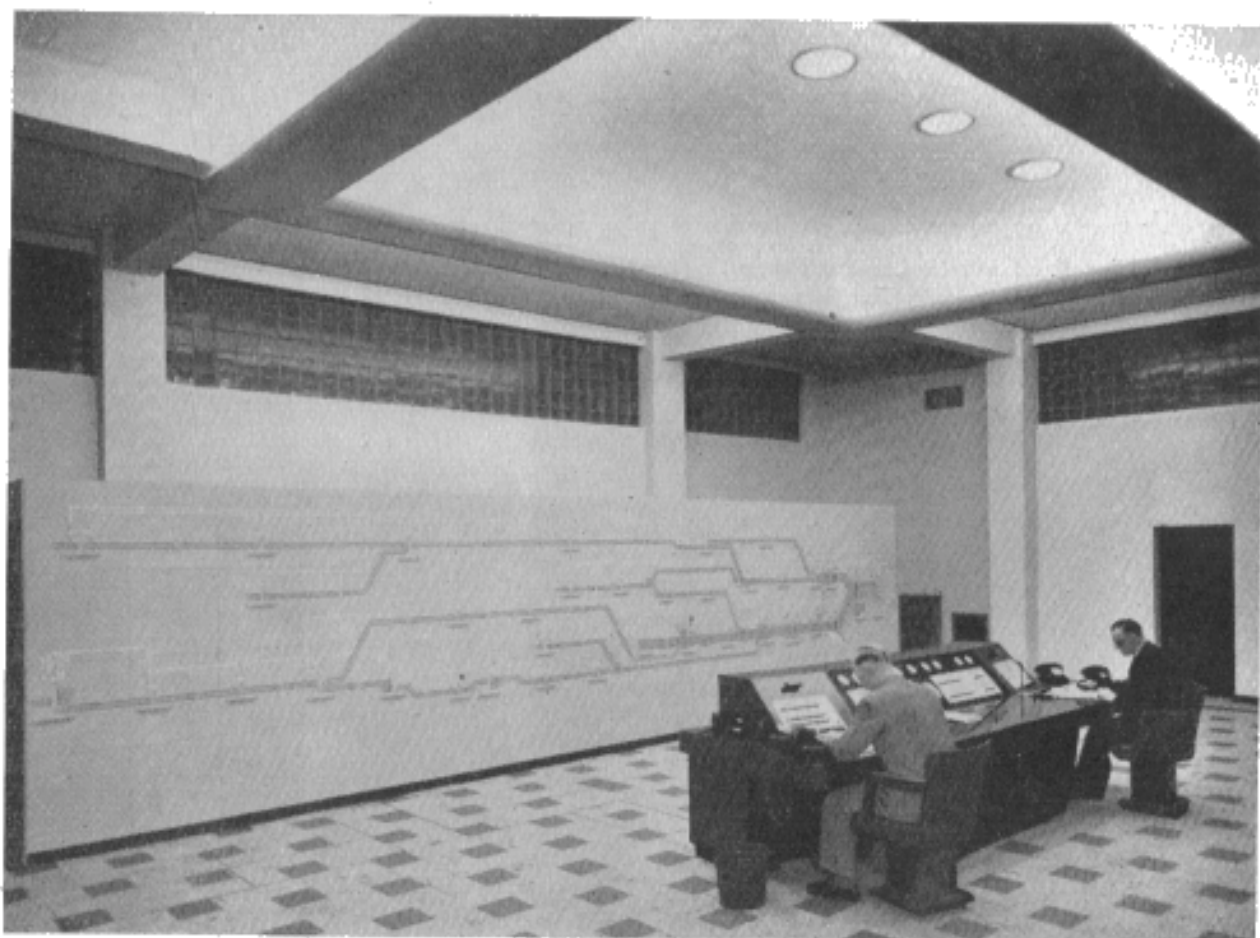


## Remote Supervisory Control in Southern Region



Mimic diagram and operators' desk at Raynes Park

**T**HE most extensive remote supervisory control system yet provided for railway electrification in Great Britain is being installed in connection with the London area change-of-frequency scheme on British Railways, Southern Region, the subject of a note in our April, 1954, issue. When this changeover to 50-cycle high-voltage supplies is completed, 71 rectifier substations, 70 track paralleling huts, and a number of supply points and switching stations will be controlled from three control stations, at Raynes Park, Lewisham, and Selhurst, respectively. The first two of these are already in operation.

In the design of the equipment special attention has been paid to speed of working, an important feature in this respect being the provision for selecting track feeder circuit breakers at each substation in groups, and operating them simultaneously when required, as well as individually. To avoid control operations being delayed by indications, separate

control and indication cable cores are used.

Control is effected by means of discrepancy switches and push buttons on a mimic diagram. The small size of the switches has enabled the complex network of lines supervised from Raynes Park to be shown as a geographical diagram on a straight board 29 ft. 5 in. long and 7 ft. 7 in. high, with the switches in the correct positions on the diagram according to the tracks or feeders controlled by their associated circuit breakers.

The advantage of the small switch dimensions is particularly apparent where multiple tracks have to be shown on the board. On the Raynes Park diagram, for example, there is an eight-track section from Waterloo through Queens Road Station, and some 17 miles of continuous four-track main line. The area controlled covers the Western Section main line from Waterloo to Walton-on-Thames, with the branches from Raynes Park to Epsom and Effingham Junction; Motspur Park to Chessington; Hampton

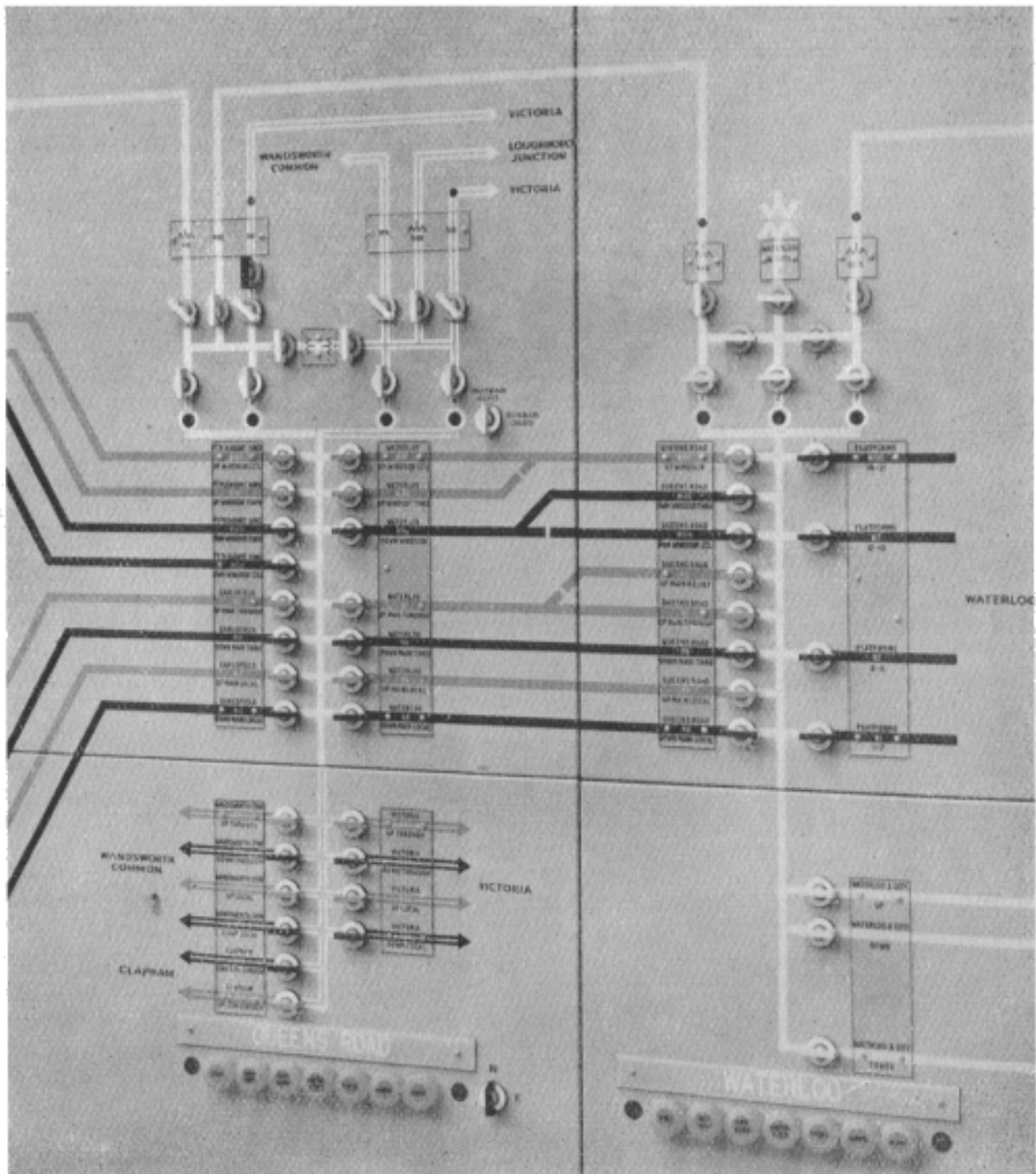
Court Junction to Effingham Junction and Guildford; Hampton Court Junction to Hampton Court; and Malden to Shepperton and Twickenham.

Also in the area controlled are the Windsor line from Waterloo to Egham, the branch from Staines to Windsor, and the Hounslow loop line. A total of 527 circuit breakers will eventually be controlled from this board, and 627 indications (including alarms) will be received.

Remote metering facilities are provided on the operators' desk. Lever keys enable substations which have two or more

rectifiers to be selected for the purpose of reading the total d.c. current at such a substation at any moment. Other instruments on the desk show the supply voltage and frequency. Certain equipment faults are also identified by means of alarms on the control desk.

Two operators are on duty in the Raynes Park control room. Both can work independently, as 12 separate control systems are provided, each controlling a maximum of six substations and track paralleling huts or other equipment. As a safeguard against loss of power



Section of diagram in Raynes Park control room, showing how the close spacing of the switches facilitates representation of multi-track main lines

supply to the tracks, due to the temporary failure of a control system, two control systems follow each route. Substations are connected alternately to one or to the other system.

The supervisory apparatus is divided and housed in two apparatus rooms, and substations are connected alternately to each apparatus room so that in the event of a fault in either half, adjacent substations are not put out of action and track sections can continue to be fed from one end.

Provision is made at Raynes Park for taking over control in emergency of equipment in two important "frontier"

substations which are at Queens Road and Wimbledon and which normally would be operated from the Selhurst control room. Conversely, Queens Road and Wimbledon equipments normally controlled from Raynes Park can be taken over by Selhurst control room, and Waterloo substation can be taken over by the control room at Lewisham.

The equipment has been designed to the requirements of Mr. S. B. Warder, Chief Electrical Engineer, British Railways Central Staff, and is being installed under his direction. All the remote supervisory control apparatus is being supplied by the General Electric Co. Ltd.