting output change on the Model 410B. There should be no change in voltage shown on the Model 410B. If necessary adjust Mod. Zero Set (R69, rearmost control in row of five controls on modulation chassis) until there is no change of output when the MODULATION SELECTOR is switched. Turn the MODULATION AMPLITUDE control. The output should not change. If necessary, adjust R69.

g. Recheck step e and f and adjust, if necessary. The two controls R69 and R60 interact with each other. Recheck the other adjustment any time one control is adjusted.

4-48. SET PERCENT MODULATION METER.

a. Set FREQUENCY. . . . . 1 MC
MODULATION SELECTOR. . . . . INT 1000 ∿
ATTENUATOR . . . . . 1 VOLT range
VERNIER. . . . . 1 volt
Meter mechanical zero . . . . . par. 4-29
MODULATION AMPLITUDE meter. . . 50% on

b. Connect the RF OUT output, properly terminated, to the vertical input terminals of an oscilloscope such as an **HP** Model 180A. If a lower frequency oscilloscope is used it may be necessary to set the Model 606A to a lower frequency.

c. Synchronize pattern internally so that several modulation cycles are visible on the screen.

d. Set the MODULATION SELECTOR to CW.

e. Adjust the sensitivity control on the oscilloscope until the pattern is exactly 4 centimeters high. Do not use the 3 VOLTS range on the Model 606A.

f. Switch the MODULATION SELECTOR to INT 1000 ∿ .

g. Set PERCENTAGE MODULATION meter to 50% with the MODULATION AMPLITUDE control. The pattern on the screen should now be 6 centimeters high at the peaks and 2 centimeters high at the troughs (see figure 4-3). If pattern is not exactly three times as high at the peaks as at the troughs, adjust the MODULATION AMPLITUDE control until it is. The Model 606A is now modulating exactly 50%.

h. Adjust Mod. Cal. (R67) control until PERCENTAGE MODULATION meter reads 50%. This control is second from the front in the row of five controls on the modulation chassis.

i. Set ATTENUATOR VERNIER to 0.2 VOLTS.

j. Repeat steps d to g. If the reading on the PERCENTAGE MODULATION meter is not 50 ± 5% adjust MODULATION AMPLITUDE until it is. Now adjust Carrier Zero Set (R35) slightly until the pattern on the oscilloscope is as in step g. Recheck MAXIMUM CARRIER SET paragraph 4-47 resetting R60 if necessary.

4-49. RF OUTPUT METER CALIBRATION.

a. Check the output meter zero adjustment (see paragraph 4-29).

b. Connect ac probe of Model 410B High Frequency VTVM (1 volt range) to the end of the output termination using a UG-290/U connector. Solder tip of 410B ac probe to center conductor of connector (see figure 4-5). Insert connector into OUTPUT connector of output termination.

c. Set ATTENUATOR VERNIER so that the Model 606A output meter reads 0.9 volt rms.

d. Rotate the FREQUENCY dial and RANGE switch through all frequencies, keeping the reading on the Model 606A output meter at 0.9 volt. Record the lowest and highest readings on the Model 410B.

e. Determine the average of the two readings recorded in step d.

f. Set the FREQUENCY dial and RANGE switch to a frequency that will give this average reading on the Model 410B.

g. Set attenuator vernier so that the Model 410B reads 0.9 volt.

h. Set the output meter to read 0.9 volts by adjusting Output Cal. control (R37).

4-50. ATTENUATOR REPAIR.

4-51. The **A1 (606A-34C)** output attenuator is a precision device. It is held to rigid electrical and mechanical specifications during manufacture. Testing of the attenuator is extremely involved; it requires special equipment and techniques which are not normally available. It is recommended that the attenuator be returned to the factory for necessary repair.

4-52. ADJUST FEEDBACK RELAY.

4-53. Set ATTENUATOR to 3 VOLTS. Feedback relay K1 should operate, increasing the output to 3 volts. If the relay does not operate, complete the following procedure:

a. Clip an HP Model 428B Clip-On Milliammeter probe over the lead going to the coil of relay K1. If a Model 428B is not available, unsolder the lead and insert a conventional 10 mA dc milliammeter.

b. Set ATTENUATOR to 3 VOLTS range. The current through the relay should be a nominal 5.5 mA. If the current is not approximately this value, check the +300 volts supply and C26, C27, R27, R28 and R46. If this current does not operate the relay, fix or replace the relay. If the relay operates but the output does not increase to 3 volts, check R25, R26 and the entire feedback loop.

4-54. DRIVE CABLE ASSEMBLY REPLACEMENT.

4-55. Replacement of the drive cable assembly HP stock number 606A-18) requires only the removal of the old drive cable assembly and winding the replacement drive cable onto the idler shaft, tuner pulley, and drive pulley. An adjustment of the drive cable assembly is made to obtain proper rotation of the frequency dial and tuner plates. No special tools are required. Following is the installation procedure:

a. Disconnect power. Remove cabinet and RF generator shield.

b. Turn instrument upside-down and remove the aluminum shielding plate between the RF oscillator and RF amplifier.

c. Refer to figure 4-6. Loosen the two setscrews in the spring load nut and the one setscrew in the end of the drive pulley.

d. Remove old drive cable assembly.

e. Push end of replacement drive cable nearest drive collar over tuner pulley. Press the drive collar into the notch in tuner pulley.

f. Wrap the short end of drive cable around the tuner pulley as shown in **Figure** 4-6. Attach end of

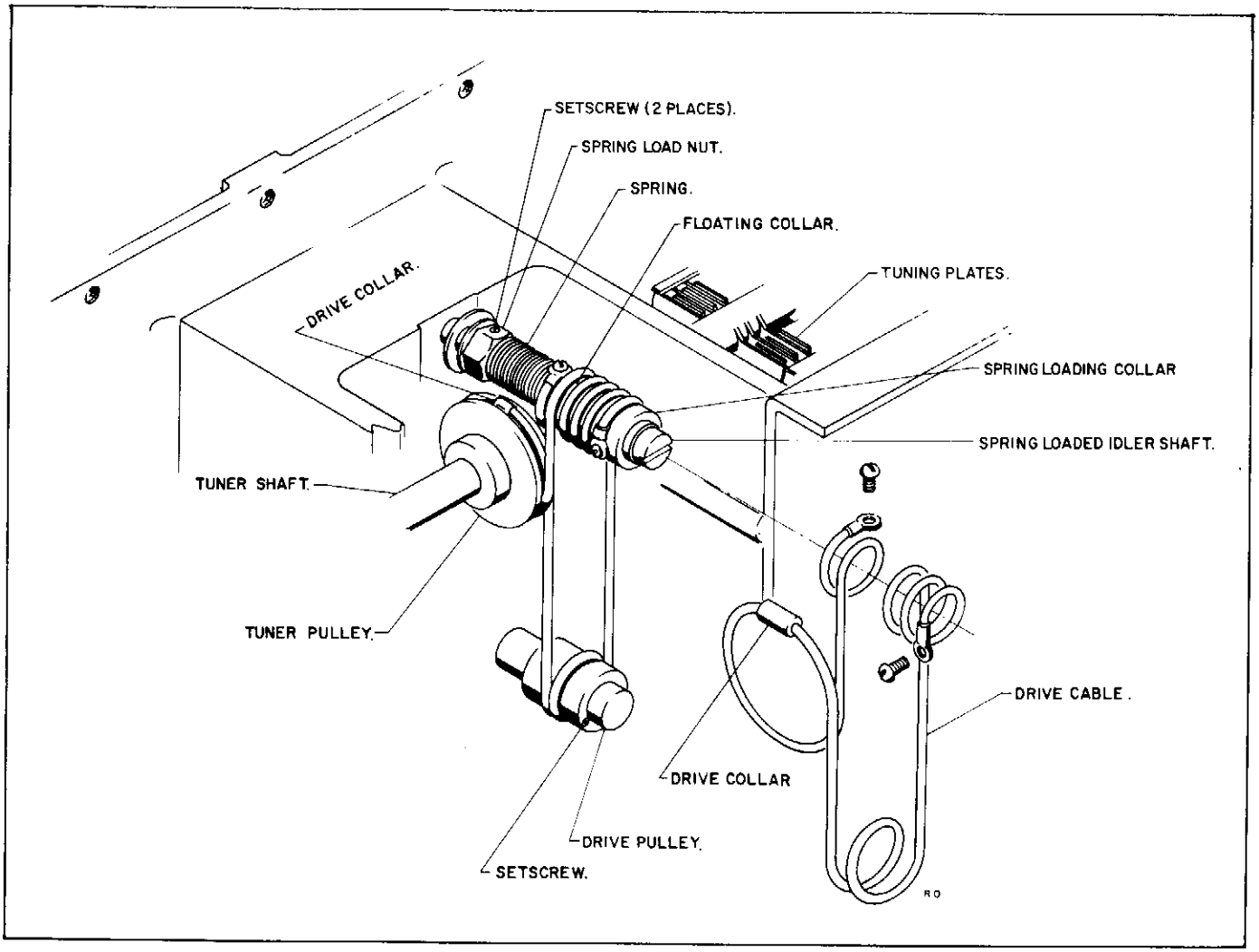


Figure 4-6. Installation of Drive Cable Assembly

cable to the floating collar on the spring loaded idler shaft with 4-40 x 1/4 inch round-head machine screw.

g. Wind two full turns of the drive cable onto the floating collar. Be sure the spring load nut is positioned so that one of the setscrews is accessible. Place a 9/16 inch open-end wrench over the spring load nut to prevent its turning.

h. Wrap one and a half turns of the drive cable around the drive pulley as shown in figure 4-6.

i. Rotate the spring-loaded idler shaft so that the number 4-40 screw hole in the spring-loading collar is accessible.

j. Attach the long end of drive cable to the spring loading collar using the 4-40 x 1/4 round-head machine screw.

k. Place a screwdriver in the slot at end of the spring-loaded idler shaft and rotate shaft counterclockwise to remove slack in drive cable. Continue to hold spring-load nut with end wrench.

m. Tighten one setscrew in the spring-load nut and remove end wrench.

n. Turn frequency dial to approximately mid-range and seat cable in the slot on the drive pulley.

p. Holding spring-load nut with 9/16 inch open-end wrench, loosen the previously tightened setscrew in spring-load nut and turn spring-loaded idler shaft counterclockwise to a torque of approximately 7 inch-pounds. Retighten setscrew and remove wrench.

q. Hold frequency dial against its low frequency stop. Slip the drive cable on the drive pulley by turning the spring-loaded idler shaft with screwdriver. Turn the idler shaft until both tuning capacitors are fully meshed.

r. Tighten the 4-40 allen setscrew in drive pulley.

s. Rotate frequency dial through its range and observe position of drive cable.

t. Check dial calibration as outlined in para. 4-16.

u. Replace aluminum shielding plate between the **RF oscillator and RF amplifier.**

v. Turn instrument right-side up. Replace rf generator shield and cabinet. This completes the procedure.

4-56. RANGE SWITCH DETENT ASSEMBLY.

4-57. Difficulty in changing bands, or a loss of the detent action in the 606A Signal Generators may occur due to a misalignment of the components in the range switch. Numerous "life tests" of this switch detent assembly show that with proper alignment and lubrication, trouble-free operation over the life of the instrument is assured. Molybdenum-disulfide grease is an effective lubricant for the bearing surfaces of the rollers and the aluminum detent lift assembly.

4-58. With improper alignment and continued use, the roll-pin pressed into the aluminum detent lift assembly may work loose and fall out. Alignment applies to the positioning of the two rollers on the detent cam and detent lift assembly. On the attached sketch, Figure 4-6A, the proper positioning of one of these rollers is shown. The roller can be adjusted by loosening the 8-32 x 1/2" binding head mounting screw on the leaf spring. If this screw is loosened to make the adjustment, take care to assure that it is securely retightened. The lower roller (not shown in the sketch) is aligned in the same manner. In the case where the roll pin is loose or has fallen out, the following is a recommended repair procedure: back the RF Generator casting from the front panel by removing the appropriate knobs, shield cover screws, and four round head screws through the front panel. The roll pin hole in the face of the drive gear-detent lift part of the switch will then be accessible and may be tapped to provide for a 4-40 x 7/8" round head stainless steel screw. This screw installed in the new threaded hole will substitute nicely for the missing pin.

4-59. PERFORMANCE CHECK.

4-60. The following procedures check performance and verify proper operation of the Model 606A.

4-61. FREQUENCY CALIBRATION.

a. Set line voltage to 115 volts.

b. Perform operations listed in paragraph 4-17.

c. Repeat this procedure with line voltage set at 102.5 volts and 127.5 volts.

4-62. OUTPUT.

a. With line voltage set at 115 volts perform operations indicated in paragraph 4-18.

b. Rotate output meter RANGE switch through each position, adjusting output control at each setting. Output should be adjustable from zero to full scale in each position of the range switch.

c. Repeat steps a and b with line voltage set at 102.5 volts and 127.5 volts.

d. To check the output impedance, switch the VTVM to 1 volt range, and the attenuator to the 0.3 volt range.

e. Adjust Model 606A output to read 1 on the **0.1 scale at 20 MHz.**

f. Remove the 50 ohm load. Output voltage should rise to **2 ± 0.2 volts.**

g. Set Model 606A FREQUENCY dial to **65 MHz** and reconnect the 50 ohm load.

h. Reset output to 1 volt as indicated by VTVM.

i. Remove 50 ohm load. Output should rise to 2 volts ±0.2 volt.

4-63. MODULATION.

a. Perform procedure outlined in paragraph 4-15 with line voltage set at 115 volts.

b. Rotate FREQUENCY dial through all ranges; observe envelope pattern for distortion and squegging.

c. Repeat steps a and b with line voltage set at 102.5 volts and 127.5 volts.

d. Reset line voltage to 115 volts.

e. To check external modulation set MODULATION SELECTOR to EXT. AC.

f. Turn MODULATION AMPLITUDE control fully clockwise.

g. Set FREQUENCY control to 15 mc.

h. Connect an audio oscillator (20 cps to 20 kc) to MODULATION input jack of Model 606A and SYNC input of oscilloscope.

i. Adjust the audio oscillator to produce a signal of 4.5 volts peak. PERCENT MODULATION meter of Model 606A should indicate at least 100%.

j. Repeat steps e to i with line voltage set at 102.5 volts and 127.5 volts.

4-64. FREQUENCY DRIFT.

a. Allow Model 606A to warm up for at least two hours.

b. Set FREQUENCY control to 1 MHz.

c. Monitor output of Model 606A with a counter for 10 minutes. Frequency drift should be less than 50 cycles over the 10 minute period.

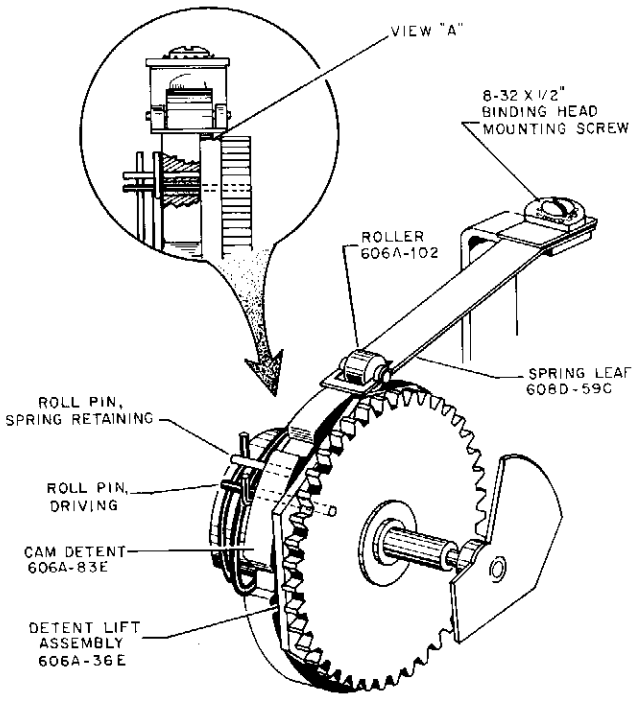


Figure 4-6A. Range Switch Detent Mechanism

SCHEMATIC DIAGRAM NOTES

1. Heavy solid line shows main signal path; heavy dashed line shows control, secondary signal, or feedback path.
2. Heavy box indicates front-panel engraving.
3. Arrows on potentiometers indicate clockwise rotation as viewed from the round shaft end; counterclockwise from the rectangular shaft end.
4. Resistance values in ohms, inductance in microhenry, and capacitance in picofarads unless otherwise specified.
5. Rotary switch schematic are electrical representations; for exact switching details refer to the switch assembly drawings.
6. Relays shown in condition prevailing during normal instrument operation.
7. Interconnecting parts and assemblies are shown on cable diagram.
8. * indicates factory adjustment. Part may be omitted.

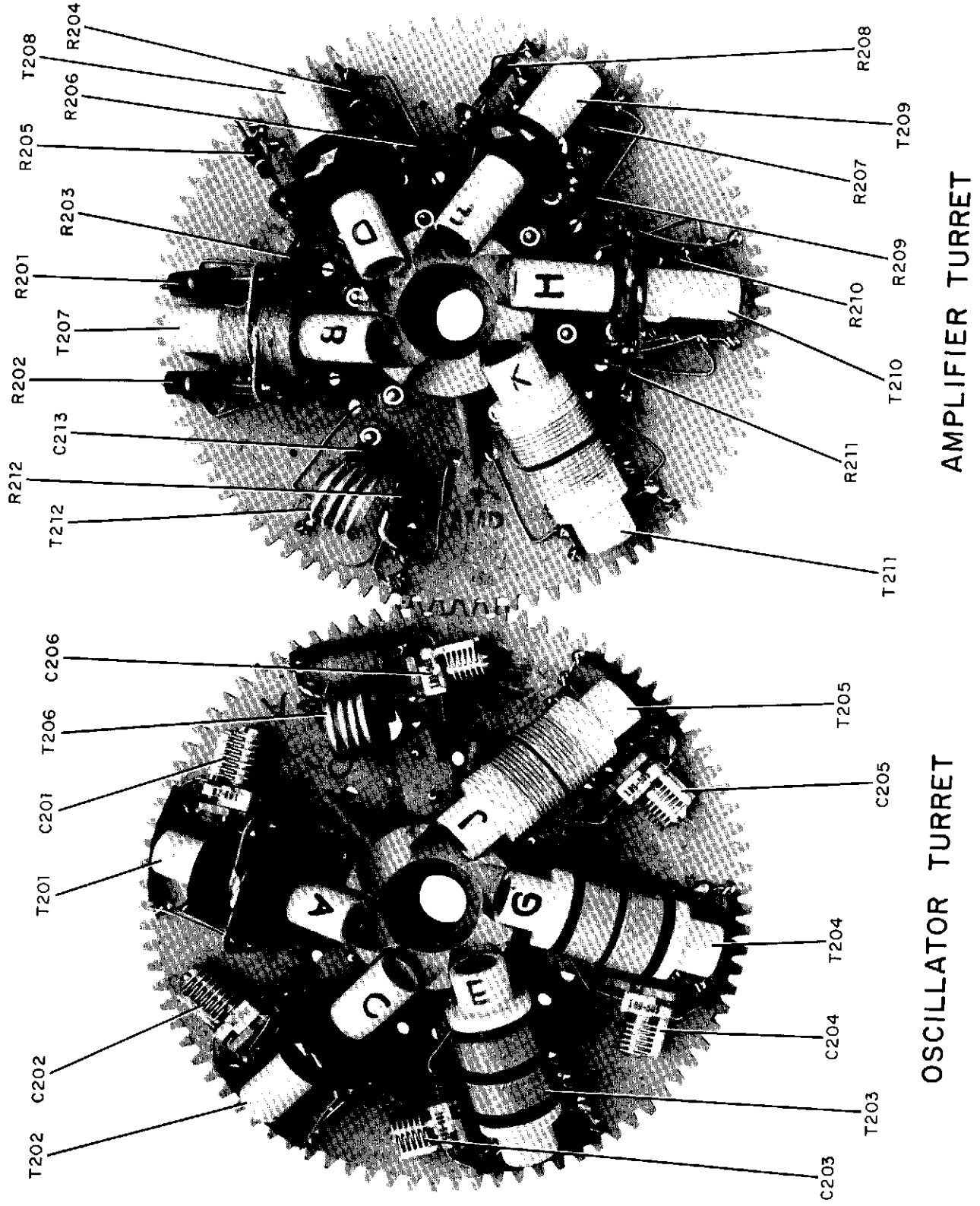
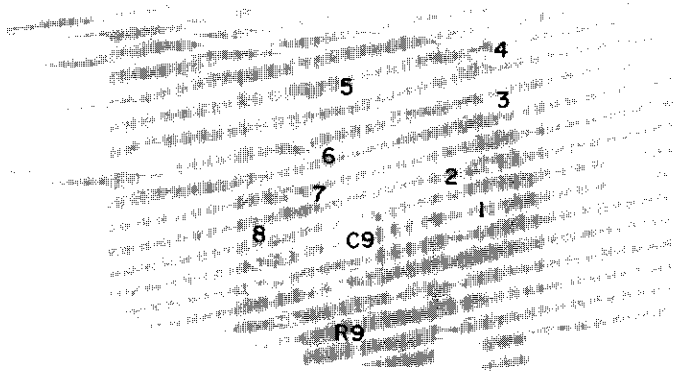
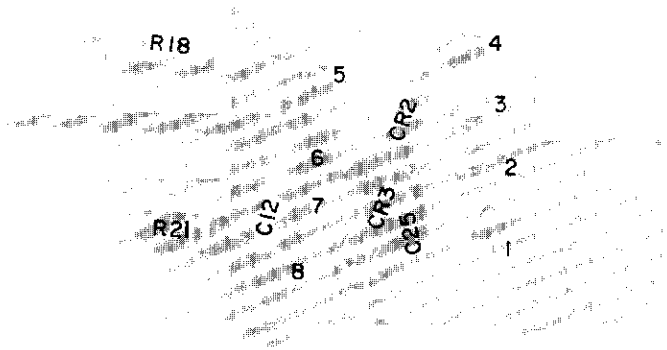


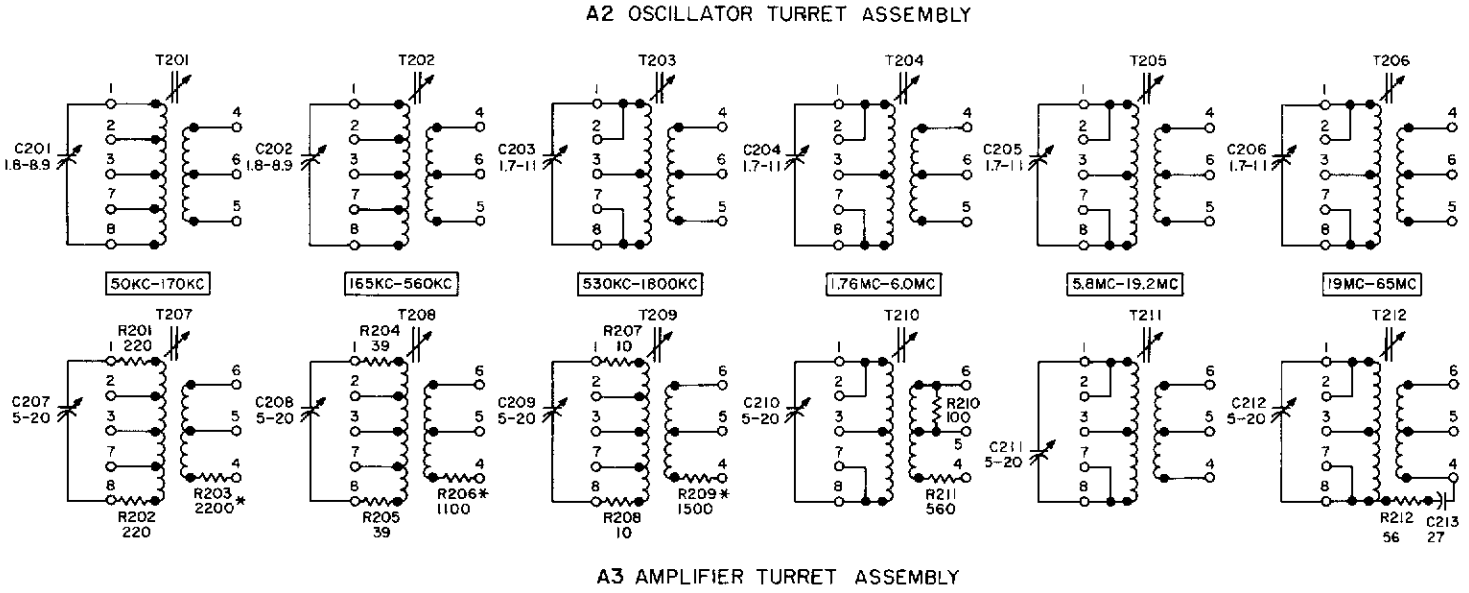
Figure 4-7. Oscillator and Amplifier Turrets viewed from Front Panel



Oscillator Stator Block

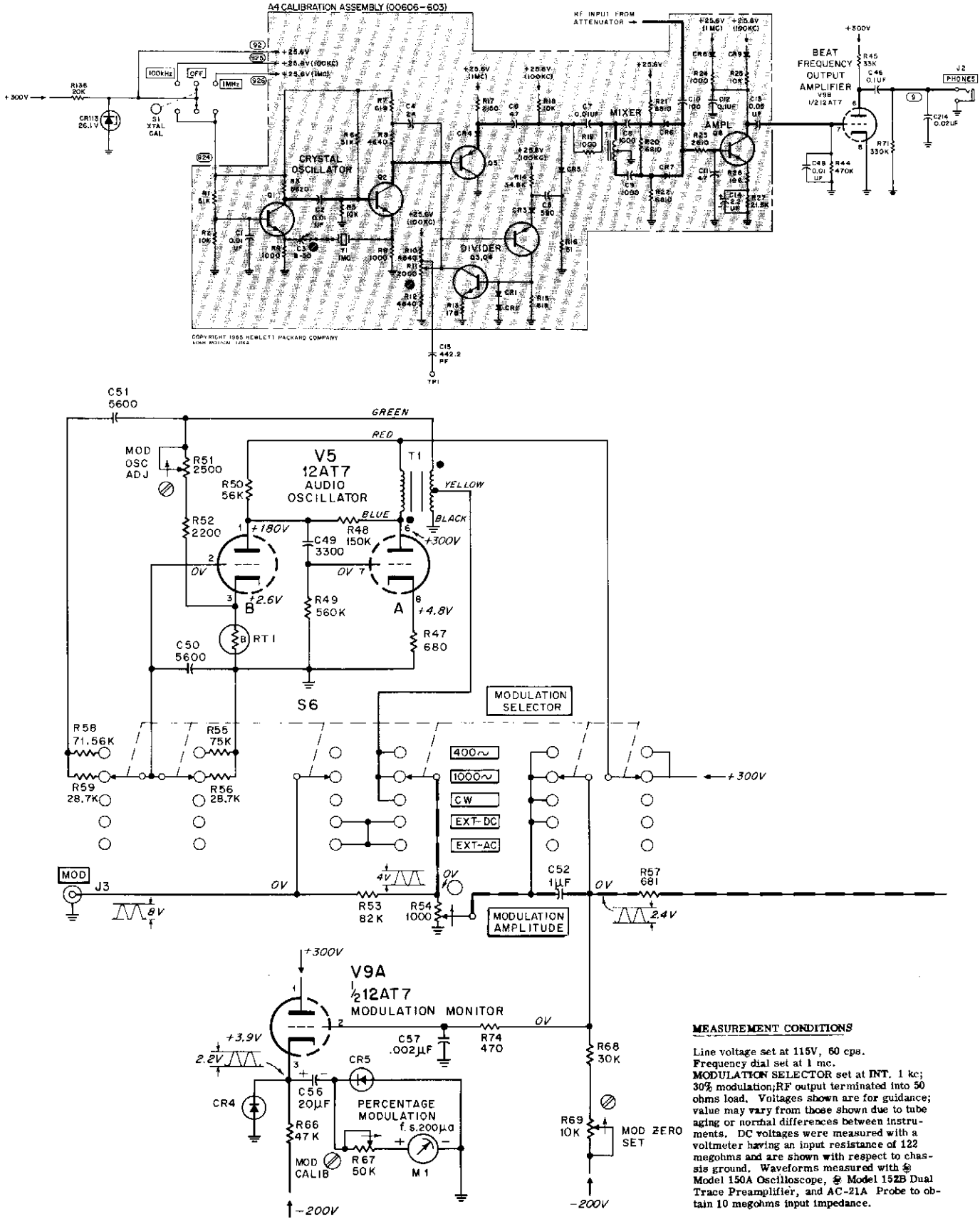


Amplifier Stator Block



* INDICATES FACTORY SELECTED PART, TYPICAL VALUE GIVEN.

Figure 4-8. Oscillator and Amplifier Turrets Schematic



MEASUREMENT CONDITIONS

Line voltage set at 115V, 60 cps. Frequency dial set at 1 mc. MODULATION SELECTOR set at INT. 1 kc; 30% modulation; RF output terminated into 50 ohms load. Voltages shown are for guidance; value may vary from those shown due to tube aging or normal differences between instruments. DC voltages were measured with a voltmeter having an input resistance of 122 megohms and are shown with respect to chassis ground. Waveforms measured with Ⓗ Model 150A Oscilloscope, Ⓗ Model 152B Dual Trace Preamplifier, and AC-21A Probe to obtain 10 megohms input impedance.

Figure 4-9. Signal Generator (Sheet 1 of 2)

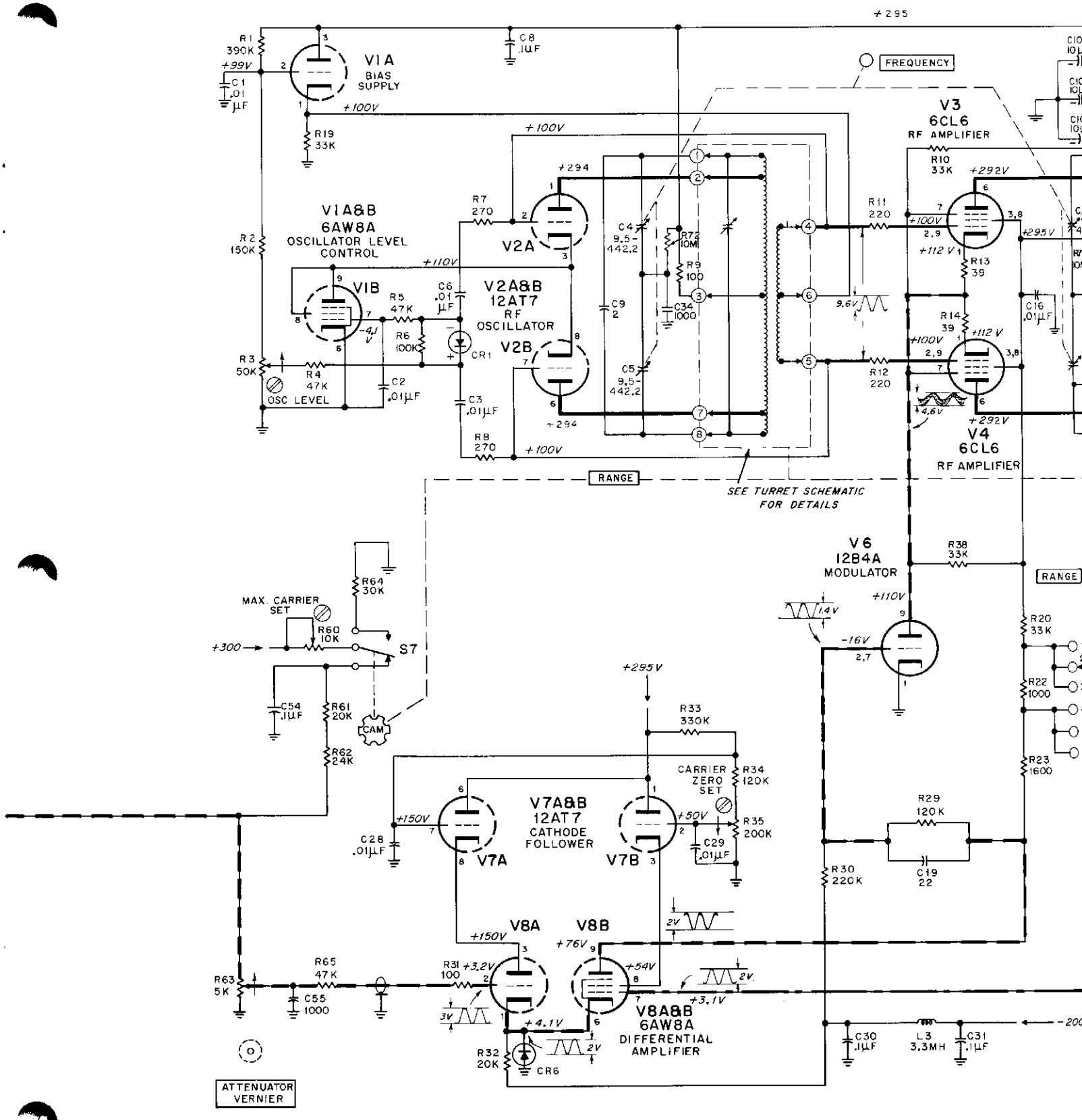
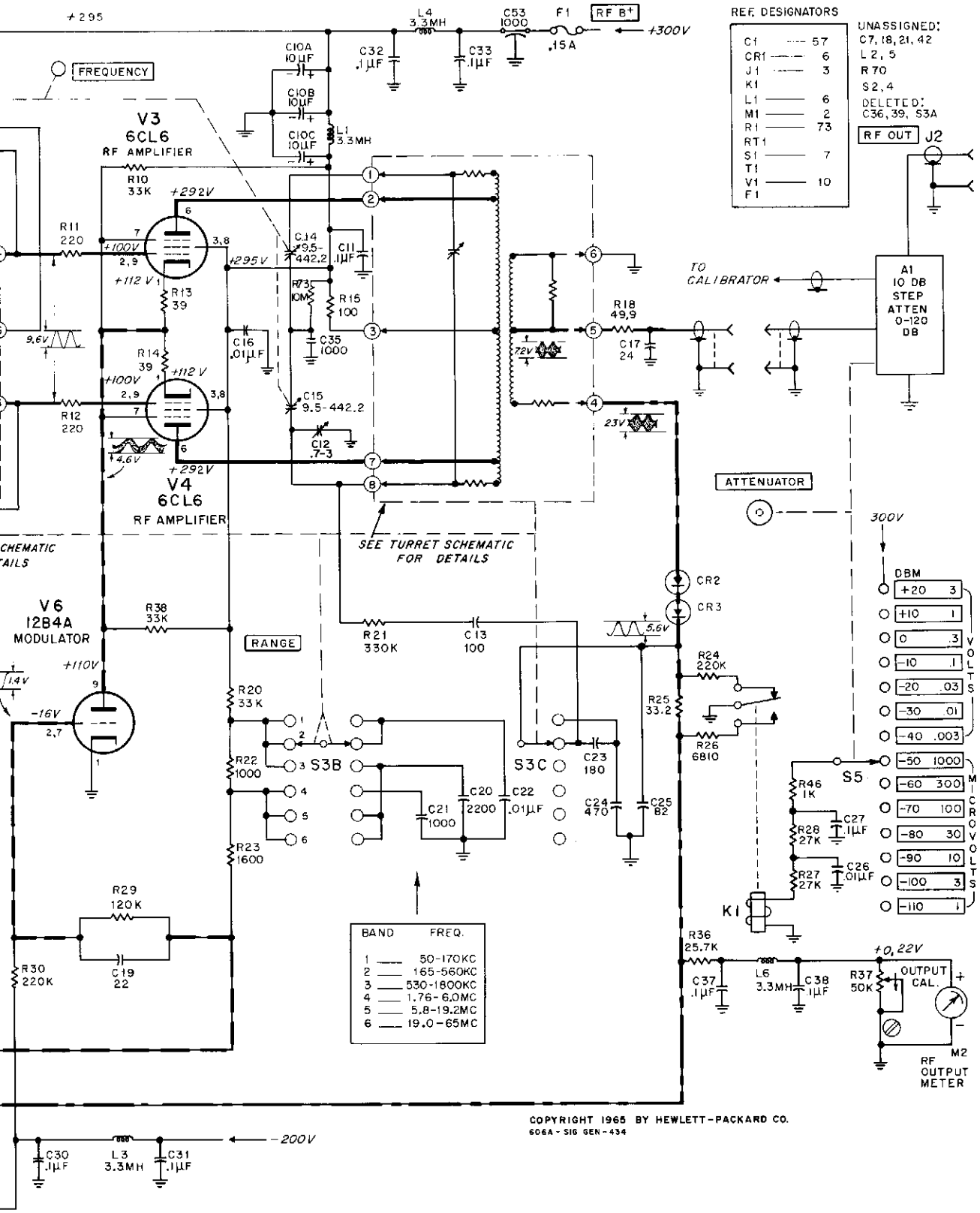
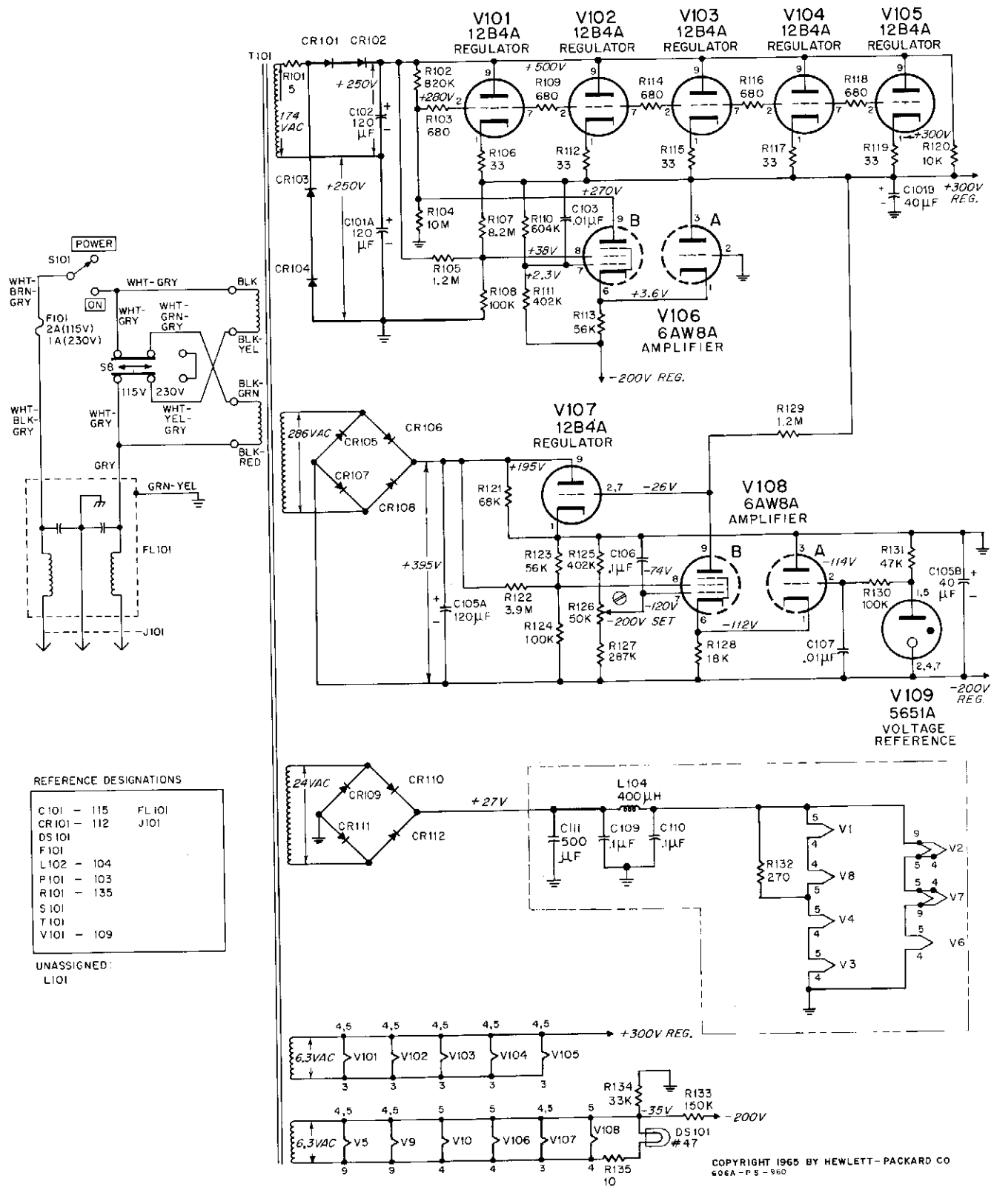


Figure 4-9. Signal Generator (Sheet 2 of 2)



Signal Generator (Sheet 2 of 2)

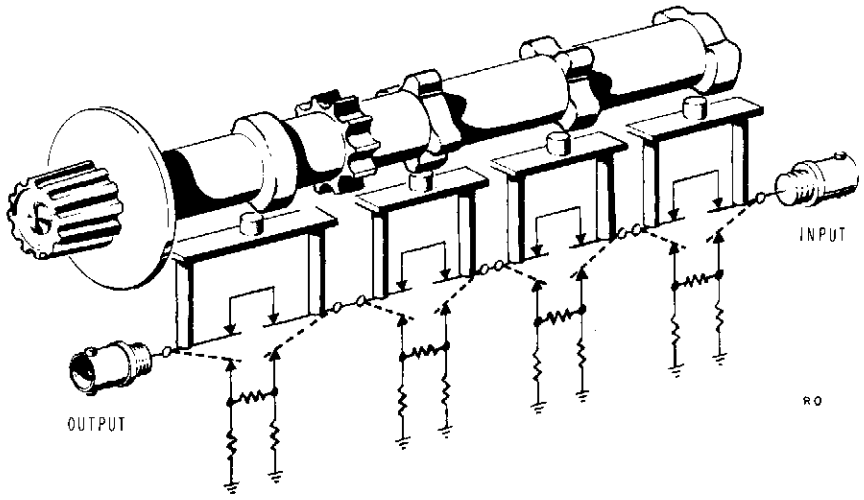


REFERENCE DESIGNATIONS

C101 – 115		FL101
CR101 – 112		J101
DS101		
F101		
L102 – 104		
P101 – 103		
R101 – 135		
S101		
T101		
V101 – 109		

UNASSIGNED: L101

Figure 4-10. Power Supply



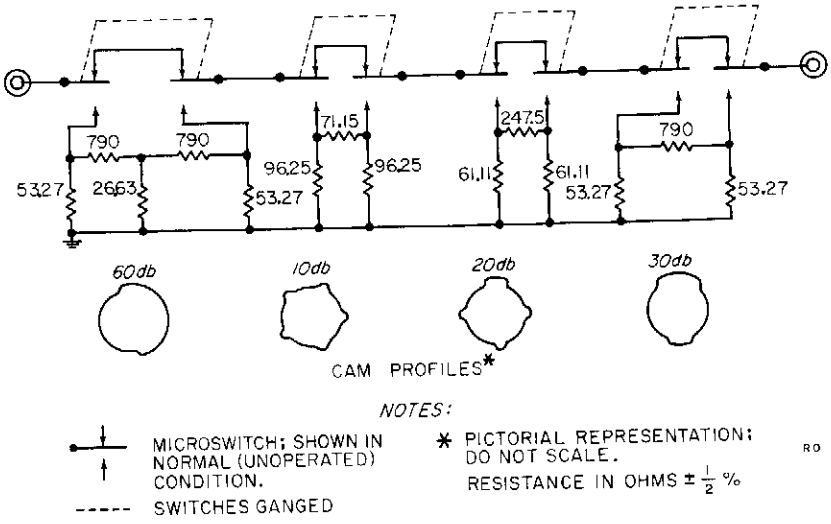


Figure 4-11. Model 606A Output Attenuator

SECTION V
REPLACEABLE PARTS

5-1. INTRODUCTION.

5-2. This section contains information for ordering replaceable parts. Table 5-1 is a list of the replaceable parts and is organized as follows:

a. Electrical assemblies and their components in alpha-numerical order by reference designation.

b. Chassis-mounted parts in alpha-numerical order by reference designation.

c. Miscellaneous parts.

The information for each part consists of:

a. The Hewlett-Packard part number.

b. Total quantity (Qty) in the instrument.

c. Description of the part.

d. Typical manufacturer of the part in a five-digit code.

e. The manufacturer's number for the part.

Total quantity for each part is given only once — at the first appearance of the part number.

5-2. Table 5-2 contains the names and addresses that correspond to the manufacturer's code numbers.

5-3. ORDERING INFORMATION.

5-4. To obtain replacement parts, address order or inquiry to your local Hewlett-Packard office (see list at rear of this manual for addresses). Identify parts by their Hewlett-Packard part numbers.

5-5. To obtain a part that is not listed, include:

a. Instrument model number.

b. Instrument serial number

c. Description of the part.

d. Function and location of the part.

REFERENCE DESIGNATORS

A	= assembly	F	= fuse	P	= plug	V	= vacuum tube, neon bulb, photocell, etc.
B	= motor	FL	= Filter	Q	= transistor		
BT	= battery	J	= jack	R	= resistor		
C	= capacitor	K	= relay	RT	= thermistor	VR	= voltage regulator
CP	= coupler	L	= inductor	S	= switch		
CR	= diode	LS	= loud speaker	T	= transformer	W	= cable
DL	= delay line	M	= meter	TB	= terminal board	X	= socket
DS	= device signaling (lamp)	MK	= microphone	TP	= test point	Y	= crystal
E	= misc electronic part	MP	= mechanical part	U	= integrated circuit	Z	= tuned cavity, network

ABBREVIATIONS

A	= amperes	H	= henries	N/O	= normally open	RMO	= rack mount only
AFC	= automatic frequency control	HDW	= hardware	NOM	= nominal	RMS	= root-mean square
		HEX	= hexagonal	NPO	= negative positive zero (zero temperature coefficient)	RWV	= reverse working voltage
AMPL	= amplifier	HG	= mercury			S-B	= slow-blow
		HR	= hour(s)			SCR	= screw
BFO	= beat frequency oscillator	Hz	= Hertz	NPN	= negative-positive-negative	SE	= selenium
						SECT	= section(s)
BE CU	= beryllium copper	IF	= intermediate freq	NRFR	= not recommended for field replacement	SEMICON	= semiconductor
BH	= binder head	IMPG	= impregnated			SI	= silicon
BP	= bandpass	INCD	= incandescent			SIL	= silver
BRS	= brass	INCL	= include(s)			SL	= slide
BWO	= backward wave oscillator	INS	= insulation(ed)	NSR	= not separately replaceable	SPG	= spring
		INT	= internal			SPL	= special
				OBD	= order by description	SST	= Stainless steel
CCW	= counterclockwise	K	= kilo = 1000			SR	= split ring
CER	= ceramic			OH	= oval head	STL	= steel
CMO	= cabinet mount only			OX	= oxide		
COEF	= coefficient	LH	= left hand				
COM	= common	LIN	= linear taper	P	= peak	TA	= tantalum
COMP	= composition	LK WASH	= lock washer	PC	= printed circuit	TD	= time delay
COMPL	= complete	LOG	= logarithmic taper	PF	= picofarads = 10^{-12} farads	TGL	= toggle
CONN	= connector	LPF	= low pass filter			THD	= thread
CP	= cadmium plate			PH BRZ	= phosphor bronze	TI	= titanium
CRT	= cathode-ray tube	M	= milli = 10^{-3}	PHL	= Phillips	TOL	= tolerance
CW	= clockwise	MEG	= meg = 10^{6}	PIV	= peak inverse voltage	TRIM	= trimmer
		MET FLM	= metal film			TWT	= traveling wave tube
DEPC	= deposited carbon	MET OX	= metallic oxide	PNP	= positive-negative-positive		
DR	= drive	MFR	= manufacturer				
		MHz	= mega Hertz	P/O	= part of	μ	= micro = 10^{-6}
ELECT	= electrolytic	MINAT	= miniature	POLY	= polystrene		
ENCAP	= encapsulated	MOM	= momentary	PORC	= porcelain		
EXT	= external	MOS	= metalized substrate	POS	= position(s)	VAR	= variable
				POT	= potentiometer	VDCW	= dc working volts
F	= farads	MTG	= mounting	PP	= peak-to-peak		
FH	= flat head	MY	= "mylar"	PT	= point		
FIL H	= Fillister head			PWV	= peak working voltage	W/	= with
FXD	= fixed	N	= nano (10^{-9})			W	= watts
		N/C	= normally closed	RECT	= rectifier	WIV	= working inverse voltage
G	= giga (10^{9})	NE	= neon	RF	= radio frequency		
GE	= germanium	NI PL	= nickel plate	RH	= round head or right hand	WW	= wirewound
GL	= glass					W/O	= without
GRD	= ground(ed)						

Table 5-1. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
A1	606A-34C	1	ASSY:ATTENUATOR	28480	606A-34C
A2	606A-42B	1	ASSY:OSCILLATOR TURRET	28480	606A-42B
A3	606A-42A	1	ASSY:AMPLIFIER TURRET	28480	606A-42A
A3			INCLUDES C207 THRU C213, R201 THRU R212		
A3			T207 THRU T212.		
A4	00606-603	2	BOARD ASSY:CRYSTAL CALIBRATION	28480	00606-603
A4	0380-0059	1	SPACER:SLEEVE BRASS FOR #6 HDW	00866	OBD
A4C1	0150-0053	4	C:FXD CER 0.01 UF +80-20% 100VDCW	72982	801-K800011
A4C2	0150-0093		C:FXD CER 0.01 UF +80-20% 100VDCW	72982	801-K800011
A4C3	0130-0017	1	C:VAR CER 8-50 PF	28480	0130-0017
A4C4	0160-0196	2	C:FXD MICA 24PF 5% 300VDCW	04062	RDM15C240J3S
A4C5	0140-0200	1	C:FXD MICA 390 PF 5%	72136	RDM15F391-J3C
A4C6	0140-0204	2	C:FXD MICA 47 PF 5% NPO 500VDCW	14655	RDM15E470J5C
A4C7	0150-0093		C:FXD CER 0.01 UF +80-20% 100VDCW	72982	801-K800011
A4C8	0150-0050	2	C:FXD CER 1000 PF +80-20% 1000VDCW	56289	C067B102E102ZS26-CDH
A4C9	0150-0050		C:FXD CER 1000 PF +80-20% 1000VDCW	56289	C067B102E102ZS26-CDH
A4C10	0140-0176	1	C:FXD MICA 100 PF 2%	28480	0140-0176
A4C11	0140-0204		C:FXD MICA 47 PF 5% NPO 500VDCW	14655	RDM15E470J5C
A4C12	0150-0121	1	C:FXD CER 0.1 UF +80-20% 50VDCW	56289	5C50B1S-CML
A4C13	0150-0096	1	C:FXD CER 0.05 UF +80-20% 100VDCW	91418	TA
A4C14	0180-0155	1	C:FXD ELECT 2.2 UF 20% 20VDCW	56289	150D225X0020A2-DYS
A4C15	0150-0093		C:FXD CER 0.01 UF +80-20% 100VDCW	72982	801-K800011
A4CR1	1901-0621	1	DIODE:SILICON ALLOY 100V 200MA	28480	1901-0621
A4CR2	1910-0016	9	DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
A4CR3	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
A4CR4	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
A4CR5	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
A4CR6	1901-0040	2	DIODE:SILICON 30MA 30WV	07263	FDG1088
A4CR7	1901-0040		DIODE:SILICON 30MA 30WV	07263	FDG1088
A4CR8	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
A4CR9	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
A4Q1	1854-0005	3	TSTR:SI NPN	80131	2N708
A4Q2	1854-0005		TSTR:SI NPN	80131	2N708
A4Q3	1854-0005		TSTR:SI NPN	80131	2N708
A4Q4	1853-0009	2	TSTR:SI PNP	28480	1853-0009
A4Q5	1853-0009		TSTR:SI PNP	28480	1853-0009
A4Q6	1854-0071	1	TSTR:SI NPN(SELECTED FROM 2N3704)	28480	1854-0071
A4R1	0757-0458	2	R:FXD MET FLM 51.1K OHM 1% 1/8W	28480	0757-0458
A4R2	0757-0442	4	R:FXD MET FLM 10.0K OHM 1% 1/8W	28480	0757-0442
A4R3	0757-0200	1	R:FXD MET FLM 5.62K OHM 1% 1/8W	28480	0757-0200
A4R4	0757-0280	4	R:FXD MET FLM 1K OHM 1% 1/8W	28480	0757-0280
A4R5	0757-0442		R:FXD MET FLM 10.0K OHM 1% 1/8W	28480	0757-0442
A4R6	0757-0458		R:FXD MET FLM 51.1K OHM 1% 1/8W	28480	0757-0458
A4R7	0757-0418	2	R:FXD MET FLM 619 OHM 1% 1/8W	28480	0757-0418
A4R8	0698-3155	3	R:FXD MET FLM 4.64K OHM 1% 1/8W	28480	0698-3155
A4R9	0757-0280		R:FXD MET FLM 1K OHM 1% 1/8W	28480	0757-0280
A4R10	0698-3155		R:FXD MET FLM 4.64K OHM 1% 1/8W	28480	0698-3155
A4R11	2100-1774	1	R:VAR WW 2K OHM 5% TYPE H 1W	28480	2100-1774
A4R12	0698-3155		R:FXD MET FLM 4.64K OHM 1% 1/8W	28480	0698-3155
A4R13	0698-3439	1	R:FXD MET FLM 178 OHM 1% 1/8W	28480	0698-3439
A4R14	0757-0123	1	R:FXD MET FLM 34.8K OHM 1% 1/8W	28480	0757-0123
A4R15	0757-0418		R:FXD MET FLM 619 OHM 1% 1/8W	28480	0757-0418
A4R16	0757-0394	1	R:FXD MET FLM 51.1 OHM 1% 1/8W	28480	0757-0394
A4R17	0698-0084	1	R:FXD MET FLM 2.15K OHM 1% 1/8W	28480	0698-0084
A4R18	0757-0442		R:FXD MET FLM 10.0K OHM 1% 1/8W	28480	0757-0442
A4R19	0757-0280		R:FXD MET FLM 1K OHM 1% 1/8W	28480	0757-0280
A4R20	0757-0439	3	R:FXD MET FLM 6.81K OHM 1% 1/8W	28480	0757-0439
A4R21	0757-0439		R:FXD MET FLM 6.81K OHM 1% 1/8W	28480	0757-0439
A4R22	0757-0439		R:FXD MET FLM 6.81K OHM 1% 1/8W	28480	0757-0439
A4R23	0698-0085	1	R:FXD MET FLM 2.61K OHM 1% 1/8W	28480	0698-0085
A4R24	0757-0280		R:FXD MET FLM 1K OHM 1% 1/8W	28480	0757-0280
A4R25	0757-0442		R:FXD MET FLM 10.0K OHM 1% 1/8W	28480	0757-0442
A4R26	0698-3440	1	R:FXD MET FLM 196 OHM 1% 1/8W	28480	0698-3440
A4R27	0757-0199	1	R:FXD MET FLM 21.5K OHM 1% 1/8W	28480	0757-0199
A4T1	9100-0399	1	TRANSFORMER	28480	9100-0399
A4Y1	0410-0013	1	CRYSTAL:QUARTZ 1MHZ	28480	0410-0013
			CHASSIS AND MISCELLANEOUS PARTS		
C1	0150-0012	10	C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C2	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C3	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C4	0121-0144	2	C:VAR AIR 442.2 PF	28480	0121-0144
C5	0121-0144		C:VAR AIR 442.2 PF	28480	0121-0144
C6	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C7			NOT ASSIGNED		
C8	0170-0022	13	C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE Z4

See introduction to this section for ordering information

Table 5-1. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
C9	0150-0025	1	C:FXD CER 2 PF 500VDCW	72982	315-000-P3K0-209F
C10	0180-0016	1	C:FXD ELECT 3X10UF -10/+50% 450VDCW	37942	TYPE FP 103090
C11	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C12	0132-0003	1	C:VAR POLY 0.7-3.0 PF	28480	0132-0003
C13	0140-0041	1	C:FXD MICA 100PF 5% 500VDCW	28480	0140-0041
C14	0121-0145	2	C:VAR AIR 442.2 PF	28480	0121-0145
C15	0121-0145		C:VAR AIR 442.2 PF	28480	0121-0145
C16	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C17	0160-0196		C:FXD MICA 24PF 5% 300VDCW	04062	RDM15C240J3S
C18			NOT ASSIGNED		
C19	0140-0034	1	C:FXD MICA 22PF 5% 500VDCW	28480	0140-0034
C20	0140-0024	1	C:FXD MICA 2200 PF 10% 500VDCW	28480	0140-0024
C21	0140-0079	1	C:FXD MICA 1000 PF 5% 500VDCW	28480	0140-0079
C22	0140-0068	1	C:FXD MICA 0.01 UF 10% 300VDCW	00853	RCM35E103K
C23	0140-0023	1	C:FXD MICA 180 PF 10%	00853	RCM20E181K
C24	0140-0027	1	C:FXD MICA 470 PF 10%	00853	RCM20E471K
C25	0140-0146	1	C:FXD MICA 82 PF 5% 300VDCW	14655	RDM15E820J3S
C26	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C27	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C28	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C29	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C30	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C31	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C32	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C33	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C34	0150-0019	2	C:FXD CER 1000 PF 20% 500VDCW	72982	327005X5U0102M
C35	0150-0019		C:FXD CER 1000 PF 20% 500VDCW	72982	327005X5U0102M
C36			NOT ASSIGNED		
C37	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C38	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C39			NOT ASSIGNED		
C48			NOT ASSIGNED		
C49	0160-0008	1	C:FXD MY 0.0033 UF 10% 600VDCW	56289	106P33296 PMD
C50	0140-0071	2	C:FXD MICA 5600PF 1% 500WVDC	28480	0140-0071
C51	0140-0071		C:FXD MICA 5600PF 1% 500WVDC	28480	0140-0071
C52	0170-0018	1	C:FXD MY 1UF 5% 200VDCW	84411	TYPE 621M 10552
C53	0150-0005	1	C:FXD CER 1000 PF 20% 500VDCW	04222	CFS-1
C54	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C55	0140-0003	1	C:FXD MICA 1000 PF 10%	04062	RCM20E120K
C56	0180-0045	1	C:FXD ELECT 20UF 25VDCW	56289	30D206-G0-25DB-6M1
C57	0150-0023	1	C:FXD CER 2000 PF 20% 1000VDCW	56289	20C295A2-CDH
C58			NOT ASSIGNED		
C100			NOT ASSIGNED		
C101	0180-0030	3	C:FXD ELECT 40/120 UF 450VDCW	56289	D32352 DFP
C102	0180-0030		C:FXD ELECT 40/120 UF 450VDCW	56289	D32352 DFP
C103	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C104			NOT ASSIGNED		
C105	0180-0030		C:FXD ELECT 40/120 UF 450VDCW	56289	D32352 DFP
C106	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C107	0150-0012		C:FXD CER 0.01 UF 20% 1000VDCW	56289	29C214A3
C108			NOT ASSIGNED		
C109	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C110	0170-0022		C:FXD MY 0.1UF 20% 600VDCW	09134	TYPE 24
C111	0180-0047	1	C:FXD ELECT 500 UF 75VDCW	56289	D32443 DFP
C112			NOT ASSIGNED		
C113			NOT ASSIGNED		
C114			NOT ASSIGNED		
C115			NOT ASSIGNED		
C116			NOT ASSIGNED		
C200			NOT ASSIGNED		
C201	606A-95C	2	C:VAR AIR 1.8 TO 8.9 PF(INCL BRACKET)	28480	606A-95C
C202	606A-95C		C:VAR AIR 1.8 TO 8.9 PF(INCL BRACKET)	28480	606A-95C
C203	606A-95B	4	C:VAR AIR 1.7 TO 11 PF(INCL BRACKET)	28480	606A-95B
C204	606A-95B		C:VAR AIR 1.7 TO 11 PF(INCL BRACKET)	28480	606A-95B
C205	606A-95B		C:VAR AIR 1.7 TO 11 PF(INCL BRACKET)	28480	606A-95B
C206	606A-95B		C:VAR AIR 1.7 TO 11 PF(INCL BRACKET)	28480	606A-95B
C207	0130-0006	6	C:VAR CER 5-20 PF N300	28480	0130-0006
C208	0130-0006		C:VAR CER 5-20 PF N300	28480	0130-0006
C209	0130-0006		C:VAR CER 5-20 PF N300	28480	0130-0006
C210	0130-0006		C:VAR CER 5-20 PF N300	28480	0130-0006
C211	0130-0006		C:VAR CER 5-20 PF N300	28480	0130-0006
C212	0130-0006		C:VAR CER 5-20 PF N300	28480	0130-0006
C213	0140-0042	1	C:FXD MICA 27PF 5% 500VDCW	28480	0140-0042
CR1	1910-0042	3	DIODE:GE 5MA AT 1.0V	28480	1910-0042
CR2	1910-0042		DIODE:GE 5MA AT 1.0V	28480	1910-0042

See introduction to this section for ordering information

Table 5-1. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
CR3	1910-0042		DIODE:GE 5MA AT 1.0V	28480	1910-0042
CR4	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
CR5	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
CR6	1910-0016		DIODE:GERMANIUM 100MA/0.85V 60PIV	93332	D2361
CR7			NOT ASSIGNED		
CR100			NOT ASSIGNED		
CR101	1901-0028	8	DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR102	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR103	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR104	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR105	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR106	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR107	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR108	1901-0028		DIODE:SILICON 0.75A 400PIV	04713	SR1358-9
CR109	1901-0026	4	DIODE:SILICON 0.75A 200PIV	04713	SR1358-8
CR110	1901-0026		DIODE:SILICON 0.75A 200PIV	04713	SR1358-8
CR111	1901-0026		DIODE:SILICON 0.75A 200PIV	04713	SR1358-8
CR112	1901-0026		DIODE:SILICON 0.75A 200PIV	04713	SR1358-8
CR113	1902-3268	1	DIODE BREAKDOWN:26.1V 5%	28480	1902-3268
DS1			NOT ASSIGNED		
DS100			NOT ASSIGNED		
DS101	2140-0C09	1	LAMP:INCANDESCENT 6.3V 0.15 AMPS	08806	47(BRASS BASE)
F1	2110-0017	1	FUSE:CARTRIDGE 0.15 AMP SLOW BLOW	75915	313.150
F2			NOT ASSIGNED		
F100			NOT ASSIGNED		
F101 F101	2110-0303	1	FUSE:CARTRIDGE 2A 250V SLOW-BLOW (115 VOLT OPERATION)	71400	MDX-2A
F101 F101	2110-0312	1	FUSE:CARTRIDGE 1 AMP 250V SLOW-BLOW (230 VOLT OPERATION)	71400	MDL-1
FL1	9100-2887	1	FILTER:LINE 50/400 HZ	05245	F1221A
J1			NOT ASSIGNED		
J2			N.S.R. PART OF A1 ASSY		
J3	1250-0001	1	CONNECTOR:RF BNC BULKHEAD MOUNT JACK	28480	1250-0001
J4			NOT ASSIGNED		
J100			NOT ASSIGNED		
J101	1251-2357	1	SOCKET:3-PIN MALE POWER RECEPTACLE	82389	EAC-301
K1	0490-0018	1	RELAY:ARMATURE SPDT	77342	RS-1124 5000 OHM
L1	9140-0052	4	COIL:FXD RF 3.3 MHY	28480	9140-0052
L2			NOT ASSIGNED		
L3	9140-0052		COIL:FXD RF 3.3 MHY	28480	9140-0052
L4	9140-0052		COIL:FXD RF 3.3 MHY	28480	9140-0052
L5			NOT ASSIGNED		
L6	9140-0052		COIL:FXD RF 3.3 MHY	28480	9140-0052
L7			NOT ASSIGNED		
L101			NOT ASSIGNED		
L102			NOT ASSIGNED		
L103			NOT ASSIGNED		
L104	9140-0051	1	COIL:FXD 400 UHY	28480	9140-0051
M1	1120-0075	1	METER:0-200 MA SPEC SCALE 0-100%	28480	1120-0075
M2	1120-0074	1	METER:0-100 MA SPEC SCALE 0-3V	28480	1120-0074
P1			NOT ASSIGNED		
P100			NOT ASSIGNED		
P101	8120-1348	1	CABLE ASSY:POWER, DETACHABLE	70903	KHS-7041
R1	0690-3941	1	R:FXD COMP 390K OHM 10% 1W	01121	GB 3941
R2	0690-1541	1	R:FXD COMP 150K OHM 10% 1W	01121	GB 1541
R3	2100-0141	4	R:VAR COMP 50K OHM 20% LIN 1/4W	28480	2100-0141
R4	0687-4731	4	R:FXD COMP 47K OHM 10% 1/2W	01121	EB 4731
R5	0687-4731		R:FXD COMP 47K OHM 10% 1/2W	01121	EB 4731
R6	0687-1041	4	R:FXD COMP 100K OHM 10% 1/2W	01121	EB 1041
R7	0687-2711	2	R:FXD COMP 270 OHM +/-10% 1/2W	01121	EB 2711
R8	0687-2711		R:FXD COMP 270 OHM +/-10% 1/2W	01121	EB 2711
R9	0690-1011	2	R:FXD COMP 100 OHM 10% 1W	01121	GB 1011
R10	0693-3331	3	R:FXD COMP 33K OHM 10% 2W	01121	HB 3331
R11	0687-2211	2	R:FXD COMP 220 OHM 10% 1/2W	01121	EB 2211
R12	0687-2211		R:FXD COMP 220 OHM 10% 1/2W	01121	EB 2211
R13	0687-3901	4	R:FXD COMP 39 OHM 10% 1/2W	01121	EB 3901
R14	0687-3901		R:FXD COMP 39 OHM 10% 1/2W	01121	EB 3901
R15	0690-1011		R:FXD COMP 100 OHM 10% 1W	01121	GB 1011
R16			NOT ASSIGNED		
R17			NOT ASSIGNED		
R18	0757-0072	1	R:FXD MET FLM 49.9 OHM 1.0% 1/2W	28480	0757-0072
R19	0690-3331	1	R:FXD COMP 33K OHM 10% 1W	01121	GB 3331
R20	0693-3331		R:FXD COMP 33K OHM 10% 2W	01121	HB 3331
R21	0687-3341	1	R:FXD COMP 330K OHM 10% 1/2W	01121	EB 3341

See introduction to this section for ordering information

Table 5-1. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
R22	0686-1025	1	R:FXD COMP 1000 OHM 5% 1/2W	01121	EB 1025
R23	0686-1625	1	R:FXD COMP 1600 OHM 5% 1/2W	01121	EB 1625
R24	0687-2241	1	R:FXD COMP 220K OHM 10% 1/2W	01121	EB 2241
R25	0757-0044	1	R:FXD MET FLM 33.2K OHM 1% 1/2W	28480	0757-0044
R26	0757-0835	1	R:FXD MET FLM 6.81K OHM 1% 1/2W	28480	0757-0835
R27	0693-2731	2	R:FXD COMP 27K OHM 10% 2W	01121	HB 2731
R28	0693-2731		R:FXD COMP 27K OHM 10% 2W	01121	HB 2731
R29	0690-1241	2	R:FXD COMP 120K OHM 10% 1W	01121	GB 1241
R30	0690-2241	1	R:FXD COMP 220K OHM 10% 1W	01121	GB 2241
R31	0687-1011	2	R:FXD COMP 100 OHM 10% 1/2W	01121	EB 1011
R32	0816-0018	2	R:FXD WW 20K OHM 5% 10W	28480	0816-0018
R33	0690-3341	1	R:FXD COMP 330K OHM 10% 1W	01121	GB 3341
R34	0690-1241		R:FXD COMP 120K OHM 10% 1W	01121	GB 1241
R35	2100-0016	1	R:VAR 200K OHM 10% CWLOG	28480	2100-0016
R36	0757-0112	1	R:FXD MET FLM 25.7K OHM 1% 1/4W	28480	0757-0112
R37	2100-0141		R:VAR COMP 50K OHM 20% LIN 1/4W	28480	2100-0141
R38	0693-3331		R:FXD COMP 33K OHM 10% 2W	01121	HB 3331
R39			NOT ASSIGNED		
R45			NOT ASSIGNED		
R46	0687-1021	1	R:FXD COMP 1000 OHM 10% 1/2W	01121	EB 1021
R47	0687-6811	6	R:FXD COMP 680 OHM 10% 1/2W	01121	EB 6811
R48	0687-1541	2	R:FXD COMP 150K OHM 10% 1/2W	01121	EB 1541
R49	0687-5641	1	R:FXD COMP 560K OHM 10% 1/2W	01121	EB 5641
R50	0690-5631	1	R:FXD COMP 56K OHM 10% 1W	01121	GB 5631
R51	2100-0067	1	R:VAR COMP 2500 OHM 10% LIN 1/2W	28480	2100-0067
R52	0687-2221	2	R:FXD COMP 2200 OHM 10% 1/2W	01121	EB 2221
R53	0687-8231	1	R:FXD COMP 82K OHM 10% 1/2W	01121	EB 8231
R54			N.S.R. PART OF S6		
R55	0757-0856	1	R:FXD MET FLM 75.0K OHM 1% 1/2W	28480	0757-0856
R56	0698-3103	2	R:FXD MET FLM 28.7K OHM 1% 1/2W	28480	0698-3103
R57	0757-0816	1	R:FXD MET FLM 681 OHM 1% 1/2W	28480	0757-0816
R58	0757-0888	1	R:FXD FLM 71.5K OHM 1% 1/4W	28480	0757-0888
R59	0698-3103		R:FXD MET FLM 28.7K OHM 1% 1/2W	28480	0698-3103
R60	2100-0053	2	R:VAR WW 10K OHM 20% LIN 2W	28480	2100-0053
R61	0771-0004	1	R:FXD MET FLM 20K OHM 10% 4W	28480	0771-0004
R62	0771-0005	1	R:FXD MET FLM 24K OHM 10% 4W	28480	0771-0005
R63	2100-0225	1	R:VAR WW 5000 OHM 10% LIN 2W	28480	2100-0225
R64	0815-0001	1	R:FXD WW 30K OHM 5% 10W	28480	0815-0001
R65	0687-4731		R:FXD COMP 47K OHM 10% 1/2W	01121	EB 4731
R66	0693-4731	1	R:FXD COMP 47K OHM 10% 2W	01121	HB 4731
R67	2100-0141		R:VAR COMP 50K OHM 20% LIN 1/4W	28480	2100-0141
R68	0771-0007	1	R:FXD MET FLM 30K OHM 10% 4W	28480	0771-0007
R69	2100-0053		R:VAR WW 10K OHM 20% LIN 2W	28480	2100-0053
R70			NOT ASSIGNED		
R71			NOT ASSIGNED		
R72	0690-1061	2	R:FXD COMP 10 MEGOHM 10% 1W	01121	GB 1061
R73	0690-1061		R:FXD COMP 10 MEGOHM 10% 1W	01121	GB 1061
R74	0687-4711	1	R:FXD COMP 470 OHM 10% 1/2W	01121	EB 4711
R75			NOT ASSIGNED		
R100			NOT ASSIGNED		
R101	0813-0017	1	R:FXD WW 5 OHM 10% 5W	28480	0813-0017
R102	0687-8241	1	R:FXD COMP 820K OHM 10% 1/2W	01121	EB 8241
R103	0687-6811		R:FXD COMP 680 OHM 10% 1/2W	01121	EB 6811
R104	0687-1061	1	R:FXD COMP 10 MEGOHM 10% 1/2W	01121	EB 1061
R105	0687-1251	1	R:FXD COMP 1.2 MEGOHM 10% 1/2W	01121	EB 1251
R106	0687-3301	5	R:FXD COMP 33 OHM 10% 1/2W	01121	EB 3301
R107	0687-8251	1	R:FXD COMP 8.2 MEGOHM 10% 1/2W	01121	EB 8251
R108	0687-1041		R:FXD COMP 100K OHM 10% 1/2W	01121	EB 1041
R109	0687-6811		R:FXD COMP 680 OHM 10% 1/2W	01121	EB 6811
R110	0757-0155	1	R:FXD MET FLM 604K OHM 1% 1/2W	28480	0757-0155
R111	0698-4022	2	R:FXD MET FLM 402K OHM 1.0% 1/2W	28480	0698-4022
R112	0687-3301		R:FXD COMP 33 OHM 10% 1/2W	01121	EB 3301
R113	0693-5631	1	R:FXD COMP 56K OHM 10% 2W	01121	HB 5631
R114	0687-6811		R:FXD COMP 680 OHM 10% 1/2W	01121	EB 6811
R115	0687-3301		R:FXD COMP 33 OHM 10% 1/2W	01121	EB 3301
R116	0687-6811		R:FXD COMP 680 OHM 10% 1/2W	01121	EB 6811
R117	0687-3301		R:FXD COMP 33 OHM 10% 1/2W	01121	EB 3301
R118	0687-6811		R:FXD COMP 680 OHM 10% 1/2W	01121	EB 6811
R119	0687-3301		R:FXD COMP 33 OHM 10% 1/2W	01121	EB 3301
R120	0816-0008	1	R:FXD WW 10K OHM 10% 10W	28480	0816-0008
R121	0690-6831	1	R:FXD COMP 68K OHM 10% 1W	01121	GB 6831
R122	0687-3951	1	R:FXD COMP 3.9 MEGOHM 10% 1/2W	01121	EB 3951
R123	0687-5631	1	R:FXD COMP 56K OHM 10% 1/2W	01121	EB 5631
R124	0687-1041		R:FXD COMP 100K OHM 10% 1/2W	01121	EB 1041
R125	0698-4022		R:FXD MET FLM 402K OHM 1.0% 1/2W	28480	0698-4022

See introduction to this section for ordering information

Table 5-1. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
R126	2100-0141		R:VAR COMP 50K OHM 20% LIN 1/4W	28480	2100-0141
R127	0757-0154	1	R:FXD MET FLM 287K OHM 1% 1/2W	28480	0757-0154
R128	0690-1831	1	R:FXD COMP 18K OHM 10% 1W	01121	GB 1831
R129	0690-1251	1	R:FXD COMP 1.2 MEGOHM 10% 1W	01121	GB 1251
R130	0687-1041		R:FXD COMP 100K OHM 10% 1/2W	01121	EB 1041
R131	0687-4731		R:FXD COMP 47K OHM 10% 1/2W	01121	EB 4731
R132	0690-2711	1	R:FXD COMP 270 OHM 10% 1W	01121	GB 2711
R133	C687-1541		R:FXD COMP 150K OHM 10% 1/2W	01121	EB 1541
R134	0687-3331	1	R:FXD COMP 33K OHM 10% 1/2W	01121	EB 3331
R135	C69C-1001	1	R:FXD COMP 10 OHM 10% 1W	01121	GB 1001
R136	0816-0018		R:FXD WW 20K OHM 5% 10W	28480	0816-0018
R137			NOT ASSIGNED		
R200			NOT ASSIGNED		
R201	C690-2211	2	R:FXD COMP 220 OHM 10% 1W	01121	GB 2211
R202	0690-2211		R:FXD COMP 220 OHM 10% 1W	01121	GB 2211
R203	C687-2221		R:FXD COMP 2200 OHM 10% 1/2W	01121	EB 2221
R203			FACTORY SELECTED PART		
R204	0687-3901		R:FXD COMP 39 OHM 10% 1/2W	01121	EB 3901
R205	0687-3901		R:FXD COMP 39 OHM 10% 1/2W	01121	EB 3901
R206	0686-1125	2	R:FXD COMP 1100 OHM 5% 1/2W FACTORY SELECTED PART	01121	EB 1125
R207	C686-1125		R:FXD COMP 1100 OHM 5% 1/2W	01121	EB 1125
R208	0687-1001	1	R:FXD COMP 10 OHM 10% 1/2W	01121	EB 1001
R209	C686-1525	1	R:FXD COMP 1500 OHM 5% 1/2W	01121	EB 1525
R209			FACTORY SELECTED PART		
R210	0687-1011		R:FXD COMP 100 OHM 10% 1/2W	01121	EB 1011
R211	C687-5611	1	R:FXD COMP 560 OHM 10% 1/2W	01121	EB 5611
R212	0687-5601	1	R:FXD COMP 56 OHM 10% 1/2W	01121	EB 5601
RT1	2140-0007	1	LAMP:INCANDESCENT 12V, 8MA	08806	8A/S6-12V
S1	3101-0012	1	SWITCH:TOG DPDT ON OFF ON	04009	82609
S2			NOT ASSIGNED		
S3	3100-0197	1	SWITCH-ROTARY: 2 SECT 6 POS	28480	3100-0197
S4			NOT ASSIGNED		
S5	3130-0105	1	SECTION:ROTARY SWITCH	28480	3130-0105
S6	3100-0190	1	SWITCH-ROTARY: 1 SECT 5 POS	28480	3100-0190
S7	3102-001C	1	SWITCH: SENSITIVE SPDT 125 VAC 10 AMP	91929	BZ 2RW822
S8	3101-1234	1	SWITCH:SLIDE DPDT	82389	11A-1242
S9			NOT ASSIGNED		
S100			NOT ASSIGNED		
S101	3101-0030	1	SWITCH:TOGGLE SPST ON-NONE-OFF	27191	8906K368
S101			(115 VOLT ONLY)		
T1	9120-0036	1	TRANSFORMER:AUDIO	28480	9120-0036
T2			NOT ASSIGNED		
T100			NOT ASSIGNED		
T101	9100-0101	1	TRANSFORMER:POWER	28480	9100-0101
T102			NOT ASSIGNED		
T200			NOT ASSIGNED		
T201	606A-60A	1	TRANSFORMER:OSC. 50-170 KC	28480	606A-60A
T202	606A-60C	1	TRANSFORMER:OSC. 165-560 KC	28480	606A-60C
T203	606A-60E	1	TRANSFORMER:OSC. 530-1800 KC	28480	606A-60E
T204	606A-60G	1	TRANSFORMER:OSC. 1.76-6.0 MC	28480	606A-60G
T205	606A-60J	1	TRANSFORMER:OSC. 5.8-19.2 MC	28480	606A-60J
T206	606A-60M	2	TRANSFORMER:SECONDARY COIL	28480	606A-60M
T206	606A-60L	1	TRANSFORMER:OSC. 19-65 MC	28480	606A-60L
T206			CONSISTS OF PRIMARY COIL		
T207	606A-60B	1	TRANSFORMER:AMPL. 50-170 KC	28480	606A-60B
T208	606A-60D	1	TRANSFORMER:AMPL. 165-560 KC	28480	606A-60D
T209	606A-60F	1	TRANSFORMER:AMPL. 530-1800 KC	28480	606A-60F
T210	606A-60M		TRANSFORMER:SECONDARY COIL	28480	606A-60M
T211	606A-60K	1	TRANSFORMER:AMPL. 5.8-19.2 MC	28480	606A-60K
T212	606A-60N	1	TRANSFORMER:AMPL. 19-65 MC	28480	606A-60N
T212			CONSISTS OF PRIMARY COIL		
V1	1933-0002	2	ELECTRON TUBE: 6AW8 TRIODE PENTODE	93332	S/B 6AW8A
V2	1932-0027	3	ELECTRON TUBE:12AT7 DUAL TRIODE	33173	12AT7
V3	1923-0072	2	ELECTRON TUBE:6CL6	28480	1923-0072
V4	1923-0072		ELECTRON TUBE:6CL6	28480	1923-0072
V5	1932-0045	1	ELECTRON TUBE:12AT7	13396	12AT7
V6	1921-0010	7	ELECTRON TUBE:12B4A	33173	12B4A
V7	1932-0027		ELECTRON TUBE:12AT7 DUAL TRIODE	33173	12AT7
V8	1933-0002		ELECTRON TUBE: 6AW8 TRIODE PENTODE	93332	S/B 6AW8A
V9	1932-0027		ELECTRON TUBE:12AT7 DUAL TRIODE	33173	12AT7
V10			NOT ASSIGNED		
V11			NOT ASSIGNED		
V100			NOT ASSIGNED		
V101	1921-0010		ELECTRON TUBE:12B4A	33173	12B4A

See introduction to this section for ordering information

Table 5-1. Replaceable Parts

Reference Designation	HP Part Number	Qty	Description	Mfr Code	Mfr Part Number
V102	1921-0010		ELECTRON TUBE:1284A	33173	1284A
V103	1921-0010		ELECTRON TUBE:1284A	33173	1284A
V104	1921-0010		ELECTRON TUBE:1284A	33173	1284A
V105	1921-0010		ELECTRON TUBE:1284A	33173	1284A
V106	1933-0011	2	ELECTRON TUBE:6AW8A	33173	6AW8A
V107	1921-0010		ELECTRON TUBE:1284A	33173	1284A
V108	1933-0011		ELECTRON TUBE:6AW8A	33173	6AW8A
V109	1940-0001	1	ELECTRON TUBE:5651	86684	5651A
			MISCELLANEOUS		
	606A-18	1	ASSY:FREQ. DRIVE CABLE	28480	606A-18
	606A-95A	1	ASSY:TURRET CONTACT	28480	606A-95A
	608D-59C	1	DETENT SPRING LEAF	28480	608D-59C
	1400-0084	1	FUSEHOLDER:EXTRACTOR POST TYPE	75915	342014
	606A-14E	1	GEAR FREQUENCY:VERNIER PINION	28480	606A-14E
	1450-0413	1	JEWEL:PILOT LITE	28480	1450-0413
	0370-0036	1	KNOB:SKIRTED BAR BLK 1.0" DIA	28480	0370-0036
	0370-0037	1	KNOB:SKIRTED BAR 1" DIA,BLACK	28480	0370-0037
	0370-0066	1	KNOB:ROUND BLACK 0.375" DIA SHAFT	28480	0370-0066
	0370-0083	1	KNOB:ROUND, BLACK 0.500" DIA	28480	0370-0083
	0370-0063	1	KNOB:RED 3/4" DIA	28480	0370-0063
	9170-0024	1	CORE:TUNING #10-32 THREAD	28480	9170-0024
	1251-0156	1	CONNECTOR:RECEPTACLE	01009	CS402 ACG

Table 5-2. Manufacturers' Code List

MFR NO.	MANUFACTURER NAME	ADDRESS	ZIP CODE
00853	SANGAMO ELECTRIC CO.PICKENS DIV.	PICKENS, S.C.	29671
00866	GOE ENGINEERING CO. INC.	CITY OF INDUSTRY, CALIF.	91746
01009	ALDEN PROD. CO.	BROCKTON, MASS.	02403
01121	ALLEN BRADLEY CO.	MILWAUKEE, WIS.	53204
04009	ARROW, HART & HEGEMAN ELECT. CO.	HARTFORD, CONN.	06106
04222	HI-Q DIV. OF AEROVOX CORP.	MYRTLE BEACH, S.C.	29577
04713	MOTOROLA SEMICONDUCTOR PROD.INC.	PHOENIX, ARIZ.	85008
05245	COMPONENTS CORP.	CHICAGO, ILL.	60657
07263	FAIRCHILD CAMERA & INST. CORP. SEMICONDUCTOR DIV.	MOUNTAIN VIEW, CALIF.	94040
08806	G.E. CO. MINIATURE LAMP DEPT.	CLEVELAND, OHIO	44112
09134	TEXAS CAPACITOR CO. INC.	HOUSTON, TEX.	77042
13396	TELEFUNKEN (GMBH)	HANNOVER, GERMANY	
14655	CORNELL DUBLIER ELECT. DIV.FEDERAL PACIFIC ELECT. CO.	NEWARK, N.J.	07105
27191	CUTLER-HAMMER INC. POWER DIST. & CONTROL DIV.	MILWAUKEE, WISC.	53216
28480	HEWLETT-PACKARD COMPANY	PALO ALTO, CALIF.	94304
33173	G.E. CO. TUBE DEPT.	OWENSBORO, KTY.	42301
56289	SPRAGUE ELECTRIC CO.	N. ADAMS, MASS.	01247
70903	BELDEN CORP.	CHICAGO, ILL.	60644
71400	BUSSMANN MFG. DIV. MC GRAW-EDISON CO.	ST. LOUIS, MO.	63017
72136	ELECTRO MOTIVE MFG. CO. INC.	WILLIMANTIC, CONN.	06226
72982	ERIE TECHNOLOGICAL PROD. INC.	ERIE, PA.	16512
75915	LITTELFUSE INC.	DES PLAINES, ILL.	60016
77342	AMERICAN MACHINE & FOUNDRY CO. POTTER & BRUMFIELD DIV.	PRINCETON, IND.	47570
80131	ELECTRONIC INDUSTRIES ASSOCIATION	WASHINGTON D.C.	20006
82389	SWITCHCRAFT INC.	CHICAGO, ILL.	60630
84411	TRW CAPACITOR DIV.	OGALLALA, NEBR.	69153
86684	RCA ELECTRONIC COMPONENTS	HARRISON, N.J.	07029
91418	RADIO MATERIALS CO.	CHICAGO, ILL.	60646
91929	HONEYWELL INC. MICRO SWITCH DIV.	FREEPORT, ILL.	61032
93332	SYLVANIA ELECTRIC PROD. INC. SEMICONDUCTOR DIV.	WOBURN, MASS.	01801

See introduction to this section for ordering information

ILLUSTRATED PARTS IDENTIFICATION

MODEL 606A
HIGH FREQUENCY SIGNAL GENERATOR

PRINTED: JULY 1964

REF.	STOCK NO.	DESCRIPTION	QTY.
1		See Figure 2	
2		See Figure 3	
3		See Figure 4	
4		See Figure 5	
5		See Figure 10	
6		See Figure 9	
7		See Figure 6	
8		See Figure 6	
9		See Figure 6	
10		See Figures 7 & 8	
11	606A-55A	Shield Box	1
12	606A-44A-2	Cabinet Body Assembly	1
13	5000-0201	Cover, Rear (Cabinet only)	1

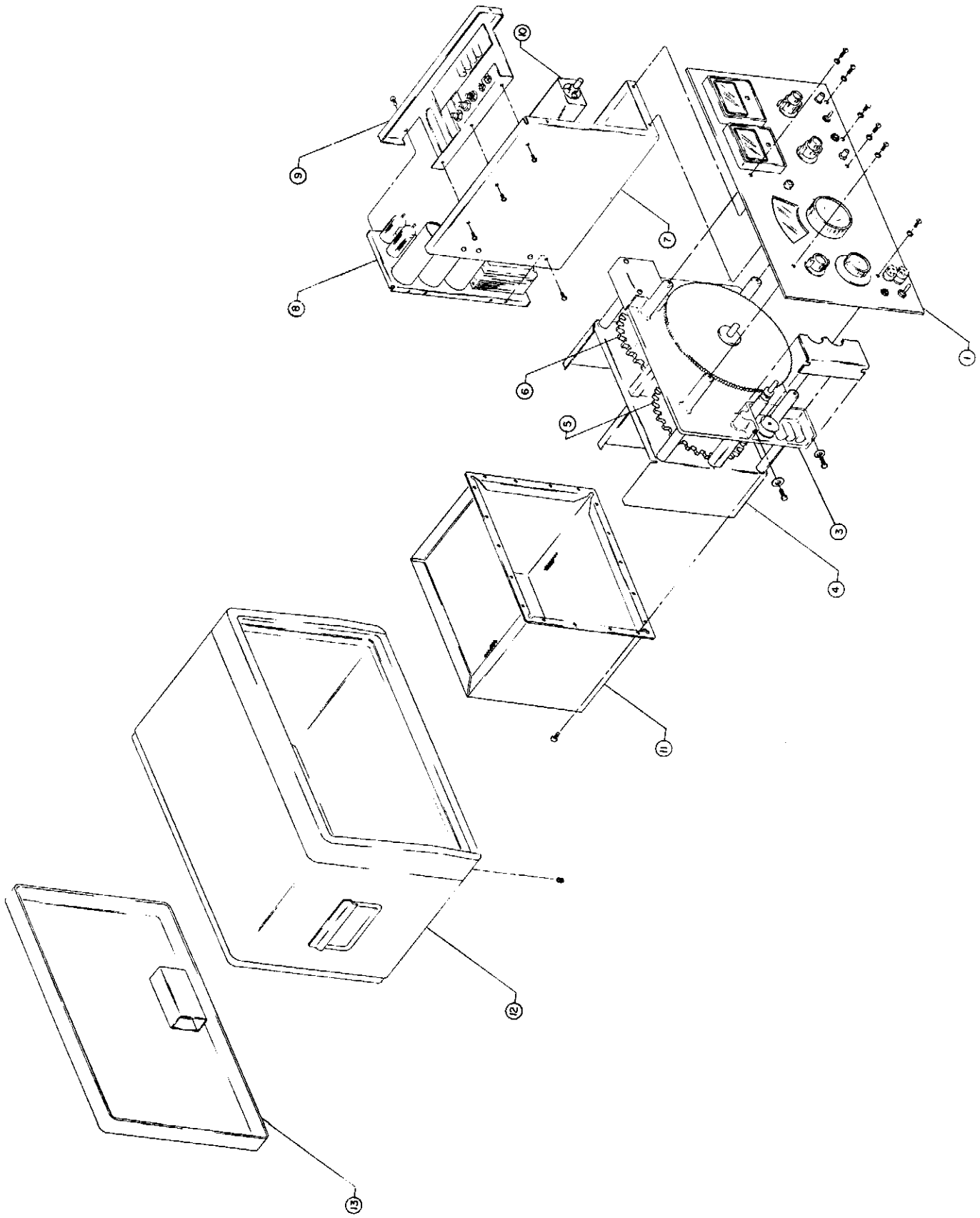


Figure 1. Model 606A High Frequency Signal Generator, General Arrangement

REF.	STOCK NO.	DESCRIPTION	QTY.
1	3100-0190	Switch: Rotary 1 Section 5 Position	1
2	2190-0016	Washer: Lock ph brz np 1/2 od x 3/8 id	2
3	0360-0024	Terminal: Lug grounding for potentiometer	1
4	606A-83D	Window: Dial	1
5	606A-110	Boss: Guide	1
6	0510-0040	Ring: Retaining stl cp 5/16 id x 0.025 thk	1
7	560A-88E	Washer: Flat	1
8	1251-0071	Connector: Jack telephone type 2 contact	1
9	2190-0016	Washer: Lock ph brz np 1/2 od x 3/8 id	3
10	2950-0001	Nut: Hex br np 3/8-32 x 1/2	4
11	3101-0012	Switch: Toggle dpdt on-off-on	1
12	2950-0035	Nut: Hex brx np 15/32-32 x 9/16 x 5/16 thk	2
13	2950-0007	Nut: Hex brs np 5/16-32 x 7/16 x 3/32 thk	1
14	1450-0019	Lampholder: Pilot light	1
15	2140-0009	Lamp: Incandescent 6.8v type 47	1
16	2190-0025	Washer: Lock ext ph brz np S5/16 Scr x 19/32	1
17	3101-0030	Switch: Toggle spst 15 amp 125 vac	1
18	2950-0038	Nut: Hex 1/2-24 x 11/16 x 1/8 thk	2
19	2190-0037	Washer: Lock int sstl cp 0.781 od x 0.52 id	2
20	606A-2A	Panel: Front	1
21	2930-0004	Screw, Flat head ss 10-24 thd, 1/2 in. lg.	2
22	3050-0022	Washer: Flat brs np 7/16 od x 0.318 id x 0.02	1
23	606A-74A	Knob: Assembly: calibrate assembly	1
24	0590-0012	Nut: Knurled brs np 15/32-32 x 0.60 od x 1/16	2
25	1400-0084	Fuseholder: Extractor post type	2
26	0900-0016	Gasket: Rubber 11/16 od x 1/2 id x 3/32 dia	2
27	1450-0020	Jewel: Pilot light red faceted plastic	1
28	606A-40B	Knob: 100 divisions	1
29	0370-0036	Knob: Plastic black 1 inch bar	1
30	0370-0066	Knob: Plastic black 2-3/4 dia 3/8 shaft	1
31	2220-0002	Screw: Machine fil h sstl 4-40 x 1/4	4
32	1250-0001	Connector: BNC	2
33	3050-0032	Washer: Flat brass 0.189 id x 5/16 od x 0.10 thk	6
34	2920-0002	Screw: Machine rh sstl 10-24 x 1/2	6
35	3050-0067	Washer: Flat brs np 5/8 od x 3/8 id x 0.031 thk	1
36	1120-0075	Microammeter: 200 microamperes Z0 to 100Z	1
37	1120-0074	Microammeter: 0.100 microamperes	1
38	2460-0007	Screw: Machine pan hd phl dr brs	4
39	0590-0038	Nut: Hex brs np 1/2-32 x 5/8 x 3/32	1
40	0370-0037	Knob: Concentric	2
41	0370-0063	Knob: 3/4" red	2

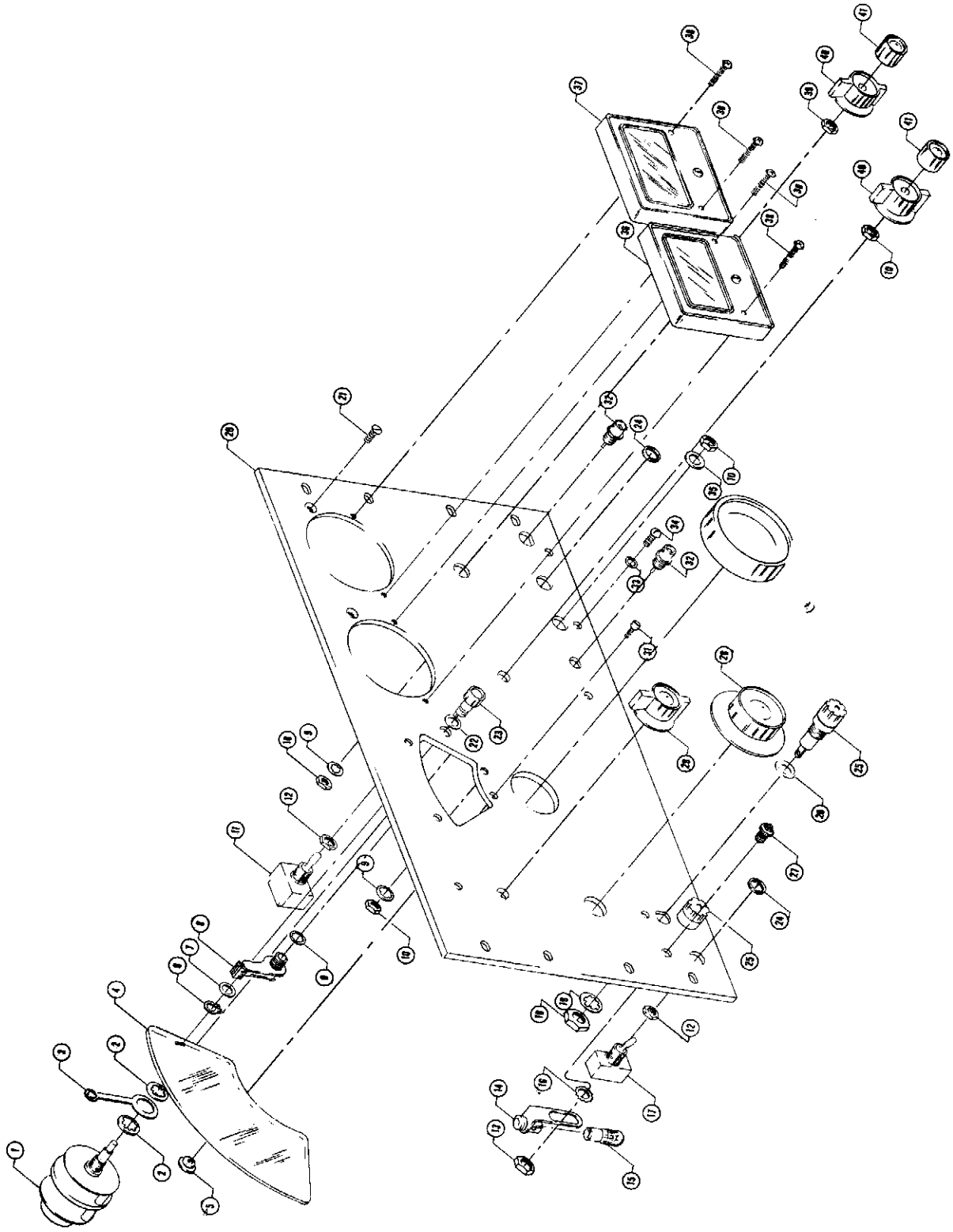


Figure 2. Model 606A High Frequency Signal Generator, Front Panel Assembly

REF.	STOCK NO.	DESCRIPTION	QTY.
1	606A-20A	Main Casting	1
2	606A-47A	Spacer: Chassis Mounting (Hallow)	1
3	1480-0085	Pin: Drive sstl 3/32 od x 9/16	1
4	3030-0005	Screw: Machine set cup-pt st cp 8-32 x 1/8	2
5	606A-100E	Drum: Dial Drive	1
6	0510-0081	Ring: Retaining stl 0.5 id x 0.035 thk	1
7	3030-0018	Screw: Machine headless set 4-40 x 1/4 hex dr	1
8	606A-47B	Spacer: Chassis Mounting (Solid)	3
9	Not Assigned		
10	3030-0001	Screw: Machine Set cup-pt st 8-32 x 3/16	12
11	606A-37A	Shaft: Turret Drive	1
12	606A-36G	Spur Gear: Turret Drive	1
13	2190-0011	Washer: Lock int ph brz np S10 scr x 0.373 id	3
14	2920-0003	Screw: Machine rh sstl 10-24 x 5/8	3
15	1480-0008	Drive Pin: Stl 1/16 od x 1/2	1
16	606A-14B	Shaft: Vernier	1
17	606A-14E	Pinion: Vernier load	2
18	1480-0079	Roll Pin: Stl 3/32 od x 7/8	1
19	Not Assigned		
20	1460-0067	Spring: Helical stl cp 2-3/16	1
21	606A-37B	Shaft: Pointer	1
22	606A-105A	Hub: Dial	1
23	1480-0084	Roll Pin: Stl 1/8 od x 1/2	1
24	1460-0022	Spring: Helical 1/8 od x 1-1/2	1
25	0510-0005	Ring: Retainer st cp 1/4"	2
26	3050-0074	Washer: Flat be cu 3/4 od x 0.255 id x 0.006 thk	1
27	606A-99A	Indicator: Dial range	1
28	1480-0267	Roll Pin: Stl 5/32 od x 1	1
29	3050-0024	Washer: Flat be cu 17/32 id x 1-1/4 od x 0.006	1
30	0510-0080	Ring: Retaining st cp 1/2"	1
31	606A-40A	Dial: Frequency	1
32	Not Assigned		
33	606A-48T	Strap: Grounding	4
34	606A-17	Bushing: Dial Shaft	1
35	1410-0019	Bearing: Ball 1.125 od x 0/5 id x 0.25	2
36	606A-37D	Shaft: Tuner	1
37	0510-0079	Ring: Retaining stl cp 0.461 id x 0.035 thk	1
38	606A-105B	Hub: Outer Dial	1
39	2370-0002	Screw: Machine fh sstl 6-32 x 3/8	4
40	606A-16B	Part of Cable Assembly (Amplifier Output)	0
41	2190-0016	Washer: Lock ph brz np 1/2 od x 3/8 id	1
42	1410-0003	Bushing: Threaded 3/8-32 x 1/2" lg	1
43	606A-37F	Shaft: Turret Oscillator	1
44	606A-48T	Strap Grounding	2
45	3050-0025	Washer: Flat be cu 1-1/4 od x 9/32 id x 0.006	1
46	0510-0080	Ring: Retaining St cp 1/2"	1
47	1460-0053	Spring: Helical sst 1-3/8 id	1
48	1480-0085	Pin: Drive sstl 3/32 od x 9/16	4
49	606A-36E	Detent Lift Assembly	1
50	3050-0191	Washer: Flat brs laminated 718 id x 1-118 od	1
51	0510-0077	Ring: Retaining stl 7/8 id x 0.042 thk	1
52	606A-108A	Cam Assembly: Dial Pointer	1
53	2550-0009	Screw: Machine bh sstl 8-32 x 1/2 W/ext lk W	2
54	3050-0129	Washer: Pressure al 5/8 od x 3/16 id x 1/8 thk	2
55	606A-91B	Spring: Leaf	2
56	608D-59C	Spring: Detent	2
57	606A-36H	Bracket: Detent Mounting	1
58	606A-102	Roller: Detent	2

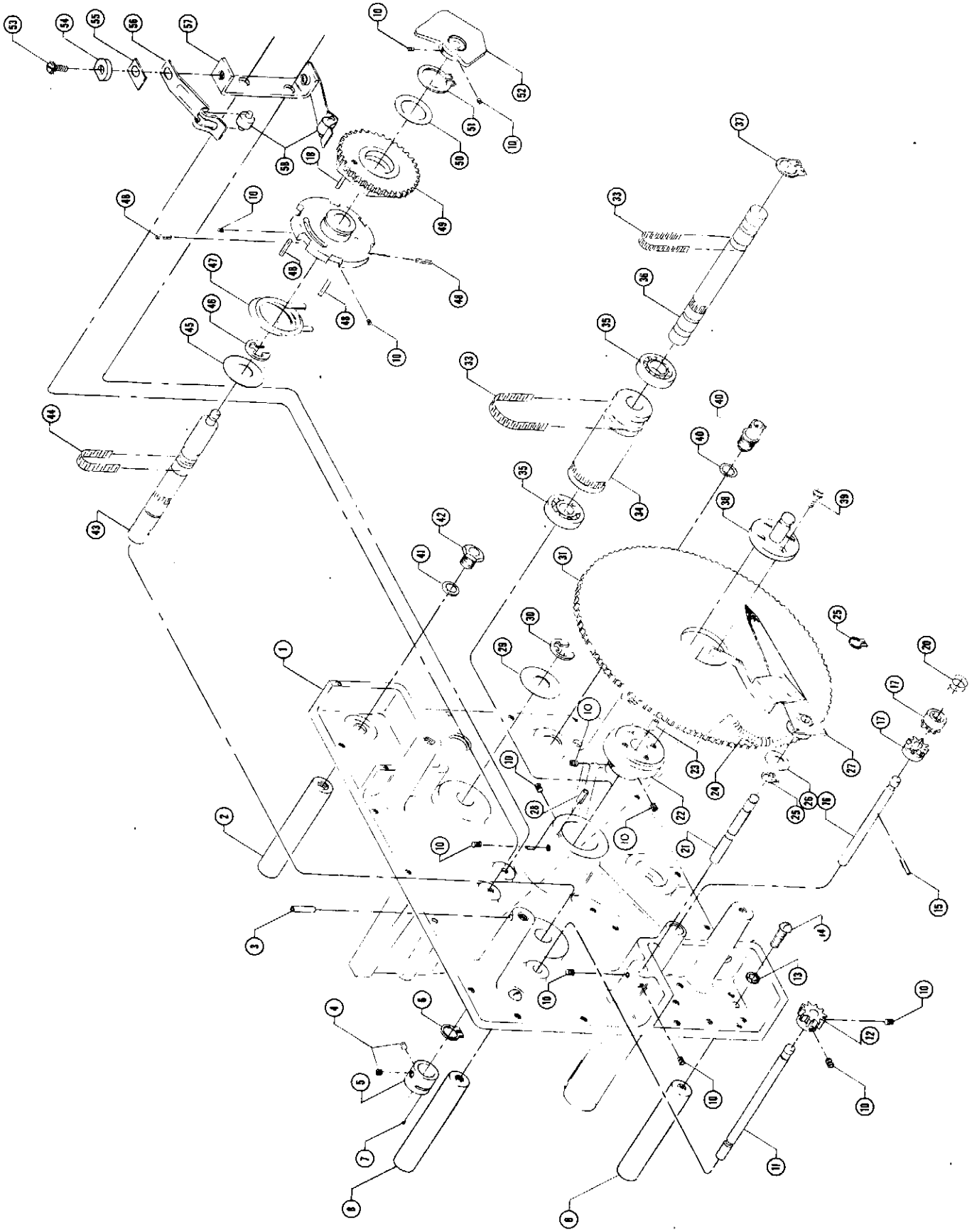


Figure 3. Model 606A High Frequency Signal Generator Front Section RF Signal Generator

REF.	STOCK NO.	DESCRIPTION	QTY.
1	606A-20	Main Casting	1
2	2510-0001	Screw: Machine th sst phillips dr 8-32 x 5/8	6
3	2190-0017	Washer: Lock split-ring ph br np 5164 No. 8	6
4	3050-0006	Washer: Fiber extruded 1/2 od x 1/16 tk	6
5	0121-0026	C: Var air 12.2 to 454.4 pf	1
6	606A-88	Washer: Shoulder	6
7	3050-0071	Washer: Flat brs cp 7/16 od x 0.172 id x 0.031 tk	6
8	0121-0027	C: Var air 12.2 to 454.4 pf	1
9	606A-48L	Shorting Contact Assembly	1
10	2210-0002	Screw: Machine fh sst 4-40 x 1/4	2
11	1480-0004	Pin. Roll st 0.094 od x 3/8	2
12	606A-48R	Shorting Contact Assembly	1
13	3030-0001	Screw: Machine set cup-pt st 8-32 x 3/16	4
14	5040-0223	Coupling 0.375 flexible	1
15	606A-16B	Cable Assembly: coaxial	1
16	3030-0033	Screw: Machine set cup-pt st cp 6-32 x 3/16	2
17	606A-83C	Cable Drum	1
18	0510-0080	Ring: Retaining st cp 1/2 inch	2
19	606A-48T	Strap Grounding	4
20	606A-37E	Shaft: Turrent amplifier	1
21	606A-37F	Shaft: Turrent oscillator	1
22	1410-0017	Bearing: Ball 0.3125 id x 0.6882 od	1
23	0510-0084	Ring: Retaining st 5/16 inch	1
24	606A-100A	Nut: Spring, loading	1
25	3030-0005	Screw: Machine set cup-st cp 8-32 x 1/8	3
26	1460-0052	Spring: Torsion 13/32 id x 1/2 od	1
27	606A-100B	Collar: Tension free	1
28	606A-100C	Collar: Tension fixed	1
29	606A-37C	Shaft: Idler	1
30	3030-0061	Screw: Machine set st cup-pt 10-32 x 3/16	4
31	606A-42A	Turrent Assembly: Oscillator	1
32	606A-42B	Turrent Assembly: Amplifier	1
33	3030-0022	Screw: Machine set cup pt st cp 6-32 x 1/8	2
34	1500-0005	Coupling, Mechanical, brs np 1/4 id x 1/2 x 3/16	1
35	1500-0004	Coupling, Mechanical, Nylon 1/2 od x 7/32	1

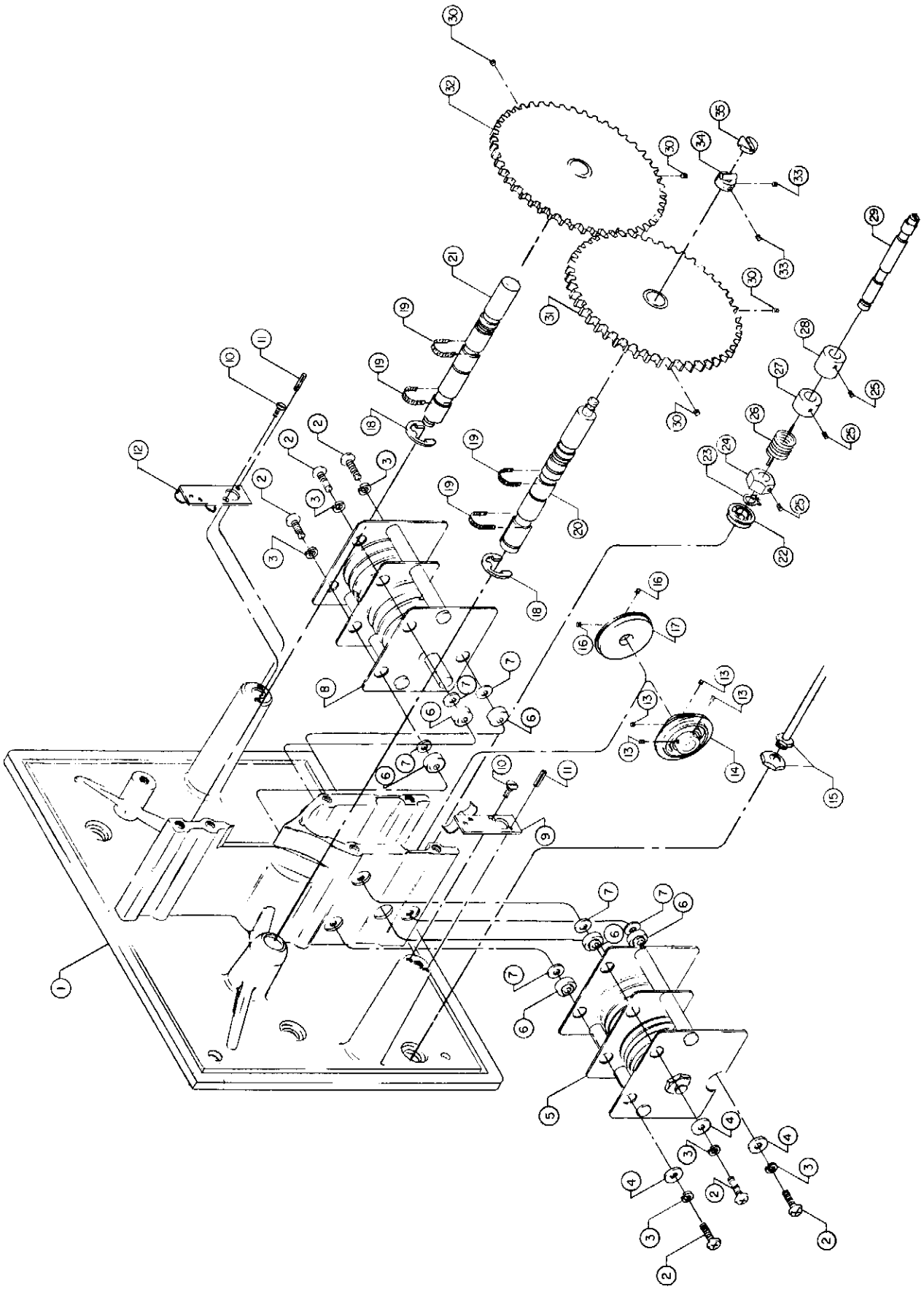


Figure 4 Model 606A High Frequency Signal Generator, Front Section RF Signal Generator Rotated 180°

REF.	STOCK NO.	DESCRIPTION	QTY.
1	606A-6D	Shield: Turrent	1
2	2420-0001	Nut: Hex stl np 6-32 x 5/16 w/lockwasher	3
3	3050-0066	Washer: Flat brs np 0.147 id x 3/8 od x 0.031 thk	3
4	1400-0053	Clamp: Loop cable	1
5	2390-0009	Screw: Machine bh sst 6-32 x 3/8 w/lockwasher	8
6	2190-0010	Washer: Lock ext ph brz np for S8 screw	4
7	606A-95A	Contact Subassembly	2
8	2550-0007	Screw: Machine bh sst 8-32 x 3/8 w/lockwasher	6
9	1500-0005	Coupling: Mechanical brs np 1/4 id x 1/2 x 3/16	1
10	2950-0001	Nut: Hex br np 3/8-32 x 1/2	2
11	2190-0022	Washer: Lock int ph brz np 0.690D x 0.678 id	3
12	606A-12C	Switch Bracket: Amplifier	1
13	3100-0197	Switch: Rotary 2 section, 6 position	1
14	606A-4D	Chassis: RF	1
15	2100-0016	R: Var comp 200k ohm 10% cwlog	1
16	0590-0035	Nut: Brs np 3/8-32 x 7/16 x 7/32	1
17	0590-0036	Bushing: Lock brs np 1/4 x 1/2 x 1/2	1
18	2190-0016	Washer: Lock ph brz np 1/2 od x 3/8 id	1
19	2950-0006	Nut: Hex brs np 1/4-32 x 318 x 3132 thk	1
20	2190-0027	Washer: Lock int ph brz np for 1/4 screw x 15/32	1
21	2100-0141	R: Var comp 50k ohm 20% lin 1/4 w	1
22	2190-0009	Washer: Lock int ph brz np for S8 screw x 0.332	4
23	2520-0001	Screw: Machine rh sstl 8/32 x 1/4	4
24	606A-6B	Shield: RF upper	1
25	606A-6C	Shield: RF lower	1

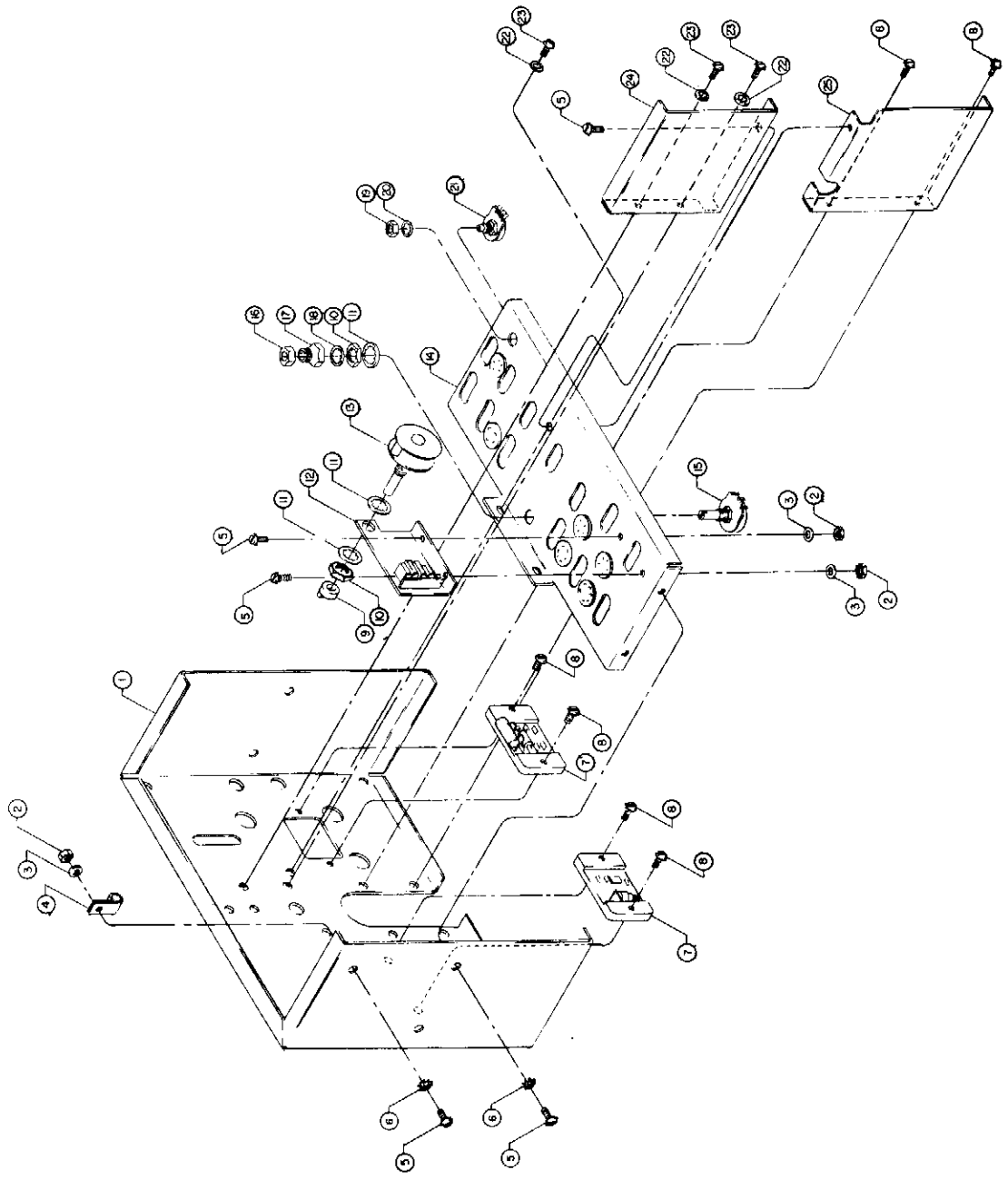


Figure 5 Model High Frequency Signal Generator, Rear Section RF Generator Assembly

REF.	STOCK NO.	DESCRIPTION	QTY.
1	606A-4C	Crystal Calibrator Assembly	1
2	2390-0007	Screw: Machine bh sst 6-32 x 5/16	20
3	606A-43C	See Figures No. 6 & 7	
4	0410-0014	Crystal-Quartz 100 kc	1
5	0180-0047	C: Fxd elect 500 uf 75 vdcw	1
6	0410-0013	Crystal Unit: Quartz 100 kc	1
7	2200-0009	Screw: Machine ne rh sst 4-40 x 1/2	2
8	3050-0082	Washer: Flat phenolic 0.11 id x 0.188 od x 0.037	2
9	1200-0028	Socket: Crystal 2-Contact	2
10	5000-0011	Clip: Electrical retaining	2
11	2420-0001	Nut: Hex st np 6-32 x 5/16 w/lockwasher	2
12	2190-0005	Washer: Lock ext ph brz np for S4 screw x 0.282	2
13	2260-0001	Nut: Hex sstl 4-40 x 1/4 x 3/32	2
14	2550-0007	Screw: Machine bh sst 8/32 x 3/8 w/lockwasher	2
15	3050-0066	Washer: Flat brs np 0.147 id x 3/8 od x 0.031	6
16	606A-12D	Bracket: Capacitor shield	1
17	606A-75B	Terminal Board: Audio oscillator	1
18	606A-75E	Terminal Board: Rectifier right	1
19	3050-0036	Washer: Flat fiber 3/8 id x 3/4 od x 1/16 thk	2
20	2950-0030	Nut: Hex brs np 3/8-32 x 9/16 x 3/32 thk	3
21	2190-0022	Washer: Lock int ph brz np 0.692 od x 0.678 id	3
22	2950-0006	Nut: Hex brs np 1/4-32 x 318 x 3132 thk	2
23	2190-0027	Washer: Lock int ph brz np for 1/4 scr x 15/32	2
24	0590-0036	Bushing: Lock brs np 1/4 x	2
25	0590-0035	Nut: Brs np 3/8-32 x 7/16 x 7/32	2
26	606A-4A	Chassis: Modulator	1
27	1450-0013	Socket: Candelabra	1
28	2190-0006	Washer: Lock sstl sr for S6 scr x 5/64 x 1/32	1
29	2470-0003	Screw: Machine bh brs np 6-32 x 3/4	2
30	606A-75A	Terminal Board: Crystal calibrator	1
31	2190-0006	Washer: Lock sstl sr for S6 src x 5/64 x 1/32	1
32	0360-0005	Terminal: Lug brs	1
33	2190-0008	Washer: Lock ext ph brz np for S6 scr x 0.312	1
34	9120-0036	Transformer: Audio	1
35	606A-75C	Terminal Board: Audio oscillator	1
36	9100-0101	Transformer: Power	1
37	606A-4B	Chassis: Power supply	1
38	2580-0003	Nut: Hex stl np 8/32 x 11/32 x 1/8	4
39	606A-75D	Rectifier Board: Left	1
40	2420-0001	Nut: Hex st np 6/32 x 5/16 w/lockwasher	4

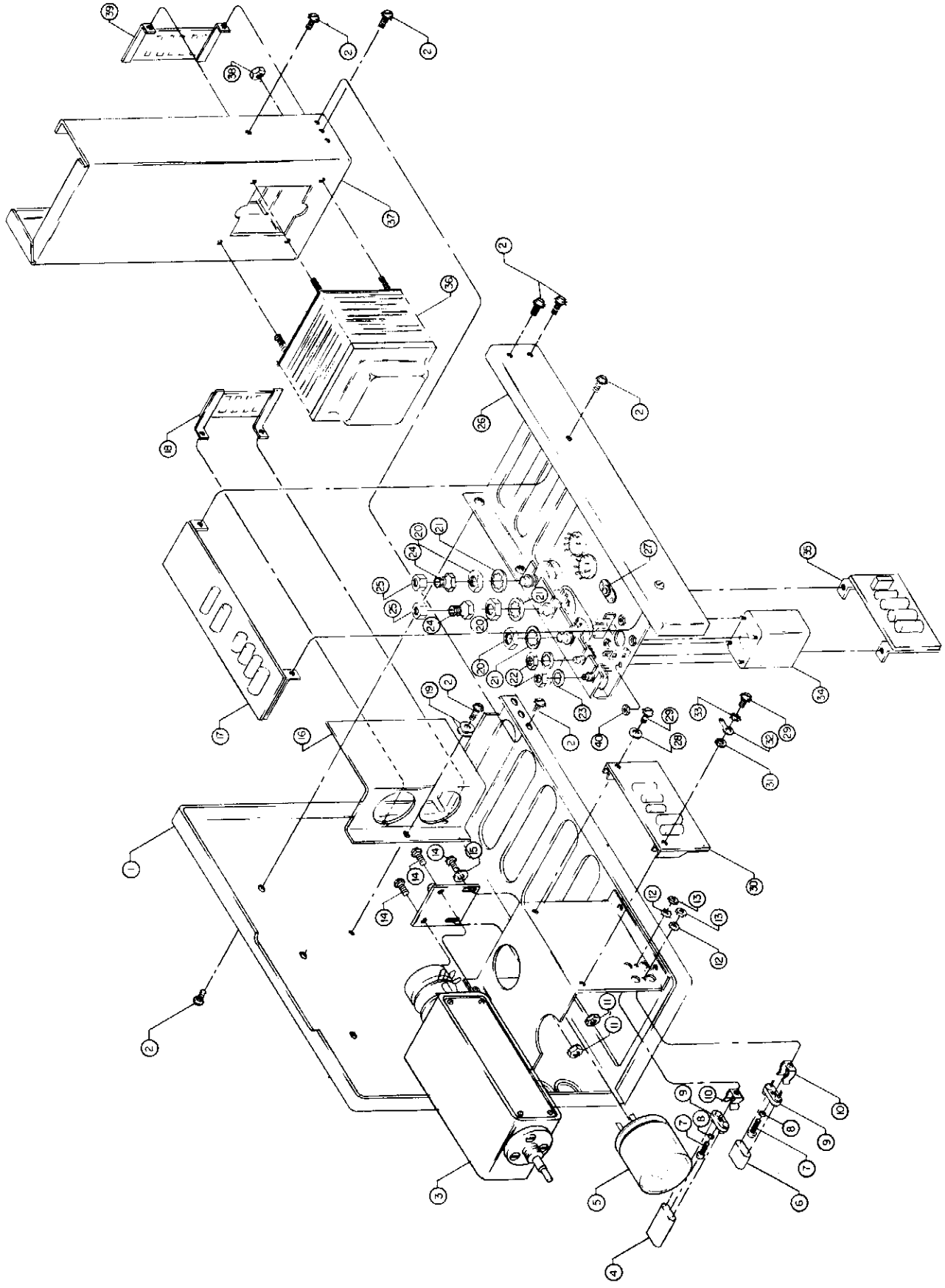


Figure 6. Model 606A High Frequency Signal Generator, Right Deck Arrangement

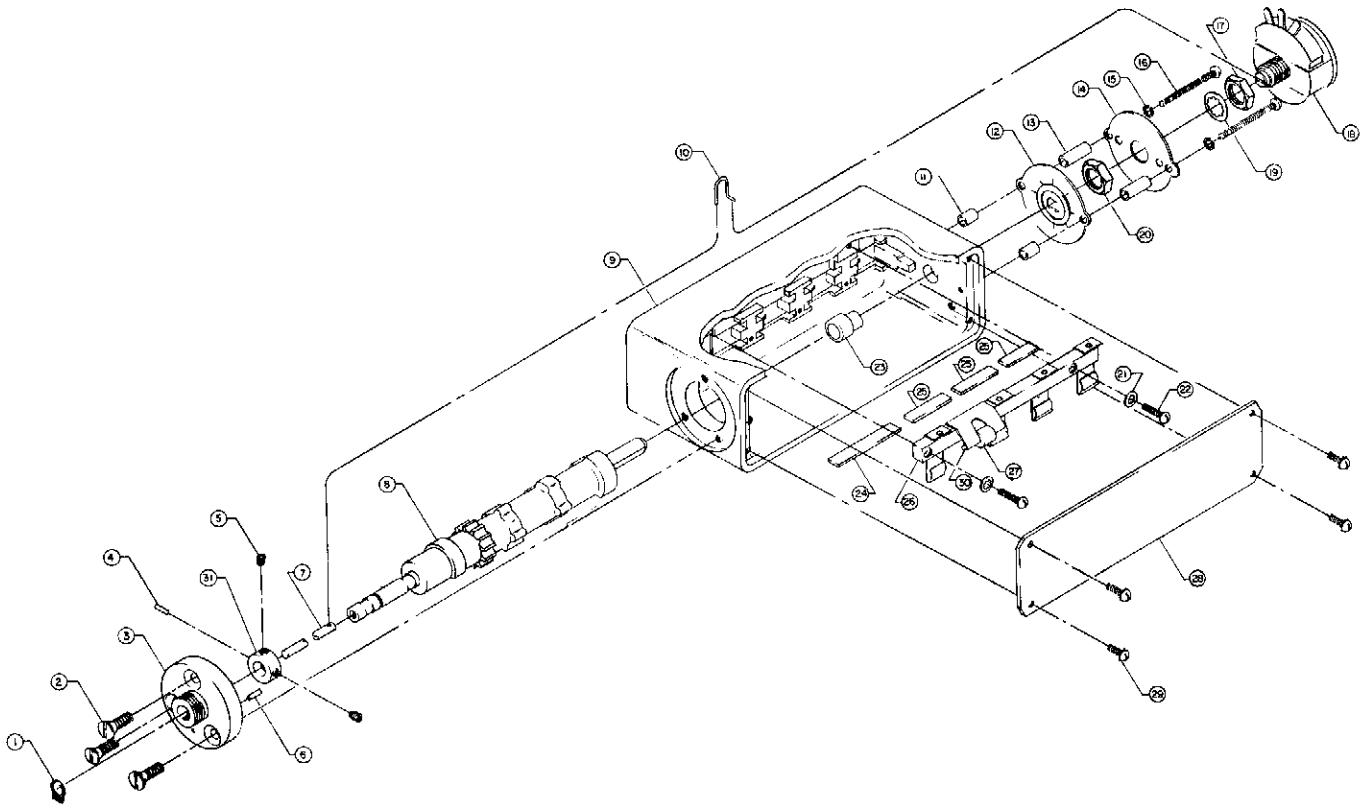


Figure 7. HP Model 606A High Frequency Signal Generator, VHF Attenuator Details

REF.	STOCK NO.	DESCRIPTION	QTY.
1	0510-0005	Ring: Retainter stl cp 1/4 inch	1
2	2530-0003	Screw: Machine fh 8-32 x 1/2	3
3	606A-34B-9	Collar: Mounting	1
4	1480-0059	Pin: Roll stl 1/16 od x 1/4	1
5	3030-0005	Screw: Machine set cuppt stl cp 8-32 x 1/8	2
6	1480-0074	Pin: Roll be cu 1/16 od x 7/16	1
7	606A-34B-6	Shaft: Straight	1
8	606A-95E	Cam Shaft	1
9	606A-34C-1	Housing: Main	1
10	3130-0038	Coupling: Mechanical Switch	1
11	0380-0020	Spacer: Sleeve brs np for S5 Screw 1/4	2
12	3100-0105	Switch: Wafer	1
13	0380-0033	Spacer: Sleeve brs np for S4 Screw 1/2	2
14	3100-0041	Switch Wafer	1
15	2190-0003	Washer: Lock split-ring sst 1/16 no. 4	2

REF.	STOCK NO.	DESCRIPTION	QTY.
16	2200-0011	Screw: Machine rh sst 4-40 x 7/8	2
17	2950-0001	Nut: Hex brs np 3/8/32 x 1/2	1
18	2100-0225	R: Var ww 5000 ohm 10% lin 2w	1
19	2190-0016	Washer: Lock ph brx np 1/2 x 3/8 id	1
20	2950-0001	Nut: Hex brs np 3/8-32 x 1/2	1
21	2190-0004	Washer: Lock ph brz np 0.270 od for 4 Screw	2
22	2200-0009	Screw: Machine rh sst 4-40 x 1/2	2
23	606A-34C-7	Bushing: Sleeve	1
24	355C-107C	Actuator Bar	1
25	355C-107B	Actuator Bar	3
26	355C-32	Spring Assembly Attenuator	1
27	355A-102	Roller: Detent	1
28	606A-34C-8	Cover Plate: Attenuator	1
29	2200-0004	Screw: Machine rh sst 4-40 x 1/4	4
30	355A-101	Detent Pin	1
31	606A-34C-6	Collar; Shaft	1

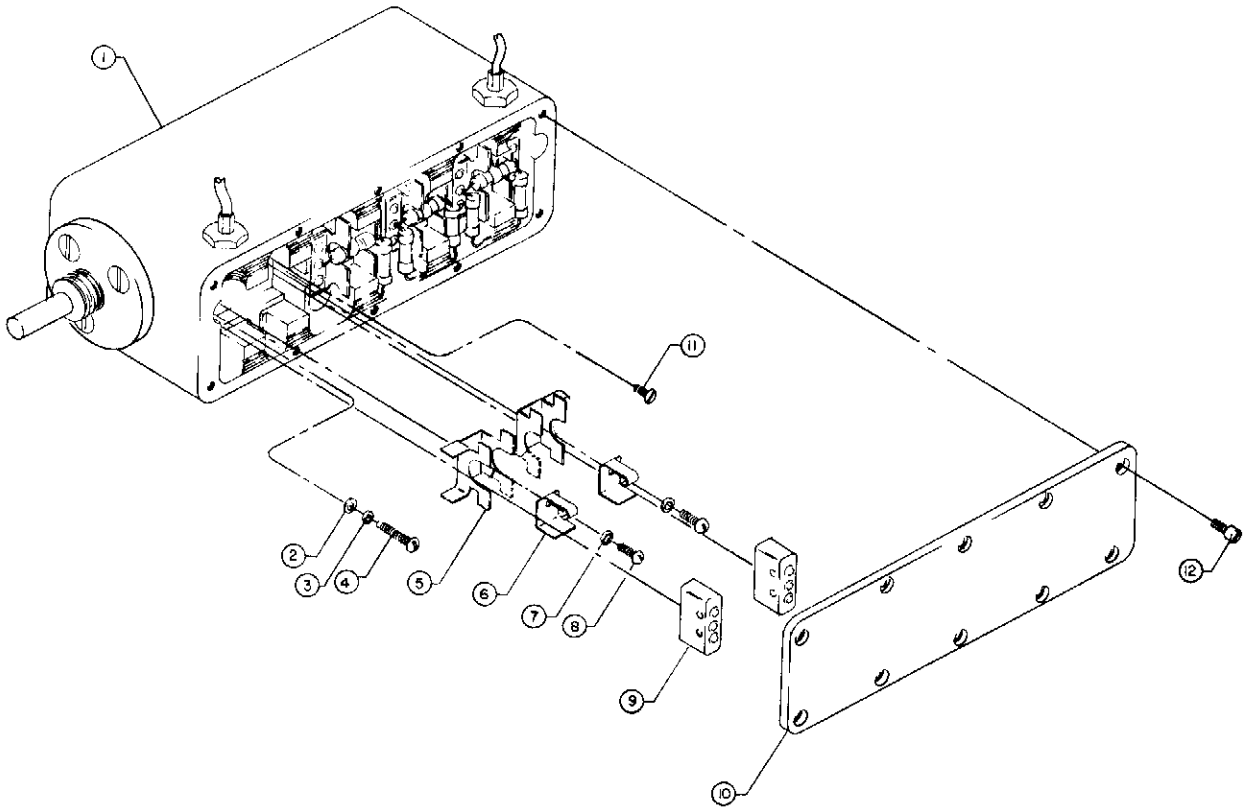


Figure 8. Model 606A High Frequency Signal Generator, VHF Attenuator Details Rotated 180°

REF.	STOCK NO.	DESCRIPTION	QTY.
1	606A-34C-1	Housing: Attenuator	1
2	3050-0098	Washer: Flat sstl 1/40D x 1/32 thk for S2	2
3	2190-0014	Washer: Lock int ph brz np 0.18 od x 0.091 id	2
4	0520-0020	Screw: Machine rh sst 2/56 x 3/4	2
5	355C-6B	Shield: Attenuator Section	5
6	355C-6A	Shield: Resistor	5

REF.	STOCK NO.	DESCRIPTION	QTY.
7	2190-0014	Washer: Lock int ph brz np 0.187 od x 0.091 id	7
8	0520-0024	Screw: Machine bh sst 2/56 x 3/16	8
9	3102-0006	Switch: Sensitive spdt pin plunger	8
10	606A-34C-9	Cover Plate: Attenuator	1
11	0520-0036	Screw: Machine fh sst 2/56 x 1/2	2
12	2220-0002	Screw: Machine fil h sstl 4-40 x 1/4	10

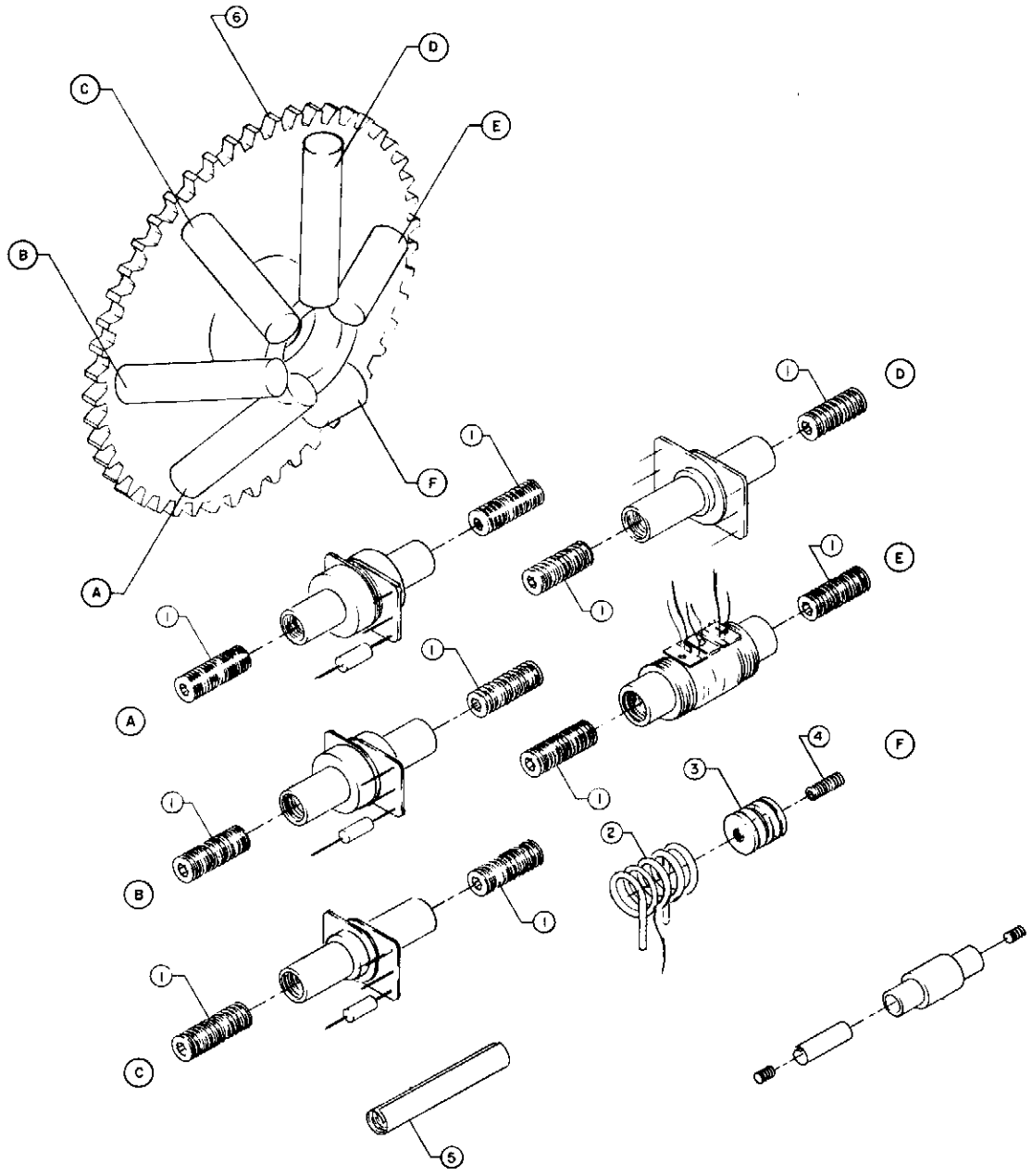


Figure 9. Model 606A High Frequency Signal Generator, Amplifier Turret

REF.	STOCK NO.	DESCRIPTION	QTY.
A	606A-60B	Transformer: Amplifier turret 50-170 kc	
B	606A-60D	Transformer: Amplifier turret 165-560 kc	
C	606A-60F	Transformer: Amplifier turret 530-1800 kc	
D	606A-60H	Transformer: Amplifier turret 1.76-6.0 mc	
E	606A-60K	Transformer: Amplifier turret 5.8-19.2 mc	
F	606A-60N	Coil: Primary, amplifier turret 19-65 mc	

REF.	STOCK NO.	DESCRIPTION	QTY.
	606A-60L	Coil: Secondary, Amplifier turret 19-65 mc	
1	9170-0040	Core: Ferrite, adjustable tuning 5/16-28 x 718	10
2	606A-60L	Coil: Primary, band 6	1
3	606A-56C	Coil Form	1
4	9170-0024	Core: Iron, threaded, 3/8 od w/10-32 hole	1
5	9150-0033	Coil Form: .338 od x 1-7/8	5
6	606A-83A	Turret Mold	1

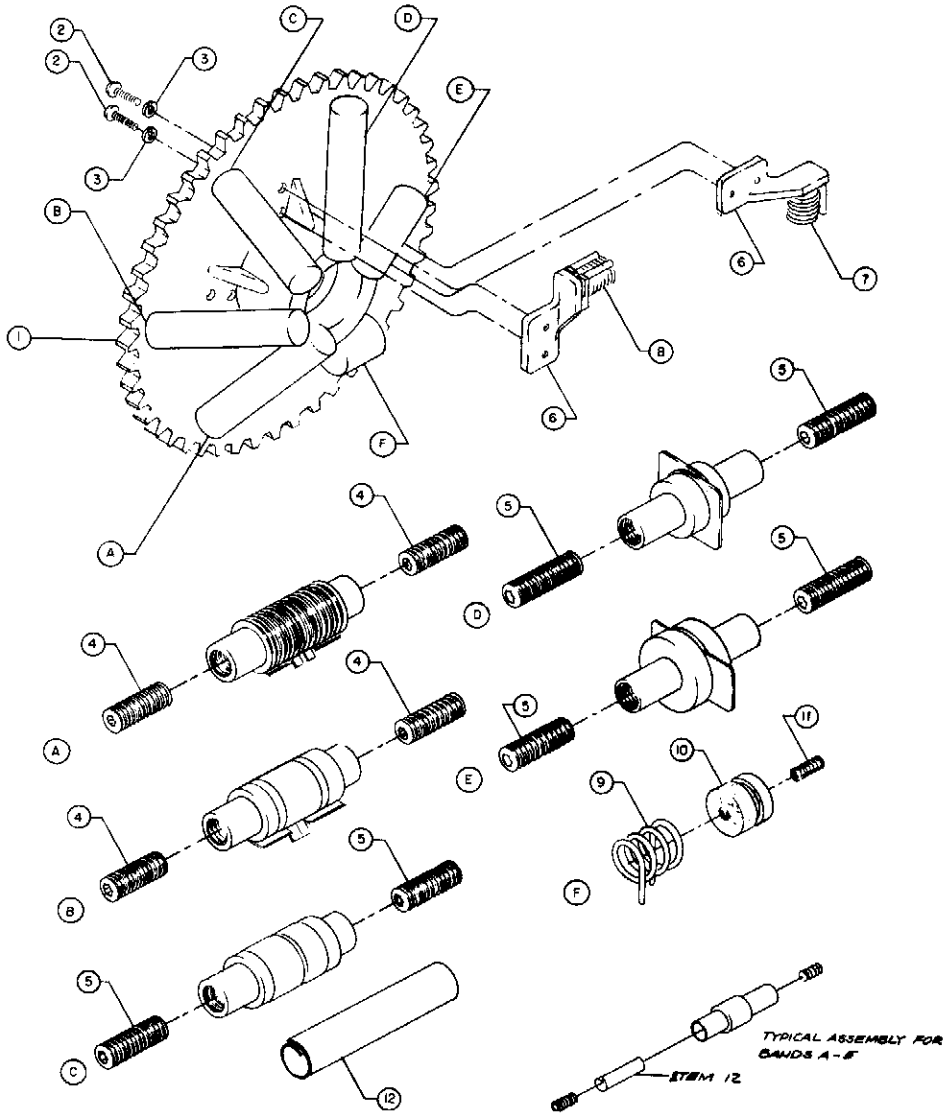


Figure 10. Model 606A High Frequency Signal Generator, Oscillator Turret

REF.	STOCK NO.	DESCRIPTION	QTY.
A	606A-60J	Transformer: Oscillator turret 5.8-19.2 mc	
B	606A-60G	Transformer: Oscillator turret 1.76-6.0 mc	
C	606A-60E	Transformer: Oscillator turret 560-1800 kc	
D	606A-60C	Transformer: Oscillator turret 165-560 kc	
E	606A-60A	Transformer: Oscillator turret 50-170 kc	
F	606A-60L	Coil: Primary, Oscillator turret 19-65 mc	
	606A-60M	Coil: Secondary, Oscillator turret 19-65 mc	
1	606A-83A	Turret, Molded	1

REF.	STOCK NO.	DESCRIPTION	QTY.
2	0624-0002	Screw: Machine thread-cutting rh sst S4 x 1/2	12
3	2190-0030	Washer: Lock ph brz np split ring S4 x 3/16 od	12
4	9170-0041	Core: Adjustable tuning polyiron 5/16-28	4
5	9170-0040	Core: Adjustable tuning 5/16-28 x 7/8	6
6	606A-83F	Bracket: Capacitor mounting	
7	0121-0032	C: Var Air 2.2-8.45 pf	4
8	0121-0031	C: Var Air 1.85-10.38 pf	2
9	8100-0001	Wire, Electrical .062 dia .003 thk	1
10	606A-56C	Coil Form	1
11	9170-0024	Core: Adjustable tuning 3/8 od w/10-32 hole	1
12	9150-0033	Coil Form: .338" od x 1-7/8" long	5

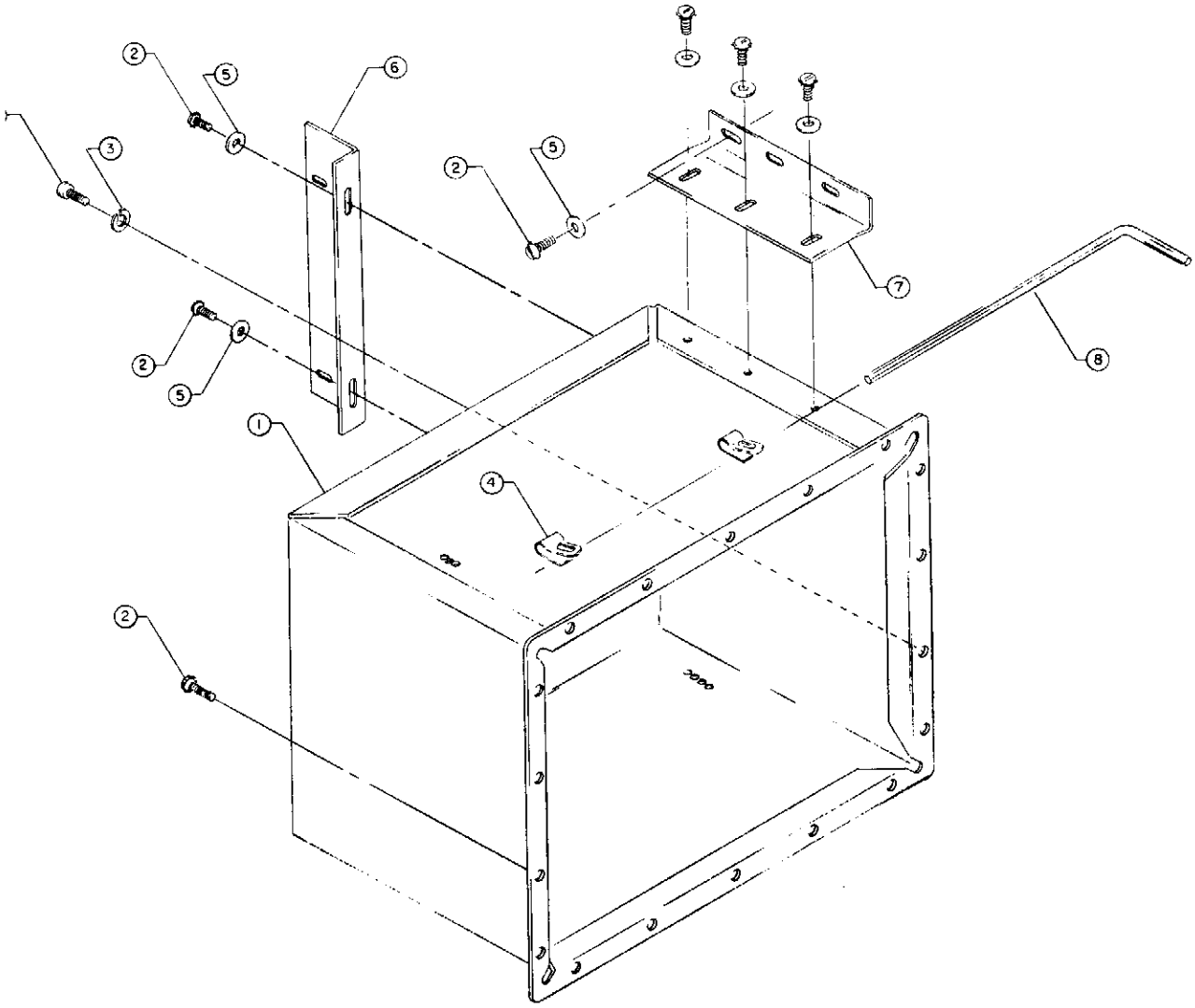


Figure 11. Model 606A High Frequency Signal Generator, Shield Box Assembly

REF.	STOCK NO.	DESCRIPTION	QTY.
1	606A-55A	Shield Box	1
2	2390-0009	Screw: Machine bh sst 6-32 x 3/8 w/ext lockwasher	25
3	2190-0018	Washer: Lock ph brz #6 x 5/64 od x 1/32 thk	4
4	1400-0043	Clip: Fahnstock brs np 3/4 x 5/16	2

REF.	STOCK NO.	DESCRIPTION	QTY.
5	3050-0066	Washer: Flat brs np #6 x 3/8 od x 0.003 in	11
6	606A-55A-5	Brace: Shield box upper	1
7	606A-55A-4	Brace: Shield box left	1
8	1470-0010	Wrench: Hex socket 0.1087 across flats	1

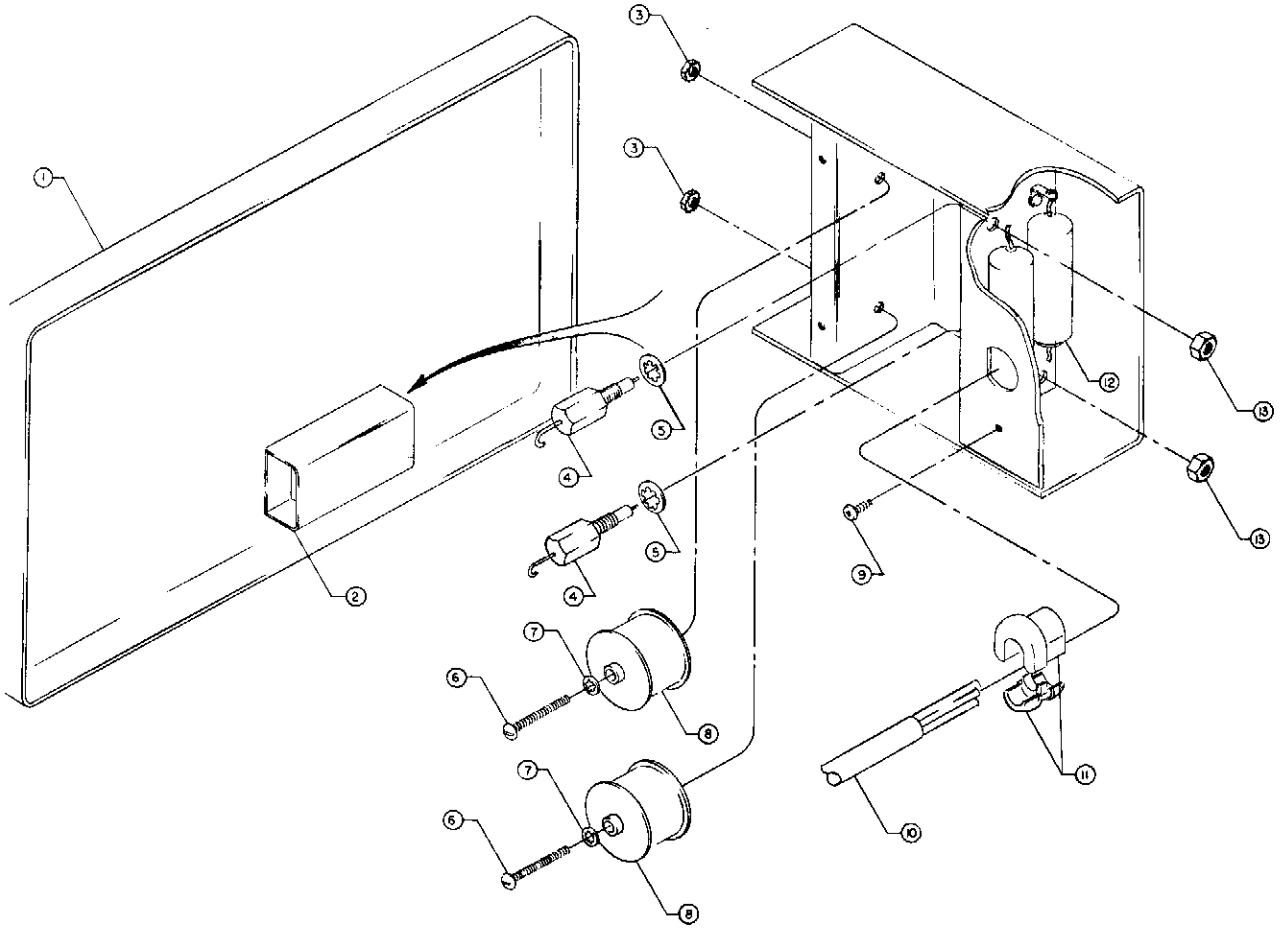


Figure 12. Model 606A High Frequency Signal Generator, Rear Cover Filter Assembly

REF.	STOCK NO.	DESCRIPTION	QTY.
1	5000-0201	Rear Cover	1
2	606A-27A	Line Filter Cover	1
3	2420-0001	Nut: Hex stl np 6-32 x 7/64 w/lockwasher	2
4	0150-0019	C: Fxd cer 1000 pf 20% feed-thru type	2
5	2190-0027	Washer: Lock ph brz np for 1/4 in. screw	2
6	2360-0015	Screw: Machine rh sst 6-32 x 1-1/8	2
7	2190-0007	Washer: Int lock ph brz np for #6 screw	2

REF.	STOCK NO.	DESCRIPTION	QTY.
8	9140-0051	Coil: Fxd 400 uh 5%	2
9	0626-0001	Screw: Thread-cutting sst bh #6 x 1/4 phl dr	2
10	8120-0015	Cable: Electrical 3 x #18 awg x 7.5 ft.	4
11	0400-0004	Grommet: Strain-relief nylon 5/8 in.	1
12	0160-0001	C: Fxd 0.1 uf 10% 600 V D	2
13	2950-0041	Nut: Brs cp 1/2-28 x 5/16 x 1/8	2

APPENDIX

MANUAL CHANGES

MODEL 606A

SIGNAL GENERATOR

Make all backdating corrections in this manual according to changes below:

Serial Prefix or Number	Make Manual Changes
139-	A through L
139- above 00630	B through L
943-	C through L
009-	D through L
038-	E through L
244-	F through L
248-	G through L
301-	H through L

Serial Prefix or Number	Make Manual Changes
417-	I through L
434-	J through L
644-	K through L
842-	L
842- above 12331	M
960-	N
960- above 12981	O

CHANGE A: Amplifier feedback network and coil assemblies changed. Use new circuit and parts as shown in this manual. Old circuit not recommended.

CHANGE B: Figure 4-9 and Parts List:
Change capacitor C21 from 3300 pF, HP Part No. 0140-0029 to 1000 pF, HP Part No. 0140-0079.

CHANGE C: Coil forms in turrets changed. New forms interchangeable with old. Order by new part numbers.

CHANGE D: Delete C34, R72, C35 and R73. This side of the tuning capacitors connected directly to ground.

CHANGE E: Figure 4-9, Signal Generator (Sheet 2 of 2):
S3: Add a section of this switch so that the connection between R38 and R20 is open in the position.

C57, R74: Delete. Replace C57 with an open, R74 with a short.
Table 5-1, Replaceable Parts: delete C57, R74.

CHANGE F: Table 5-1, Replaceable Parts:
R121: Change wattage to 1/2W, HP Part No. 0687-6831.

CHANGE G: Figure 4-9, Signal Generator (Sheet 2 of 2):
C16 is shown connected to ground. Connect instead to junction of C14/15 and R73/C35.

C12 is shown connected to ground. Change to show that C12 is connected to junction of C14/15.

CHANGE H: R31: Change to R:FXD WW 100 ohm 10%; HP Part No. 0813-0020.

CHANGE I: S8: Delete. The transformer is wired for either 115- or 230-volts. To change connections:

a. Remove rear cover of instrument.

b. Remove right-hand rectifier board (see Figure 4-1).

c. Change jumper arrangement on transformer terminal board:

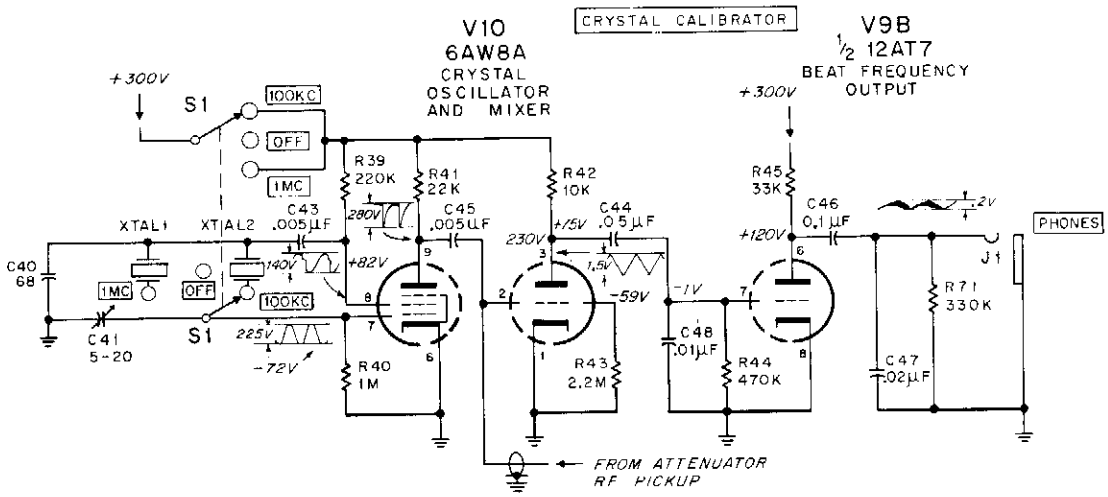
1. For 230-volt operation, connect the black-yellow wire to the black-green. Use one amp slow-blow fuse.

2. For 115-volt operation, connect the black to the black-green, and the black-yellow to the black-red. Use two amp slow-blow fuse.

On schematic, delete switch S8 and connect wires directly.

CHANGE J: C4, C5: Change HP Part No. to 0121-0027.
C14, C15: Change HP Part No. to 0121-0026.

CHANGE K: Figure 4-9:
Substitute the partial schematic below for the crystal calibrator part of Figure 4-9.



Replacement Schematic for the Crystal Calibrator
(Part of Figure 4-9)

Table 5-1:
Delete R136 and CR113.
Delete entire A4 Crystal Calibrator assembly.
Add the parts in the table below.

Reference Designation	HP Part No.	Qty	Description	Mfr Code	Manufacturer Part No.
C40	0140-0082	1	C:FXD MICA 68 pF 5% 500 VDCW	28480	0140-0082
C41	0130-0006	1	C:VAR CER 5 to 20 pF 500 VDCW	28480	0130-0006
C43	0150-0014	2	C:FXD CER 0.005 μF 500 VDCW	96095	2D1-4
C44	0151-0052	1	C:FXD CER 0.05 μF 20% 400 VDCW	56289	33C17A
C45	0150-0014		C:FXD CER 0.005 μF 500 VDCW	96095	D1-4
C46	0170-0022	1	C:FXD MY 0.1 μF 20% 600 VDCW	09134	Type 24
C47	0150-0024	1	C:FXD CER 0.02 μF +80 −20% 600 VDCW	71590	Type DD 203
C48	0151-0012	1	C:FXD CER 0.01 μF 20% 1000 VDCW	56289	29C214A3
J1	1251-0071	1	JACK:TELEPHONE	82389	3J-1259
R39	0687-2241	1	R:FXD COMP 220K OHM 10% 1/2W	01121	EB 2241
R40	0687-1051	1	R:FXD COMP 1 MEGOHM 10% 1/2W	01121	EB 1051
R41	0187-2231	1	R:FXD COMP 22K OHM 10% 1/2W	01121	EB 2231
R42	0687-1031	1	R:FXD COMP 10K OHM 10% 1/2W	01121	EB 1031
R43	0687-2251	1	R:FXD COMP 2.2 MEGOHM 10% 1/2W	01121	EB 2251
R44	0687-4731	1	R:FXD COMP 470K OHM 10% 1/2W	01121	EB 4731
R45	0693-3331	1	R:FXD COMP 33K OHM 10% 2W	01121	HB 3331
R71	0687-3341	1	R:FXD COMP 330K OHM 10% 1/2W	01121	EB 3341
S1	3101-0012	1	SWITCH:TOGGLE DPDT	27191	8962K319
V10	1933-0002	1	ELECTRON TUBE: 6AW8	93332	S/B 6AW8
XTAL1	0410-0013	1	CRYSTAL UNIT: Quartz 1000 KC	28480	0410-0013
XTAL2	0410-0014	1	CRYSTAL UNIT: Quartz 100 KC	28480	0410-0014

CHANGE L: Figure 4-8 and Parts List:
Change R209 to 1500 ohm, 10%, HP Part No. 0687-1521.
Change R203 and R206 from "factory selected part".
Add "factory selected . . . " to R210 and R211 description.

CHANGE M: Delete asterisk from R206 and R209.

CHANGE N: Parts List:
Add C112, C113; C:FXD MY 0.1 μF 10% 600 VDCW HP Part No. 0160-0001.
Add C114, C115; C:FXD CER 1000 pF 20% 500 VDCW HP Part No. 0150-0019.
Delete FL1.
Change J101 to HP Part No. 1251-0095.
Add L102 and L103; COIL:FXD 400 μH HP Part No. 9140-0051.
Add P102; POWER CABLE, HP Part No. 8120-0015.
Change P101 to HP Part No. 8120-0045, Power Cable Assembly.
Change S8 to HP Part No. 3101-0033.
Under Miscellaneous:
Add: Assy, Line Filter HP Part No. 606A-27A
Change Figure 4-10 Power Supply as shown below.

CHANGE O: Parts List, under Miscellaneous:
Change JEWEL:PILOT LIGHT to Red, HP Part No. 1450-0020
Change A4CR1 to HP Part No. 1901-0025.

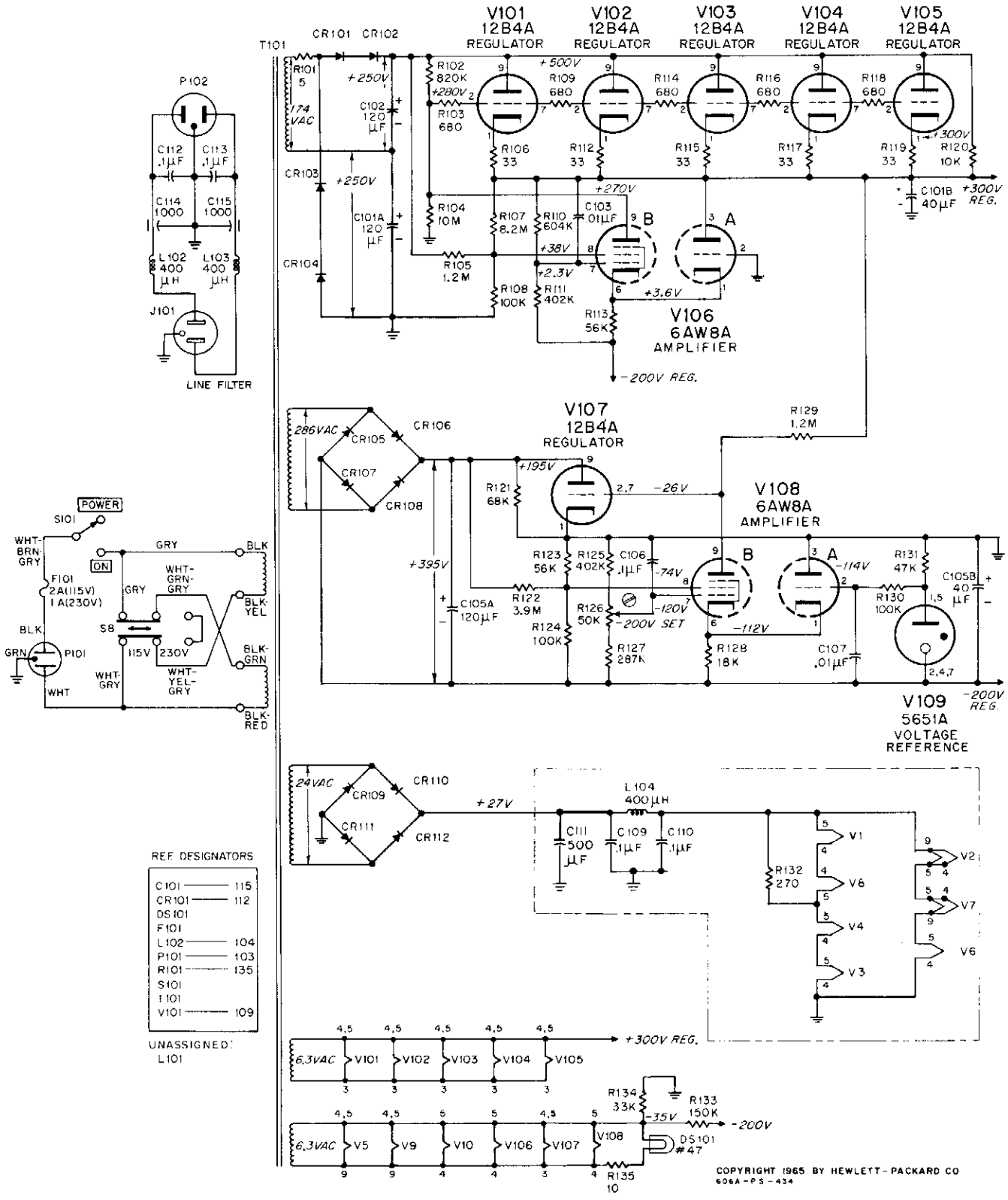


Figure 4-10. Power Supply

MANUAL CHANGES

MANUAL IDENTIFICATION

Model Number:	606A
Date Printed:	May 1971
Part Number:	00606-90013

This supplement contains important information for correcting manual errors and for adapting the manual to instruments containing improvements made after the printing of the manual.

To use this supplement:

Make all ERRATA corrections

Make all appropriate serial number related changes indicated in the tables below.

Serial Prefix or Number	Make Manual Changes
1205A	1
1241A	1, 2
➧ 1352A, 1433A	1 - 3

Serial Prefix or Number	Make Manual Changes

➧ NEW ITEM

ERRATA

Page 4-19/4-20 (schematic):
Change C4 to read C4A.
Change C5 to read C4B.
Change C14 to read C14A.
Change C15 to read C14B.

➧ Page 4-21, Figure 4-10 (schematic):
Change FL101 to FL1 (2 places).

Page 5-3, Table 5-1:
Change C4 to 0121-0145.
Delete C5.

Page 5-4, Table 5-1:
Change C14 to 0121-0144.
Delete C15.

➧ Page 5-5, Table 5-1:
Change FL1 to 9100-3142.

NOTE

Manual change supplements are revised as often as necessary to keep manuals as current and accurate as possible. Hewlett-Packard recommends that you periodically request the latest edition of this supplement. Free copies are available from all HP offices. When requesting copies quote the manual identification information from your supplement, or the model number and print date from the title page of the manual.

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3 Pages

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ERRATA (Cont'd)

Page 5-8, Table 5-1:
Add 0606-626 TUNING DIAL, FREQUENCY.

Illustrated Parts Identification
Page 6, Item 31:
Change 606A-40A to 0606-625.

Page 8, Item 5 and 8:
Change 0121-0026 to 0121-0145.
Change 0121-0027 to 0121-0144.

Page 12:
Change item 17 to 00606-60036.
Change item 18 to 00606-60039.
Change item 35 to 00606-60037.
Change item 39 to 00606-60038.

Page 16:
Delete item F, 606A-60N and 606A-60L.
Change item 3 to 606A-60N, Coil: Primary, amplifier turret 19-65 mc.
Change item 5 to 9150-0727.

Page 17:
Delete item F, 606A-60L and 606A-60M.
Change item 4 to 9170-0843.
Change item 9 to 606A-60L, Coil: Primary, Oscillator turret 19-65 mc.
Change item 10 to 606A-60M, Coil: Secondary Oscillator turret 19-65 mc.

CHANGE 1

Illustrated Parts Identification
Page 2, Item 12:
Change HP 606A-44A-2 to HP 606A-44B-2 Cabinet Body Assy (Blue-Gray).
Add HP 00606-60034 Cabinet Body Assy (Olive-Gray).
Add HP 00606-00025 Dust Cover Assy, Rack (Blue-Gray).
Add HP 00606-00032 Dust Cover Assy, Rack (Olive Gray).

Item 13:
Change HP 5000-0201 Cover, Rear to HP 00606-00019 Cover, Rear (Cabinet Only) (Blue-Gray).
Add HP 00606-00029 Cover, Rear (Cabinet Only) (Olive-Gray).

Page 4, Item 20:
To HP 606A-2A Panel, Front, add (Light-Gray).
Add HP 00606-00027 Panel, Front (Mint-Gray).

CHANGE 2

Page 1-0, Table 1-1:

Change the following paragraphs as shown:

FREQUENCY CALIBRATOR: (useful to 19 MHz)

AMPLITUDE MODULATION: Continuously adjustable from 0 to 100% as indicated by panel meter on 1 Volt range and below. At least 0-30% on 3 Volt range. Modulation level is constant within ±1/2 dB regardless of carrier frequency and output level changes on 1 Volt range and below.

INTERNAL MODULATION: 400 Hz ± 5% or 1000 Hz ± 5%.

EXTERNAL MODULATION: May also be modulated by square waves and other complex signals on 1 Volt range and below.

INCIDENTAL FM: 30 parts in 10^{-6}.

CHANGE 3

Page 1-0, Table 1-1:

Change SPURIOUS HARMONIC OUTPUT specification to read as follows:

Harmonics (RF Output meter set between −10 and +3): >25 dB below fundamental of 50 kHz to 65 MHz.

Page 4-19, Figure 4-9 (schematic):

Delete C12.

Page 5-4, Table 5-1:

Delete C12.