CHECKING RECEIVERS by Measuring INPUT CURRENTS

An instruction booklet issued by a test-instrument manufacturer explains how considerable information about a set's condition can be obtained from a meter measuring the input current.

AN original and simple method of set testing is described in a new instruction booklet issued by Everett Edgcumbe & Co., Ltd., Colindale Works, London, NW9, in connection with their APT All-Purpose Tester. It is shown that considerable information can be gained just by connecting the meter in the mains input lead and then noticing the gain in consumption as the valves are inserted.

To begin with, all valves are removed, and after checking the mains adjustment, the meter, switched to read low AC current, is placed in series with the mains transformer primary. On switching on a no-load current of 40-90 ma should be read, and any excessive reading suggests short-circuited turns in the transformer.

Allow for Surge

Temporarily switch the meter to a higher range to allow for the surge, and insert the rectifier. After some 8 secs., an 8-watt rectifier should increase the current by about 35 ma at 230 volts in addition to current supplied to any potential dividers or shunt fields.

An increase to about 200 ma denotes a shorted filter condenser and a rise to one ampère indicates a shorting reservoir condenser.

Insert the remaining valves one by one, noting the increase in current after it has fallen to normal following the initial surge. The surge indicates heater continuity while the later rise shows the effect of the valve emission.

Valve Emission

The emission of each valve can be calculated from

$$Ip = \frac{E_2}{E_1}$$

Where Ip is the increase in primary current in milliamps, E_1 the HT voltage, and E_2 the supply voltage.

The consumption in primary current, due to potentiometer networks or speaker fields in parallel with the HT supply can be calculated from

$$I = \frac{E_1^2}{E_2 \times R}$$

Where E_1 is the HT voltage, E_2 the mains voltage and R the shunt resistance.

Table 1 gives the primary current readings for a typical AC receiver.

A similar test procedure is applicable to battery receivers, the meter being connected between the negative HT lead and HT negative of the battery.

Table 2 gives the HT current measured in typical battery sets.

The Everett Edgcumbe booklet also deals with the methods suitable for testing AC–DC sets, and a separate section explains the testing of components. Ways of using the All-Purpose Tester as an indicator when aligning a superhet are reviewed, and there are notes on testing the oscillator section, on plotting a resonance curve and on conducting AVC and sensitivity checks.

Electrical Tests

The first part of the booklet explains the use of the meter for ordinary electrical tests of voltage, current, resistance, and capacity. A number of practical applications such as armature and earth resistance testing are dealt with in detail.

Throughout the booklet, large clear diagrams show how the meter should be connected for each particular test, and these drawings will be of the greatest help in enabling new users to become confident in their handling of the instrument.

TABLE 1.

Primary current (ma) at 230 volts in a typical receiver.

—	On insert-ing.	After 8 secs.	After 20 secs.	Valve emis-sion.
Valves out	62	62	62*	—
8-watt rect	115	95	97†	—
4-watt FC	128	116	124	6
4-watt IF	152	140	147	5
4-watt DDT	175	162	170	6
8-watt LF Pen.	230	205	255	32

* Magnetising current. † Screen pot. feed.

TABLE 2.

H.T. current (ma) in typical battery sets.

Valve.	Portable economy superhet.	Table superhet.	4-valve portable.
SG ..	—	—	2
FC ..	0.8	1.5	—
IF ..	0.7	3.5	—
Det. ..	—	1.0	0.5
LF ..	1.0	2.5	1.5
Output	4.5	9.0	5.0
Total ..	7.0	17.5	9.0