

Private Automatic Exchange at Filton

Believed to be the largest private automatic telephone exchange in the world, the new 1,700 line P.A.X. manufactured by The General Electric Company Limited and installed by the Reliance Telephone Company Limited (a subsidiary of the G.E.C.) has recently been put into service for the Bristol Aeroplane Company Limited at their Filton Works in the West of England.

As in so many factories in the aeroplane industry, the various divisions at Filton are separated by quite appreciable distances. Previously, three individual automatic exchanges, also of G.E.C. manufacture, were employed and were linked together by tie lines, but as the intercommunication load grew, these proved inadequate so the Bristol Aeroplane Company Limited drew up a special specification for a central 1,700 line automatic exchange with provision for the inclusion of additional when needed.

The new exchange, employing pre-selectors, first and second group selectors and final selectors, operates on a 4-digit dialling system. A numbering problem arose immediately because the three exchanges already in use were numbered independently and thus a major change of many numbers was apparently necessary. The problem was solved by keeping the existing 3-digits of the individual extensions and using the fourth digit of the new system as a prefix. Thus the three separate groups of original numbers :—

100—899	became	2,100—2,899
200—899	„	3,200—3,899
200—399	„	4,200—4,399

and any major changes of existing numbers became unnecessary

The exchange equipment follows normal rack mounting practice but a limitation of height in the available accommodation necessitated the use of



Fig. 1.—Power room with ringing machines on the left, battery charging equipment and main power switchboard.

racks measuring 8' 6" in height. The line relays are of the G.E.C. P 10 (minor) series and the uniselectors are of the G.E.C. UN 2100 series, the robust design of which ensures long life and great reliability. The group and final selectors are of the 2-motion channel mounted type with a 100-outlet capacity.

Of the 1,700 lines, 100 are provided with the "Executive right-of-way" facility to enable selected executives to obtain communication with extensions which may be already engaged.

If a first group selector is "held" unnecessarily by a line fault, a special "permanent glow" line location feature incorporated in the system enables the offending line to be traced. This feature is also employed to locate a line where the telephone hand-set has been removed from its cradle and on which dialling did not follow after a reasonable period.

Automatic audible and visible alarms are given at a central point by a bell and designated lamps, should a fault occur on the exchange equipment. The alarms, which include fuse, release, and permanent glow, are graded in prompt and deferred categories.



Fig. 2.—Unselector racks.



Fig. 3.—General view of the exchange showing the equipment racks and cabling.

Ringling, engaged, dial and number unobtainable tone and alternating supply for ringing purposes are derived from a mains operated ringing machine. A spare mains operated machine is also provided together with a battery operated machine for use in the event of a mains failure.

A rotary time switch, operated by pulses from the ringing equipment, provides the necessary delay periods for the delayed alarm.

Other apparatus provided with exchange equipment includes a graduated howler, a line tester and a selector tester.

The graduated howler is an instrument which may be connected to a line of which the telephone handset has been accidentally removed from its cradle. Upon connecting the instrument to the affected line, a warning is transmitted to the receiver of the telephone which starts at a low level and increases in volume by graded steps until maximum output is reached. The replacement of the telephone hand-set automatically switches off the howler.

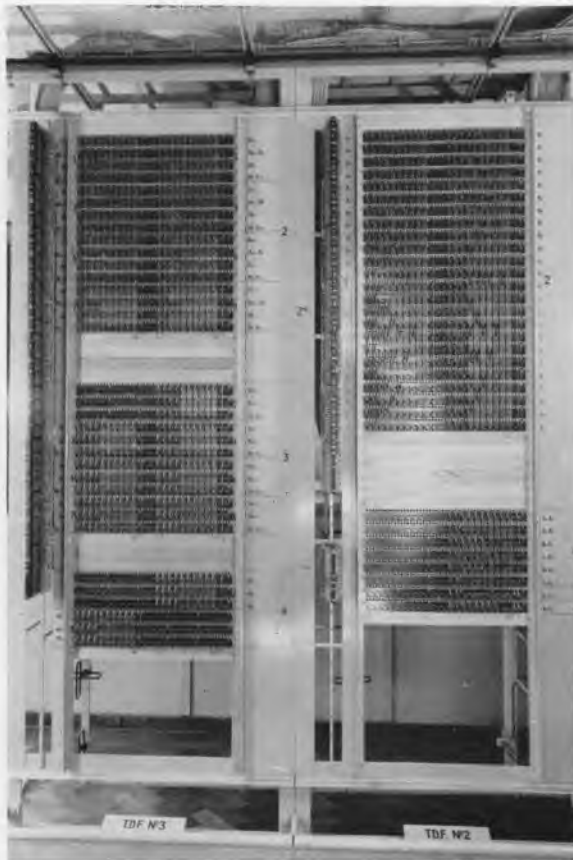


Fig. 4.—Trunk distribution frames showing the grading.

The line and selector testers are used for carrying out routine tests on the apparatus. Facilities are provided for ringing, speaking, dialling and voltmeter tests on lines and telephone instruments and ringing and speaking tests on the exchange equipment.

All lines are terminated on a main distribution frame and access to any line may be obtained through jacks without interference to the exchange apparatus. In addition to providing a point where line tests and alterations may be effected, the distribution frame is equipped with protection apparatus in the form of fuses and arresters to guard against damage caused by external lines exposed to accidental contact with power cables or the effects of lightning discharges.

The power equipment for the exchange comprises two automatic float chargers, a trickle charger and

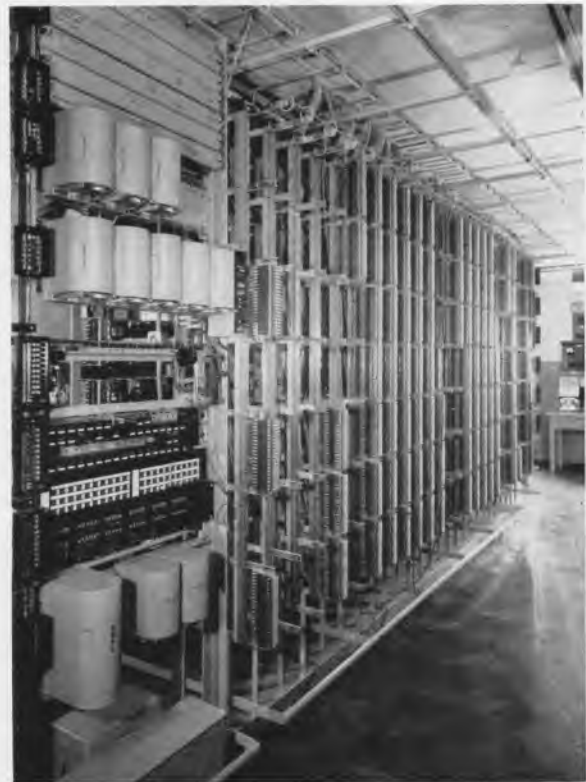


Fig. 5.—Main distribution frame and miscellaneous apparatus rack.

two 50-volt batteries, each of 600 ampere hour capacity working on the divided battery float system.

Unusually heavy loading of the exchange is experienced at peak periods, some 3,600 calls having been recorded during one hour on each of three successive days. This compares with a G.P.O. Exchange of similar size at a ratio of 3 1

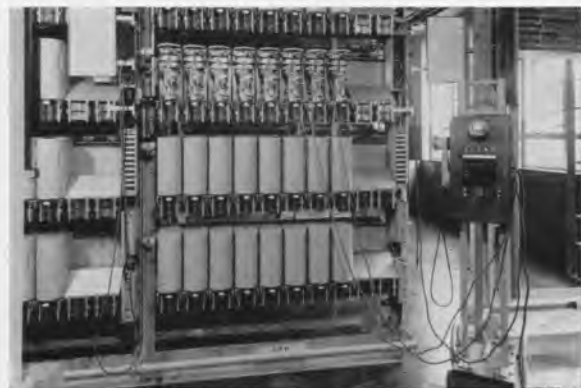


Fig. 6.—The selector tester in use on the first group selectors.