3 Dumont 248 Oscillograph, 1945

The 248 is larger, heavier and more sophisticated than the 224a. It has a larger vertical bandwidth (5MHz vs 2MHz), includes a vertical channel delay (for the observation of the leading edge of pulses) and a triggered timebase.

The 5 inch CRT includes a selectable 2000 volt/4000 volt post deflection accelerator, which increases trace intensity at fast sweeps and low repetition rates[1].

The vertical channel is still AC coupled. The vertical calibration is limited to three gain steps: $\times 1$, $\times 10$ and $\times 10$, with a variable gain control. The manual advises that the vertical sensitivity is halved at the higher acceleration voltage. This further limits the ability to make accurate voltage measurements.

The triggered timebase has four sweep durations: 5, 25, 100 and 1000 μSec. (The 1:2:5 sequence, for vertical or horizontal settings, had not yet been invented.)

As usual for the day, the vertical and horizontal deflection plates can be accessed from front panel terminals. Direct access removes the frequency limitations of the vertical and horizontal amplifiers. This allows the scope to display a Lissajous figure for the precise determination of a radio frequency.

The power supply (page 11) is entirely line operated (no high frequency oscillators), with 4 power transformers, a 19 henry inductor and a 7 henry inductor for filtering. As shown on the schematic of page 14, the 425V B+ line of the vertical amplifier is regulated. This regulator uses a total of 7 tubes: three triodes as the series-pass element, a pentode as the error amplifier, a gas-discharge tube as the reference element and two diode rectifiers. A delay relay alows time for the filaments to reach temperature before applying the B+ voltage.

The Dumont 248 must be one of the largest, heaviest oscilloscopes ever made. It's divided into two units: a display and the power supply. Together, they total a volume of 5 cubic feet. Some indication of the size can be obtained from the picture on page 10, recognizing that the CRT is 5 inches in diameter.

The total weight of the unit is 170 pounds: 60 pounds for the display (the *indicator unit*), 110 pounds for the power supply. Notice in the photograph page 10 that the display unit has one carrying handle. The power supply has two[2].

The *Someone Stole My Scope!* situation (as a co-worker makes off with one's test equipment) is familiar to anyone who has worked in an electronics shop. This would not be a problem with the Dumont 248: the would-be thief would need a fork lift truck or several accomplices.

Photographs and schematics of the Dumont 248 are shown on pages 10 to 14.

It's interesting to compare the timebase of the Dumont 248 (page 13) with that of the Tektronix 511 (page 19). The Tek circuit abandons the earlier *synchronized oscillator* approach and focusses entirely on a triggered sweep.

[1] It is possible to obtain the same result by making the cathode voltage more negative. However, this reduces the deflection sensitivity of the CRT, which places more demand on the vertical and horizontal amplifiers. The PDA has less effect on deflection sensitivity, so it is the preferred approach to increase intensity.

Even with a high accelerator voltage, the trace was dim at low repetition rates. A so-called *fishmask* accessory was available to help with this. It was a rubber tube, cutout for the observers face at one end and to be placed over the CRT face at the other. This device blocked ambient light. An engineer who used one of these things for an entire day would return home with a bizarre red mark around the face. To simulate this experience, place your face in the opening of a rubber boot.

[2] Tektronix also produced at least one model in which the display and power supply were in separate units, which the author recalls using in the 1960's. The two units were more-or-less permanently installed on a Tektronix scope dolly.

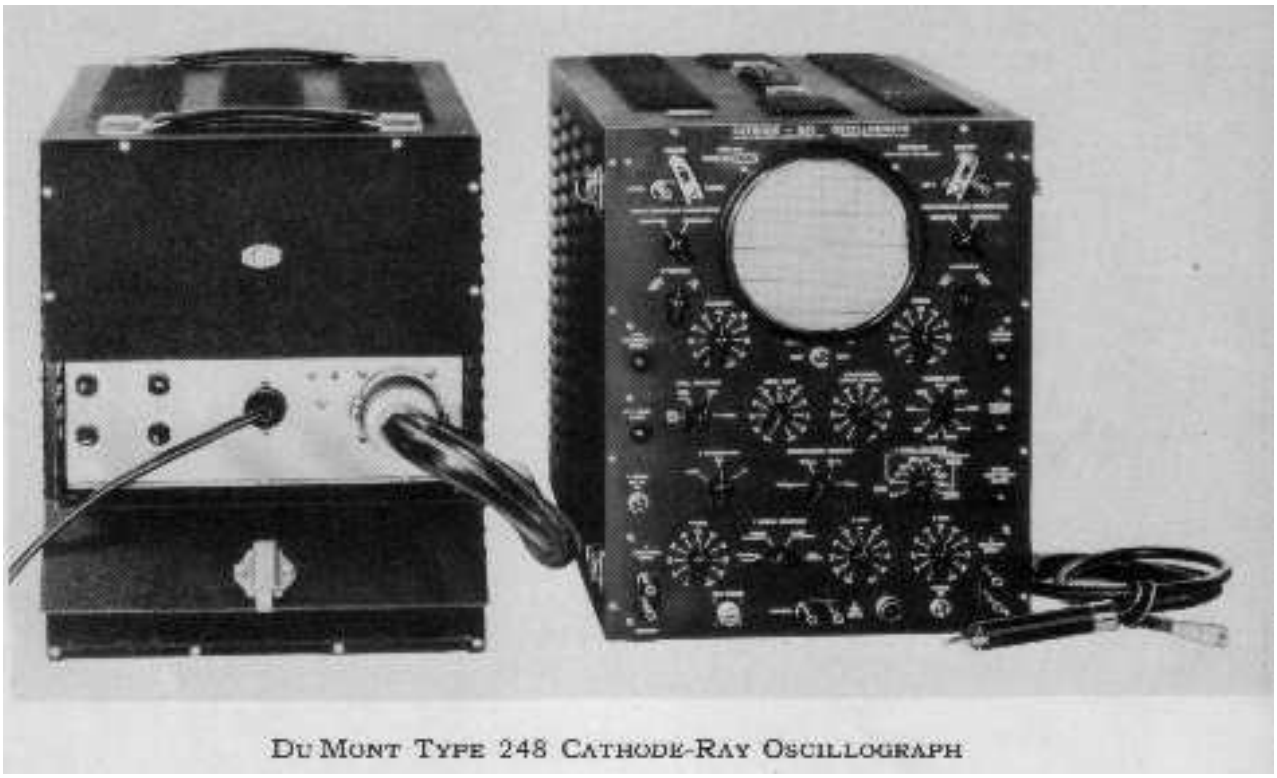

Figure 5: Instrument Picture

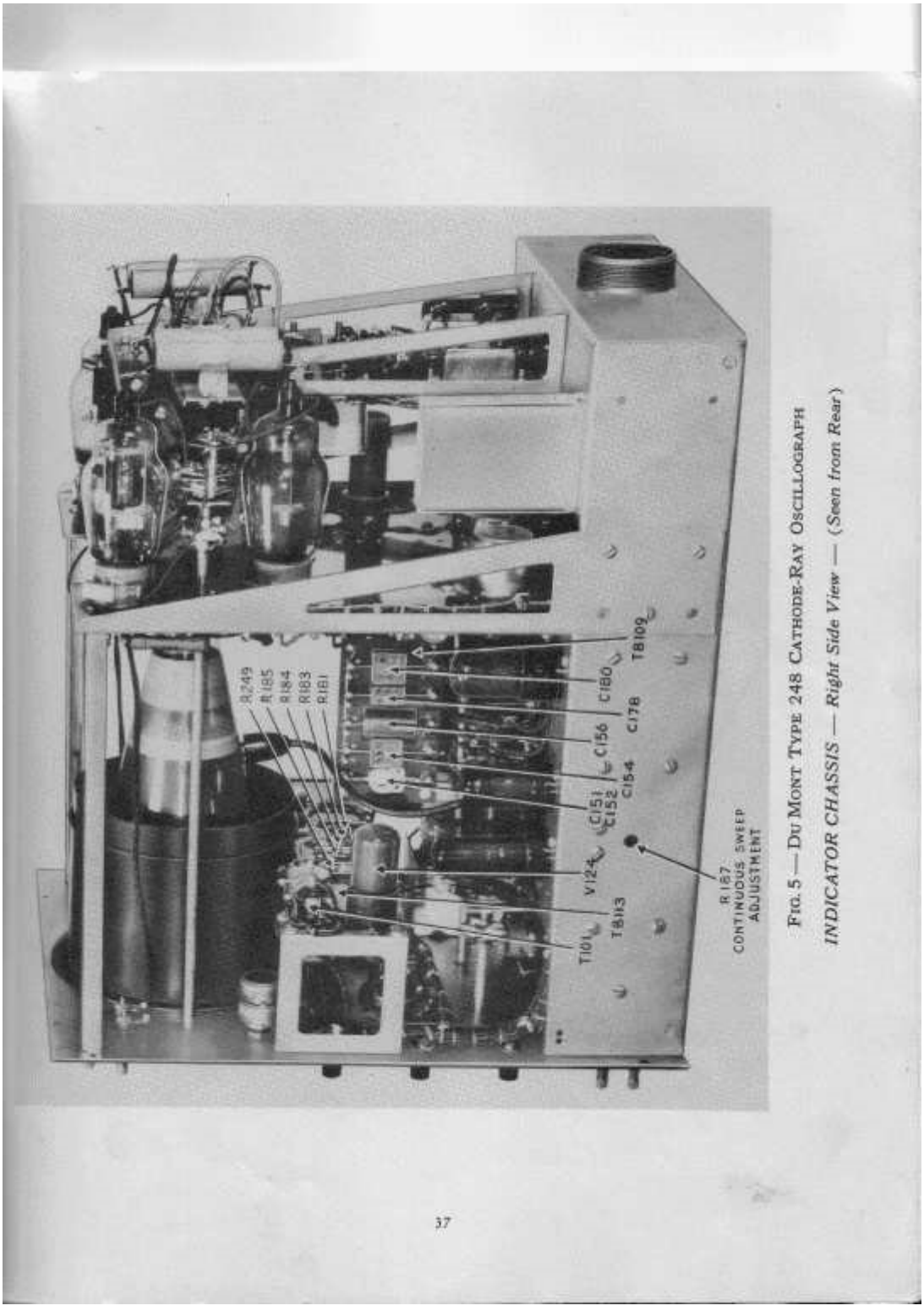

FIG. 5 — DU MONT TYPE 248 CATHODE-RAY OSCILLOGRAPH

INDICATOR CHASSIS — Right Side View — (Seen from Rear)

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Figure 6: Display Unit Internals

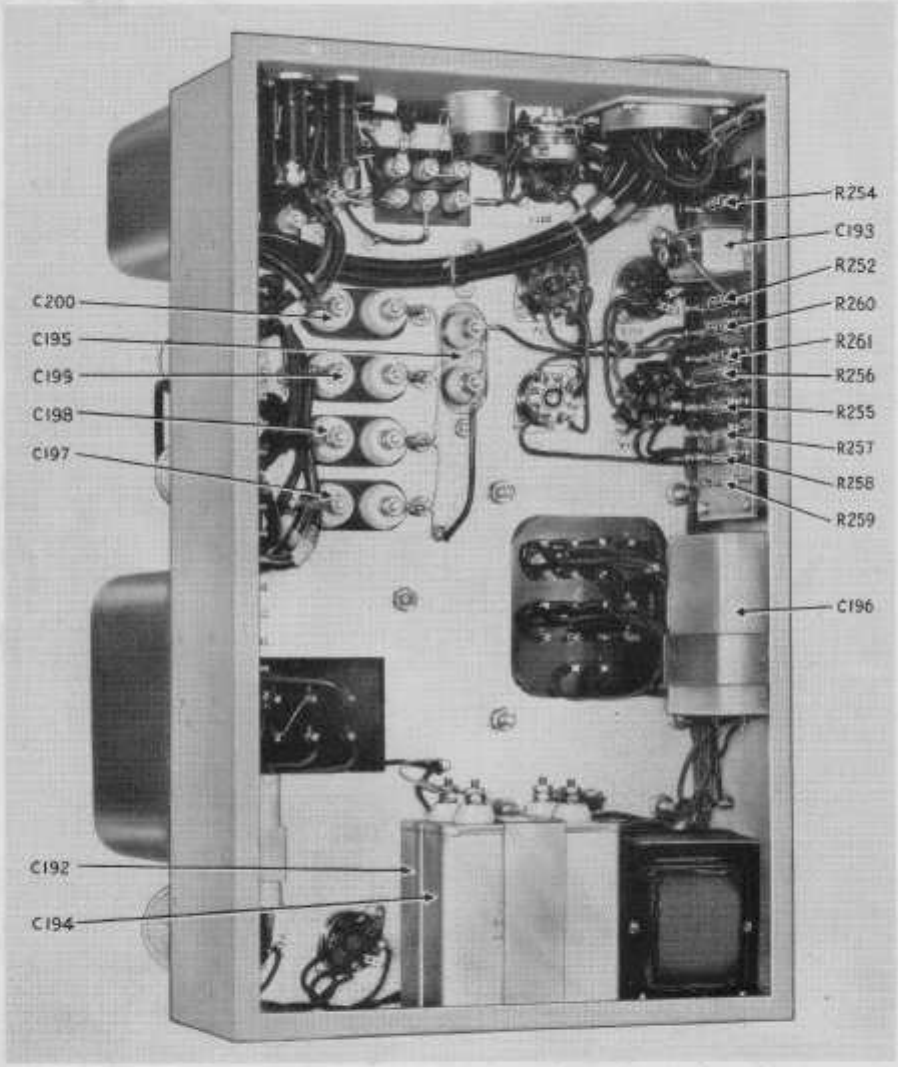

FIG. 10 — DU MONT TYPE 248 CATHODE-RAY OSCILLOGRAPH

POWER SUPPLY UNIT — Bottom, View A

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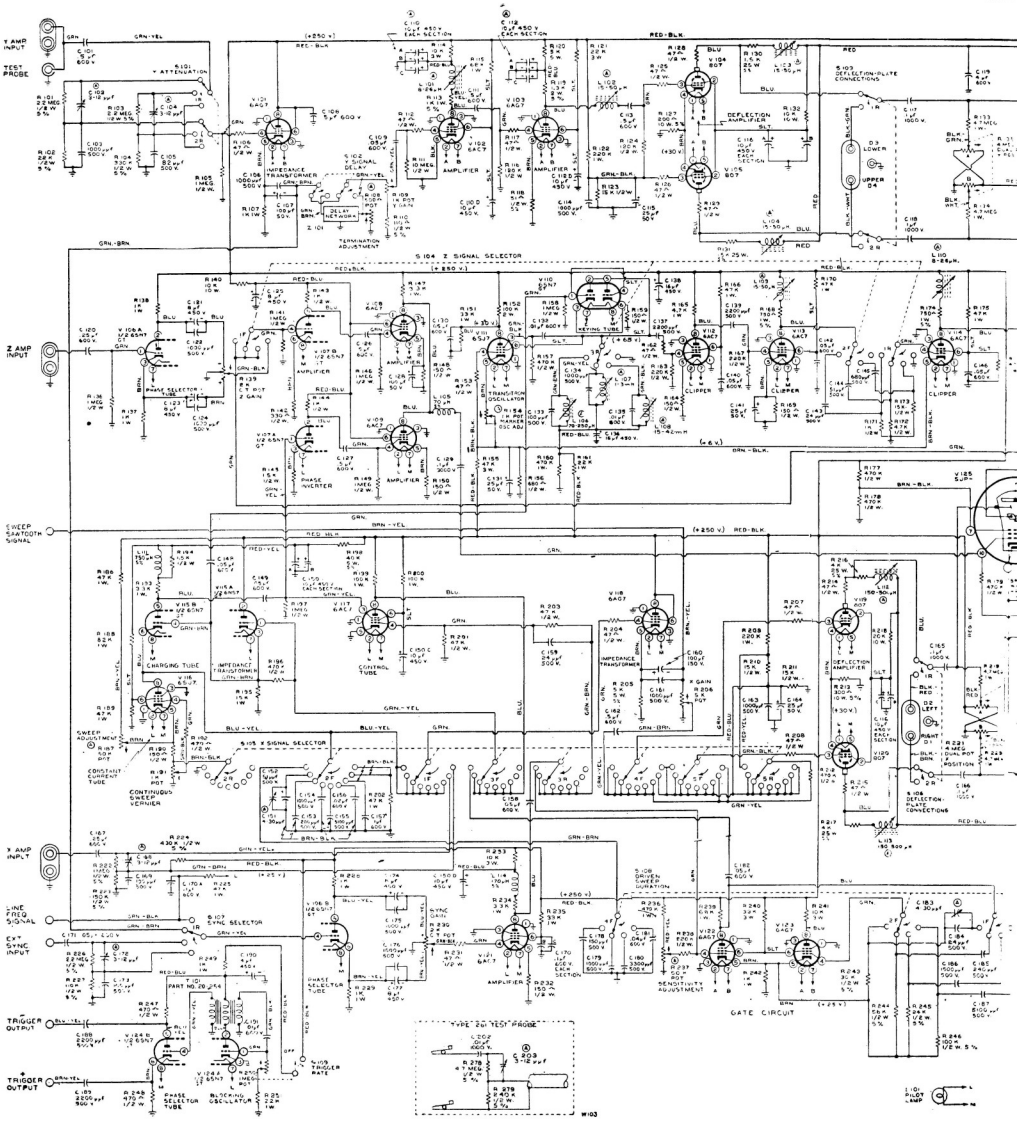
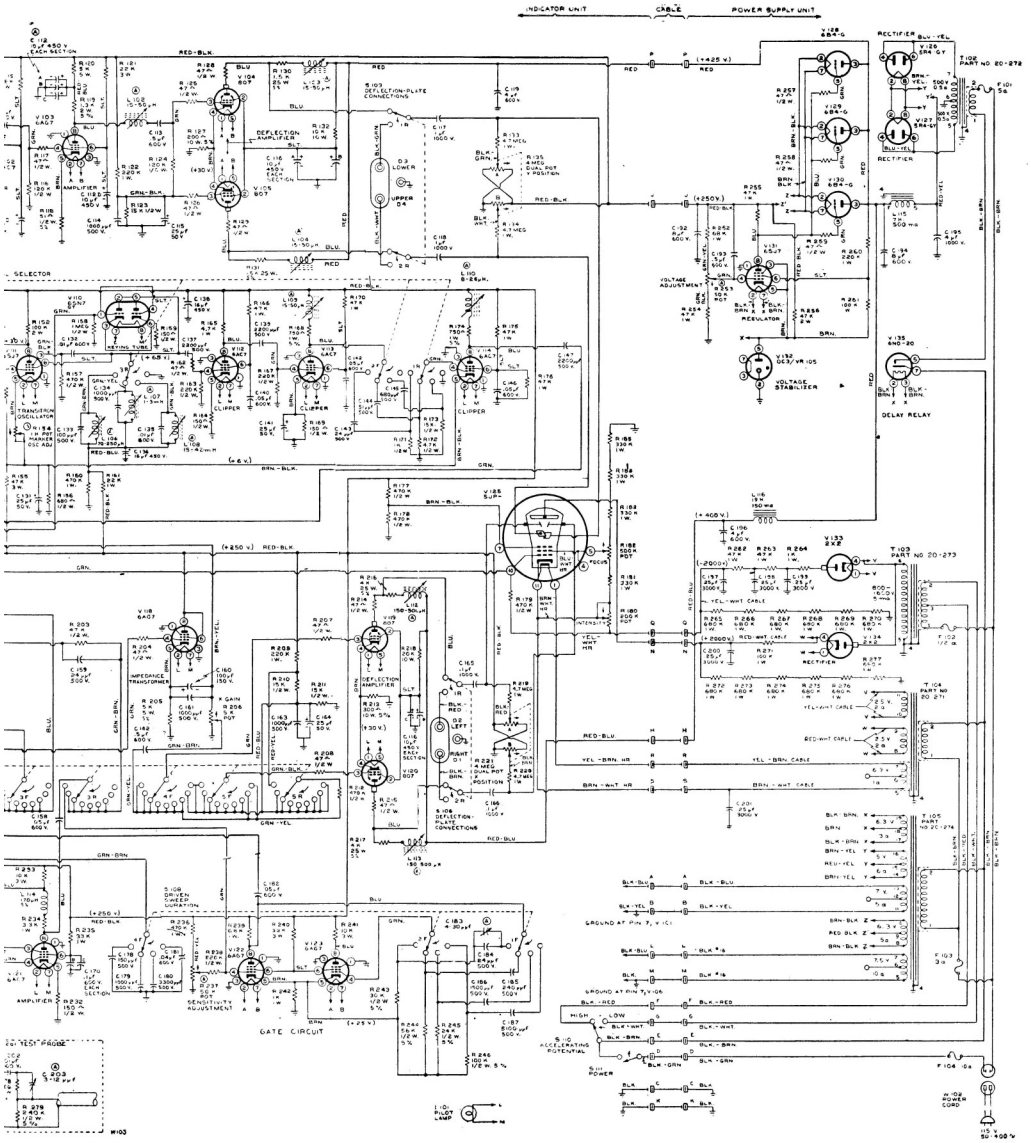
Figure 7: Power Supply Underside



DU MONT TYPE 248 CATHODE-RAY OSC
SCHEMATIC OF CIRCUIT
Ref.: DD-4363-E-4

Figure 8: Schematic LHS



DU MONT TYPE 248 CATHODE-RAY OSCILLOGRAPH
SCHEMATIC OF CIRCUIT
Ref.: DD-4363-E-4

Figure 9: Schematic RHS