AccessionIndex: TCD-SCSS-T.20141212.002
Accession Date: 12-Dec-2014
Accession By: Dr.Brian Coghlan
Object name: Roband RO50A MkII Oscilloscope
Vintage: c.195x
Synopsis: Roband Oscilloscope Type RO50A Mark II, with Type 5C plugin dual trace unit. RO50A S/N: RO50A/52C, Type 5C S/N: 5C/399.

Description:
The Roband Oscilloscope Type RO50A Mark II was a high-quality cathode-ray (CRT) oscilloscope, using mixed valve (vacuum-tube) and transistor technology. Except for a few exotic applications, valves were replaced with transistors in the 1960s then chips (integrated circuits) in the 1970s.

At the time of its introduction, most electronic systems were still analog, for which 25MHz was considered a high frequency, although VHF and UHF technologies were already in use, for example in FM radio and microwave radars. All of the first generation of digital computers were valve-based, as were most of the 1950s generation, whereas the 1960s generation used transistors. All these operated on clock cycles slower than 100nS (10MHz). Only in the 1970s with the introduction of microprocessors were higher operating frequencies used. Hence this oscilloscope is typical of those used for debugging problems with the valve and transistor generation of digital computers in the period 1950-1970.

The oscilloscope displays signals versus time as a 2-d Y-vs-X graph on the CRT. The CRT itself is a long vacuum-tube, with a negatively-charged cathode that emits electrons, and a highly-positively-charged anode that accelerates the electrons towards a phosphorus front (the CRT screen) that glows when hit by electrons. Between the cathode and anode, charged plates deflect the electron beam according to the voltage charge. One positive/negative pair deflect the beam in the X dimension and another pair in the Y dimension. Front-panel controls allow adjustment to optimise focus, intensity, astigmatism, and graticule visibility.

The X deflection plates are driven by sawtooth voltage by a timebase circuit. The timebase is selectable between 0.1uS and 2Sec/cm, is also variable, and can be magnified x 10. The sweep may be triggered internally from the dual trace unit or externally (from a BNC TRIG input). In each case the trigger level can automatically be derived by the internal trigger circuit, or it can be manually adjusted. In the latter case any static trigger source voltage may be ignored or not (AC or DC coupling). The ‘HF Sync’ setting ignores all but high-frequency trigger signals. In all cases triggering may be selected to be on the positive or negative slope of the trigger signal.

The Type 5C Plugin Unit (dual trace unit) drives the Y deflection plates. The input voltage range for each input is independently selectable between 0.05 and 20V/cm, and each is also variable. A mode switch allows input A, B to be displayed, or A then B on alternate sweeps of the timebase, or both together, or A+B. The impression of two simultaneous display is created by chopping the Y deflection plates between the two input signals at such a high speed that the chopping is not visually perceptible. Each can independently be inverted, and the position of each can independently be adjusted. The timebase trigger source can be switched to be from either signal.

Squarewave 10V and 10mV outputs are provided for calibration. The standard of construction is high, with ceramic insulation where high-frequency signal paths exist.

The Roband company was set up in the late 1950s to manufacture high-quality electronic instruments, but has gradually left that market. The company still exists (c.2014), producing high-quality power supplies for industry.

'My father, who started the company, saw a gap in the market for high quality instruments such as this. Unfortunately at that time either HP and/or Tektronix decided to enter the same market in a big way and with their muscle sort of pulled the rug from under us. The RO50 was a valve-based device, and was superseded by the RO70, a solid state item, but this never really got going for the reason given above, despite having top quality performance.'
Ref: Andrew Gold, Managing Director, Roband Electronics plc, Charlwood Works, Charlwood, Horley, Surrey, England, RH6 0BU.

Accession Index	Object with Identification
TCD-SCSS-T.20141212.002.01	Roband Oscilloscope Type RO50A Mark II. S/N: RO50A/52C
TCD-SCSS-T.20141212.002.02	Type 5C Plugin Dual Trace Unit. S/N: 5C/399
TCD-SCSS-V.20141212.002	Roband RO50A Oscilloscope Instruction Manuals.

The instruction manuals are properly part of the Literature category of this catalog, but are listed here too for convenience.

Figure 1: Roband RO50A MkII Oscilloscope right three-quarter top view

Figure 2: Roband RO50A MkII Oscilloscope front top view

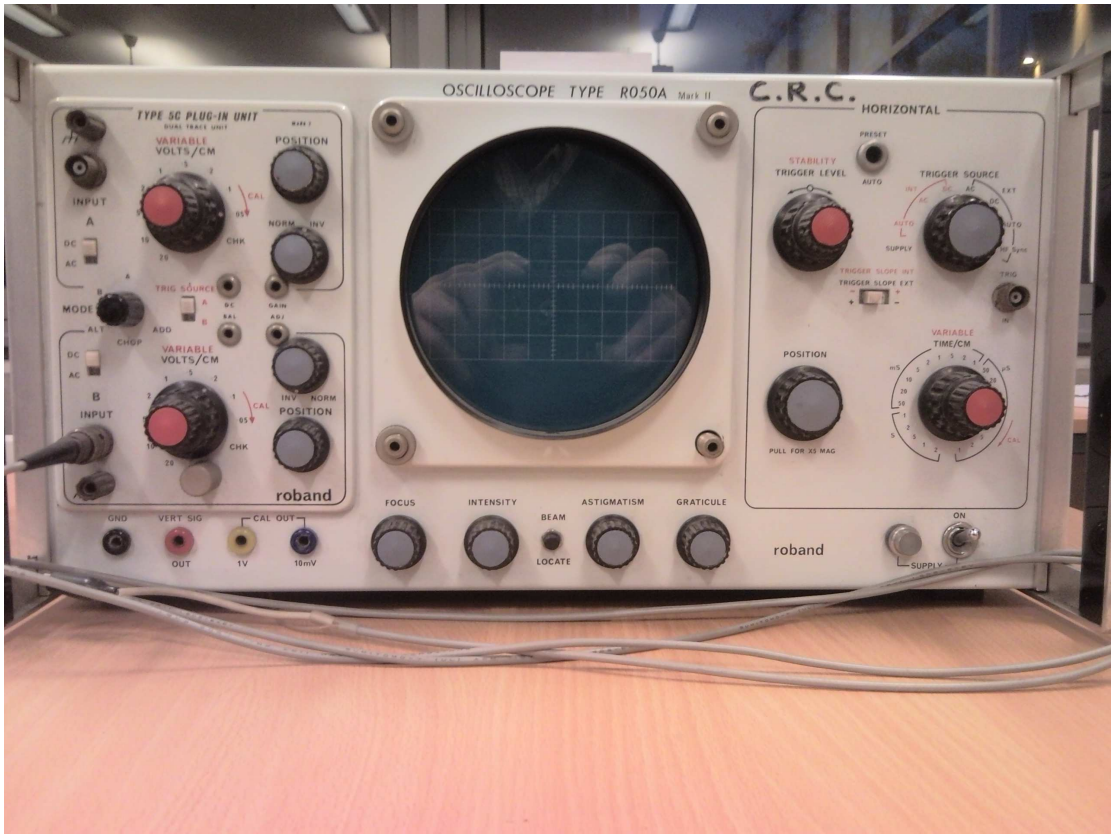

Figure 3: Roband RO50A MkII Oscilloscope front view

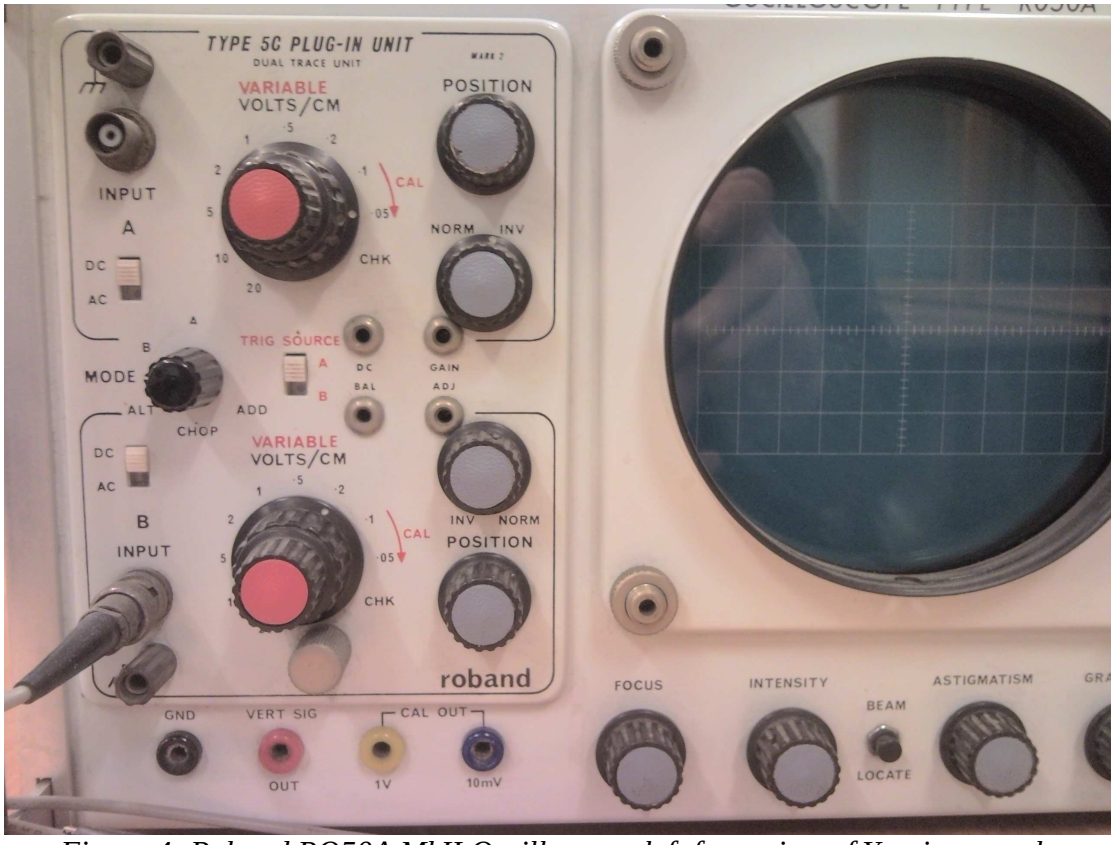

Figure 4: Roband RO50A MkII Oscilloscope left front view of Y-axis controls

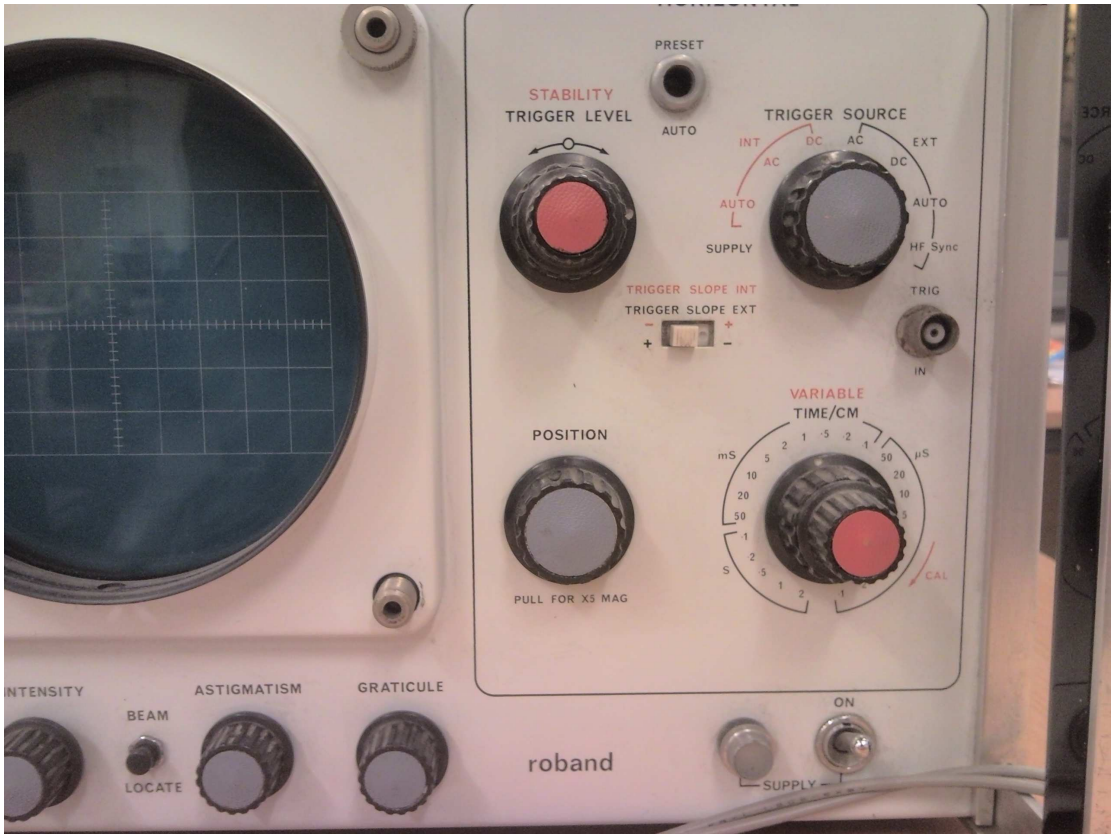

Figure 5: Roband RO50A MkII Oscilloscope right front view of X-axis controls

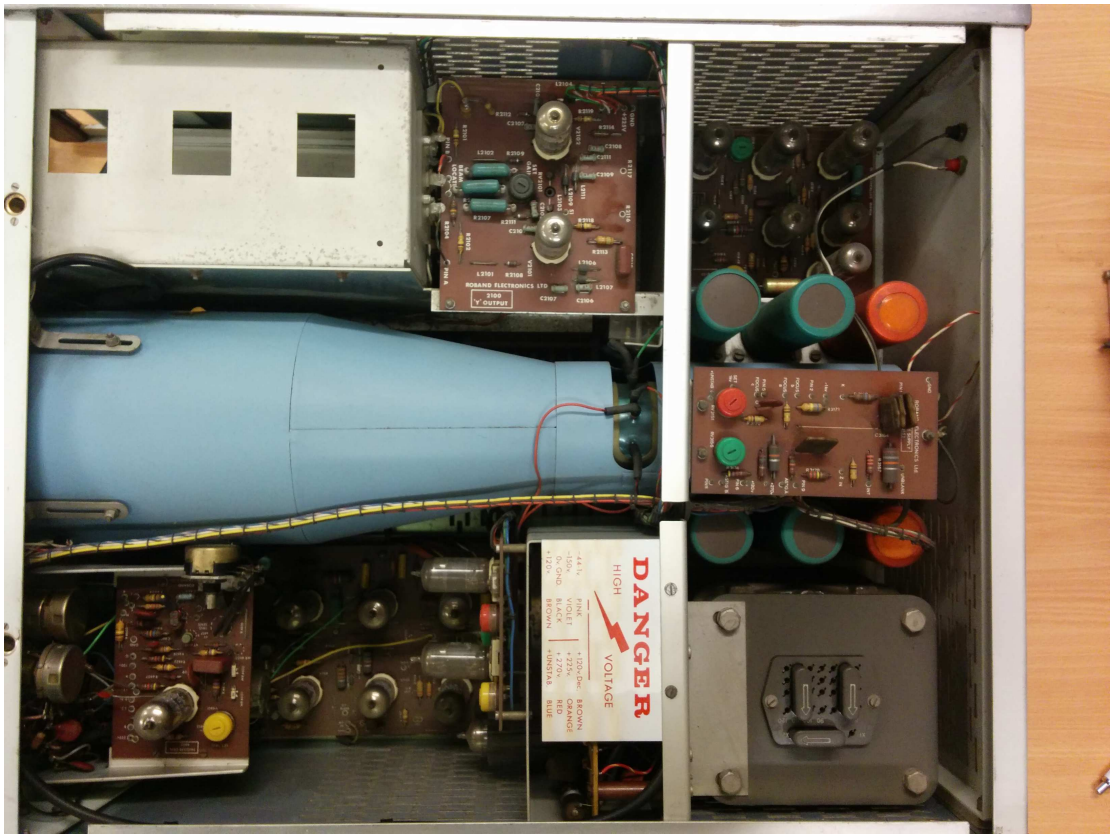

Figure 6: Roband RO50A MkII Oscilloscope top internal view
Y-axis at top left, CRT at middle, X-axis at lower left, power supplies at right

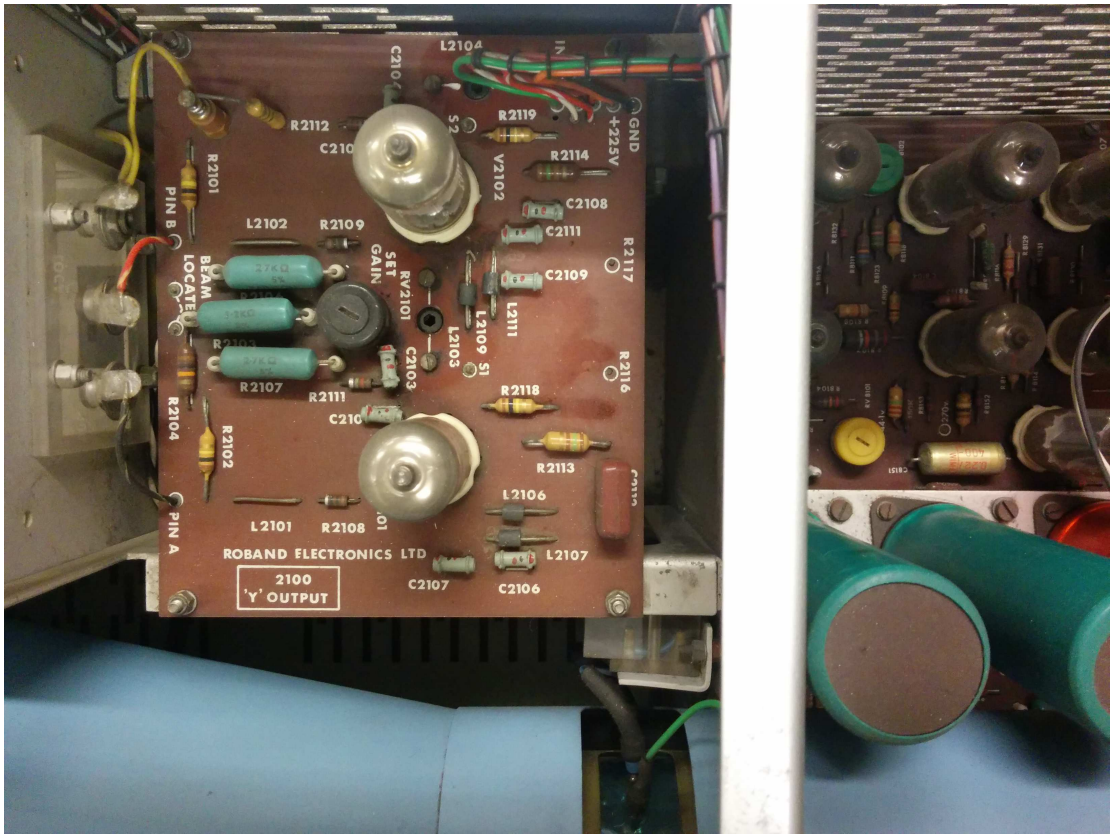

Figure 7: Roband RO50A MkII Oscilloscope Y-axis output circuit

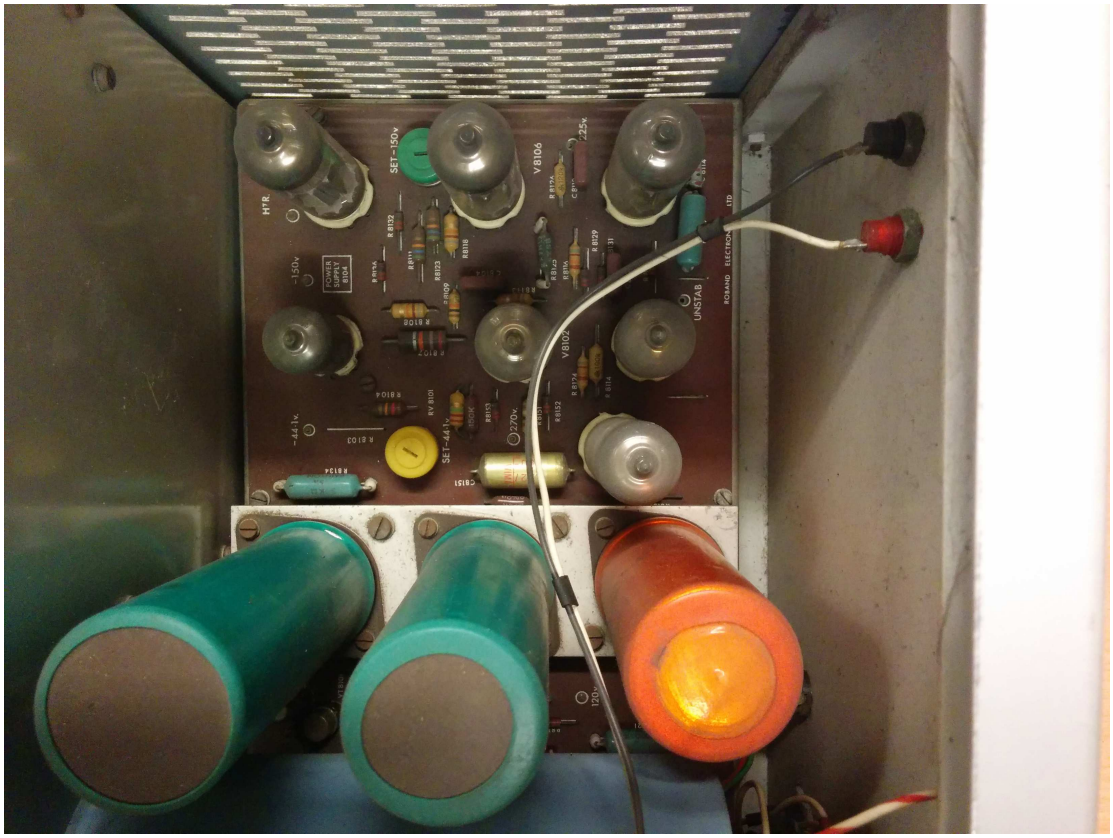

Figure 8: Roband RO50A MkII Oscilloscope rear right top internal view
Power supply circuit (for -44.1V, -150V, +225V, +270V)

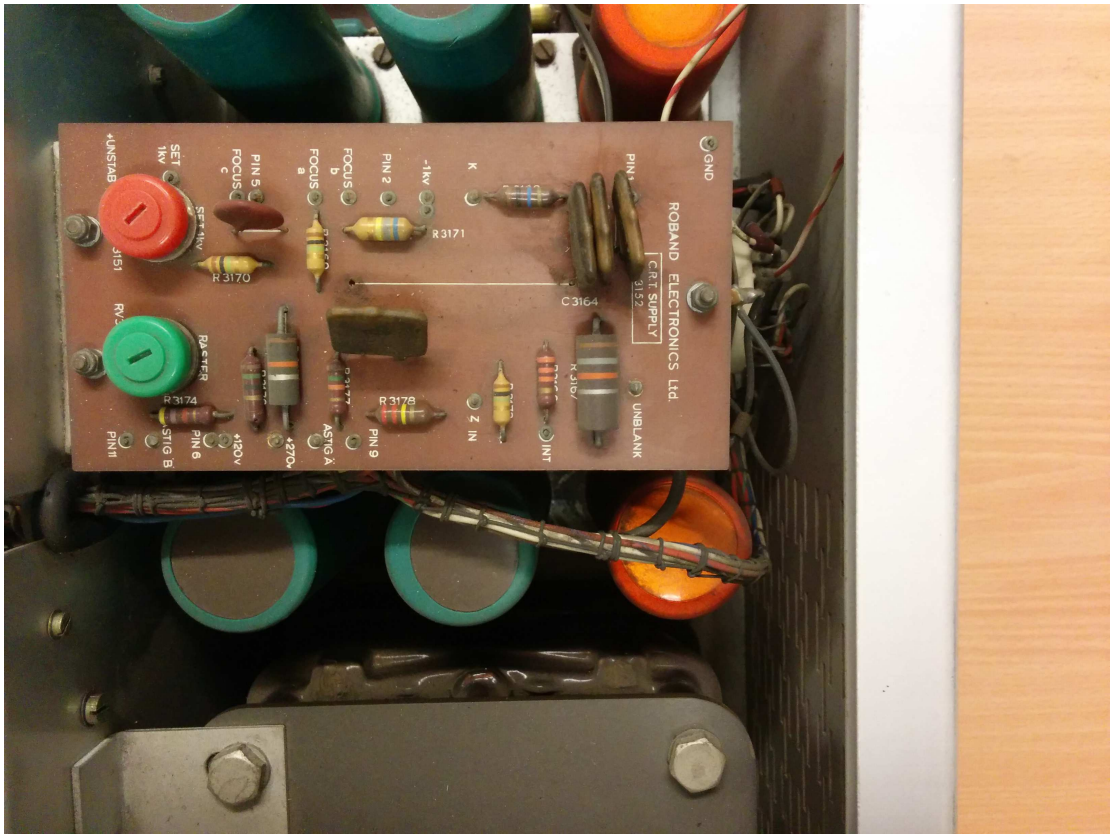

Figure 9: Roband RO50A MkII Oscilloscope rear middle top internal view
CRT supply circuit (for blanking, focus, astigmatism, 1kV anode voltage)

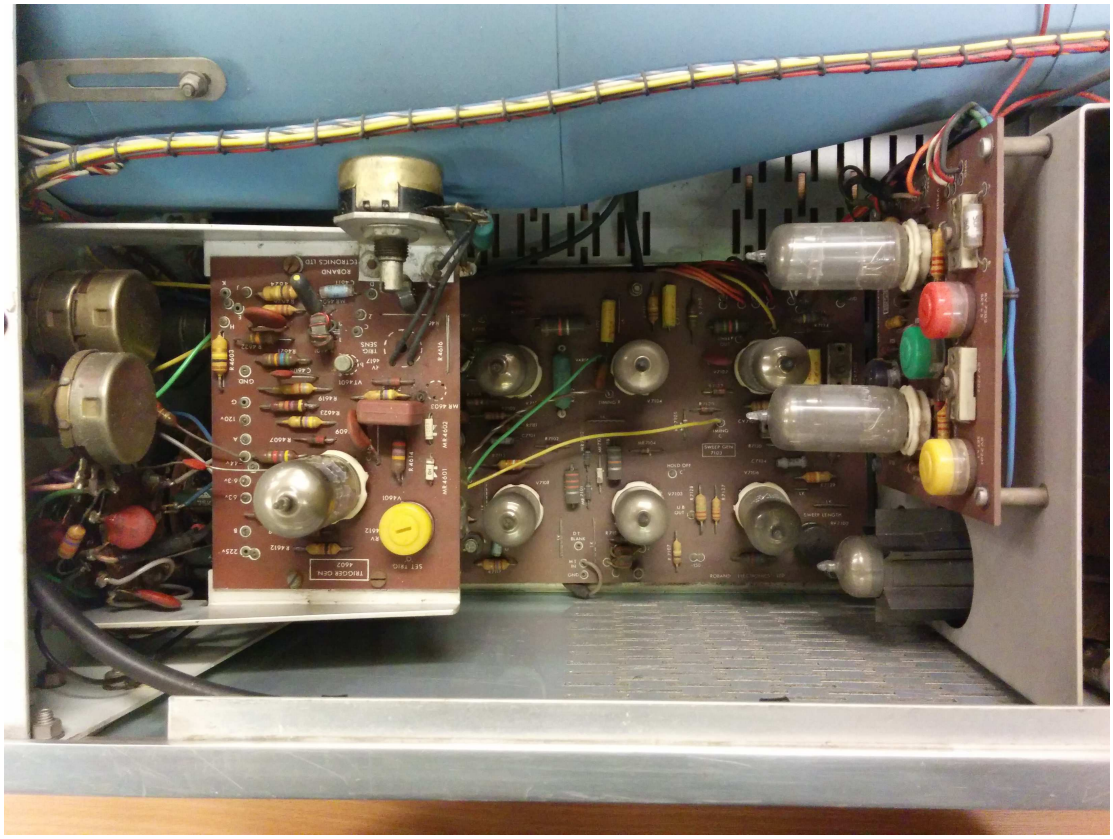

Figure 10: Roband RO50A MkII Oscilloscope X-axis circuits
left: trigger circuit, middle: timebase (sweep) circuit, right: X-axis output circuit

Figure 11: Roband RO50A MkII Oscilloscope X-axis circuits
bottom: trigger circuit, middle: timebase (sweep) circuit, top: X-axis output circuit

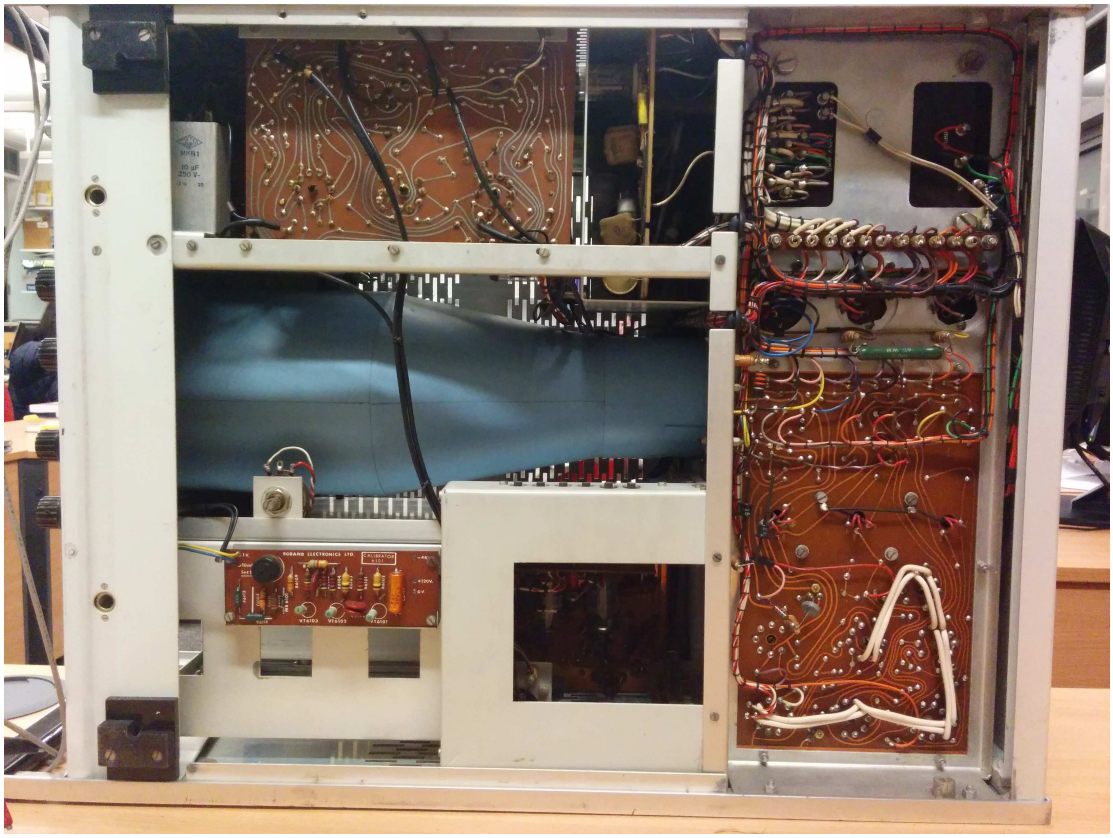

Figure 12: Roband RO50A MkII Oscilloscope bottom internal view

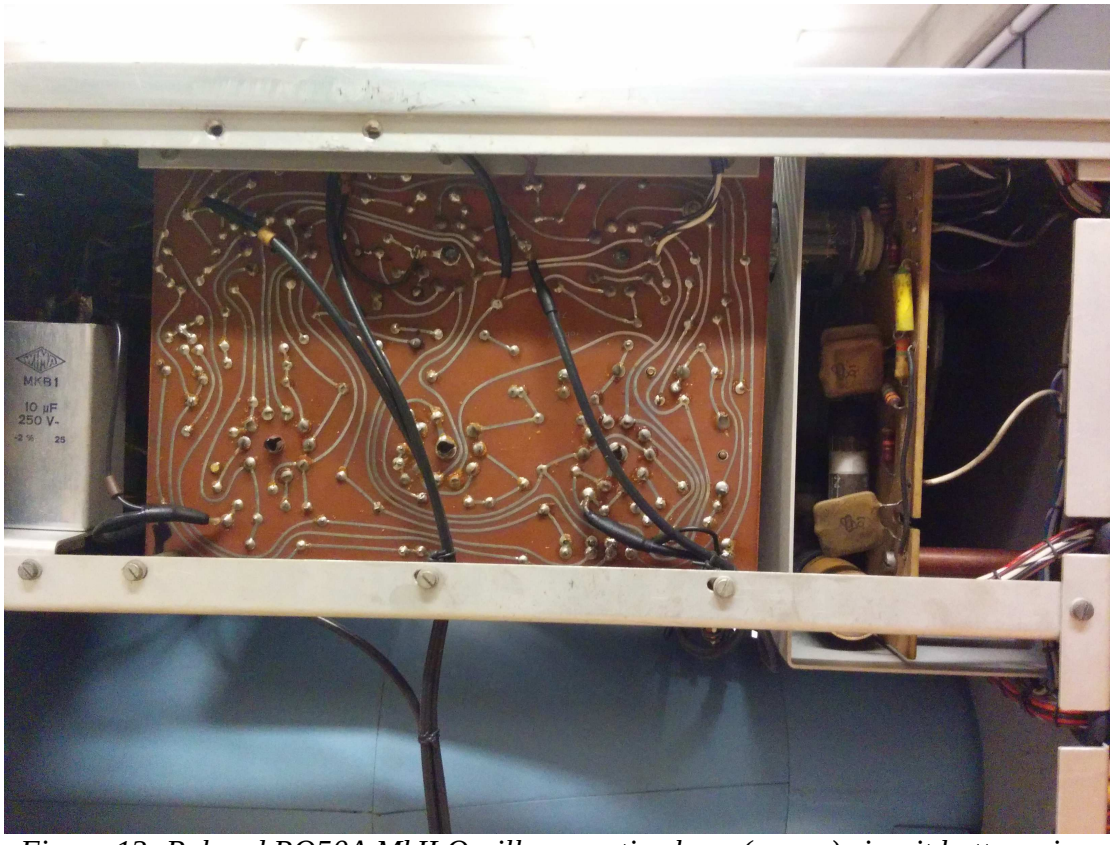

Figure 13: Roband RO50A MkII Oscilloscope timebase (sweep) circuit bottom view

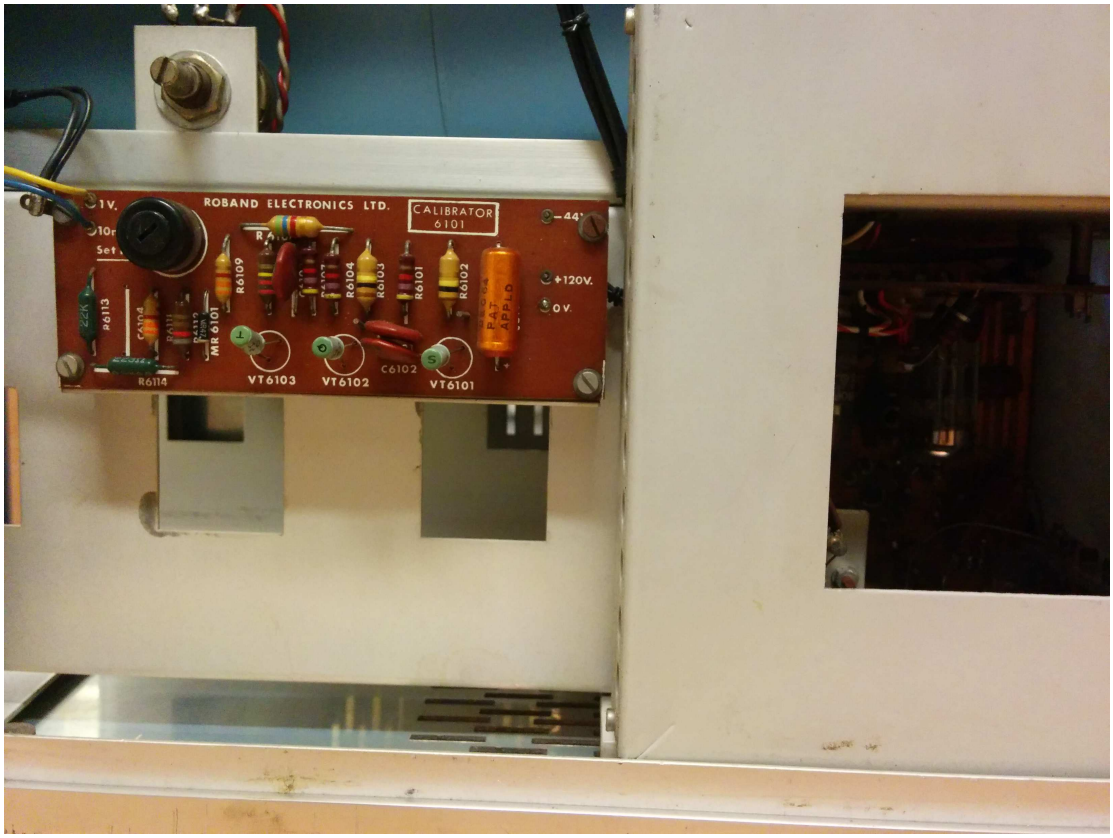

Figure 14: Roband RO50A MkII Oscilloscope calibrator circuit

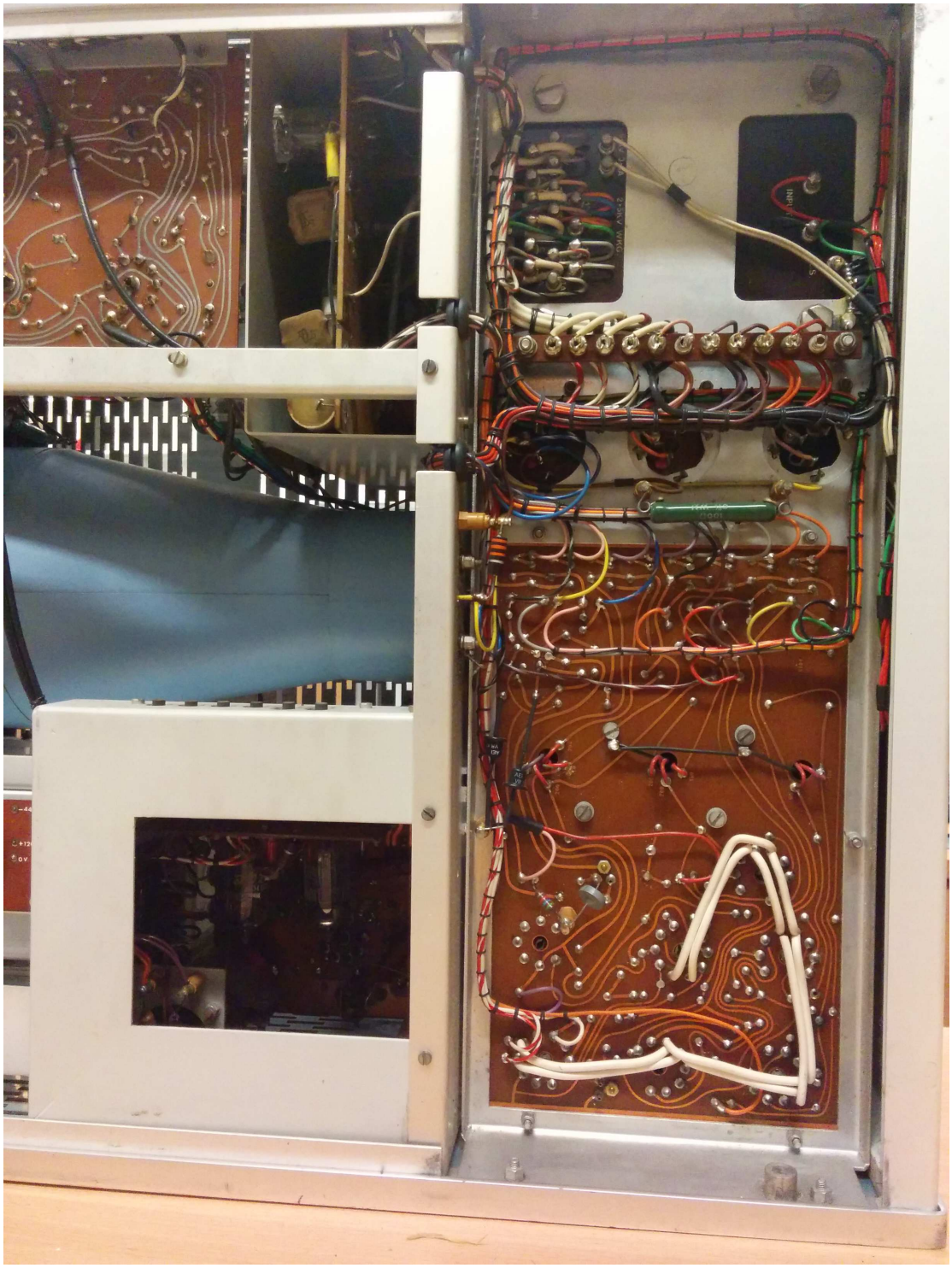

Figure 15: Roband RO50A MkII Oscilloscope power supply circuits bottom view
Transformer at top right, power supply circuits at bottom right

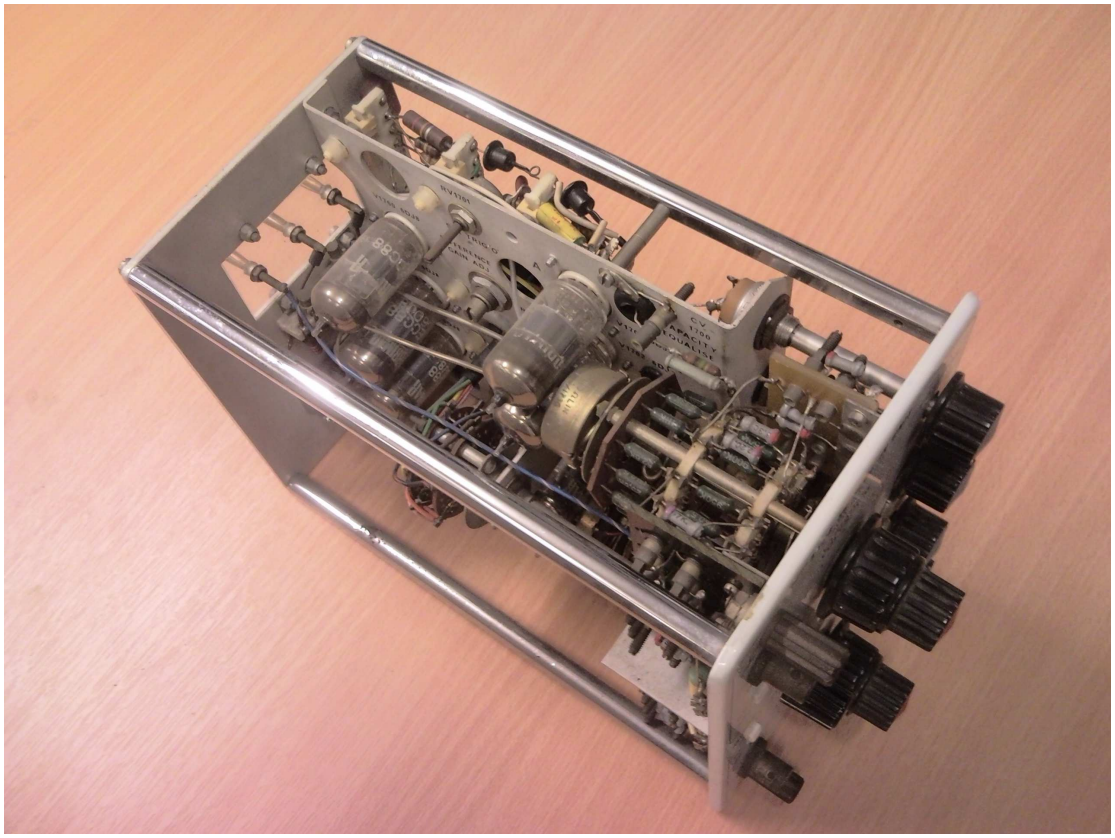

Figure 16: Roband RO50A MkII Oscilloscope dual trace unit three-quarter top view

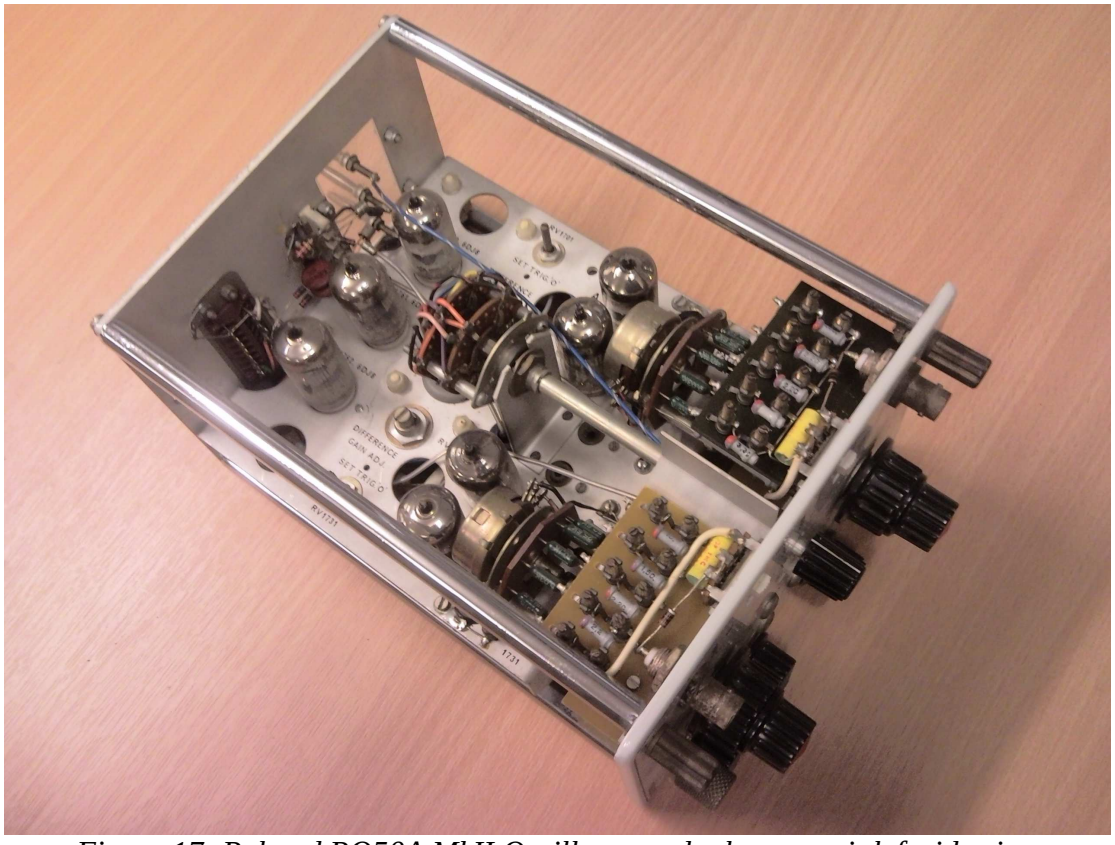

Figure 17: Roband RO50A MkII Oscilloscope dual trace unit left side view

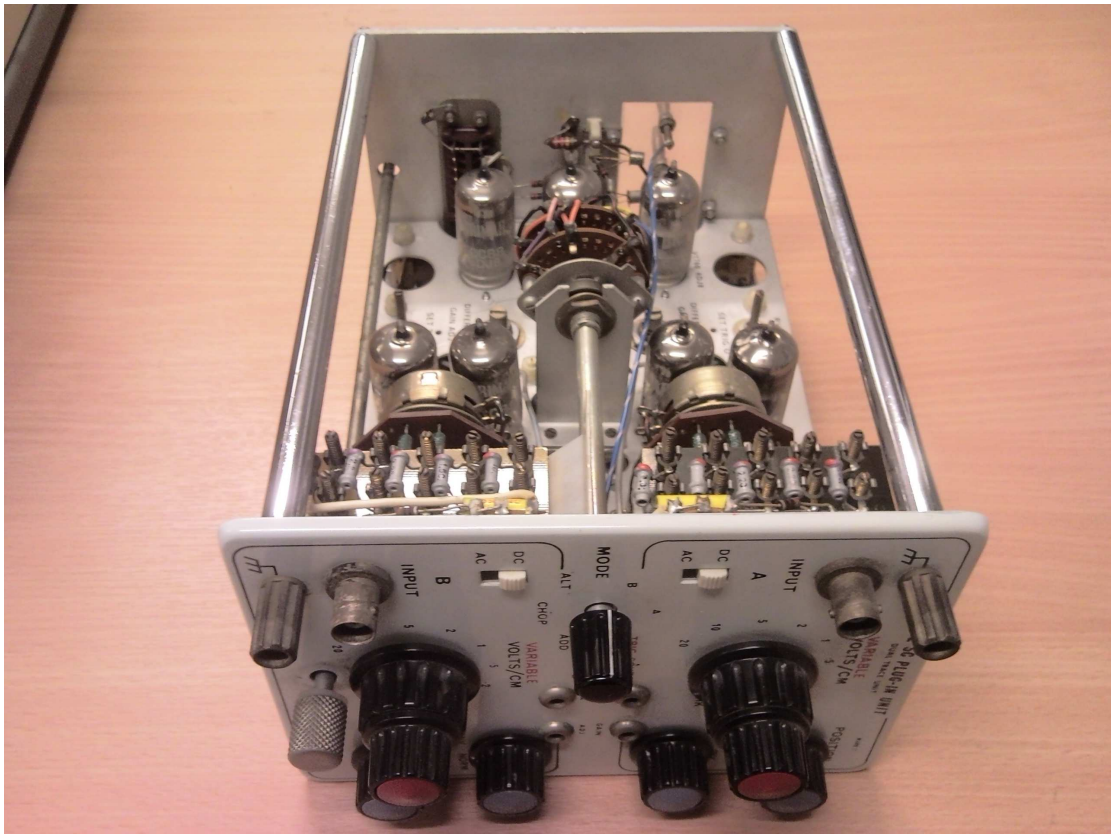

Figure 18: Roband RO50A MkII Oscilloscope dual trace unit left front top view

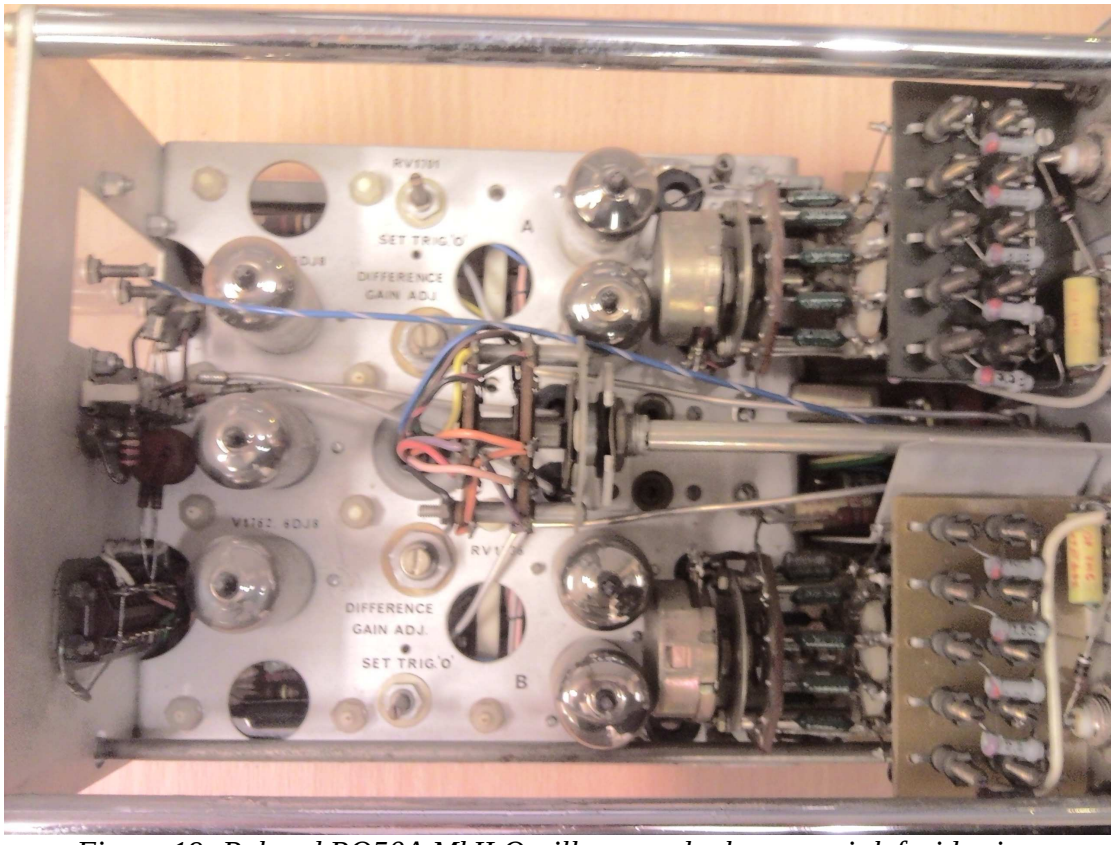

Figure 19: Roband RO50A MkII Oscilloscope dual trace unit left side view

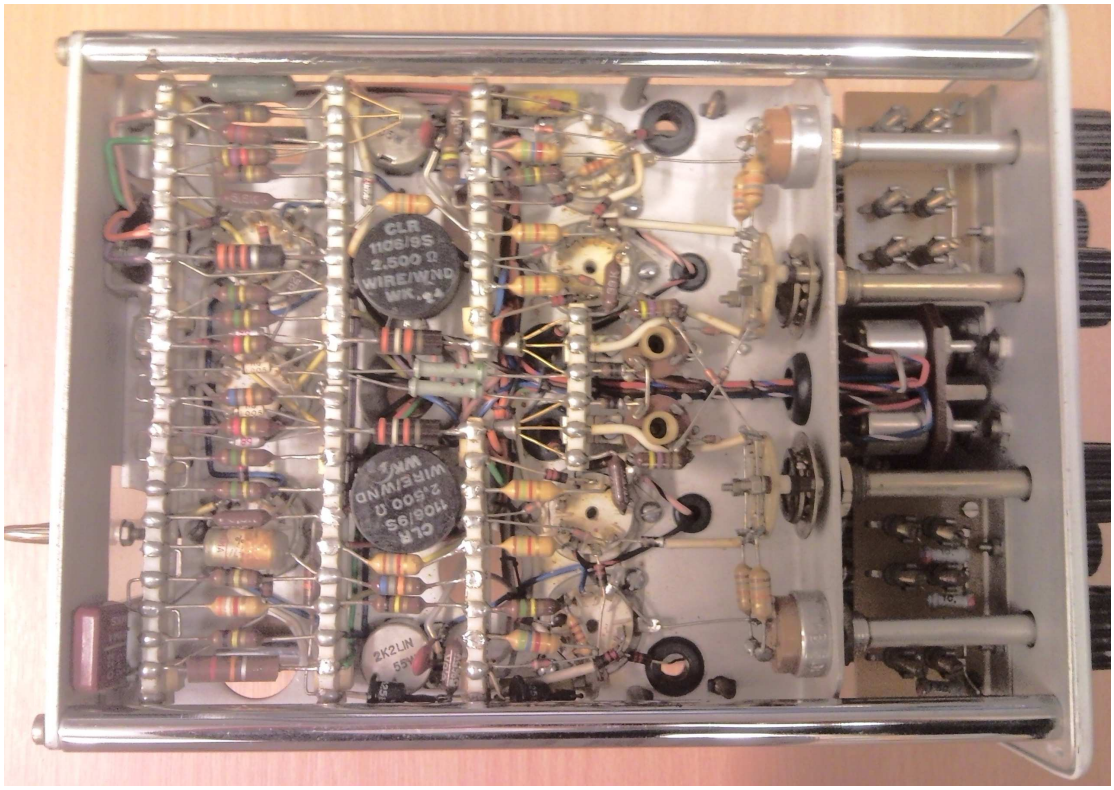

Figure 20: Roband RO50A MkII Oscilloscope dual trace unit right side view

Figure 21: Roband RO50A MkII Oscilloscope dual trace unit rear view, S/N: 5C/399

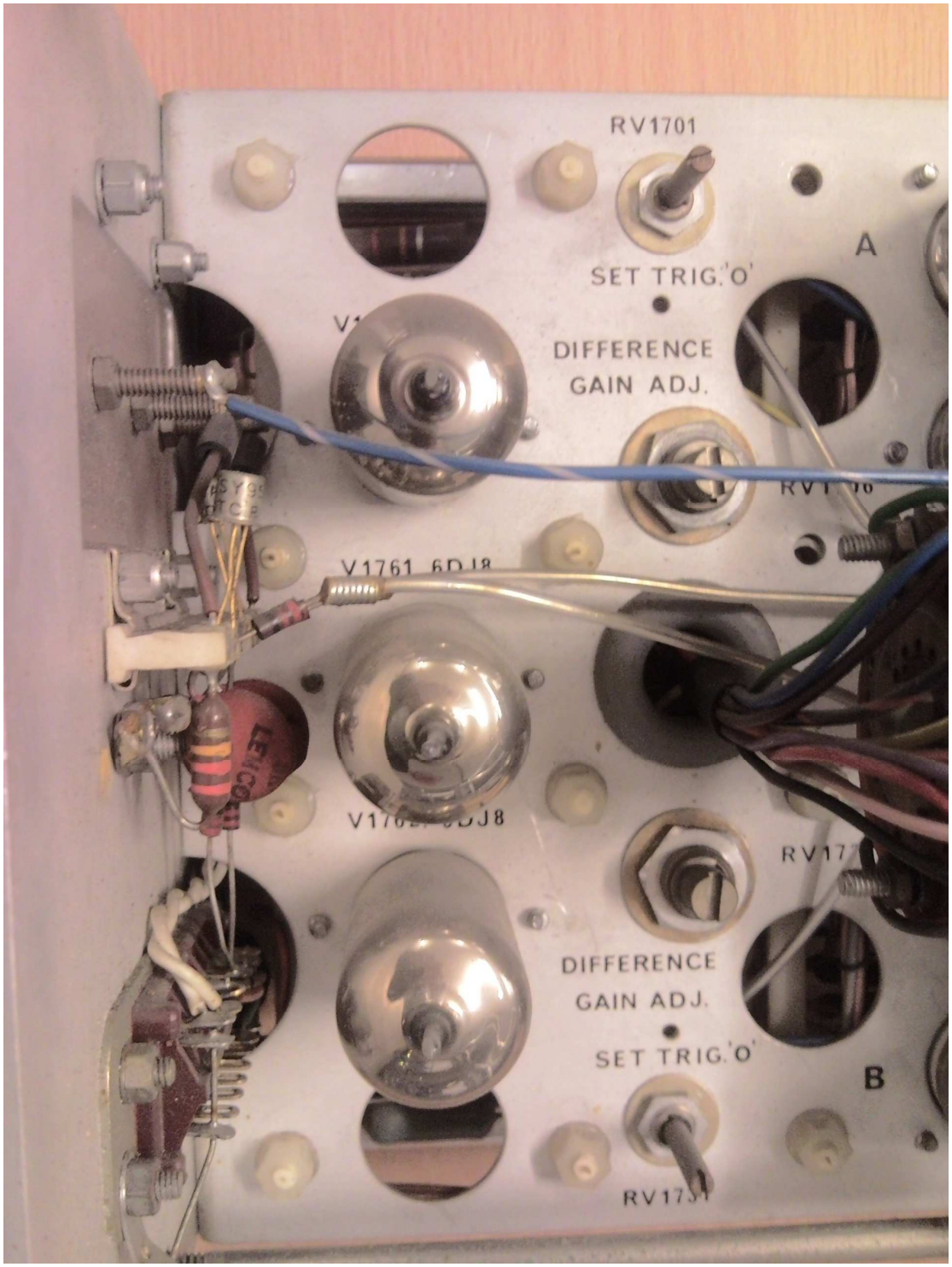

Figure 22: Roband RO50A MkII Oscilloscope dual trace unit rear of left side closeup

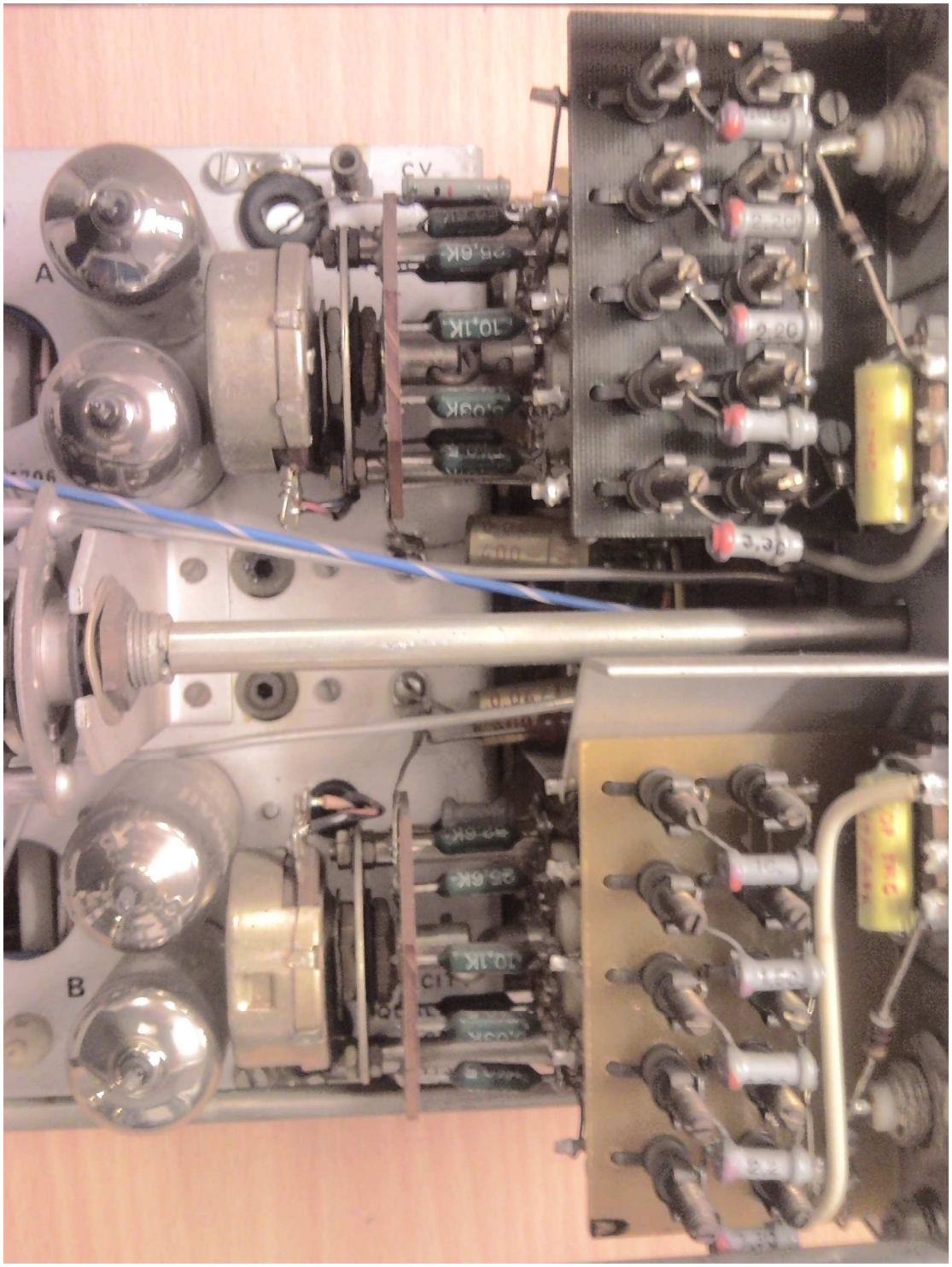

Figure 23: Roband RO50A MkII Oscilloscope dual trace unit front of left side closeup

Figure 24: Roband RO50A MkII Oscilloscope rear view

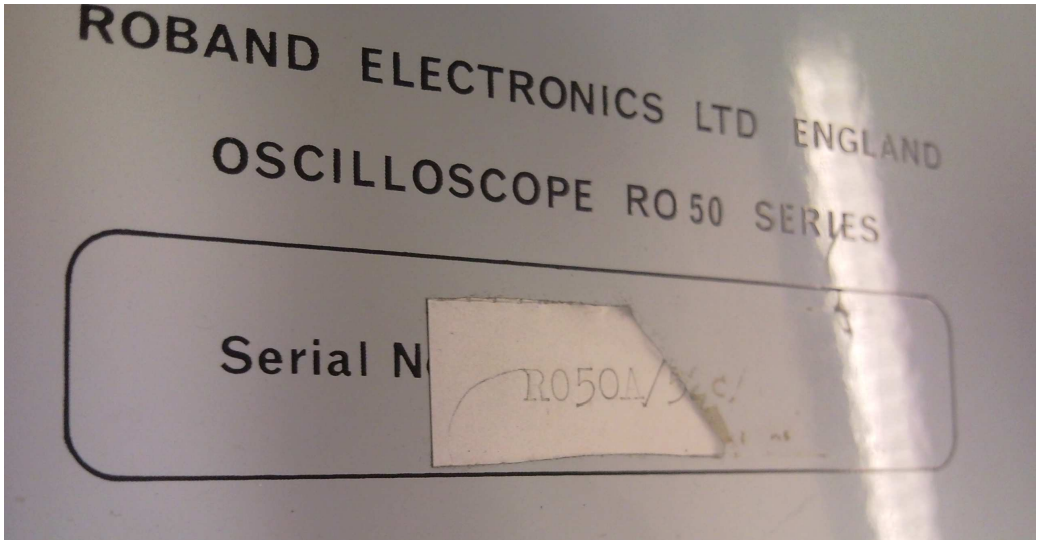

Figure 25: Roband RO50A MkII Oscilloscope serial number
S/N: RO50A/52C