

Frequency range of the AN/APX-6



LO range

To find out the frequency range of the APX-6 transponder, I tried to make the lighthouse tubes to oscillate. And indeed, that wasn't too hard for the LO, that's the 2C46 at the right on the photo. With the anode tied to 260Vdc via 8k2 I got a signal on the diode output over the full tuning range, from 980 MHz (dial 000) up to 1250MHz (dial 999) at a fairly constant level of about 0.5mW, and nearly proportional with the dial setting. The receiving frequency is 60 MHz below the LO frequency.

Receiver range

I used a -20dB attenuator, extended with a pin, which was inserted instead of the mixer diode. On this position, at each LO frequency I could find a dip in the signal level while tuning the middle dial, and a peak at a dial position 12 higher. I assume the dip is the receiving frequency, as the middle cavity is the preselector cavity, and absorbs the LO signal.

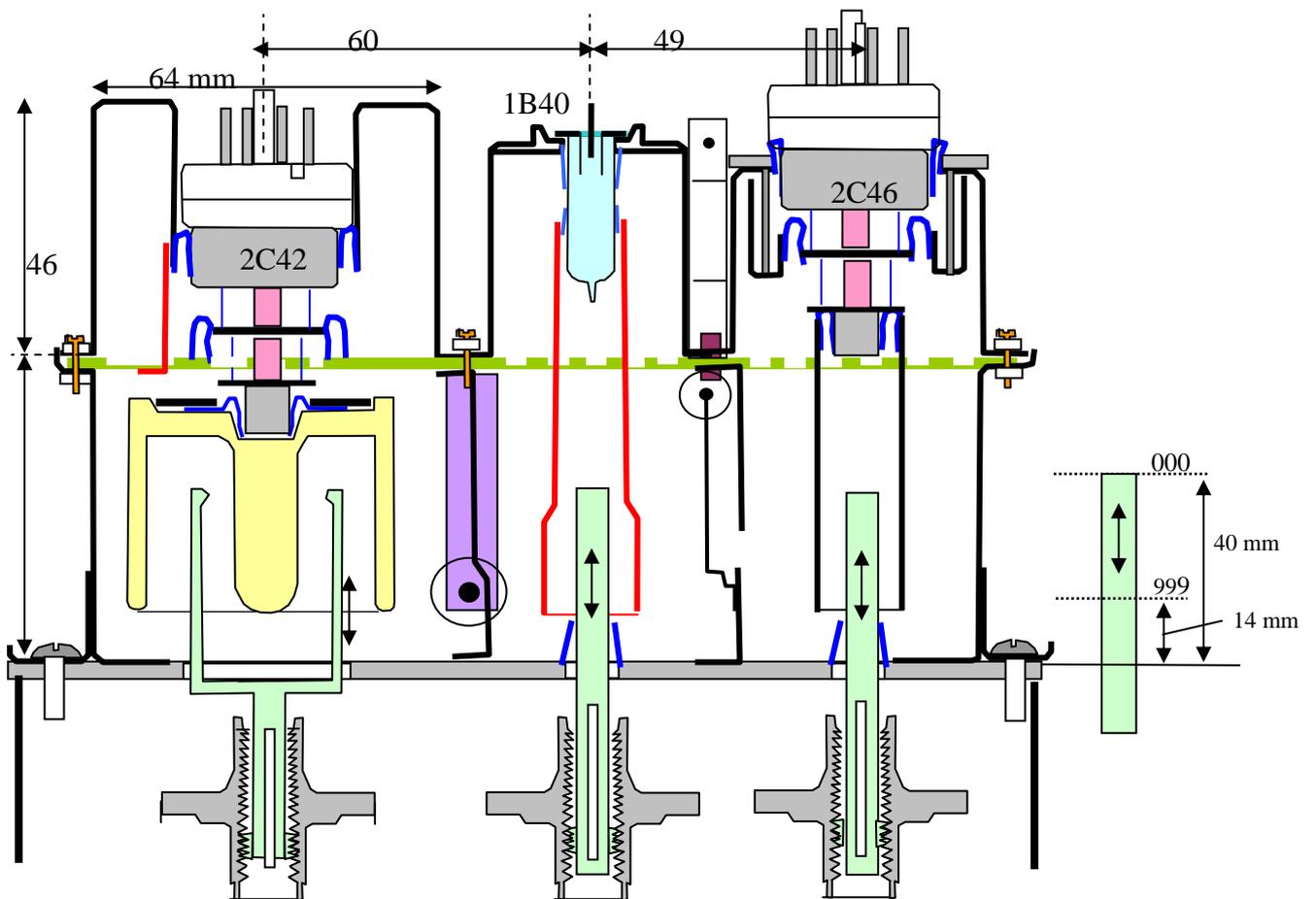
Transmitter range

The transmitter 2C42, left on the photo above, only oscillated in the lower half of the range at moderate anode voltage. I tied the cathode via 47 ohm to ground, and the anode via 4k7 to +260V up to 950MHz, and above this without series resistor. When the 2C42 oscillates, the anode current rises to 120mA, or 20mA when not oscillating, measured by the voltage across the cathode resistor.

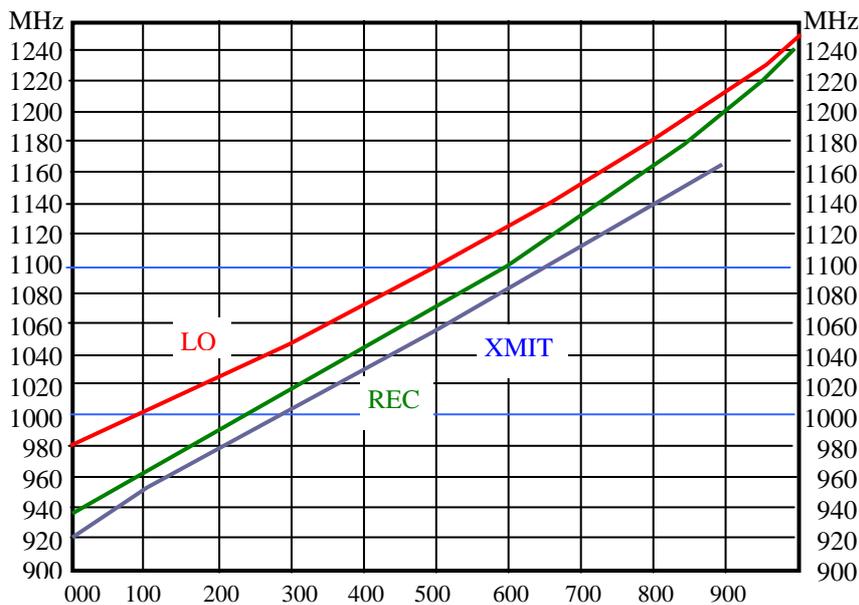
The high anode current was applied for just one second to make the frequency measurement.

With 260V oscillation above 1050MHz was not possible. OK, in a real APX6 the anode voltage is pulsed to 2kV, so what are we talking about.

View inside the cavities, at 70% of real size.



The frequency curves were recorded with the maximum piston height (green parts above) preset at exactly 40mm above the surface of the gearbox with all 3 dials at 000. In this position, the transmitter piston stays clear of the (yellow) anode part by 2mm. But the transmitter piston gets stuck at dial 910 against the bottom of the gearbox. Well- better this then shorting the anode supply pulse to ground.



The frequency range of the 3 dials in my RT-82/APX-6 unit is shown below. Red is the right hand dial, green the middle dial, and blue the left (transmitter) dial.

Example : to receive at 1030MHz, the LO frequency would be 1090MHz, and the LO dial is set at 450. The middle dial should be set at 350. And for a transmitter frequency of 1090MHz, the left dial should be set at 620.