

Peter Starič
My Photo Gallery



Fig. 1: This instrument, labeled MA4001, was designed in 1957, and it was the first oscilloscope with a triggered time base which went into regular serial production at Iskra. Maximal vertical sensitivity was 1 cm/100 mV, bandwidth 10 Hz to 800 kHz; the cathode ray tube was a 7 cm flat screen Telefunken DG 7-52A.

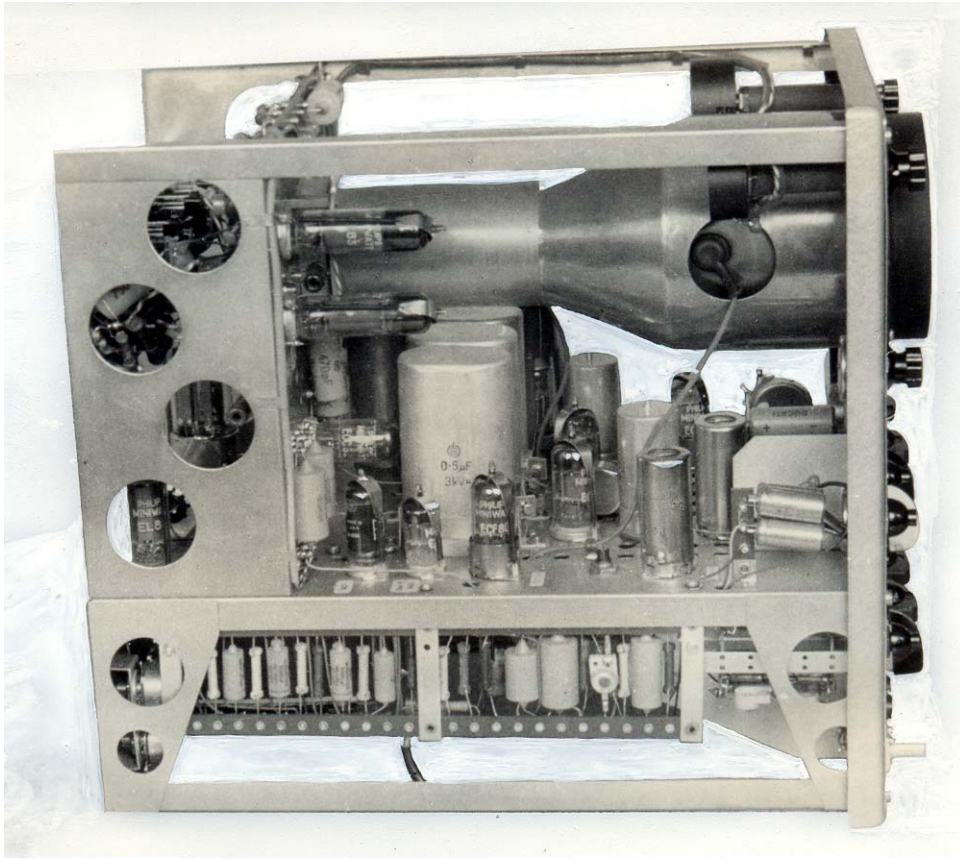


Fig. 2: The next step was the MA 4040 oscilloscope, with a flat screen 10 cm diameter CRT, type Telefunken DG 10-54, designed in 1958. Maximal vertical sensitivity was 1 cm/100 mV, and the bandwidth from 10 Hz to 3 MHz. Although the design was sound, the bandwidth of MA 4040, as well as that of MA 4001 was impaired ‘for tradition’: the wiring and the binding posts for the direct access to deflection plates increased the amplifier output capacitances, thus needlessly reducing the possible bandwidth by more than 30% (this tradition was abandoned in the very last oscilloscope, the MA4050, designed in 1967, which had a bandwidth from DC to 6 MHz and a ‘conventional’ 12 cm flat screen cathode ray tube).

Fig. 3:

This mass spectrometer was one of my last significant designs. It was completed in 1985 and the whole machine is still in daily operation at the Jožef Stefan Institute (the photo was taken in 2000). My successors have added a few external instruments and introduced some smaller changes.

The equipment shown was, in fact, a replacement for an old spectrometer built in 1954; then vacuum tubes governed the field, so the size was about 3 times larger and the power consumption was some 5 kW — over 10 times more than the current one. From the old spectrometer I have kept only the magnet, the two pumps, and the vacuum meter.



The bezel of the oscilloscope tube is from an old Tektronix oscilloscope. The maximum ion acceleration potential is 2 kV and the maximum vertical sensitivity is 1cm/ pA. If an electronic multiplier with up to 3.5 kV max is switched on the sensitivity can be increased continuously for several orders of magnitude — with correspondingly increased noise, of course. To reduce the noise the oscilloscope module has two switchable five-pole active low pass Bessel filters (one for the oscilloscope and the other for the recorder). The magnet power supply/amplifier is stabilized by magnetic feedback, employing a Hall effect sensor. This allows the sweep to start always from the same (chosen) mass and the masses on the record appear equidistant. The instrument has a mass marker. All the power supplies (the LVPS and also all the three HVPSs for the CRT, the ion acceleration, and the electronic multiplier) are short circuit proof.

⇒ see also [my first article](#)

⇒ back to [Contents](#)