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Mod for the Heath IO-102 Scope

- - faster warm-up

The Heath IO-102 scope kit appears to be one of the "better buys for the money." The 30 mV vertical sensitivity, 80 nanosecond rise time, and 5 MHz frequency response seem to fill the bill. Actually, the vertical response is adequate for viewing 15 MHz or higher signals with sufficient trace height to be usable. Assembly is on four main circuit boards: vertical, horizontal, sweep, and power supply. The finished unit is uncluttered, internal adjustments are no problem, and most components are easily serviced.

Critical power supply voltages are zener regulated, a fact which contributes to the operational stability after warm-up. The power transformer, which is double shielded, and circuit board layout result in a trace like those drawn in textbooks.

The initial alignment and internal adjustments, although not difficult, *must* be performed as directed. An accurate VOM or VTVM is the only equipment needed. During this alignment, one wishes he had a screwdriver with a ten to one drive. However, with a light touch, the desired results can be achieved.

Heath states that vertical drift during warm-up "for the first half hour or so" is to be expected. Experience with two of these units was as follows: From a cold start at 70° F, the trace was completely off the screen for the first ten minutes. After ten minutes, the trace appeared at the top of the CRT and drifted downward for 35 minutes, at which time it stabilized and no further drift was noted over several hours of operation. For someone who turns on the instrument and intends to use it all day, this may not appear as a problem. My use is on an intermittent basis and I found juggling the vertical position control inconvenient. The addition of four simple heat sinks produced two improvements:

1) A usable trace on the screen in 3 to 4 minutes.
2) A completely stable trace, without touching the position control, in 12 to 15 minutes.

Two heat sinks (Fig. 1) were made from 1/8 in. aluminum and attached to the vertical output transistor heat sink tabs as shown. The tops of these sinks, which were bent 90°, may be secured to the CRT shelf with standoff insulators or RTV cement. Two additional heat sinks, 1 in. by 1 in., were attached to the driver transistors with a small wrap-around wire.

Heath incorporates a 1 volt peak to peak calibrating signal at a front panel jack. I personally prefer a square wave calibrating signal and incorporated the circuit shown in Fig. 2. This calibrator provides a clipped sine wave signal of .1 V, 1 V, and 10 V. Three pin jacks were added next to the vertical input ground jack, to bring these signals to the front panel from the circuit which was mounted on the cover of the power supply transformer using existing screws.

All things considered, I feel you will find this instrument a worthwhile addition to your test bench and a pleasure to use. ■

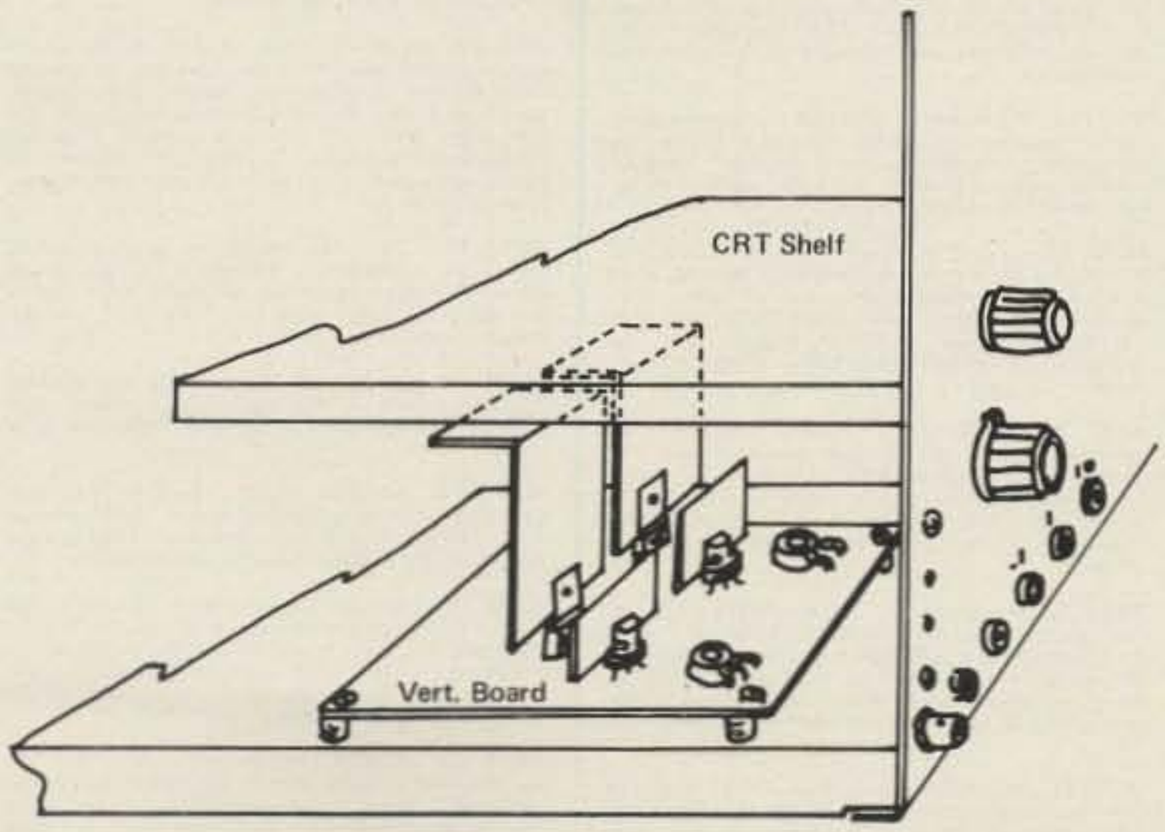

Fig. 1.

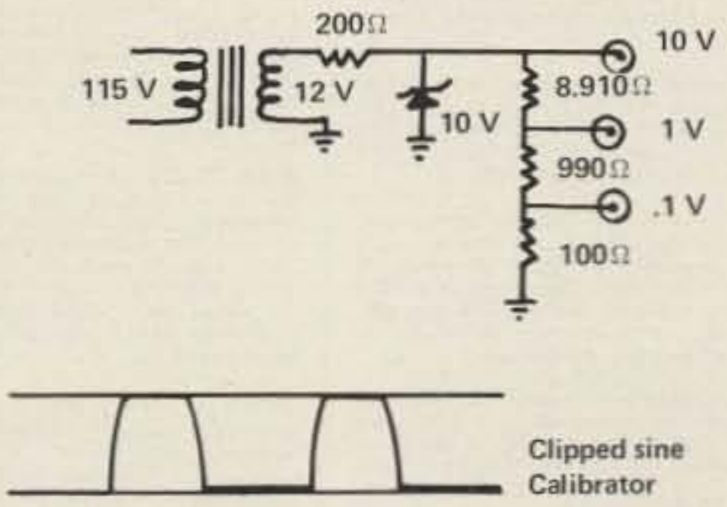

Fig. 2.