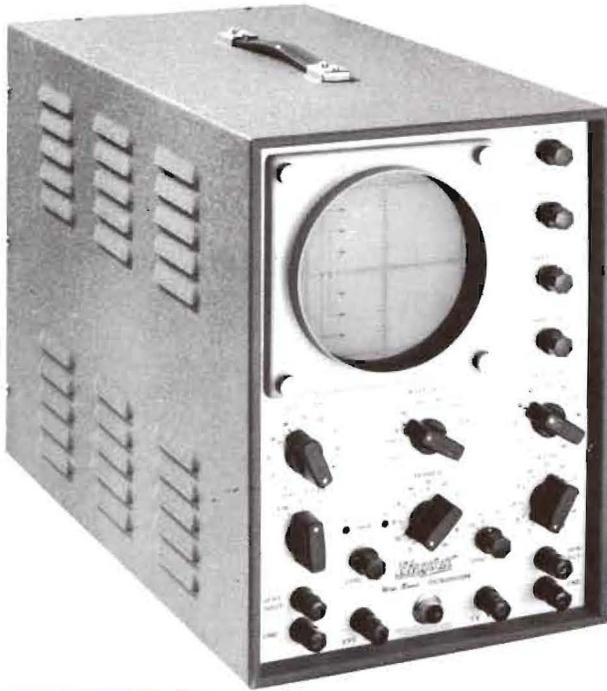


HICKOK

WIDE BAND SERVICE TECHNICIAN'S OSCILLOSCOPE

MODEL 677



This new 5" wide-band 'scope has been specifically developed to provide television service technicians with a high quality instrument at an economical cost. *Color-Approved*, it is especially suited for color TV servicing, FM Multiplex alignment and similar service assignments. The calibrated screen and sharp, bright trace with full astigmatic correction facilitate its use in both waveform observation and peak-to-peak measurements.

FEATURES:

- AC Response—5 cps to 4.5 MC within 3 db
- Pre-set Horizontal and Vertical Sweep Positions
- Sharp, Bright Trace with Full Astigmatic Correction
- Built-in Peak-to-peak Calibrator

Technical Specifications

VERTICAL AMPLIFIER: Frequency response flat to within 3 db from 5 cycles to 4.5 MC. Sensitivity, 40 MV RMS per inch. Rise time, 0.08 μ sec or better. Three step decade attenuator plus vernier gain control, Cathode follower input. Input impedance, 3 megohms shunted with 10 mmfd; approximately 33 megohms shunted with 6 mmfd through accessory lo-capacity probe.

HORIZONTAL AMPLIFIER: Response within 3 db, 5 cycles to 350 KC. High gain provides minimum 5-times sweep expansion, facilitates detailed observation of TV sync waveforms, including color burst. Vernier gain control. Input impedance, 5 megohms shunted with 30 mmfd.

SWEEP GENERATOR: Covers 10 cycles to 500 KC with step and vernier frequency control, plus two fixed frequencies of 30 cycles and 7,875 cycles to speed

checking of vertical and horizontal TV sweep waveforms. Choice of \pm internal, external and line sync. High stability provided by 6DT6 tube (commonly used in TV circuits as gated sync separator). Retrace blanking built in.

DISPLAY: 5" CRT with 1,600 volts accelerating potential. Separate astigmatism control. DC coupling to deflection plates to eliminate spot drift. Filtered green graticule calibrated in decades and with multiplier factors of 1, 2 and 3. Used with built-in 1 volt p-p calibrator, greatly facilitates measurement of peak-to-peak voltages.

POWER SUPPLY: 117 volts, 50/60 cycles, 90 watts, fused. All critical voltages are electronically regulated.

DIMENSIONS: 14" H, 9 $\frac{1}{2}$ " W, 18 $\frac{1}{2}$ " D, 26 pounds, net weight. Furnished complete with detailed application and instruction book, test leads and warranty.

'SCOPE FACTS

by *Hickok*

(or Why You Need a 'scope for Color TV Service)

Q. Why do I need a 'scope for color TV service?

A. Fact is, maybe the question to start with should be: "Why does **anybody** need a 'scope for **any** TV or electronic service?"

Q. Alright . . .

A. Well, like any piece of test equipment a 'scope has to **save time . . .** and time is money.

Q. But what about using a 'scope—"to save time," as you say—in black-and-white TV service?

A. The great majority of TV technicians will agree a 'scope "is very handy" to use, but for a long time they agreed more in **principle** than in **practice**. But, in recent years as TV service became more competitive and the importance of time has really become emphasized, large numbers of technicians have bought and are using 'scopes. Test equipment manufacturers will tell you that the sharp increase in their 'scope sales in recent years proves this.

Q. I guess this shows more fellows are finding a 'scope is worthwhile . . . but I'd like to see an example.

A. Notice the schematic in figure 1, below; Let's say the complaint is "poor vertical sync." The schematic shows there should be 70V p-p at the input of the vertical integrator (left end of R606, 39K) and 28V p-p at the output (cathode terminal of the 9A8 tube). Measuring these two voltages shows the 70V is OK but the 28V point measures only 3V. You can immediately conclude the integrator circuit is at fault. You don't waste time in costly substitutions—you go right to the trouble.

Q. But you didn't check wave forms . . .

A. That's right—I used one of the scope's most useful features—it's really a good, sensitive, light loading, wide-band, peak-to-peak "VTVM" that also tells you what **frequency** you're "reading".

Q. Can't I use the peak-to-peak scales on my VTVM?

A. Yes—but you have to be careful. It loads down circuits (typical AC input capacitance is about 150 mmfd) and it **can't tell the difference** between vertical and horizontal pulses.

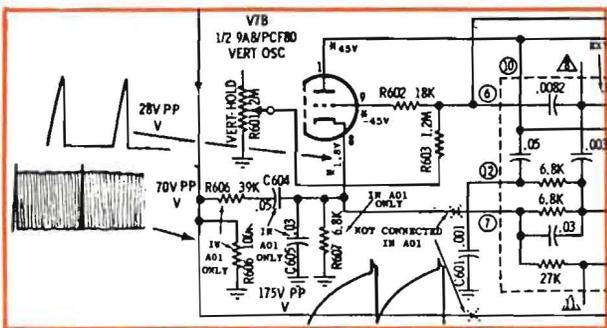


Figure 1

Q. You're saying I have to use a 'scope not only to check waveforms but also to measure voltages, like a voltmeter?

A. Yes, and that's why a 'scope is so useful.

Q. OK—now, what about color?

A. The difference is that there are parts of the **color** section where it isn't just **useful**, it's **essential** . . . you **have to** use a 'scope to service color because nothing else does the job.

Q. For instance—give me an example.

A. Generally, this is any circuit where the 3.58 MC color information is present. A good example is the burst gate stage.

Q. How about elaborating?

A. The burst gate stage functions much like a gated AGC tube—it is triggered by horizontal pulses and by color (burst) pulses. Both have to be present at the right amplitude in order to work properly. For example—let's say the complaint is "no color." Referring to the schematic figure 2, the service notes call for 30V p-p of horizontal pulse and 10V p-p of 3.58 MC pulse at the grid of the 6EW6. Let's say you find the 30V horizontal pulse measures OK but the burst level measures only 0.5 volts. Thus, you **immediately localize** the trouble.

Q. I can see where a VTVM certainly wouldn't have worked there . . .

A. Right—not only would it have loaded the circuit completely, but you wouldn't have been able to measure burst and horizontal pulses separately.

Q. Incidentally, why did you check first at the grid of the burst gate?

A. Because this is the start of the color sync section. Starting there with the 'scope **saved time**. And, of course, this is just one example where a scope pays for itself in time saved, not only because it is faster but because you can handle jobs that **can't** be handled by any other piece of test equipment.

Q. OK—How much is your new Scope?

A. \$199.50—you'll find all the specifications on the other side of this sheet. And note that this is not a "built-up" kit but a fully assembled, wired and factory calibrated instrument.

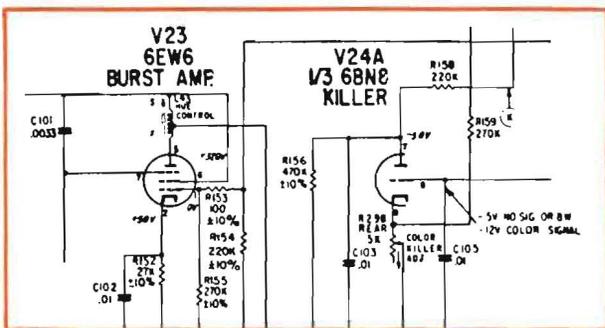


Figure 2

Zenith and Motorola schematics courtesy of Howard W. Sams & Co., Inc. and Electronic Technician magazine

The Hickok Electrical Instrument Co.