

CHAPTER VI.

D/F OUTFIT FH.

1. GENERAL DESCRIPTION. D/F outfit FH is used for working on H/F only. The frequency range is 667 to 20,000 kc/s.

One open aerial is fitted and this is used when searching for signals.

All the components used in outfit FH which are common to outfits FA, FC and FH are described in Chapters I, II and III.

2. RECEIVING INSTRUMENTS. All the receiving instruments are grouped in one panel as shown in Fig. 28. The goniometer is supported on a table in front of the D/F panel.

A diagram of the connections is shown in Fig. 29 and the H.T. and L.T. supplies to the valves in Fig. 30.

3. H/F APPARATUS.

Radiogoniometer S29.
Heterodyne detector E27.
Amplifier M9.
Note magnifier N20.
Heterodyne Unit K7.

The aerial change over switch is only used for connecting the frame coil to the goniometer S29 or to earth. The "M/F" connections on this switch are not used.

When the aerial change over switch is set to "H/F", the loops of the frame coil are connected to the field windings of the goniometer S29, the search coil of which is connected to the input circuit of the heterodyne detector E27 in which the incoming signals are heterodyned and detected.

The output terminals of the E27 are connected to the "Receiver" switch on the switch unit and thence to the input terminals of amplifier M9 which is used as an intermediate amplifier working on a frequency of approximately 100 kc/s. Rectified signals from the M9 are passed to the note magnifier N20 and thence to the telephones.

For the reception of C.W. signals, a heterodyne unit K7 is used as a separate heterodyne and is connected to the heterodyne terminals of amplifier M9.

Two 0.03-jar condensers are fitted in a box attached to the strap carrying the connecting leads on the front of the panels. These condensers are connected in the open aerial connecting leads between the switch unit and the heterodyne detector E27 in order to reduce the effective capacity of the leads. This arrangement prevents a large capacity, due to the leads, being connected across the search coil of the goniometer.

D/F OUTFIT FH.

ARRANGEMENT OF PANELS

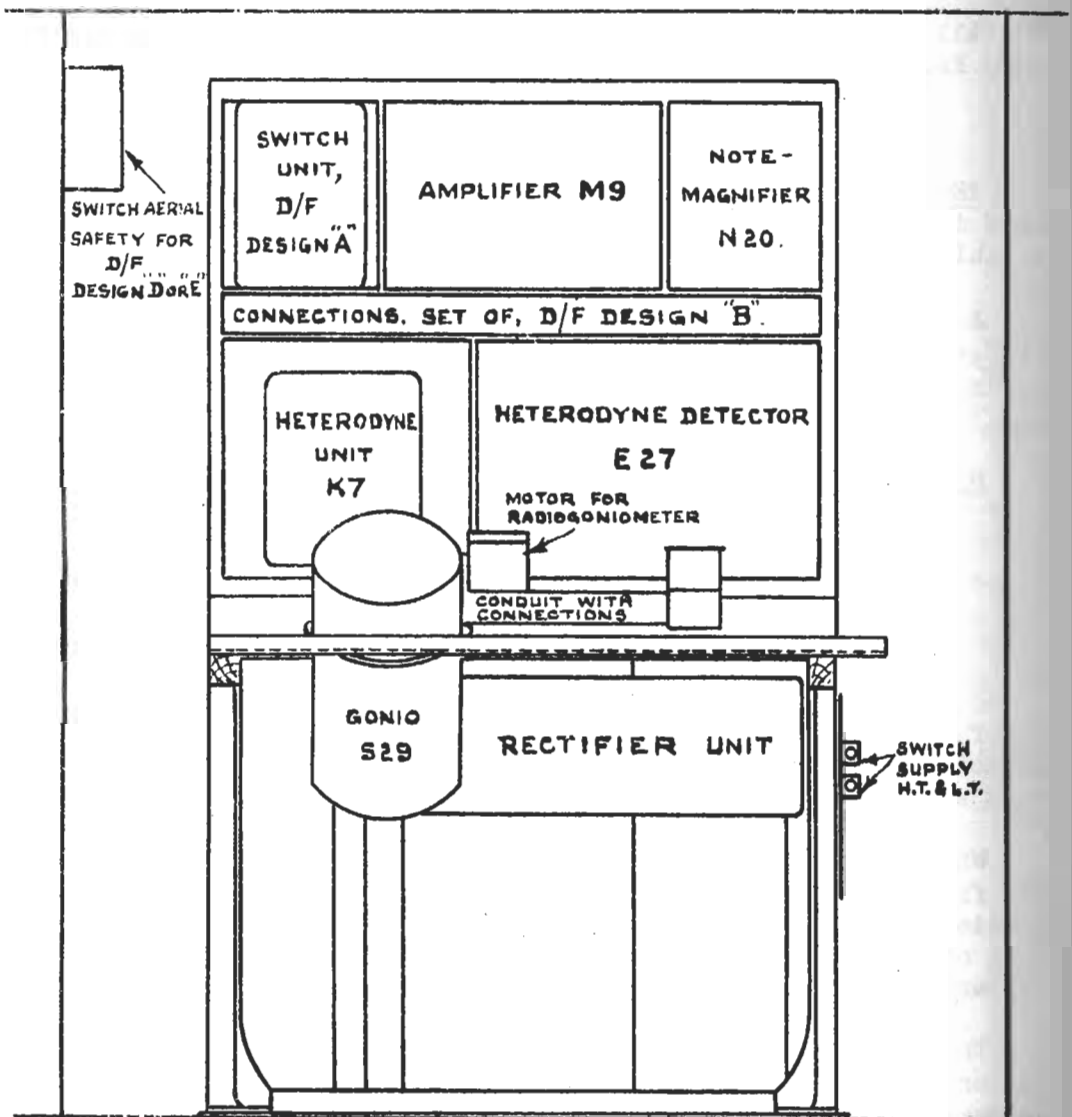


FIG. 28.

D/F OUTFIT F.H. CIRCUIT DIAGRAM.

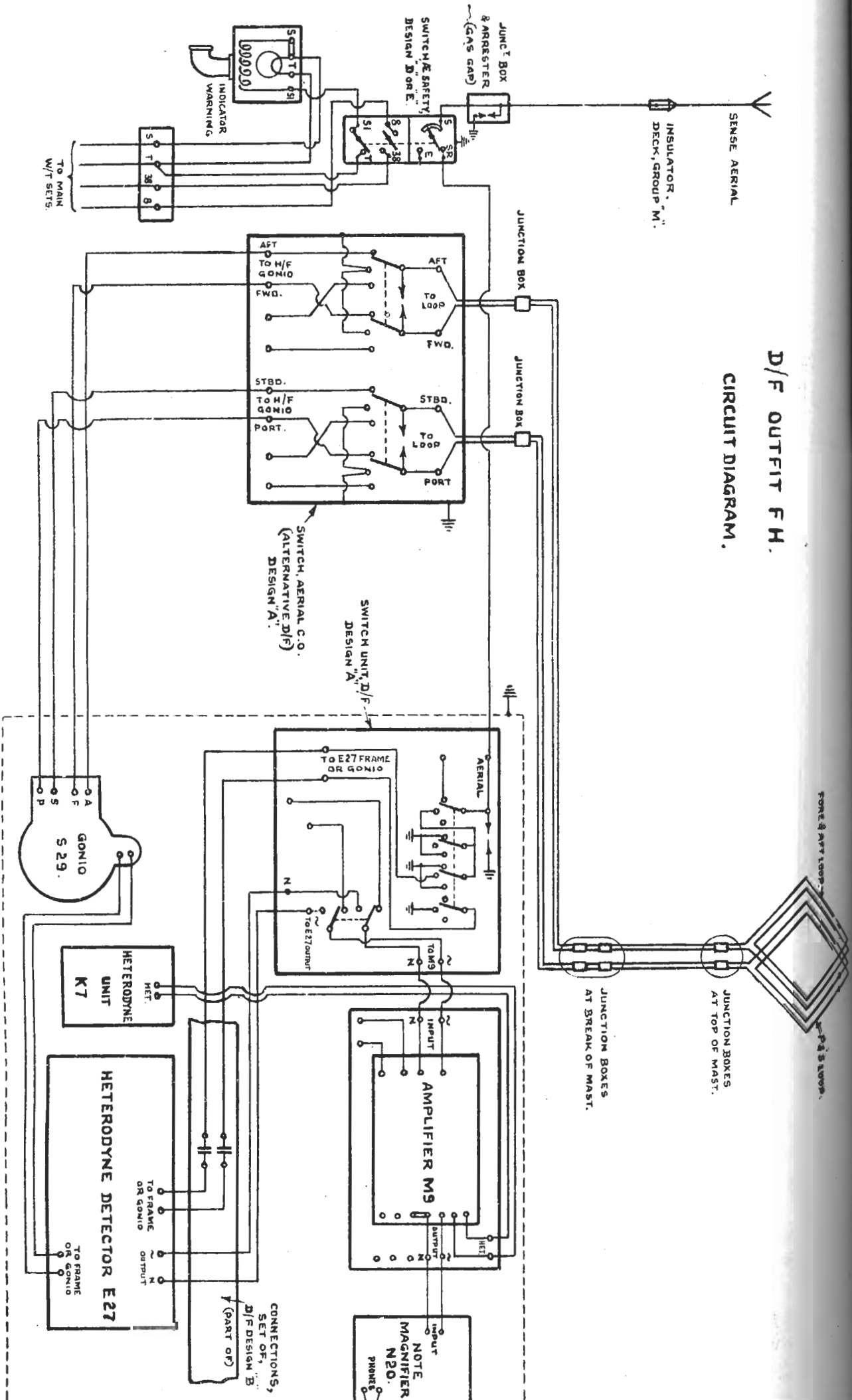
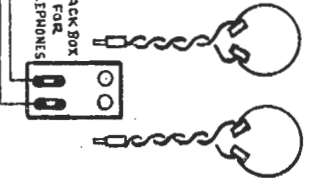


FIG 29

TELEPHONE
RECEIVERS



D/F OUTFIT FH.

SUPPLY TO VALVES

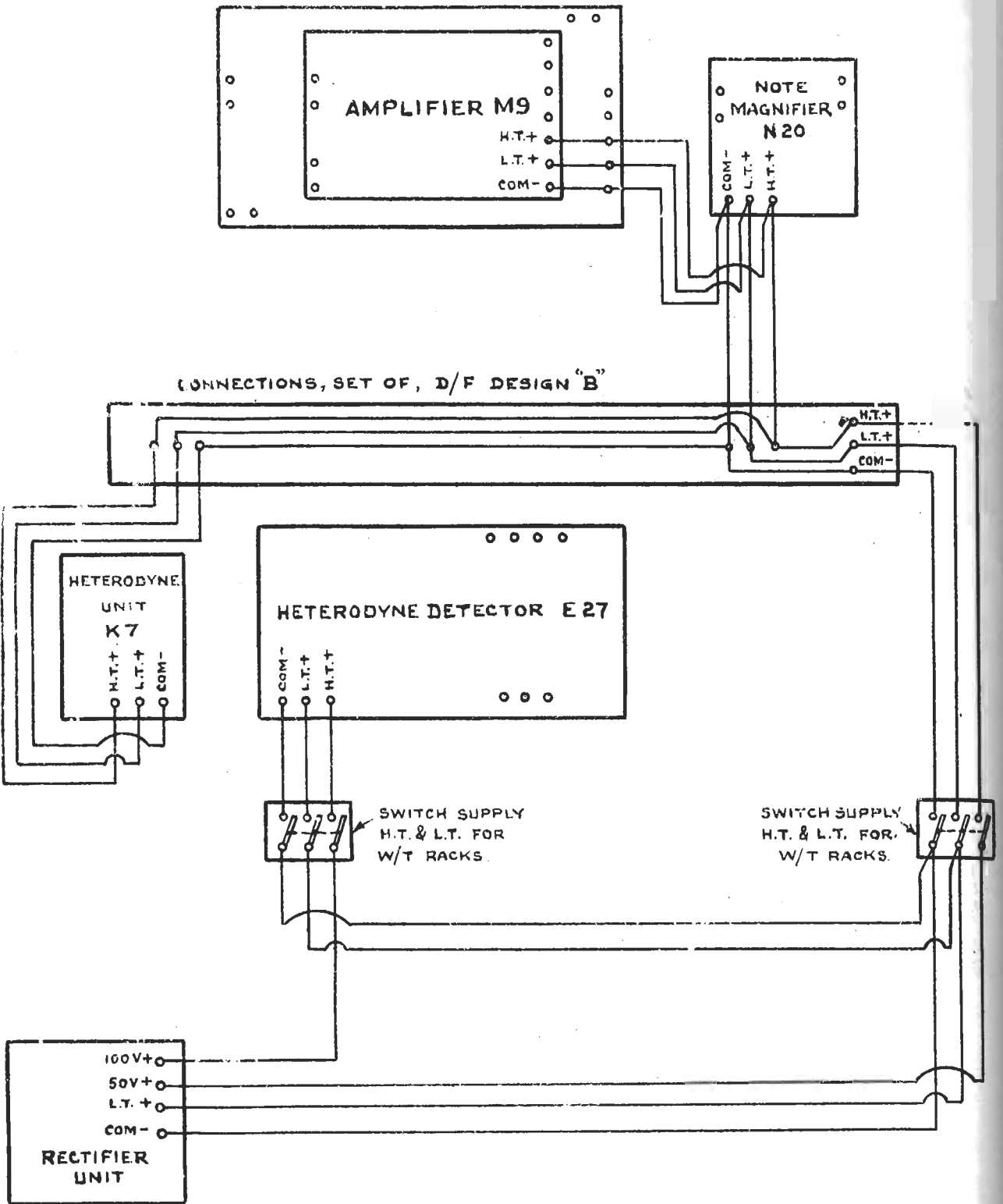


Fig. 30.

6. OPERATION. In order to take a D/F bearing on any frequency in the range covered by the H/F apparatus, the appropriate coils must be plugged into the heterodyne detector E27. The heterodyne and detector circuits of this instrument are then tuned to the required frequency by using the engravings on the discs of the tuning condensers or by reference to the curves of settings supplied with the outfit. The heterodyne unit K7 should be switched on and tuned to the frequency of the intermediate amplifier, i.e., 100 kc/s. (the range switch of the K7 will be set at position 2 and the tuning condenser at 30° approximately).

The sensitivity of the E27 should be controlled by means of the reaction condenser, the sensitivity increasing with the condenser setting. The value of reaction should not be increased to the point where the detector circuit oscillates; it should not exceed about 10° - 20°.

The heterodyne detector should be slowly adjusted by means of the slow motion control until the required signals are heard and the detector circuit retuned, if necessary, until signals are loudest.

If I.C.W. signals are being received, it may be advantageous to switch off the K7 after tuning E27 but, for tuning purposes, the characteristic rustle produced by the K7 when the heterodyne and detector circuits are in tune together, will always be found an aid.

If it is necessary to search over an appreciable band of frequencies for any station the heterodyne and detector condensers should be adjusted together.

When searching for signals watch is normally kept on the open aerial which is connected to the heterodyne detector E27 by setting the open aerial switch on the switch unit to "H/F Search". In order to obtain the maximum signal strength when searching, the open aerial and frame coil can be used together, if desired, by setting the aerial change over switch to "H/F" and the switch unit to "H/F Search".

When a signal is heard of which it is required to take a D/F bearing, the open aerial must be isolated by setting the open aerial switch on the switch unit and the aerial change over switch to "H/F".

It should be noted that the "M/F" positions of the switches on the switch unit and the aerial change over switch are not used with this outfit.

The relative bearings are taken in the usual way by observing the position of minimum signal strength and checking the observation on the reciprocal minimum. Operators should guard against recording false minima due to fading and, when fading occurs, observations should be made when signals are loudest.

Any variation in position of bearings and in the definition of the minima should be noted and reported.

Relative D/F bearings should be corrected in accordance with the curves supplied after calibration, and converted to true bearings by reference to the gyro scale on the goniometer. It should be noted that the corrections required for any observed bearing and its reciprocal are not necessarily equal. Accordingly, since no provision is made in this outfit for determining "Sense" on H/F, the D/F operator should always report two corrected bearings, which, in general, will not differ by 180 degrees. In such circumstances, other information may be available for deciding which of these two bearings is the correct one.