UNIT AUTOMATIC EXCHANGES, USING UNITS, AUTO., NO. 13
50/200-Line Standard Type
General Information

1. Introduction. The U.A.X. No.13 has been developed for exchanges where through-junction traffic has to be handled, in contra-distinction to U.A.X. No.12, which is not designed for dealing with through-junction traffic. It has a capacity of 200 subscriber's lines. Where a greater capacity than this is required, the U.A.X. No.14 (in process of development) or a larger non-unit type of equipment, should be employed. U.A.X. No.13 equipment should also be used where No.12 equipment would ordinarily apply, but is not of sufficient capacity to meet ultimate development.

2. Scope of Instruction. This Instruction gives the characteristic features, a brief outline of the circuit operation, and references to other relevant E.I.'s.

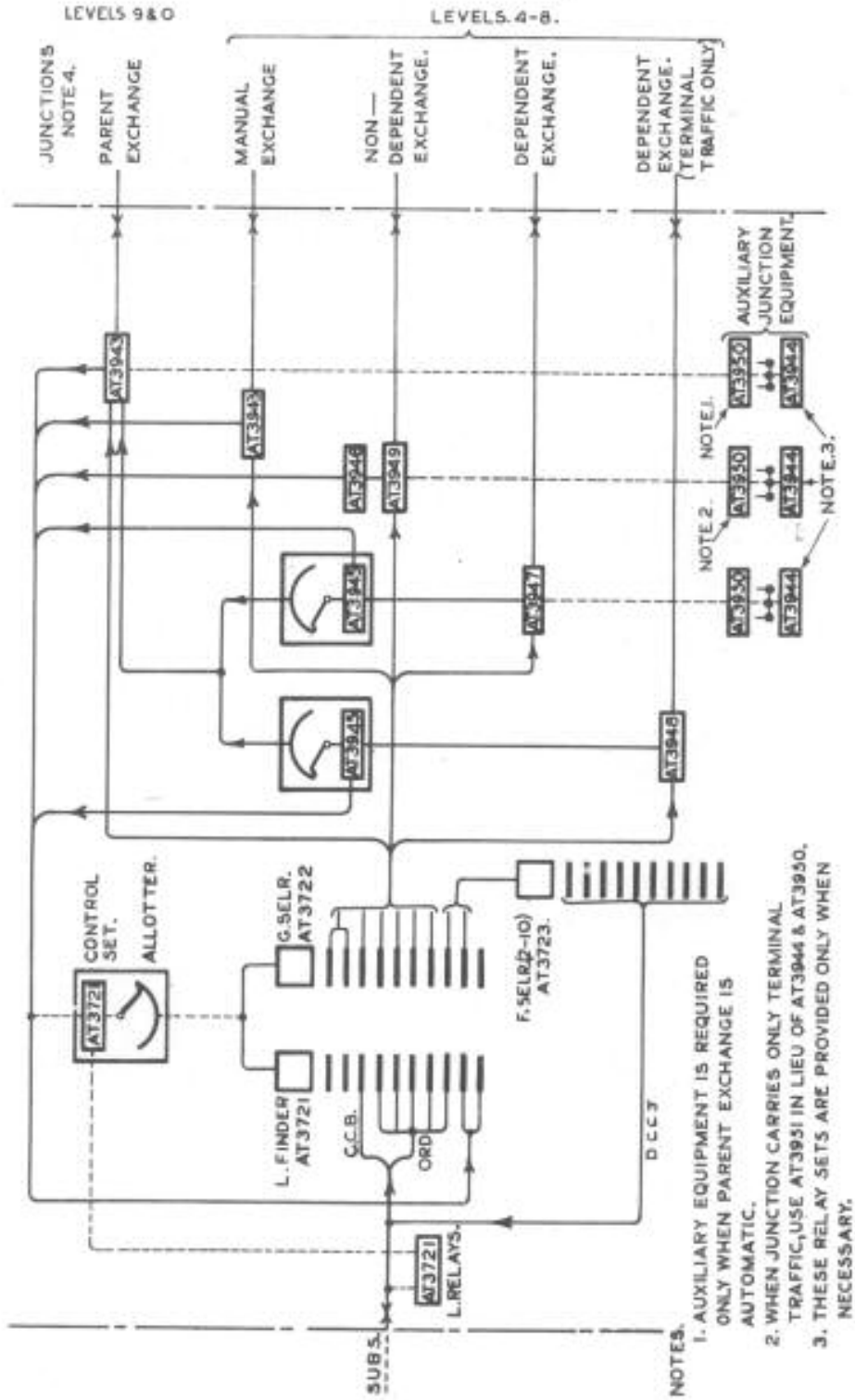
3. Junction capacity. Ten junctions can be connected to each line-finder group, thus providing for a maximum of 40 incoming or bothway junctions at each fully-equipped exchange. The number of outgoing junctions is limited only by rack capacity.

4. General design. The principle of enclosing the apparatus in steel cabinets has been followed, thus enabling these exchanges to be installed in unheated buildings. In addition to the use of the standard P.O. 3000- and 600-type relays, selectors of the 2000-type are employed. Ballast transmission bridges and balanced-tone feed circuits are also incorporated in the equipment. A departure from previous unit auto-design practice is the use of strip-mounted junction and auxiliary equipment, instead of jacked-in units.

5. *Trunking arrangements.* A trunking scheme of a typical U.A.X. No.13 is shown in Fig. 1.

6. *'O' level routing (tandem working).* The U.A.X. No.13 scheme enables incoming 'O' level calls from dependent exchanges to be routed to the parent exchange without any further action on the part of the caller. Discriminating signals are extended to line from the calling exchange (on combined 'G' and 'O' level junctions), the incoming junction terminations accepting these signals and then routing the call to an outgoing parent exchange junction. Direct access from the tandem exchange to the parent junction is afforded by means of a junction hunter, the calling signal being transmitted forward after a disengaged line has been found. The appropriate calling lamp (i.e. 'coin-box' or 'ordinary') is lit at the parent exchange.

7. *Route discrimination.* Means of determining the fee appropriate to any objective exchange, to which direct or indirect access can be given, are afforded by route-discriminating equipment. This equipment also provides facilities for route-barring in cases where a caller dials an exchange code to which access is not allowable. Generally, these route-discrimination controls are effected at the originating exchange, but means are provided at tandem exchanges whereby any arrangements for route-barring of subscribers connected to that exchange are



* FIG. 1. U.A.X. No. 13. TYPICAL TRUNKING ARRANGEMENTS

rendered inoperative in so far as incoming junction calls are concerned. These controls are effected by the use of positive-battery signals transmitted from the incoming junction terminations *via* the 'meter' wires.

8. *Junction services at U.A.X.s No. 1* are divided into four main categories as follows:-

(a) Parent exchange junctions. These connect a U.A.X. to its parent exchange and may either go direct to that exchange or be routed *via* selectors at an intermediate exchange. In the latter case, the routing through the tandem exchange of calls outgoing from the U.A.X. does not require to be controlled by dialled impulses (*see* para. 6). The parent exchange operator deals with trunk, assistance and other 'O' level traffic to or from subscribers on the U.A.X. or any dependent U.A.X.s (*see (b)*). Calls may also be routed *via* these junctions into the parent exchange auto. network as explained in para. 9.

(b) Dependent exchange junctions. These connect a U.A.X. to a remote U.A.X. not having direct junctions to a parent and form the parent exchange junctions of the remote U.A.X.

(c) Non-dependent exchange junctions. This term is employed to indicate junctions directly connecting either auto. - or manual-type exchanges to a U.A.X. which is neither a dependent or parent exchange so far as the non-dependent exchange junctions are concerned.

(d) Terminal junctions. The expression "terminal" here relates to outgoing traffic over a direct route where it is not intended that callers shall be able to gain access to any outgoing junctions terminating in the called exchange.

9. *Dual-service junctions.* The trunking arrangements involve the use of a single group of junctions for two separate services to the parent exchange; the services *(a)* 'O' or assistance, and *(b)* auto.-auto. service *via* parent exchange selector levels. (Bothway working is catered for). Standard signalling and control facilities are afforded over these junctions, i.e., two-discrimination on 'O' level calls ('coin-box' or 'ordinary' subscribers' calling signals), manual hold, re-ring, trunk-offering train, busy tone and flash, etc. The auto.-auto. service to the parent exchange is routed *via* level '9'.

10. *Trunk-offering train.* The final selectors - all of which are of the 2-10 P.B.X. type - are almost identical in design with standard final selectors, excepting that means are provided for the reception of special line-signals from the parent exchange to over-ride busy-back signals and permit of trunk-offering and re-ring facilities.

*11. *Ticketed calls.* All calls dialled-out to adjacent exchanges will be ticketed, manual-hold facilities being provided. Alternatively, metering will take place on calls routed to dialled-out manual exchanges *via* non-director areas.

12. Detailed descriptions of the units, apparatus and wiring are given in G 1531.

13. Route-discriminating equipment. A description of the route-discrimination scheme, together with typical numbering schemes and the various means of employing the route-discriminating facilities provided, is given in G 1051 (*see* also G 1533).

14. Installation of switching equipment. Instructions relating to the installation of this equipment are given in G 3530.

15. Installation of power plant. Single-battery working is employed when A.C. mains supply is available, but double-battery working is employed in cases where no A.C. supply is available. Details regarding the type of power plant to be provided are given in POWER, General, A 1003.

16. Maintenance. General maintenance instructions are given in G 5001.

17. List of circuits. A list of diagrams and relevant specifications relating to Units, Auto. No.13, is given in G 1532. A similar list (with specifications) relating to out-station terminations is given in G 1505. Explanatory circuit notes appear in each specification.

18. Facilities. A detailed list of service and engineering facilities for standard unit auto. exchanges is given in G 1502.

*19. Outline of operation. The subscribers' lines (ordinary and coin-box) and junctions are terminated on the line-finder banks in a common group (*see* also para. 20). The junctions, however, have alternative (or bypath) access to the group selector, *via* the control relay-set, to enable dialling to proceed early without waiting for the line-finder to step to the marked bank contact. Each line-finder group is provided with two control relay-sets and associated allotters, and caters for 50 subscribers' lines and 10 junctions. As far as possible, each control equipment carries half the subscribers' lines and half the junctions. Overlapping junction calls (but not local subscribers' calls) cause both control equipments to be switched into service.

20. The 10 junctions are terminated on levels 1 and 2, and ordinary subscribers' lines are terminated on levels 3 to 7. Level 8 is reserved for coin-collecting-box lines and arrangements are made for coin-box discrimination to be transmitted from this level.

21. The subscribers' line circuits are of the three-relay type and provide for PG lock-out. PG alarm facilities are provided.

22. *Link seized by subscriber.* Removal of a subscriber's receiver causes the associated line relay to energize the allotter controls, and switch a line-finder link into service. Automatic vertical- and rotary-search movements of the line-finder are followed by through-switching of the subscriber's negative and positive wires, transmission of dial tone, and the release of the allotter controls. The release of the allotter is accompanied by an automatic step-on movement of its wipers, thereby causing preselection of the next disengaged link.

23. *Selectors.* The rotary- and vertical-movement controls of the group and final selectors are in accordance with standard practice for 2000-type selectors. These selectors (as well as the two-motion line-finders) are not provided with release magnets. The replacement of a caller's receiver is followed by automatic rotation, which carries the wiper beyond the 11th step position, causing the shaft to release vertically and then rotate the wiper to normal below the level of the bank.

24. *Time-pulse controls* are associated with line-finders, group selectors and final selectors, and provide the facilities detailed in para. 21.

References:- G 1051, 1502, 1505, 1531, 1532, 1533, 3530
(Tp1) POWER, General, A 1003

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