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FREQUENCY METERS CT504 AND CT505

GENERAL AND TECHNICAL INFORMATION AND SCALE OF SERVICING SPARES

FOR USE IN THE

ROYAL NAVY

ROYAL AIR FORCE

(Prepared by the Ministry of Technology)

Issued Feb. 68

FREQUENCY METER CT504 AND CT505

LEADING PARTICULARS

Ref. No. CT504	10T/695
CT505	10T/699
Purpose of equipment	*Direct-reading absorption type frequency meter*
Frequency range CT504	2000 *to* 4000 *Mc/s* ± 4 *Mc/s*
CT505	106 *to* 160 *Mc/s* ± 0·2%
Dimensions and weight CT504	7½ *in.* × 8 *in.* × 7½ *in.* 8 *lb.*
CT505	7 *in.* × 7 *in.* × 6 *in.* 7 *lb.*
Commercial equivalent	*Marconi Instruments Ltd.*
	CT504: TF1026/4M
	CT505: TF1026/11
Old Type No.	*CT504:* 9938
	CT505: 11528

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Introduction (fig. 1)

1. The frequency meters CT504 and CT505 are both direct-reading, portable, absorption-type frequency meters covering the ranges of 2000 to 4000 Mc/s and 100 to 160 Mc/s respectively. The meters require no power supplies, they possess high Q and a low temperature coefficient; they are fully enclosed to ensure efficient screening. Each meter is supplied complete with appropriate feeder cables.

FREQUENCY METER CT504

Design details (fig. 2 and 3)

2. The resonant system of the CT504 is in the form of an enclosed cylinder with a rotatable shaft mounted along its axis and projecting through the front end-wall. The rotor of a tuning capacitor is formed by vanes attached to the inner end of the shaft and these mesh with corresponding stator vanes projecting from the side-walls of the cylinder. The system is thus essentially that of a concentric line, enclosed at one end and tuned at the other by means of a variable capacitor. A hair-line cursor is attached to the outer end of the shaft and a tuning frequency is indicated on an approximately linear scale.

3. The input to the system is fed via a coaxial plug and a capacitive coupling to the tuning end of the line; either the coaxial feeder or the short stub aerial supplied with each instrument may be attached without impairing the accuracy of cali-

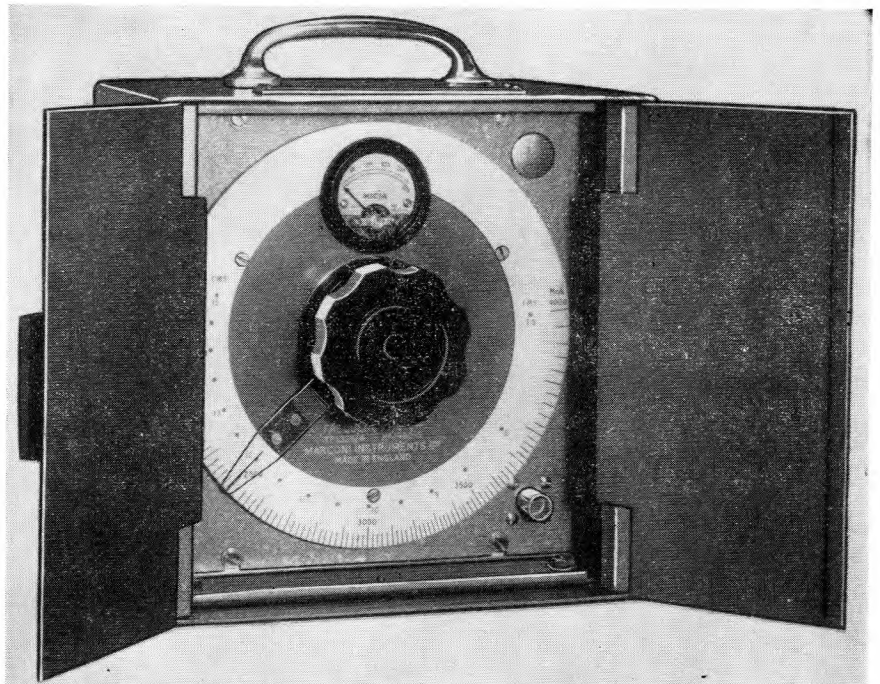


FIG. 1 (a) FREQUENCY METER CT 504 - FRONT

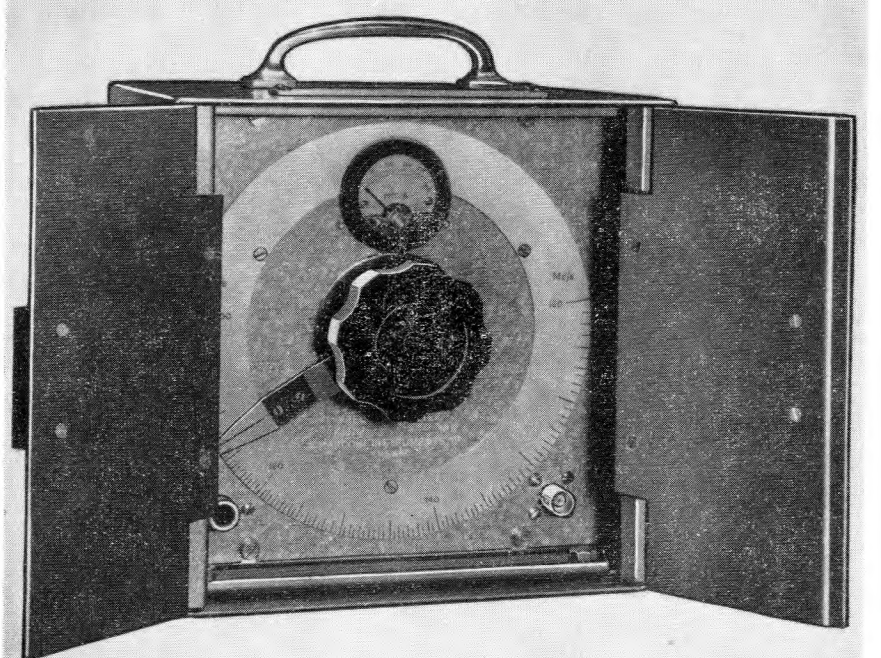


FIG. 1 (b) FREQUENCY METER CT505 - FRONT

Fig. 1. Front view of (a) CT504 and (b) CT505

bration. The built-in detector and indicator consist of a silicon crystal and a microammeter of 250 μA full-scale deflection.

Operation

4. A Pye plug Type 75460 (modified) is used as the signal inlet to each meter. Coupling to the source can be made by means of the stub aerial, which fits the central spigot of the Pye plug; alternatively, where the signal strength is weak, direct connection with the source can be made by means of the feeder cable, which is fitted at one end of a Pye socket Type 75506. The input impedance of the frequency meter is nominally 70 ohms and therefore, when using direct connection, the source should be matched to this

impedance to obtain maximum indication on the microammeter. When not in use, the stub aerial is clipped vertically inside the body of the carrying case and the feeder cable is coiled and clipped inside the lid.

Frequency measurement

5. Remove the instrument from its case and couple it to the signal source, directly or indirectly as required. Adjust the central tuning control for resonance, as indicated by maximum deflection on the microammeter. When using indirect coupling, the instrument or the coupling loop in the case should be suitably positioned and orientated to give a convenient meter deflection, say 100 μA, at resonance; similarly, when using the coaxial connector, the coupling to the source should be adjusted to give a deflection of the same order. The frequency (and, for the Type 9938 meter, the wavelength) are directly indicated by the position of the cursor hair-line against the calibrated scale.

WARNING . . .

To avoid overload the crystal rectifier, do not allow the meter deflection to exceed about three-quarters of the full scale.

FREQUENCY METER CT505

Design details

6. The resonant system of CT505 is a conventional tuned circuit having a fixed inductor and variable capacitor (fig. 2(b)). The metering circuit is similar to that for the CT504 excepting that, in addition, an output jack is connected via a capacitor.

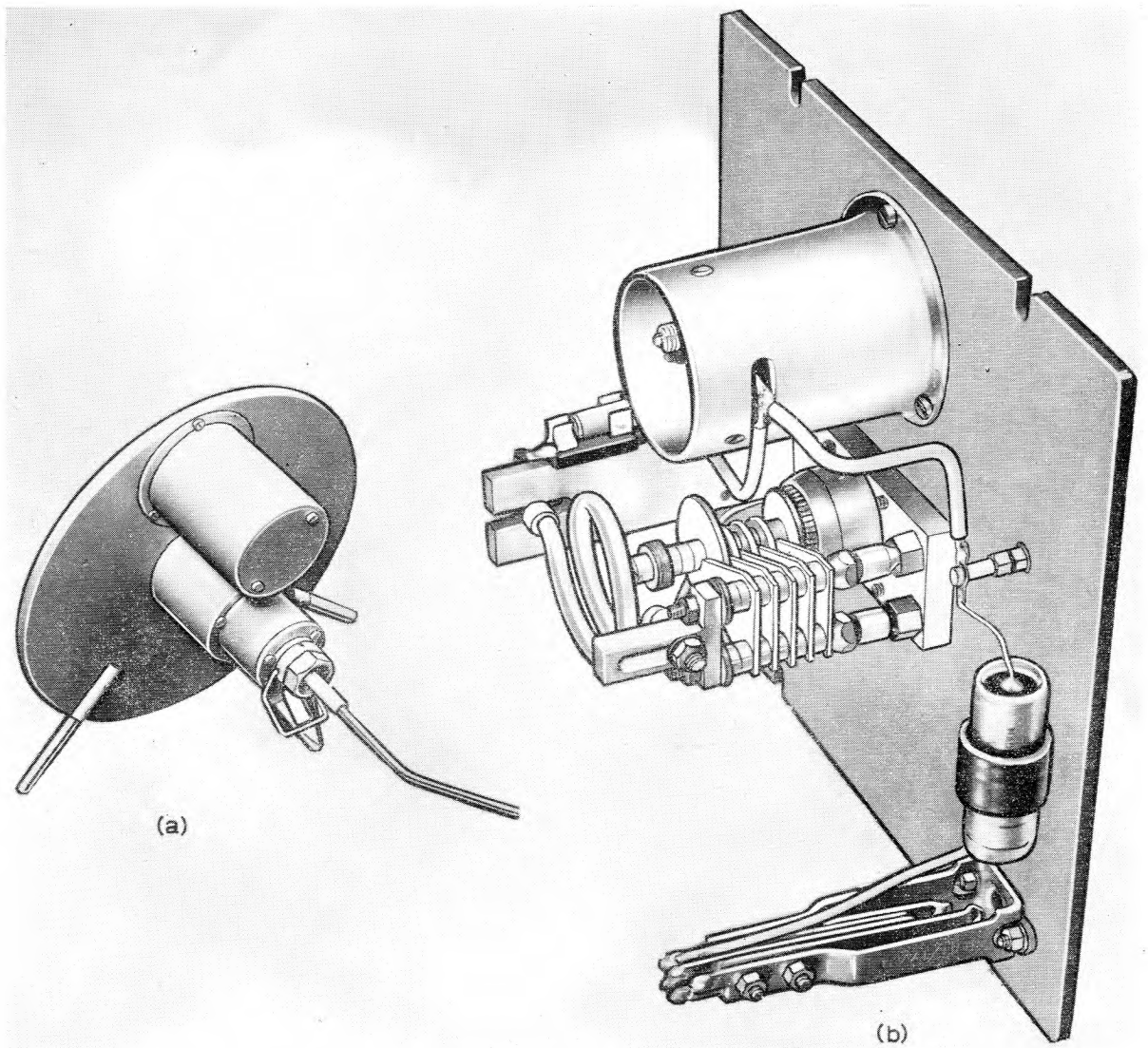


Fig. 2. Rear view of (a) CT504 and (b) CT505

Operation and frequency measurements

7. The method of operation and frequency measurement is as for the CT504 excepting that the instrument is not removed from its case. The warning note to para. 5 should be observed.

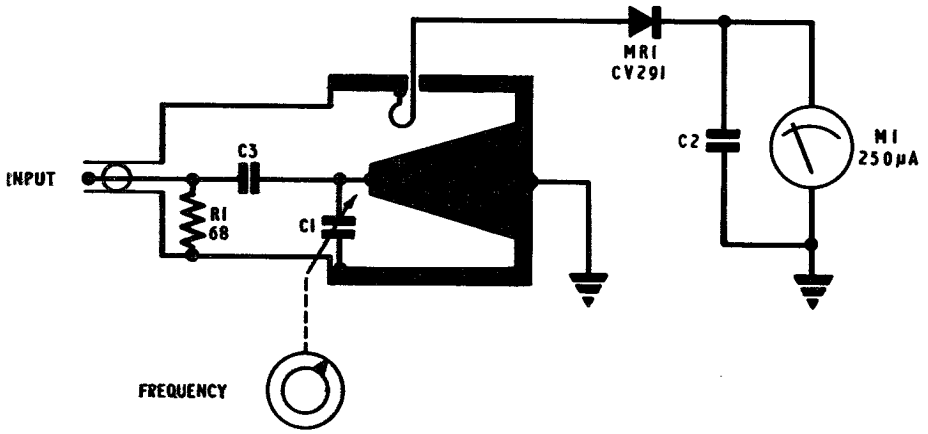
SERVICING

Removal of microammeter

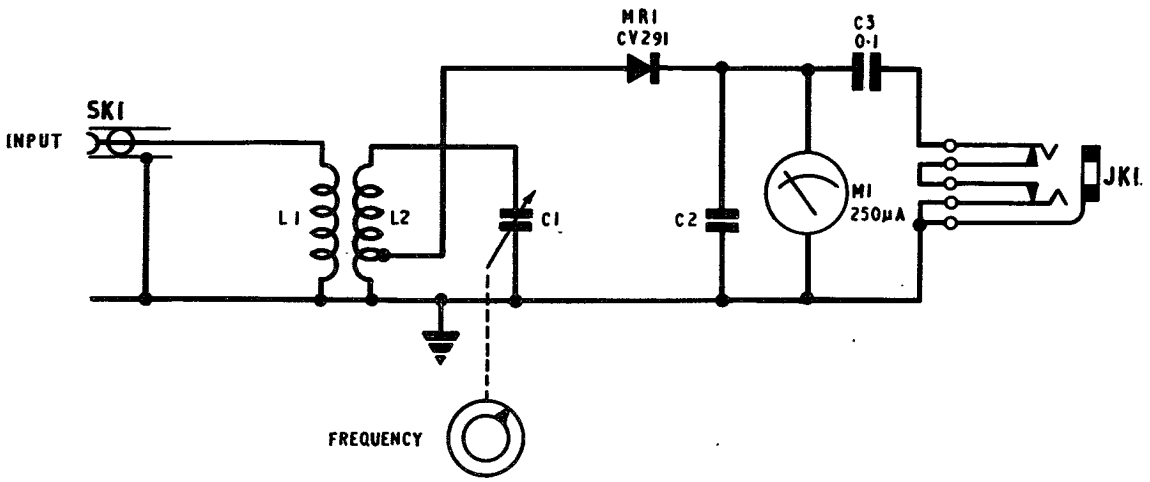
8. The plug-in microammeter can be withdrawn from the front of the instrument. If a replacement meter is to be fitted, the two bifurcated plugs which are screwed on to the meter terminals should be transferred to the new meter; this can be then plugged into the socket in the meter housing and pushed home.

Calibration

9. No further replacement at 1st or 2nd line servicing is permitted since replacement of a component can affect the calibration. Full 3rd line calibration procedure is given in the appropriate Marconi Instrument Operating and Maintenance Handbook.



(a)



(b)

Fig. 3. Circuit of (a) CT504 and (b) CT505