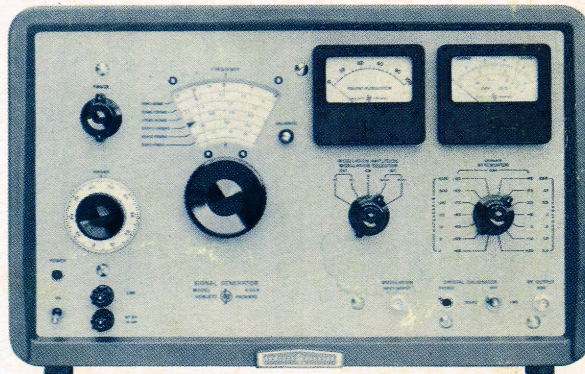


SIGNAL GENERATOR

606A



HEWLETT  PACKARD



MANUAL CHANGES

MODEL 606A

HF SIGNAL GENERATOR

Manual Serial Prefixed: 644-

Manual Printed: August 1966

MAKE ALL CORRECTIONS IN THIS MANUAL ACCORDING TO ERRATA BELOW, THEN CHECK THE FOLLOWING TABLE FOR YOUR INSTRUMENT SERIAL PREFIX (3 DIGITS) OR SERIAL NUMBER (8 DIGITS) AND MAKE ANY LISTED CHANGE(S) IN THE MANUAL.

► NEW ITEM.

SERIAL PREFIX OR NUMBER	MAKE MANUAL CHANGES	SERIAL PREFIX OR NUMBER	MAKE MANUAL CHANGES

ERRATA: Table 1-1:

Change FREQUENCY DRIFT specification to read, "(Attenuator on 1 volt range Less than 50 parts in 10^6 (or 5 cycles, whichever is greater) per 10 minute after 2 hour warm-up. Less than 10 minutes to restabilize after changing frequency."

Change the Output Impedance Specification to read: "50 ohms; SWR less than on 0.3 volt attenuator range and below." Delete the remainder of the specification.

Paragraph 4-62:

Change steps d, e, and f to read:

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

(e) 1 on the 0.1 scale at 20 MHz.

(f) Remove the 50-ohm load. Output voltage should rise to 2 ± 0.2 .

Paragraph 4-64:

Change step a to read, "Allow Model 606A to warm up for at least two hours."

Parts List:

Change the stock no. of tubes V3 and V4 from 1923-0030 to 1923-0072.

Figure 4-8 and Parts List:

Change resistor R206 from 1500 ohms,
stock no. 0687-1521 to 1100 ohms, stock no. 0686-1125.

► Figure 4-10 and Parts List:

Change V109 tube type from 5651 to 5651A.

► Parts List:

Change stock number of V5 from 1932-0027 to 1932-0045.

Section	Page	Section	Page
I GENERAL INFORMATION	1-1	IV MAINTENANCE (Cont'd)	
1-1. General Description	1-1	4-11. Front Panel Operation Check . . .	4-3
1-4. Differences between Instruments .	1-1	4-13. Preliminary Check	4-3
1-6. Unpacking and Inspection	1-1	4-15. Modulation Meter Calibration . .	4-3
1-11. Installation Instructions	1-2	4-16. Frequency Calibration	4-3
1-14. Power Cable	1-2	4-18. Output Level Frequency Response	4-3
1-16. Accessories Available	1-2	4-19. Troubleshooting	4-4
		4-27. Turn-On Procedure After Repair .	4-9
II OPERATING INSTRUCTIONS	2-1	4-29. Mechanical Adjustment of Meter Zero	4-9
2-1. Output Termination	2-1	4-31. General Test and Alignment . . .	4-9
2-5. Setting the Cursor	2-1	4-36. Power Supplies	4-10
2-7. Output Attenuator	2-1	4-42. Audio Oscillator	4-10
2-9. Use of the 3-Volt Range	2-1	4-43. Crystal Calibrator	4-10
2-11. External Modulation	2-1	4-44. Tune Oscillator and Amplifier . .	4-10
2-13. External Synchronization Signal .	2-1	4-45. Set Maximum Oscillator Current .	4-11
2-15. B+ Fuse	2-1	4-46. Carrier Zero Set	4-11
2-17. Modulation Data	2-1	4-47. Maximum Carrier Set and	
		Modulation Zero Set	4-12
III THEORY OF OPERATION	3-1	4-48. Set Percent Modulation Meter . .	4-12
3-1. Overall Operation	3-1	4-49. RF Output Meter Calibration . . .	4-12
3-3. Circuit Description	3-1	4-50. Attenuator Repair	4-12
		4-52. Adjust Feedback Relay	4-13
IV MAINTENANCE	4-1	4-54. Drive Cable Assembly Replacement	4-13
4-1. Introduction	4-1	4-56. Performance Check	4-14
4-3. Cabinet Removal	4-1	4-58. Frequency Calibration	4-14
4-4. RF Shield Removal	4-2	4-59. Output	4-14
4-5. Test Equipment Required	4-2	4-60. Modulation	4-14
4-7. Tube Replacement	4-2	4-61. Frequency Drift	4-14
		V REPLACEABLE PARTS	5-1
		5-1. Introduction	5-1
		5-5. Ordering Information	5-1

Appendix - Manual Changes . . . A-1

LIST OF ILLUSTRATIONS

Number	Title	Page	Number	Title	Page
1-1. Model 606A High Frequency Signal Gen.		1-1	4-3. Waveform for 50% Modulation		4-3
1-2. 115 or 230 volt Power Switch		1-2	4-4. Frequency Calibration		4-3
2-1. Modulating vs Carrier Frequency		2-1	4-5. Output Level Frequency Response . . .		4-4
2-2. General Operation		2-2	4-6. Installation of Drive Cable Assembly . .		4-13
2-3. External Output Termination		2-3	4-6A. Range Switch Detent Mechanism		4-15
2-4. Calibration		2-4	4-7. Oscillator and Amplifier Turrets		
2-5. External Modulation		2-5	viewed from Front Panel		4-16
3-1. Model 606A Block Diagram		3-0	4-8. Oscillator and Amplifier Turrets		
			Schematic		4-17
4-1. Location Diagram Model 606A		4-1	4-9. Signal Generator Schematic		4-18
4-2. Modulation Meter Calibration		4-3	4-10. Power Supply Schematic		4-21
			4-11. Model 606A Output Attenuator		4-22

LIST OF TABLES

Number	Title	Page
1-1. Specifications		1-0
4-1. Tube Replacement		4-2
4-2. Troubleshooting Chart		4-4
4-3. Troubleshooting the Feedback Loop . . .		4-7
4-4. Typical Voltage. Oscillator and Ampli-		
fier Current Output 1 volt into 50 ohms .		4-9
4-5. Regulated Power Supply Tolerances . . .		4-10
5-1. Reference Designation Index.		5-2
5-2. Replaceable Parts		5-8
5-3. Code List of Manufacturers		5-12
Illustrated Parts Identification List		

OPERATING AND SERVICE MANUAL

MODEL 606A HIGH FREQUENCY SIGNAL GENERATOR

SERIALS PREFIXED: 644-

(For other serials see Appendix)

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1501 PAGE MILL ROAD, PALO ALTO, CALIFORNIA, U.S.A.

Table 1-1. Specifications

FREQUENCY RANGE:

50 kc to 65 mc in 6 bands

50 - 170 kc	1.76 - 6.0 mc
165 - 560 kc	5.8 - 19.2 mc
530 - 1800 kc	19.0 - 65.0 mc

FREQUENCY ACCURACY: Within $\pm 1\%$

FREQUENCY CALIBRATOR:

Crystal oscillator provides checkpoints at 100-kc (useful to 6 mc) and 1-mc intervals accurate within 0.01% from 0° to 50°C

RF OUTPUT LEVEL:

Continuously adjustable from 0.1 μ v 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

OUTPUT IMPEDANCE:

50 ohms, swr less than 1.1 on 0.3 volt range; on 1-volt and 3-volt ranges, less than 1.1 to 20 mc and less than 1.2 to 65 mc. BNC output connector mates with UG-88A/B/C/D.

SPURIOUS HARMONIC OUTPUT: Less than 3%

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 $\pm 1/2$ db regardless of carrier frequency and output level changes.

INTERNAL MODULATION:

0 to 100% sinusoidal modulation at 400 cps $\pm 5\%$ or 1000 cps $\pm 5\%$

MODULATION BANDWIDTH:

DC to 20 kc 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.
$\frac{0.06}{f_c}$	$\frac{0.02}{f_c}$	$\frac{0.003}{f_c}$ (3 kc max.)

EXTERNAL MODULATION:

0 to 100% sinusoidal modulation dc to 20 kc, 4.5 volts peak produces 100% modulation at modulating frequencies from dc to 20 kc. Input impedance is approximately 600 ohms. May also be

ENVELOPE DISTORTION:

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

MODULATION METER ACCURACY:

Within $\pm 5\%$ of full scale (from 0 to 90% modulation) for modulation frequencies to 10 kc; within 10% of full scale from 10 to 20 kc.

INCIDENTAL FM:

On the 1-volt and lower ranges and 30% modulation: $\pm 0.0025\%$ or ± 100 cps, whichever is greater

SPURIOUS FM:

Less than $\pm 0.0001\%$ or ± 20 cps whichever is greater

SPURIOUS 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 $\pm 10\%$, 50 to 1000 cps, 135 watts

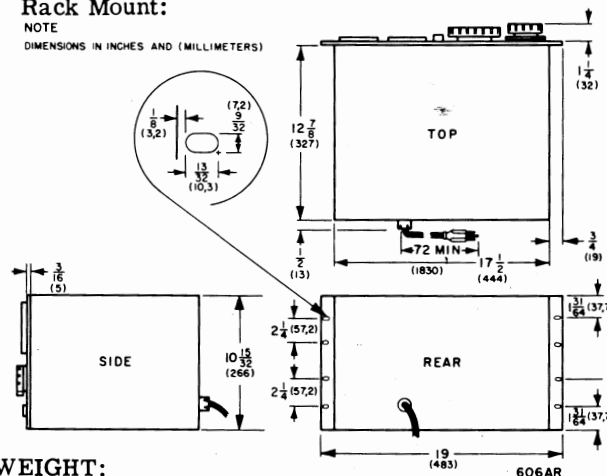
DIMENSIONS:

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

Rack Mount:

NOTE

DIMENSIONS IN INCHES AND (MILLIMETERS)



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

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 kc to 65 mc. 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 kc and 1 mc 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 cps. It can be externally modulated from dc to 20 kc 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

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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-cps 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.  11507A OUTPUT TERMINATION. The 606A-34A provides the following:

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

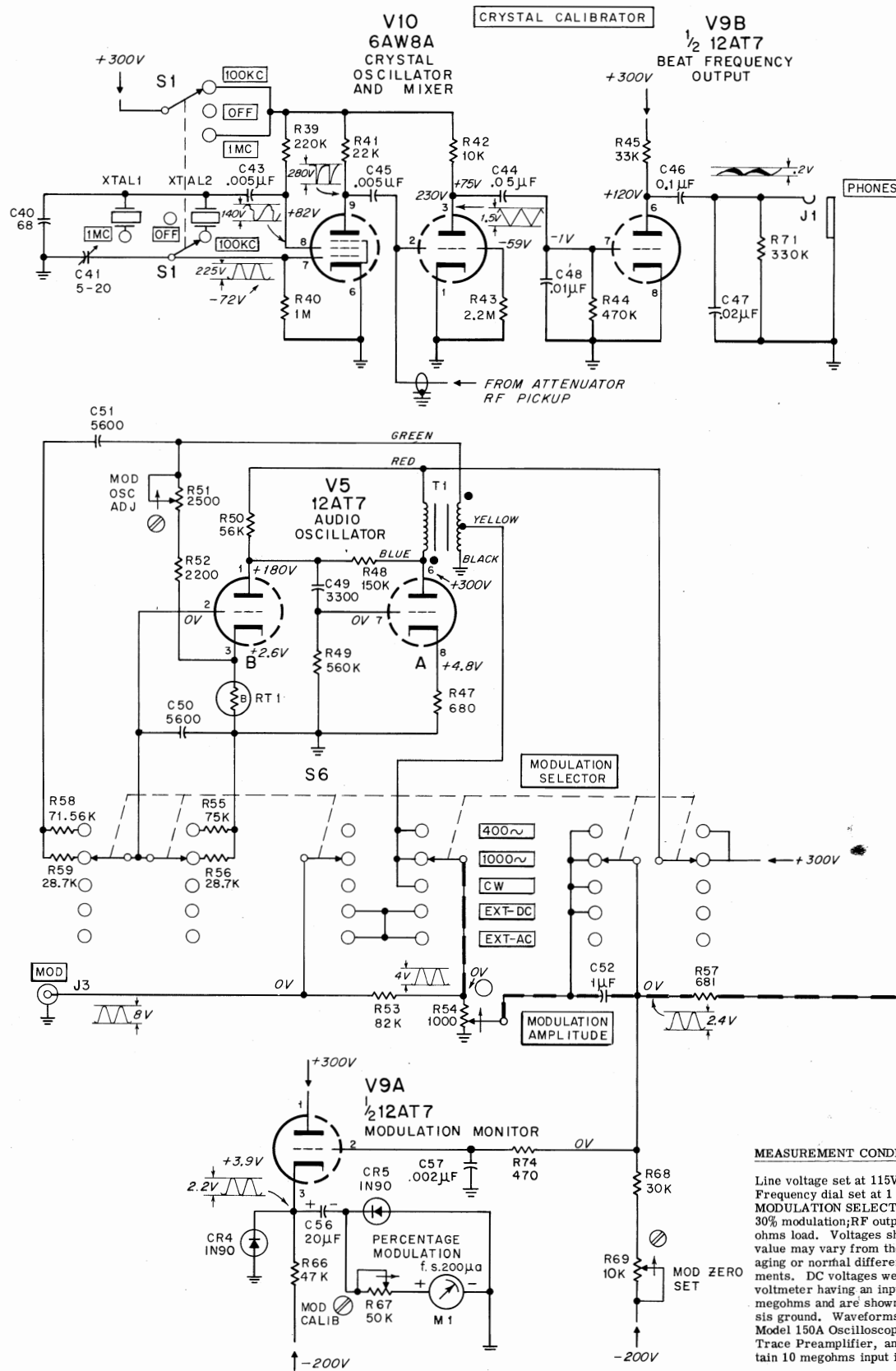


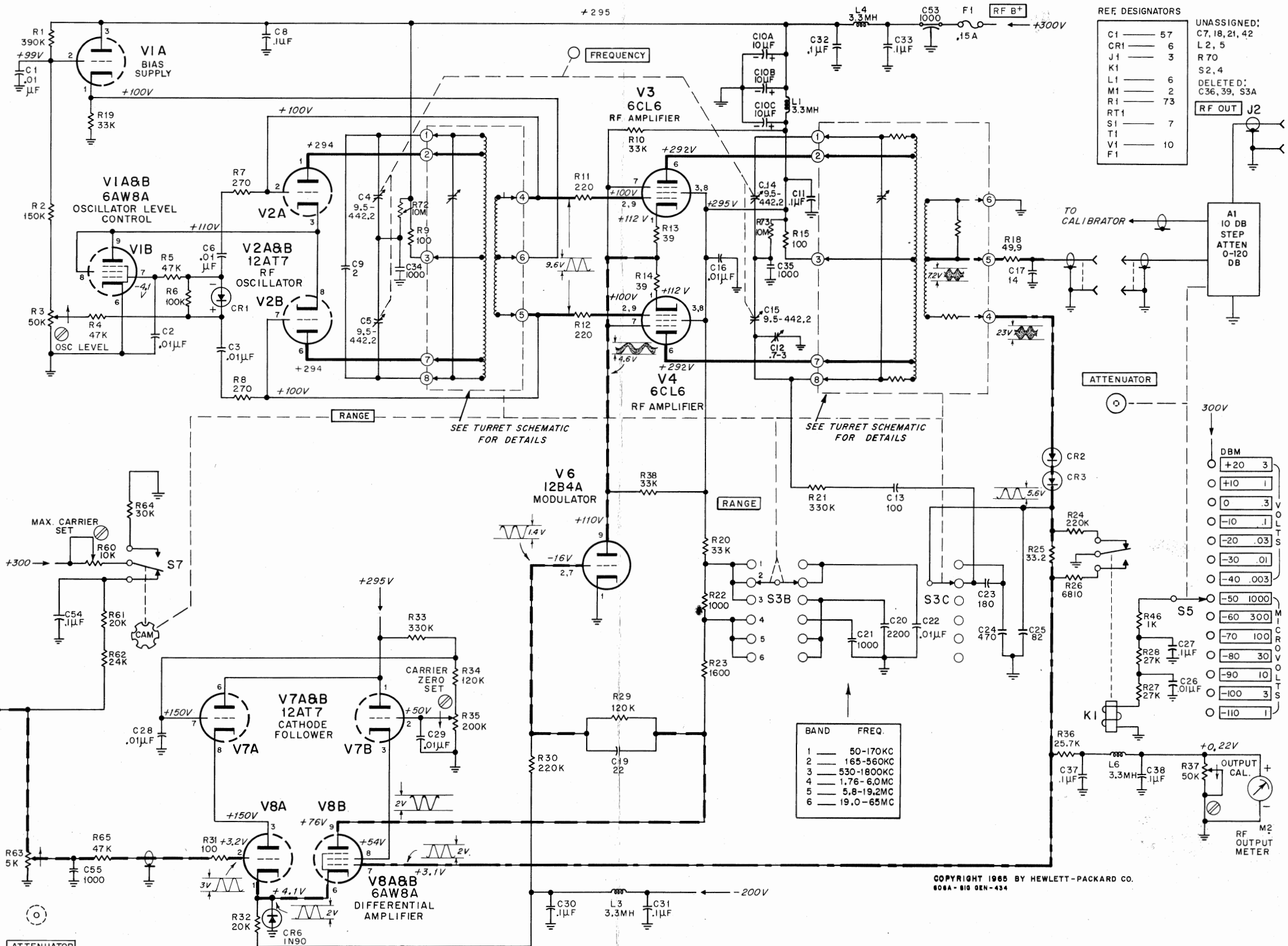
b) 20 db attenuator (10:1 voltage divider) which reduces the source impedance to 5 ohms.

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

1-18.  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.)







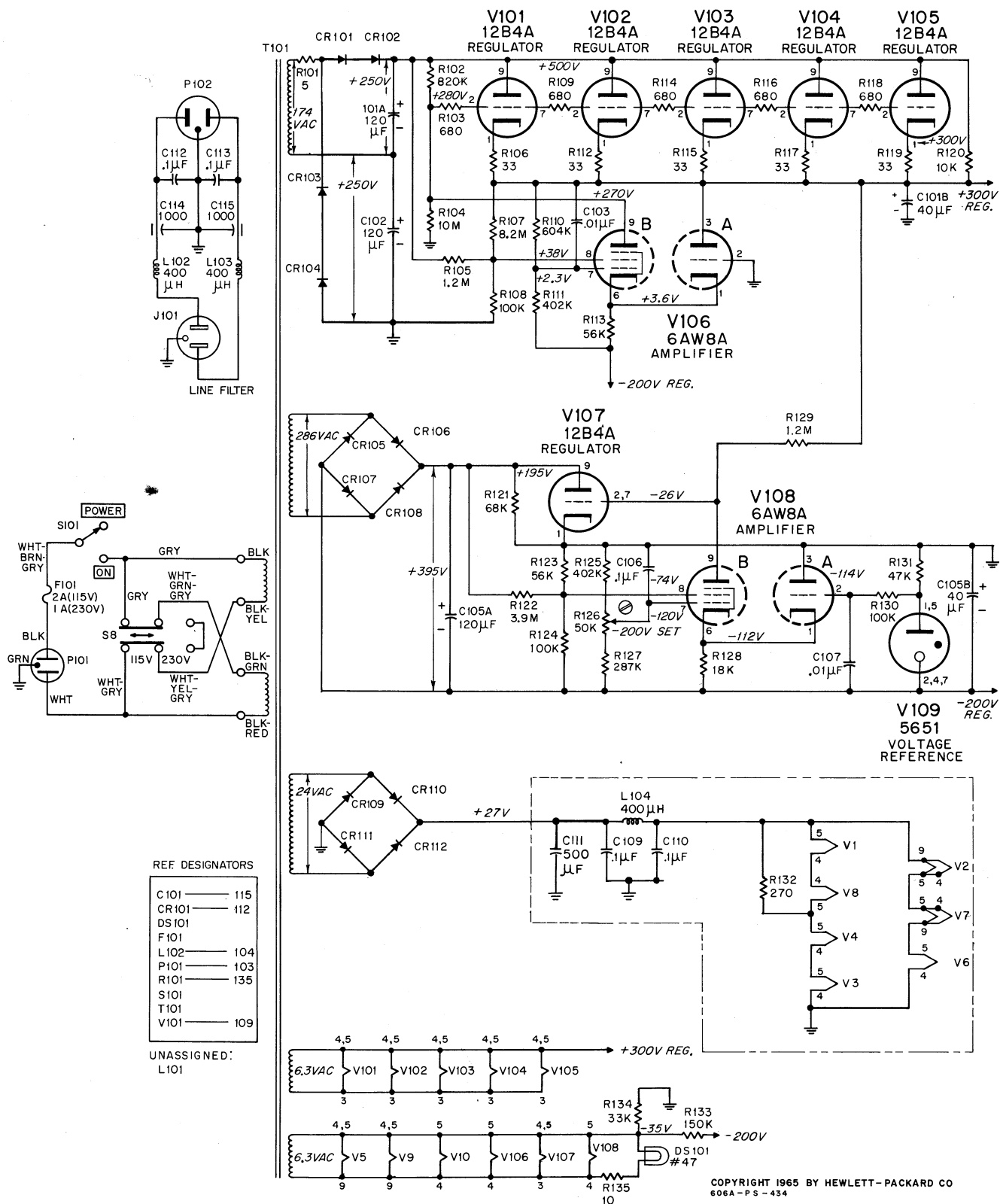
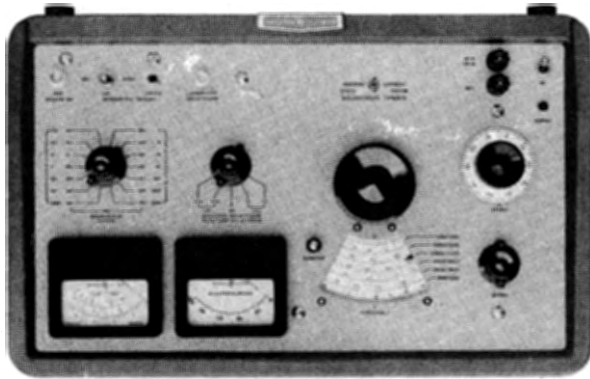


Figure 4-10. Power Supply

SIGNAL GENERATOR 606A



HEWLETT  PACKARD

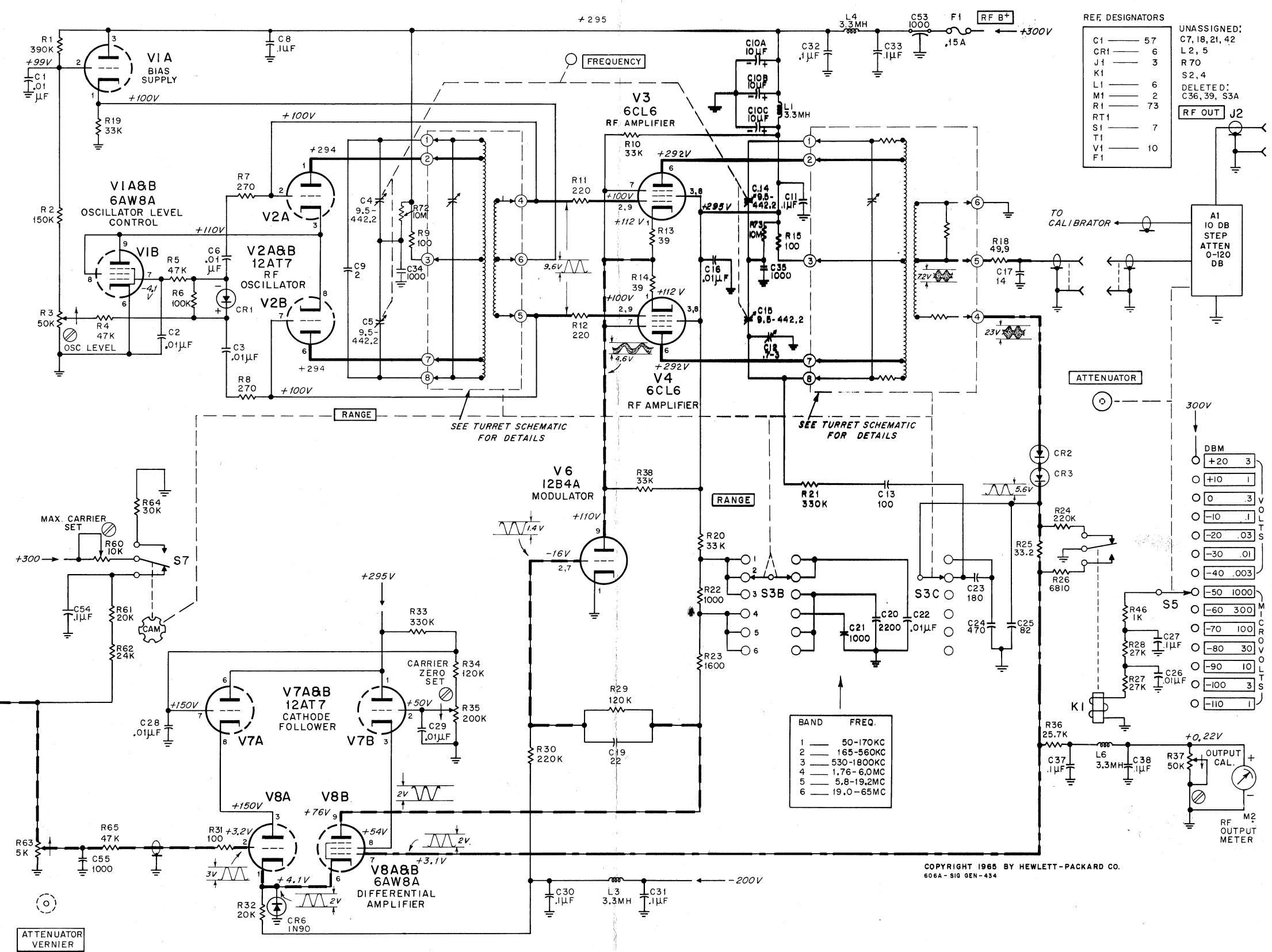


Figure 4-9. Signal Generator (Sheet 2 of 2)