

Bob Luther's 'Scope

Resuscitating a DuMont 403

On the Surface

- A few missing tubes
- Ratty power cord
- Broken fuse holder
- A missing knob
- Broken front-panel jacks
- No side covers
- No readily-available (\$0) manual, but Manuals Plus had one – with schematics!

And on Further Inspection

- Burned-out selenium rectifier.
- One missing tube was really an iron-wire current regulator, which are hard to get.
- 3 electrolytics were getting very hot.
- One 0.1 μF capacitor was leaky ($\sim 50 \text{ k}\Omega$).
- Cold solder joint on a tube socket pin.
- +400V supply didn't quite match the schematic.

But...

- All the tubes that were there were good.
- After replacing the bad electrolytics, no sparks or smoke, and the AC filaments and panel lights worked.
- After fixing up the DC filament supply the DC-filament tubes lit.
- After replacing the 0.1 uF capacitor and the missing tubes, all power supplies (+400V, +185, +150V, +120V, -85V, -2500V) began working, and I had a spot!

Post “It Works!” Work

- But only a spot – no beam deflection.
- 400V series regulator tube was glowing red – silicon diode replacement for the 5V4 rectifier put out about 30V more, meaning about 20W more had to be dissipated, lighting up the tube’s plates.
- Following the manual’s alignment procedure for the 25 internal pots and trimmer capacitors brought the ‘scope back to something like working order.

Some Neat Features

- Differential vertical amplifiers with DC filaments minimizing 60 Hz hum without affecting low-frequency response.
- DC-coupled stages throughout
- RF 2500V supply with 2% regulation
- Very bright, narrow trace with no blooming at full intensity.
- Mu-metal shielded flat-face 5" P7 CRT
- Cool DuMont pilot light

Summary

This was an interesting and educational project. If the 'scope works perfectly, it is a brand-new 1957-vintage 'scope with:

- Synchronized, not triggered, sweep
- Deflection amplifiers with 200 kHz BW
- A single vertical channel
- 26 tubes, 44 lbs, lots of heat & shelf space

No wonder Tektronix, Agilent, LeCroy... are today's big names in oscilloscopes!

Thanks for Coming

DUMONT

**CATHODE-RAY
OSCILLOSCOPES**

TYPES 403 and 403-R

Block Diagram

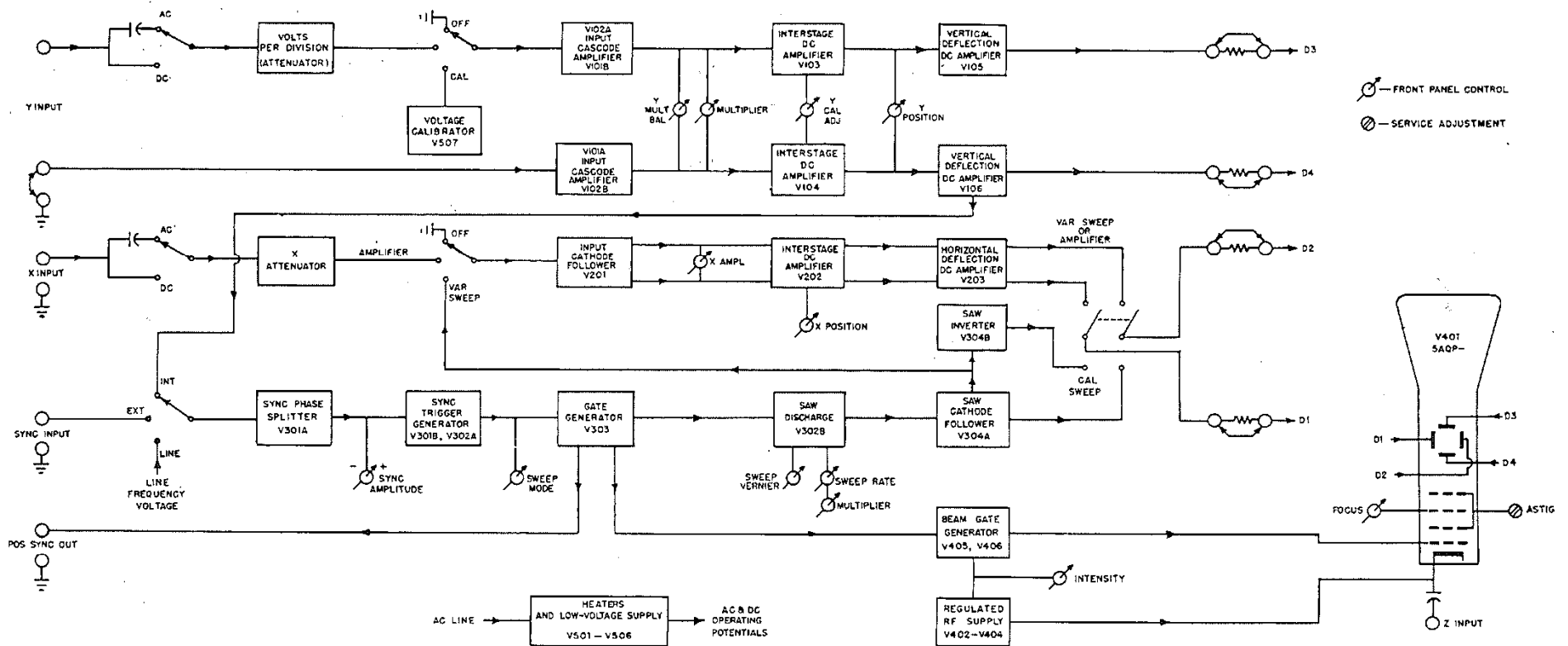


Figure 3-1. Over-All Functional Block Diagram Type 403/403-R Cathode-ray Oscilloscope



David Stephenson's Dumont 401, the green-trace version of the 403.