

IV THEORY OF OPERATION

A photograph of the Mechanical Filter is shown in Figure 3; and in Figure 4 the frequency response curves are compared to those obtained by conventional means.

The Mechanical Filter achieves this unusual selectivity by a combination of electrical and mechanical elements. The filter is composed of three general sections: the input transducer, the resonant section, and the output transducer. The input and output sections of the filter are identical, and function to convert the electrical signal to a mechanical form and vice versa. The input signal is impressed on a small coil which surrounds a nickel wire. By means of magnetostriction, the magnetic field variations are converted to mechanical vibrations. One end of a nickel wire is welded to the first of a series of discs which comprise the resonant section of the filter. There are six of these resonant discs composed of a special alloy metal which has a very sharp resonance and excellent frequency stability. The vibrations of the nickel wire cause the end disc to vibrate, and these vibrations are coupled to the other discs by wires which are welded to their edges. The output end of the filter is identical to the input end, and is composed of a nickel wire and a coil. Here the magnetostriction action of the nickel wire functions to convert the mechanical vibrations of the disc into a varying magnetic field. The coil intercepts this field and supplies the output voltage. The entire unit is housed in a hermetically sealed case smaller in size than a normal intermediate frequency transformer.

V MAINTENANCE

If a defect in the adapter is suspected, the adapter should be replaced with a 6SC7 tube, and the receiver i-f realigned as mentioned in Part II. If the receiver now operates normally, the trouble is in the adapter.

The adapter voltage and resistance measurements shown in Table I will be an aid in locating trouble in the adapter. However, should obscure troubles arise, only a trained and competent communications receiver repairman should be allowed to service the receiver or adapter. The Mechanical Filter itself is a sealed unit, just as a vacuum tube is, and no attempt should be made to open the case.

TABLE I

Tube Socket Resistance and Voltage Measurements

- Conditions - 1. Voltage: No signal, Manual operation, RF GAIN full on, 80 meter band, B*ON, NL OUT, Line Voltage 117 AC, 60 cps; all measurements to ground.
2. Resistance: Same as above, AC switch OFF, all measurements to ground.

Meter Used: Simpson Model 260 VOM.

Tube: V201, 6BA6 Amplifier			
PIN NO.	FUNCTION	RESISTANCE	VOLTAGE
1	Grid	11k	0
2	Suppressor	330	1.5
3	Heater	0	0
4	Heater	0.2	6.3 ac
5	Plate	17k	55
6	Screen	19k	45
7	Cathode	330	1.5