



Figure 4-6. 51J-4 Crystal Phasing Rejection Notch

of T102 for those positions. This results in a more rapid decrease in V301 grid voltage as the i-f deviates to either side of 500 kc. Hence, as the effective impedance of T102 lowers, selectivity increases. In the sharpest position the bandwidth at 6 db down is from 200 to 300 cps.

The primary purpose of PHASING capacitor C188 is to produce a controllable rejection notch in the i-f response curve so that unwanted heterodynes may be tuned out. The section of C188 connected to the bottom end of T101 secondary provides a capacitive path around the crystal that balances out the shunt capacitance of the crystal in its holder and external capacitor C187. Varying C188 either side of the balance point varies the antiresonant frequency of the crystal circuit within 3 kc either side of 500. Since the impedance of the crystal circuit at antiresonance is extremely high, the crystal filter rejects signals at the antiresonant frequency. Thus at antiresonant frequency points, the phasing action gives a sharp dip in response and the selectivity curve takes on a notch as illustrated in figure 4-6.

In order to avoid detuning tuned circuit T102 when varying C188, a second section of C188 is shunted across T102. Since C188 has a split stator and a single rotor, the total shunt capacitance across T102

remains practically constant as the setting of C188 is varied.

4.2.8 SECOND INTERMEDIATE FREQUENCY. - The second intermediate frequency channel is fixed-tuned to 500 kc. It consists of the mechanical filter and four amplifier stages and employs 6BA6 tubes in all stages. Input tube V301 is excited by the crystal filter output coil T102. Permeability-tuned transformers, with output taps taken off the secondary coils near the ground end, are used in the amplifier portion. Both i-f amplifier stages and one tube in the mechanical filter are supplied with AVC voltage. Plate and fixed screen voltages are controlled by the ON-STANDBY-OFF switch and the remote operation relay, K101 on all 500 kc i-f tubes except V302. These voltages are removed to render the receiver inoperative during transmission periods.

4.2.9. DETECTOR. - The detector in the 51J-4 Receiver consists of one half of a 12AX7 dual triode tube, V110 (pin numbers 6, 7, and 8). The tube is used as a diode, with rectification taking place between the plate and cathode, the grid being connected to the plate. R150 and R151 serve as load resistors for the detector while C202 provides r-f filtering.

4.2.10. NOISE LIMITER. - A series type noise limiter is used in the 51J-4 Receiver. This limiter