SECTION 10.

EXCHANGE EQUIPMENT LAYOUTS

1. **GENERAL.**

1.1 Details which must be considered when preparing layouts of 2000 type, pre-2000 type, and C.B. sleeve control equipment are set out in the following Sections of this series of Instructions -

Section 5 – Safe Floor Loads.

Section 6 – Widths and Lengths of Exchange Buildings.

Section 7 – Ceiling Heights for Internal Plant Buildings.

Section 8 – Locating Columns in New Buildings.

Section 9 – Areas Including Columns.

Section 11 – Aisles.

Section 12 – Passageways – Exchange Equipment other than Manual.

Section 13 – Air Ducts in Exchange Buildings.

Section 14 – Cable Design Methods.

Section 15 – Provision of Cable Holes in Buildings.

Reference should also be made to Sections 1-4 when groupings of various classes of equipment are being arranged in the one building.

1.2 It is realised that in many instances the shape of the floor, space, width of building, type of building and class of exchange will generally decide the layout of the equipment.

Figures have been included in this Instruction together with information on the main points to be considered in arranging satisfactory groupings of equipment racks.

The subject is dealt with under the following headings –

2. 2000 TYPE EQUIPMENT.

2.1 Layout Procedure.

Layout of Equipment in Buildings. The details included in Table A provide a ready means for determining the maximum number of rows of 2000 type racks which can be sited in an equipment room of any given length. The number of racks in each row is dependent on the position of the M.D.F., the cable entry arrangements and the position of any columns in the building.

The transparent rack layout shown in Fig. 1 will also provide a ready means of ascertaining the maximum number of racks which can be installed on the floor area. Table A, in conjunction with a transparent drawing which includes a pattern of racks correctly sited with respect to standard aisle spacing, will enable the Engineer planning a layout to arrange the position of the racks even when columns are included in any given floor area.

A 2000 type layout rule, can be used to aid in the preparation of layouts in areas not including columns.

Association of Equipment. The best arrangement of equipment for operating and maintenance reasons, as well as for cabling economies is one in which the switches performing like functions are arranged in one group, that is, the subscribers' line equipment should be placed in one group, the first selectors in another group, the relay set racks in another, etc., and in no circumstances shall racks performing one function be separated by racks performing another function, except when a fold over layout is introduced.

2.2 Grouping practices for Subscribers' Line Equipment.

Where the ultimate capacity exceeds 1200 lines, subscribers' equipment should be arranged in uniform groupings of 1200 lines or 1000 lines. Various combinations of racks serving subscribers' equipment are shown in the Figs. included in the equipment grouping arrangements. (See pages 26-40.)

For Exchanges under 1200 Lines Maximum Capacity, reference to typical layouts included in Section 4 of this Instruction will provide a guide to approved arrangements of equipment for layouts in such buildings as portable exchanges, garage building units, etc.

2.3 Metropolitan Areas.

Branch Exchange Buildings.

Because branch exchange buildings are generally planned for fixed capacities of 4800 and 9600 lines, exchange layouts have developed accordingly on these capacities. The capacities are related to the allotment of a level and/or the sharing of a level.

Depending on the 20-year development figures and the initial building to be provided, the equipment is laid out on either a 9600 line layout, two 4800 line layouts employing a "folded-over" principle, or 4800 lines where the 20-year development figures will not exceed that number of lines.

The 9600 line layout should not be adopted unless the initial installation will exceed 3600 lines at the 5-year period, or where the development will exceed 4800 lines before 10 years.

The "fold over" type of layout should be provided in most instances, particularly where the initial installation is within the range of 1200 or 2400, or where 4800 lines will not be needed under 10 years.

In some instances a 2400 line layout will apply to exchanges in permanent buildings where that figure will not be exceeded in 20 years, although it is not general practice to have layouts of this capacity, other than in country areas.

Main Exchanges.

The planning of main exchanges, shall be related to 20-year and post 20-year periods and should provide -

(i) A 9600 line layout for subscribers' line equipment where only one level will be allotted to the exchange, and

(ii) Two or more 9600 line layouts for subscribers' equipment when more than one level will be allotted to the exchange.

(iii) Sufficient floor space to meet the Junction requirements for the network, in relation to the subscribers' equipment and through calls.

The design of main exchanges situated in large networks generally calls for the provision of considerable building space at the erection stage in order to provide for junction equipment requirements. The development figures, in association with other long term planning aspects, generally dictate the space to be allotted for subscribers' line equipment racks.

City Main and Co-Main exchanges, because the accommodation is generally in multi-storey buildings, it is usual to provide for more than one 10,000 line unit or equipment at each building. Each 10,000 line unit should be considered separately for cabling and other engineering aspects, except for common M.D.F., power plant, etc..

2.4 Present Arrangements of Various Types of Racks.

Subscribers' Line Equipment Rack Grouping. When planning layouts of subscribers' equipment racks the aim should be to provide 1200 line groups in branch or main exchanges where the width of the building permits. Where this is not possible uniform grouping, determined by building widths and columns should be selected from the various grouping arrangements detailed in the figures included in the equipment groupings arrangements (see pages 26-40).

The foregoing arrangement of Subscribers' Line Equipment racks applies to the use of standard 2000 type equipment using uniselector racks of 300 capacity and Final Selector racks either of 600 lines or of 400 lines capacity. Consideration is being given to the development of equipment to provide for 1000 line Suites for Subscribers' Line Equipment. A supplementary instruction will be issued when firm details are available.

Other Switching Equipment Racks. The location of other main 2000 type equipment racks including selectors, repeaters, discriminating selector repeaters and large group final selectors, is determined by -

(i) Operating and maintenance considerations,

(ii) Cabling economies between each switching rank or the M.D.F.,

(iii) The need for meeting growth in any rank.

Various diagrams are included with this Instruction to illustrate the grouping arrangements of each stage to meet the condition laid down.

Section 14 "Cabling Design Methods" should be studied before determining the areas selected for each switching rank.

Where growth in any rank cannot be accurately determined, it may be desirable for two adjacent ranks of equipment to grow towards each other.

The principles to be considered to provide for growth are illustrated in the Figs. attached.

The location of meter, routine control and access racks, when required, T.D.F., T.C.F., I.D.F., A.E.R., M.A.R., F.P.R. and miscellaneous Relay Set Racks, should be arranged to obtain economy in cabling and their close proximity to associated equipment, for example, the F.D.R. should be adjacent to M.D.F.

A Table is included to assist in the selection of the most suitable positions for each minor type rack.

2.5 Typical Layouts.

Typical layouts are included in this Instruction for a -

(i) Co-Main Exchange.

(ii) Main Exchange.

(iii) Branch Exchange.

(iv) Garage Type Exchange. See Section 4.

(v) Portable Exchange. See Section 4.

(vi) Minor Capacity Exchange. See Section 4.

2.6 Country Areas.

Country Automatic exchange capacities vary considerably and the size of building and layout provided are governed by factors stated in Section 4. The same 1200 line or 1000 line groupings of subscribers' equipment as indicated for metropolitan layouts should be used. Typical ultimate capacities are 1200, 2400 and 3600 lines.

Where larger groups of lines are involved, special layouts should be developed. The positions selected for the associated trunk Switching and Long Line equipment should conform to the principles discussed in Section 4.

2.7 Proposed Layout Practices.

New Features in layout have been developed for branch exchanges which employ a 7-rack suite for 1200 subscribers' lines.

It will be seen in the drawings that the previously accepted locations of the D.S.R. and the various selector ranks have been modified and they are -

(i) Four D.S.R's ranks in rows in appropriate positions match the four U.S. racks in the 1200 line (7 rack) equipment groups to achieve cable economy.

(ii) Three F.S. racks are included in each line equipment group. They in turn are matched by three 4th selectors in each row with the remaining 4ths included in succeeding rows of three,

(iii) The 3rd selector racks have also been grouped to ensure cabling follows an economical cyclic course.

(iv) The miscellaneous equipment racks including meter, routiner control and AER and MAR, etc., are centred into the layout to reduce ineffective maintenance time.

This revised arrangement of racks in a standard branch exchange employing a 1200 line suite has been developed following on a study of cabling practices to obtain economy. The cabling practice which will be introduced to meet this layout is detailed in Section 14 of these Instructions.

The principles which determine this method for laying out equipment are -

(i) Each succeeding rank of equipment should occupy the same length and have the same number of racks in a row, or part of row.

(ii) A cyclic cabling arrangement should be used to economise in cable used.

(iii) Improved cabling methods are obtained.

(iv) Assist staff operating and maintaining plant by a reduction in necessary movement between succeeding ranks.

2.8 Proposed Change from 20-year Layout Planning.

The foregoing details all relate to the layout of equipment based on the general acceptance of 20-year planning.

A revision in present planning practices, particularly in regard to the use of 20-year equipment layouts should be introduced with the issue of this Instruction.

The accepted principles of line equipment grouping and association of other equipment racks still apply but variable factors indicated in the following paragraphs must be taken into account in future.

Effect in Changes in Types of Equipment.

A survey of the dates on which the various types of automatic exchange equipment have been introduced, together with the modifications to individual types of equipment which have occurred during the period in which the equipment has been available for purchase, indicates that changes in type and operating principles have occurred with some degree of regularity. In fact after the passage of very few years a new equipment or a modification in the type has taken place. The effect of this is that comparatively few exchanges have one type of equipment installed in the area provided originally for the original 20-year equipment layout.

When a change in type has been introduced, the dimensions of either the base of the unit or rack, the height of the equipment or the capacity of the rack has varied considerably from the original plant purchased.

Typical examples are -

Keith Plunger Line Units – base dimensions 1′10″ x 2′10″ or 3′2″ compared with Rotary Line Switch Units 1′10″ x 4′.

Pre-2000 Line Units and Trunk Boards, height 9′1-9/16″ compared with 10′6½″ for 2000 type racks.

2000 type equipment racks – width 4′6″ compared with 4′3″ of the Siemens No. 17 rack.

Apart from the changes in the physical dimensions of the racks, their capacity in subscribers′ line circuits has also been altered.

2.9 Floor Areas. The difference in the floor area for 1200 lines of subscribers′ equipment between pre-2000 type line units and 2000 type racks is 48′ x 1′10″ compared with 31′6″ x 1′3½″ excluding passageways.

The changes in the physical dimensions of the racks supplied by different contractors, coupled with 20-year layout initially spread over complete floor areas, brings about one or more of the following:-

(i) Rearrangements in cabling schemes;

(ii) Revisions of layouts;

(iii) Alterations to overhead runway and supporting superstructure;

(iv) Complete replacement of existing plants;

(v) Extensions in the newer types of plant.

For example the installation of 2000 type racks in areas between racks of pre-2000 type equipment introduces difficulties which result in waste in manhours and material.

2.10 New Planning Approach. In order to prevent as much as possible such subsequent re-arrangements when new types of plant are introduced, the following approach is to be considered when planning the layout of equipment -

(i) A 20-year plan should be developed to determine the floor areas for the equipment.

(ii) The plan should take into account the possibilities of a change in plant within the planned period. The planned floor areas must be adequate to meet requirements and shall be determined on the principles detailed previously in this instruction.

As periodical introduction of new types of equipment must be contemplated, the layout prepared should be based on -

(a) Providing for a 20-year period if the original date of introduction of the type of equipment proposed is reasonably close to the time the layout is prepared.

(b) When the new plant has been in use for 5 years, all subsequent planning for new installations shall be reduced to a 10-year layout requirement.

(c) When the new plant has been in use for 10 years, all subsequent planning for new installations shall be reduced to a 5-year space requirement.

(d) When the plant has been in use for 15-years, layouts should be confined to a small section of the floor area. Temporary installations may be effected in some instances where knowledge of the introduction of new types of equipment is available. The possibility of using material recovered from other exchanges of the same type for re-installation naturally would influence the layout proposed at such a stage in the life of the original plant.

Row	Dimension	Row	Dimension	Row	Dimension	Row	Dimension	Row	Dimension	Row	Dimension	Row	Dimension
1	0′0″	11	32′6″	21	65′0″	31	97′6″	41	130′0″	51	162′6″	61	195′0″
2	2′8″	12	35′2″	22	67′8″	32	100′2″	42	132′8″	52	165′2″	62	197′8″
3	6′6″	13	39′0″	23	71′6″	33	104′0″	43	136′6″	53	169′0″	63	201′6″
4	9′2″	14	41′8″	24	74′2″	34	106′8″	44	139′2″	54	171′8″	64	204′2″
5	13′0″	15	45′6″	25	78′0″	35	110′6″	45	143′0″	55	175′6″	65	208′0″
6	15′8″	16	48′2″	26	80′8″	36	113′2″	46	145′8″	56	178′2″		
7	19′6″	17	52′0″	27	84′6″	37	117′0″	47	149′6″	57	182′0″		
8	22′2″	18	54′8″	28	87′2″	38	119′8″	48	152′2″	58	184′8″		
9	26′0″	19	58′6″	29	91′0″	39	123′6″	49	156′0″	59	188′6″		
10	28′8″	20	61′2″	30	93′8″	40	126′2″	50	158′8″	60	191′2″		

To determine the number of rows of equipment which can be arranged in any given length of switchroom, the following calculations shall be made:-

1. Set down width of Front End Passage – A
2. Set down width of One Rack – 1′3½″
3. Set down width of any Transverse – B (either 3′10″ or 2′8″ - See Section 6.)
4. Set down width of Rear Passage – C

Total Length = A + B + C + 1′3½″

Then subtract total from length of building.

The remaining distance should then be related to the Table of Dimensions included above, e.g. 80′ -(5′ + 3′10″ + 3′ + 1′3½″) = 66′10½″ between.

This length of switchroom would provide 21 rows or, by reducing either A or C in full or part a total of 9½″ 22 rows could be installed.

TABLE A. DIMENSIONS OF NUMBER OF ROWS OF EQUIPMENT IN SWITCHROOM. (2000 Type Equipment.)

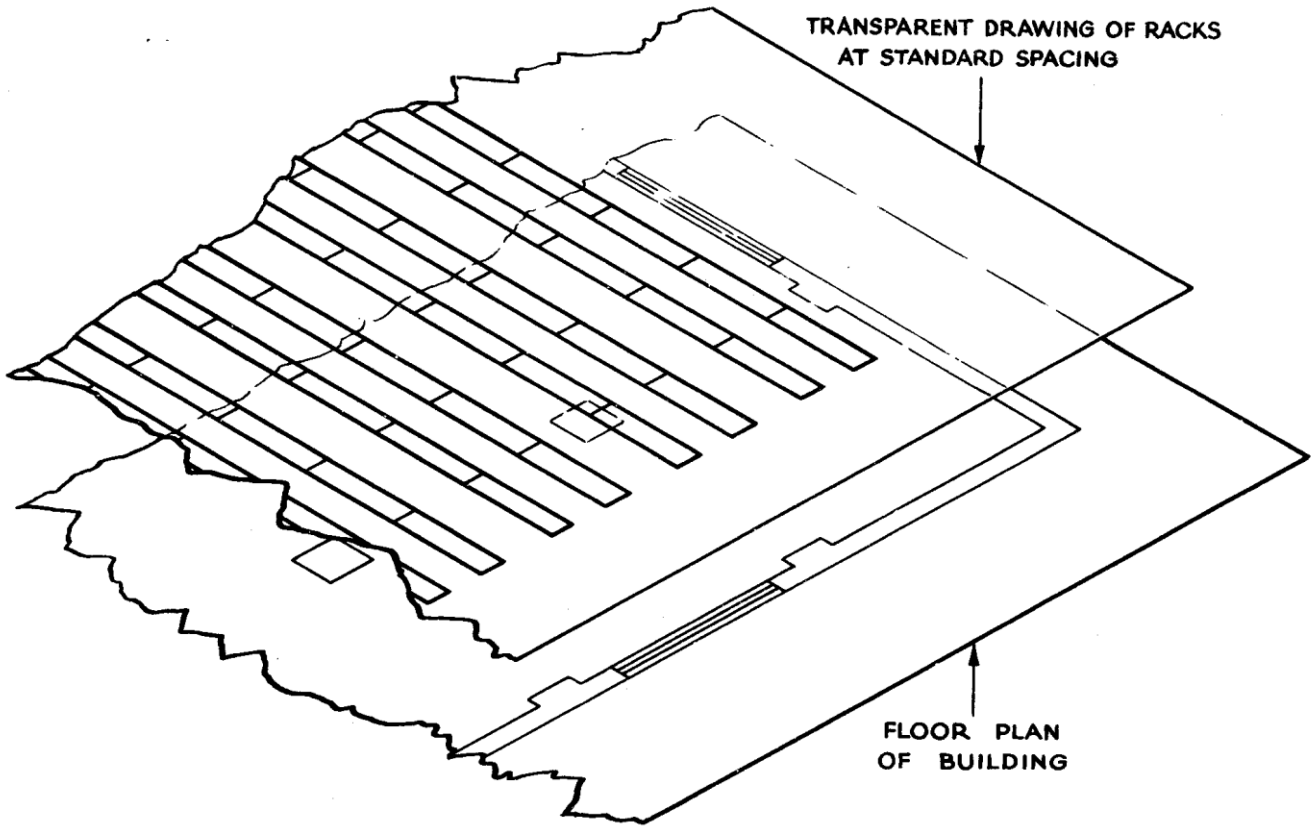


FIG. 1. USING A TRANSPARENT OUTLINE TO LAYOUT RACKS IN AN AREA WITH COLUMNS.

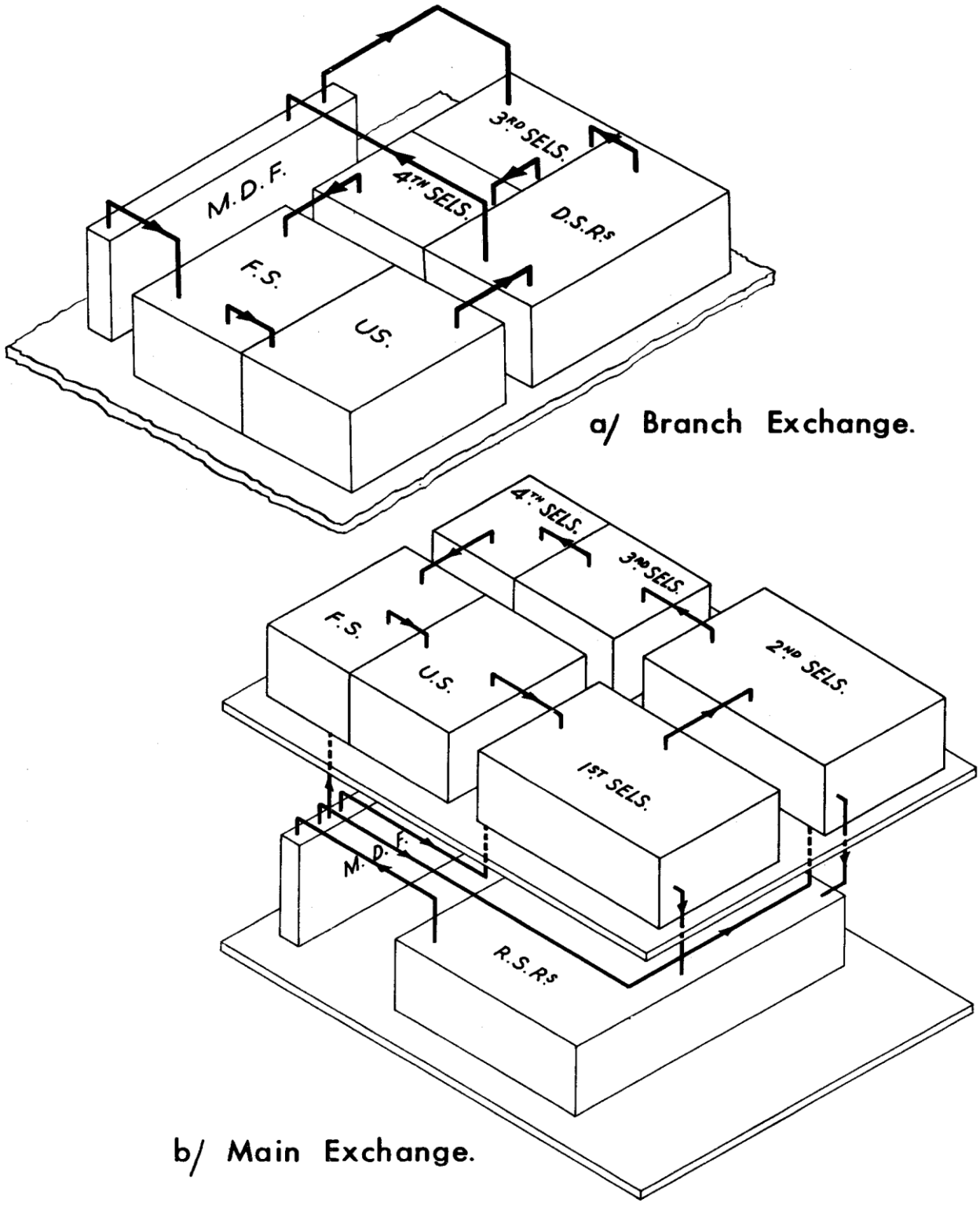


FIG. 2. EQUIPMENT GROUPING FOR CABLE ECONOMY.

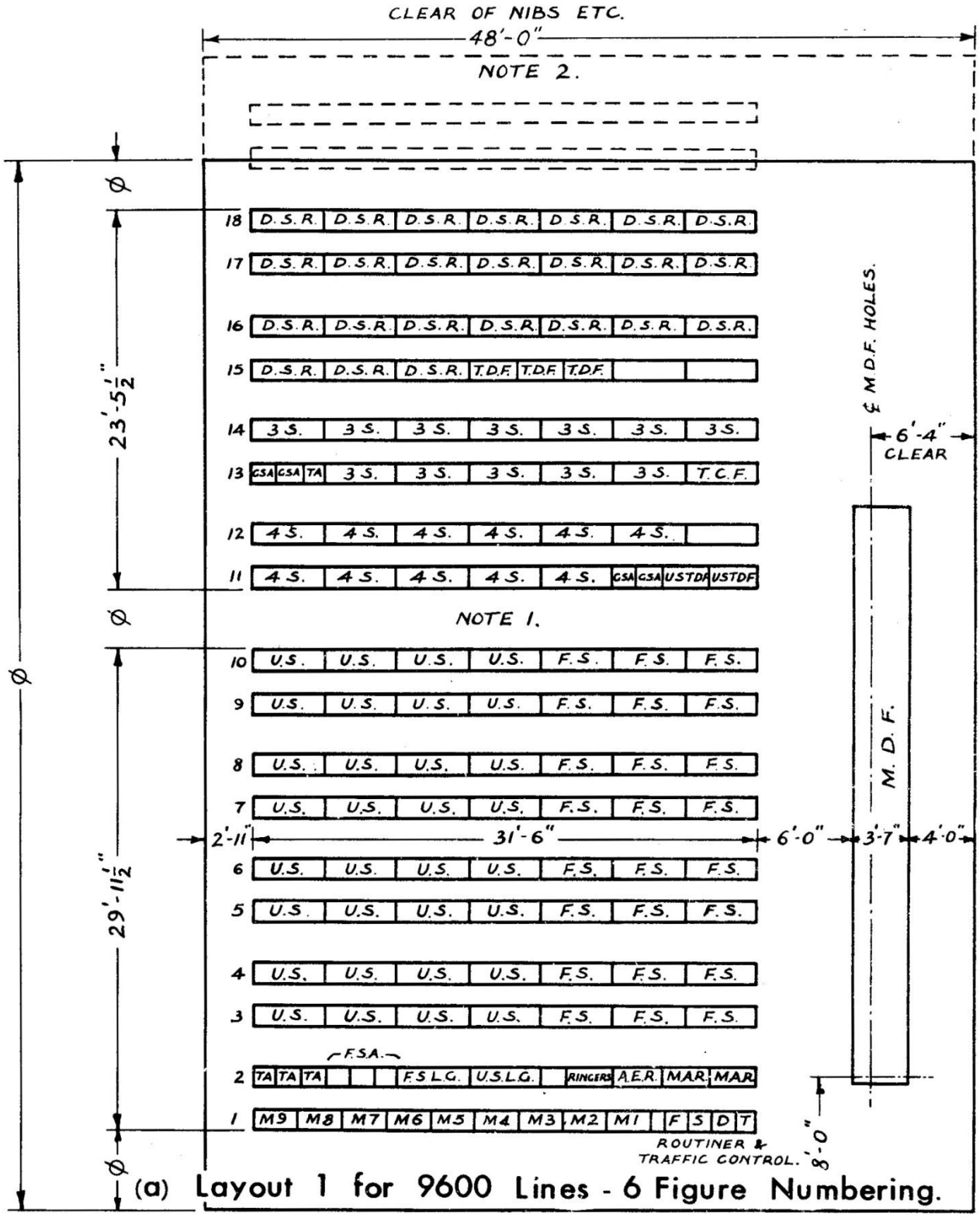
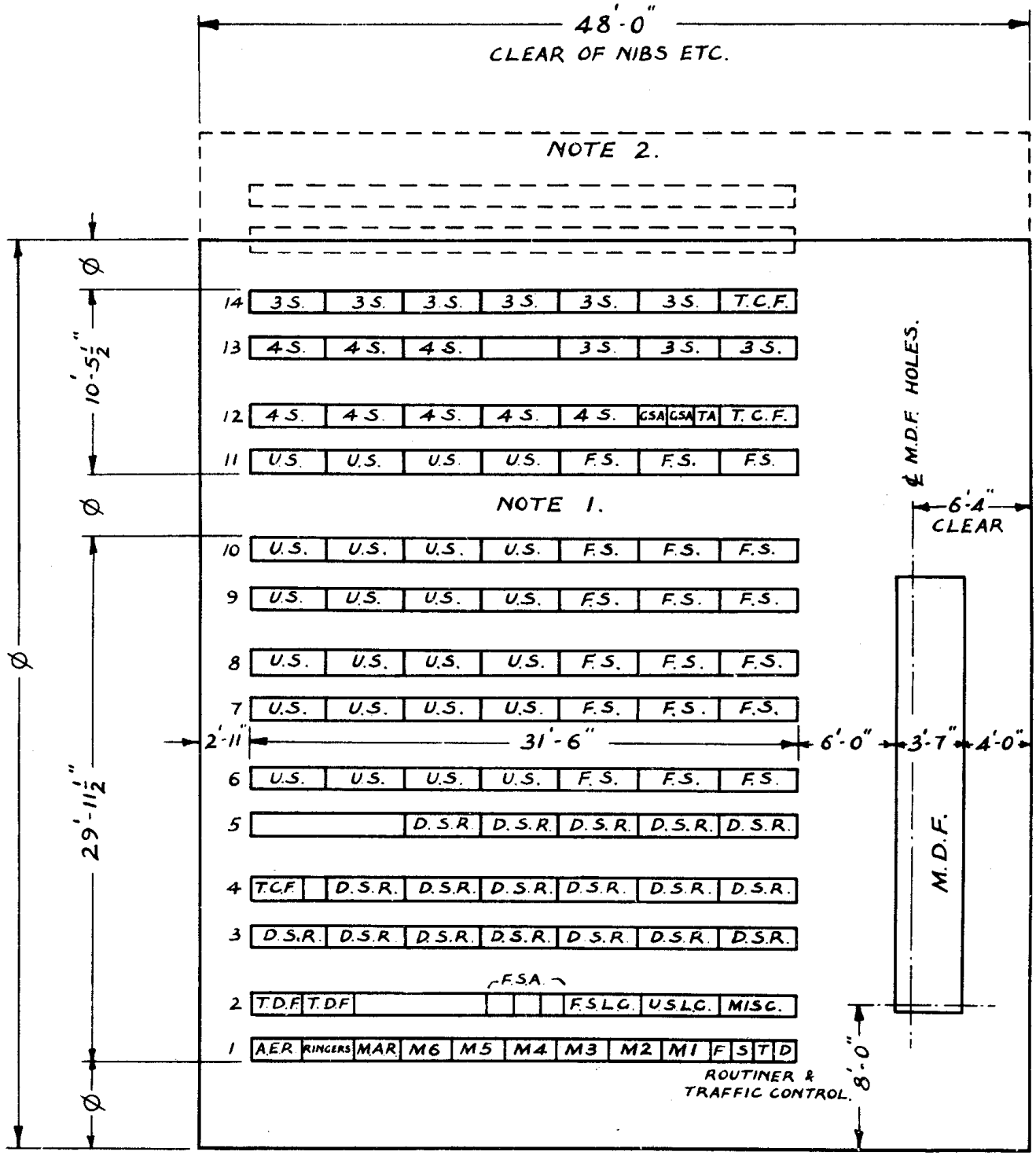


FIG. 3. TYPICAL BRANCH EXCHANGE LAYOUTS.

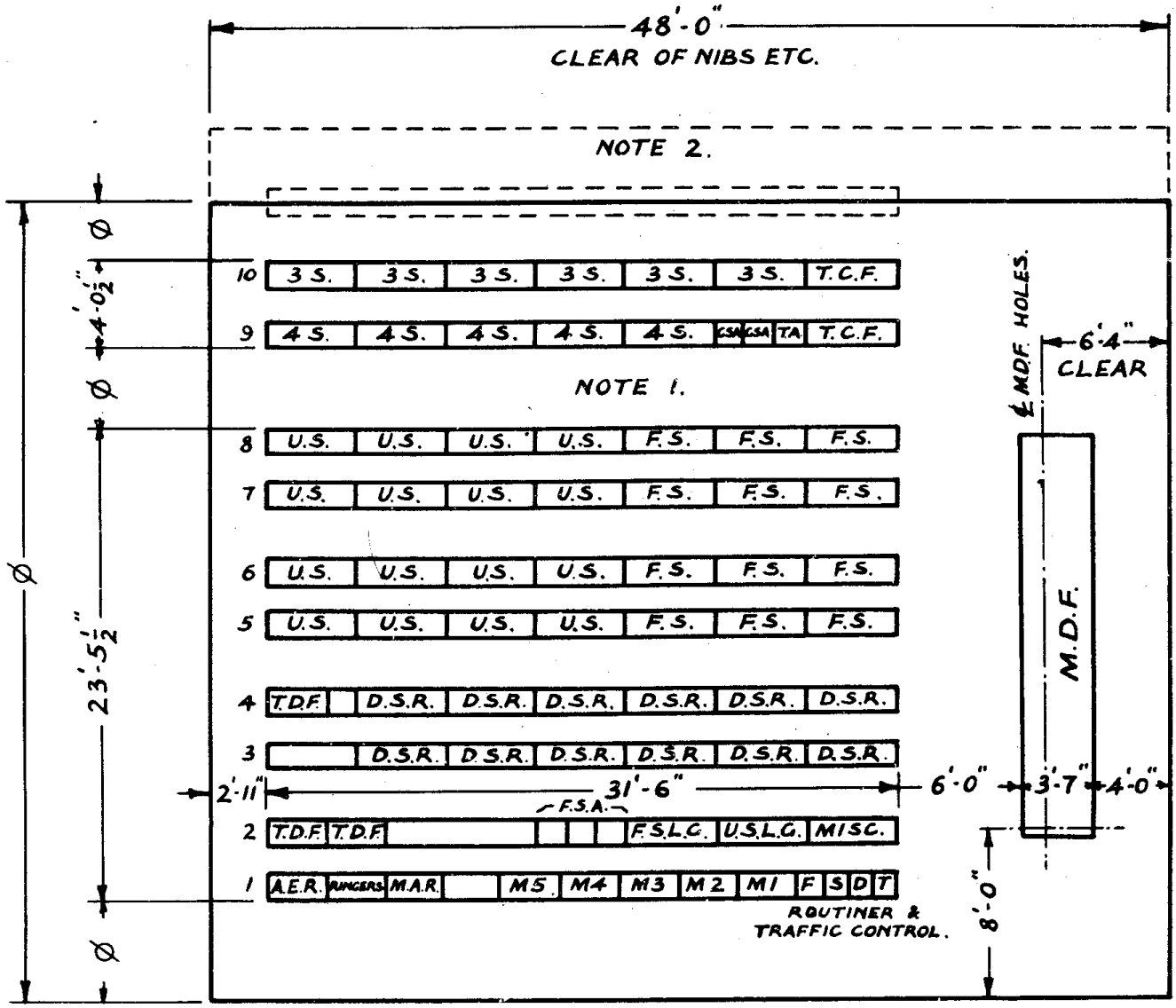
The layouts on this and pages 11, 12 and 13 can be placed in single storey, mezzanine type or two-story buildings. (See notes on page 13.)



(b) Layout 2 for 7200 Lines - 6 Figure Numbering.

FIG. 3. TYPICAL BRANCH EXCHANGE LAYOUTS.

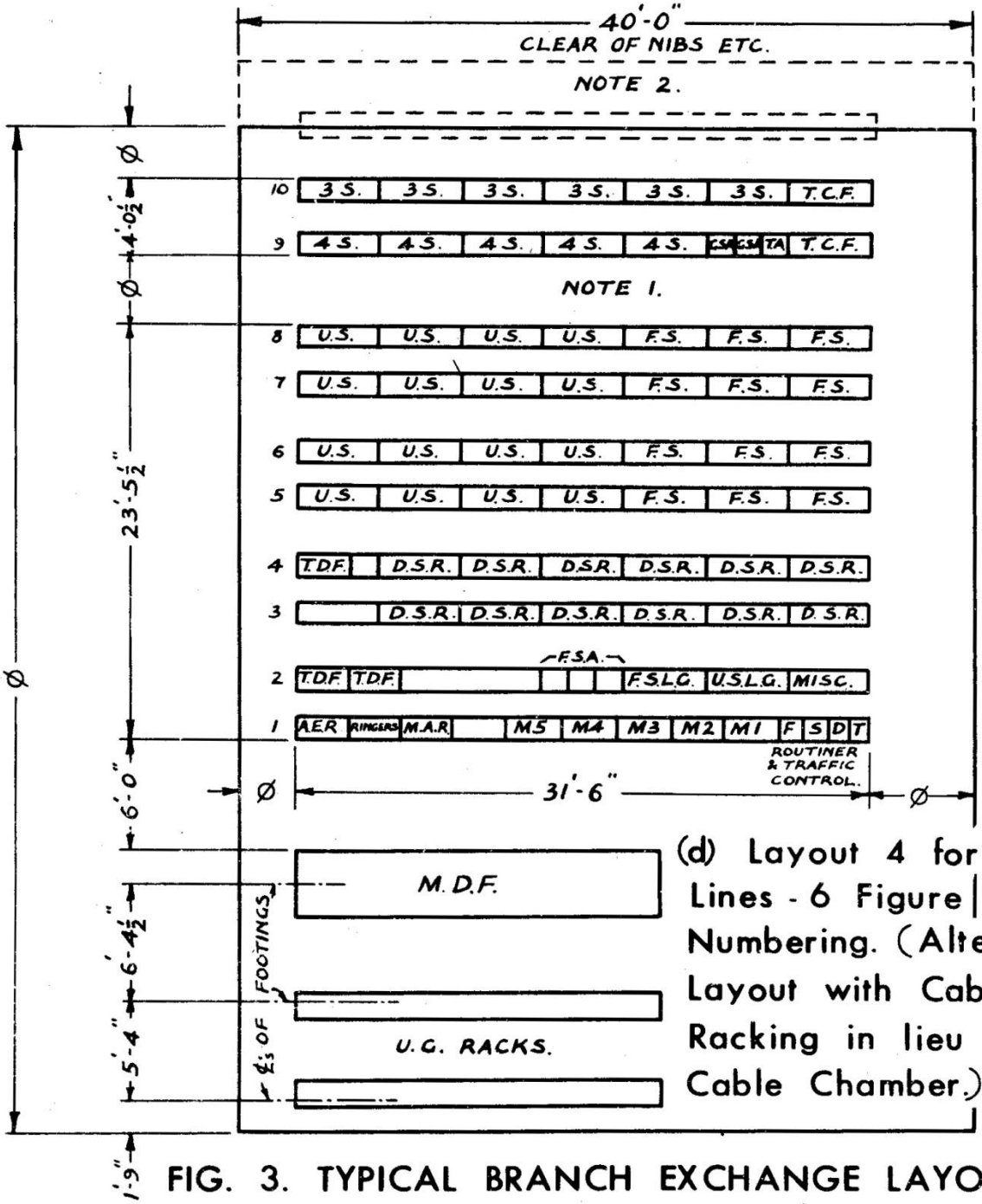
The layouts on this and pages 10, 12 and 13 can be placed in single storey, mezzanine type or two-story buildings. (See notes on page 13.)



(c) Layout 3 for 4800 Lines - 6 Figure Numbering.

FIG. 3. TYPICAL BRANCH EXCHANGE LAYOUTS.

The layouts on this and pages 10, 11 and 13 can be placed in single storey, mezzanine type or two-story buildings. (See notes on page 13.)



(d) Layout 4 for 4800 Lines - 6 Figure Numbering. (Alternative Layout with Cable Racking in lieu of Cable Chamber.)

FIG. 3. TYPICAL BRANCH EXCHANGE LAYOUTS.

The layouts on this and pages 10, 11 and 12 can be placed in single storey, mezzanine type or two-story buildings.

NOTES: 1. The passageway between rows 10 and 11 in layouts 1 and 2 and 8 and 9 in layouts 3 and 4 is provided for access to power room. So that this passageway can centre on the entrance to the power room rows 1 and 2 in layouts 1 and 2 can be moved to rear group of equipment if desired.

2. Dotted space for 7 figure numbering. This additional space to be determined taking into account the proposed trunking, i.e. possibility of sub-mains, 2 or 3 figure D.S.R's etc.

3. Dimension shown thus Ø to be in accordance with details supplied in (a) Section 6 Length and Widths of Buildings. (b) Section 12 Passageways.

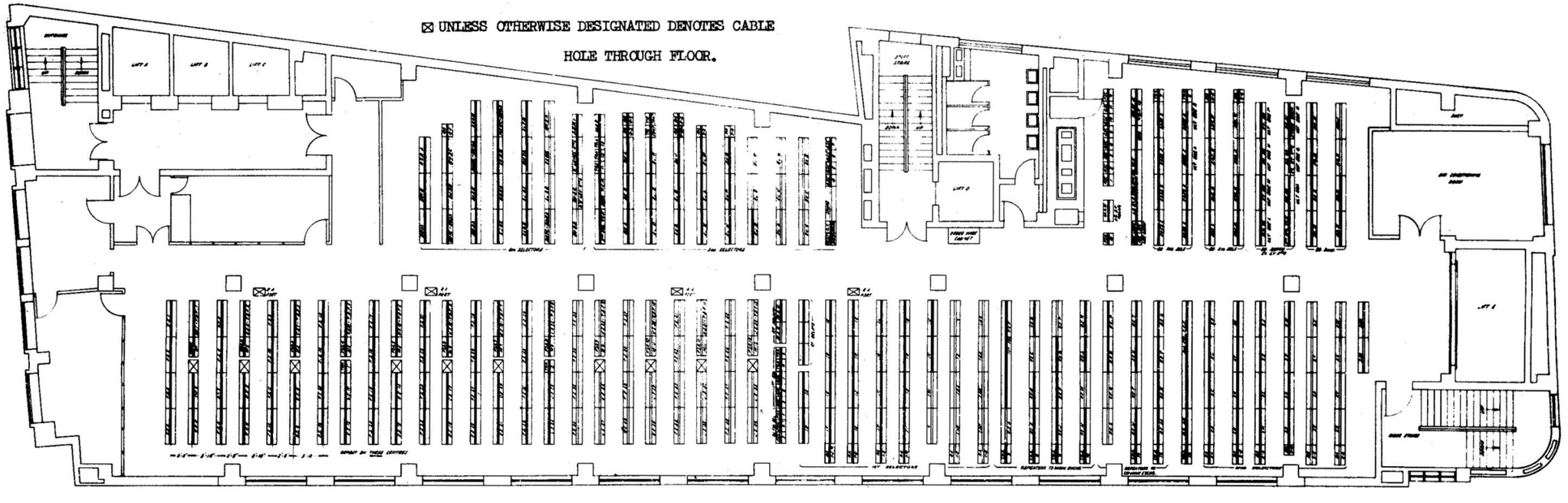
UNISELECTOR RACKS.	INSTALL NEAR	FINAL SELECTOR RACKS.
1ST SELECTOR RACKS.		2ND SELECTOR RACKS.
2ND SELECTOR RACKS.		3RD SELECTOR RACKS.
3RD SELECTOR RACKS.		4TH SELECTOR RACKS.
4TH SELECTOR RACKS.		FINAL SELECTOR RACKS.
FINAL SELECTOR RACKS.		M.D.F. & UNISELECTOR RACKS.
METER RACKS.		FINAL SELECTOR RACKS.
R.S.R.		T.C.F. 2A & M.D.F.
R.S.R.		T.C.F. 3A & M.D.F.
A.E.R.		EQUIPMENT CENTRE.
F.P.R.		M.D.F.
M.A.R.		TEST DESK.
T.D.F. (UNISELECTORS)		UNISELECTOR RACKS.
T.C.F. 1A (UNISEL'S., INC. JUNC'S., 1ST SEL'S.)		M.D.F., UNISEL. & 1ST SEL. RACKS.
T.C.F. 2A (1ST SEL'S. LOC. LEV., INC. JUNC'S., R.S.R., 2ND SEL'S.)		M.D.F., R.S.R., 1ST SEL. & 2ND SEL. RACKS.
T.C.F. 3A (2ND SEL'S. LOC. LEV., R.S.R., 3RD SEL'S.)		R.S.R., 2ND SEL. & 3RD SEL. RACKS.
T.C.F. 4A (3RD SEL. OUTLETS, 4TH SEL'S.)		3RD SEL. & 4TH SEL. RACKS.
TRAFFIC REC. CONTROL RACKS.		EQUIPMENT CENTRE.
TRAFFIC REC. ACC. RACKS. (1ST SEL'S.)		ROUTINER ACC. RACKS. (1ST SEL'S.)
TRAFFIC REC. ACC. RACKS. (2ND SEL'S.)		ROUTINER ACC. RACKS. (2ND SEL'S.)
TRAFFIC REC. ACC. RACKS. (3RD SEL'S.)		ROUTINER ACC. RACKS. (3RD SEL'S.)
TRAFFIC REC. ACC. RACKS. (4TH SEL'S.)		ROUTINER ACC. RACKS. (4TH SEL'S.)
TRAFFIC REC. ACC. RACKS. (FIN. SEL'S.)		ROUTINER ACC. RACKS. (FIN. SEL'S.)
ROUTINER CONTROL RACKS.		EQUIPMENT CENTRE.
ROUTINER ACC. RACKS. (1ST SEL'S.)		T.C.F. 1A
ROUTINER ACC. RACKS. (2ND SEL'S.)		T.C.F. 2A
ROUTINER ACC. RACKS. (3RD SEL'S.)		T.C.F. 3A
ROUTINER ACC. RACKS. (4TH SEL'S.)		T.C.F. 4A
ROUTINER ACC. RACKS. (FIN. SEL'S.)		4TH SEL. & FINAL SEL. RACKS.

(a) Main Exchange.

UNISELECTOR RACKS.	INSTALL NEAR	FINAL SELECTOR RACKS.
D.S.R. RACKS.		3RD SELECTOR RACKS.
3RD SELECTOR RACKS.		4TH SELECTOR RACKS.
4TH SELECTOR RACKS.		FINAL SELECTOR RACKS.
FINAL SELECTOR RACKS.		M.D.F. & UNISEL. RACKS.
METER RACKS		FINAL SELECTOR RACKS.
R.S.R. (MISCELLANEOUS)		M.D.F.
A.E.R.		EQUIPMENT CENTRE.
F.P.R.		M.D.F.
M.A.R. 1.		TEST DESK.
M.A.R. 2. (JUNC. GUARD RLYS.)		D.S.R. RACKS.
T.D.F. (UNISELECTORS)		UNISELECTOR RACKS.
T.D.F. (JUNC. HUNTS & D.S.R. LEVS.)		D.S.R. RACKS.
T.C.F. 1A (D.S.R. LOC. LEV., INC. JUNCS, 3RD SELS.)		M.D.F., D.S.R. & 3RD SEL. RACKS.
T.C.F. 2A (3RD SEL. OUTLETS, 4TH SELS.)		3RD & 4TH SELECTOR RACKS.
ROUTINER CONTROL RACKS		EQUIPMENT CENTRE.
TRAFFIC REC. CONTROL RACK		EQUIPMENT CENTRE.
TRAFFIC REC. ACC. RACKS (D.S.R.)		U.S. T.D.F.
TRAFFIC. REC. ACC. RACKS (3RD SELS)		ROUTINER ACC. RACKS (3RD SELS)
TRAFFIC REC. ACC. RACKS (4TH SELS)		ROUTINER ACC. RACKS (4TH SELS)
TRAFFIC REC. ACC. RACKS (FIN. SELS)		ROUTINER ACC. RACKS (FIN. SELS)
ROUTINER ACC. RACKS (3RD SELS)		T.C.F. 1A.
ROUTINER ACC. RACKS (4TH SELS)		T.C.F. 2A.
ROUTINER ACC. RACKS (FIN. SELS)		4TH & FINAL SELECTOR RACKS.

(b) Branch Exchange.

FIG. 4. TABLE B SHOWING ASSOCIATION OF EQUIPMENT FOR SITING VARIOUS TYPES OF RACKS.



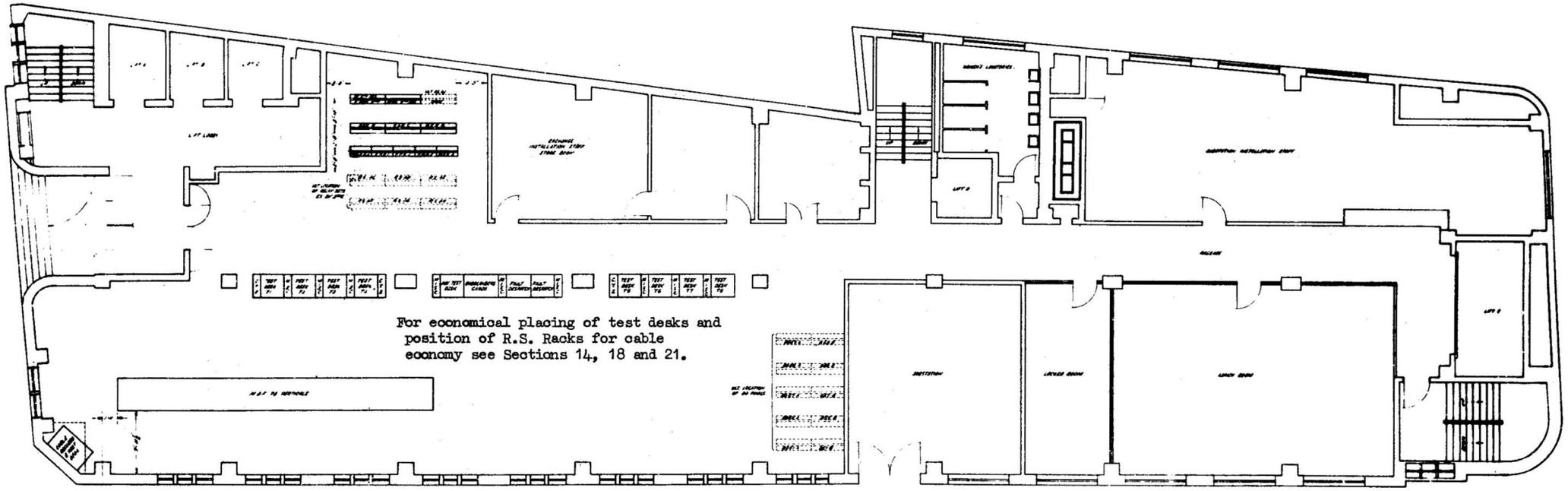


FIG. 5. 2000 TYPE CO-MAIN EXCHANGE.

FIG. 5.

(THIS IS NOT REGARDED AS AN EXAMPLE OF GOOD BUILDING DESIGN BECAUSE OF THE SITE LIMITATIONS.)

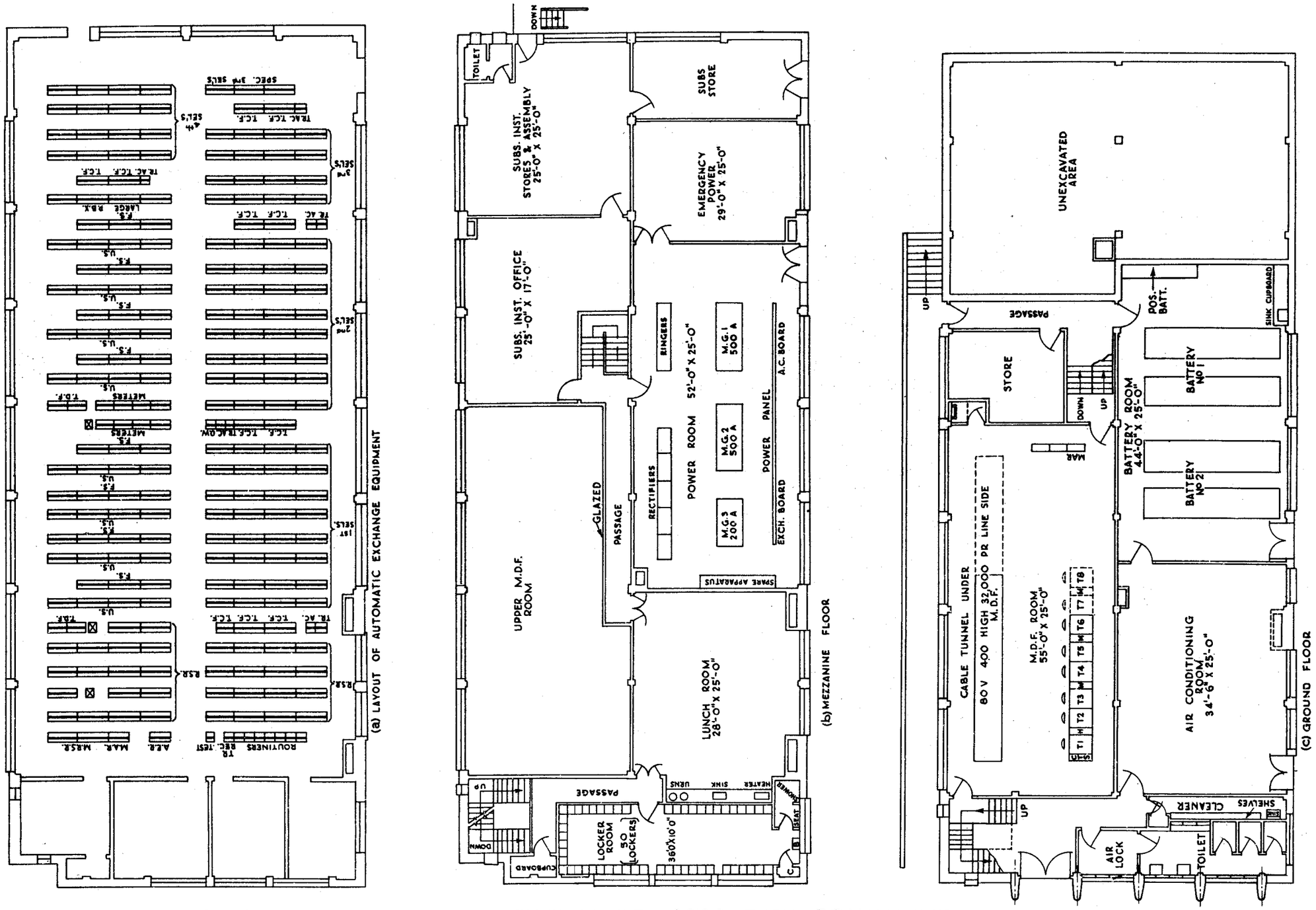
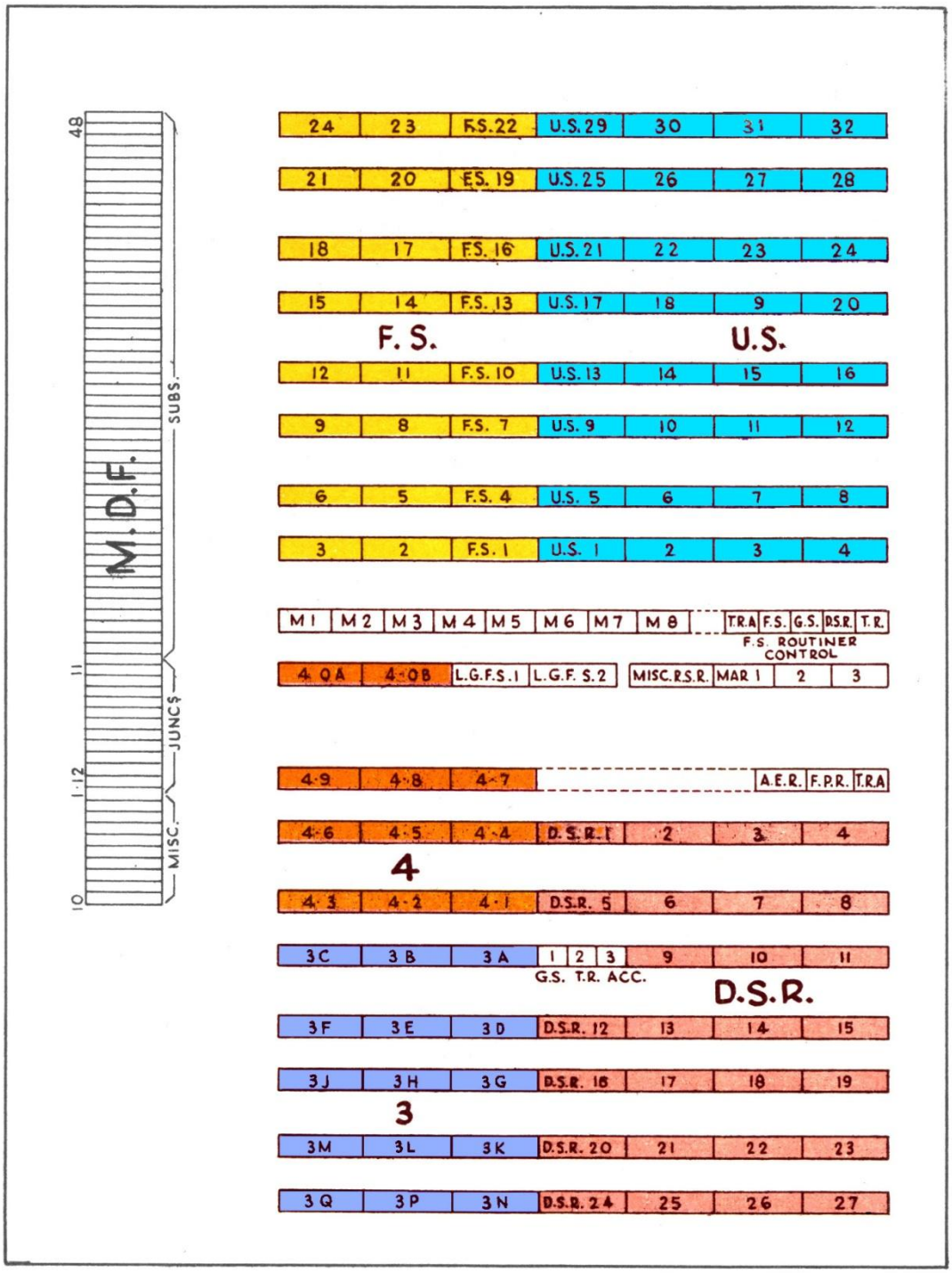


FIG. 6. SUBURBAN MAIN EXCHANGE - 2000 TYPE EQUIPMENT.

FIG. 6.



Layout for 9600 Lines. Using Track & Lane Cabling. T.C.F's mounted on D.S.R. racks 1-4 & 3rd selector racks 3A-3C. Routiner access switches mounted on F.S., G.S. & D.S.R. Racks.

FIG. 7. 2000 TYPE BRANCH EXCHANGE LAYOUT.

This layout illustrates the "Cyclic" arrangement described in Section 14 for cabling economy. It is suitable for "Lane & Track" cabling methods.

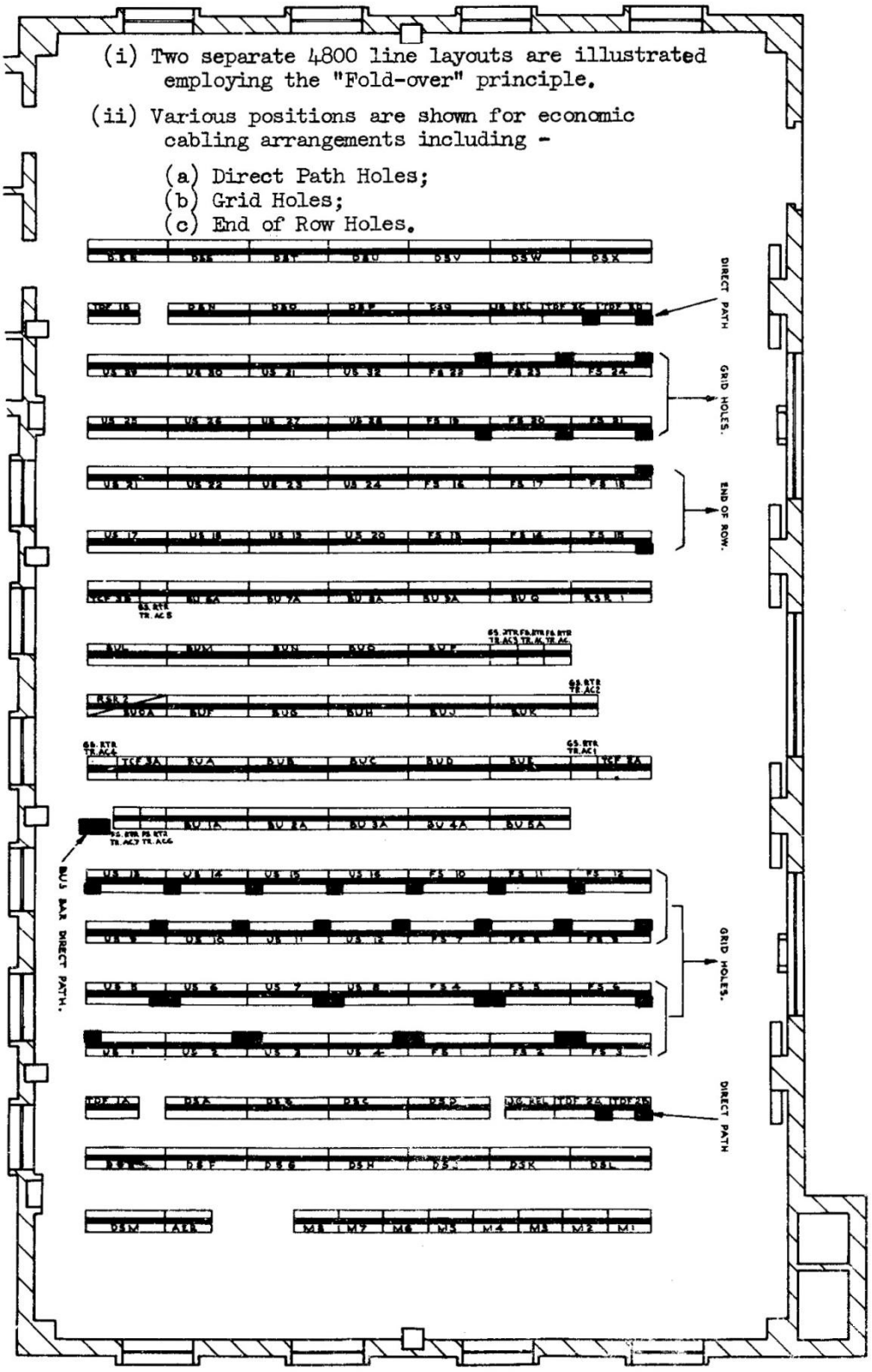
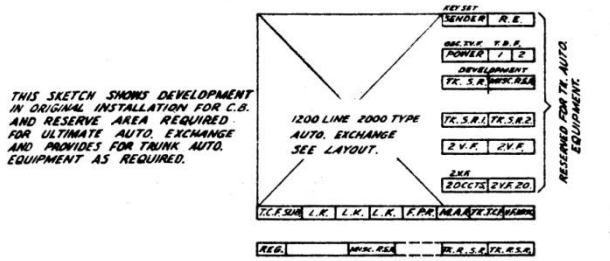
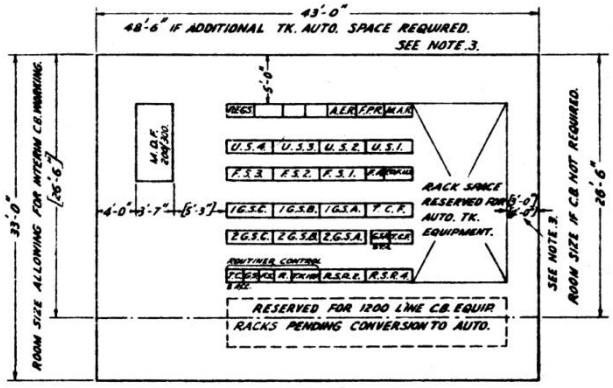


FIG. 8. TWO-STOREY BRANCH EXCHANGE.
LAYOUT OF EQUIPMENT ON FIRST FLOOR.



LAYOUT TK. AUTO. AND C.B. RACKS 1200 LINES.



1200 Line Layout.

(a) Typical layouts showing locations of Exchange and Trunk Switching Equipment.

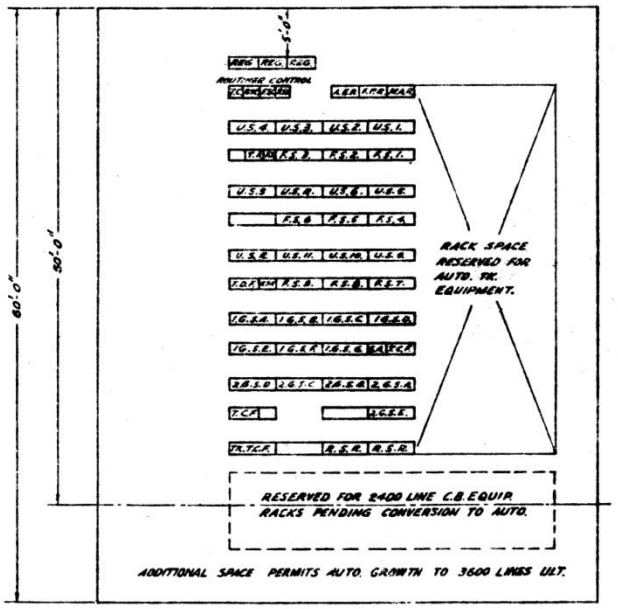
(b) Reserved areas (approx 25% above planned requirements.

NOTE: Additional area provided is to cater for long term development of automatic trunk equipment. This reserved area may be used for the installation of C.B. rack equipment and if such plant is to be installed before the automatic exchange is established.

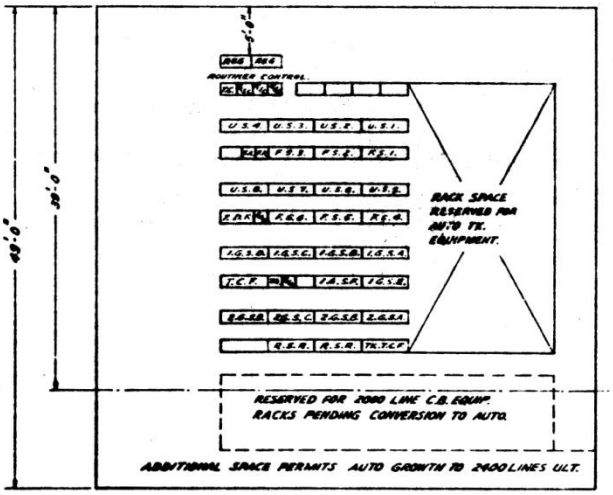
NOTES: 1. Figures shown [3'0"] are variable in small dimensions due to wall irregularities.

2. Layouts are typical. Developed to determine physical dimensions of switch room only.

3. Should trunk automatic require additional space room could be 48'6" wide providing 3 rack suites for this purpose.



3600 Line Layout.



2400 Line Layout.

FIG. 9. COUNTRY EXCHANGES.

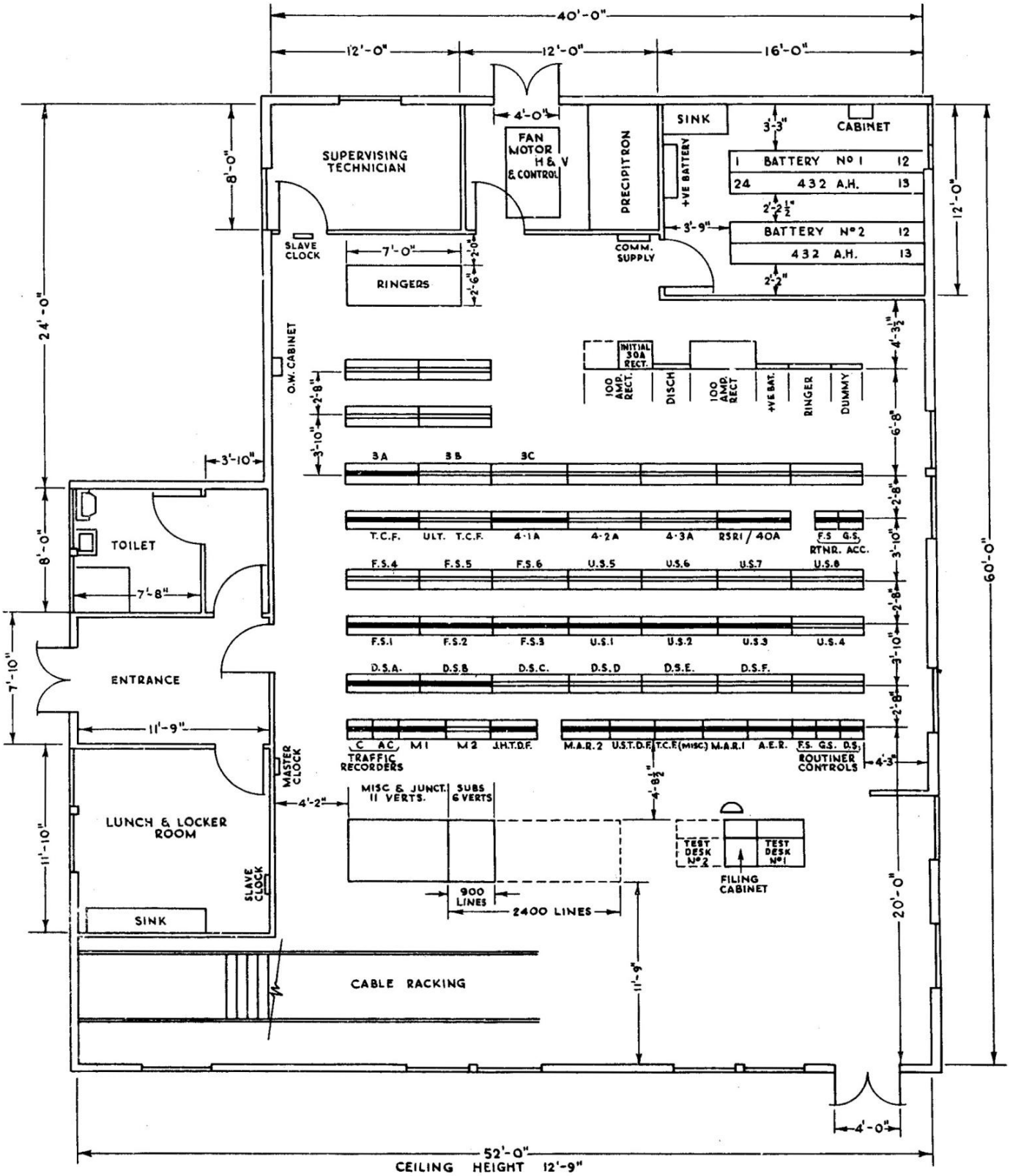


FIG. 10. SINGLE STOREY BRANCH EXCHANGE - 2400 LINE LAYOUT.

Suitable for Country Exchanges.

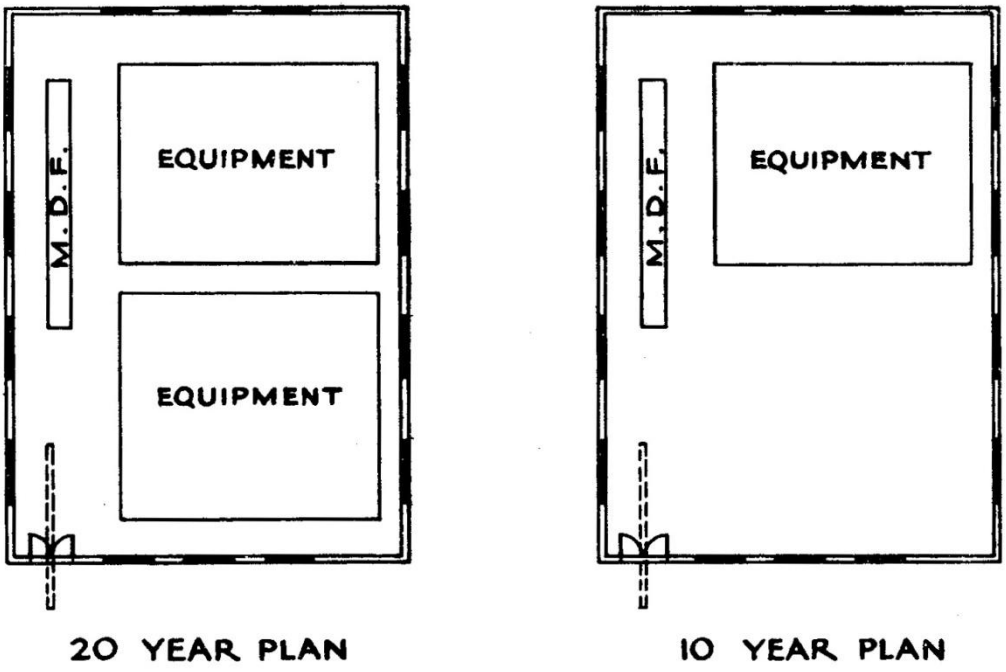


FIG. 11. PROPOSED PLANNING APPROACH FOR THE LAYOUT OF EQUIPMENT.

(Based on the ideas discussed in the text regarding thee effects on layouts due to changes in the design of equipment.)

3. PRE-2000 TYPE EQUIPMENT.

3.1 Typical layouts of main and branch pre-2000 type exchanges have been included and these indicate the grouping of the various ranks of equipment to ensure economy in cabling and floor areas.

Figs. have been included to show the allowed aisle and passageway dimensions when preparing layouts for this equipment.

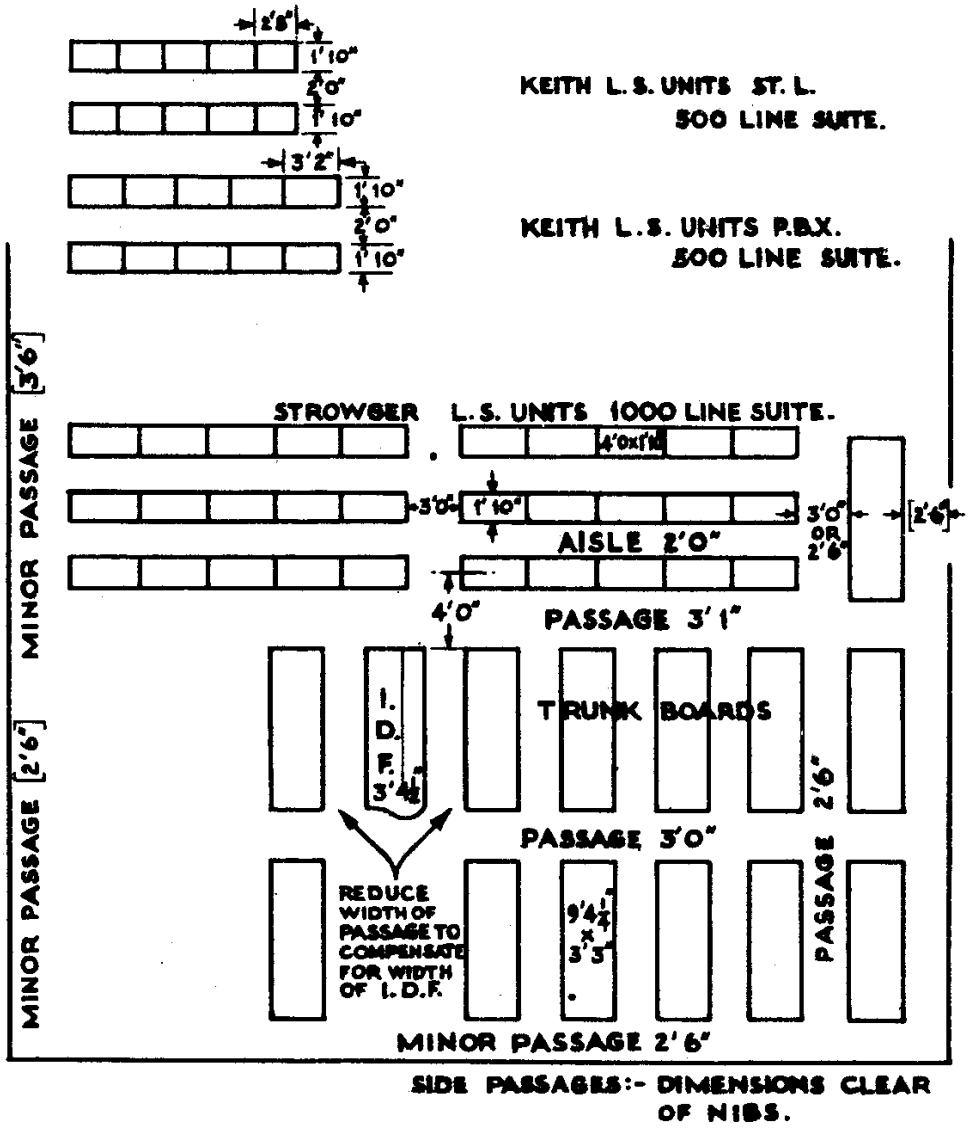


FIG. 12. PRE-2000 TYPE LAYOUTS. DIMENSIONS OF AISLES AND PASSAGEWAYS.

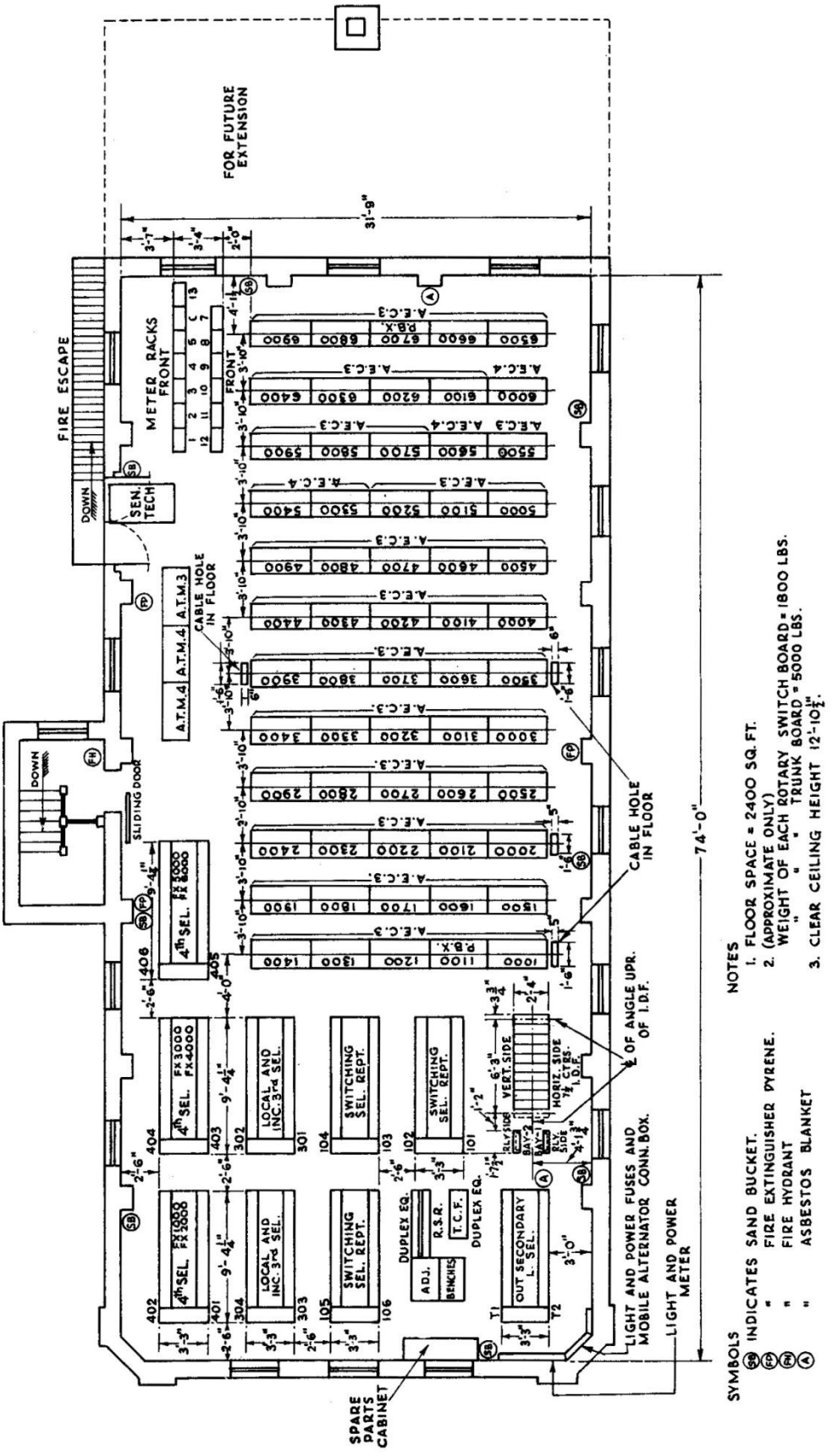
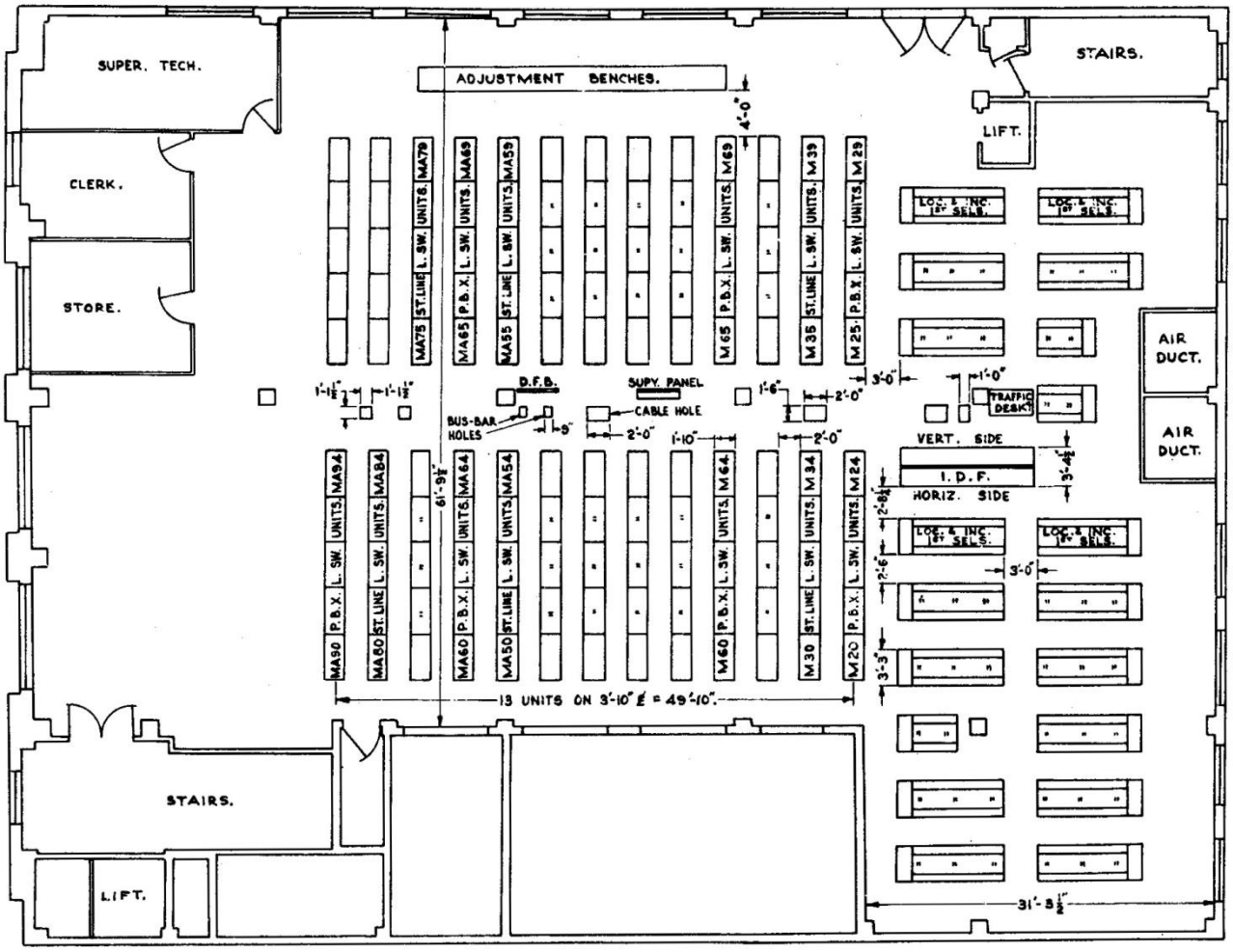


FIG. 13. PRE-2000 TYPE BRANCH EXCHANGE.



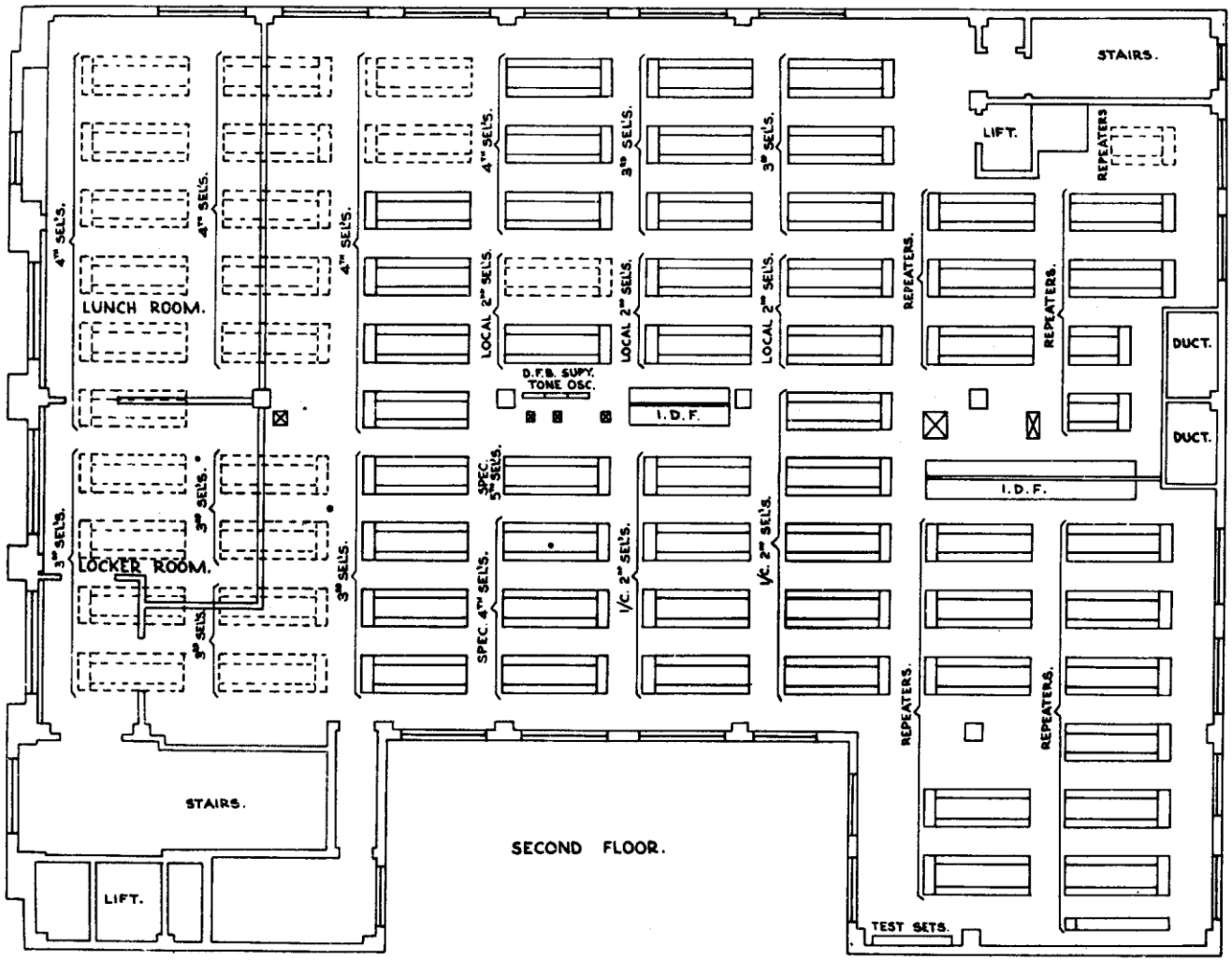
(a) First Floor. (see Fig. 14b for second floor)

Including

(i) subscribers' equipment, and ,

(ii) local and incoming first selectors.

FIG. 14. PRE-2000 TYPE MAIN EXCHANGE.



(b) Second Floor. (see Fig. 14a for first floor)

Including

(i) second,

(ii) third,

(iii) fourth selectors,

(iv) junction equipment.

FIG. 14. PRE-2000 TYPE MAIN EXCHANGE.

4. ADDITIONAL INFORMATION.

4.1 The following has been included to assist the Design Engineer in the preparation of Exchange Equipment layouts and to determine the floor area requirements for various classes of exchanges.

4.2 Equipment Grouping Arrangements. (See below.)

This includes details of various groupings of subscribers equipment, the symbols to be used in the preparation of floor plans and approved methods for grouping various ranks of equipment.

4.3 Assessing Floor Areas for Exchanges. (See page 40.)
(2000 Type)

This includes a number of tables which can be utilised to determine the equivalent number of 4′6″ racks for Branch, Main and Country exchanges of various capacities related to selected calling rates per line.

The method of application is included.

5. EQUIPMENT GROUPING ARRANGEMENTS.

5.1 The information detailed in the following sheets (Figs. 15-27) shown -

(i) Various combinations of Subscribers′ Equipment Racks employing Final Selector Racks Types 1-6 as shown in Fig. 15.

(ii) Provision for Growth of Ranks of Equipment.

(iii) Rack accommodation and standard rack numbering.

(iv) Method of showing racks on layout of equipment and cable plan drawings.

(v) Method of illustration M.D.F. on Floor Plans.

(vi) Details of Pre-2000 type equipment.

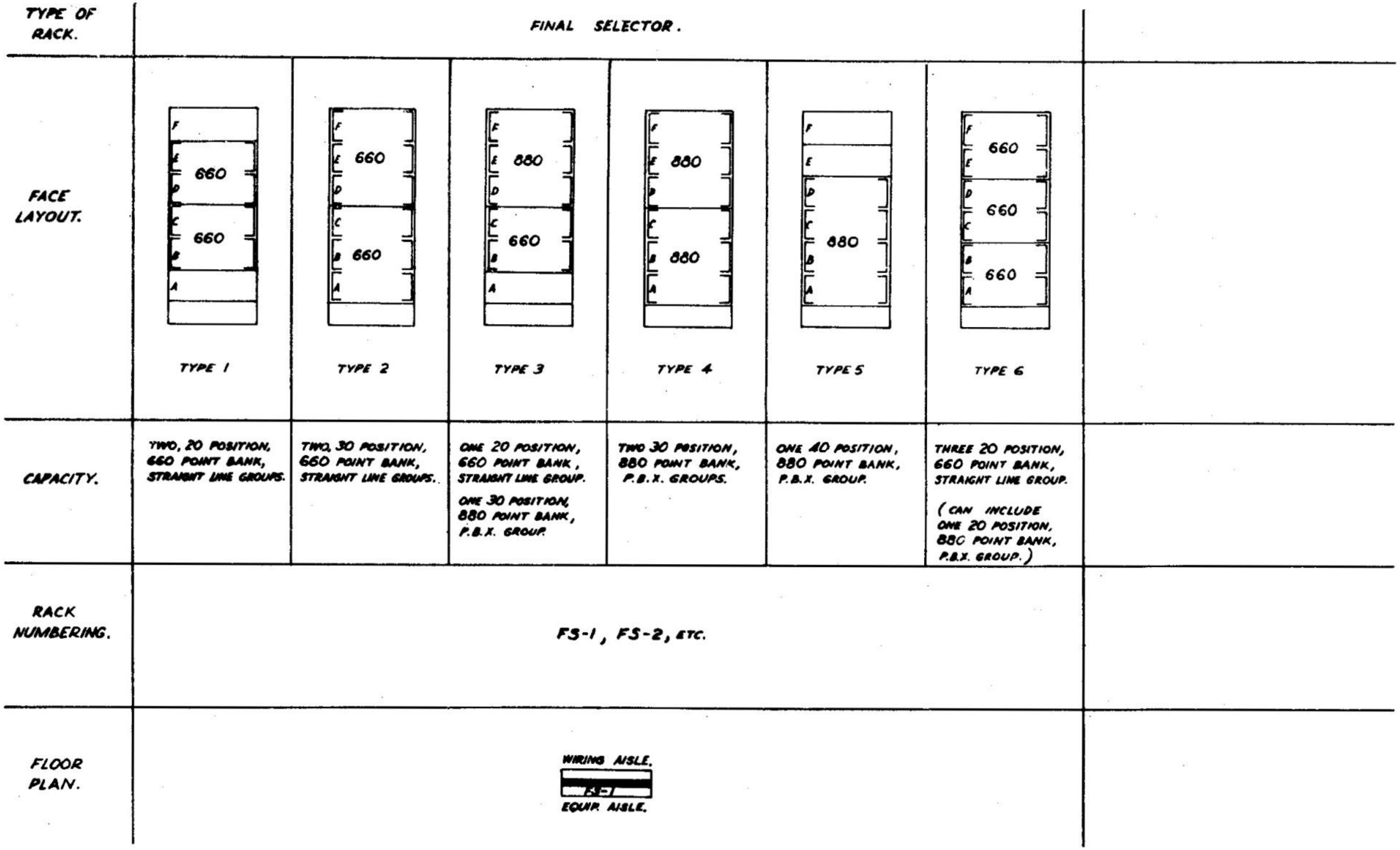


FIG. 15. TYPES OF FINAL SELECTOR RACKS.
2000 TYPE

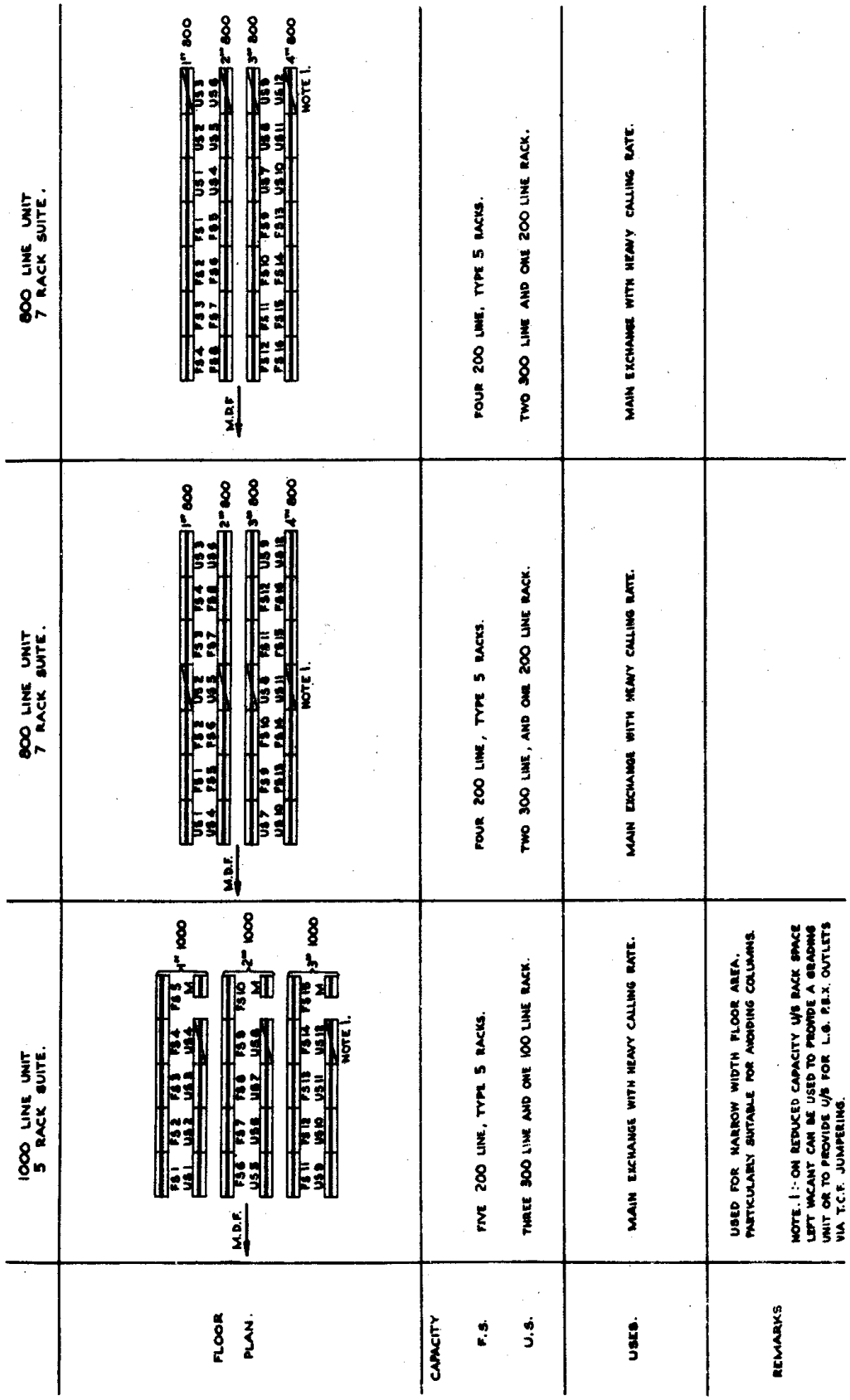


FIG. 16. VARIOUS GROUPINGS OF SUBSCRIBERS' EQUIPMENT.

2000 TYPE

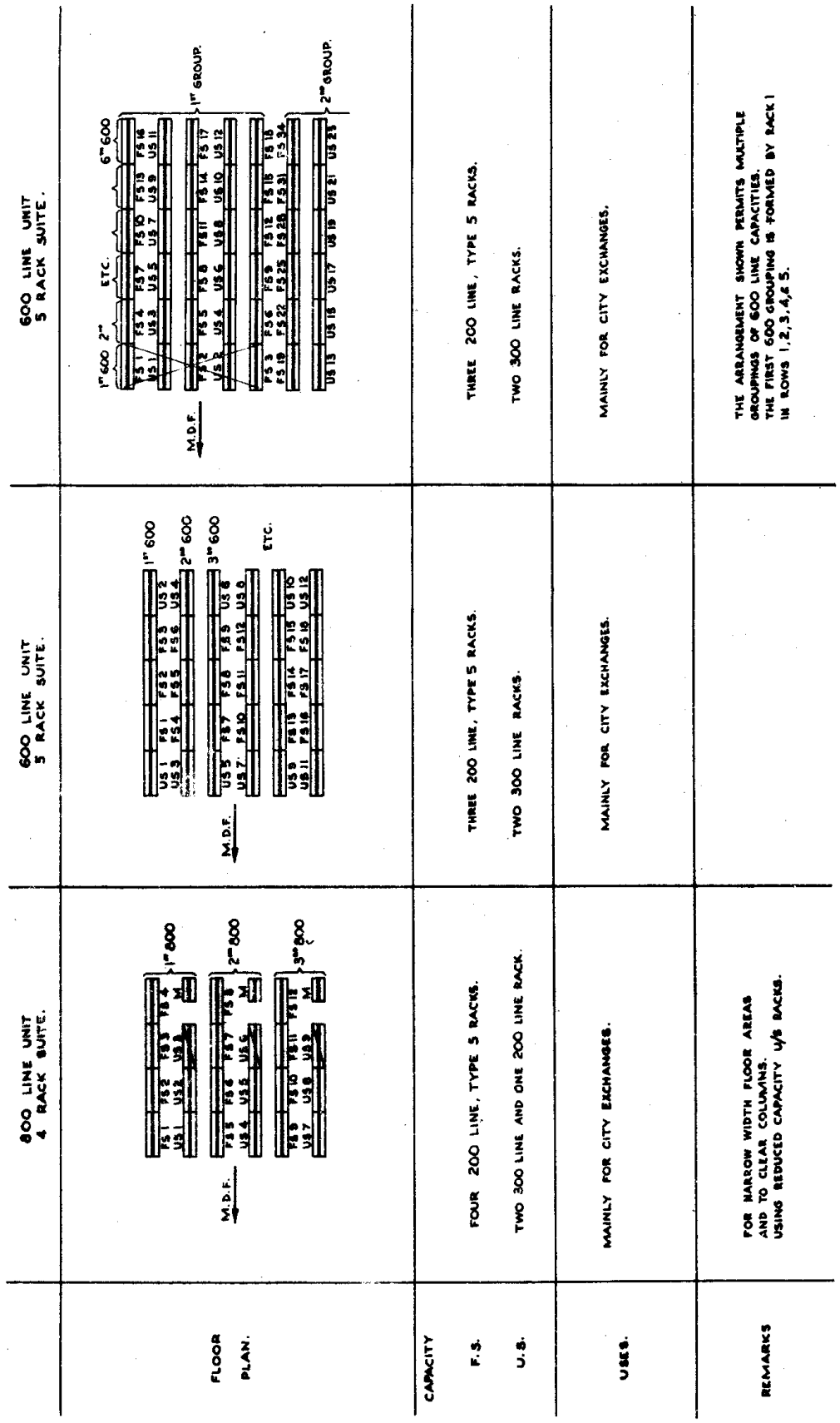


FIG. 17. SUBSCRIBERS' EQUIPMENT LAYOUTS.

2000 TYPE

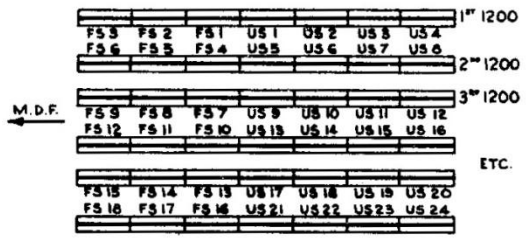
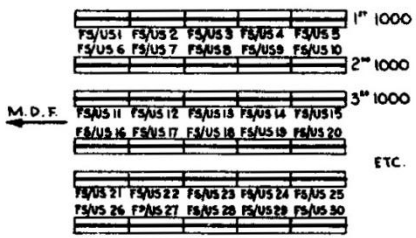
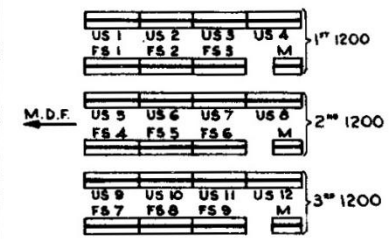
	1200 LINE UNIT 7 RACK SUITE.	1000 LINE UNIT 5 RACK SUITE.	1200 LINE UNIT 4 RACK SUITE.
FLOOR PLAN.			
CAPACITY F.S.	THREE 400 LINE, TYPES 1, 2, OR 3, RACKS.	200 LINE COMBINED F.S. AND U.S. RACK.	THREE 400 LINE, TYPES 1, 2, 3, OR 4 RACKS.
U.S.	FOUR 300 LINE RACKS.		FOUR 300 LINE RACKS.
USES.	SUBURBAN EXCHANGES AND COUNTRY EXCHANGES WITH HEAVY CALLING RATES.	SUBURBAN EXCHANGES OR COUNTRY EXCHANGES WITH LIGHT CALLING RATES.	COUNTRY EXCHANGES AND MAIN EXCHANGES WITH HEAVY CALLING RATES.
REMARKS.	STANDARD GROUPING FOR BRANCH EXCHANGES WHERE THE TERMINATING REQUIREMENTS CAN BE MET BY EITHER 30 STRAIGHT LINE OR 30 P.B.X. BANKS.	A 1000 LINE SUITE ARRANGEMENT OF FIVE 200 LINE F.S./U.S. RACKS.	SUITABLE FOR NARROW WIDTH BUILDINGS OR WHERE UNIFORM RACK ARRANGEMENTS CAN BE MADE BETWEEN COLUMNS AND SIDE WALLS OF AN EXCHANGE.

FIG. 18. SUBSCRIBERS' EQUIPMENT LAYOUTS.

2000 TYPE

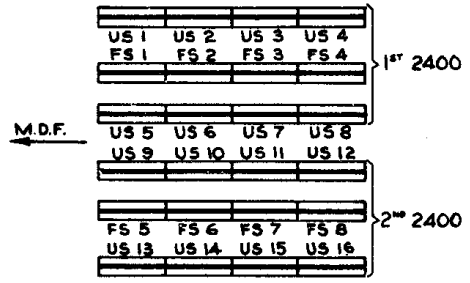
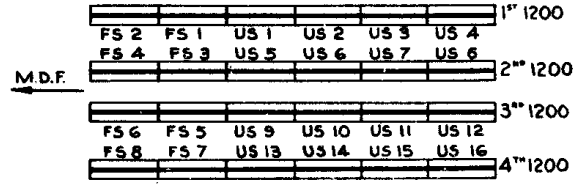
	2400 LINE UNIT 4 RACK SUITE.	1200 LINE UNIT 6 RACK SUITE.
FLOOR PLAN.		
CAPACITY F.S. U.S.	FOUR 600 LINE, TYPE 6 RACKS. 300 LINE.	TWO 600 LINE, TYPE 6 RACKS. 300 LINE.
USES.	COUNTRY EXCHANGES, OR LIGHT CALLING RATES IN METROPOLIT	COUNTRY EXCHANGES.
REMARKS.	A FOUR RACK GROUPING FOR SUBSCRIBERS US. AND F.S. RACKS AND FOR SWITCHING RANKS ALLOWS (a) FOR TWO RACKS OF TRUNK SWITCHING IN EACH ROW IN A 43' WIDE BUILDING. OR (b) THREE RACKS OF TRUNK SWITCHING IN EACH ROW IN A 48' WIDE BUILDING.	SUITABLE FOR A 43' WIDE BUILDING WHERE TRUNK SWITCHING EQUIPMENT IS SITUATED IN A SEPARATE AREA IN THE BUILDING.

FIG. 19. SUBSCRIBERS' EQUIPMENT LAYOUTS. 2000 TYPE

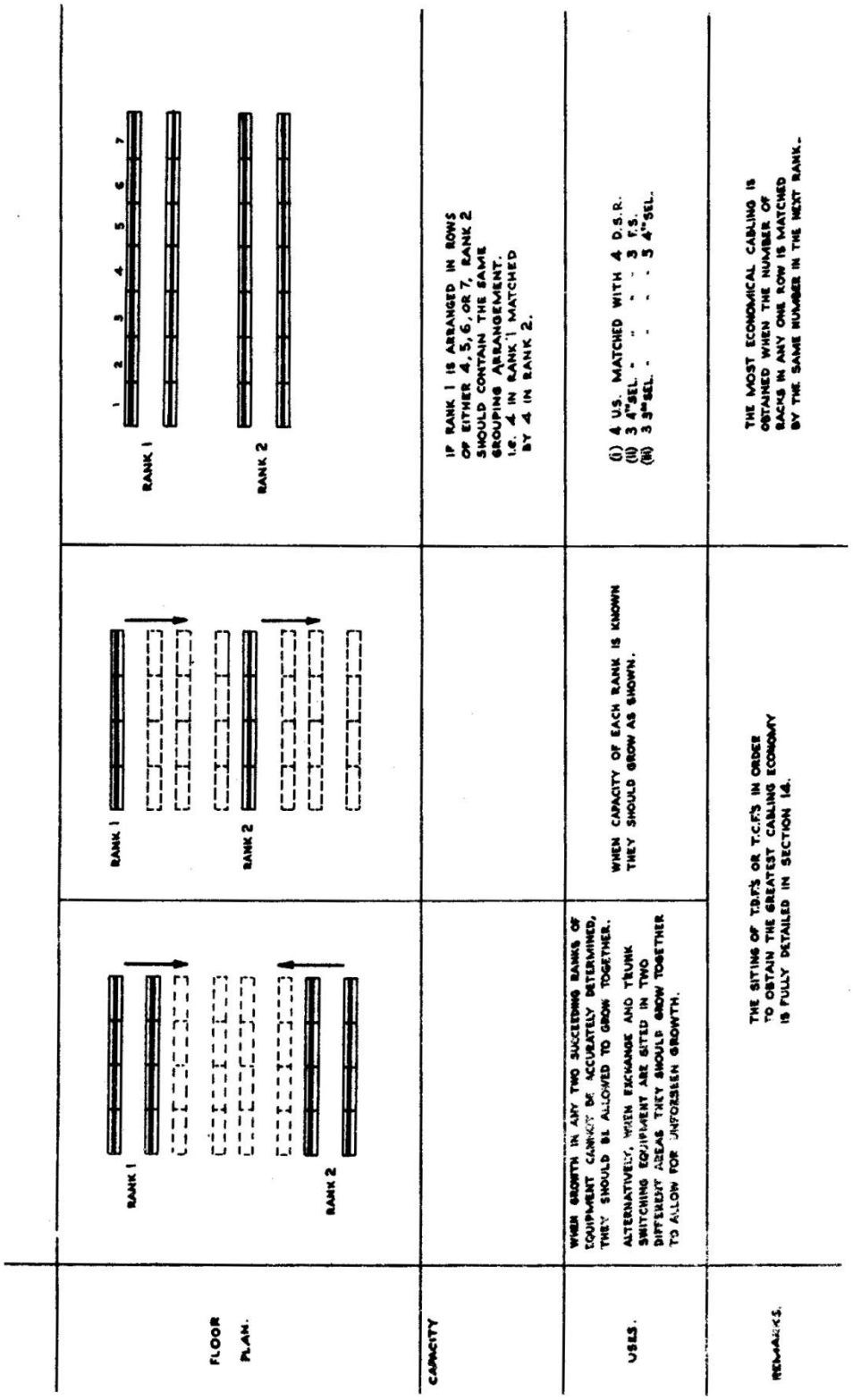


FIG. 20. PROVISION FOR GROWTH IN SWITCHING RANKS.
2000 TYPE

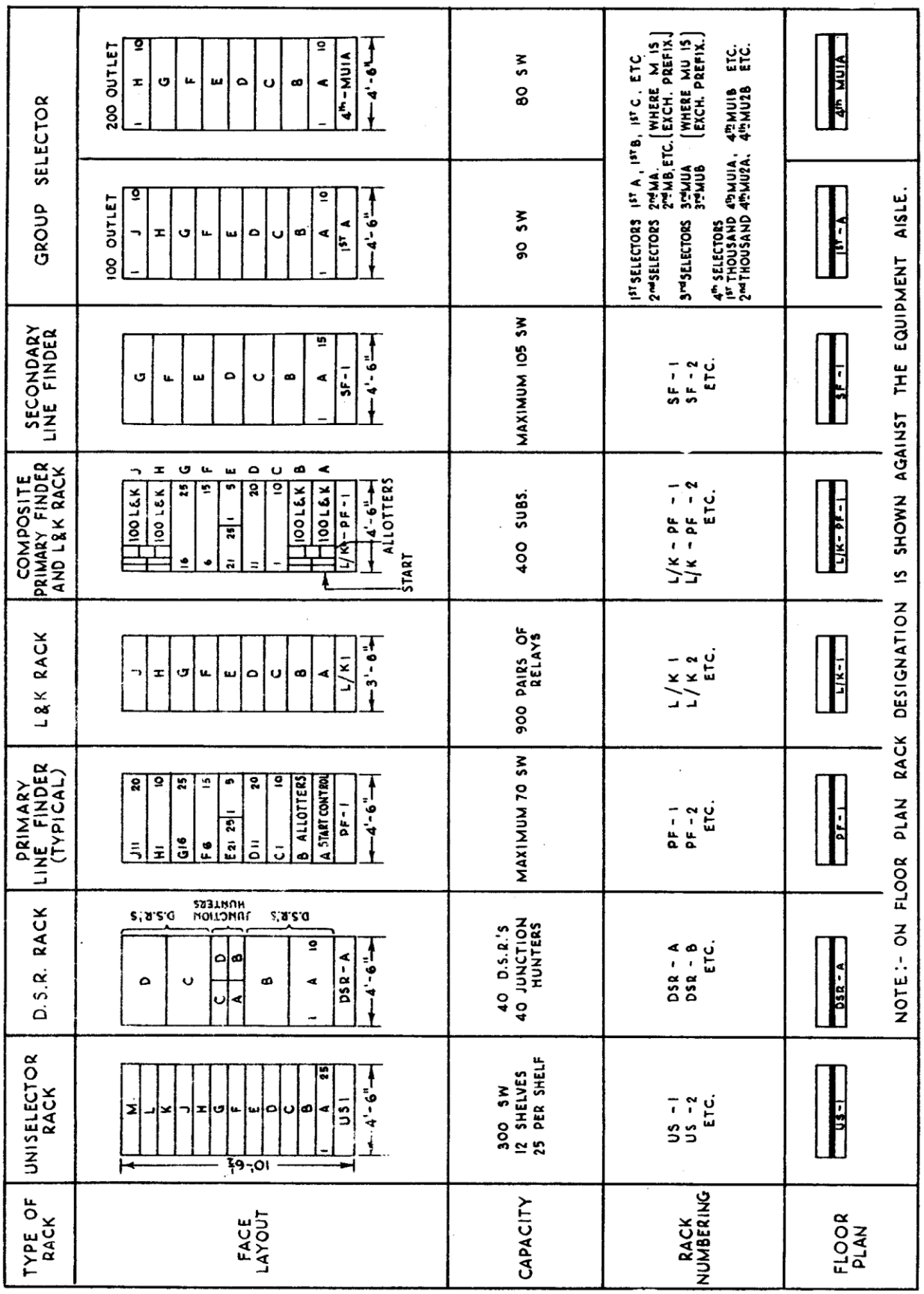


FIG. 21. 2000 TYPE EQUIPMENT, RACK ACCOMMODATION AND STANDARD RACK NUMBERING. (See Figs. 22 and 23 also.)

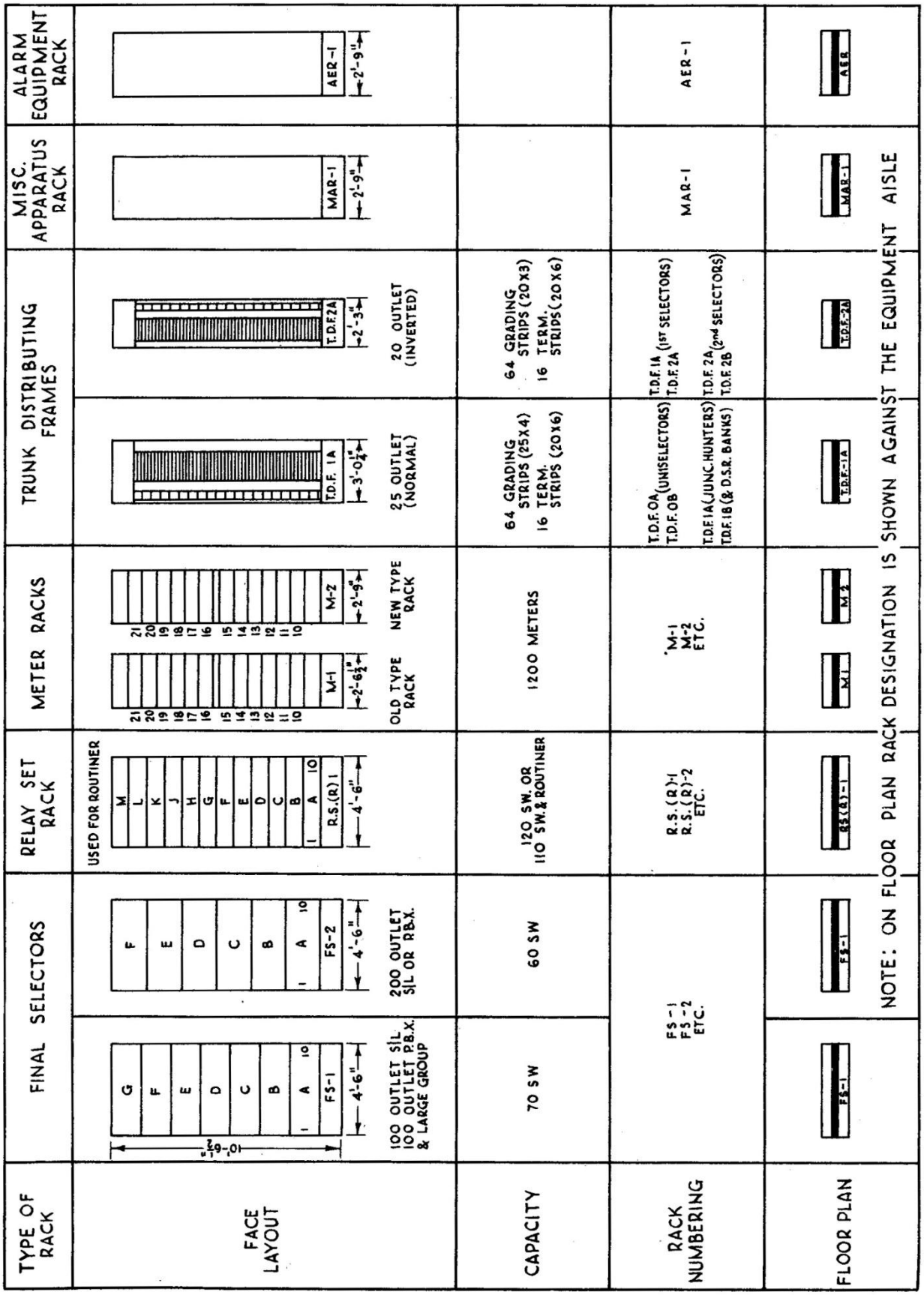


FIG. 22. 2000 TYPE EQUIPMENT. RACK ACCOMMODATION AND STANDARD RACK NUMBERING. (See Figs 21 and 23 also.)

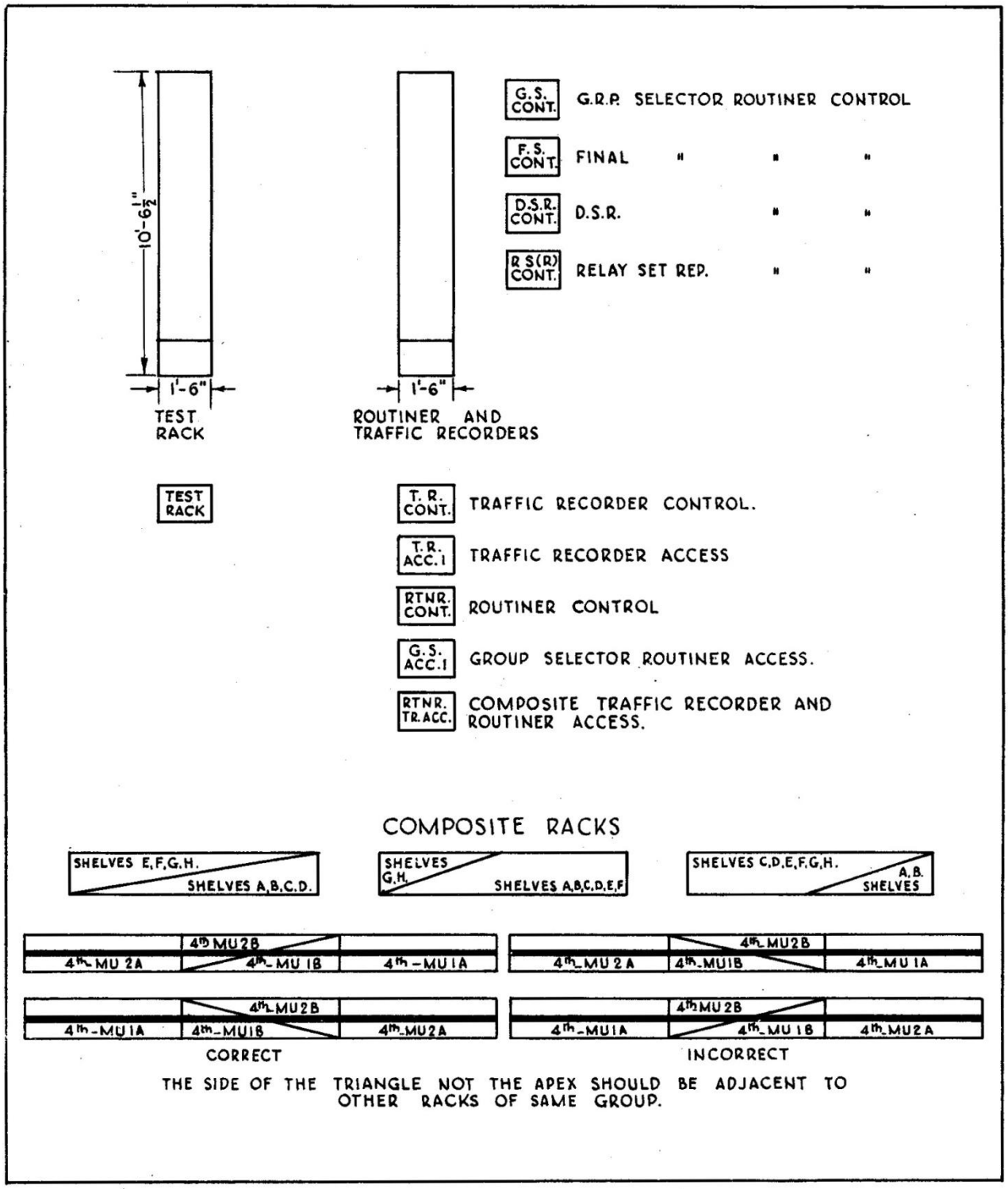


FIG. 23. 2000 TYPE EQUIPMENT RACK ACCOMMODATION AND STANDARD RACK NUMBERING.

(See Figs. 21 and 22 also.)

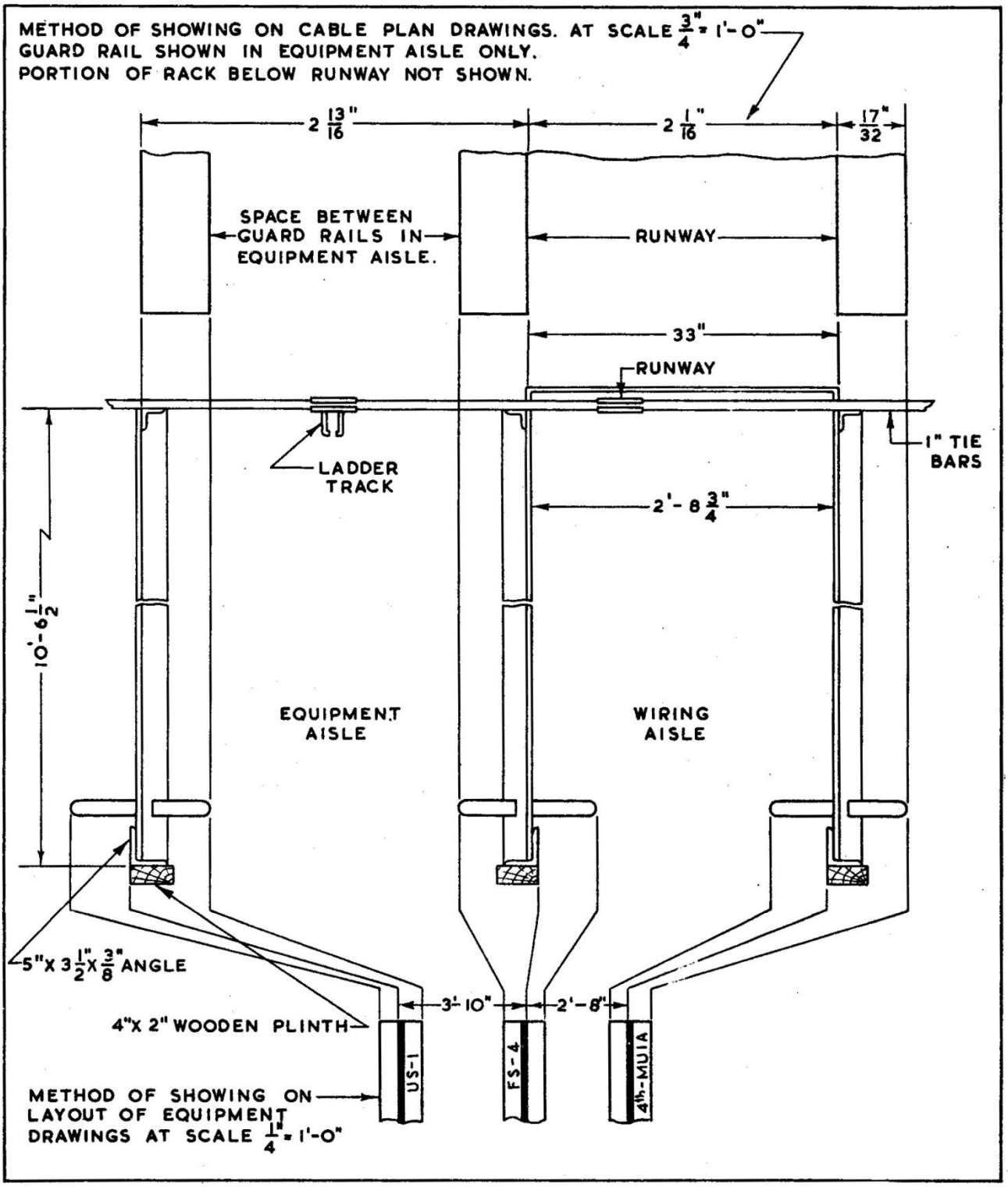
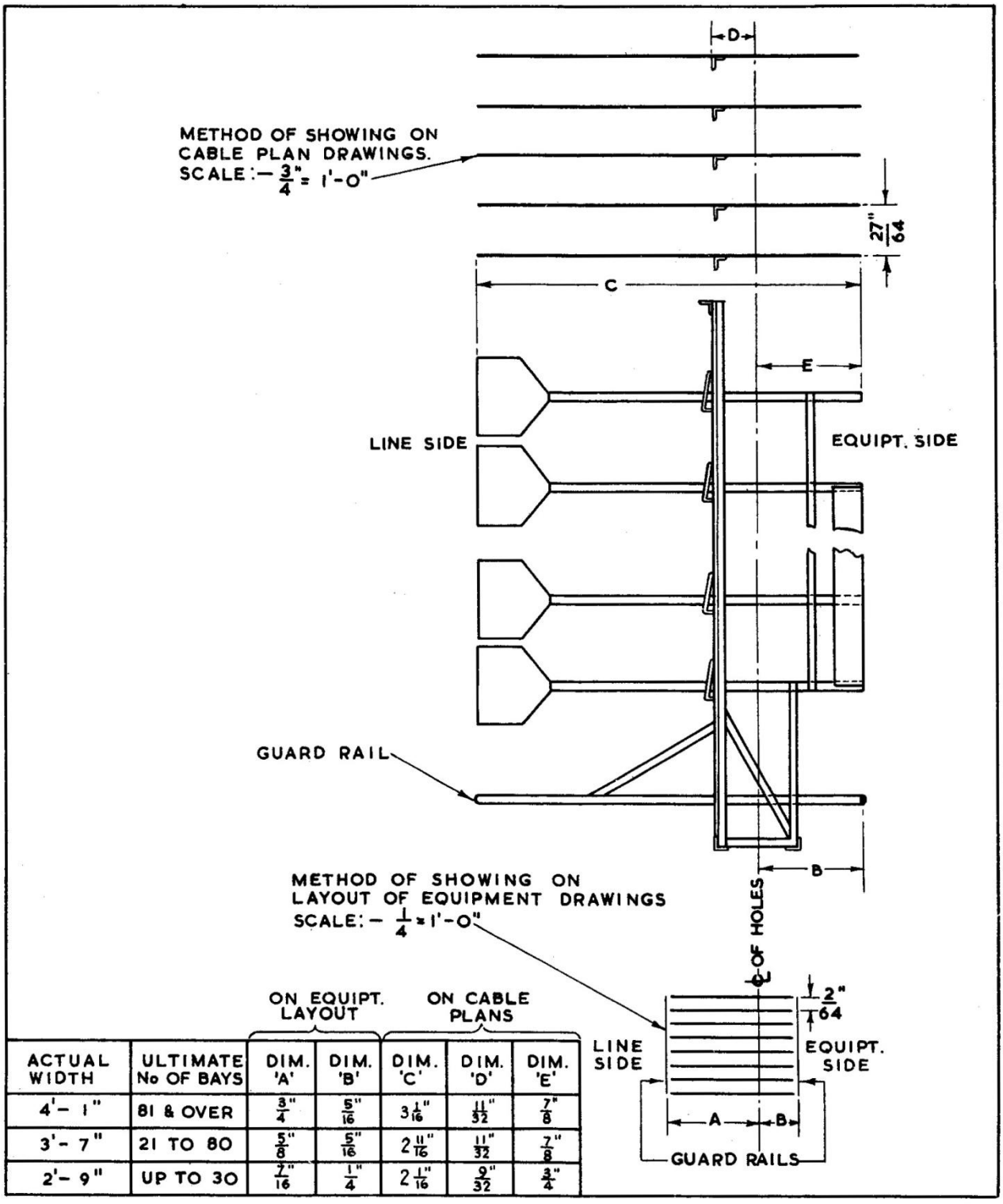


FIG. 24. 2000 TYPE EQUIPMENT. METHOD OF SHOWING RACKS ON LAYOUT OF EQUIPMENT AND CABLE PLAN DRAWINGS.



ACTUAL WIDTH	ULTIMATE No OF BAYS	ON EQUIPT. LAYOUT DIM. 'A'	ON EQUIPT. LAYOUT DIM. 'B'	ON CABLE PLANS DIM. 'C'	ON CABLE PLANS DIM. 'D'	ON CABLE PLANS DIM. 'E'
4'- 1"	81 & OVER	3/4"	5/16"	3 1/16"	11/32"	7/8"
3'- 7"	21 TO 80	5/8"	5/16"	2 11/16"	11/32"	7/8"
2'- 9"	UP TO 30	7/16"	1/4"	2 1/16"	9/32"	3/4"

FIG. 25. 2000 TYPE EQUIPMENT, METHOD OF SHOWING M.D.F. ON LAYOUT OF EQUIPMENT AND CABLE PLAN DRAWINGS.

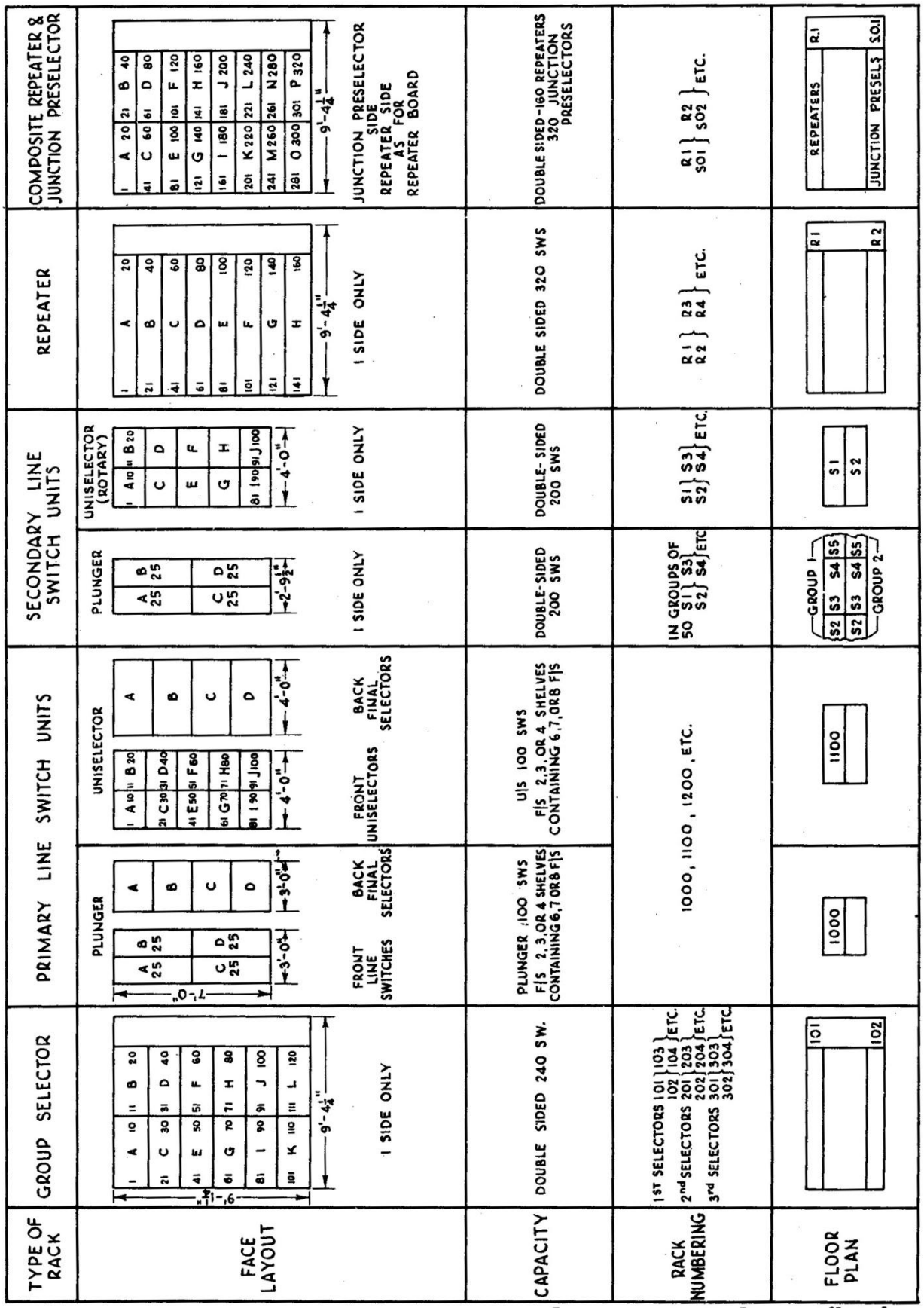


FIG. 26. PRE-2000 TYPE EQUIPMENT. RACK ACCOMMODATION AND STANDARD RACK NUMBERING.

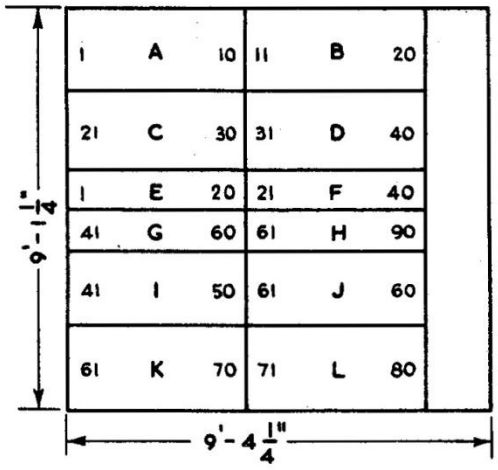
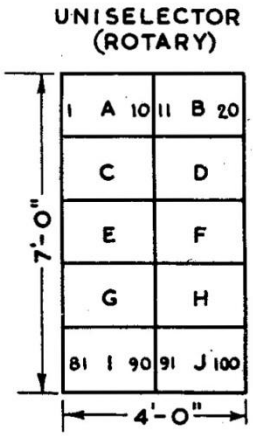
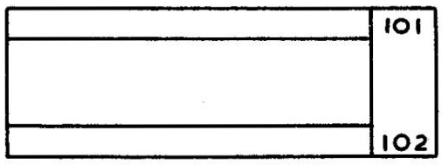
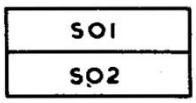
TYPE OF RACK	S.S.R.	JUNCTION PRESELECTOR
FACE LAYOUT	 I SIDE ONLY	 I SIDE ONLY
CAPICITY	DOUBLE SIDED 160 } S.S.R.'S 160 } JUNCTION HUNTERS	DOUBLE SIDED 200 SWITCHES
RACK NUMBERING	101 } 103 } 102 } 104 } ETC.	S01 } S03 } S02 } S04 } ETC
FLOOR PLAN		

FIG. 27. PRE-2000 TYPE EQUIPMENT. RACK ACCOMMODATION AND STANDARD RACK NUMBERING.

6. ASSESSING FLOOR AREAS FOR 2000 TYPE EXCHANGES.

6.1 Details based on the use of standard 2000 type equipment are included, in the attached Tables, of the rack requirements to satisfy various calling rates for City Main, Branch and Country Exchanges. They provide a ready means for calculating the total rack requirements for various classes of exchanges particularly when comprehensive planning details and trunking diagrams are not available.

6.2 City.

Typical examples of their use are outlines below to assess the number of racks required:-

(i) for a branch exchange.

(ii) for a main exchange with branches.

Case A. To determine the equivalent number of 4'6" racks for the installation of either:-

(a) 2,400

(b) 4,800

(c) 9,600 line Standard 6 Figure Branch exchanges, the details shown in Table "A" should be employed.

e.g. 4,800 Line Branch Exchange with a C.R. of 0.06.

Equipment	No. of Racks
D.S.R's	12
3rd Selectors	6
4th Selectors	5
Final Selectors	8
Uniselectors	16
Meters	4
Miscellaneous	7
(Units of 4'6" spaces to accommodate access, Routiner, M.A.R., A.E.R. racks, etc.)	
Total Equivalent 4'6" racks	58

Case B. To determine the equivalent number of 4'6" racks for a main exchange with its associated branch exchanges Tables B, C and D should be used.

Assume a new main exchange has to be established with an anticipated calling rate of 0.1. Provision is to be made for:-

(i) 9,600 lines of subs. Equipment in the main exchange

(ii) connection to 4 branch exchanges of

(a) 2,400 subs. lines of C.R. 0.04

(b) 4,800 subs. lines of C.R. 0.05

(c) 4,800 subs. lines of C.R. 0.07

(d) 9,600 subs. Lines of C.R. 0.06

(Iii) connection to other main exchanges assuming that the O/G traffic to these exchanges is equal to I/C traffic and that 20% of the originating traffic is local.

Rack of Equipment	Main Exch. 9,600 lines C.R. = 0.1	Branch Exchanges				Total Racks Required for Each Rank
		2,400 lines C.R. = 0.04	4,800 lines C.R. = 0.05	4,800 lines C.R. = 0.07	9,600 lines C.R. = 0.06	
1 S.R.	20	1½	3½	4¾	8	38
2 S.R.	17	1½	3½	4¾	8¼	35
3. S.R.	17	½	¾	1	1¾	21
4. S.R.	20	½	¾	1	1¾	24
U/S.	32	-	-	-	-	32
F/S.	32	-	-	-	-	32
Meter	8	-	-	-	-	8
Misc. 4'6" equivalent	11	½	½	½	1	14
R.S.R's from 1.S.R	10	1	2	3	5	21
R.S.R's from 2.S.R	-	1	2	3	5	11
						236

6.3 Country.

Tables E, F, G and H for country areas are based on the standard codes in Table J and the standard trunking in Figs. 28, 29 and 30.

	Nº OF LINES	2400							4800							9600							REMARKS
	CALLING RATE	·04	·05	·06	·07	·08	·09	·10	·04	·05	·06	·07	·08	·09	·10	·04	·05	·06	·07	·08	·09	·10	
TOTAL ORIGINATING T.U.		96	120	144	168	192	216	240	192	240	288	336	384	432	480	384	480	576	672	768	864	960	
Nº. OF GROUPS OF 1200 LINES		2	2	2	2	2	2	2	4	4	4	4	4	4	4	8	8	8	8	8	8	8	
T.U. PER GROUP.		48	60	72	84	96	108	120	48	60	72	84	96	108	120	48	60	72	84	96	108	120	
D.S.Rs. PER GROUP		78	96	115	133	151	170	188	78	96	115	133	151	170	188	78	96	115	133	151	170	188	C23
RACKS PER GROUP		2	2½	3	3½	4	4½	5	2	2½	3	3½	4	4½	5	2	2½	3	3½	4	4½	5	
RACKS D.S.R.		4	5	6	7	8	9	10	8	10	12	14	16	18	20	16	20	24	28	32	36	40	40 PER.
OUTGOING TRAFFIC TO MAIN		77	96	115	134	154	172	192	154	192	230	268	308	345	384	307	384	460	538	615	690	768	80% ORIGINATING TRAFFIC
OUTGOING JUNCTION TO MAIN		109	135	160	186	218	242	270	218	270	320	372	436	484	540	436	540	640	744	872	968	1080	B23
INCOMING TRAFFIC FROM MAIN		62	77	92	107	124	138	154	124	154	184	214	248	276	308	248	308	368	428	496	552	616	80% OUTGOING TRAFFIC.
INCOMING 3RD SELECTORS		104	128	152	176	203	228	256	203	256	304	352	406	450	512	406	512	608	704	812	900	1024	C20
LOCAL TRAFFIC INTO 3RDS		19	24	29	34	38	44	48	38	48	58	68	76	87	96	77	96	116	134	153	174	192	20% ORIGINATING TRAFFIC.
LOCAL 3RD SELECTORS		45	57	68	79	88	101	110	88	110	133	155	173	198	218	175	218	266	310	346	396	436	C10
TOTAL 3RD SELECTORS		149	185	220	255	291	326	366	291	366	437	507	579	648	730	581	730	874	1014	1158	1296	1460	INCOMING 3RD
RACKS 3RD SELECTOR		2	3	3	4	4	4	5	4	5	6	7	8	8	9	8	9	11	13	15	17	19	80 PER RACK
TOTAL TRAFFIC INTO 4THS		89	111	133	155	177	200	223	177	223	268	312	357	402	446	357	446	536	624	714	804	892	ASSUMES T.R. = C.R. AT FINAL SELECTOR STAGE WITH 75% INCREMENT FROM 4THS TO FINALS.
T.U. PER 1000 LINES		35·5	44·5	53·1	62	71	80	89	35·5	44·5	53·1	62	71	80	89	35·7	44·6	53·6	62·4	71·4	80·4	89·2	
4TH SELECTORS PER 1000 LINES		61	76	89	104	118	132	147	61	76	89	104	118	132	147	61	76	90	104	119	133	147	C20
4TH SELECTOR RACKS PER 1000 LINES		1	1	1	1½	1½	2	2	1	1	1	1½	1½	2	2	1	1	1	1½	1½	2	2	80 PER RACK
RACKS 4TH SELECTOR		3	3	3	4	4	5	5	5	5	5	8	8	10	10	10	10	10	15	15	20	20	
RACKS FINAL SELECTOR		4	4	4	6	6	6	8	8	8	8	12	12	12	16	16	16	16	24	24	24	32	C.R. = ·06 600 PER RACK; ·07–·09 400 " "; ·10 = 300 " "
RACKS SUBS UNISELECTOR		8	8	8	8	8	8	8	16	16	16	16	16	16	16	32	32	32	32	32	32	32	300 PER RACK.
RACKS SUBS METER		2	2	2	2	2	2	2	4	4	4	4	4	4	4	8	8	8	8	8	8	8	1200 PER RACK
RACKS MISCELLANEOUS	R.T. M.A.R.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	800 CCTS. PER RACK
	J.G.	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	400 " "
	U.S. T.D.F.	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	
	J.H.&D.S.R. T.D.F.	1	1	1	1	1	1	1	1	1	1	1	–	–	–	2	2	2	2	–	–	–	
	J.H. T.D.F.	–	–	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–	–	2	2	2	
	D.S.R. T.D.F.	–	–	–	–	–	–	–	–	–	–	–	1	1	2	–	–	–	–	2	3	3	
RINGERS	A.E.R. M.A.R.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	
TRAFFIC CONTROL ROUTINER	F.S. G.S. D.S.R.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	
T.C.F.	(3RDS & 4THS)	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	1ea.	
RACKS MISCELLANEOUS EQUIVALENT 4'-6"		7	7	7	7	7	7	7	7	7	7	7	8	9	9	10	10	10	10	11	11	11	
▶ TOTAL RACKS		30	32	33	38	39	41	45	52	55	58	68	72	77	84	100	105	111	130	137	148	162	
M.D.F. VERTICALS	SUBS	12	12	12	12	12	12	12	24	24	24	24	24	24	24	48	48	48	48	48	48	48	
	JUNCTION	2	2	2	2	2	2	2	4	4	4	4	4	4	4	8	8	8	8	8	8	8	
	MISCELLANEOUS	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	
TOTAL VERTICALS		16	16	16	16	16	16	16	30	30	30	30	30	30	30	60	60	60	60	60	60	60	

TABLE A. RACK REQUIREMENTS, CITY BRANCH EXCHANGES.

MAIN EXCHANGE RACK REQUIREMENTS W/O BRANCHES	LINES C.R.	2400 ·04	·05	·06	·07	·08	·09	·10	4800 ·04	·05	·06	·07	·08	·09	·10	·12	·14	8600 ·04	·05	·06	·07	·08	·09	·10	·12	·14
1st SELECTOR RACKS									4	6	6	8	8	10	10	12	14	8	12	12	16	16	20	20	24	28
REPEATER (O/G TO MAIN) RACKS									2	3 (2½)	3	4 (5½)	4	5 (4½)	5	6	7	4	5	6	7	8	9	10	12	14
2nd SELECTOR RACKS									4 (5½)	5 (4½)	5	6	7	8 (7½)	9 (8½)	11 (10½)	12	7	9 (8½)	11 (10½)	12	14	15	17	21 (20½)	24
3rd SELECTOR RACKS									4 (3½)	5 (4½)	5	6	7	8 (7½)	9 (8½)	11 (10½)	12	7	9 (8½)	11 (10½)	12	14	15	17	21 (20½)	24
4th SELECTOR RACKS									5	5	8 (7½)	8 (7½)	8 (7½)	10	10	15 (12½)	13 (12½)	10	10	15	15	15	20	20	25	25
UNISELECTOR RACKS									16	16	16	16	16	16	16	16	16	32	32	32	32	32	32	32	32	32
FINAL SELECTOR RACKS									8	8	8	12	12	12	16	16	16	16	16	16	24	24	24	32	32	32
METER RACKS									4	4	4	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8
MISCELLANEOUS RACKS									7	8 (7½)	8 (7½)	8	8	8	9 (8½)	9 (8½)	9	8	9 (8½)	9	10	10	11	11	12	13 (12½)
M.D.F. VERTICALS									34	34	34	36	36	36	36	36	36	68	68	68	72	72	72	72	72	72
▶ TOTAL RACKS									54	60	63	72	74	81	88	98	105	100	110	120	136	141	154	167	187	200
MAIN EXCHANGE ADDITIONAL RACKS REQUIRED PER BRANCH EXCHANGE																										
1st SELECTOR RACKS		2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	3	4 (3½)	3 (2½)	4 (3½)	4	5 (4½)	6 (5½)	6	7 (6½)			6 (5½)	7 (6½)	8	10 (9½)	11	13 (12½)	14 (13½)		
REPEATER (O/G TO MAIN) RACKS		1	1	2 (1½)	2 (1½)	2 (1½)	2	2	2 (1½)	2	3 (2½)	3	4 (3½)	4 (3½)	4			4 (3½)	4	5	6 (5½)	7 (6½)	8 (7½)	8		
2nd SELECTOR RACKS		2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	4 (3½)	4 (3½)	3 (2½)	4 (3½)	4	5 (4½)	6 (5½)	7 (6½)	7			6 (5½)	7	9 (8½)	10 (9½)	11	13 (12½)	14		
REPEATER (O/G TO BRANCH) RACKS		1	1	2 (1½)	2 (1½)	2 (1½)	2	2	2 (1½)	2	3 (2½)	3	4 (3½)	4 (3½)	4			4 (3½)	4	5	6 (5½)	7 (6½)	8 (7½)	8		
3rd SELECTOR RACKS		1 (¼)	1 (½)	1 (¼)	1 (¼)	1 (¼)	1 (¼)	1 (¼)	1 (¼)	1 (¼)	1 (¼)	1	1	2 (1½)	2 (1½)			1	2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	3 (2½)		
4th SELECTOR RACKS		1 (¼)	1 (½)	1 (¼)	1 (¼)	1 (¼)	1 (½)	1 (½)	1 (¼)	1 (½)	1 (½)	1	1	2 (1½)	2 (1½)			1	2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	3 (2½)		
MISCELLANEOUS RACKS 4'-6" EQUIVALENT		1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)			1 (½)	1 (½)	1	1	1	2 (1½)	2 (1½)		
▶ TOTAL RACKS		9	9	11	13	13	14	15	13	15	17	19	23	26	27			23	27	32	37	43	50	52		
BRANCH EXCHANGE RACK REQUIREMENTS																										
D.S.R. RACKS		4	5	6	7	8	9	10	8	10	12	14	16	18	20			16	20	24	28	32	36	40		
3rd SELECTOR RACKS		2	3	3	4	4	4	5	4	5	6	7	8	8	9			8	9	11	13	15	17	19		
4th SELECTOR RACKS		3	3	3	4	4	5	5	5	5	5	8	8	10	10			10	10	10	15	16	20	20		
FINAL SELECTOR RACKS		4	4	4	6	6	6	8	8	8	8	12	12	12	16			16	16	16	24	24	24	32		
UNISELECTOR RACKS		8	8	8	8	8	8	8	16	16	16	16	16	16	16			32	32	32	32	32	32	32		
METER RACKS		2	2	2	2	2	2	2	4	4	4	4	4	4	4			8	8	8	8	8	8	8		
MISCELLANEOUS RACKS		7	7	7	7	7	7	7	7	7	7	7	8	9	9			10	10	10	10	11	11	11		
M.D.F. VERTICALS		16	16	16	16	16	16	16	30	30	30	30	30	30	30			60	60	60	60	60	60	60		
O/G JUNCTIONS TO MAIN		108	135	160	186	218	242	270	218	270	320	372	436	484	540			436	540	640	744	872	968	1080		
▶ TOTAL RACKS		30	32	33	38	39	41	45	52	55	58	68	72	77	84			100	105	111	130	137	148	162		

NOTES: 1. For rack requirements main exchange without branches see Table C.
2. For additional racks required per branch exchange see Table D.
3. For branch exchange requirements see Table A.
4. Figures in ◯ equal switch capacity requirements, adjacent figure no. of racks needed.

TABLE B. RACK REQUIREMENTS. CITY EXCHANGES MAIN AND BRANCH SUMMARY.

AUSTRALIAN POST OFFICE
ENGINEERING INSTRUCTION

LINES	4800									9600									REMARKS
C.R.	·04	·05	·06	·07	·08	·09	·10	·12	·14	·04	·05	·06	·07	·08	·09	·10	·12	·14	
LOCAL ORIGINATING TRAFFIC	192	240	288	336	384	432	480	576	672	384	480	576	672	768	864	960	1152	1344	
T.U. PER GROUP OF 1200 LINES	48	60	72	84	96	108	120	144	168	48	60	72	84	96	108	120	144	168	
LOCAL 1ST SELECTORS PER GROUP	78	96	115	133	151	170	188	230	266	78	96	115	133	151	170	188	230	266	C23
RACKS 1ST SELECTORS PER GROUP	1	1½	1½	2	2	2½	2½	3	3½	1	1½	1½	2	2	2½	2½	3	3½	80 PER RACK
RACKS LOCAL 1ST SELECTORS	4	6	6	8	8	10	10	12	14	8	12	12	16	16	20	20	24	28	
OUTGOING TRAFFIC TO MAINS NOTE 1	154	192	230	268	307	345	384	461	538	308	384	460	532	614	690	768	921	1075	80% ORIGINATING TRAFFIC
REPEATERS O/G TO MAINS	219	276	330	376	436	495	549	651	764	438	549	660	752	872	990	1098	1302	1519	B20
REPEATER RACKS O/G TO MAINS	2	3 (2½)	3	4 (3½)	4	5 (4½)	5	6	7	4	5	6	7	8	9	10	12	14	110 PER RACK
LOCAL TRAFFIC INTO 2ND SELECTORS	38	48	58	68	76	87	96	115	134	76	96	116	136	152	174	192	230	269	20% ORIGINATING TRAFFIC
INCOMING TRAFFIC INTO 2NDS	154	192	230	268	308	345	384	461	538	308	384	460	536	616	690	768	921	1075	ASSUMES I/C FROM MAINS = O/G TO MAIN EXCHANGES
TOTAL TRAFFIC INTO 2NDS	192	240	288	336	384	432	480	576	672	384	480	576	672	768	864	960	1151	1344	
2ND SELECTORS	276	342	410	476	552	609	682	820	955	552	682	820	952	1104	1218	1362	1640	1904	B20
RACKS 2ND SELECTORS	4 (3½)	5 (4½)	5	6	7	8 (7½)	9 (8½)	11 (10½)	12	7	9 (8½)	11 (10½)	12	14	15	17	21 (20½)	24	80 PER RACK
TRAFFIC INTO 3RD SELECTORS	192	240	288	336	384	432	480	576	672	384	480	576	672	768	864	960	1151	1344	
3RD SELECTORS	276	342	410	476	552	609	682	820	955	552	682	820	952	1104	1218	1362	1640	1904	B20
RACKS 3RD SELECTORS	4 (3½)	5 (4½)	5	6	7	8 (7½)	9 (8½)	11 (10½)	12	7	9 (8½)	11 (10½)	12	14	15	17	21 (20½)	24	80 PER RACK
TRAFFIC INTO 4TH SELECTORS	178	223	268	312	357	402	446	538	624	356	446	536	624	714	804	892	1075	1255	ASSUMES TR = C.R. AT F/S STAGE WITH 7·5% INCREMENT FROM 4TH TO FINALS
T.U./1000	36	45	54	62	71	80	89	108	125	36	45	54	62	71	80	89	108	125	
SELECTORS/1000	62	76	80	104	119	133	147	177	204	62	76	90	104	119	133	147	177	204	C20
RACKS/1000	1	1	1½	1½	1½	2	2	2½	2½	1	1	1½	1½	1½	2	2	2½	2½	80 PER RACK
RACKS 4TH SELECTORS	5	5	8 (7½)	8 (7½)	8 (7½)	10	10	13 (12½)	13 (12½)	10	10	15	15	15	20	20	25	25	
RACKS UNISELECTOR	16	16	16	16	16	16	16	16	16	32	32	32	32	32	32	32	32	32	300 PER RACK
RACKS FINAL SELECTOR	8	8	8	12	12	12	16	16	16	16	16	16	24	24	24	32	32	32	600 PER RACK FOR C.R. <·06; 400 PER RACK FOR C.R. <·07 — ·09 & 300 PER RACK FOR C.R. <·10
RACKS METER	4	4	4	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8	1200 PER RACK
R.T. M.A.R.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	840 PER RACK
FUSE PANEL RACK	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
U.S. T.D.F.	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	
T.C.F. (2NDS, 3RDS, 4THS)	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	
A.E.R. M.A.R. RINGERS & TRAFFIC CONTROL	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	1 ea.	
ROUTINER G.S.	2	2	2	3	3	3	4	4	5	3	4	5	5	5	6	7	8	10	960 SWITCHES PER ROUTINER i.e. 12 RACKS OF G/S
ROUTINER F.S.	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	960 " " " i.e. 16 " " F/S
ROUTINER REPTR.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1200 " " " i.e. 20 " " REPTRS.
RACKS MISCELLANEOUS 4'-6' EQUIVALENT	7	8 (7½)	8 (7½)	8	8	8	9 (8½)	9 (8½)	9	8	9 (8½)	9	10	10	11	11	12	13 (12½)	
▶ RACKS TOTAL	54	60	63	72	74	81	88	98	105	100	110	120	136	141	154	167			
M.D.F. VERTICALS — SUBS.	24	24	24	24	24	24	24	24	24	48	48	48	48	48	48	48	48	48	200/300
M.D.F. VERTICALS — JUNCTIONS	6	6	6	8	8	8	8	8	8	12	12	12	16	16	16	16	16	16	
M.D.F. VERTICALS — MISCELLANEOUS	4	4	4	4	4	4	4	4	4	8	8	8	8	8	8	8	8	8	
TOTAL	34	34	34	36	36	36	36	36	36	68	68	68	72	72	72	72	72	72	

NOTES:
1. DIVISION OF OUTGOING & LOCAL TRAFFIC INTO 70%/30% RATIO INSTEAD OF 80%/20% OF ORIGINATING TRAFFIC AS SHOWN, RESULTS IN A MAXIMUM REDUCTION OF 1 REPEATER RACK ONLY

TABLE C. RACK REQUIREMENTS. CITY EXCHANGES MAIN EXCLUDING BRANCHES.

See note 4 on page 43.

NOTES:

1. For rack requirements main exchanges without branch see Table C.
2. For branch exchange requirements see Table A.
3. For summary of main and branch requirements see Table B.

	LINES	2400							4800							9600							REMARKS
	C.R.	·04	·05	·06	·07	·08	·09	·10	·04	·05	·06	·07	·08	·09	·10	·04	·05	·06	·07	·08	·09	·10	
I/C TRAFFIC FROM BRANCH		77	96	115	134	154	173	192	154	192	230	268	308	346	384	308	384	460	536	616	692	768	80% TOTAL BRANCH TRAFFIC
I/C 1ST SELECTORS		109	135	160	186	218	244	270	218	270	320	372	436	486	540	436	540	640	744	872	972	1080	B23
RACKS I/C 1ST SELECTORS		2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	3	4 (3½)	3 (2½)	4 (3½)	4	5 (4½)	6 (5½)	6	7 (6½)	6 (5½)	7 (6½)	8	10 (9½)	11	13 (12½)	14 (13½)	80 PER RACK
ADDITIONAL O/G TRAFFIC TO OTHER MAINS		61·5	77	92	108	123	139	154	123	154	184	216	246	278	308	246	308	368	432	492	556	616	80% I/C FROM BRANCH
" " REPEATERS		91	112	133	155	176	198	219	176	219	266	310	352	396	438	352	438	532	620	704	792	876	B20
RACKS O/G REPEATER ADDITIONAL		1	1	2 (1½)	2 (1½)	2 (1½)	2	2	2 (1½)	2	3 (2½)	3	4 (3½)	4 (3½)	4	4 (3½)	4	5	6 (5½)	7 (6½)	8 (7½)	8	110 PER RACK
ADDITIONAL I/C TRAFFIC TO 2ND FROM MAINS		61·5	77	92	108	123	139	154	123	154	184	216	246	278	308	246	308	368	432	492	556	616	= 80% I/C FROM BRANCH
" LOCAL TRAFFIC INTO 2ND		15·5	19	23	26	31	34	38	31	38	46	52	62	68	76	62	76	92	104	124	136	152	= 20% I/C " "
TOTAL ADDITIONAL TRAFFIC INTO 2ND		77	96	115	134	154	173	192	154	192	230	268	308	346	384	308	384	460	536	616	692	768	= I/C FROM BRANCH
ADDITIONAL 2ND SELECTORS		112	138	165	191	219	250	276	219	276	330	382	438	500	552	438	552	660	764	876	1000	1104	B20
RACKS 2ND SELECTOR ADDITIONAL		2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	4 (3½)	4 (3½)	3 (2½)	4 (3½)	4	5 (4½)	6 (5½)	7 (6½)	7	6 (5½)	7	9 (8½)	10 (9½)	11	13 (12½)	14	80 PER RACK
TRAFFIC O/G TO BRANCH		61·5	77	92	108	123	139	154	123	154	184	216	246	278	308	246	308	368	432	492	556	616	80% I/C FROM BRANCH
REPEATERS O/G TO BRANCH		91	112	133	155	176	198	219	176	219	266	310	352	396	438	352	438	532	620	704	792	876	B20
REPEATER RACKS O/G TO BRANCH		1	1	2 (1½)	2 (1½)	2 (1½)	2	2	2 (1½)	2	3 (2½)	3	4 (3½)	4 (3½)	4	4 (3½)	4	5	6 (5½)	7 (6½)	8 (7½)	8	110 PER RACK
ADDITIONAL TRAFFIC INTO 3RD		15·5	19	23	26	31	34	38	31	38	46	52	62	68	76	62	76	92	104	124	136	152	20% I/C FROM BRANCH
" 3RD SELECTORS		20	27	36	38	43	48	53	43	53	62	74	86	96	106	86	106	124	148	172	192	212	B20 ABOVE 100 T.U.
RACKS 3RD SELECTOR ADDITIONAL		1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1	1	2 (1½)	2 (1½)	1	2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	3 (2½)	80 PER RACK
ADDITIONAL TRAFFIC INTO 4TH		15·5	19	23	26	31	34	38	31	38	46	52	62	68	76	62	76	92	104	124	136	152	20% I/C FROM BRANCH
" 4TH SELECTORS		20	27	36	38	43	48	53	43	53	62	74	86	96	106	86	106	124	148	172	192	212	B20 ABOVE 50 T.U.
RACKS 4TH SELECTOR ADDITIONAL		1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1	1	2 (1½)	2 (1½)	1	2 (1½)	2 (1½)	2	3 (2½)	3 (2½)	3 (2½)	80 PER RACK
RACKS G.S. ROUTINER 4'6" EQUIVALENT ADDITIONAL		1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1 (½)	1	1	1	2 (1½)	2 (1½)	
▶ RACKS TOTAL		9	9	11	13	13	14	15	13	15	17	19	23	26	27	25	27	32	37	43	50	52	

TABLE D. RACK REQUIREMENTS. CITY EXCHANGES, MAIN.

ADDITIONAL RACKS PER BRANCH.

See note 4 on page 43.

	LINES	1200							2400							3600							4800							REMARKS
	C.R.	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	
LOCAL ORIGINATING TRAFFIC		24	36	48	60	72	84	96	48	72	96	120	144	168	192	72	108	144	180	216	252	288	96	144	192	240	288	336	384	
LOCAL TRAFFIC PER GROUP OF 1200 LINES		24	36	48	60	72	84	96	24	36	48	60	72	84	96	24	36	48	60	72	84	96	24	36	48	60	72	84	96	
LOCAL 1ST SELECTORS PER GROUP		41	60	78	96	115	133	151	41	60	78	96	115	133	151	41	60	78	96	115	133	151	41	60	78	96	115	133	151	C 23
RACKS 1ST SELECTORS PER GROUP		½	¾	1	1¼	1½	1¾	2	½	¾	1	1¼	1½	1¾	2	½	¾	1	1¼	1½	1¾	2	½	¾	1	1¼	1½	1¾	2	80 PER RACK
RACKS 1ST SELECTOR TOTAL		1(½)	1(¾)	1	2(1¼)	2(1½)	2(1¾)	2	2(1¼)	2(1¾)	2	3(2¾)	4(3¼)	4(3¾)	5(4¼)	2(1¾)	3(2¾)	4(3¼)	4	5(4¾)	6(5¼)	7(6¼)	3(2¾)	4(3¼)	5(3¾)	6(5¼)	7(6¼)	8(7¼)	9(6¾)	
INCOMING TRAFFIC FROM TRUNKS (MANUAL)		2·4	3·6	4·8	6	7·2	8·4	9·6	4·8	7·2	9·6	12	14·4	16·8	19·2	7·2	10·8	14·4	18	21·6	25·2	28·8	9·6	14·4	19·2	24	28·8	33·6	38·4	10% OF ORIGINATING T.U.
INCOMING TRUNK SELECTORS (M.U.)		5	7	9	10	12	14	15	9	12	15	19	22	25	28	12	17	22	26	31	35	40	15	22	28	34	40	46	52	F/A
RACKS 2VF & M.U. SWITCHES		1(½)	1(¾)	1	1	2(1½)	2(1½)	2(1½)	1	2(1½)	2(1½)	2	3(2¼)	3(2½)	3(2¾)	2(1½)	2	3(2¼)	3(2¾)	3	3	3	2(1½)	3(2¼)	3(2¾)	3	3	4(3½)	5(4½)	40 PER 3 RACKS
TRAFFIC INTO 2ND SELECTORS ON LEVEL 0		2·4	3·6	4·8	6	7·2	8·4	9·6	4·8	7·2	9·6	12	14·4	16·8	19·2	7·2	10·8	14·4	18	21·6	25·2	28·8	9·6	14·4	19·2	24	28·8	33·6	38·4	10% OF ORIGINATING T.U.
2ND SELECTORS ON LEVEL 0		9	11	13	15	16	18	20	13	16	20	24	27	31	35	16	22	27	33	39	45	50	20	27	35	43	50	58	66	C 20
TRAFFIC INTO 2NDS ON OTHER LEVELS		24	36	48	60	72	84	96	48	72	96	120	144	168	192	72	108	144	180	216	252	288	96	144	192	240	288	336	384	100% ORIGINATING T.U.
TRAFFIC PER 1000 LINES		20	30	40	50	60	70	80	20	30	40	50	60	70	80	20	30	40	50	60	70	80	20	30	40	50	60	70	80	
2ND SELECTORS PER 1000 LINES		36	52	68	84	100	116	132	36	52	68	84	100	116	132	36	52	68	84	100	116	132	36	52	68	84	100	116	132	C 20
RACKS 2NDS PER 1000 LINES		½	¾	¾	1	1¼	1½	1¾	½	¾	¾	1	1¼	1½	1¾	½	¾	¾	1	1¼	1½	1¾	½	¾	¾	1	1¼	1½	1¾	80 PER RACK
RACKS 2ND SELECTORS TOTAL		1(¾)	1	2(1¼)	2(1½)	2(1¾)	2	3(2¼)	2(1¼)	2(1¾)	2	3(2¾)	4(3¼)	4(3½)	5(4½)	2(1¾)	3(2½)	4(3½)	4	5	6(5¾)	7(6½)	3(2½)	4(3½)	5(4½)	6(5½)	7(6½)	8(7¾)	9(8¼)	
RACK UNISELECTORS		4	4	4	4	4	4	4	8	8	8	8	8	8	8	12	12	12	12	12	12	12	16	16	16	16	16	16	16	300 PER RACK
RACKS FINAL SELECTORS		2	2	2	2	3	3	3	4	4	4	4	6	6	6	6	6	6	6	9	9	9	8	8	8	8	12	12	12	SEE NOTE 1
RACKS METER		1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	1200 PER RACK
RACKS MISCELLANEOUS 4-6 EQUIVALENTS (INCLUDES TCF, METERS, ROUTINER ETC.)		2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	5	5	
▶RACKS TOTAL - 4 FIGURE NUMBERING		11	11	12	13	15	15	16	20	21	21	23	28	28	30	28	30	33	33	38	40	42	37	40	42	44	50	53	56	
RACKS 3RD SELECTORS		1(¾)	1	2(1¼)	2(1½)	2(1¾)	2	3(2¼)	2(1¼)	2(1¾)	2	3(2¾)	4(3¼)	4(3½)	5(4½)	2(1¾)	3(2½)	4(3½)	4	5	6(5¾)	7(6½)	3(2½)	4(3½)	5(4½)	6(5½)	7(6½)	8(7¾)	9(8¼)	ASSUMES EQUAL No. OF 2ND & 3RD SELECTORS
▶RACKS TOTAL - 5 FIGURE NUMBERING		12	12	14	15	17	17	19	22	23	23	26	32	32	35	30	33	37	37	43	46	49	40	44	47	50	57	61	65	
M.D.F. VERTICALS — SUBS.		6	6	6	6	6	6	6	12	12	12	12	12	12	12	18	18	18	18	18	18	18	24	24	24	24	24	24	24	
M.D.F. VERTICALS — JUNCTIONS		1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
M.D.F. VERTICALS — MISCELLANEOUS		1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
TOTAL VERTICALS		8	8	8	8	8	8	8	14	14	14	14	14	14	14	22	22	22	22	22	22	22	28	28	28	28	28	28	28	

NOTE:-
1. C.R. → ·5 F/S MULT. 600 SUBS/RACK
C.R ·06 → ·08 F/S MULT. 400 SUBS/RACK

TABLE E. RACK REQUIREMENTS. COUNTRY AUTO EXCHANGES

EXCLUDING BRANCH EXCHANGE.

See note 4 on page 43.

ULT. CAPACITY OF BRANCH EXCH.	LINES	1200							2400							3600							REMARKS
CALLING RATE OF BRANCH EXCH.	C. R.	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	
BRANCH EXCHANGE ORIGINATING T.U.		24	36	48	60	72	84	96	48	72	96	120	144	168	192	72	108	144	180	216	252	288	
I/C TRAFFIC INTO 2NDS LEVEL O		2·4	3·6	4·8	6	7·2	8·4	9·6	4·8	7·2	9·6	12	14·4	16·8	19·2	7·2	10·8	14·4	18	21·6	25·2	28·8	10% OF BRANCH ORIGINATING T.U.
ADDITIONAL 2NDS LEVEL O		9	11	13	15	16	18	20	13	16	20	24	27	31	35	16	22	27	33	39	45	50	C 20
RACKS 2ND SELECTORS ADDITIONAL		¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	½	½	¼	¼	¼	½	½	½	¾	
ADDITIONAL TRAFFIC I/C TO TRUNKS		2·4	3·6	4·8	6	7·2	8·4	9·6	4·8	7·2	9·6	12	14·4	16·8	19·2	7·2	10·8	14·4	18	21·6	25·2	28·8	10% OF BRANCH ORIGINATING T.U.
ADDITIONAL TRUNK SELECTORS (M.U)		5	7	9	10	12	14	15	9	12	15	19	22	25	28	12	17	22	26	31	35	40	F/A
RACKS 2 V.F.+M.U. SWITCHES ADDITIONAL		½	¾	1	1	1½	1½	1½	1	1½	1½	2	2¼	2½	2¾	1½	2	2¼	2¾	3	3	3	40 PER 3 RACKS
OUTGOING TRAFFIC TO BRANCHES		7·2	10·8	14·4	18	21·6	25·2	28·8	14·4	21·6	28·8	36	43·2	50·4	57·6	21·6	32·4	43·2	54	64·8	75·6	86·4	30% OF BRANCH ORIGINATING T.U. (SEE NOTE 1)
OUTGOING JUNCTIONS TO BRANCHES		16	22	27	33	39	45	50	27	39	50	62	73	85	97	39	57	73	91	108	125	143	C 20
REPEATERS		16	22	27	33	39	45	50	27	39	50	62	73	85	97	39	57	73	91	108	125	143	
RACKS REPEATERS		¼	¼	¼	¼	¼	½	½	¼	¼	½	½	¾	¾	1	¼	½	¾	¾	1	1¼	1¼	110 PER RACK
RACKS TOTAL ADDITIONAL		1	1¼	1½	1½	2	2¼	2¼	1½	2	2¼	2¾	3¼	3¾	4¼	2	2¾	3¼	4	4½	4¾	5	SEE NOTE 2

NOTES:-

1. THIS PERCENTAGE DEPENDS ON THE NUMBER AND SIZE OF BRANCH EXCHANGES IN THE PARTICULAR CASE

2. TOTAL RACKS ADDITIONAL SHOULD BE CALCULATED AFTER DUE ALLOWANCE FOR SPARE SPACE ON TABLE E.

3. BRANCH EXCHANGES HAVE NO APPRECIABLE EFFECT ON THE NUMBER OF 2ND & 3RD SELECTORS AS
(a) C.R. = T.R.
(b) TRAFFIC FROM BRANCH TO MAIN EQUALS TRAFFIC FROM MAIN TO BRANCH

TABLE F. RACK REQUIREMENTS. COUNTRY AUTO EXCHANGES.
ADDITIONAL RACKS IN MAIN FOR EACH BRANCH EXCHANGE.

	LINES	1200							2400							3600							REMARKS
	C. R.	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	
TOTAL ORIGINATING TRAFFIC		24	36	48	60	72	84	96	48	72	96	120	144	168	192	72	108	144	180	216	252	288	
TRAFFIC PER GROUP OF 1200 LINES		24	36	48	60	72	84	96	24	36	48	60	72	84	96	24	36	48	60	72	84	96	
LOCAL 1ST SELECTORS PER GROUP		41	60	78	96	115	133	151	41	60	78	96	115	133	151	41	60	78	96	115	133	151	C 23
RACKS 1ST SELECTORS PER GROUP		½	¾	1	1¼	1½	1¾	2	½	¾	1	1¼	1½	1¾	2	½	¾	1	1¼	1½	1¾	2	80 PER RACK
RACKS 1ST SELECTORS		1 (½)	1 (¾)	1	2 (¼)	2 (½)	2 (¾)	2	1	2 (½)	2	3 (2½)	3	4 (3½)	4	2 (1½)	3 (2¼)	3	4 (3¾)	5 (4½)	6 (5¼)	6	
OUTGOING TRAFFIC		16·8	25·2	33·6	42	50·4	59	67·2	33·6	50·4	67·2	84	101	118	134	50·4	75·5	101	126	152	176	202	70% OF ORIGINATING TRAFFIC IN AT LEAST TWO GROUPS
OUTGOING JUNCTIONS		36	50	62	76	90	104	116	62	90	116	144	170	198	224	90	130	170	210	252	290	332	C 20
REPEATERS		36	50	62	76	90	104	116	62	90	116	144	170	198	224	90	130	170	210	252	290	332	
RACKS REPEATERS		1 (½)	1 (½)	1 (½)	1 (¾)	1 (¾)	1	1	1 (½)	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	1 (¾)	2 (1¼)	2 (1¾)	2	3 (2¼)	3 (2¾)	3	110 PER RACK
TRAFFIC INTO 2ND SELECTORS		24	36	48	60	72	84	96	48	72	96	120	144	168	192	72	108	144	180	216	252	288	100% OF ORIGINATING TRAFFIC
TRAFFIC PER 1000 LINES		20	30	40	50	60	70	80	20	30	40	50	60	70	80	20	30	40	50	60	70	80	
SELECTORS PER 1000 LINES		36	52	68	84	100	116	132	36	52	68	84	100	116	132	36	52	68	84	100	116	132	C 20
RACKS PER 1000 LINES		½	¾	¾	1	1¼	1½	1¾	½	¾	¾	1	1¼	1½	1¾	½	¾	¾	1	1¼	1½	1¾	80 PER RACK
RACKS 2ND SELECTORS		1 (½)	1 (¾)	1	2 (¼)	2 (½)	2 (¾)	2	1	2 (½)	2	3 (2½)	3	4 (3½)	4	2 (1¾)	3 (2¼)	3	4 (3¾)	5 (4½)	6 (5¼)	6	
RACKS UNISELECTOR		4	4	4	4	4	4	4	8	8	8	8	8	8	8	12	12	12	12	12	12	12	300 PER RACK
RACKS FINAL SELECTOR		2	2	2	2	3	3	3	4	4	4	4	6	6	6	6	6	6	6	9	9	9	(SEE NOTE 1)
RACKS SUBS. METER		1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	1200 PER RACK
RACKS MISCELLANEOUS 4'-6" EQUIVALENT		3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	5	5	
▶ RACKS TOTAL - 4 FIGURE NUMBERING & TRUNKED AS BRANCH MAIN		12	12	12	14	15	15	15	19	21	21	24	26	28	28	26	31	31	33	39	41	41	
D.S.R.'s PER GROUP (SAME AS 1ST SEL'S ABOVE)		41	60	78	96	115	133	151	41	60	78	96	115	133	151	41	60	75	96	115	133	151	
RACKS D.S.R.'s PER GROUP		1	1½	2	2½	3	3½	4	1	1½	2	2½	3	3½	4	1	1½	2	2½	3	3½	4	40 PER RACK
RACKS D.S.R.'s		1	2 (1½)	2	3 (2½)	3	4 (3½)	4	2	3	4	5	6	7	8	3	5 (4½)	6	8 (7½)	9	11 (10½)	12	
INCOMING TRAFFIC TO BRANCH		16·8	25·2	33·6	42	50·4	59	67·2	33·6	50·4	67·2	84	101	118	134	50·4	75·5	101	126	152	176	202	70% OF ORIGINATING TRAFFIC
INCOMING 2ND SELECTORS		31	45	58	72	85	99	112	58	85	112	139	166	193	219	85	125	166	206	252	290	332	C 20
RACKS 1/C 2ND SELECTORS		1 (½)	1 (½)	1 (¾)	1	1	2 (1¼)	2 (1½)	1 (¾)	1	2 (1½)	2 (1¾)	2	3 (2½)	3 (2¾)	1	2 (1½)	2	3 (2½)	4 (3¼)	4 (3¾)	4	80 PER RACK
RACKS, REPEATERS, UNISELECTORS FINAL SELECTORS AND MISC. AS ABOVE		10	10	10	10	11	11	11	17	17	17	18	20	20	20	24	25	25	25	29	29	29	
RACKS 3RD SELECTORS		1 (½)	1 (¾)	1	2 (¼)	2 (½)	2 (¾)	2	1	2 (½)	2	3 (2½)	3	4 (3½)	4	2 (1¾)	3 (2¼)	3	4 (3¾)	5 (4½)	6 (5¼)	6	100% OF ORIGINATING TRAFFIC
▶ RACKS TOTAL - 5 FIGURE NUMBERING & TRUNKED AS BRANCH MAIN		13	13	13	16	17	17	17	20	23	23	27	29	32	32	30	34	34	37	44	47	47	
▶ RACKS TOTAL - 5 FIGURE NUMBERING & TRUNKED AS D.S.R. BRANCH		13	14	14	16	17	19	19	21	23	25	28	31	34	35	30	35	36	40	47	50	51	
M.D.F. VERTICALS	SUBS.	6	6	6	6	6	6	6	12	12	12	12	12	12	12	18	18	18	18	18	18	18	
	JUNCTION	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	
	MISCELLANEOUS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	
		8	8	8	8	8	8	8	14	14	14	14	14	14	14	22	22	22	22	22	22	22	

NOTE :-
1. C.R. → ·05 F/S MULT. 600 SUBS/RACK
C.R. ·06 → ·08 F/S MULT. 400 SUBS/RACK

TABLE G. RACK REQUIREMENTS. COUNTRY BRANCH EXCHANGE.

TABLE H.
RACK REQUIREMENTS.
COUNTRY AUTO EXCHANGES.
SUMMARY.

MAIN EXCHANGE EXCLUDING BRANCHES — LINES / C.R.	1200							2400							3600							4800						
	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08	·02	·03	·04	·05	·06	·07	·08
RACKS 1ST SELECTORS	1 (½)	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	2 (1¼)	2 (1¾)	2	3 (2¼)	4 (3¼)	4 (3¾)	5 (4¼)	2 (1¾)	3 (2½)	4 (3¼)	4	5 (4¾)	6 (5½)	7 (6¼)	3 (2½)	4 (3¼)	5 (4¼)	6 (5¼)	7 (6¾)	8 (7½)	9 (8¼)
RACKS 2 VF & MU SWITCHES	1 (½)	1 (¾)	1	1	2 (1½)	2 (1½)	2 (½)	1	2 (1½)	2 (1½)	2	3 (2¼)	3 (2½)	3 (2¾)	2 (1½)	2	3 (2½)	3 (2¾)	3	3	3	2 (1½)	3 (2¼)	3 (2¾)	3	3	4 (3½)	5 (4½)
RACKS 2ND SELECTORS	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	3 (2¼)	2 (1¼)	2 (1¾)	2	3 (2¾)	4 (3¼)	4 (3¾)	5 (4½)	2 (1¾)	3 (2½)	4 (3½)	4	5	6 (5¼)	7 (6½)	3 (2½)	4 (3½)	5 (4½)	6 (5½)	7 (6½)	8 (7¾)	9 (8¼)
RACKS UNISELECTORS	4	4	4	4	4	4	4	8	8	8	8	8	8	8	12	12	12	12	12	12	12	16	16	16	16	16	16	16
RACKS FINAL SELECTORS	2	2	2	2	3	3	3	4	4	4	4	6	6	6	6	6	6	6	9	9	9	8	8	8	8	12	12	12
RACKS MISCELLANEOUS	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	5	5
M. D. F. VERTICALS	8	8	8	8	8	8	8	14	14	14	14	14	14	14	22	22	22	22	22	22	22	28	28	28	28	28	28	28
▶RACKS TOTAL - 4 FIGURE NUMBERING	11	11	12	13	15	15	16	20	21	21	23	28	28	30	28	30	33	33	38	40	42	37	40	42	44	50	53	56
RACKS 3RD SELECTORS	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	3 (2¼)	2 (1¼)	2 (1¾)	2	3 (2¾)	4 (3¼)	4 (3¾)	5 (4½)	2 (1¾)	3 (2½)	4 (3½)	4	5	6 (5¼)	7 (6½)	3 (2½)	4 (3½)	5 (4½)	6 (5½)	7 (6½)	8 (7¾)	9 (8¼)
▶RACKS TOTAL - 5 FIGURE NUMBERING	12	12	14	15	17	17	19	22	23	23	26	32	32	35	30	33	37	37	43	46	49	40	44	47	50	57	61	65
ADDITIONAL RACKS REQ. AT MAIN EXCHANGE BECAUSE OF BRANCH EXCHANGES (PER BRANCH EXCHANGE)																												
RACKS ADDITIONAL 2ND SELECTORS	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	½	½	¼	¼	¼	½	¼	½	¾							
RACKS ADDITIONAL 2 VF & MU SWITCHES	½	¾	1	1	1½	1½	1½	1	1½	1½	2	2¼	2½	2¾	1½	2	2¼	2¾	3	3	3							
RACKS REPEATER	¼	¼	¼	¼	¼	½	½	¼	¼	½	½	¾	¾	1	¼	½	¾	¾	1	1¼	1¼							
▶RACKS TOTAL	1	1¼	1½	1½	2	2¼	2¼	1½	2	2¼	2¾	3¼	3¾	4¼	2	2¾	3¼	4	4½	4¾	5							
BRANCH EXCHANGE RACK REQUIREMENTS																												
RACKS TOTAL 1ST SELECTORS	1 (½)	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	1	2 (1½)	2	3 (2½)	3	4 (3½)	4	2 (1½)	3 (2¼)	3	4 (3¾)	5 (4½)	6 (5¼)	6							
RACKS REPEATERS	1 (½)	1 (½)	1 (½)	1 (¾)	1 (¾)	1	1	1 (½)	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	1 (¾)	2 (1¼)	2 (¾)	2	3 (2¼)	3 (2¾)	3							
RACKS 2ND SELECTORS	1 (½)	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	1	2 (1½)	2	3 (2½)	3	4 (3½)	4	2 (1¾)	3 (2¼)	3	4 (3¾)	5 (4½)	6 (5¼)	6							
RACKS UNISELECTORS	4	4	4	4	4	4	4	8	8	8	8	8	8	8	12	12	12	12	12	12	12							
RACKS FINAL SELECTORS	2	2	2	2	3	3	3	4	4	4	4	6	6	6	6	6	6	6	9	9	9							
RACKS MISCELLANEOUS 4'-6" EQUIVALENT	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	5	5							
VERTICALS M.D.F. TOTAL	8	8	8	8	8	8	8	14	14	14	14	14	14	14	22	22	22	22	22	22	22							
▶RACKS TOTAL - 4-FIGURE NUMBERING & TRUNKED AS BRANCH MAIN	12	12	12	14	15	15	15	19	21	21	24	26	28	28	28	31	31	33	39	41	41							
RACKS D.S.R's	1	2 (1½)	2	3 (2½)	3	4 (3½)	4	2	3	4	5	6	7	8	3	5 (4½)	6	8 (7½)	9	11 (10½)	12							
RACKS I/C 2ND SELECTORS	1 (½)	1 (½)	1 (¾)	1	1	2 (1¼)	2 (1½)	1 (¾)	1	2 (1½)	2 (¾)	2	3 (2½)	3 (2¾)	1	2 (1½)	2	3 (2½)	4 (3¼)	4 (3¾)	4							
RACKS, REPEATERS, UNISELECTORS FINAL SELECTORS AND MISC. AS ABOVE	10	10	10	10	11	11	11	17	17	17	18	20	20	20	24	25	25	25	29	29	29							
RACKS 3RD SELECTORS	1 (½)	1 (¾)	1	2 (1¼)	2 (1½)	2 (1¾)	2	1	2 (1½)	2	3 (2½)	3	4 (3½)	4	2 (1¾)	3 (2¼)	3	4 (3¾)	5 (4½)	6 (5½)	6							
▶RACKS TOTAL - 5 FIGURE NUMBERING & TRUNKED AS BRANCH MAIN	13	13	13	16	17	17	17	20	23	23	27	29	32	32	30	34	34	37	44	47	47							
▶RACKS TOTAL - 5 FIGURE NUMBERING & TRUNKED AS D.S.R. BRANCH	13	14	14	16	17	19	19	21	23	25	28	31	34	35	30	35	36	40	47	50	51							

'O' LEVEL - TRUNK SERVICE ETC.

01	TRUNK CALLS
02	TRUNK ENQUIRY
03	INFOMATION
04	TIME
05	PHONOGRAMS
061	MOBILE RADIO TELEPHONE SERVICE
062-069	MULTI-METERING ACCESS TO NEIGHBOURING SECONDARY TRUNK AREAS
060	PARTY LINE MANUALLY SERVED
07	TRUNK CALLS FROM MULTI-COIN PUBLIC TELEPHONE
08	JUNCTION TEST
09	MULTI-METERING ACCESS TO LOCAL NETWORK
00	COMPLAINTS

'BO', 'FO' OR SIMILAR LEVELS.

B01	SPECIAL P.B.X. FINAL SELRS. FOR NON-METERING ENGINEERING SERVICES (SEE BELOW)
BO2-3	POSSIBLE SUBSCRIBERS LEVELS
B04	LARGE GROUP P.B.X. SERVICES
B05-6	POSSIBLE SUBSCRIBERS LEVELS
B07	RING BACK
B08	JUNCTION TEST
B09	TEST DESK
B00	SPARE

'BO1' OR SIMILAR LEVELS.

B0111	ALSO 0911	TEST DESK (STRAPPED TO B09)
B0211	ALSO 0921	SUBSCRIBERS' MAINTENANCE
B0131	ALSO 0931	EXCHANGE INSTALLATION
B0141	ALSO 0941	TRUNK TEST BOARD
B0151	ALSO 0951	FAULT DISPATCH
B0161	ALSO 0961	LINE DEPOT
B0171	ALSO 0971	SUBSCRIBERS' INSTALLATION DEPOT
B0181	ALSO 0981	M.D.F.
B0191	ALSO 0991	M.D.F. IN SATELLITE EXCHANGES (IF ANY)
B0101	ALSO 0901	TRAFFIC

TABLE J. RACK REQUIREMENTS COUNTRY AUTO EXCHANGES STANDARD 'O' LEVEL CODES.

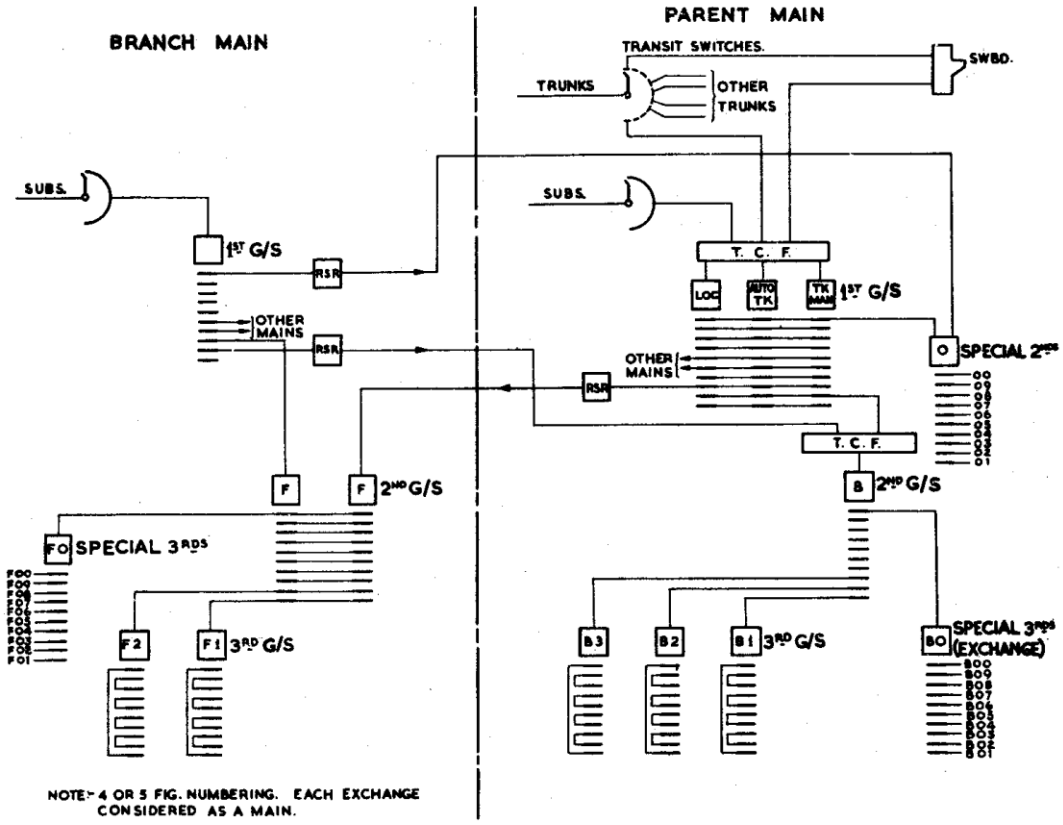


FIG. 28. COUNTRY AUTO EXCHANGES - TRUNKING.

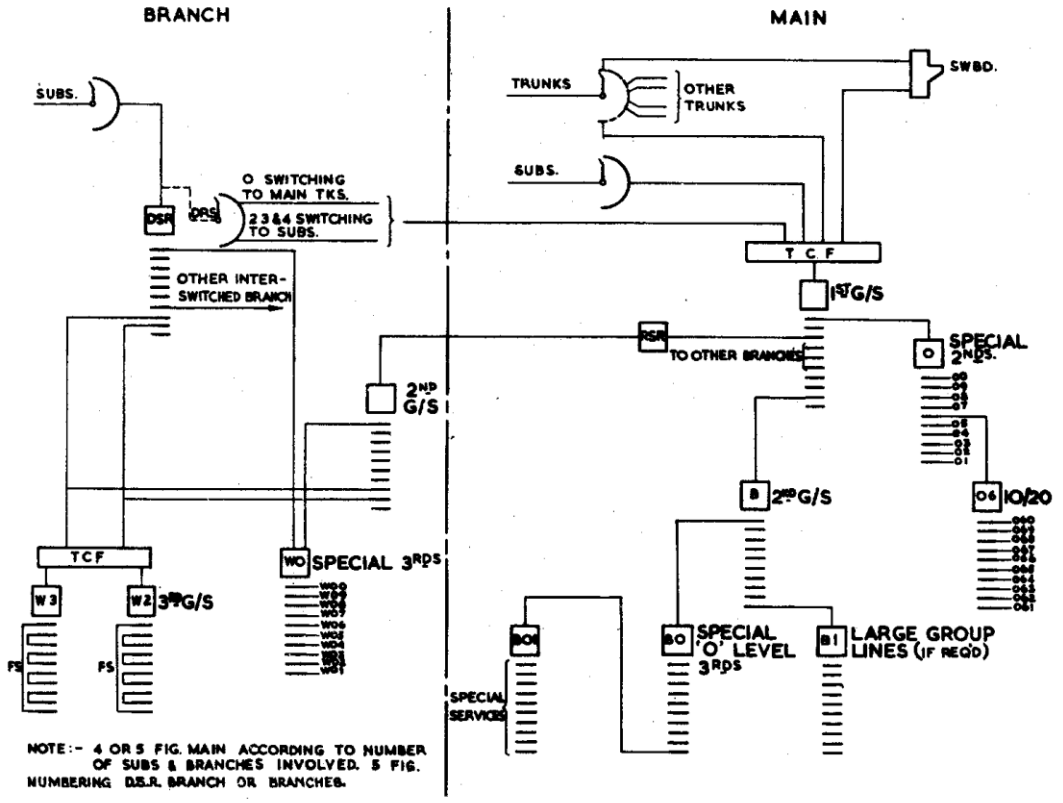


FIG. 29. COUNTRY AUTO EXCHANGES - TRUNKING.

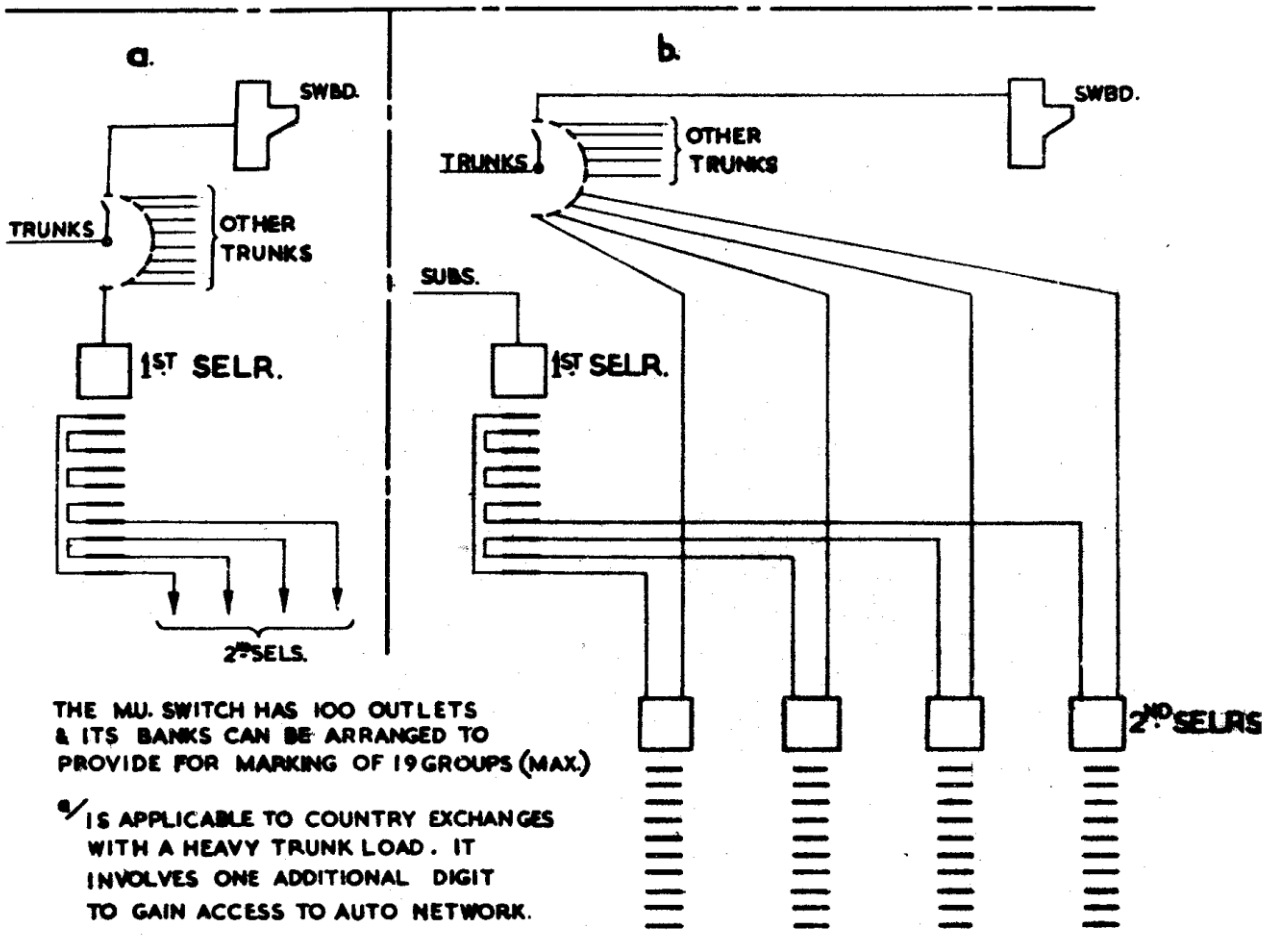


FIG. 30. COUNTRY AUTO EXCHANGES - ALTERNATE TRUNKING OF TRANSIT SWITCHES.