SPECIFICATIONS

VERTICAL AMPLIFIER

Input Resistance. . . . . 100 KΩ.

Sensitivity Chart

	Optional Frequency Inputs	Nominal input voltage (rms) per inch of vertical deflection.
Untuned	10 cps to 400 cps.	2.0 v
	400 cps to 10,000 cps (RTTY).	1.0 v
	10 kc to 455 kc.	500 mv
Tuned	455 kc.	70 mv
	1600 to 1680 kc.	200 mv
	2075 kc.	200 mv
	2215 kc..	200 mv
	2475 kc.	200 mv
	3000 kc.	400 mv
	3055 kc.	400 mv
	3395 kc.	500 mv
	5000 to 6000 kc.	600 mv

HORIZONTAL AMPLIFIER

Frequency Response. . . . . ±3 db from 3 cps to 15 kc.

Sensitivity. . . . . 800 mv per inch deflection.

Input Resistance. . . . . 1 megohm.

SWEEP GENERATOR

Recurrent Type. . . . . Sawtooth produced by internal sweep generator.

Frequency. . . . . 15 to 200 cps (variable).

TONE OSCILLATORS

Frequencies. . . . . Approximately 1500 cps and 1950 cps.

Output Voltage. . . . . 50 mv (nominal).

GENERAL

Frequency Coverage. . . . . 160 through 6 meters (50-75 Ω coaxial input).

Signal Power Limits (at rear coaxial connector). . . . . 15 watts to 1 kilowatt (see Page 39 for use with Citizen's band power levels).

Tube And Diode Complement.	1 - 3RP1 CRT, medium persistance, green trace. 1 - 6BN8 Clamper, low level RF detector. 1 - 6C10 Sweep generator, horizontal amplifier. 1 - 6J11 Twin phase-shift tone generator. 1 - 6EW6 Vertical amplifier. 1 - Germanium diode, sync rectifier. 4 - Silicon diodes, B+ rectifiers. 2 - Selenium diodes, high voltage rectifiers.
Front Panel Controls.	Sweep. Sweep Frequency - pull for Clamp. Tone Generator. Horizontal Gain. Horizontal Position. Vertical Gain. Vertical Position. Focus. Intensity - AC Off.
Rear Panel Control	Transmitter Attenuator. Attenuates to 24 db at approximately 8 db per step.
Power Supply.	Transformer operated, fused at 1/2 ampere.
Power Requirements.	120 V AC 50/60 cps, 35 watts.
Dimensions.	6" high x 10" wide x 11-1/8" deep (including knobs).
Net Weight.	9 lbs. 10 oz.

All prices are subject to change without notice. The Heath Company reserves the right to discontinue instruments and to change specifications at any time without incurring obligation to incorporate new features in instruments previously sold.

TRANSMITTER MONITORING (Figure 12)

Most transmitters have 50-75 Ω coaxial outputs. The following instructions are written for this type of connection, with either a dummy load or an antenna. If the transmitter has other than a 50-75 Ω coaxial output, use a pickup antenna or a coaxial-coupled pickup link. Place it near the final RF amplifier tank coil and connect it to either one of the rear panel ANTENNA jacks of the Monitor Scope. With open wire or ribbon feed systems, use a length of wire placed close to one of the feeders.

Make sure a dummy load or antenna is connected each time the transmitter is operated, either through the Scope as in the case of coaxial feed, or directly where other antenna transmission line systems are used. When the Scope is used with the Heathkit HX-10 or HA-10 equipment, the full RF output should be connected through the Scope rather than using the special scope output on these units.

Refer to Figure 12 and connect the Transmitter, Scope, and antenna or dummy load as follows:

1. Connect the RF output of the transmitter or linear amplifier to either ANTENNA jack on the rear of the Scope.
2. Connect the dummy load or antenna to the other Scope ANTENNA jack.
3. Set the front panel controls as described in the Initial Control Settings section. Set the XMTR ATTEN switch fully clockwise.
4. Turn on the transmitter and adjust the XMTR ATTEN, HORIZ GAIN, and SWEEP FREQ controls for the desired pattern height and display.
5. Modulation of an AM or SSB transmitter may be checked by connecting a shielded cable from the TONE output jack of the Scope to the microphone input of the transmitter. If this is done, place the TONE GEN switch to the 1.5 kc position. A 2-tone position is also available for SSB checks and alignment. Voice modulation may be checked by using a microphone to voice modulate the transmitter.
6. Refer to the Transmit Envelope Patterns on Page 41 to evaluate the transmitter display.

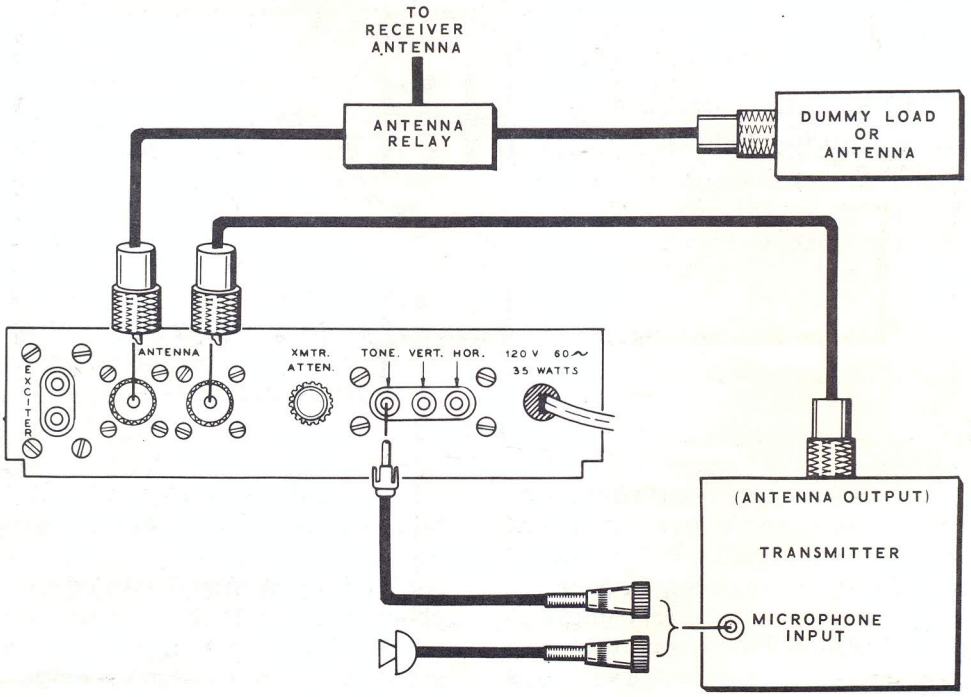


Figure 12

RF TRAPEZOID PATTERNS (Figure 13)

To check a linear amplifier for linearity, it is necessary to compare the exciter RF output with the RF output of the linear amplifier. The setup used for this purpose is shown in Figure 13.

1. Connect a coaxial cable from the RF output of the exciter to either EXCITER input jack of the Scope.

2. Connect a coaxial cable from the other EXCITER jack on the Scope to the input jack of the linear amplifier.

3. Connect a coaxial cable from the RF output of the linear amplifier to either ANTENNA jack of the Scope.

4. Connect the dummy load or antenna to the other ANTENNA jack on the Scope.

5. Connect a cable from the TONE jack of the Scope to the microphone input of the exciter.

6. Set all front panel controls on the Scope as directed in the Initial Control Settings section, but with the TONE GEN switch at the 2-TONE position and the SWEEP switch in the RF TRAP position.

7. Turn on the exciter and linear amplifier and adjust the Scope's XMTR ATTEN switch and HORIZ GAIN controls, and the transmitter's audio gain control for the desired display height pattern.

8. The trapezoid pattern that is shown on the Scope is obtained by comparing the RF output signal of the exciter with the amplified RF output of the linear amplifier. Refer to the Trapezoid Patterns on Page 44 and 45 for display analysis.

NOTE: The RF trapezoid pattern only indicates the linearity of the linear amplifier. This setup should not be used for general monitoring as it does not evaluate the exciter signal.

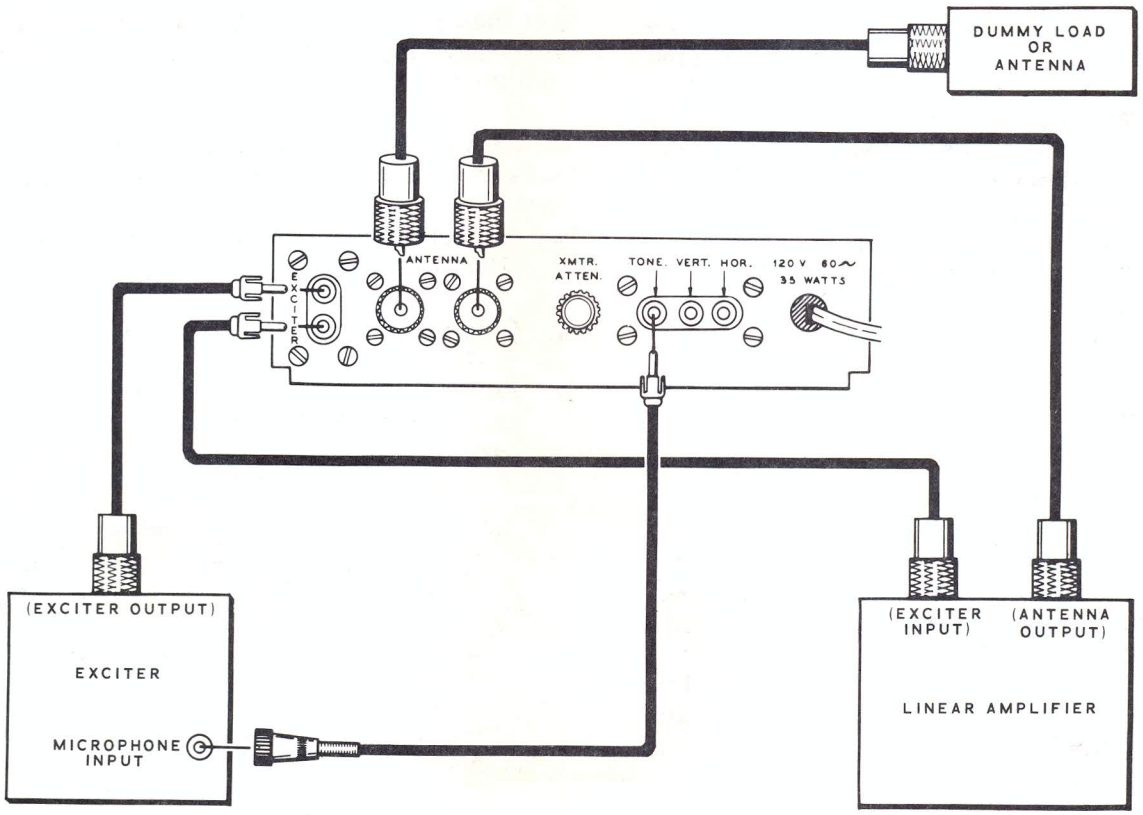


Figure 13

RTTY CROSS PATTERNS (Figure 14)

1. Connect a coaxial or shielded cable from the "mark" channel of the RTTY terminal unit to the HOR input jack of the Scope.

2. Connect a coaxial or shielded cable from the "space" channel of the RTTY terminal unit to the VERT input jack of the Scope.

3. Set the front panel controls as directed in the Initial Control Settings section.

4. Turn the terminal unit and Scope on, and place the scope SWEEP switch in the RTTY position with the Clamp switch pushed in.

NOTE: The "mark" and "space" outputs of the terminal unit should be adjusted to provide equal output voltages from the two channels when properly tuned in. This can be determined by alternately inserting the mark and space signals into the VERT input of the Scope and adjusting the terminal unit's balance control for equal height from both channels.

5. With the space channel connected to the VERT input and the mark channel connected to the HOR input, adjust the VERTICAL and HOR GAIN controls on the Scope to produce a cross pattern with equal height and width (about 1" x 1"). Once the desired size of the cross pattern has been set, the gain controls on the Scope should not be changed, as this will interact with the true setting of the balance control on the terminal unit.

6. Refer to RTTY Cross Patterns on Pages 45 and 46.

OSCILLOSCOPE USE (Figure 15)

The Monitor Scope can be used as a normal oscilloscope for limited test applications where internal sync, high sweep frequency, or high vertical amplifier gain are not required. To use the Monitor Scope as an oscilloscope, the vertical amplifier stage must be wired for "RTTY and 1 kc to 150 kc" in the Alternate Connections section (Page 24).

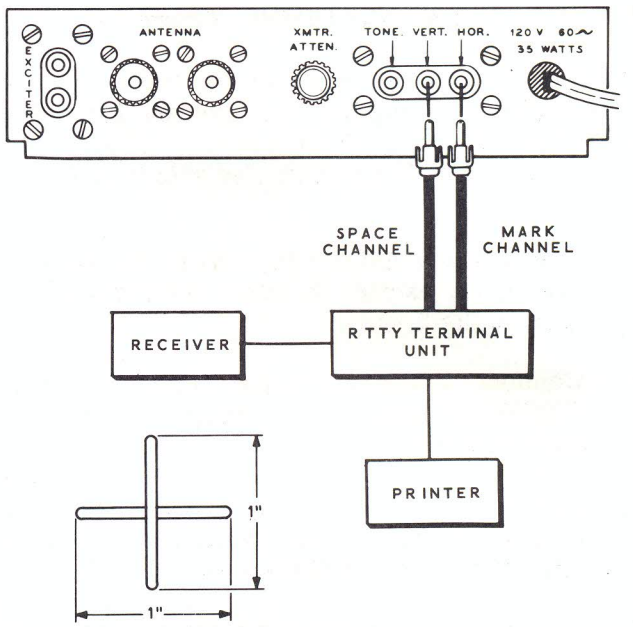


Figure 14

For most applications, the SWEEP switch will be set in the INT position to use the internal sawtooth generator for horizontal sweep. To use an external source for horizontal sweep, connect the horizontal signal to the HOR input, place the SWEEP switch in the RF TRAP position, and push the CLAMP switch in.

To use the Scope as an oscilloscope, connect the leads and adjust as follows (see Figure 15).

1. Connect a test lead to the VERT input jack. (Use a normal scope test probe.)

2. Connect a test lead to the HOR input jack.

3. Adjust the VERTICAL GAIN, HOR GAIN, and SWEEP FREQ controls for the desired pattern.

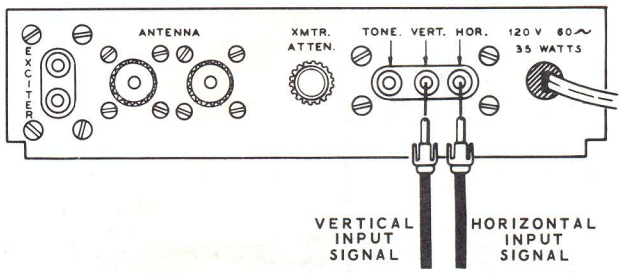
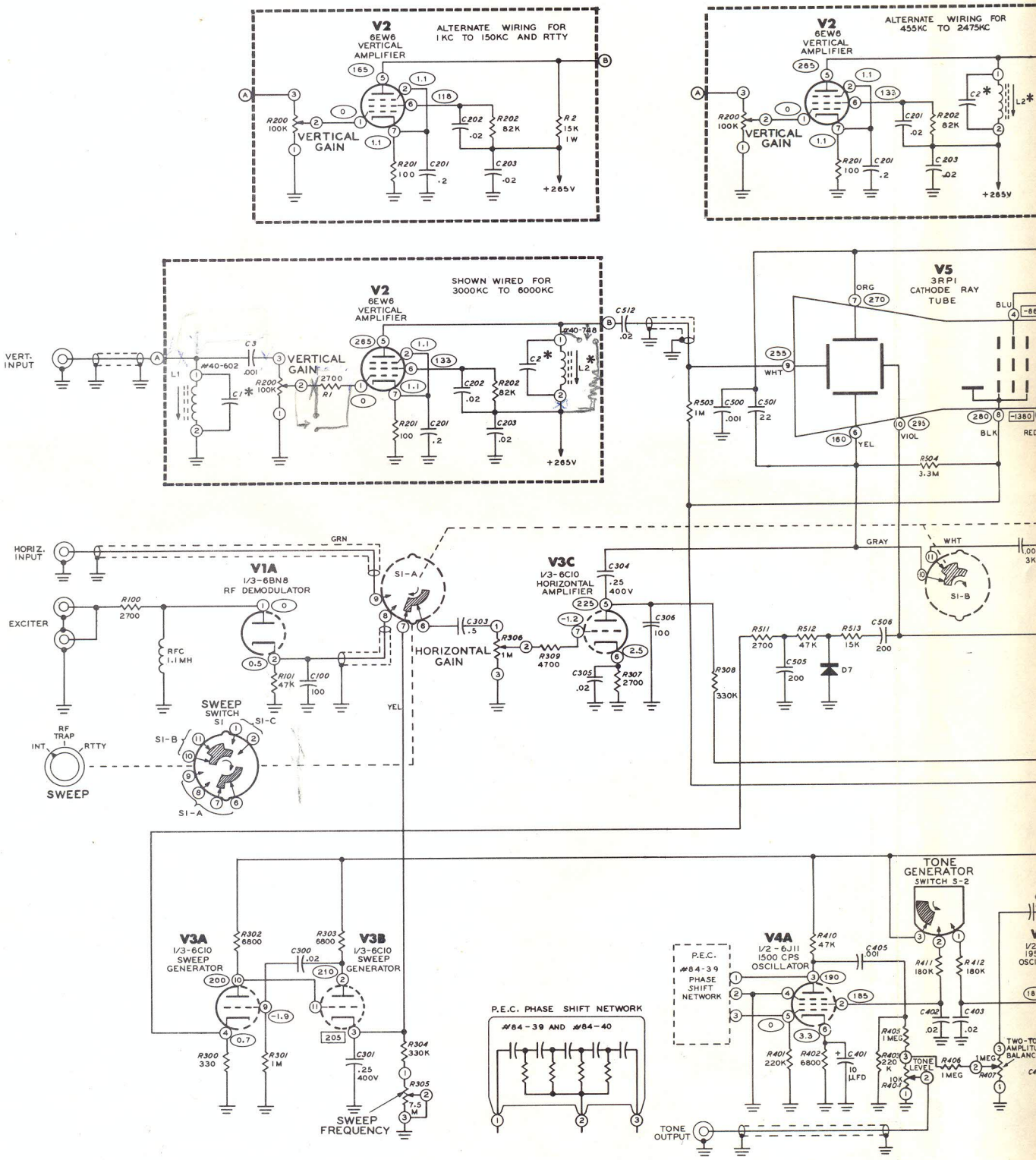
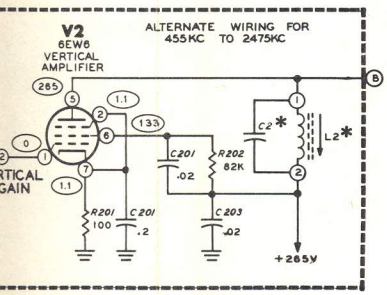


Figure 15


V2
6EW6
VERTICAL
AMPLIFIER
ALTERNATE WIRING FOR
1KC TO 150KC AND RTTY
VERTICAL
GAIN
R200
100K
R201
100
C201
.2
C202
.02
R202
82K
C203
.02
R2
15K
1W
+265V
ALTERNATE WIRING FOR
455KC TO 2475KC
C2*
L2*
SHOWN WIRED FOR
3000KC TO 6000KC
VERT.
INPUT
#40-602
#40-788
C3
.001
C1*
R1
2700
C512
.02
V5
3RP1
CATHODE RAY
TUBE
ORG
WHT
BLU
BLK
VIOL
YEL
R503
1M
C500
.001
C501
22
R504
3.3M
HORIZ.
INPUT
V1A
1/3-6BN8
RF DEMODULATOR
EXCITER
R100
2700
RFC
1.1MH
R101
47K
C100
100
GRN
YEL
SI-A
SI-B
HORIZONTAL
GAIN
C303
.5
R306
1M
R309
4700
V3C
1/3-6C10
HORIZONTAL
AMPLIFIER
C304
.25
400V
C306
100
C305
.02
R307
2700
R308
330K
R511
2700
R512
47K
R513
15K
C506
200
C505
200
D7
GRAY
WHT
SWEEP
SWITCH
S1
SI-B
SI-C
SI-A
RF
TRAP
INT.
RTTY
SWEEP
V3A
1/3-6C10
SWEEP
GENERATOR
V3B
1/3-6C10
SWEEP
GENERATOR
R302
6800
R303
6800
C300
.02
R300
330
R301
1M
C301
.25
400V
R304
330K
R305
1.5
M
SWEEP
FREQUENCY
P.E.C. PHASE SHIFT NETWORK
#84-39 AND #84-40
P.E.C.
#84-39
PHASE
SHIFT
NETWORK
V4A
1/2-6J11
1500 CPS
OSCILLATOR
R410
47K
C405
.001
R411
180K
R412
180K
C402
.02
C403
.02
R403
1MEG
R401
220K
R402
6800
C401
.01
MFD
R404
10K
TONE
LEVEL
R406
1MEG
R407
TONE
GENERATOR
SWITCH S-2
TONE
OUTPUT
TWO-TO
AMPLIT
BALANC

SCHEMATIC OF THE HEATHKIT®
MONITOR SCOPE
MODEL SB-610



NOTES:

1. MOST RESISTORS AND CAPACITORS ARE NUMBERED ACCORDING TO THE TUBE THEY ARE ASSOCIATED WITH.

   EXAMPLE:

   R 4 1 3
   - PART OF TUBE CIRCUIT V4
   - RESISTOR
   - THE NUMBER FOR THIS RESISTOR

2. PARTS IN THE POWER SUPPLY ARE NUMBERED IN THE 600 SERIES.
3. *REFER TO THE ALTERNATE CONNECTIONS SECTION OF THE MANUAL FOR THE CORRECT PART (C1, C2, AND L2).
4. ALL RESISTORS ARE 1/2 WATT UNLESS MARKED OTHERWISE, RESISTOR VALUES ARE IN OHMS (K = 1000, MEG = 1,000,000).
5. CAPACITOR VALUES LESS THAN 1 ARE IN μfd. VALUES OF 1 AND ABOVE ARE IN μμf, UNLESS THEY ARE MARKED OTHERWISE.
6. (○) THIS SYMBOL INDICATES A POSITIVE DC VOLTAGE MEASUREMENT, TAKEN WITH AN 11 MEGOHM VTVM, FROM THE POINT INDICATED TO CHASSIS GROUND. VOLTAGES MAY VARY ±10%.
7. (▭) THIS SYMBOL INDICATES A VOLTAGE THAT MAY VARY WITH ASSOCIATED CONTROL SETTING.
8. VOLTAGE READINGS TAKEN WITH THE CONTROLS AND SWITCHES IN THE FOLLOWING POSITIONS:

   HORIZONTAL GAIN - FULL CLOCKWISE
   SWEEP FREQUENCY - FULL CLOCKWISE
   INTENSITY - SET FOR NORMAL TRACE
   FOCUS - SET FOR NORMAL TRACE
   VERTICAL POSITION - SET FOR NORMAL TRACE
   HORIZONTAL POSITION - SET FOR NORMAL TRACE
   VERTICAL GAIN - FULL COUNTERCLOCKWISE
   SWEEP - FULL COUNTERCLOCKWISE
   TONE GENERATOR - FULL COUNTERCLOCKWISE EXCEPT FOR MEASUREMENTS AT V4. VOLTAGE READINGS AT V4 ARE TAKEN WITH TONE SWITCH IN 2-TONE POSITION.
   CLAMP - PUSHED IN

9. SWITCH WAFERS SHOWN IN FULL COUNTERCLOCKWISE POSITION, AS VIEWED FROM THE KNOB END OF THE SHAFT.