TYPE 48

GRID SIGNALLING AND ABSORBING CIRCUITS

Grid signalling and absorbing circuits (see figure p.) The grid signalling and absorbing circuits are fitted in the grid signalling and absorbing panel.

The method of grid signalling used for I/F and H/F master controlled transmissions necessitates the H.T. supply to the main amplifying and master valves being made continuously.

The main valves (41)(42) and (44)(45) have been designed to act as self-absorbers when the main circuits are not oscillating during the "spacing" periods of signalling.

The H.T. supply to the master valves (43)(46) is connected to a P745A absorber valve (47) and the circuit is arranged so that, when the master circuit is not oscillating the H.T. load is dissipated in the 20,000 ohms anode resistance (130) of the absorber valve (47). The anode resistance (130) consists of two units each of eight 5000 ohms resistances, connected in series, Bakelite and is fitted in the Low Power Rectifying Panel.

Power absorption during space is necessary with high speed keying to avoid the possibility of power line surges either from electrical resonance of the supply circuit or mechanical resonance of the generators. It also reduces key clicks, particularly where hot cathode rectifying valves are used.

The 800 volts negative potential required for controlling the grids of the master control and absorber valves is obtained from the small rectifying unit comprising the transformer (132), the rectifying valve (48) and the smoothing condenser (131). The rectifying valve (48) is connected to the transformer (132) in series with the condenser (131) and the anode terminal of the transformer (132) is earthed. At the moment of first exciting the rectifier unit, the anode of the rectifying valve is at earth potential. During the first half cycle of the transformer voltage when, say, the filament terminal connection of the transformer is positive to the earthed terminal, no current can flow in the rectifying valve because its filament is positive to the anode. During the negative half cycle, the filament is below earth potential and therefore negative to the anode so that electrons will travel from the valve filament to anode and build up a negative charge on the condenser plate connected to the valve anode. This condenser plate therefore builds up a negative potential, the limiting value of which is equal to the peak potential difference across the transformer winding. Actually it does not reach this limit because of the action of the grid signalling key which operates as follows:

Spacing Position. In the spacing position, the moving contact of the key connects the grid of the absorbing valve direct to its filament. Current then flows through this valve and through the absorbing resistance (130) thus causing power absorption. At the same time the connection between the grids of the master valves and their filaments is broken thus leaving them connected to the negative potential supply on the smoothing condenser (131). This negative potential prevents the master valve in use from oscillating and from taking any anode current. It will be noticed that the 3000 ohm resistance (129) prevents short circuit of the smoothing condenser (131). If a short circuit occurred there would be no negative potential available for shutting down the master valves and the rectifying valve anode would become very hot.

Marking Position. On the marking position of the key the opposite action occurs, the grids of the master valves being connected, in series with their grid leaks, to their filaments and the grid of the absorbing valve is isolated from its filament and left connected to the negative supply on the smoothing condenser. The master valve in use can now oscillate and drive the power amplifying valve whilst the absorber valve is prevented from taking any anode current. The 3000 ohm resistance (127) carries out the same function as did resistance (129) in the spacing condition.

The two 4 jar condensers (125) and (126) are connected across the key contacts to prevent arcing.

It will be noticed that the negative keying potential is not applied to the grids of the power amplifying valves. If the circuit is correctly balanced these cannot self oscillate but they do pass anode current and therefore assist in power absorption during the spacing periods.

A photograph of the grid signalling and absorbing panel is shown in figure 4a.

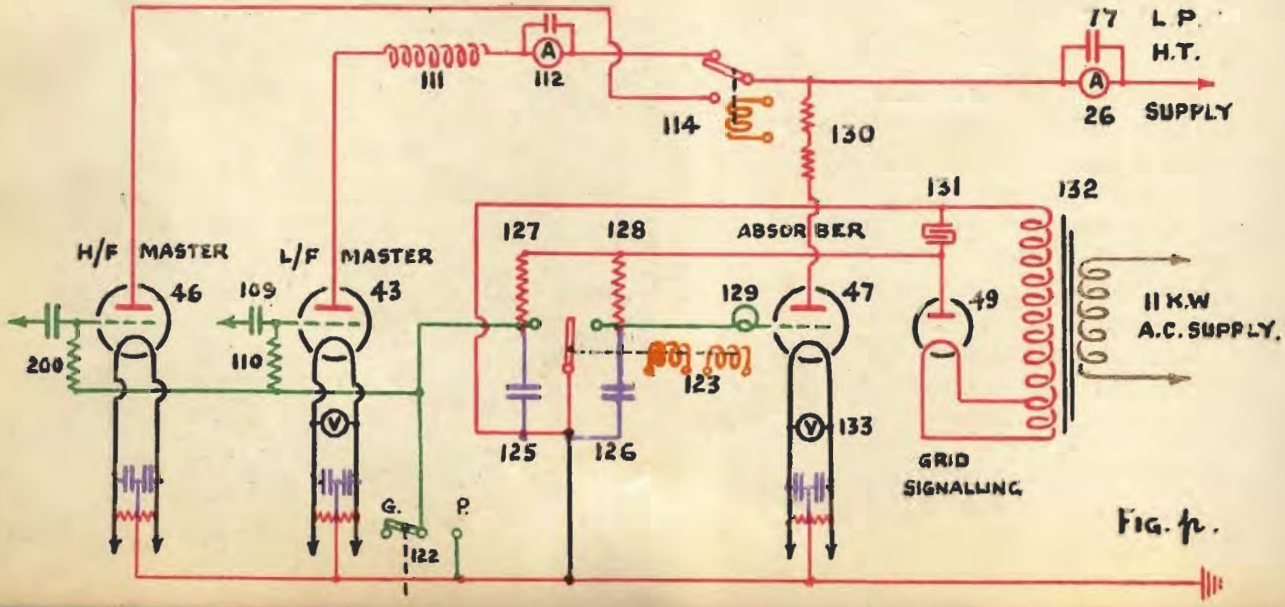

Fig. 4.