R-1051/URR – HF Communication Receiver

Fig.1 – Front panel of the R-1051/URR receiver

The R-1051/URR is probably the latest communication receiver still using vacuum tubes. Actually it just uses two vacuum tubes in the RF front-end. The receiver is a digitally-tuned triple-conversion superetherodyne, capable of receiving LSB, USB, ISB, FSK, AM, CW and MCW emissions over a range from 2 to 30 MHze. The frequency stability is better than 0.01 ppm per day and the accuracy is better than 0.05 Hz at 5 MHz. First IF tunes from 20 to 30 MHz, second IF is 2.85 MHz, third IF is 500 kHz.

The receiver combines its exceptional performances to a marvellous modular execution, with the RF unit containing two tuning turrets inside a larger one. The outer motor-driven turret contains 28 tuning strips, one for each 1 MHz range. The inner turrets are chain-driven by the frequency controls on the front panel. They contains PCB dishes with tuning capacitors for tenths and hundredths of MHz. The fine tuning is accomplished with a VFO, locked in phase with the internal reference.

The exceptional frequency stability is based upon an internal 5.0 MHz frequency standard reference and a synthesizer, phase locked to the reference, also containing an error canceling loop. An external 5 MHz standard may be selected when available. Two audio channels are available in the ISB mode. Various revisions were built in the years, with increasing tuning resolution. Depending upon the revision, varies the quantity of semiconductors (Transistors and even ICs) used.

This sample was manufactured by Elmer, Pomezia.

User/service manuals available.

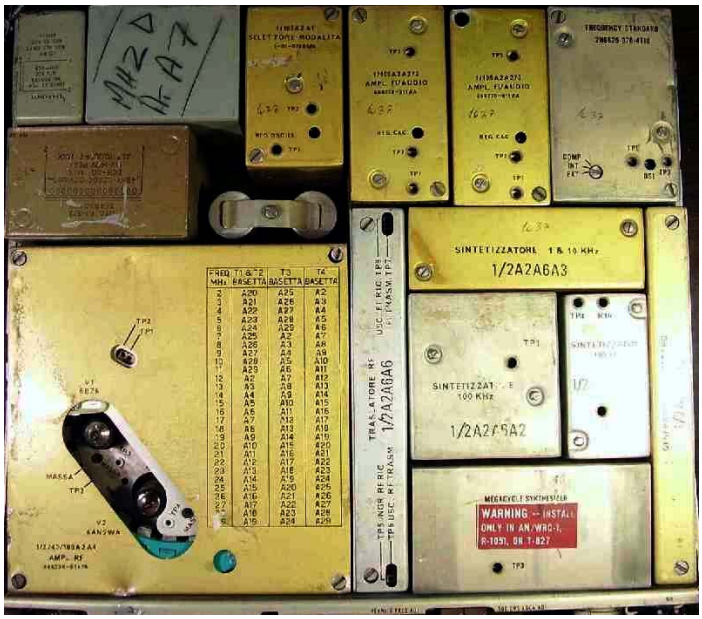

Fig. 2 – Internal view of the top side, showing the plug-in modules. Power supply, two audio amplifiers and the internal crystal controlled reference are visible in the top row. The RF amplifier, with the rotating tuning turrets, and the frequency synthesizer unit, with six sub-units, are in the bottom row.

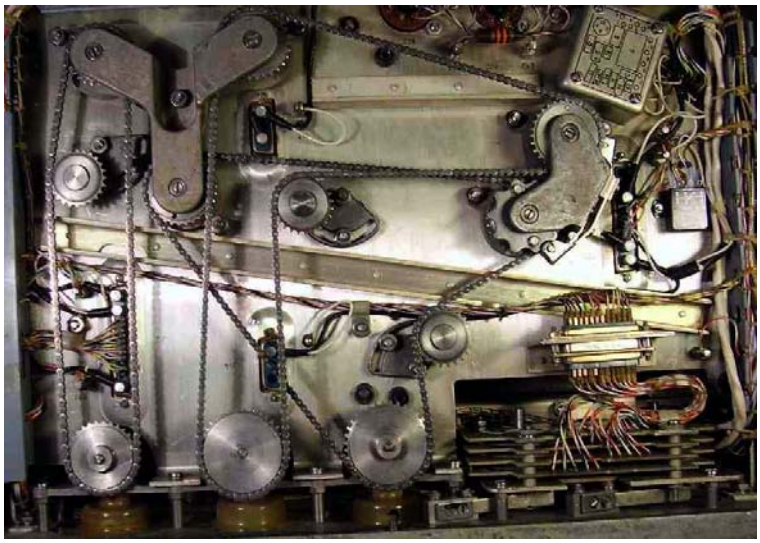

Fig. 3 – Transmission chains used to actuate the tuning switches in the RF and in the frequency synthesizer plug-in units.

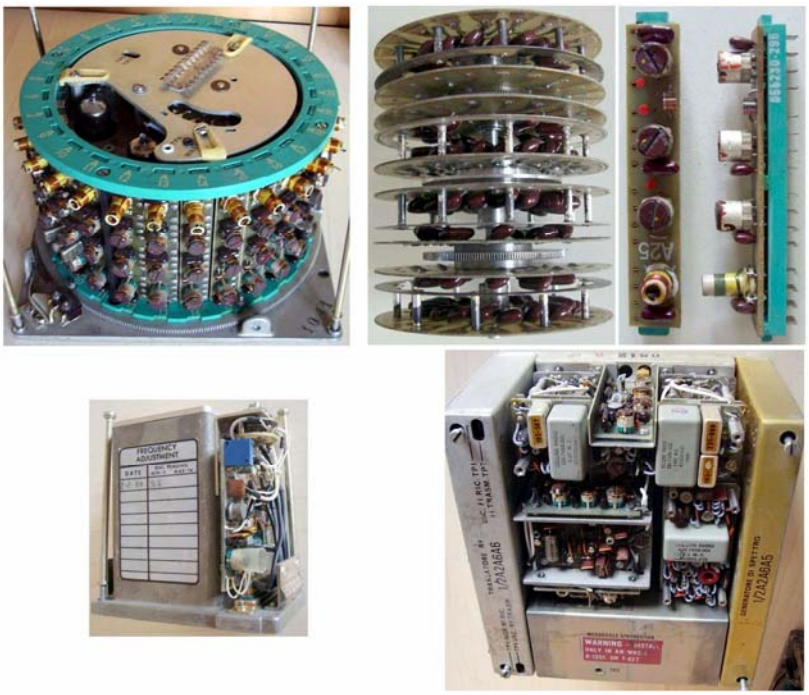

Fig. 4 – Some details of the plug-in modules. From the top-left we see the megahertz rotating turret, with the two RF tubes and other circuitry inside, one of the smaller tuning turrets, lodged inside the larger one, and detaild of one MHz tuning strip.
In the bottom row, the inside view of the frequency reference with the termostatic oven that contains the vacuum sealed quartz crystal, and the frequency synthesizer units, with some covers removed.