Reliance
SYSTEMS INFORMATION

Rex-Reed Electronic Exchange

Introduction

REX is the first of a new generation of PABX systems. Specially designed for industrial and commercial applications, it establishes new standards in fast, reliable communications.
Fully sealed reed relays plus solid state electronic control circuits have given REX the ability to set up calls extremely fast.
This combination also leads to near silent operation and requires far less floor space than conventional exchanges. In fact REX can quite easily be installed in normal office accommodation.
Each switchboard is equipped with a calling line identification indicator, and the operator is constantly presented with call progress information by means of a visual display panel on a desk-top console little bigger than a typewriter

Facilities

Dial or Key
Telephone Instrument can have a dial or fast action keyphone without modification at the PABX.

Distinctive Calling
Operator connected and transferred calls produce a distinctive ringing cadence to forewarn extensions.

Enquiry Button
Its use allows enquiry calls to a second extension during a call to or from the public exchange or a distant private exchange.

Transfer
The re-routing of incoming or outgoing public exchange or tie line calls to a second extension after enquiry by simple replacement of receiver Unanswered, faulty and prohibited transfers revert to the operator

First Party Release
On extension to extension calls and incoming junction calls replacing telephone receiver immediately releases the instrument for further calls.

Operator Recall
Any extension having difficulty with a call outside the PABX can obtain assistance by using a 'recall' button and dialling 'O' The signal to the operator is special to get priority service.

Direct Dialling Out
Calls to the public network or the private network can be made without operator intervention from dial or keyphones independent of keyphone capability of the distant network.

Class of Service
All extensions can be classified or graded according to the number of facilities to which they have access.

Classes are numbered 1 to 13, the lower the number the less restricted the extension.
(See Facilities Chart)

Operator Assistance
Outgoing calls made with operator assistance are made on demand. Calls from low grade extensions to class 1 extensions are made with operator's help.

Priority Assistance
Special calling signals on the console attract the operator's attention to give priority of answer These calling signals can be associated with executives and operator recall.

Optional Facilities

Incorporation of these facilities is by the substitution of plug-in units or the addition of external equipment to available access points on the PABX.

Inter PBX Tie Lines
Provide communications with other exchanges. The use of keyphones on the REX is not affected by the keyphone capability of the distant exchange.

Executive Right of Way (EROW)
Selected extensions nominated as executives can intrude upon established connections, except where such connections are involved with a public exchange call. A special busy tone is returned to executive when intrusion is possible in all other circumstances normal busy tone is returned. Upon receipt of special busy tone an executive may either:–

i) remain camped on to the wanted connection until cleardown.
ii) by pressing his recall button inject a tone into the established call so indicating that an executive is awaiting attention.

In both cases, 'ring when free' conditions apply

PBX Group Hunting
Free outlet hunting over groups of extensions up to a maximum of five numbers is achieved by using a special group calling code. Five such groups can be provided, which need not be consecutively numbered.

***Extension Line STD Metering**
This metering provides a record of the STD metering rate for the extension so equipped.

***Short Code Dialling**
Long, frequently used public exchange numbers can be translated into much shorter codes which are keyed or dialled by extensions having access to the short code dialling equipment.

***Alternative Routing Tie Lines**
On some routes the number of tie lines provided is small. The chance of these being congested is large. Arrangements can be made to re-route such calls automatically via the public network by suitable digit translation.

***Staff Location Access**
Access to various forms of staff location including radio pocket paging systems.

***Fire Alarm Access**
Various arrangements for giving access to fire alarm equipment.

***Watchman's Service**
A system whereby a patrolling security officer can originate calls from any telephone and have the action recorded with telephone identity and time.

***Central Dictation**
Access to centralised dictation equipment.

***Emergency Number**
Various arrangements.

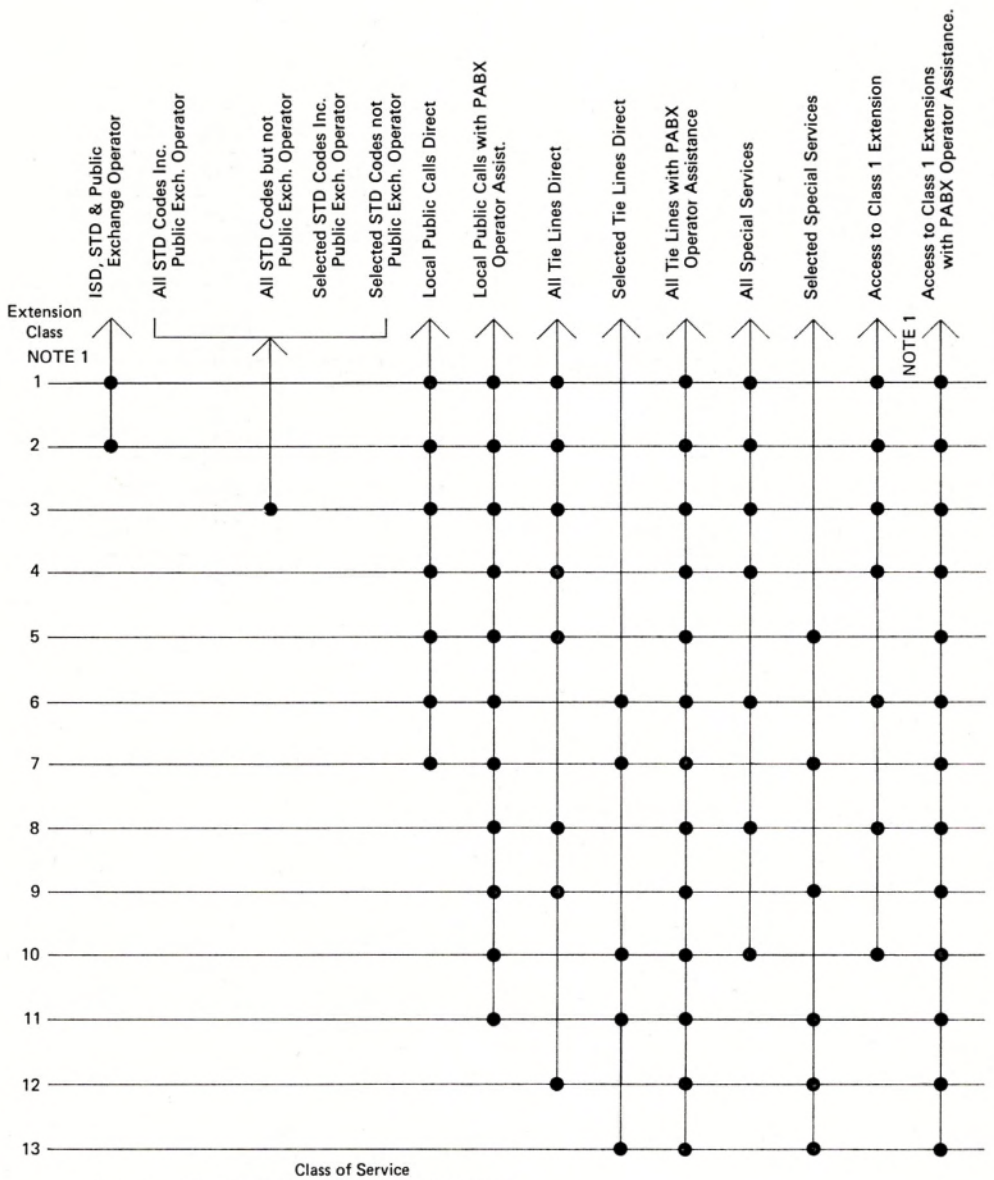
***Conference**
Enables a limited number of extension users to meet on a common conference facility

***Position STD Metering**
A more general arrangement than Extension Line Metering whereby an outgoing call to the public exchange can be metered by the PABX Operator

***Direct Dialling In (DDI)**
Permits the dialling of extension numbers by external (Public Exchange) subscribers.

***Planned for the future**

Facilities Chart



Note 1 Class 1 extensions are protected from classes 5, 7, 9, 11, 12 & 13.

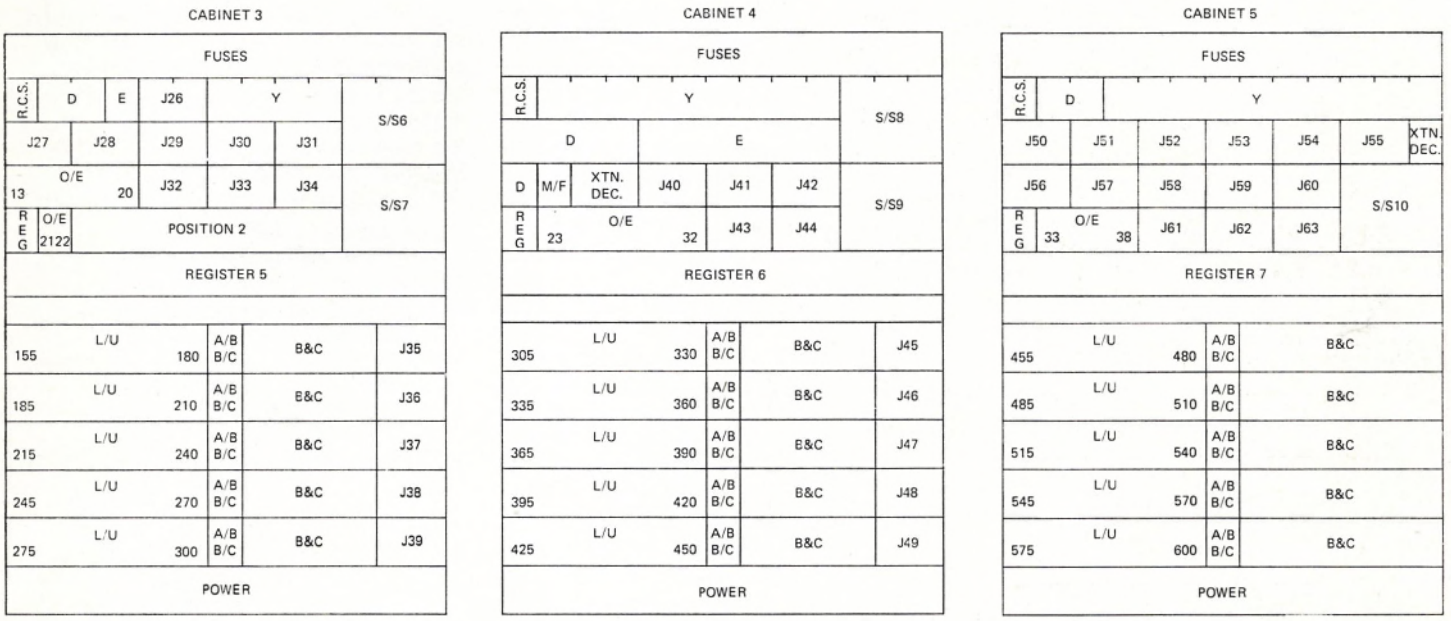
Rack Layouts

CABINET 1

FUSES						
R.C.S. / XTN. DEC.	Y					S/S1
XTN. DEC.	D	E	J1	J2		
J3	J4	J5	J6	J7		S/S2
J8	J9	J10	J11	J12		
J13	J14	O/E 1 2	POSITION 1			
L/U 5 10 15 20 25 30	A/B B/C	B&C	J15	J16		
L/U 35 60	A/B B/C	B&C	O/E 3 4			S/S3
L/U 65 90	A/B B/C	B&C	O/E 5 6			
L/U 95 120	A/B B/C	B&C	O/E 7 8			S/S4
L/U 125 150	A/B B/C	B&C	O/E 9 10			
POWER						

CABINET 2

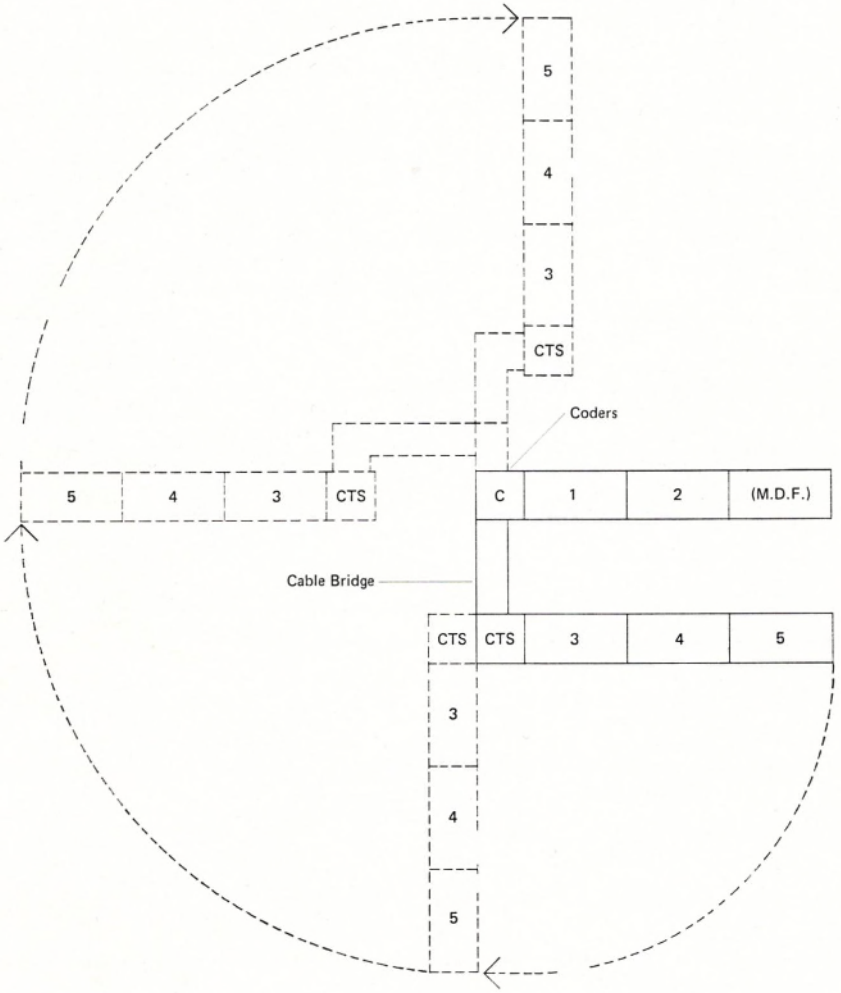
FUSES								
CONTROL								
CONTROL								
R.C.S.	D	E	Y	SPARE	SPARE	SPARE	SUPY. DECODE	
RINGER	RING & TONE	M/F	CW & PILOT	M/A			S/S5	
J17	J18	J19	J20	J21				
REG	J22	J23	J24	J25	O/E 11 12			
REGISTER 1								
REGISTER 2								
REGISTER 3								
REGISTER 4								
POWER								



KEY

R.C.S.	=	Rack Common Services
XTN.DEC	=	Extension Decode
Y	=	Y Switchblock
D	=	D Switchblock
E	=	E Switchblock
J1 etc.	=	Junction Supervisories
S/S1 etc.	=	Services Supervisories
O/E1 etc.	=	Own Exchange Supervisories
Position	=	Manual Board Circuit
L/U	=	Line Unit (including A switch)
A/B B/C	=	A-B Access Switch
B&C	=	B & C Switchblock
M/F	=	Mains Fail
M/A	=	Miscellaneous Alarms
CW & Pilot	=	Calls Waiting & Pilot
Supy Decode	=	Supervisory Decode
REG	=	Register Equipment

Equipment Room Layout



The REX philosophy of pre-packaged, pre-wired equipment using plug and socket terminated inter-rack cabling means in particular that inter-rack cabling lengths must be decided at the manufacturing stage.
In order to avoid a multiplicity of varying cable lengths, pre-determined layouts are proposed.
This does not necessarily mean cabinets must be installed in a straight line but does mean that the relative positions of the cabinets are fixed.
The possible layout variations are shown on the left.

Physical Dimensions

The dimensions of the cabinets including doors are :–

Height 2407 mm (7′ 10$\frac{3}{4}$″)
Depth 797 mm (2′ 7$\frac{3}{8}$″)

The widths vary as below :–

Standard Cabinet No's 2 and 4
965 mm (3′ 2″)
Coder plus Cabinet No's. 1 and 3
1313 mm (4′ 3$\frac{11}{16}$″)

A Main Distribution Frame is provided in a standard width cabinet.

The dimensions of the Manual Board are :–

Height 140 mm (0′ 5$\frac{1}{2}$″)
Width 404 mm (1′ 6$\frac{1}{4}$″)
Depth 324 mm (1′ 0$\frac{3}{4}$″)

The dimensions of the Operators Service Panel are :–

Height 349 mm (1′ 1$\frac{3}{4}$″)
Width 462 mm (1′ 6$\frac{3}{16}$″)
Depth 77 mm (0′ 3$\frac{1}{32}$″)

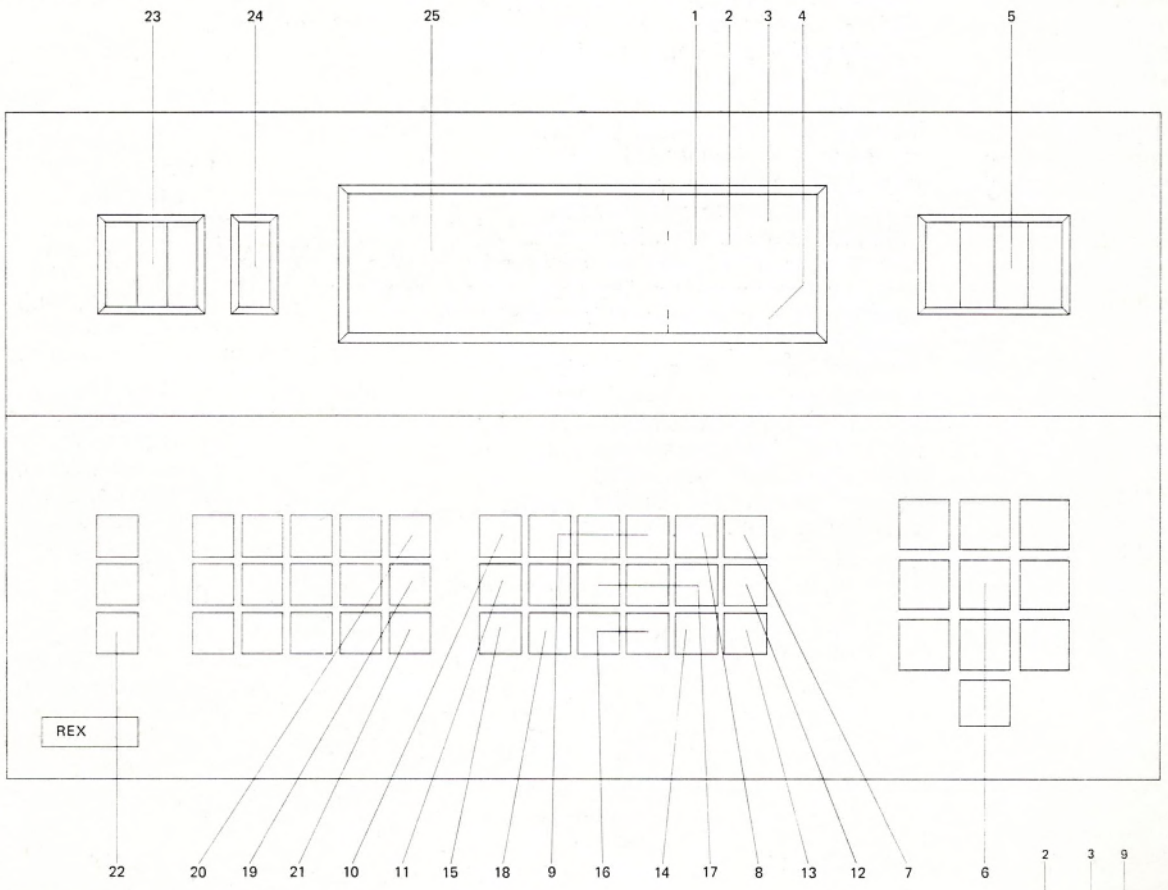
Minimum access space around cabinets is suggested at 762 mm (2′ 6″) with 864 mm (2′ 10″) between the arms of the 'U' shape.

Power Supplies

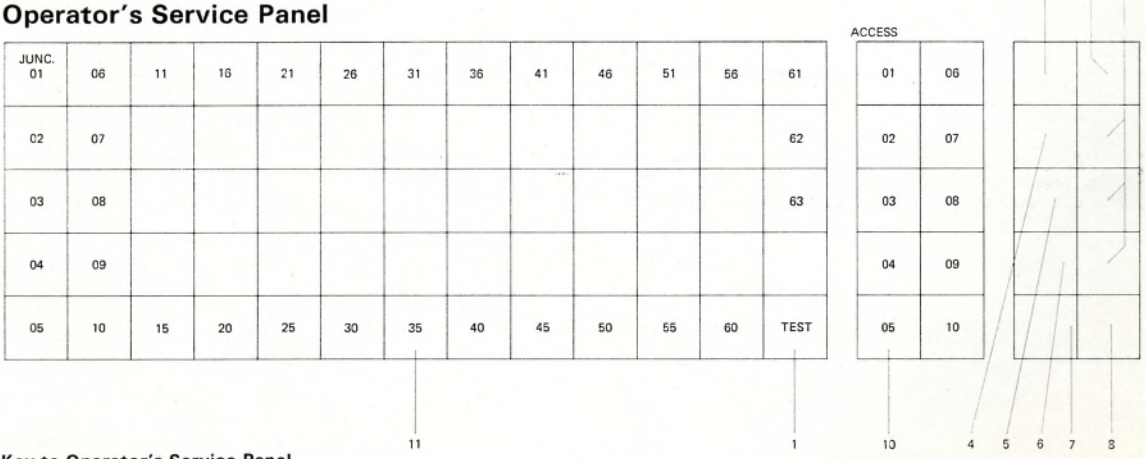
Power for the exchange is normally derived directly from the Public Supply mains and converted into DC supplies by power packs mounted within each cabinet.
This method of providing power means that equipment is installed with the correct power capacity without needing to consider the ultimate expansion requirements.
The power packs have been designed to suit the exchange equipment exactly and quotations will include prices for power
A mains fail switching facility is normally provided as a basic feature but for customers who request standby power facilities there are various options available using either secondary cells or generating sets as a basic power source.

Console and Operator's Service Panel

Console



Operator's Service Panel



Key to Operator's Service Panel

1 Test Key and Lamp activates buzzer, circuit lamps, and night service lamp.
2. Prompt Alarm.
3. Emergency Service Key Switches designated lines to exchange lines.
4. Deferred Alarm Lamp.
5. Alarms Extended to Equipment Room.
6. Alarm Cut-off Key and Lamp.
7 Pilot Key and Lamp, disconnects audible alarm.
8. Night Service Key and Lamp, Switches with Operator's Head Set, into night service.
9. Change of Class of Service Keys and Lamps.
10. Access Keys and Lamps, Operator access buzz facility.
11 Junction Keys and Lamps, allows the Operator to buzz faulty junction circuits.

Key to Operator's Console

1 The words PBX, 1 BUSY PBX, 2 BUSY etc., appear on the console screen when all lines on that route are in use.

2. EXCHANGE BUSY similarly appears when all lines to the public exchange are in use.
3. ACCESS BUSY appears when all access circuits (services supervisories) are in use.
4. FAULT appears as an extension of the alarm system. The nature of the fault is defined on other equipment.
   A flashing FAULT lamp indicates that Night Service switching has been incorrectly performed.
5. The Digital display which appears here varies according to the state of the call, or which key has been operated. In general when an extension is connected the extension directory number is displayed. At other times the routing digit and equipment number are displayed. At any time the display can be changed by operating the IDENTIFY INWARD, IDENTIFY OUTWARD, or IDENTIFY ACCESS keys. In all cases the display refers to the call connected to the operator indicated by the illuminated SPEAK key (21)
   It should be noted that in addition to identifying the caller connected to the operator it also displays equipment numbers to help maintenance and fault reporting.
6. The ten digit keys numbered 1 to 0 are used to key all numbers both internally and externally being translated where necessary into 10 IPS loop disconnect signals. The first digit keyed indicates the route digit '0' prefixes internal calls.

7 This key ANSWER EXCHANGE, will light when an incoming exchange line call is signalled. Its operation will answer the call and extinguish the lamp signal unless there is another incoming exchange line call waiting to be answered.

8. This key ANSWER ACCESS, will light when an internal extension calls the operator for assistance. This signal will 'flash' when a priority extension or an operator re-call signal is made to draw the operators attention to the need for priority of answer
9. These keys, ANSWER PBX 1 etc., will light when an incoming tie line call is signalled. Its operation will extinguish the lamp signal unless there is another incoming call waiting.
10. This key ANSWER TRANSFER, is only of use on multiposition installations and when lit indicates that another position wishes to transfer a call. Momentary depression answers and extinguishes the lamp signal.

11 Depression of this key OFFER TRANSFER, on multiposition installations followed by a single digit key representing the required position causes key 10 of the distant position to light. When the called position answers momentary depression of the RELEASE SPEAK key (key 15) will complete the transfer

12. This key RECALL, is used on exchange lines terminated at a manual board to signal the distant operator It is equivalent to flashing an operator by subscriber switch hook flashing. It is similarly used on manually terminated tie lines.
13. Momentary depression of this key CANCEL, will cancel the last performed function of the operator and is useful for example to clear down a wrong number mis-keyed. On established calls the appropriate party may be disconnected by depressing this key in conjunction with either the SPEAK INWARD or SPEAK OUTWARD keys (16) On operator connected extension to extension calls the CANCEL key will clear down the last made connection. In all cases after depressing the CANCEL key any new call will require the depression of the route code on the digit keys before the required number
14. This key INTRUDE, enables the operator who has made or extended a trunk call to a busy extension to talk to that extension whilst the key is held depressed. Warn tone is induced to advise the extension that their call is no longer secret.
15. This key RELEASE SPEAK, enables the operator to disconnect the speech path and control from the call. Normally the act of answering or originating another call performs this function so that this key is only used when there is no further traffic requiring attention (see also key 11)
16. These two keys, SPEAK INWARD, SPEAK OUTWARD, split an established connection allowing the operator to converse with either side without the other hearing. These keys are held operated during such a conversation. These two keys are also used in conjunction with the CANCEL key to provide selective clearing.

17 These keys IDENTIFY INWARD ACCESS and OUTWARD, and are used to alter the line identification display as required (see item 5)

18. This HOLD key allows the operator to retain control of the call on the link circuit by momentary depression. The link circuit retained in this 'held' condition is indicated by the lighting of the HELD lamp (19) Operation of the link SPEAK key (21) followed immediately by a second operation of the HOLD key releases the condition.
19. This HELD lamp identifies the link on hold condition (see 18 above)

Electrical Performance

20. There are five SUPY lamps which can glow during a setting up period, but 'flash' to call the operator to that link for further assistance on an established held call. Operator connection to a particular link is controlled by operation of the link SPEAK key (21)
21 Each of the five SPEAK keys has a lamp which indicates on which link circuit the operator is talking and to which link the displays refer Operation of any SPEAK key connects the operator to that link. Operation of another link SPEAK key releases the connections made by the previous SPEAK key
22. Three METER keys permit the recording of fee units on three separate exchange lines. Connection of the metering equipment is by momentary depression of a free key A lamp within the key glows to indicate when in use but flashes at the end of call. Depressions of the METER key after the original connection will display the units used at item 23 at any time, but depression when the meter lamp is flashing will display the final figure, and release the meter circuit for further use. During the depression of a METER key the operator can talk to both parties.
23. This displays the number of STD units that may be recorded by any one of the three metering circuits.
24. This displays the number of calls waiting to be answered by the operator
25. The Call Progress Indicator displays signals as a written word to enable the operator to follow the progress of a call. The screen display only refers to the link circuit in use and which has the lamp in key 21 SPEAK, glowing.

Loop Resistance
Dial Instrument
1000 ohms max.

Push Button Instrument
(DC Leg Code C) 1000 ohms max.

Loop Resistance
Inter-exchange (Loop disconnect signalling) 1000 ohms max.

Leak Resistance

Leg-to-Leg	33000 ohms min.
Leg-to-Earth	36000 ohms min.

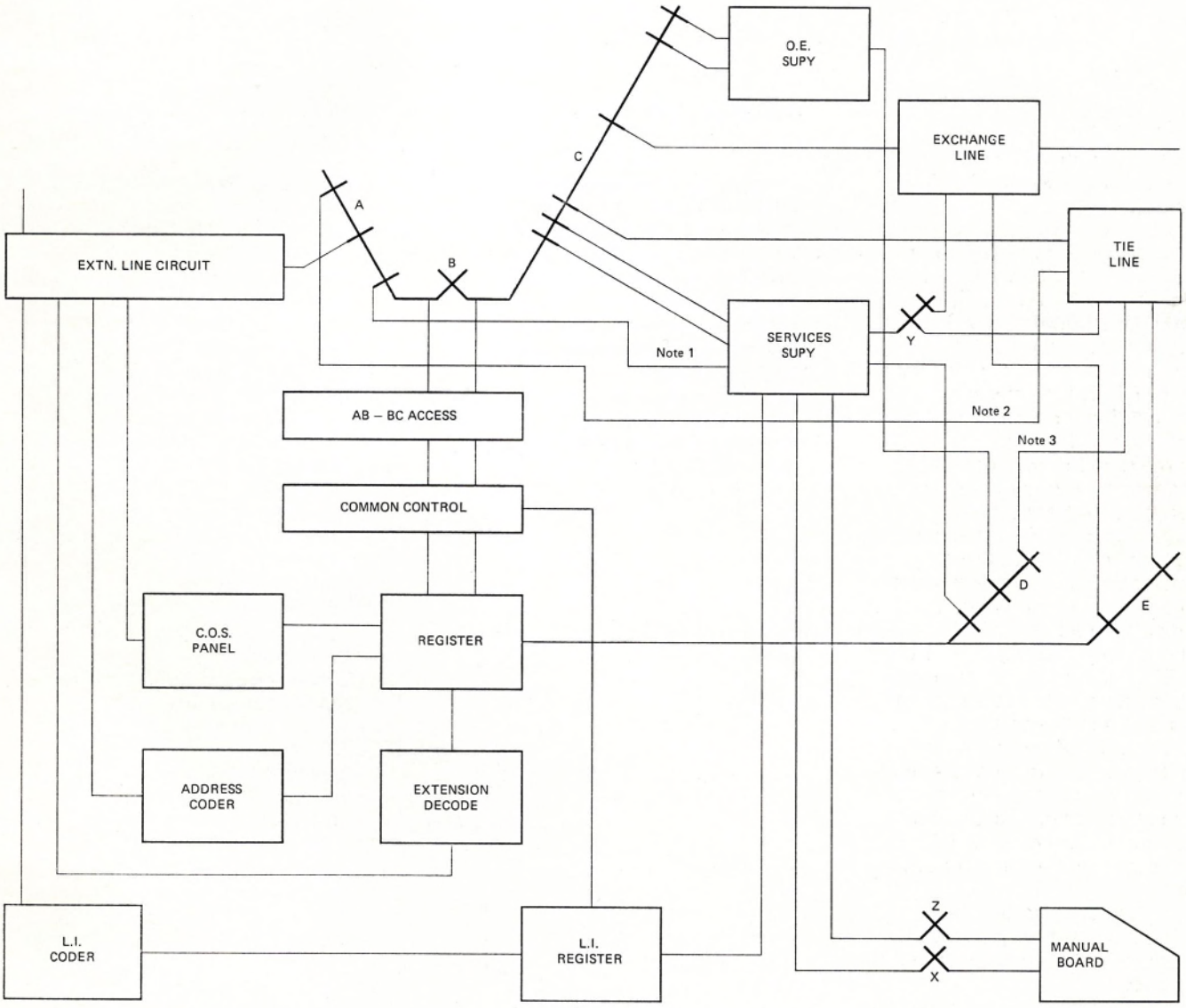
Signalling

Dial speed	7–12pps
Dial break ratio	63–72%
Push button	International Code 'C'

Maintenance

Conventional routine maintenance is unnecessary for the REX system. Digital meters are provided to monitor strategic points in the system, these meters record malfunctions which may result in a depreciation in the quality of service.
It is intended that these fault indication meters will be checked at prescribed intervals and recorded. When a non permissible failure rate is observed, the system will be monitored by a portable tester which produces a coded print out. The Maintenance Engineer will interpret the code, analyse the information presented and identify the faulty circuit, the faulty unit is then withdrawn, and a replacement plugged in.

Trunking Diagram



Note 1 Used for Operator assisted tandem traffic.
2. Used for tandem traffic.
3. Used for DDI Junctions.

Reliance
A member of the GEC group

As part of our policy of continuous product improvement, the Company reserves the right to alter the specifications of any equipment without notice.

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Publication No. 217
0653

Printed in England

TIB 5585