



SPECIFICATIONS  
MODEL IO-104

15 MHz  
TRIGGERED-SWEEP  
OSCILLOSCOPE



HEATHKIT

Schlumberger

HEATH COMPANY, BENTON HARBOR, MICHIGAN 49022

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# SPECIFICATIONS

## VERTICAL

Input Impedance . . . . .	1 M $\Omega$ shunted by 40 pF.
Maximum Input Voltage . . . . .	600 volts DC.
Sensitivity . . . . .	10 millivolts/cm.
Frequency Response . . . . .	DC to 15 MHz, $\pm 3$ dB with 4 cm deflection.
Rise Time . . . . .	24 ns.
Attenuator . . . . .	12 positions in a 1, 2, 5 sequence. .01 volt/cm to 50 volts/cm $\pm 3\%$ .

## HORIZONTAL

Input Impedance . . . . .	$\approx 1$ M $\Omega$
Sensitivity . . . . .	Less than .5 volt/cm.
Frequency Response . . . . .	DC to 1 MHz, $\pm 3$ dB.
Attenuator . . . . .	2 position, X1 and X10.

## TIME BASE

Sweep . . . . .	22 steps in a 1, 2, 5 sequence, 2 $\mu$ s/cm to .2 $\mu$ s/cm, $\pm 5\%$ .
Horizontal Expansion . . . . .	X5 $\pm 5\%$ .
Trigger Modes (switch selected) . . . . .	AUTO/NORMAL + or - AC/DC INT/EXT

## TRIGGER SENSITIVITY

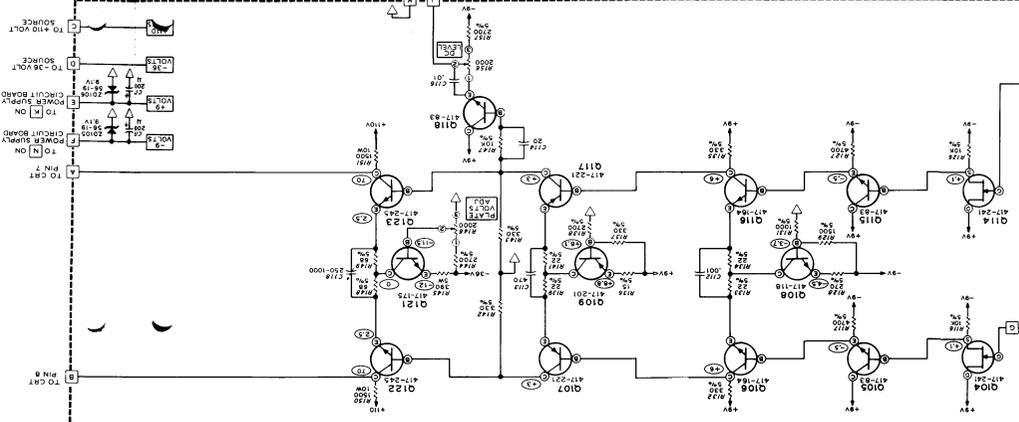
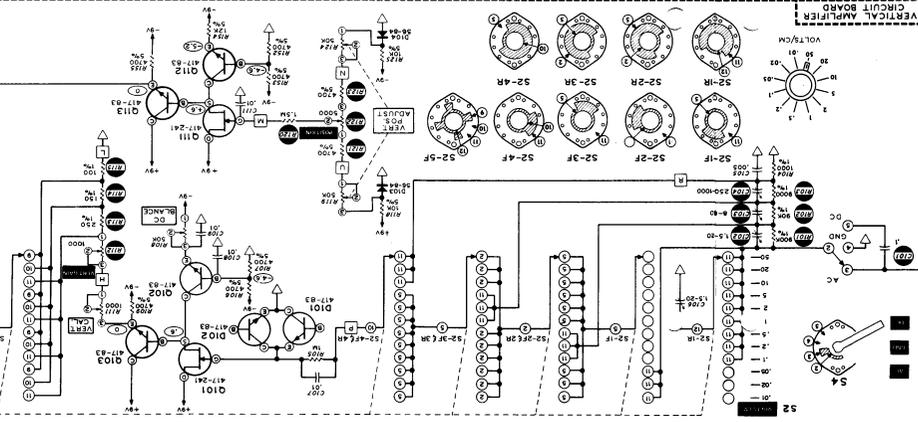
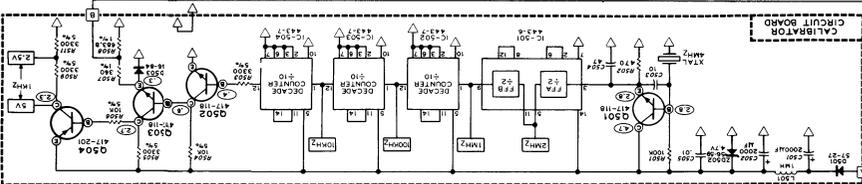
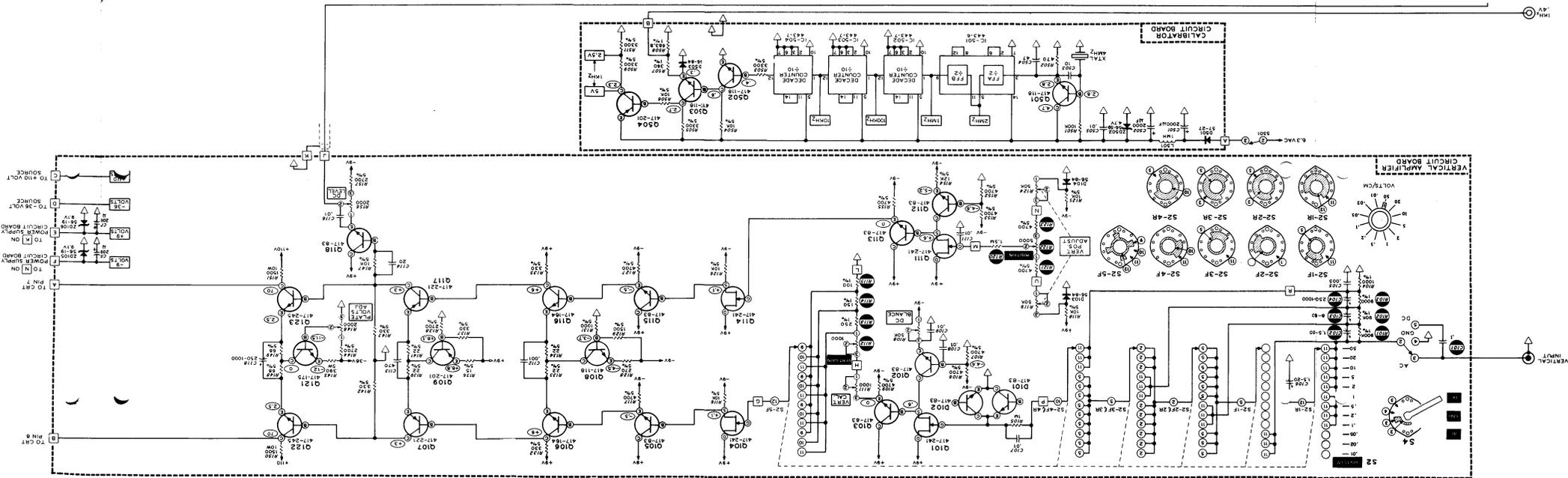
Internal . . . . .	1 cm display.
External . . . . .	.5 volt peak-to-peak.

## CALIBRATOR

Signal Source . . . . .	4 MHz oscillator, crystal controlled $\pm 0.01\%$ .
Outputs (TTL square wave, peak-to-peak)	
Front panel . . . . .	1 kHz, .4 volt $\pm 5\%$ .
Internal . . . . .	1 kHz, 2.5 volts (approximately). 1 kHz, 5 volts (approximately). 10 kHz, 3 volts (approximately). 100 kHz, 3 volts (approximately). 1 MHz, 3 volts (approximately). 2 MHz, 3 volts (approximately).

## GENERAL

Input Connections	
Vertical . . . . .	Coaxial, BNC.
Horizontal . . . . .	Banana jack.
Trigger . . . . .	Banana jack.
CRT Accelerating Potential . . . . .	2800 volts DC, regulated.
CRT Type . . . . .	5ABP31, 6X10 cm viewing area; green, medium persistence phosphor.
Retrace Suppression . . . . .	DC-coupled unblanking of the CRT.
Graticule . . . . .	Engraved, 6X10 cm, edge lighted.
Power Requirements . . . . .	110 to 130 VAC or 220 to 260 VAC, 50/60 Hz, 45 watts.
NOTE: Specifications measured at 25°C with 120 VAC line voltage.	
Overall Dimensions . . . . .	12-3/8" high x 10-3/4" wide x 20" long. (These dimensions include all protruding surfaces; knobs, handle, feet, etc.)
Net Weight . . . . .	32 lbs.





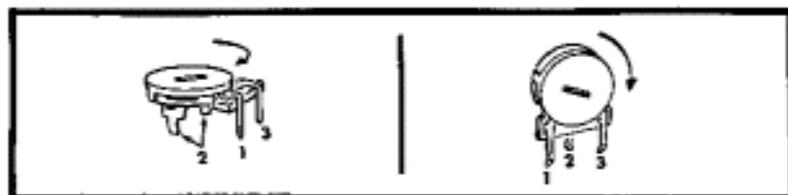


**SCHEMATIC OF THE  
HEATHKIT®**

**15 MHz TRIGGERED-SWEEP OSCILLOSCOPE  
MODEL 10-104**

NOTES:

1. REFER TO THE CHASSIS PHOTOGRAPHS AND CIRCUIT BOARD X-RAY VIEWS FOR THE PHYSICAL LOCATION OF PARTS.
2. ALL RESISTORS ARE 1/2 WATT 10% UNLESS OTHERWISE SPECIFIED.
3. ALL CAPACITOR VALUES LARGER THAN 1.0 ARE IN pF UNLESS OTHERWISE SPECIFIED. CAPACITOR VALUES LESS THAN 1.0 ARE IN  $\mu$ F.
4. THE ARROW INDICATES CLOCKWISE ROTATION OF A CONTROL OR SWITCH, AS VIEWED FROM THE KNOB END OR AS SHOWN FOR CIRCUIT BOARD CONTROLS. THE FOLLOWING CIRCUIT BOARD CONTROL LUG NUMBERS CORRESPOND TO THOSE SHOWN ON THE SCHEMATIC AND X-RAY VIEWS.



5. ALL VOLTAGES MEASURED WITH AN 11 MEGOHM INPUT VTVM FROM THE POINT INDICATED TO GROUND.
6. ○ INDICATES A DC VOLTAGE MEASURED FROM THE POINT INDICATED TO GROUND WITH THE TIME/CM SWITCH AT THE EXT HORIZ X 1 POSITION, THE CALIBRATOR SWITCH ON (PRESSED IN), AND BOTH THE VERTICAL AND THE HORIZONTAL AMPLIFIERS BALANCED (DOT CENTERED).
7. ○\* INDICATES A SWEEP CIRCUIT VOLTAGE TAKEN WITH THE TIME/CM SWITCH IN THE 1 mSEC POSITION AND THE STABILITY CONTROL AT THE CENTER OF ITS ROTATION.
8. □ INDICATES A LETTERED WIRE CONNECTION TO A CIRCUIT BOARD.
9. ▽ INDICATES CIRCUIT GROUND.
10. ← INDICATES A POWER SUPPLY CONNECTION.
11. ● INDICATES A PART MOUNTED ON THE CHASSIS ALTHOUGH ITS LOCATION IN THE SCHEMATIC SUGGESTS ANOTHER LOCATION.
12. COMPONENTS ARE NUMBERED IN THE FOLLOWING GROUPS:  

0-99	PARTS IN THE CRT CIRCUIT.
100-199	PARTS IN THE VERTICAL AMPLIFIER CIRCUIT.
300-399	PARTS IN THE HORIZONTAL AMPLIFIER CIRCUIT.
400-499	PARTS IN THE POWER SUPPLY CIRCUIT.
500-599	PARTS IN THE CALIBRATOR CIRCUIT.