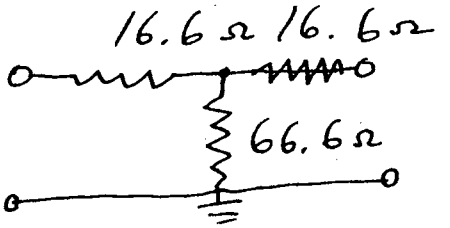
OPERATING INSTRUCTIONS

for

MEASUREMENTS MODEL 80



6 Db. Pad

Any near value. or R ok

MEASUREMENTS CORPORATION

BOONTON NEW JERSEY

Printed in U.S.A.

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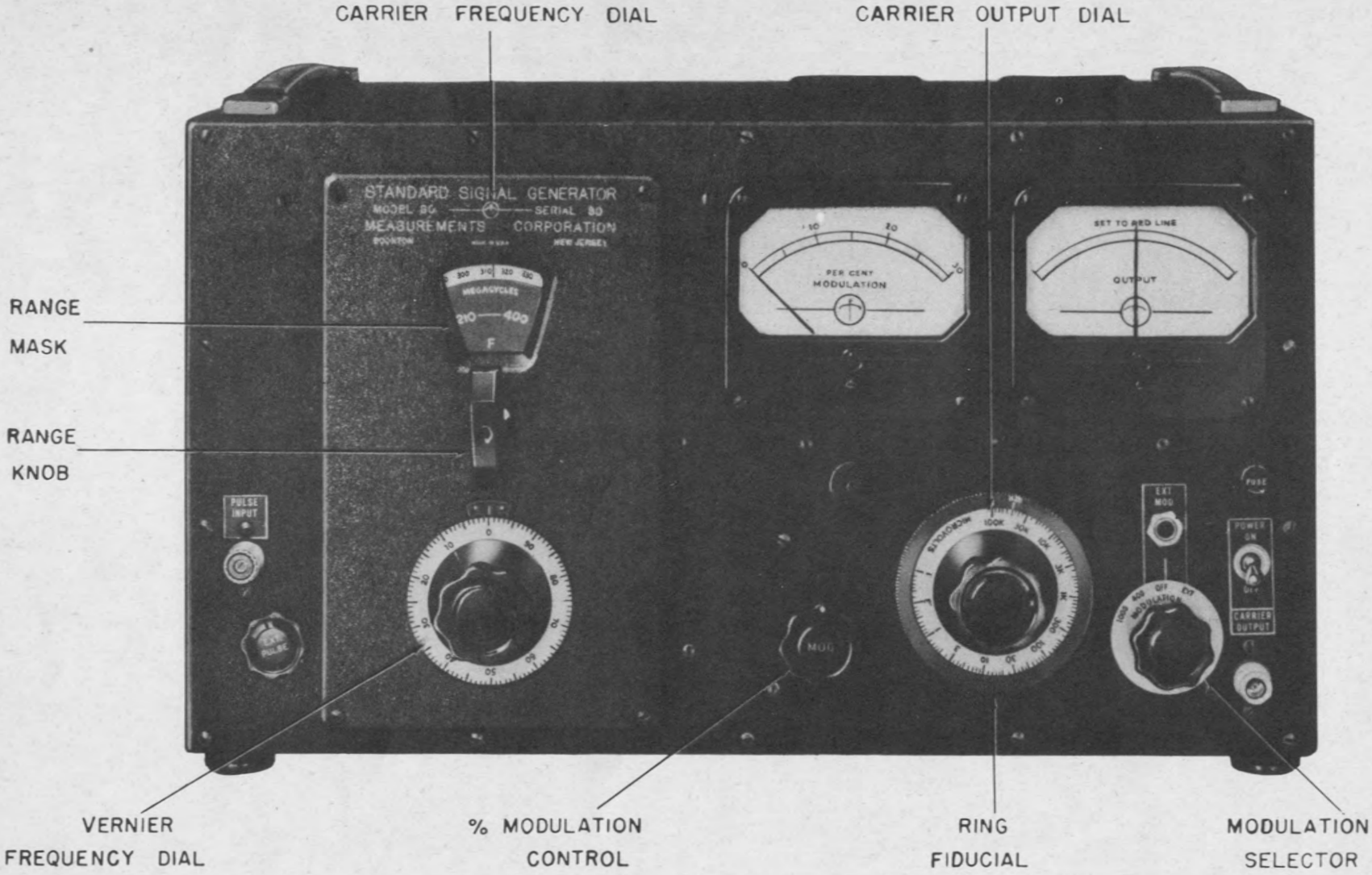


Figure 1-1—Front View of Model 80

SECTION I

GENERAL DESCRIPTION

1. INTRODUCTION.

a. This handbook describes the basic operation, construction and maintenance of the Model 80 Standard Signal Generator. Revision sheets will be supplied from time to time covering special problems of application and maintenance encountered by users of this equipment.

b. The Model 80 is a portable instrument providing standard radio frequency test signals of accurately known frequency and amplitude. Though designed as a laboratory standard, the Model 80 is sufficiently flexible for use in production testing or field maintenance of communications and video equipment.

2. GENERAL CHARACTERISTICS.

a. CARRIER FREQUENCY RANGE.

(1) 2 to 400 megacycles in six bands. The range switch operates a mask to conceal those frequency ranges that are not in use.

(2) Each range is individually calibrated and is accurate to within $\pm 0.5\%$.

(3) Small increments of carrier frequency can be obtained by means of a 0 to 100 vernier dial which is adjustable to place its zero at any desired center frequency.

(4) Backlash in the tuning mechanism is less than one division of the vernier dial, (one part in 1,850).

b. CARRIER OUTPUT SYSTEM.

(1) Continuously variable from 0.1 to 100,000 microvolts.

(2) Stray radiation is less than 0.1 microvolt at any point outside the case.

(3) Continuous metering of the 100,000 microvolt absolute level permits manual correction for variations in output vs. frequency, without disturbing the "Microvolt Dial" setting.

c. OUTPUT IMPEDANCE.

(1) Approximately 50 ohms (across output jack).

(2) A selection of matching pads and output cables is available on order to match the Model 80 output to various types of equipment. See "Equipment Not Supplied", and "Connections for Operation".

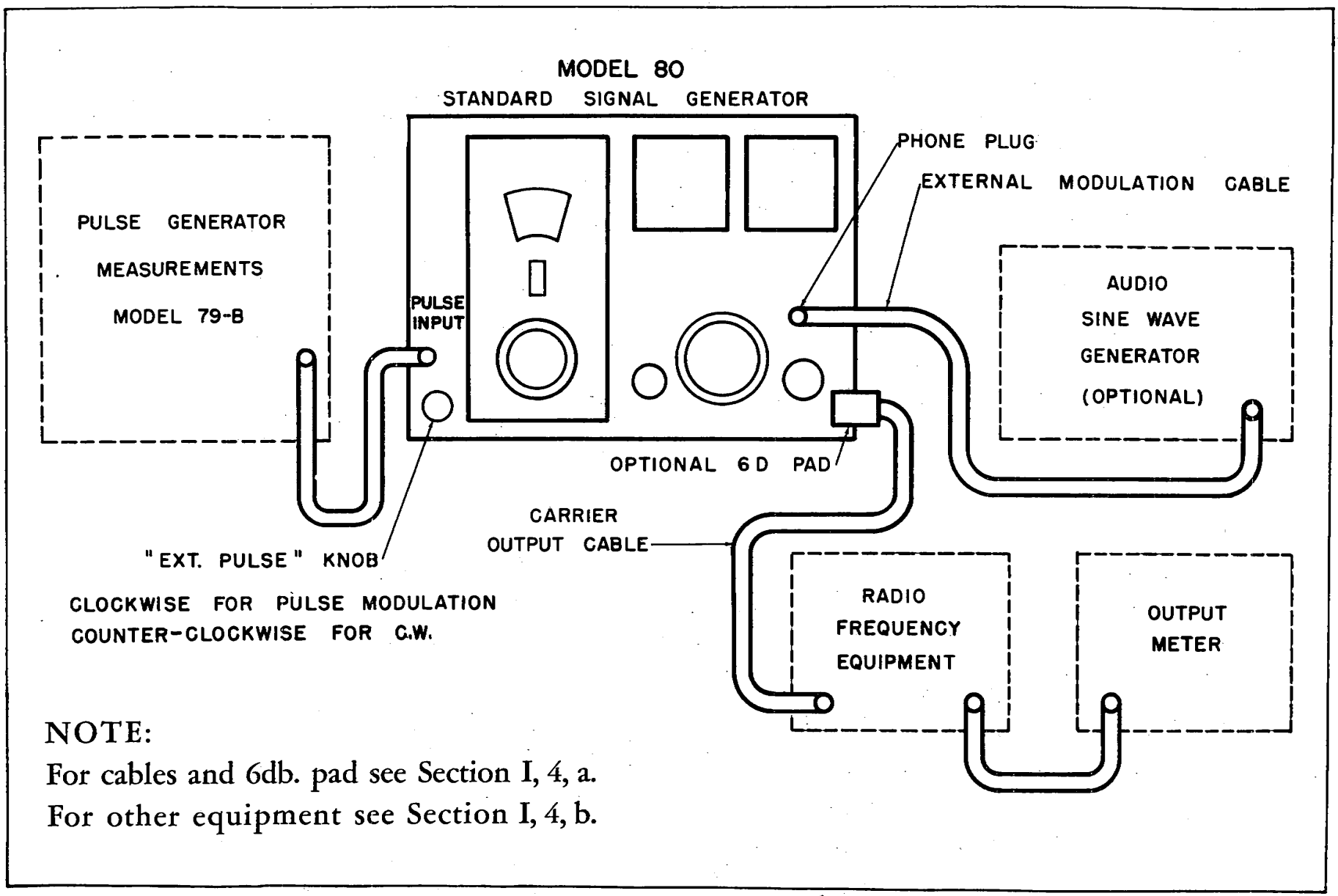
d. MODULATION.

(1) Sine-wave modulation, continuously variable from 0 to 30%, is indicated directly on Per Cent Modulation Meter. Choice of 400 or 1,000 cycles from an internal RC type oscillator, or external modulation over the range of 50 to 10,000 cycles. An external signal of approximately 5 rms. volts is sufficient for 30% modulation.

(2) Input jack provided for pulse modulation from an external source (such as the Measurements Corp. Model 79 Pulse Generator). The minimum pulse width vs. carrier frequency varies somewhat, in accordance with the graph of Figure 4. A pulse amplitude of 180 peak volts will provide a carrier amplitude equivalent to the continuous-wave value of the Model 80 carrier output.

e. POWER SUPPLY SOURCE.

(1) Potential.....117 volts
(2) Frequency.....50 to 60 cycles
(3) Power Consumption....65 watts
(4) Fuse Protection.....one type 3AG 1 ampere



NOTE:
For cables and 6db. pad see Section I, 4, a.
For other equipment see Section I, 4, b.

Figure 1-2—Typical Connections

3. EQUIPMENT SUPPLIED.

The following is included with each shipment, unless otherwise specified in the order:

Quantity	*Description*	*Weight*	*Height*	*Width*	*Depth*
1	Model 80 Standard Signal Generator	53 lbs.	10¾"	19"	9½"
1	Handbook of Maintenance Instructions				

4. EQUIPMENT NOT SUPPLIED.

Part No.	*Description*
80-ZH1	Output Matching Pad, 6 db. loss, with Navy type ⌗49194 jack.
80-ZH3	Output Matching Pad, 6 db. loss, with Navy type ⌗49269 jack.
80-ZH4	Carrier Output Cable, 4 ft., coaxial, 50 ohms impedance with 50 ohms termination, binding posts, and Navy type ⌗49268 connector.
84-Z2-1	Patch Cable, 4 ft., coaxial, for connecting Measurements Model 79-B Pulse Generator to Model 80 Pulse Input jack. Two Navy type ⌗49195 connectors.
84-Z2-2	Carrier Output Cable, 4 ft., coaxial, 50 ohms impedance, with Navy type ⌗49195 and ⌗49268 connectors.
84-Z2-3	Carrier Output Cable, 4 ft., coaxial, 50 ohms impedance, with two Navy type ⌗49268 connectors.

5. ASSOCIATED EQUIPMENT.

The Model 80 may be used without additional equipment, other than the equipment under test. However, provision is made for external modulation by suitable pulse or sine-wave generators. The specifications of this external equipment should be as follows:

a. The *Pulse Generator* should provide a minimum of 150 peak volts. An output impedance of 1,000 ohms or less is desirable.

b. A *Sine-Wave Generator* having on output of 5 rms. volts or more and a frequency range from 50 to 10,000 cycles per second will be adequate for external sine-wave modulation. (See Fig. 1-2, and Section II, 3).

6. PHYSICAL DESCRIPTION.

a. Dimensions and weight of the Model 80 are given in paragraph 3, above. All controls and assemblies are mounted on the front panel, as shown in Figures 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, and can be removed from the outer case for service and tube replacement, (see instructions in Section IV, 1, d).

b. Ventilating louvres are provided above and below the Modulation & Power Supply chassis and a six foot line cord is permanently attached to this assembly.

c. Since the Model 80 was designed for precise laboratory measurements it should not be subjected to rough handling nor exposed to the weather, except when properly packed in its special shipping container. (See "Packing for Return Shipment", Section IV, 1, b).

7. TUBE COMPLEMENT.

Eleven vacuum tubes are employed as follows:

*Schematic Symbol**	*JAN Type Designation*	*Function (See also Wiring Schematic, Figure 12)*
V-1	6V6-GT	Sine-Wave Oscillator—used with V-7 as a source of 400 and 1,000 cycle modulation.
V-2	6V6-GT	Power Output Tube for modulation amplifier.
V-3	Mazda 120v., 3w. (candalabra base)	Bias control for V-7.
V-4	VR-105-30	Used in series with V-6 to regulate the 180 volt plate supply.
V-5	5Y3-GT	Full-Wave Rectifier for plate voltage supply.
V-6	VR-75-30	Used in series with V-4 to regulate the 180 volt plate supply.
V-7	6SJ7	Sine-Wave Oscillator—used with V-1 as a source of 400 and 1,000 cycle modulation.
V-8	6SN7-GT	Voltage amplifier for modulation amplifier. Modulation meter diode rectifier.
V-9	6SL7-GT	Barretter bridge amplifier.
V-10	6SN7-GT	Barretter bridge balance detector.
V-11	955	Carrier oscillator tube.

*For location of V-1 to V-10, see Figure 3-5. V-11 is shown in Figure 3-2.

SECTION II

OPERATION AND ADJUSTMENT

1. INSTALLATION AND ADJUSTMENT.

Since the Model 80 Signal Generator is portable test equipment, no permanent installation is required. The ventilating louvres must not be obstructed by other equipment nor should the instrument be directly exposed to the weather. There is no adjustment necessary prior to operation.

2. PRELIMINARY CHECKS PRIOR TO OPERATION.

To determine whether all controls and functions are in order the following checks can be made:

a. Connect the Line Plug to a source of 117 volt, 50 to 60 cycle a.c. power. Flip Power Switch to "On" and note whether "megacycle" dial is illuminated. If not, check line cord connections and fuse (located above Power Switch). If fuse is defective, insert a new type 3-AG one ampere fuse.

b. Turn the Modulation Selector to "Off".

c. Turn the External Pulse knob to "Off", (counter-clockwise).

d. Rotate the Range Knob until the letter "A" appears in the window above the knob. Rock the knob slightly from side to side to make certain that the range change mechanism has locked into position.

e. Set the Output Meter to the red line by means of the Ring Fiducial, (see Figure 1-1). Rotate the Frequency Dial from one end to the other and note whether it is possible to set the Output Meter to red line at all carrier frequencies. (NOTE: the Frequency Dial will automatically disengage when the usable part of the tuning range has been passed. Disengagement is accompanied by a jumpy action of the dial which should not be mistaken for faulty operation.)

f. Turn the Range Knob clockwise to the B, C, D, E and F ranges successively, using the left hand, while adjusting the Ring Fiducial with the right hand as in "e". If the Output Meter will not set to red line at some particular range and frequency, refer to Section IV.

g. Turn "Mod." knob counter-clockwise and set Modulation Selector switch to "400". Turn "Mod." knob clockwise until Per Cent Modulation Meter reads 30. Output Meter should deflect slightly to the right as modulation is applied. Turn Modulation Selector switch to "1000". Modulation Meter should return to 30 without readjustment of the "Mod." knob.

h. Any indication of faulty operation during the above tests should be reported to the Measurements Corporation. If emergency repairs are necessary, consult Section IV, Maintenance, before proceeding. Removal of knobs, dials, etc., is likely to upset factory calibrations which can only be restored by the use of special calibrating equipment.

3. CONNECTIONS FOR OPERATION.

a. To connect the Model 80 to radio frequency equipment, refer to the list of cables and matching pads in Section I, 4, and to the connection diagram, Figure 1-2. The two 6 db. matching pads are electrically the same, but differ as to their types of output jacks. The purpose of both pads is to isolate the attenuator system of the Model 80 from any standing wave effects which may be present in loads of uncertain impedance. They present a constant 50 ohm load to the generator, accompanied by a constant insertion loss of 6 db. (a voltage drop of 50%).

b. Of two 50 ohm coaxial output cables, the ♯84-Z2-3 having two type ♯49268 connectors is preferred for applications above 200 mc. Another cable, the ♯80-ZH4, which terminates in two binding posts and a 50 ohm resistor, may be used with care at frequencies as high as 200 mc. when working directly into a high impedance (such as a vacuum tube grid) using *short* clip leads. When coupled to a 6 db. matching pad its output impedance is constant at 25 ohms over the entire range from 2 to 400 mc. Figure 1-2 shows the general method of interconnecting the equipment. Figure 2-1 illustrates some common types of dummy antenna arrangements.

c. The use of an external pulse or sine-wave generator is optional. For external sine-wave modulation a short, low capacity line is best. It should terminate in a phone plug to be inserted into the "Ext. Mod." jack (see Figure 1-2). To connect an external pulse generator, (such as our Model 79-B) to the "Pulse Input" jack, use the ♯84-Z2-1 cable and turn the "Ext. Pulse" knob clockwise to its "On" position. With the "Ext. Pulse" knob "On" the other modulation controls have no effect on the carrier output.

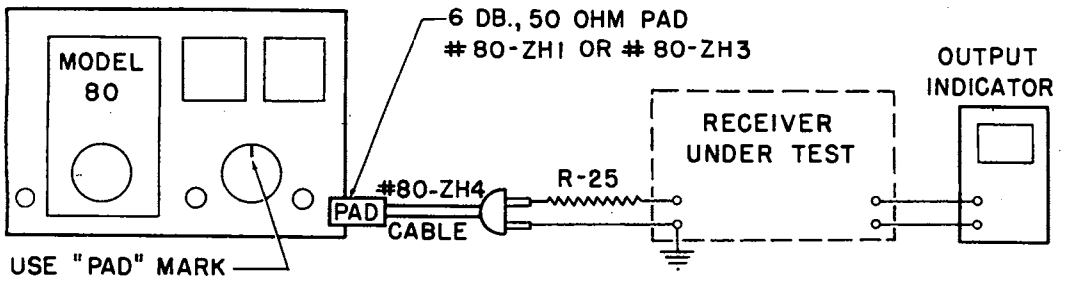


FIGURE 3-A. For unbalanced antenna inputs at frequencies below 200mc.
(R=resistance of antenna from which receiver is designed to work.)

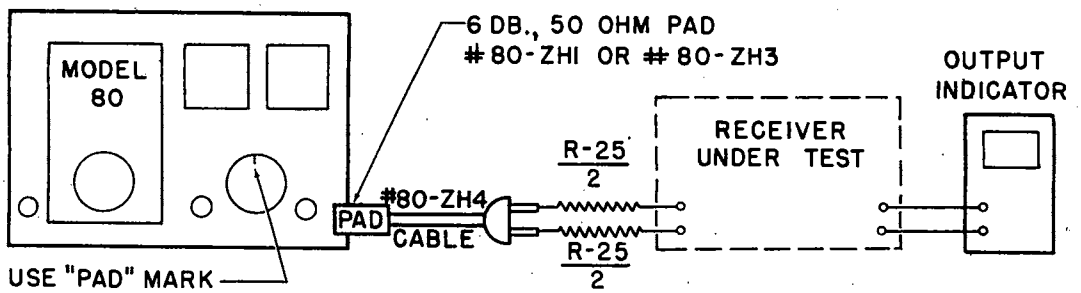


FIGURE 3-B. For balanced antenna inputs at frequencies below 200mc.
(R=resistance of antenna from which receiver is designed to work.)

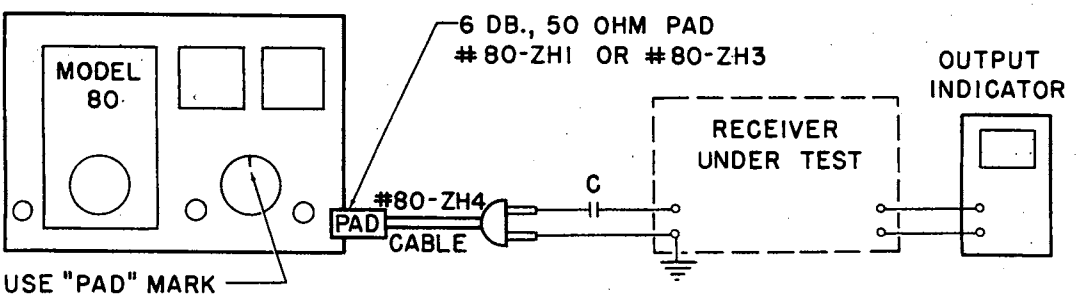


FIGURE 3-C. For short, pure capacity antenna at frequencies below 200mc.
(Xc should be much greater than 25 ohms.)

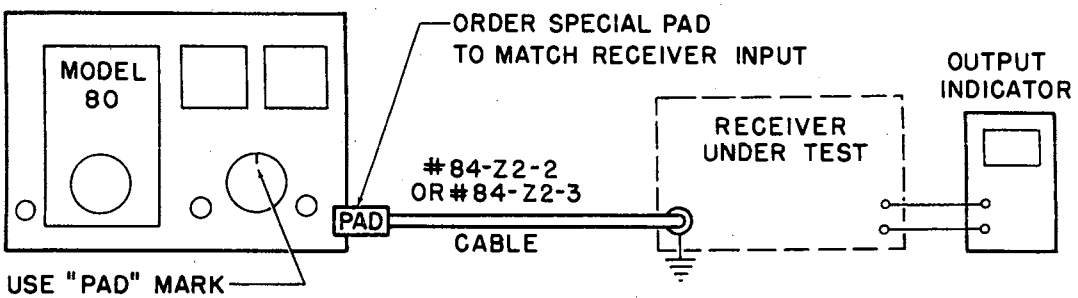


FIGURE 3-D. Recommended for frequencies above 100mc.
(#84-Z2-3 cable and #80-ZH3 pad preferred for 50 ohm inputs.)

Figure 2-1—Receiver Antenna Connections

4. TO SET UP AND OPERATE.

a. Connect the a.c. line plug to a source of 117 volt, 50 to 60 cycle power and flip the toggle switch marked "Power" to its "On" position. Illumination of the dial marked "Megacycles" shows the instrument to be ready for operation.

b. After a brief warm-up period rotate the "Range" bar knob (see Figure 1-1), until the desired carrier frequency range appears in the dial window. Use sufficient torque when turning this knob to unseat the range detent and engage the desired range solidly in its proper contacts. Rock the knob slightly from side to side to test for detent.

c. To obtain a *continuous-wave* carrier output, turn the "Ext. Pulse" knob to its "Off" position and set the Modulation Selector also to "Off".

d. Set the Output Meter pointer to the red center line by adjusting the Ring Fiducial (shown in Figure 1-1). This adjustment should be made during continuous-wave operation only.

e. Final tuning may be completed at this point. To facilitate selectivity measurements about any center frequency the "Vernier Frequency" dial may be disengaged from the tuning mechanism by pressing downward on the Vernier Knob. While holding this knob down, rotate it so as to place its zero at the fiducial mark, then release the knob carefully so as not to disturb the carrier frequency setting. The Vernier Dial is now ready for selectivity or other measurements requiring small increments above and below a given frequency.

f. To set the *carrier output* to a desired value, merely adjust the "Microvolt" Dial with reference to the white line on the Ring Fiducial. If one of the 6 db. matching pads listed in Section I, 4 is used, the "Pad" mark on this ring becomes the output reference line. The maximum output obtainable from a 6 db. pad will then be 50K (50,000) microvolts.

g. Sine-wave modulation at 400 or 1,000 cycles is obtained by setting the "Modulation" Dial to 400 or 1000 and adjusting the "Mod." knob until the "Per Cent Modulation" meter indicates the desired depth of modulation. Other modulation frequencies can be obtained by plugging an external audio oscillator into the jack marked "Ext. Mod."

h. During sine-wave modulation the position of the Output Meter pointer will change. This is a normal response to the changes in carrier output power which accompany modulation and should be ignored. Do not disturb the Output Ring Fiducial unless the Output Meter remains off center when the Modulation Dial is returned to the "Off" position.

i. To *pulse modulate* the carrier an external pulse generator must be connected to the jack marked "Pulse Input". Turning the "Ext. Pulse" knob *clockwise* to "On" will disconnect the internal modulator to permit direct pulsing of the carrier from an external source. Figure 2-2 shows the minimum pulse width limits for an average Model 80 when connected to the Measurements Corp. Model 79-B Pulse Generator.

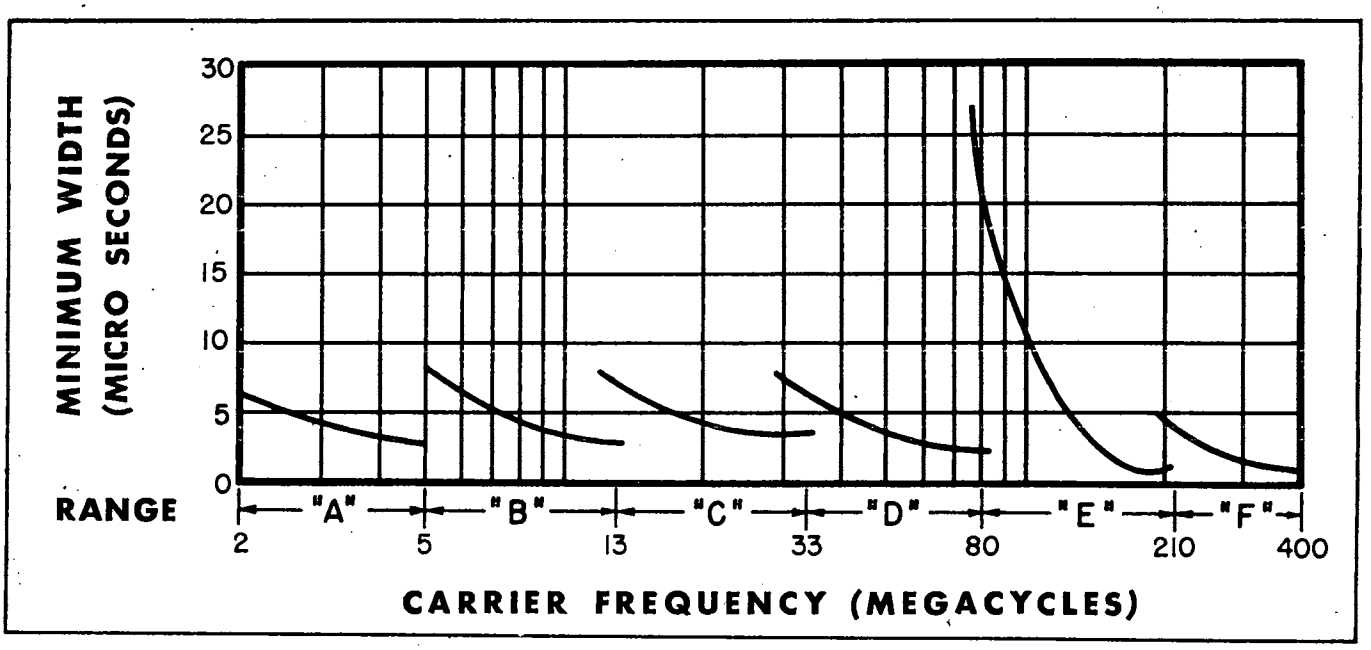


Figure 2-2—Minimum Pulse Width vs. Carrier Frequency

SECTION III

THEORY OF OPERATION

1. CARRIER OSCILLATOR.

a. A type 955 "acorn" triode is used in a Colpitts split-stator, plate-modulated oscillator circuit. The critical parts of this oscillator circuit are rigidly mounted on ceramic supports for maximum stability. A resistor, R11, is employed to minimize the effects of cathode lead inductance. (The Oscillator Assembly is shown in Figure 3-2).

b. The tuning condenser is coupled to the carrier frequency dial by a phenolic bushing. The frequency dial is rotated by a Vernier Frequency Dial which is pivoted so as to disengage when pressed downward. (See Figure 3-4). This permits resetting of the Vernier Frequency Dial so that its zero will correspond to any desired frequency. It is impossible to force the tuning mechanism when the stop is reached, since the Vernier Dial will automatically jump down and slip. The resulting jumpy action indicates that the usable part of the range has been passed. No moving contacts are used in the tuning condenser and the rotor is insulated from ground to eliminate tuning noise. Spring loading of the tuning reduction gears provides smooth operation with a minimum of dial backlash.

c. Band switching is accomplished by rotating a disc on which the six R.F. coils are mounted, (see Figure 3-3). Detents in the edge of the coil disc engage a spring-loaded detent roller to index the coils into proper position. The three contacts of each coil (shown in Figure 3-3), are formed of solid coin silver to provide reliable contact over long periods of use.

d. "Leakage" from the filament and plate supply lines of the oscillator tube, V-11, is prevented by three-section R.F. filters, each section being isolated within a separate shield.

2. OUTPUT SYSTEM.

a. The Output Meter serves merely as a balance indicator for a High-Frequency Barretter Bridge. All values of carrier output are obtained with reference to an absolute level of 0.1 volt, this being the voltage existing across the "Barretter Loop" which, in turn, controls the position of the Output, or "Attenuator Loop".

b. The two mutual inductance type loops are mounted on separate sliding tubes which are concentric with respect to each other and to a fixed outer tube. The outer of the two sliding tubes is positioned by adjusting the "Output Ring Fiducial" until the loop affixed to it yields exactly 0.1 volt of carrier. A coaxial line couples this 0.1 volt level to a "bolometer" element which varies the resistance of one arm of the Barretter Bridge, according to the amount of R.F. power applied to the bolometer. There are two of these bolometer elements, since a "dummy" bolometer is employed in an opposite arm of the bridge to compensate for temperature effects.

c. The two bolometers are identical and consist of .0001" platinum filaments in small evacuated glass envelopes. Careful matching is required, since the two bolometers should show similar resistance variations with respect to current and ambient temperature.

d. The Barretter Bridge operates on 60 cycle a.c. supplied by the power transformer. Variations above or below the 0.1 volt absolute carrier level will unbalance the Barretter Bridge, as the resistance of the Measuring Bolometer departs from its proper value. This unbalance causes a portion of the 60 cycle bridge driving voltage to appear at the input grid of V-9, the Bridge Amplifier.

e. The amplitude and phase of this "unbalance" voltage will determine the degree and polarity of the Output Meter deviation from its zero center position. The Output Meter is able to respond to changes in *phase* of the "unbalance" voltage because of a unique method of operating the twin-triode, V-10, entirely from 60 cycle a.c. Since the grids of V-10 are both driven by the 60 cycle "unbalance" voltage, an aiding and bucking condition occurs in the two plate currents, depending on the phase relation between the unbalance voltage and the voltages which are supplied to the cathodes of V-10. (See Figure 6-1).

f. This system of output metering enables the absolute reference level of 0.1 volts (100K microvolts) to be manually corrected by means of the Ring Fiducial without disturbing the Microvolt Dial setting. Since the Ring Fiducial adjustment carries the inner, or "attenuator" tube along with it, a carrier output correction is made which will assure that the actual output is in accordance with the setting of the Microvolt Dial.

g. The Output Meter will be affected by modulation of the carrier since the Barretter Bridge system is a power operated device and indicates r.m.s. values. The

increases in carrier power which accompany amplitude modulation will therefore unbalance the Output Meter. This deflection should be ignored, however, since carrier output adjustments are in terms of "microvolts" across 50 ohms, and the average value of output *voltage* is not affected by modulation. A carrier output level *must* be established with the Modulation Selector Switch at "off" (continuous-wave) and this level should be checked from time to time by returning the switch to "off" and noting whether the Output Meter returns to the red center line.

3. SINE-WAVE MODULATION.

a. The sine-wave oscillator included in the modulator section of the Model 80 operates on the resistance-tuned principle. Regeneration between the two tubes, V-1 and V-7, is controlled by the frequency selective network comprising C20, C21, R23 and R24. This regenerative network has a peak response at 400 cycles, causing the circuit to oscillate at that frequency. Two resistors, R25 and R26, may be switched across R23 and R24, tuning the network to 1,000 cycles. Another network, comprising C24 and R31, applies a degenerative voltage across the ballast lamp, V-3. The rapid increase in resistance of this lamp with respect to increases in feedback voltage tends to limit the oscillation to linear portions of the tube characteristics.

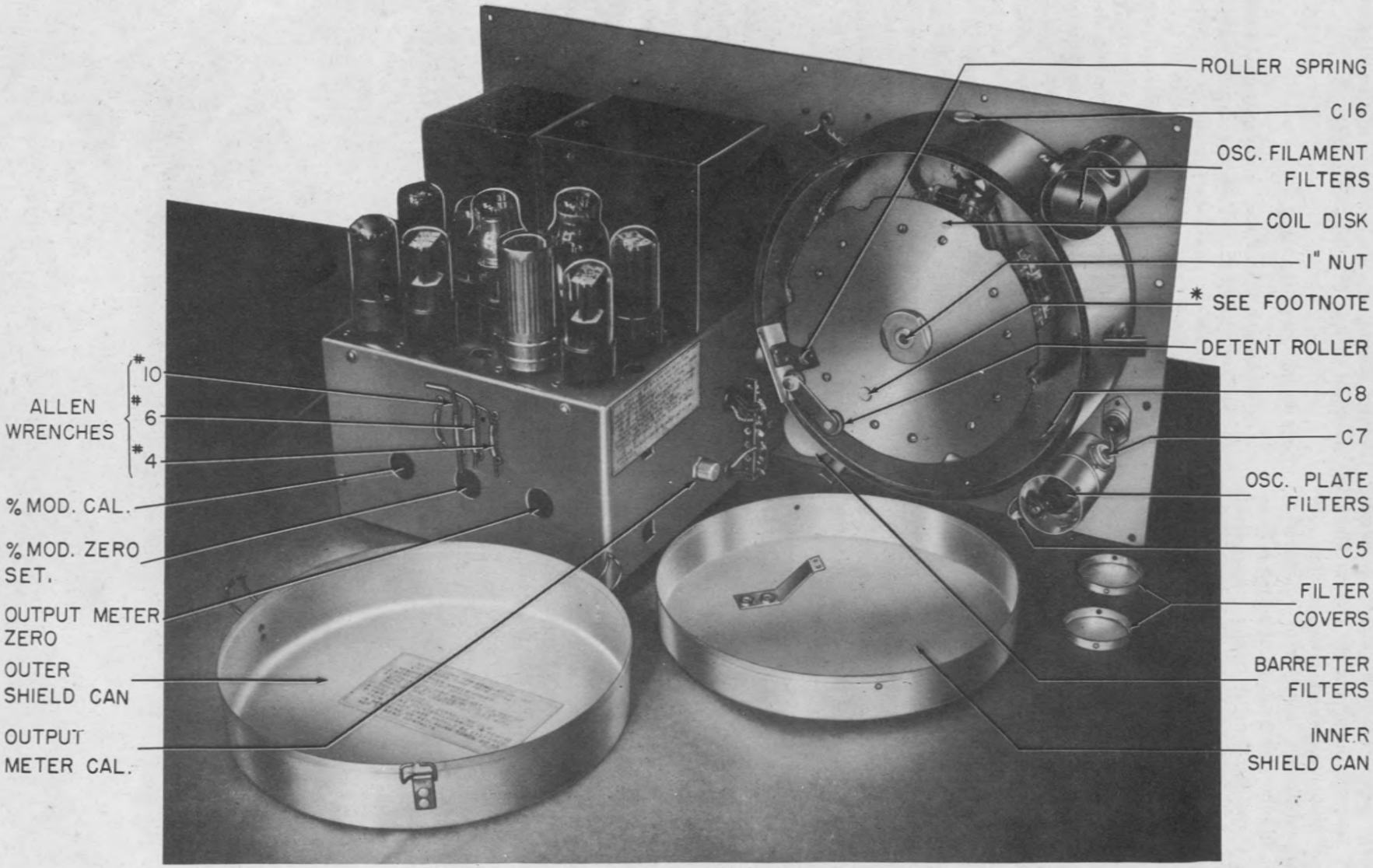
b. One section of the twin-triode, V-8, is used in a resistance coupled amplifier of which V-2 is the power output tube. The output of V-2 is metered in terms of per cent modulation by the other section of V-8, connected as a diode. The sensitivity of this diode is adjusted at the factory by means of R41 (% Mod. Cal.) while its small contact potential is balanced out by adjustment of R43 (% Mod. Zero Set).

4. PULSE MODULATION.

a. When the "Ext. Pulse" knob is turned from "off" to "on" the plate circuit of the carrier oscillator is switched from the modulator output to the "Pulse Input" jack. Since V-11 is now deprived of its plate voltage it will not oscillate unless an external supply is connected to the "Pulse Input" jack. The external supply may be a pulse generator, such as the Measurements Model 79-B. This pulse generator has the required minimum output of 150 peak volts and its type ♯49194 output jack corresponds to the "Pulse Input" jack of the Model 80 so that a ♯84-Z2-1 patch cable may be used (see "Equipment Not Supplied", Section I, 4).

b. Since the pulse filters are designed for a cutoff around four megacycles some "leakage" will be experienced when pulsing below fifteen megacycles. When the pulse switch is returned to the "off" position more filters are inserted and no difficulty should be experienced with leakage at any carrier frequency in the Model 80 range.

c. The output metering system will not indicate correctly when using pulse modulation. Approximately the same peak B+ voltage is applied from a Model 79-B Pulse Generator as is normally supplied to the oscillator of the Model 80 for continuous-wave operation of the carrier; therefore it is proper to assume the same peak value of carrier output for both conditions. This may not be quite true for very wide pulse widths, since the pulse voltage supplied by the Model 79-B is not quite constant for all pulse widths.



*THIS HOLE IS PROVIDED IN MODELS AFTER SERIAL #200 FOR TRIMMER ADJUSTMENT ON "F" RANGE.

Figure 3-1—Rear View

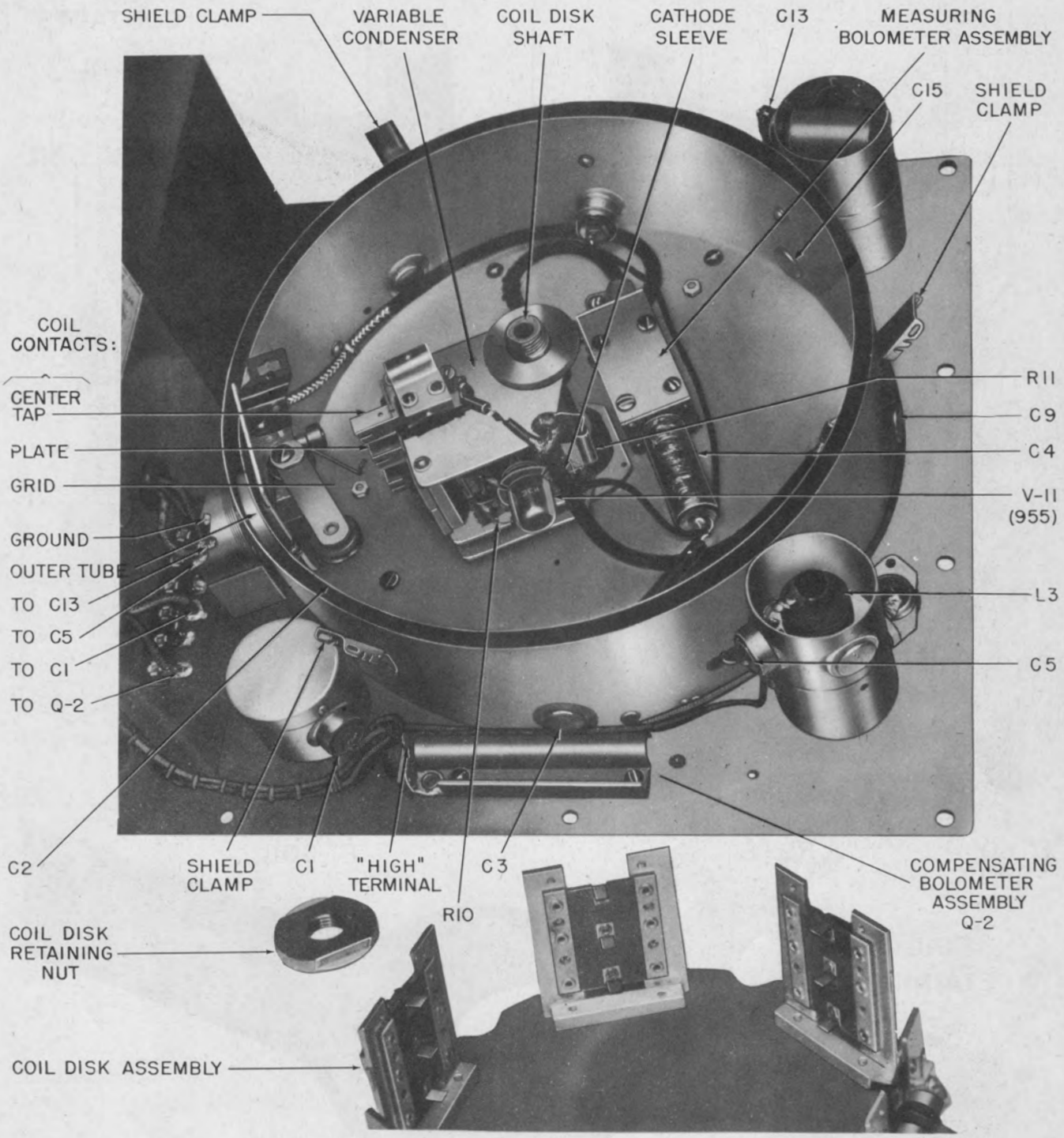


Figure 3-2—Oscillator Assembly

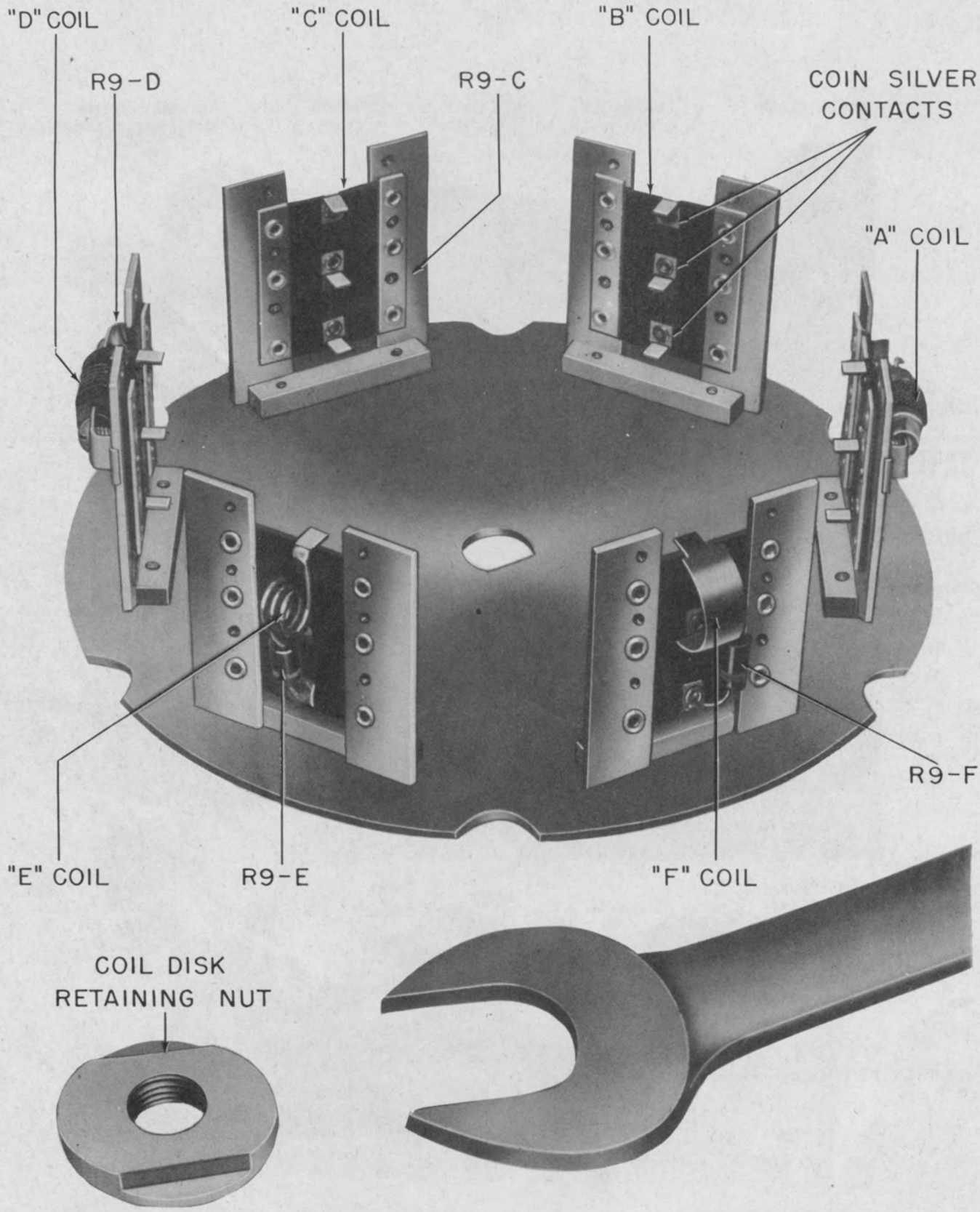


Figure 3-3—Oscillator Coil Disc Assembly

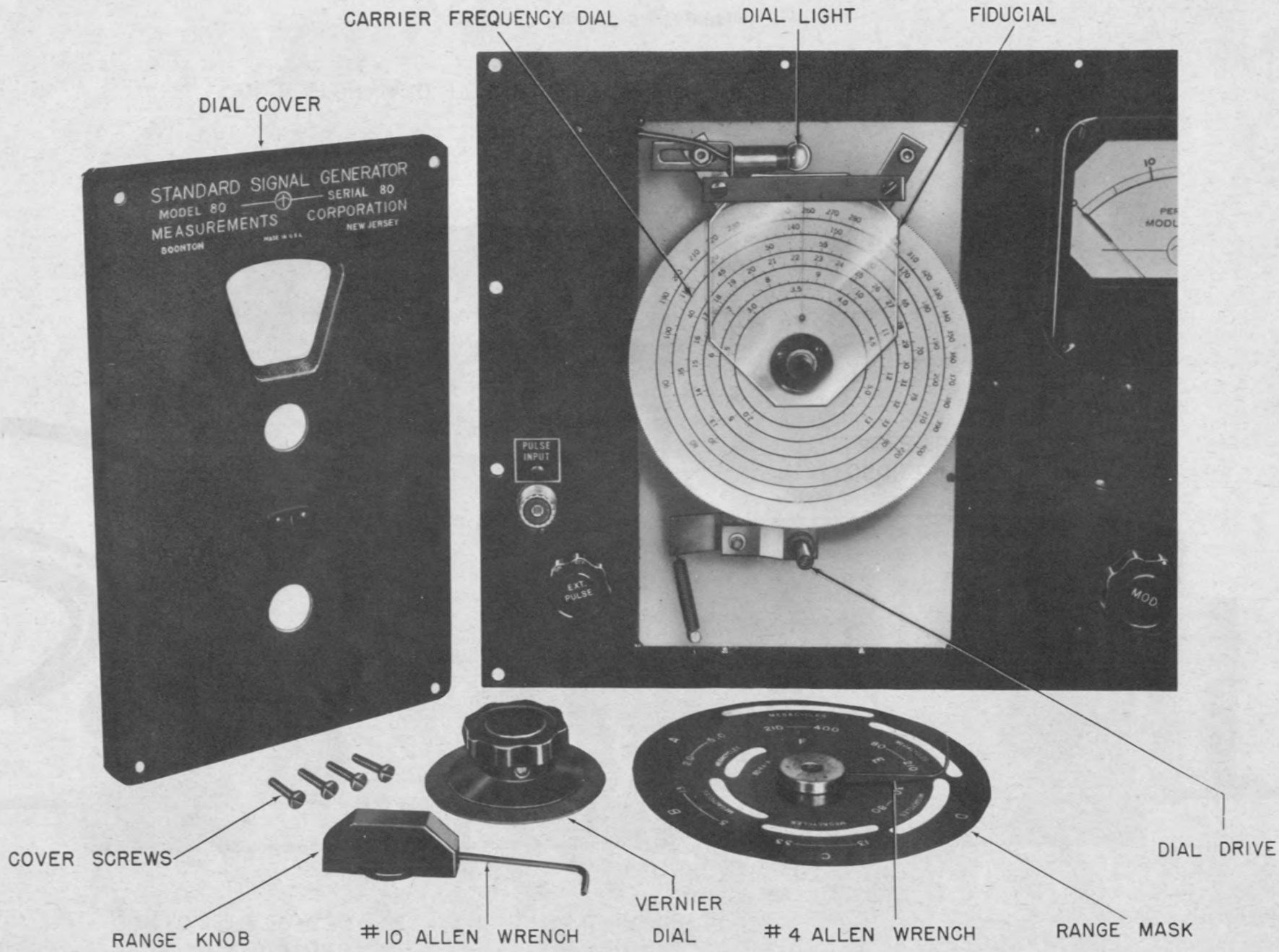


Figure3-4—Front View of Dial Mechanism

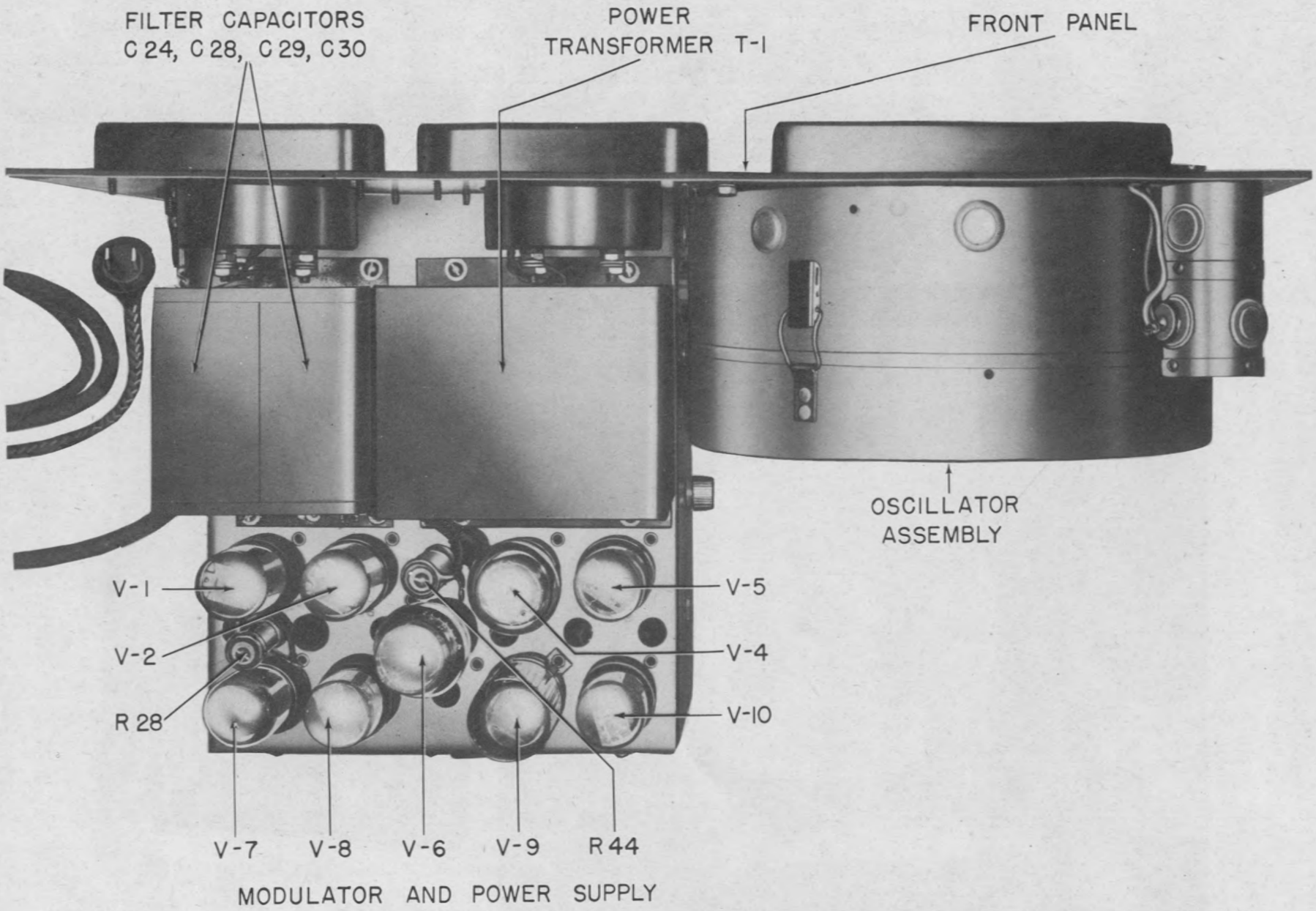


Figure 3-5—Top View

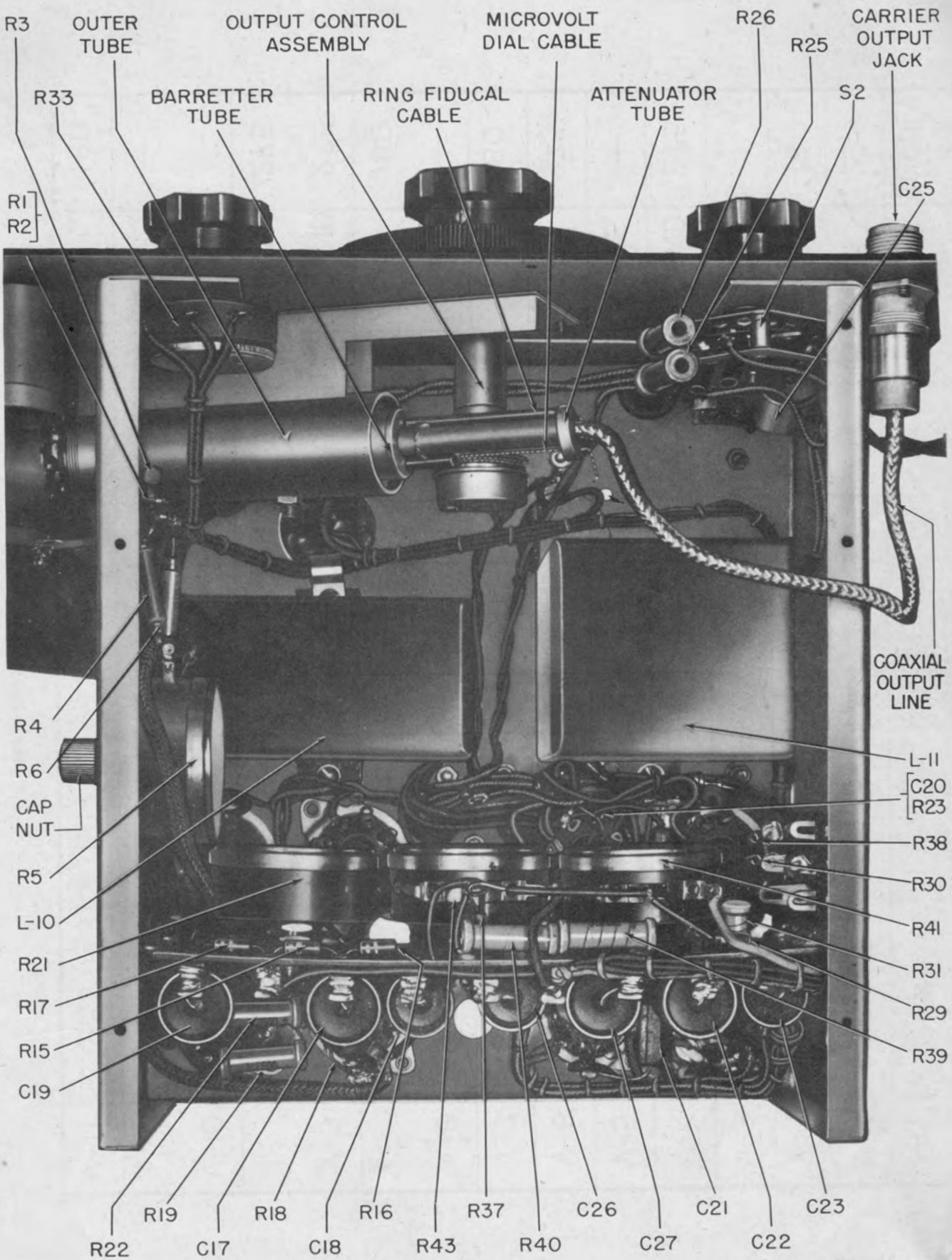


Figure 3-6—Bottom View of Modulator and Power Supply Assembly

TUBE NO.	TUBE TYPE	PLATE PIN	PLATE VOLTS	SCREEN PIN	SCREEN VOLTS	GRID PIN	GRID VOLTS	CATHODE PIN	CATHODE VOLTS	B+ SUPPLY
V-1	6V6-GT	3	130	4	180	5	0	8	12.5	275
V-2	6V6-GT	3	170	4	180	5	0	8	12.5	180
V-3	120V. 3W. AMP		APPROX. .8 RMS. VOLTS					TO	GROUND	
V-4	VR105-30	5	105	–	——	–	——	2	GROUND	275
V-5	5Y3-G	4-6	750 RMS.	–	——	–	——	2-8	5 RMS.	—
V-6	VR75-30	5	180	–	——	–	——	2	75	275
V-7	6SJ7	8	80	6	30	4	0	5	1.5	180
V-8	6SN7-GT	2	0	–	——	1	0	3	0	—
"	"	5	125	–	——	4	0	6	5.5	180
V-9	6SL7-GT	2	30	–	——	1	0	3	GROUND	275
"	"	5	80	–	——	4	0	6	GROUND	275
V-10	6SN7-GT	2	0	–	——	1	1.0 RMS.	3	1.0 RMS.	—
"	"	5	0	–	——	4	1.0 RMS.	6	1.0 RMS.	—
V-11	955	–	170	–	——	–	0	–	.1 TO 3.5	180

Figure 3-7—Tube Voltage Chart

TUBE		PLATE		SCREEN		GRID		CATHODE		B+ SUPPLY
NO.	TYPE	PIN	VOLTS	PIN	VOLTS	PIN	VOLTS	PIN	VOLTS	
V-1	6V6-GT	3	200	4	180	5	0	8	13.0	330
V-2	6V6-GT	3	180	4	180	5	0	8	13.0	180
V-3	120 V. 3 W. AMP.	APPROX. 5 RMS. VOLTS TO GROUND								
V-4	VR105-30	5	105	-	-	-	-	2	GROUND	-
V-5	5Y3-G	4-6	612 RMS.	-	-	-	-	2-8	5 RMS.	-
V-6	VR75-30	5	180	-	-	-	-	2	105	330
V-7	6SJ7	8	85	6	45	4	0	5	2.0	180
V-8	6SN7-GT	2	0	-	-	1	0	3	0	-
"	"	5	230	-	-	4	12	6	4.0	330
V-9	6SL7-GT	2	50	-	-	1	0	3	GROUND	330
"	"	5	100	-	-	4	0	6	GROUND	330
V-10	6SN7-GT	2	0	-	-	1	1.0 RMS	3	3.15 RMS	-
"	"	5	0	-	-	4	1.0 RMS	6	3.15 RMS	-
V-11	955	-	170	-	-	-	0	-	1 TO 3.5	180

Figure 3-7 Tube Voltage Chart. All voltages are positive and measured from ground with 20,000 ohms per volt meter.

SECTION IV
MAINTENANCE

1. GENERAL INSTRUCTIONS.

a. FAILURE REPORTS.

There are some parts that require careful selection for the individual instrument, and some critical adjustments must be made with special tools and calibrating equipment. Where field maintenance is found necessary, a failure report should include information on the available test equipment, such as calibrated receivers, crystal calibrators, oscillographs, etc., along with a careful analysis of the failure, the Model and Serial numbers, location, date, and service conditions, when possible.

b. PACKING FOR RETURN SHIPMENT.

Use the original packing case or an equivalent, allowing several inches clearance on all sides of the instrument. Fill this space with shock absorbent packing material, such as excelsior, (*not* newspaper).

c. WARNINGS.

(1) Refer to the paragraphs on "How to Analyze" when maintenance problems are encountered. There is one of these paragraphs applying to each major function of the Model 80.

(2) Study the photographs which illustrate each major assembly *before* removing any parts.

(3) Study the Wiring Schematic in back of this handbook, while referring to Section III—"Theory of Operation" for explanations of the various circuit elements.

(4) Do *not* use an ohmmeter, or other source of current, without first unsoldering one terminal on each of the Bolometer Assemblies (shown in Figure 3-2). These bolometer elements are easily burned out and difficult to replace.

d. TO REMOVE THE MODEL 80 FROM ITS CASE.

(1) Disconnect power cord from a.c. source.

(2) Remove 14 screws around outer edges of front panel.

(3) Obtain two lengths of 2" x 4" lumber about 2 feet long and place these at top and bottom of front panel while tipping the Model 80 forward on its face. No weight should ever be allowed to rest on any of the control knobs.

(4) Lift off the left end of case until it clears the oscillator assembly, then slide case to right while clearing the insulating strips which protect the attenuator cable. DO NOT FORCE — the clearances are small and forcing will invariably damage some projecting part of the assembly.

(5) When repairs are completed, again rest the Model 80 face down on the 2" x 4" blocks and lower the case carefully into position.

(6) Place Model 80 on its back; replace and tighten 14 panel screws. An awl or ice pick will aid in aligning panel screw holes.

Trouble Shooting Chart

TROUBLE	POSSIBLE CAUSE	REMEDY
Fuse Blown.	Shorted filter capacitor or filament lead grounded.	Replace capacitor C28, C29 or C30 or clear filament short.
No carrier output or meter indication except about 10% on Modulation Meter, with Modulation "off".	Shorted plate supply near oscillator tube, V-11.	Isolate with ohmmeter and clear short.
Meters indicate properly, but no signal available at Carrier Output Jack.	Most common cause is a shorted Output Jack due to use of a connector with a projecting center pin.	Replace connector and open up output receptacle to clear short.
Output Meter cannot be set to red center line.	Output Meter calibration out of adjustment.	Reset with vacuum-tube-voltmeter as in par. IV, 2, d.
Output Meter off-scale to left.	Compensating Bolometer, Q2, open, or bridge resistors R3, R5 or R6 open.	Replace. NOTE: Do not test bridge circuit with ohmmeter without disconnecting Bolometer.
Output Meter off-scale to right.	Measuring Bolometer or bridge resistors R4 or R5 open.	Replace. See note above.
Rapid fluctuations of Modulation Meter pointer.	R28 open.	Replace.
Modulation zero off.	Slow drift of circuit elements.	Reset "% Mod. Zero Set" (R43) through hole in rear of modulator chassis.
Output Meter cannot be set to red center line on two or more frequency ranges.	V-11 tube (type 955) in oscillator becoming weak.	Replace (see par. IV, 2, b).
Output Meter cannot be set to red center line on *one* range only.	Coil or resistor on that range open.	Replace (see par. IV, 2, c).
Ring Fiducial turns loosely without affecting Output Meter indication.	Ring Fiducial cable broken.	Replace (see par. IV, 2, e).
Microvolt Dial turns loosely without controlling carrier output voltage.	Microvolt Dial cable broken.	Replace (see par. IV, 2, e).

2. CARRIER OUTPUT FAILURES.

a. HOW TO ANALYZE.

(1) When the Output Meter reads about midway between left and center marks on meter scale and will not respond to adjustments of the Ring Fiducial:

(a) Test all ranges, using method described in Section II, 2. If *some* ranges are normal, note those that cause no Output Meter response when the Ring Fiducial is turned and refer to par. IV, 2, c, for Oscillator Coil Repairs.

(b) If the Output Meter remains fixed on *all* ranges when turning the Ring Fiducial, turn the "Ext. Pulse" knob on and off. If no change occurs in the Output Meter, try applying 400 cycle modulation until the Per Cent Modulation meter reads 20% and again turn the "Ext. Pulse" knob to both positions. If a drop occurs in the Per Cent Modulation Meter when the "Ext. Pulse" knob is "off" it is best to assume that the carrier oscillator is working. In this event, remove the Model 80 from its case (see par. IV, 1, d) and remove the type 6SL7-GT tube, V-9 (see Figure 3-5). If the Output Meter returns to the red center mark, the trouble will be found in the Barretter Bridge circuit. If the Output Meter does not return to center, an unbalanced condition in the circuit of V-10 is indicated. In that case the Output Meter will center when V-10 is removed. Select a new 6SN7-GT tube which will bring the Output Meter needle close to the red center mark. It will probably be necessary to make a slight correction in R21, the "Output Meter Zero" adjustment, in order to center the Output Meter. This control is accessible through a hole in the rear of the Modulation & Power Supply chassis. Return V-9 to its socket. An Output Meter deflection should occur when V-9 is touched, due to hum pickup. This shows the tube to be operating and the tube shield may be replaced.

(2) When the Output Meter remains off-scale:

(a) If the Output Meter remains off-scale to the *right* the Measuring Bolometer may be open. An off-scale reading to the *left* may indicate an open Compensating Bolometer. These Bolometer Assemblies are shown in Figure 3-2.

(b) To uncover the Measuring Bolometer (shown in Figure 3-2) it is necessary to remove the coil disc, the barretter cable clamp, four screws on the top plate and four screws on each end plate of the Measuring Barretter Assembly.

NOTE

Do not attempt to check the bolometer elements with an ohmmeter. The ohmmeter current may be sufficient to burn out the element.

(c) When ordering Barretter Assembly ♯80-OH2 (for the Measuring Bolometer) or Dummy Barretter Assembly ♯80-OH1 (for the Compensating Bolometer), specify the color coding of the old bolometer.

(d) To keep the Model 80 in operation until a replacement Bolometer can be obtained, use the undamaged bolometer as the Measuring Bolometer and connect a 500 ohm wire-wound variable resistor between the "high" terminal of the Compensating Bolometer and ground (see Figure 3-2). Some external means of measuring carrier output must be available (see IV, 2, d). The output dial should be set to 50K, then adjust the Ring Fiducial until an output of .05 volts (50K microvolts) is obtained. Set the Output Meter to the red center line by adjusting the temporary 500 ohm rheostat. Under constant temperature conditions the Model 80 metering system will now be fairly reliable.

(3) When Carrier Output Meter and Modulation Meter readings appear normal, but no carrier output can be obtained:

(a) Check all cables and external equipment, preferably by substituting other equipment which is known to be in working order.

(b) Measure the resistance from center conductor of Output Jack to ground. This resistance will be zero, unless the attenuator coaxial line is broken, in which case it will be infinite.

(c) With the Carrier Output Cable disconnected from the Output Jack, set the Microvolt Dial to 100K and tune the carrier slowly between 340 and 350 megacycles on the "F" band. At some point a "dip" in the Output Meter should occur. At this point, shorting the Output Jack should cause a considerable rise in the Output Meter reading. This phenomenon may be accepted as proof that the attenuator line is not shorted internally and further investigation of the carrier output connections should be made.

b. CARRIER OSCILLATOR REPAIRS.

(1) To Replace Carrier Oscillator Tube, V-11 (type 955): If the analysis of Section IV, 2, a, indicates a defective 955 tube it will be necessary to remove the oscillator shields, coil disc, etc., in order to replace this tube. The following procedure should be adhered to, referring to Figures 3-1 and 3-2 to identify the various parts:

(a) Remove the Model 80 from its case, as in Section IV, 1, d, and leave it in panel-down position.

(b) Unlatch the three shield clamps and twist off outer and inner shield cans.

CAUTION

Tools must never be used to pry off the oscillator shield cans. Slight dents in these shields may cause serious leakage of the carrier.

(c) Remove lower screw from roller spring and retract upper screw about ¼". Remove roller from spring and push spring up to clear the coil disc.

(d) Rotate the coil disc so as to place the detent roller midway *between* two detents.

(e) Grip the coil disc firmly with one hand while removing the 1" nut with a 1" flat wrench. Do not allow the disc to slip, or damage to the coil contacts may result.

(f) While clearing the detent roller, carefully lift off the coil disc assembly from its hub.

(g) Withdraw the cathode connector from cathode pin of V-11. Pull straight out without twisting, to avoid spreading the sleeve.

(h) Remove the 955 tube with a sharp counterclockwise twist.

(i) Insert a new 955 tube, carefully aligning the pins before easing them into their contacts with a clockwise twist. A screw driver should be applied to the upper right-hand pin to assist in seating it properly into the contacts. Pinch the cathode sleeve slightly and replace it on the vacant pin.

(j) Retract the detent roller, making sure that its spring is engaged. Then lower the coil disc in proper position to engage the flatted portion of its hub. Release detent roller against edge of coil disc and rock disc until it seats completely against its supporting bushing.

(k) Replace 1" nut and tighten firmly.

(l) Replace contact roller, insert lower screw in roller spring and tighten both screws.

(m) Before rotating the coil disc, check the alignment of the three coil contacts with their respective contact posts on the condenser assembly. Misalignment of these coil contacts will damage them seriously and is due to improper seating of the disc on its bushing.

(n) Check the oscillator performance on all ranges, using the method in Section II, 2.

NOTE

An oscillator trimmer adjustment is provided on all Model 80's after Serial ♯200. This trimmer compensates for frequency errors which may occur after changing the oscillator tube, V-11 (type 955). An external crystal calibrator generating one or more accurate frequencies within the range of 300 to 400 megacycles must be available. Set the Model 80 frequency dial to read the standard frequency (on the "F" range) then adjust the trimmer to zero beat against the standard by inserting a ¼" socket wrench through the coil disc hole provided for this calibration.

(o) Replace inner shield so that its grounding wiper lies opposite the coil disc contact roller. (On later models alignment marks are provided on both the inner and outer shield cans).

(p) Replace outer shield can. The three shield clamps have two locking slots, of which the one nearest the pivot is ordinarily used.

(q) Lower the case carefully into position, place Model 80 upright and replace the 14 panel screws.

c. OSCILLATOR COIL REPAIRS.

(1) To remove a defective oscillator coil it is not necessary to remove the coil disc assembly. Merely rotate the disc so that the defective coil can be reached with the fingers, then remove the two retaining screws in the disc above the coil. If repairs to the coil are attempted it is advisable not to disturb its position on the mount by loosening the two clamps, since the factory alignment of the coil will then be lost.

(2) In most cases a defect in any part of a coil assembly will require installation of a new assembly (see "Table of Replaceable Parts", Section V, for ordering data). Since the coils for "E" and "F" ranges are quite rugged, the following instructions will deal with "A" to "D" range coil replacements. An external output indicator is required when aligning the new oscillator coil with respect to the Output and Barretter coupling loops. The output indicator should be capable of a full scale reading with 0.1 rms. volts of R.F. output from the Model 80. It need not be accurate in calibration, however, since a known reference voltage of 0.1 volts can be obtained from the "A" range of the Model 80 (or the "B" range, if the "A" coil is being replaced). Installation and alignment of the new coil assembly should proceed as follows:

(a) Connect the Model 80 to an output indicator (see IV, 2, d). The ♯80-ZH4 cable listed in Section I, 4, is suitable for this purpose.

(b) Note readings of the output indicator when tuning over the range adjacent to the defective one. Keep the Output Meter at the red line during this check. If there is an appreciable change in the indicator, a compromise reading must be selected as an output reference value.

(c) Remove the oscillator shields (see Section IV, 2, b), and detach the defective coil assembly from the coil disc by removing the two retaining screws in the disc.

(d) Install new coil assembly and tighten screws. Make certain that coil leads are not lying against metallic parts of the coil bracket.

(e) Switch the new coil into operating position and set the Output Meter to center line. The output indicator should now show the same reference value as was obtained in step (b). In most cases the output from a new coil will be low. To increase the output it will be necessary to loosen the two screws on the coil mounting clips and make a very small adjustment of the coil by pushing it *away* from the coil disc and towards the front panel. A small offset-head screw driver will enable the screws to be released and tightened without having to remove the coil assembly for each adjustment. When the coil is adjusted *toward* the front panel, carrier output is *increased* while the Output Meter reading is *decreased.* Then when the meter is again brought up to the red mark an additional increase in output occurs. Since the effect of coil adjustments on carrier output is therefore magnified, the alignment process is critical.

(f) If the available movement of the Ring Fiducial is not sufficient to bring the Output Meter to center, first make certain that the 100K mark on the Output Dial is opposite the white line on the Output Ring Fiducial (not the "pad" mark). Check the Output Meter centering on other ranges and, if these are normal, repeat the adjustments in step (e).

d. BARRETTER BRIDGE RECALIBRATION.

Once the output accuracy of the Model 80 has been lost, due to bolometer replacement or other causes, it will be necessary to re-standardize the metering system by readjusting the Output Meter Calibration, R5, using some type of external standard. One of the following methods may be used:

(1) A high-frequency Barretter Bridge, with 50 ohms input impedance. This type of output indicator is used for the initial factory calibration of the Model 80.

(2) If another standard signal generator having accurate output metering is available (such as the Measurements Corp. Model 65-B, 75 or 84) any vacuum tube voltmeter capable of full scale indication with 0.1 rms. volts may be used for comparison of the standard generator with the Model 80 requiring recalibration.

(3) Fairly good standardization may be effected with a vacuum tube voltmeter having reliable calibration. A carrier frequency from 2 to 10 megacycles should be employed, with reasonably short connecting leads.

(4) The Output Meter Calibration is located on the side of the Modulator and Power Supply chassis adjacent to the carrier oscillator assembly (see Figure 3-1). To adjust this potentiometer, first set 50K on the Microvolt Dial to the Ring Fiducial mark. Then adjust the Ring Fiducial until a carrier output of exactly 50K microvolts (.05 volts) is indicated by one of the methods described above. Unscrew the cap nut on the Output Meter Calibration, R5, and set this screw driver adjustment so that the Output Meter pointer is on the red center line. Recheck this calibration at various frequencies within the range of the equipment and make a compromise adjustment of R5, if necessary. It should not be difficult to obtain carrier output levels from the Model 80 which are uniform within plus or minus 5%, unless the measuring equipment is unreliable.

3. MODULATION FAILURES.

a. PER CENT MODULATION METER SHOWS A READING WHEN MODULATION SELECTOR SWITCH IS "OFF": This may be due to a filament-cathode short in V-11, the type 955 carrier oscillator tube. If so, the Modulation will return to zero when the "Ext. Pulse" knob is "on" (clockwise). See Section IV, 2, (b), (1), for V-11 replacement technique.

b. PER CENT MODULATION METER INCORRECT OR INOPERATIVE:

(1) Be sure the "Modulation Selector" switch is at 400 or 1000 and the "Ext. Pulse" knob at "Off" (counter-clockwise). If no % Modulation Meter deflection is obtained when the modulation control is advanced, note whether the Output Meter moves to the right with increased modulation. If it does, the modulator itself is probably normal. Replace V-9 (see Figure 3-4) with a new type 6SN7-GT tube. If there is no improvement, be sure to restore the original tube to the V-9 socket.

(2) If a new V-9 tube is necessary, the new tube will require aging for about eight hours to stabilize its emission before checking the % Modulation Meter Calibration as follows:

(a) Connect high resistance a.c. and d.c. voltmeter between C5 and chassis (see Figure 3-1).

(b) Multiply the value of d.c. plate voltage obtained by the factor 0.212 and adjust the % Modulation Control until this value is obtained on the a.c. (rms. type) voltmeter.

(c) If the % Modulation Meter reads *more* than 30%, adjust R41, the "% Mod. Cal." (shown in Figure 2-2) until the meter reads slightly *less* than 30%. If

the new tube causes a *low* reading, R41 should be adjusted for a *high* reading. In either case the % Modulation Meter zero must be reestablished by switching the Modulation Selector to "Off" and setting the % Modulation Meter to zero by means of R43, the "% Mod. Zero Set."

c. TO REMOVE MODULATOR AND POWER SUPPLY COVER.—Two thin strips of phenolic on the Modulator and Power Supply Cover serve to guard the attenuator cable against chafing. A guard bracket is also mounted on this cover and must be removed when the cover is taken off. Time will be saved if the following procedure is employed:

(a) Remove guard bracket (secured by two screws).

(b) Remove line cord clamp, (one screw) to free one end of outer guard strip.

(c) Remove screw securing one end of inner guard strip.

(d) Remove seven remaining cover screws and lift off cover.

d. TO REPLACE MODULATOR AND POWER COVER:

(a) First replace the screw and lockwasher which will later be covered by the guard strips.

(b) Replace guard bracket, using 5/16" screw in rear and ¼" screw in front hole, with lockwashers on both. The shielded attenuator cable must be inserted between the two guard strips so as to slide freely when the Carrier Output Dial is rotated.

(c) Screw down inner and outer guard strips, replacing cable clamp under screw which secures the outer strip. Allow the strain relief grommet on the line cord to come between the clamp and the front panel with a slight loop to relieve strain on the power switch terminals.

(d) Replace seven remaining screws, with their lockwashers, and tighten all screws.

4. DIAL LAMP REPLACEMENT.

a. CARRIER FREQUENCY DIAL LAMP FAILURE. If the Carrier Frequency Dial will not light up after turning on the power switch, check the operation of the Model 80 as in Section II, 2. If everything else is normal it will be necessary to remove the Dial Cover (see Figure 3-3) in order to replace the dial lamp. Proceed as follows:

(1) Select the "A" range, then remove the Range Knob, after loosening its two #10 Allen set-screws. A #10 Allen wrench is attached to the rear of the Modulator Cover.

(2) Loosen two slotted set-screws in Vernier Frequency Knob and remove knob.

(3) Remove four screws at corners of Dial Cover and lift off cover.

CAUTION

Exposed portions of the calibrated Carrier Frequency Dial *must* be protected against handling. No liquids should be used for cleaning this dial.

(4) Remove bayonet base 6 volt dial lamp and replace with a G.E. #51 lamp, or equivalent.

(5) Loosen ¼" nut securing dial light bracket and adjust bracket so that lamp filament is aligned with the hairline on the plastic fiducial, with the bulb in contact with the fiducial.

(6) With dial cover held in place, the "A" range should have sufficient illumination. Before tightening the dial cover screws, adjust dial cover so that Vernier Dial just clears its phenolic fiducial and rotates freely.

(7) Replace Range and Vernier Frequency knobs and tighten their set-screws.

5. TO REPLACE DIAL CABLES.

The Barretter Tube and Attenuator Tube (shown in Figure 3-6) are moved in and out of the fixed Outer Tube by means of two separate cables which are looped around pulleys. These pulleys may be independently rotated by the Microvolt Dial and the Ring Fiducial, to which they are attached. If either of these cables breaks in service, new cable material should be ordered from the Measurements Corp., (two feet of Dial Cable, per Meas. Drg. #A-711). Before installation, the cable must be pre-stretched for eight hours by suspension from a clamp, with a weight attached to the free end by means of another clamp. The total suspended weight should be about twelve pounds, including the weight of the clamp. Apply weight gradually, to avoid damaging the cable.

(1) To replace either cable, first:

(a) Remove Model 80 from case. (See IV, 1, d).

(b) Remove Oscillator Inner and Outer Shield Cans.

(c) Support Model 80 upside-down on bench and remove cover from Modulator and Power Supply unit. (See IV, 3, c).

(2) To replace Microvolt Dial cable (shown in Figure 3-6):

(a) Unsolder end of broken dial cable nearest Output Jack.

(b) Apply heat to point on pulley where cable is secured and remove cable from pulley. Wipe pulley clean of excess solder.

(c) Withdraw the Attenuator Tube (see Figure 3-6) until end of cable is accessible; heat guide rod at point where cable is inserted and pull cable gently out of hole.

(d) Cut off 9 inches of pre-stretched dial cable. Tin one end with solder for about one-half inch. Feed cable through hole in guide rod while applying heat; withdraw cable until tinned part can be seen, then feed it back again so that no tinned portion protrudes from the hole. *No solder should remain on flexed portions of dial cable or breakage will occur when cable is flexed in service.*

(e) The Microvolt Dial cable must be looped once around its pulley and stretched to a tension of seven pounds, as measured with a spring scale, before soldering the end nearest the Output Jack. After cooling, test for tension and trim off excess cable.

(f) Observe the open end of the Outer Tube near the Variable Condenser Assembly (see Figure 3-2). Rotate the Ring Fiducial clockwise to bring the Barretter Tube in toward the Oscillator Coils. Loosen the two set screws in the Microvolt Dial and push the Attenuator Tube in carefully by hand until the Attenuator Loop (a straight piece of 1/16" diameter wire across the end of the Attenuator tube) is *exactly* in line with the Barretter Loop. They should appear as one continuous line.

CAUTION

The Barretter and Attenuator Loops must never be allowed to come in contact with an Oscillator Coil when making hand adjustments of these tubes.

(g) While holding the two loops in alignment, turn the Microvolt Dial clockwise to the stop at 100K and tighten its two set screws.

(h) Test the operation of the Microvolt Dial and replace Oscillator Shields, Modulator Cover and Case.

(3) To replace the Ring Fiducial Cable (shown in Figure 3-6):

(a) Unsolder end of broken dial cable nearest Output Jack.

(b) Apply heat to point on pulley where cable is secured and remove cable from pulley. Wipe pulley clean of excess solder.

(c) Withdraw the Barretter Tube until two screws which secure plug in end of tube can be removed; withdraw plug and unsolder cable where it enters slot in plug.

(d) Cut off a 15" length of *pre-stretched* dial cable. Tin one end with solder for about one-half inch. Feed cable into slot in plug while applying heat. Allow plug to cool, then trim off excess cable and replace plug with its two screws.

(e) Observe the open end of the Outer Tube near the Variable Condenser Assembly (see Figure 3-2), while carefully pushing the Barretter Tube by hand toward the Oscillator Assembly. The Barretter Loop (a straight portion of 1/16" diameter wire) will appear in end of the Outer Tube.

CAUTION

The Barretter and Attenuator Loops must never be allowed to come in contact with an Oscillator Coil when making hand adjustments of these tubes.

(f) Select the "A" carrier frequency band and carefully adjust the Barretter Tube until there is about 1/32" of clearance between the Barretter Loop and the "A" band coil.

(g) Turn the Ring Fiducial clockwise to the stop.

(h) Loop the dial cable twice around the Ring Fiducial pulley and pull to a tension of seven pounds, while soldering the free end. Be careful not to disturb the position of the Barretter Tube or Ring Fiducial during this operation.

(i) Replace the Shield Cans, Modulator Cover and Case.

NOTICE!

SEE SECTION V-a, SUPPLEMENT FOR CHANGES IN: C6, C24, C34, L6-E, L6-F, R9-B, R9-C, R9-E, R30, R32, R35, R36, R38, R46.

SECTION V

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
C1		CAPACITOR: approx. 1500 mmf. mica, impregnated with mineral oil; +20%—10% (Part of Osc. Ass.)	R.F. by-pass in Barretter Bridge circuit.	MEAS. CORP.	Dwg. #Q154-B
C2		CAPACITOR: Same as C1	Same as C1.	MEAS. CORP.	Dwg. #Q1
C3		CAPACITOR: Same as C1	Same as C1.	MEAS. CORP.	Dwg. #Q154
C4		CAPACITOR: approx. 10,000 mmf. mica, (Part of Osc. Ass.)	Same as C1.	MEAS. CORP.	Dwg. #80-K2
C5		CAPACITOR: Same as C1	R.F. by-pass in Carrier Oscillator plate supply	MEAS. CORP.	
C6		CAPACITOR: approx. 3,000 mmf. mica, impregnated with mineral oil; +20%—10%, made from two 80-Q154-B buttons	Same as C5.	MEAS. CORP.	Dwg. #Q154-B
C7		CAPACITOR: approx. 50 mmf. mica, impregnated with mineral oil; +10%(Part of Osc. Ass.)	Same as C5.	MEAS. CORP.	Dwg. #Q156-B
C8		CAPACITOR: approx. 100 mmf. mica, impregnated with mineral oil; +20%—10% (Part of Osc. Ass.)	Same as C5.	MEAS. CORP.	Dwg. #Q155-C
C9		CAPACITOR: Same as C8	Same as C5.	MEAS. CORP.	Dwg. #Q155-C
C10		CAPACITOR: approx. 50 mmf. mica, impregnated with mineral oil; ±10% (Part of Osc. Ass.)	Same as C5.	MEAS. CORP.	Dwg. #Q156-B
C11		CAPACITOR: Same as C10	Isolates oscillator grid from D.C. plate supply.	MEAS. CORP.	Dwg. #Q156
C12		VARIABLE CONDENSER: 5-55 mmf. (See Variable Condenser Assembly)	Carrier Oscillator variable tank circuit capacity.	MEAS. CORP.	Dwg. #80-RH13-C
C13		CAPACITOR: approx. 1500 mmf. mica, impregnated with mineral oil; +20%—10% (Part of Osc. Ass.)	R.F. by-pass in Carrier Oscillator filament circuit.	MEAS. CORP.	Dwg. #Q154-B
C14		CAPACITOR: Same as C13	Same as C13.	MEAS. CORP.	Dwg. #Q154
C15		CAPACITOR: Same as C13	Same as C13.	MEAS. CORP.	Dwg. #Q154

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
C16		CAPACITOR: approx. 3,000 mmf. mica, impregnated with mineral oil: +20%—10%, made from two #80-Q154-B buttons	Same as C13.	MEAS. CORP.	Dwg. #Q154-B
C17		CAPACITOR: .25 mfd. 10% 600 v.d.c.	By-passes portion of V-9 plate load.	Solar XTIMW	
C18		CAPACITOR: 0.1 mfd. 10% 600 v.d.c.	Couples input plate of V-9 to output grid.	Solar XTIM	
C19		CAPACITOR: .25 mfd. 10% 600 v.d.c.	Couples output plate of V-9 to grids of V-10.	Solar XTIMW	
C20		CAPACITOR: 1000 mmf. 1% silver mica, 600 v.d.c.	Series capacitor in frequency determining network of sine-wave oscillator.	Erie J or Solar	
C21		CAPACITOR: 980 mmf. 1% silver mica, 600 v.d.c.	Shunt capacitor in frequency network of s-w osc.	Erie J or Solar	
C22		CAPACITOR: .25 mfd. 10% 600 v.d.c.	Screen by-pass for V-7.	Solar XTIMW	
C23		CAPACITOR: 0.1 mfd. 10% 600 v.d.c.	Couples V-7 to V-1.	Solar XTIM	
C24		FILTER CAPACITOR: 4 mfd., paper, —0%+40%, 350 d.c. working volts, one of four capacitors in Assembly 80-K1-E	Couples plate of V-1 to cathode of V-7 (for inverse feedback.)	MEAS. CORP.	Dwg. #80-K1-E
C25		CAPACITOR: 0.1 mfd. 10% 600 v.d.c.	Couples "Ext." jack to modulation selector switch.	Solar XTIM	
C26		CAPACITOR: Same as C25	Couples V-8 to V-2.		
C27		CAPACITOR: .25 mfd. 10% 600 v.d.c.	Couples V-2 to V-8 diode.	Solar XTIMW	
C28		FILTER CAPACITOR: Same as C24	Plate supply by-pass.	MEAS. CORP.	Dwg. #80-K1-E
C29		FILTER CAPACITOR: Same as C24	Same as C28.	MEAS. CORP.	Dwg. #80-K1-E
C30		FILTER CAPACITOR: Same as C24	Same as C28.	MEAS. CORP.	Dwg. #80-K1-E
C31		CAPACITOR: .01 mfd. 20%	Same as C13.	Micamold W or Solar	

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
C32		CAPACITOR: Same as C31	Same as C13.	Micamold W or Solar	
L1		R.F. CHOKE: 78 "pi" wound turns of #36 S.V.C. Anaconda single vitrotex covered wire on 3/8 ID x 7/16 OD coil form, Stevens Grade Stone Paper Tube, equipped with one Zierick #202 lug and one Zierick #11A-6 lug.	R.F. Choke in barretter bridge circuit.	MEAS. CORP.	Dwg. #80-C10
L2		R.F. CHOKE: 45 turns of #36 S.V.C. Anaconda single vitrotex covered copper wire on 1/4 OD bakelite nat. or black Grade LE coil form, lead length - 1" Made from three Meas. 80-C9 chokes in series.	R.F. Choke in barretter bridge circuit.	MEAS. CORP.	Dwg. #80-C9
L3		R.F. CHOKE: Same as L1	R.F. Choke in Oscillator plate circuit.	MEAS. CORP.	Dwg. #80-C10
L4		R.F. CHOKE: 30 "pi" wound turns of #36 S.V.C. Anaconda single vitrotex covered wire on 3/8 ID x 7/16 OD coil form, Stevens Grade Stone Paper Tube, equipped with one Zierick #11A-6 lug.	R.F. Choke in Oscillator plate circuit.	MEAS. CORP.	Dwg. #80-C11
L5		R.F. CHOKE: Same as L2	R.F. Choke in Oscillator plate circuit.	MEAS. CORP.	Dwg. #80-L2
L6-A		R.F. COIL ASSEMBLY: consisting of one "A" Coil Assembly #C-18-B; one Coil Support Assembly #80-RH11; two Coil Mounting Brackets #80-R64; Two 4-40 x 1/4" screws. Range: 2-5 mcs., Matching instructions: 1.95 mcs. at 55 mmfd., Part of 80-C2 assembly.	"A" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg #80-C2-C
L6-B		R.F. COIL ASSEMBLY: consisting of one "B" Coil Assembly #C-12; one Coil Support #80-R12; three contacts #80-R15; one resistor, Spear type SI-1/2 1000 ohms, 1/2 watt, ±10%; one 4-40 x 3/16" hex nut; two 4-40 x 1/2" nickel plated machine screws; two Q-96 washers; three eyelets, Stimson type A564, silver plated, Range: 5-13 mcs., Matching instructions: 4.75 mcs. at 55 mmfd., Part of 80-C3 assembly.	"B" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg. #80-C3-D
L6-C		R.F. COIL ASSEMBLY: consisting of one "C" Coil Assembly #C-13; one Coil Support Assembly #80-RH14; two Coil Mounting Brackets #80-R64; one resistor, Speer type SI-1/2 500 ohms, 1/2 watt, ±10%; two 4-40 x 1/4" nickel plated screws, Range: 13-33 mcs. Matching instructions: 11.9 mcs. at 55 mmfd., Part of 80-C4 assembly.	"C" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg. #80-C4-D

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
L6-D		R.F. COIL ASSEMBLY: consisting of one "D" Coil Assembly #C-14-C; two Coil Mounting Brackets #80-R64; one Coil Support Assembly #80-RH14; one resistor, Speer type SI-½, 10,000 ohms ±10%, ½ watt; two screws - 4-40 x ¼" nickel plated, Range: 30-80 mcs., Matching instructions: 29 mcs. at 55 mmfd., Part of 80-C5 assembly.	"D" Bank R.F. tank circuit inductance.	MEAS. CORP.	Dwg. #80-C5-D
L6-E		R.F. COIL ASSEMBLY: consisting of one "E" Coil Assembly #80-C15-B; one Coil Support Assembly #80-RH11; one resistor, Epeer type SI-½, 1000 ohms,, ½ watt, ±10%, Range: 80-210 mcs., Matching instructions: 76 mcs. at 55 mmfd., Part of 80-C6 assembly.	"E" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg. #80-C6-C
L6-F		R.F. COIL ASSEMBLY: consisting of one "F" Oscillator Inductance; one Coil Support Assembly #80-RH11; one resistor, Speer type SI-½, 1000 ohms, ½ watt, ±10%, Range: 210-400 mcs., Matching instructions: 140 mcs. at 55 mmfd., Part of 80-C7 assembly.	"F" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg. #80-C7-D
L7		R.F. CHOKE: .01 m.h., consisting of 6 "pi" sections of #16 enameled copper wire in series, 107" total, 25/32" O.D., 9/32" ID. in paper tube ⅞" O.D. x 1¼" long.	Oscillator filament choke.	Fast #P32212 or #A-6150	
L8		R.F. CHOKE: Same as L7	Oscillator filament choke.	Fast #P32212 or #A-6150	
L9		R.F. CHOKE: 55 turns of #22 double silk covered wire, brush completed coil with Amphenol liquid #912-A		MEAS. CORP.	Dwg. #80-C8
L10		MODULATION CHOKE: 10 henry, 460 ohms maximum D.C. resistance, .065 amperes, Core: ⅝" tongue, ⅜" x 2-⅜" window, two "E" lamination with joint in center of coil, material #26 gauge .86" silicon steel, .010" air gap. Winding: 4,600 turns of #33 enameled copper wire on form ⅝" x 1-⅛" x2-⅝" form.	Inductive load for plate of V-2 (modulation output tube)	Red Arrow Spec. #261 per Meas.	Dwg. #80-L2
L11		POWER FILTER CHOKE: 10 henry, 200 ohms maximum D.C. resistance, 0.110 amperes maximum D.C. current. Core: ⅝" tongue, ⅜" x 2-3⅜" window, two "E" laminations with joint in center of coil, material #26 gauge .86" silicon steel, .010 air gap. Winding: 3300 turns of #30 enameled copper wire on form ⅝" x 1-⅞" x 2-5/16".	Filter chokes for high voltage plate supply.	Red Arrow Spec. #262 per Meas.	Dwg. #80-L2-G

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
T-1		TRANSFORMER: Power; potted with Robertson #366 compound; core — 1-⅛" wide tongue, ⅝" x 2-¾" window, 26 gauge silicon steel. Primary: 117 volts, 500 turns of #23 enameled copper wire, insul. test 1500 volts, color black. Secondary: 6.3 volts, 0.3 amperes, 28 turns of #26 enameled copper wire, insul. test 1500 volts, color yellow. Secondary: 6.3 volts, 4 amperes, 29 turns of #17 enameled wire, paper insul. test 1500 volts, no color. Secondary: 0.2 volts, 0.1 amperes, 1 turn of #22 stranded copper wire, insul. test 1500 volts, color green. Secondary: 5.0 volts, 2.0 amperes, 23 turns of #17 enameled copper wire, paper insul., test 1500 volts, no color. Secondary: 306-0-306 volt, 0.1 amperes, 2800 turns of #31 enameled copper wire tapped at 1400 turns, test 2000 volts, color red-black-red. Dimensions: case 4" high, 3¼" wide, 4¼" deep, mounting hole 2.812" x 3.875".	Supplies one 6.3 volt circuit, one 2.5 volt circuit, one 0.2 volt circuit, one five volt circuit, one 612 volt center tapped circuit.	Red Arrow Spec. #250 per Meas.	Dwg. #80-L1
M1		OUTPUT METER: 4-17/64" x 3.956" black bakelite case with sensitivity of 100-0-100 microamperes ±5%, resistance approx. 400 ohms, accurate to 5% of full scale, special scale	Indicates balance of barretter bridge circuit.	MEAS. CORP.	Dwg. #80-A3
M2		MODULATION METER: 4-17/64" x 3.956" black bakelite case, special scale, 400 ohms resistance, accuracy 5% of full scale,	Indicates Per Cent Modulation.	MEAS. CORP.	Dwg. #80-A4
R1		RESISTOR: 12.6 ohm, ±10%	Part of voltage divider supplying barretter bridge.	Speer SN½	
R-2		RESISTOR: 7 ohm, ±10%	Same as R1.	Speer SN½	
R3		RESISTOR: 100 ohm, 5%, manganin wirewound (Modify per Q-163) Heat resistant lacquer and Inresco paper wrapping.	Part of temperature compensating arm of barretter bridge.	Inresco WL	
R4		RESISTOR: 1000 ohm 5%, manganin wirewound (Modify per Q-136) Heat resistant lacquer and Inresco paper wrapping.	Barretter Bridge ratio arm.	Inresco WL	
R5		POTENTIOMETER: 500 ohms, shaft ¼" dia., ½" long, slotted for scr. dr. adj., resistance curve-linear.	Barretter Bridge balance factory adjustment.	Wirt Company Type A	

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
R6		RESISTOR: 700 ohm, 5%, manganin wirewound (Modify per Q-163) Heat resistant lacquer and Inresco paper wrapping.	Barretter Bridge ratio arm.	Inresco WL	
R7		RESISTOR: 5 ohm, ±10%	Part of Barretter R.F. filter.	Speer SI½	
R8		RESTOR: 60 to 70 ohm, +0, —10%	Ground per Dwg. #80-OH2 for Barretter termination.	Speer SN½	
R9-B		RESISTOR: 1,000 ohms	"B" range output correction.	Speer SN½	
R9-C		RESISTOR: 500 ohms, ±10%, ½ watt, carbon	"C" range output correction.	Speer SN½	
R9-D		RESISTOR: 10,000 ohms, ±10%, ½ watt, carbon	"D" range output correction.	Speer SN½	
R9-E		RESISTOR: 1,000 ohms, ±10%, ½ watt, carbon	"E" range output correction.	Speer SN½	
R9-F		RESISTOR: 5,000 ohms, ±10%, ½ watt, carbon	"F" range output correction.	Speer SN½	
R10		RESISTOR: 20,000 ohm, ±10%	Oscillator grid return.	Speer SI½	
R11		RESISTOR: 200 ohm, 5%	Oscillator cathode resistor.	IRC BW½	
R12		RESISTOR: 50 ohm, ±10%	Part of Osc. plate filter.	Speer SI½	
R13		RESISTOR: 1,000 ohm, ±10%	Part of Pulse Mod. filter.	Speer SI½	
R14		RESISTOR: 700 ohm, ±10%	Part of Osc. Plate filter.	Speer SI½	
R15		RESISTOR: 100,000 ohm, ±10%	D.C. portion of V-9 plate load resistance.	Speer SI½	
R16		RESISTOR: 200,000 ohm, ±10%	A.C. portion of V-9 plate load resistance.	Speer SI½	

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
R17		RESISTOR: Same as R16	V-9 output section plate load resistance.	Speer SI½	
R18		RESISTOR: 2 megohm, ±10%	V-9 output section grid return resistor.	Speer SI½	
R19		RESISTOR: 2500 ohm 2%	V-10 input plate load.	Continental XI	
R20		RESISTOR: 200,000 ohm, ±10%	V-10 input grid return.	Speer SI½	
R21		POTENTIOMETER: 200 ohms, shaft ¼" dia., ½" long, slotted for scr. dr. adj., resistance curve-linear	Output meter zero adj.	Wirt Company Type A	
R22		RESISTOR: 2500 ohm, 2%	V-10 output plate load.	Continental XI	
R23		RESISTOR: 400,000 ohm, 2%	Series frequency determining resistor for s-w. osc.	Continental XI	
R24		RESISTOR: Same as R23	Shunt frequency determining resistor for s-w, osc.	Continental XI	
R25		RESISTOR: 265,000 ohm, 2%	Shunts R23 for 1000 cycle s-w, modulation.	Continental XI	
R26		RESISTOR: Same as R25	Shunts R24 for 1000 cycle s-w. modulation.	Continental XI	
R27		RESISTOR: 500,000 ohm, ±10%	Screen resistor for V-7.	Speer SI½	
R28		RESISTOR: 10,000 ohm, 10 watt, wirewound complete with 6-32 x 2½" RHBMS, 2 centering & 2 asbestos washers, 1 #6 split lockwashers.	V-1 plate load resistor.	Wirt	

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
R29		RESISTOR: 500,000 ohm, ±10%	V-1 grid return.	Speer SI½	
R30		RESISTOR: 700 ohm, ±10%	V-1 cathode resistor.	Speer SI2	
R31		RESISTOR: 3000 ohm 2%	Sine-wave osc. feedback.	Continental XI	
R32		RESISTOR: 50,000 ohm, ±10%	V-8 output plate load.	Speer SI½	
R33		POTENTIOMETER: 100K ohms, shaft ½ OD +.000-.002, rotation-310°, Audo Grid Potentiometer Resistance - 100,000 ohms, Resistance Curve - Centralab #6	Modulation gain control.	Centralab	
R34		RESISTOR: 3000 ohm, ±10%	V-8 output cathode resistor.	Speer SI½	
R35		Eliminated	Eliminated		
R36		RESISTOR: 200,000 ohm, ±10%	Modulator feedback resistor.	Speer SI½	
R37		RESISTOR: 500,000 ohm, ±10%	V-2 grid return.	Speer SI½	
R38		RESISTOR: 700 ohm, ±10%	V-2 cathode resistor.	Speer SI2	
R39		RESISTOR: 50,000 ohm, 2%	V-8 diode input Divider.	Contental SI	
R40		RESISTOR: 27,000 ohm, 2%	V-8 diode input Divider.	Contental SI	
R41		POTENTIOMETER: 10,000 ohms, shaft ¼" dia., ½" long, slotted for scr. dr. adj., resistance curve-linear.	Per Cent Modulation factory calibration.	Wirt Company Type A	
R42		RESISTOR: 100,000 ohm, 2%	Supplies positive balancing voltage to Mod. Meter.	Continental XI	

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
R43		POTENTIOMETER: 200 ohm, shaft ¼" dia., ½" long, slotted for scr. dr. adj., resistance curve-linear.	Mod. zero set control.	Wirt Company Type A	
R44		RESISTOR: 2000 ohm, 20 watt, wirewound complete with 6-32 2½" RHBMS, 2 centering & 2 asbestos washers, 1 #6 split lockwashers.	Current limiting resistor for V-14 and V-16.	Wirt Co.	
R45		RESISTOR: 100,000 ohms, ±10%, ½watt, carbon.	V-7 plate load resistor.	Speer Sl½	
		BARRETTER ASSEMBLY: consisting of one Barretter Block, part 1 of #80-053; one Barretter Block, part 2 of #80-053; one Holding Plate for R.F. Condenser #80-054; one Resistor Grounding Plate #80-055; one Cable Support #80-059; one Bolometer #Q-122; one Resistor #SN½ mfg. by Speer, value 60 to 70 ohms determined by test; one R.F. Condenser #80-K2; 16 inches of Coaxial Cable #Q-141-2; two Screws #6-32 x ⅝" BH. BMS. nickel plated; ten Screws #3-48 x ½" RH. BMS. nickel plated.	Used in Output Meter Bridge Circuit as an indicator of R.F. current.	MEAS. CORP.	Dwg. #80-OH 2-E
		DUMMY BARRETTER ASSEMBLY: consisting of one Bolometer #Q-122; one Cover #80-072; one Terminal Strip #1513 mfg by Cinch; one Eyelet #A557 nickel plated mfg. by Stimson; two inches of Lenzite #22 stranded, green; ¾" #39 bare copper wire, tinned.	Balances out temperature variations in Output Metering Barretter.	MEAS. CORP.	Dwg. #80-OH1-F
		CARRIER OUTPUT DIAL: 2.75" O.D. x .064" thick (#14 B. & S.) nickel silver blank etched per #Q-113-B.	Indicates carrier output level.	MEAS. CORP.	Dwg. #Q113-B
		CARRIER FREQUENCY VERNIER DIAL: 2.75" O.D. x .064" (#14 B. & S.) thick, nickel silver blanks, frosted chrome finish, etched per #Q-114-B.	Selects small frequency increments on either side of desired carrier frequency.	MEAS. CORP	Dwg. #Q114-B
		BOLOMETER: selected by Measurements Corp. for each instrument. Consists of .0001" platinum filament in evacuated glass envelope about 2" long by 5/16" in diameter. Resistance—200 ohms ±25% at 0.5 milliamperes. Resistance coefficient—4 microwatts per 1% change in current, or more. Maximum current rating—1.2 milliamperes.	Used in Barretter and Dummy Barretter Assemblies as indicator of R.F. current by virtue of its positive resistance vs. current characteristic.	MEAS. CORP.	Dwg. #Q122-B

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
		ASSEMBLY, OSCILLATOR VARIABLE CONDENSER: composed of one Stator Unit Assembly #80-RH10-1; one Stator Unit Assembly #80-RH10-2; one Rotor Assembly #80-RH7; one Condenser End Plate #80-R59; one Condenser End Plate #80-R62; one Condenser Post #S-26-1; one Condenser Post #S-26-2; one Condenser Post Assembly #80-RH6; one Dial Shaft Assembly #S-29; one standard .125" diameter polished steel ball; one standard .093" diameter polished steel ball; one Condenser Adjusting Screw Bearing #S-21-1; one nut #S-241-1; one Condenser Post #S-3-4; one Contact Block Assembly #80-RH5; one Contact Insulator #80-R23; two spacers #S-22-2; two Screws #3-48 x ½ RD. HBM. C1. 2.	Variable tuning capacity in carrier oscillator tank circuit.	MEAS. CORP.	Dwg. #80-RH2-J
		ATTENUATOR ASSEMBLY: consisting of one Coaxial Cable #Q-141-2; one Attenuator Slide Tube Assembly #80-OH5; one Attenuator Inner Tube Assembly #80-OH7; one Mounting Bracket Assembly #80-OH3; One Barretter Shaft #S-60; one Pulley #80-02-2; one Pulley Hub #S-58; one Attenuator Control Shaft #80-056; six inches of Dial Cable #Q-137; one Attenuator Position Plate #80-062; one Detent Bracket #80-050; two Nuts #80-051; one Spacer #S-36-5; one Detent Block #80-052; one Detent Arm #80-065; one Detent Spring #80-R31; one Special Screw #S-73; two Screws #8-32 x ½" BH. BMS. nickel plated; two Screws #6-32 x 3/16" BH. BMS. black nickel plated; one Screw #6-32 ¾" BH. BMS., black, nickel plated; one Allen Set Screw #6-32 x ⅜" oval point, hollow head; one Pulley #80-021-1; two Ring Fiducial Stop Brackets #80-064; one Brass Pin 1/16 x ¾" long; one Attenuator Ring Fiducial Assembly #80-AH1; one Output Dial Assembly #80-RH2; one Coaxial Cable #80-OH2-9; one Panel #80-A1; one Roller Spring #80-070.	Adjustment of carrier output level.	MEAS. CORP.	Dwg. #80-OH6-L
		DIAL DRIVE MECHANISM ASSEMBLY: consisting of one Dial #80-D3; one Mask Hub #80-D4; one Mask #80-D5; one Dial Collar #80-D15; one stop pin #S-8-5; one Fiducial #80-D6; two Stop Pin Brackets #80-D11; one Dial Cover #80-D12; two Spacers #S-2-4; one Fiducial Spring #80-D7; one Dial Light Bulb, G.E. Type #51 for 6 volts, bayonet base; one Set Screw, Allen type 4-40 x 5/16" cup point; one Dial Light Socket, Drake type #706-C; one Set Screw, Allen type 10-32 x ⅝" cup point.	Includes Main Carrier Frequency Dial, Range Indicating Mask and other parts for coarse and fine tuning of the Carrier Oscillator.	MEAS. CORP.	Dwg #80-DH1-N
		PULSE MODULATION SWITCH: Centralab type #1460 modified per Meas. Drg. #80-R45-C.	Connects external pulse generator to plate circuit of Model 80 carrier oscillator for pulse modulation.	MEAS. CORP.	Dwg. #80-R45-C

SECTION V-a

TABLE OF REPLACEABLE PARTS-SUPPLEMENT

MODEL 80 SIGNAL GENERATOR — MAJOR UNIT

Reference Symbol	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPEC. NO
C6	CAPACITOR: approx. 1500 mmf. mica, impregnated with mineral oil; +20%-10% made from two 80-Q154-B buttons.	Same as C5.	MEAS. CORP.	Dwg.#Q154-B
C24	FILTER CAPACITOR: 4 mfd., paper-0%+40% 350 d.c. working volts, one of four capacitors in Assembly 80-K1-E.	Plate supply by-pass.	MEAS. CORP.	Dwg.#80-K1-E
C34	CAPACITOR: .25 mfd. 10%, 600 v.d.c.	Couples V-1 plate to V-7 cathode.	Solar XTIMW	
L6-E	R.F. COIL ASSEMBLY: consisting of one "E" Coil Assembly #80-C15-B; one Coil Support Assembly #80-RH11; one resistor Speer type, SI-½, 200 ohms, ½ watt, ±10%, Range: 80-210 mcs., Matching instructions: 76 mcs. at 55 mmfd. Part of 80-C6 assembly.	"E" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg.#80-C6-C
L6-F	R.F. COIL ASSEMBLY: consisting of one "F" Oscillator Inductance; one Coil Support Assembly #80-RH11; one resistor, Speer type, SI-½, 5000 ohms, ½ watt, ±10%, Range: 210-400 mcs., Matching Instructions: 140 mcs. at 55 mmfd., Part of 80-C7 assembly.	"F" Band R.F. tank circuit inductance.	MEAS. CORP.	Dwg.#80-C7-D
R9-B	RESISTOR: 1000 ohms. ELIMINATED			
R9-C	RESISTOR: 1000 ohms, ±10%, ½ watt	"C" range output correction.	Speer SN½	
R9-E	RESISTOR: 2000 ohms, ±10%, ½ watt carbon.	"E" range output correction.	Speer SN½	

SECTION V-a

TABLE OF REPLACEABLE PARTS-SUPPLEMENT

MODEL 80 SIGNAL GENERATOR MAJOR UNIT:

Reference Symbol	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPEC.NO.
R30	RESISTOR: 1000 ohms, ±10%.	V-1 cathode resistor	Speer SI2	
R32	RESISTOR: 100,000 ohms, ±10%.	V-8 output plate load.	Speer SI½	
R35	RESISTOR: 10,000 ohms, ±10%.	V-8 output cathode resistor.	Carbon 1w.	
R36	RESISTOR: 60,000 ohms, ±10%.	Modulator feedback resistor.	Speer SI½	
R38	RESISTOR: 1000 ohms, ±10%.	V-2 cathode resistor.	Speer SI2	
R46	RESISTOR: 1 megohm, ±10%.	V-8 grid resistor.	Speer SI½	
	ALL CHANGES SHOWN APPLY TO MODEL 80 SIGNAL GENERATORS WITH SERIAL NUMBERS ABOVE NUMBER 616.			

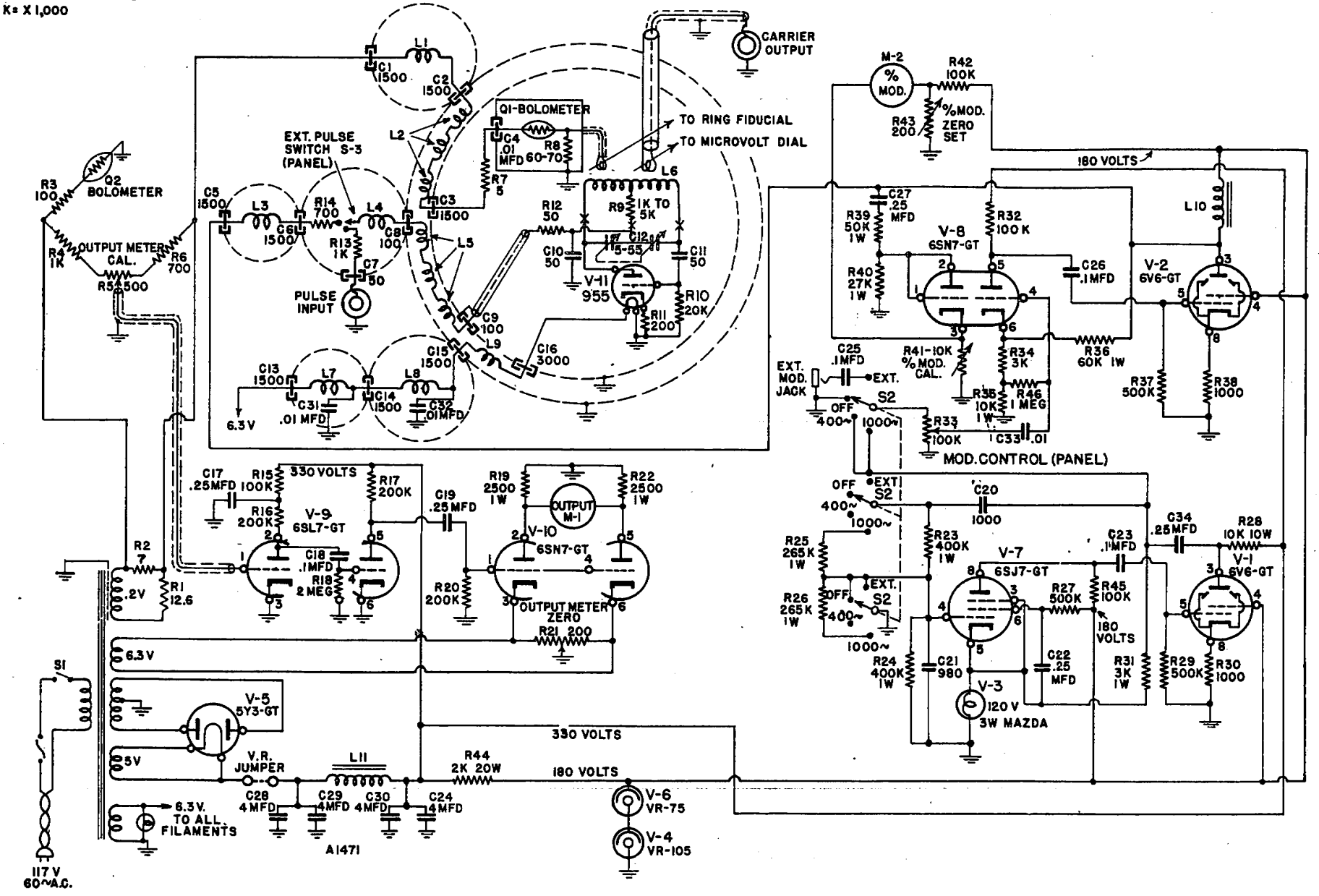


FIGURE 6-1—WIRING DIAGRAM

REVISED

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
		A.C. TOGGLE SWITCH: single-pole-double-throw. 3/8" shank, nickel plated.	Makes and breaks power transformer primary connection to power line.		
		MODULATION SELECTOR SWITCH: triple wafer type rotary, three sections with four contacts per section ganged on single shaft.	Selects external modulation or internal 400 or 1,000 cycle modulation and turns modulation off.	MEAS. CORP.	Dwg. #A-1100
		DIAL LIGHT: 6 volt bayonet base	Indicates power on and G.E. #51 illuminates carrier frequency dial.	GENERAL ELECTRIC CO.	#51
		RECEPTACLE: Navy type #49269 connector modified by Measurements Corp.	Carrier Output Jack.	MEAS. CORP.	Dwg. #80-03
		RECEPTACLE: Navy type #49194 connector modified by Measurements Corp.	Pulse Input Jack	MEAS. CORP.	Dwg. #80-061
		SET SCREW: Allen type #4, 4-40 x 5/16" cup point, hollow head.	Secures dial mask.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 1/8" cup point, hollow head.	Secures variable condenser gear.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 1/8" cup point, hollow head.	Used on Attenuator Inner Tube Assembly.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 1/8" cup point, hollow head.	Secures variable condenser gear.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 5/16" cup point, hollow head.	Used on Attenuator Slide Tube Assembly.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 5/16" cup point, hollow head.	Secures Attenuator Dial Indicator.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 5/16" cup point, hollow head.	Secures Attenuator Position Plate.	ALLEN MFG. CO.	

TABLE OF REPLACEABLE PARTS

MODEL 80 SIGNAL GENERATOR **MAJOR UNIT:**

Reference Symbol	Army Stock Number Navy Stock Number British Ref. Number	NAME OF PART and DESCRIPTION	FUNCTION	MFR. and DESIGNATION	DRAWING or SPECIFICATION NO.
		SET SCREW: Allen type #6, 6-32 x 5/16" cup point, hollow head.	Secures Attenuator Dial Indicator.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 3/8" oval point, hollow head.	Secures Ring Fiducial Stop Bracket.	ALLEN MFG. CO.	
		SET SCREW: Allen type #6, 6-32 x 3/8" oval point, hollow head.	Same as above.	ALLEN MFG. CO.	
		SET SCREW: Allen type #10, 10-32 x 1/8" cup point, hollow head.	Used on variable condenser Assembly.	ALLEN MFG. CO.	
		SET SCREW: Allen type #10, 10-32 x 1/8" cup point, hollow head.	Same as above.	ALLEN MFG. CO.	
		SET SCREW: Allen type #10, 10-32 x 5/8" cup point, hollow head.	Secures Range Change Bar Knob.	ALLEN MFG. CO.	
		SET SCREW: Allen type #10, 10-32 x 5/8" cup point, hollow head.	Same as above.	ALLEN MFG. CO.	

Additional Information with regard to the applications and maintenance of this equipment will be available from time to time. Users of the Model **80** Signal Generator are urged to discuss their problems with us and to suggest such modifications as might make the Model **80** more adaptable to their special requirements.

Maintenance difficulties should be reported before proceeding with actual repairs, since our familiarity with such problems will usually suggest a simpler procedure.

Engineering Department

MEASUREMENTS CORP.

Boonton, New Jersey

U.S.A.