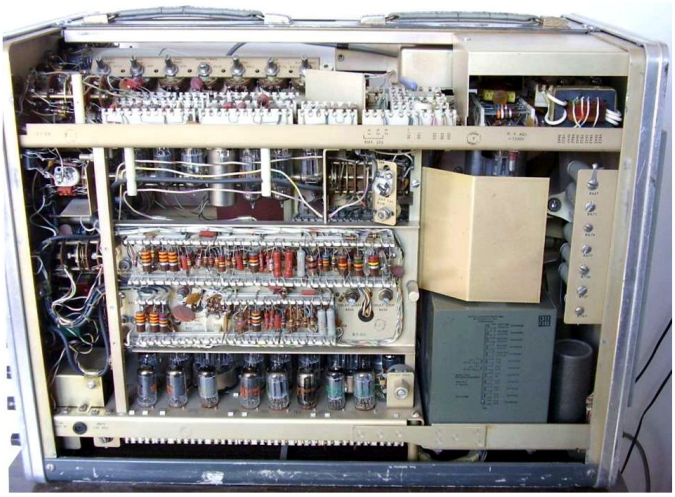
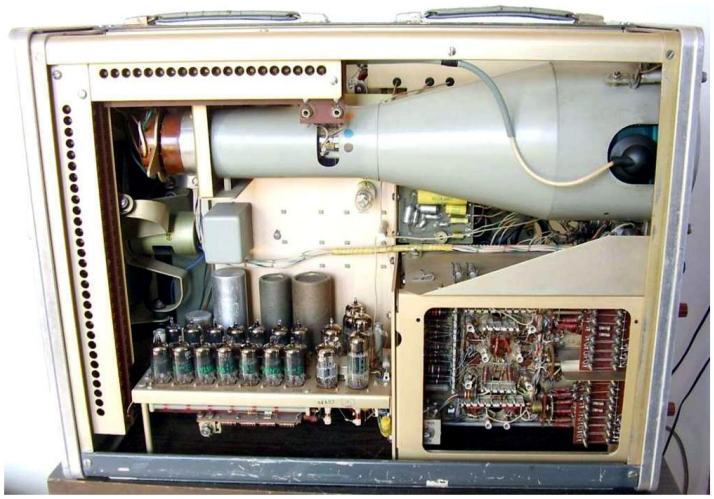
Lavoie LA-265A









The LA-265A is a mainframe oscilloscope with DC to 30 MHz bandpass and 12 ns risetime. Remarkable are the distributed gain vertical amplifier, using twelve 6DK6 tubes and the vertical delay line, with 70 LCR adjustable elementary cells.

It was a copy of the Tek 545, made to militay standards under US government orders. This sample, fully working and complete of its operator/service manual, is equipped with the LA-265-CA vertical plug-in amplifier, the equivalent of Tek CA.

Below an article on the differences between the LA-265A and the Tek 545.

Lavoie LA-265A oscilloscope compared with Tektronix



The Lavoie LA-265A was a militarized version of the Tektronix 545A oscilloscope mainframe. Of course it was intended to replace even other Tek depopulated mainframes, as the 531, the 535 and the 541. In the late fifties military asked some suppliers, Hickok, Jetronics and the same Lavoie Laboratories, for second sources of this family of widely used instruments. The LA-265A was then a true alternate source for the appreciated Tek mainframes, capable of accepting Tek letter series vertical plug-ins. Probably it was introduced quite late. We could date its production start up around the early sixties, the first edition of its technical manual, T.O. 33A1-13-229, being dated 1 November 1963. The Tek 545, the most powerful mainframe of the family had been introduced several years before, in 1955.

Electrical and mechanical specs can be summarized as follows:

- Vertical deflection bandpass, with L-type fast rise plug-in	DC to 30 MHz
- Risetime	12 ns
- Triggering modes T-base A	Auto, AC, DC, AC lf reject and AC hf
- Triggering modes T-base B	Auto, AC and DC
- Triggering level req., internal	Minimum 2 mm vertical deflection
- Triggering level, external	Signal between 0.2 and 10 volts amplitude
- Sweep times T-base A	0.1 µs to 5 s per centimeter in 24 calibrated steps. Up to 12 s/cm uncalibrated.
- Sweep times T-base B	2 µs to 1 s per centimeter in 18 calibrated steps.
- Time base accuracy	1% typical, 3% max error in calibrated positions
- Calibrator voltage	1 KHz square wave, 0.2 mV to 100Vpp in 18 steps. 3% accuracy
- Power requirements	115 to 125 and 210 to 250 VAC, 50 to 60 Hz, about 600 VA with LA-265-CA plug-in installed.
- Mechanical	13 by 16-3/4 by 24 inches, 65 pounds weight

The above figures are exactly the same given by Tektronix for its 545A oscilloscope, with the sole exception for power requirements. 500 VA for the 545A, even if with a different vertical plug inserted. Mistype, really different power requirements or different test conditions?

Looking at the front panel of the LA-265A we find that the only barely appreciable differences are in the labels, writings being screenprinted in white or red over a grey background and in the control knobs with few, yet pronounced knurls in the Lavoie model.

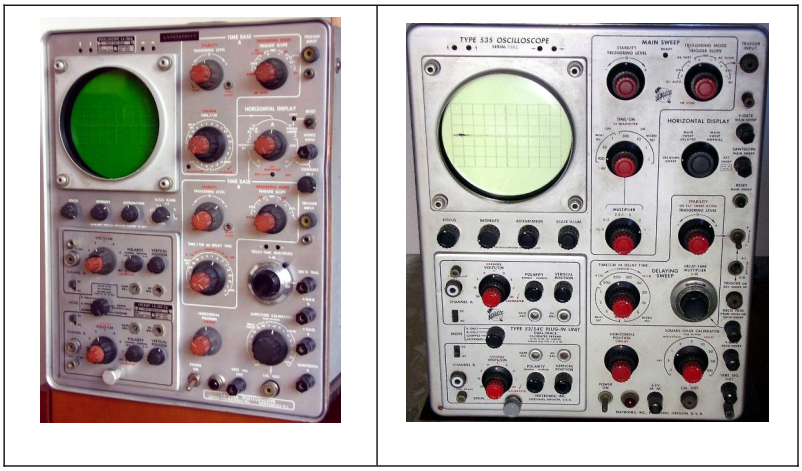


Fig. 1 – Here the front panel of a LA-265A with the LA-265-CA plug-in and the panel of a Tek mainframe, a 535 wit a CA plug-in in this case. Same controls and same layout.

Removing the cabinet side covers, the top class execution of the instrument can be appreciated. Golden-anodized aluminum is used throughout. Side covers are protected by conductive mesh windows inside, over the vent slots, to prevent radiation interference.

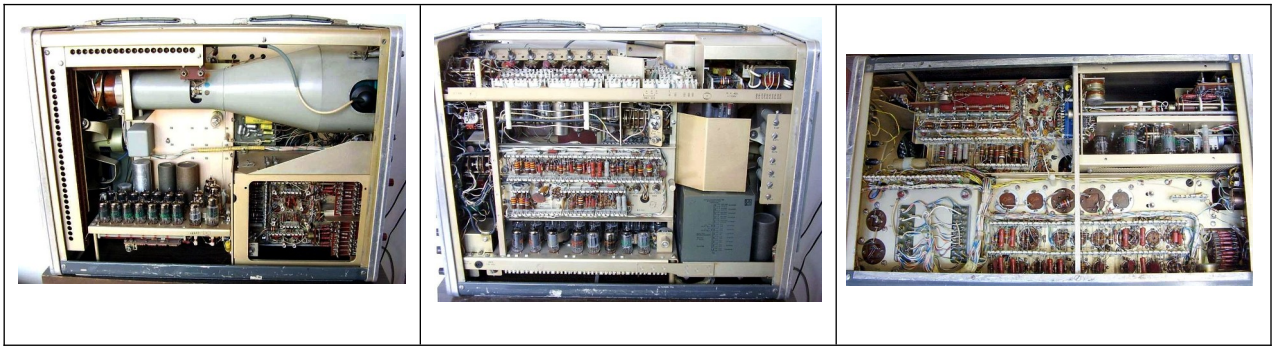


Fig. 2 – Three views of the inside. Click on thumbnails to enlarge.

As in Tek scopes, passive components are mounted between ceramic strips. In this case strips show variable spacing between notches, to accommodate components of different size. Another difference is the use of little metal tongues clamped to the ceramic strips inside notches, instead of metallized ceramic surfaces. This solution allows the use of standard Sn-Pb soldering alloys, not requiring the special silver loaded alloys as in the Tek scopes.

Quite remarkable differences are even in the sealed execution of the power transformer and of the fan motor.



Fig. 3 – Details of the time-base B, beside the power supply section, and of the sealed power transformer. The last picture on the right shows the HV stabilizer subassembly. Note the variable pitch of the notches of the ceramic strips. (Click on thumbnails to enlarge)

The most relevant departure from the solutions of the Tektronix 545A is in the CRT electron gun biasing circuit. Actually voltages in the Tek mainframes are stable and then the trace is bright, stable and focused. Anyway Lavoie decided to replace the simple resistive voltage divider used by Tektronix with a voltage stabilization circuit, based upon a series of 31 NE-2 neon bulbs. By the way these bulbs are potted with clear silicone compound inside a small aluminum can, its opening looking downward. As soon as the HV supply starts to oscillate, all the neon bulbs glow, giving a bright light all over the vertical amplifier section in normal operation. The HV stabilizer module is visible at the top right in the figure 3c.

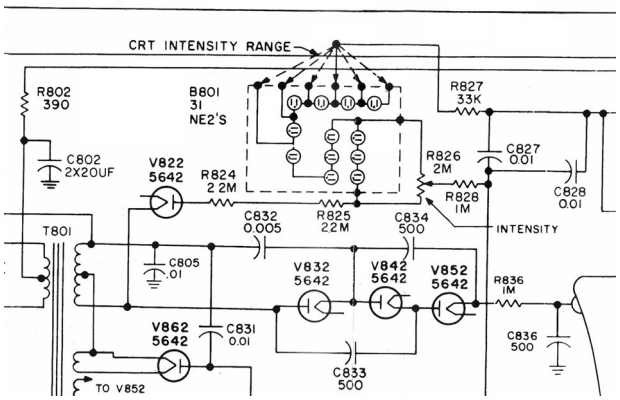


Fig. 4 – Schematic diagram of the original CRT H.V. supply. Each NE-2 in the B801 voltage stabilizer subassembly gives a typical voltage drop of 59 volts. (Click to enlarge)

The above overrefinement was eventually the source of the major drawback of this oscilloscope. The voltage drops in the neon bulbs increase with their ageing, causing instability and fading of the normal trace brightness. The original circuit given above, shows the taps added to recover normal ageing of neon bulbs, as indicated in the periodic calibration procedures. When the drop was unrecoverable, the B801 had to

be replaced, as any other electron tube. Unfortunately Lavoie went bankrupt and could no longer supply replacement modules.

In case of failure of some neon bulbs, the simplest remedy today is to replace the entire subassembly either with suitable corona-discharge voltage stabilizers or with a series of zener diodes.

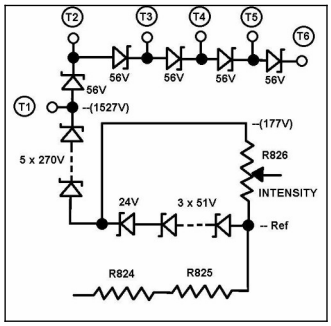


Fig. 5 - Here is a possible zener based circuit which can used to bring back to life the LA-265A in the pictures. Few NE-2 neon lamps can be left either to replace one of the 270V zener diodes or to set the voltage drops among the taps. They will help to partially preserve the charm of the faint reddish glow which lighted in origin the inside of the oscilloscope below the HV supply chassis.

Of course the LA-265 was a copy of the Tek 245, a good copy but a copy. Evidently, in response to a specific request of the military and then the government of the United States, Lavoie made no attempts to hide the fact that this instrument was a copy. Rather they did their best to deliver an oscilloscope fully compatible with 545, with same specs or even better, if possible. The small differences listed above were just due to the different suppliers and manufacturing facilities available. Anyway the copy provoked the reaction of Tektronix, who sued US government, and subsequently Lavoie and other manufacturers, for patent infringement. Tektronix started its lawsuit from a position of strength, their turnover deriving only partially from military market and also because they were leaders and could offer the broadest line of oscilloscopes. The lawsuit was filed in February 1961 and ended in January 1979 with the payment of 4.5 million dollars to Tektronix by US government. But this is another story, which anyway came when Lavoie had already gone bankrupt and by no way can influence the technical evaluation on this fine oscilloscope, in some respects even better than the original one.

Probably the dispute on patent infringements was started mainly for matters of principle and for a compensation of lost business.

Last edited by Emilio Ciardiello in November 2026.