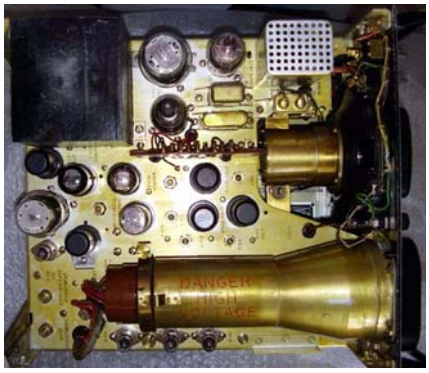
TS-148/UP - X-Band Spectrum Analyzer

This is the very early X band spectrum analyzer, designed during WWII. Just like most of the electronic equipment of its age, the TS-148/UP shows surprising simple and effective solutions. Its design and engineering are extraordinary because just before there was absolutely no practice about microwaves, with the sole exception of few university laboratories. The TS-148/UP was soon given, as standard test equipment, to each military department using X-band radar equipment. It is mentioned among the others in the technical operation manual of the AN/MPG-1 radar, TM 11-1366, 15 March 1945, and in the volumes of MIT Radiation Laboratory Series. The excellence of its design can be fully understood considering that the unit in the picture, coming from the Italian Air Force, still carries the label with the date of its last calibration, 18/01/84. Forty years of active life should be well over the expectancy of its designers and it could still be used today!

The set is very compact and sturdy. The principle is very simple, with a variable input attenuator, a resonating cavity preselector, a diode mixer and a klystron local oscillator. The repeller voltage of the klystron, and hence its oscillating frequency, is modulated by a thyratron sawthoot generator which also drives the horizontal deflection plates of the CRT. The coarse frequency adjustment is performed through the knob on the top right, which tunes the cavity of the reflex klystron. The frequency is read on the dial of the cavity resonator, from 8.430 to 9.660 MHz, with a resolution of 100 KHz. The equipment uses 18 tubes, including the CRT, and a silicon diode to do everything: the frequency conversion, the IF amplification and detection, the CRT deflection driving, up to the DC power supply.

Tubes: 6SJ7, 6SA7, 6SN7GT, 6AC7, 3BP1A, 6SJ7, 884, 6SN7GT, 6SN7GT, 2X2, 5R4GY, 6Y6G, 6SJ7, 991, 723A/B-2K25, 991, 991, 991.