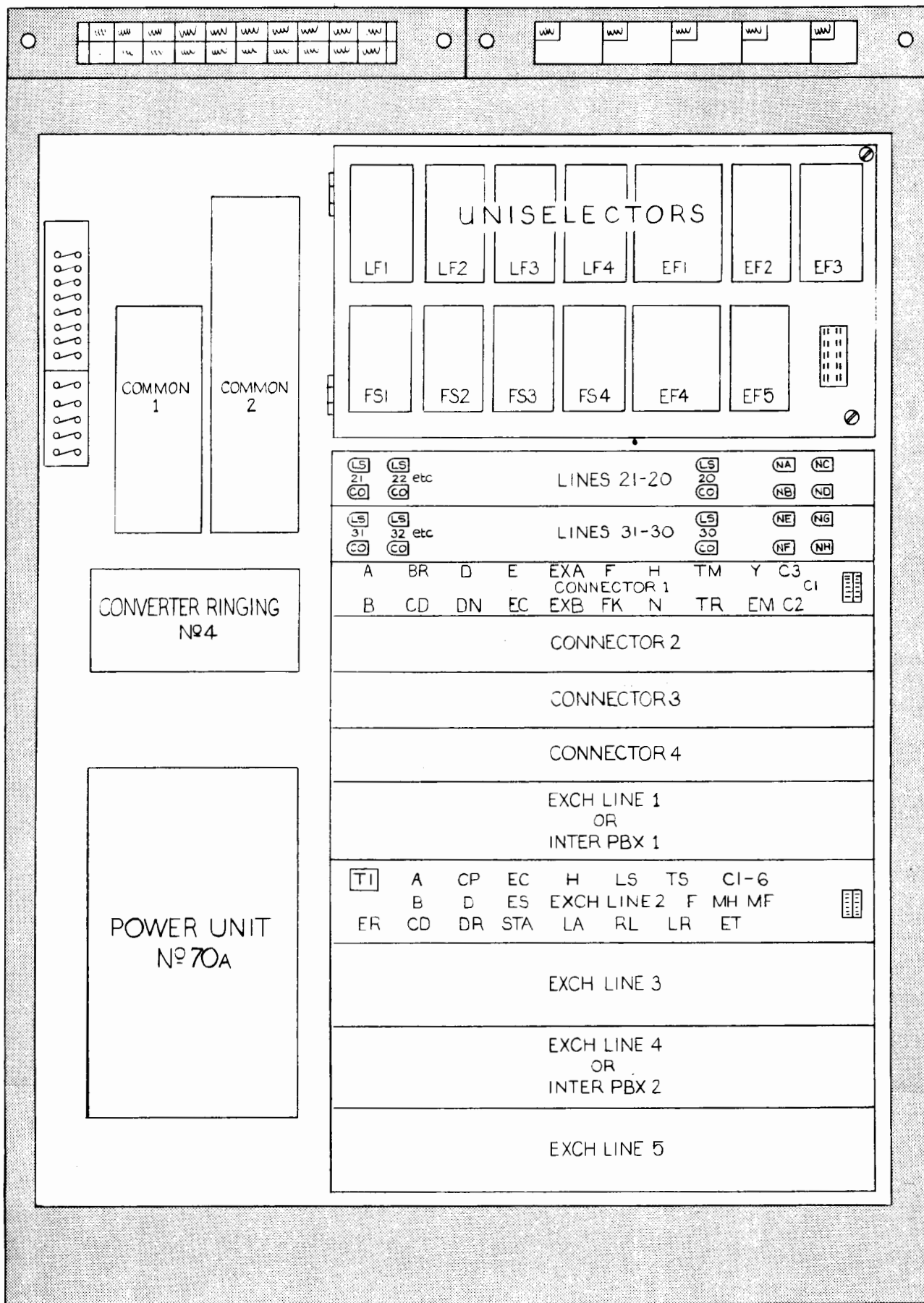


P.A.B.X. 6.
PRINCIPLES

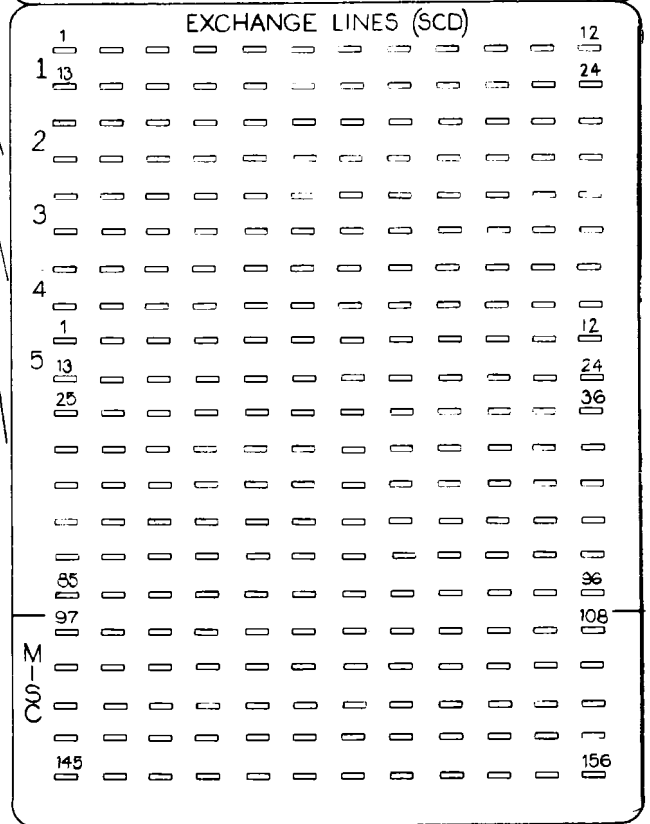
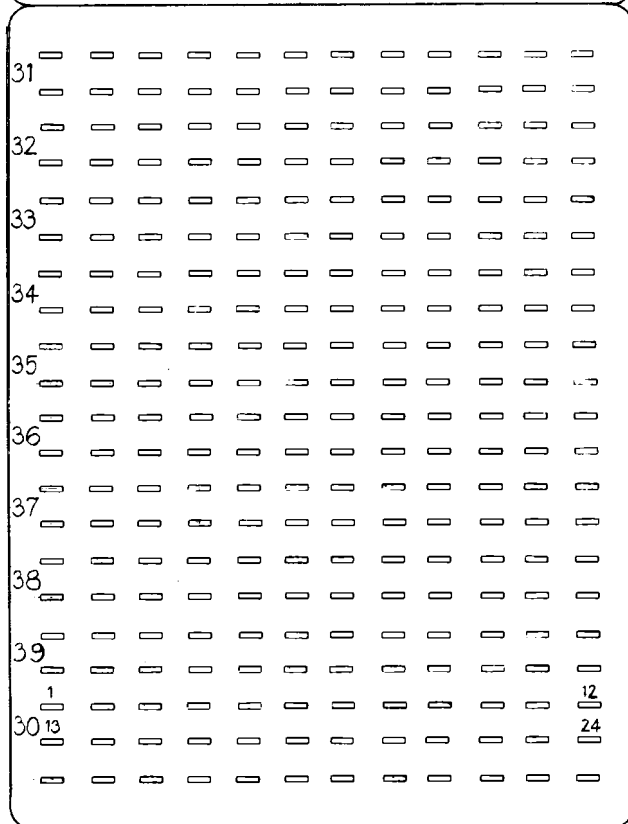
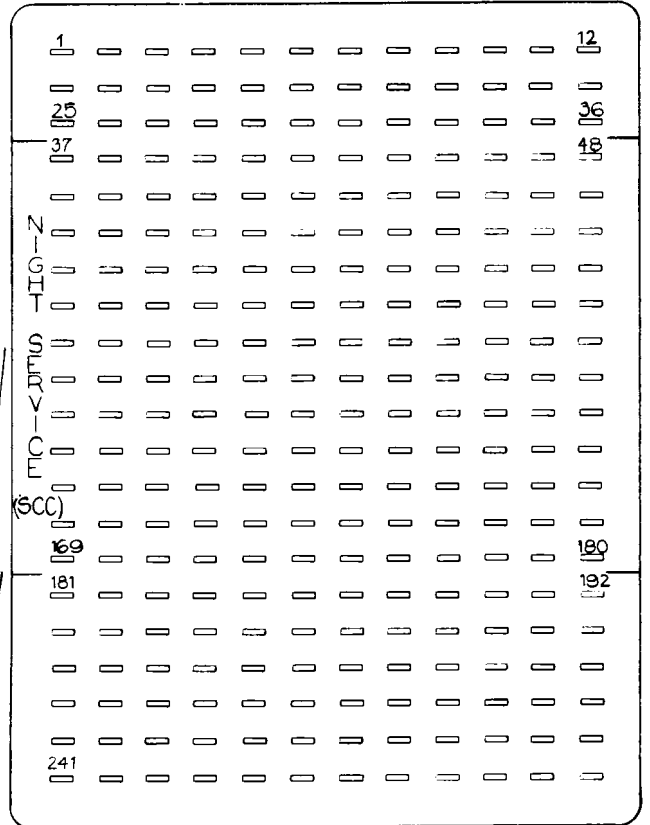
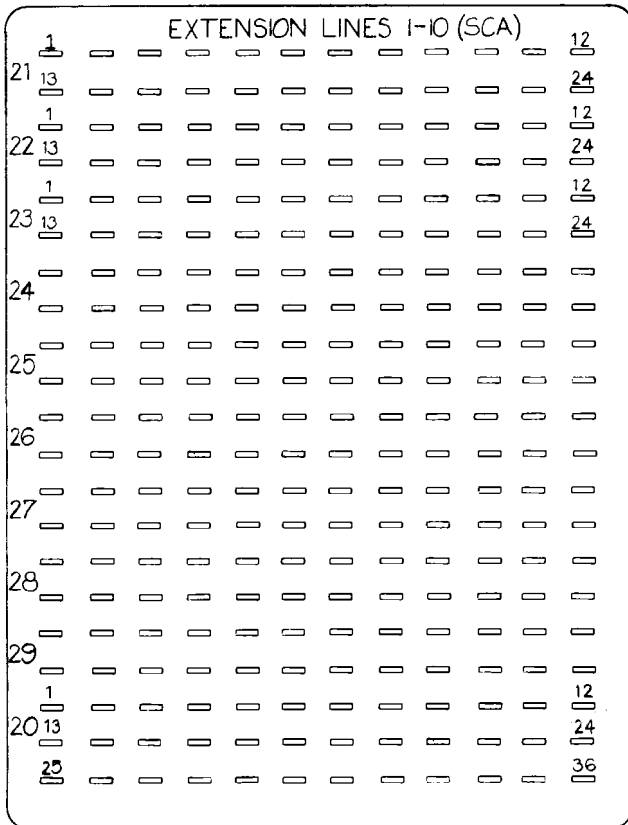
PABX 6 — PRINCIPLES

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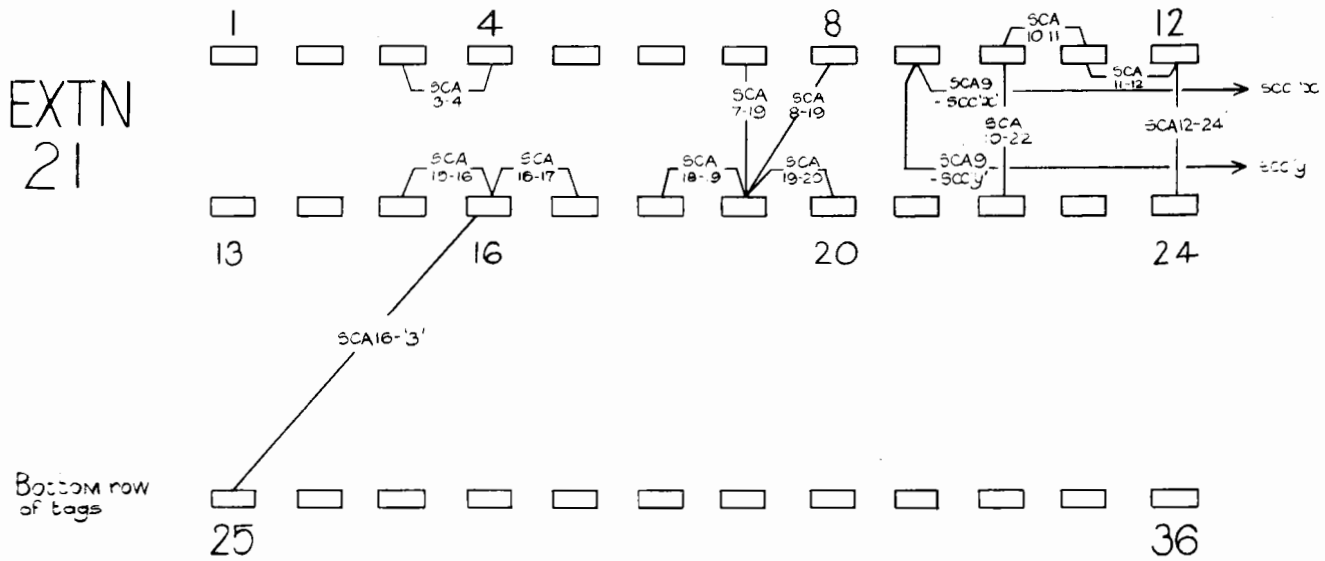
LAYOUT—FRONT VIEW



LAYOUT—STRIP CONNEXIONS (BEHIND UNISELECTOR SHELF)



EXTENSION LINE CIRCUIT STRIP CONNEXION 'SCA' STRAPS



STRAP	PURPOSE	REFERENCE
SCA 3-4	Working extension — connects 270Ω battery to PA lead.	Page 13, 18
SCA 10-11	Spare extension — " " " " EP "	" 17
<u>Designated Extension</u>		
SCA 16-3'	Starts COMMON SERVICES CCT at beginning of call.	SA 8476 table 6
SCA 10-22	Barred O/G public exchange line calls	'Extn Barred Public Exch Line Access'
SCA 19-20	" " " " — disconnects 'B' wire battery when all CONNECTING CCTS busy.	
SCA 8-19	Allowed O/G public exchange line calls — connects line 'B' wire to relay EF in COMMON SERVICES CCT when all CONNECTING CCTS busy.	
SCA 9-10	Provides 'A' wire earth via relay contact CK4-8 or CJ1-7 in COMMON SERVICES CCT — relays CK & CJ operate when all CONNECTING CCTS are busy to disconnect 'A' wire calling earth, but are released by LRB, if an I/C public exchange line call is waiting, to allow it to be answered by designated extensions	SA 8476 table 4
SCA 12-24	Permits intrusion on busy extension during enquiry call	'Intrusion on Req'd Busy Extn by Designated Extn on Exch Line Call'
SCA 16-17	Marks P1 bank of LF finders for answering of I/C exchange line call.	'Incoming Ring & Answer by Designated Extn'
<u>Non-Designated Extension</u>		
SCA 15-16	Starts COMMON SERVICES CCT at beginning of call.	Page 9
SCA 9-11	Provides 'A' wire earth via relay contact CG4-8, CH1-8 or CL1-8 in COMMON SERVICES CCT — relays CG, CH & CL operate when all CONNECTING CCTS are busy to disconnect 'A' wire calling earth.	SA 8476 table 5
SCA 18-19	Barred O/G public exchange line calls — disconnects line 'B' wire battery when all CONNECTING CCTS busy.	
SCA 11-12	Allowed I/C public exchange line calls.	'Transfer of Exch Line Call to Another Extn'
SCA 7-19	Allowed O/G public exchange line calls — connects line 'B' wire to relay EF in COMMON SERVICES CCT when all CONNECTING CCTS busy.	Page 27

REFERENCES

Telecomms Instructions

B4 F1601	P.A.B.X.6	Facilities & apparatus
C3 F1060	"	Description
F1061	"	Installation planning
F1062	"	Installation of equipment

Diagrams

SA 8475	Trunking scheme and straight line diagram
8476	Extension line circuit
8477	Connecting circuit
8478	Exchange line circuit (auto & C.B.)
8479	Inter-switchboard line circuit (B/W auto-auto)
8480	Common services circuit
8481	Inter switchboard line circuit (B/W auto-man)
8482	Attendant's telephone
8483	Exchange line circuit (magneto & CBS2)
8485	Tone generator
N 673	Power unit N°70A
651	Converter ringing N°4

To anyone using this document

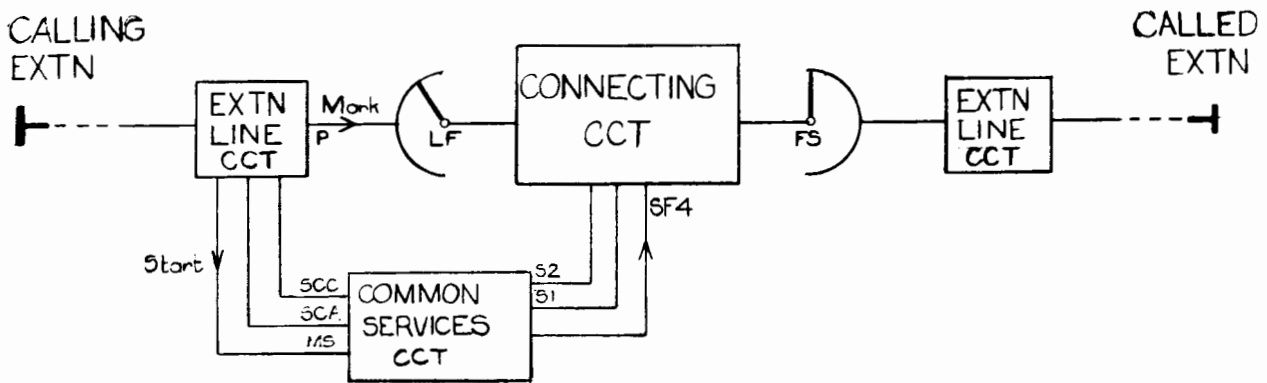
This document has been produced by the Technical Training College at Stone, Staffs. It is organised in functions, each function being fully explained, so that when dealing with a particular fault on a P.A.B.X.6 the relevant information is readily available in convenient form. It is only intended to explain principles of operation and not to replace, although it may supplement, other sources of information.

If you have occasion to use it & resulting from this have a suggestion or useful comment to make please don't hesitate to send it to:—

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P.O. Technical Training College
Yarnfield
Stone
Staffs
ST15 0NQ

EXTN TO EXTN CALLS

Trunking



EXTN LINE CCT
 When extn handset lifted for O/G call extends 'Start' condition over MS common to COMMON SERVICES CCT

LF=LINE FINDER
 Non homing 25 point uniselector - driven on seizure of CONNECTING CCT to find CALLING EXTN

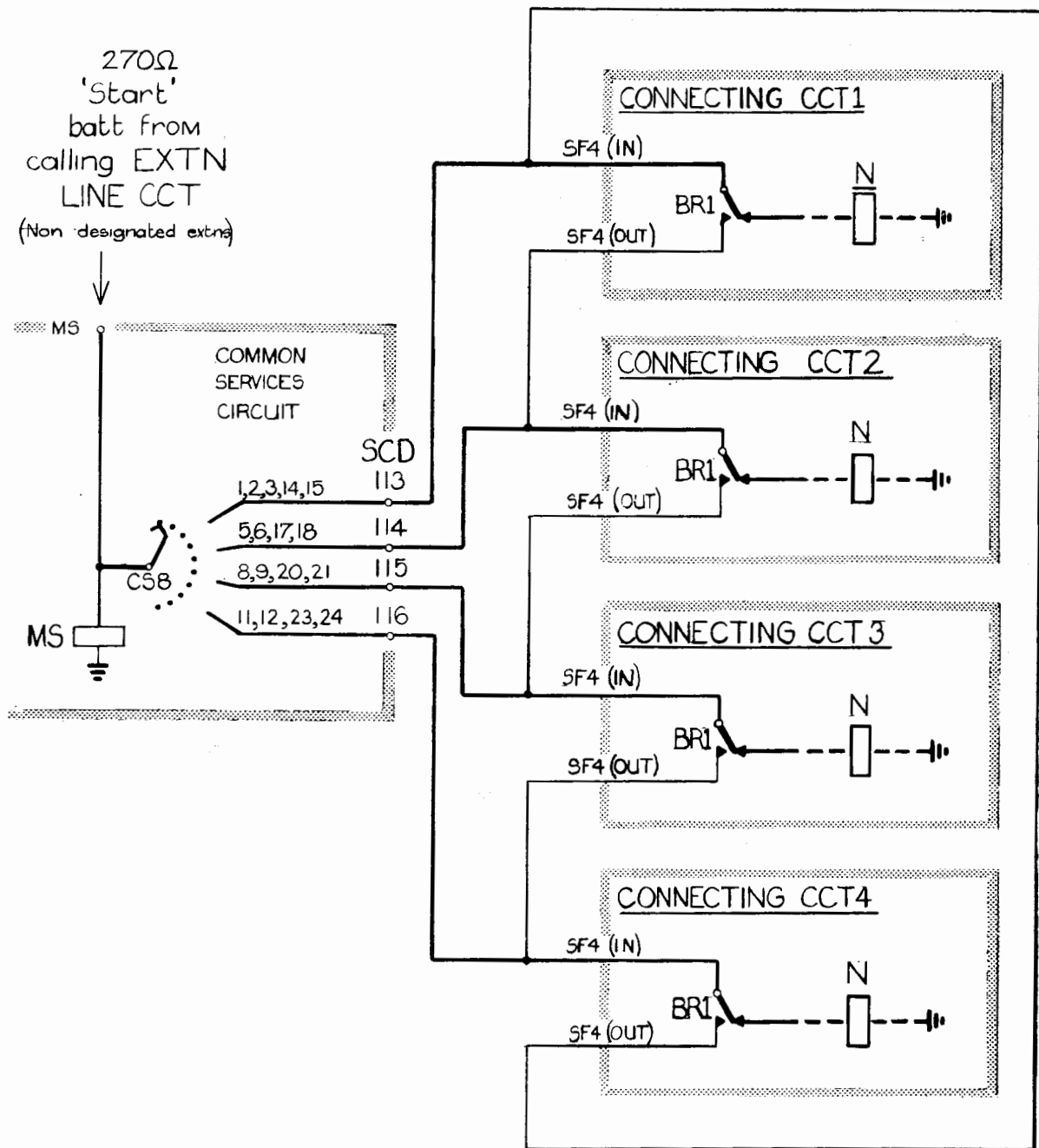
CONNECTING CCT
 Relay set with transmission bridge — on seizure connects dial tone to caller — positions FS switch under control of dialled digits — tests CALLED EXTN:—
 if free : switches to and rings extn, gives ring tone to caller
 if busy : gives busy tone to caller
 if P.G. or spare : gives NU tone to caller.

FS=FINAL SELECTOR
 25 point homing uniselector — extn line multiple on its banks — positioned by dialled extn number — first digit selects group of 10 contacts — second digit selects 1 of out 10

EXTN LINE CCT
 On incoming calls indicates state of extn line (free, busy or P.G.) to CONNECTING CCT via FS — when seized by I/C call cuts off O/G call facility.

COMMON SERVICES CCT
 Started by calling EXTN LINE CCT over MS lead — distributes calls over CONNECTING CCTS

Allocation of Connecting Circuits

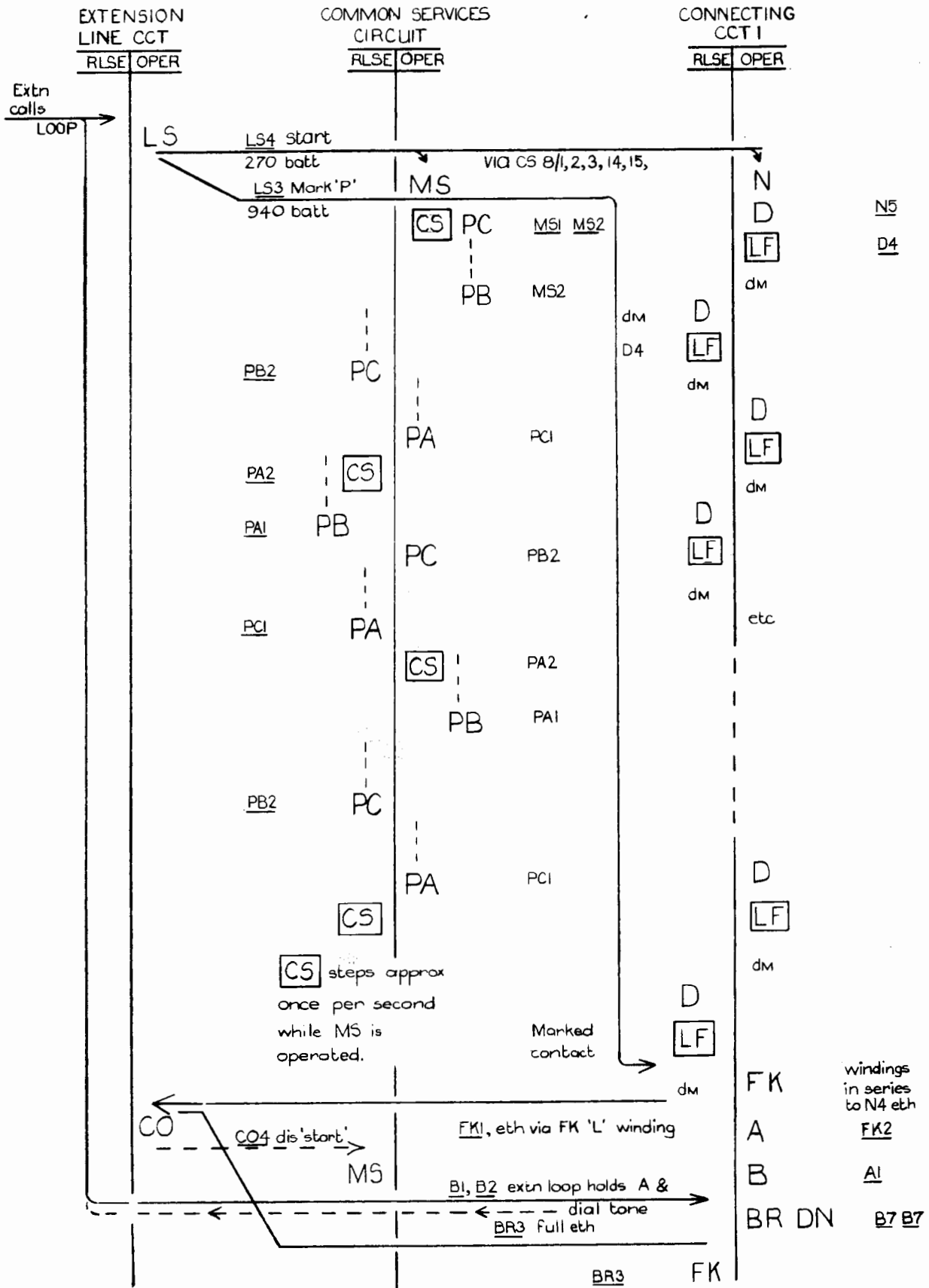


COMMON SERVICES CIRCUIT

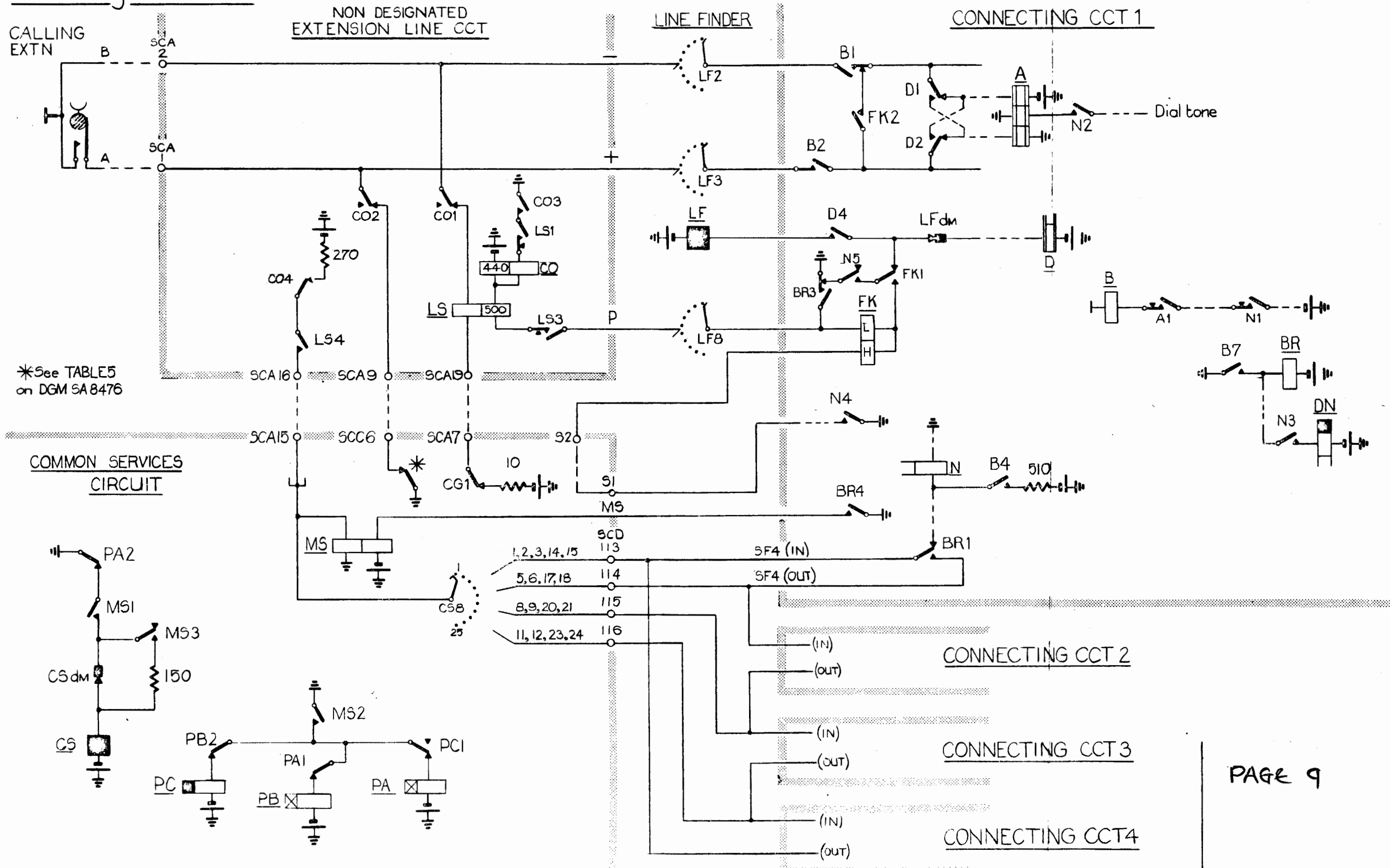
Receives batt 'start' from calling EXTN LINE CCTS — Operation of MS steps CS uniseln at 1 sec intervals — cyclically changes order of choice of CONNECTING CCTS — extends 'start' to CONNECTING CCTS.

CONNECTING CCTS

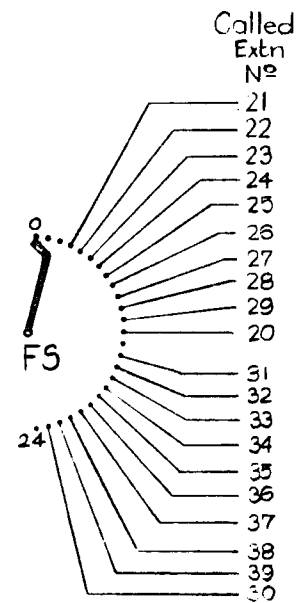
'Start' batt from calling EXTN LINE CCT ops N — if busy, BR1 operated, passes start to next CONNECTING CCTS



Obtaining Dial Tone



Order of Extensions on FS Uniselector Banks



EXTENSION NUMBERS 21 TO 20

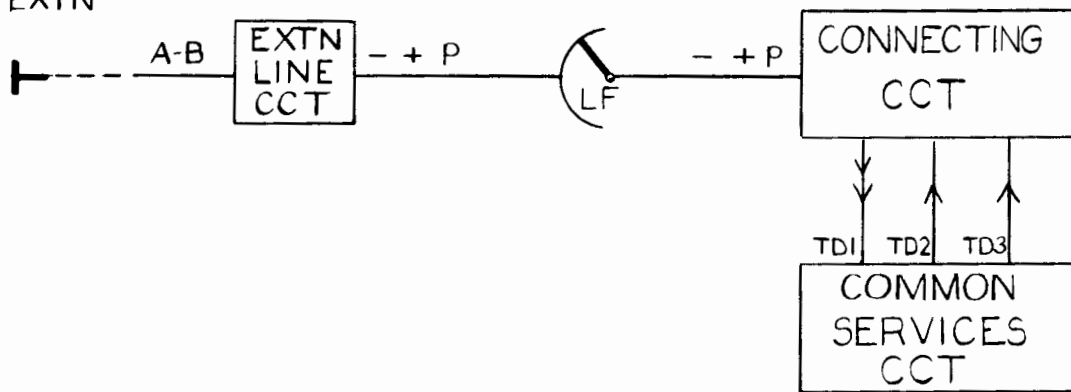
Extension number commencing with digit '2' dialled (ie 21 to 20):
 first digit 2 positions FS wipers on contact 2
 second digit (1 to 0) positions FS wipers between contacts 3 & 2

EXTENSION NUMBERS 31 TO 30

Extension number commencing with digit '3' dialled (ie 31 to 30):
 first digit 3 positions FS wipers on contact 3
 during interdigital pause FS self drives to contact 13
 second digit (1 to 0) positions FS wipers between contacts 14 & 24

PG or Delayed Dialling

CALLING
EXTN



CALLING EXTN

If dialling of any digit is delayed longer than 25-50 seconds dialling is ineffective - caller must clear and start again

EXTN LINE CCT

During O/G call CONNECTING CCT holds both LS & CO relays over P wire — if CONNECTING CCT disconnects P, while extn line still looped, relay LS is released but CO holds to extn loop until extn clears.

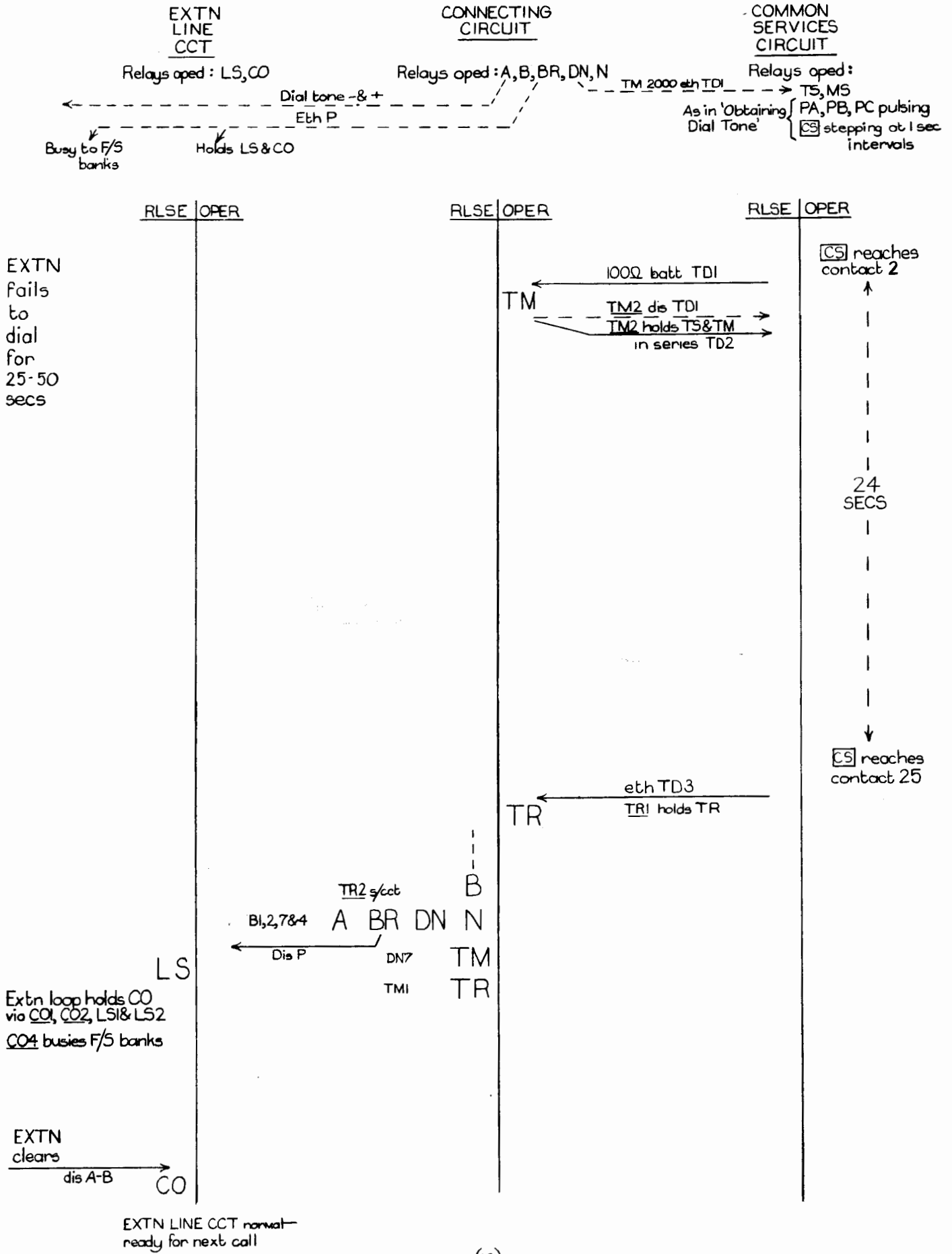
CONNECTING CCT

If first or second digit of wanted extension number is delayed condition on TD1 common keeps COMMON SERVICES CCT running - signal returned on TD2 common indicates start of 24 seconds Time Delay — signal later on TD3 common indicates end of 24 sec Time Delay & force releases CONNECTING CCT, making it available for other calls.

COMMON SERVICES CCT

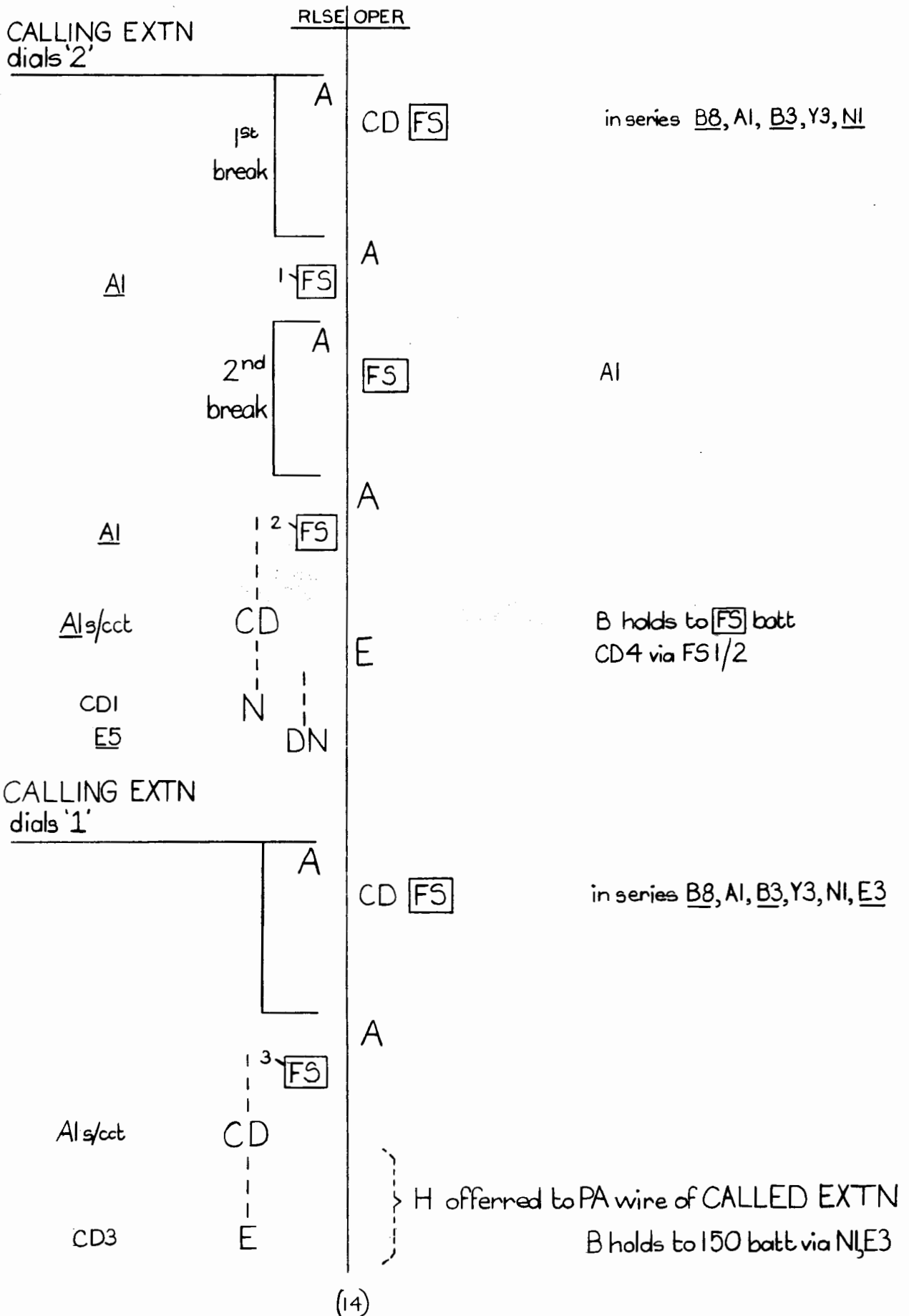
Start condition on TD1 common if CONNECTING CCT seized, but not pulsed — [CS] unselector steps at 1 step per second — beginning of Timing Delay signal given on TD2 common when [CS] on contact 1 — end of Timing Delay signal given on TD3 common when [CS] reaches contact 25.

PG or Delayed Dialling



Dialling Extn 21 (or 22 to 20)

CONNECTING CCT relays operated after seizure : A, B, BR, DN, N,



Testing & Ringing Called Extension

CONNECTING CIRCUIT

RLSE | OPER

CALLED EXTN busy (PA eth)

End of second dialled digit

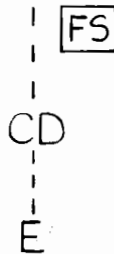


No operation of H (eth PA)

← Busy tone
N2, E1, DN3, H1, Y4, B5

CALLED EXTN spare (PA dis, EP batt)

End of second dialled digit



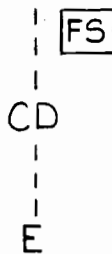
DN

CD2, SC11-10, batt
[no operation of H due to dis PA]

← NU tone
N2, E1, DN3, Y6

DN1 holds DN
[DN7 forced release if call held
see "PG or Delayed Dialling"]

CALLED EXTN free (PA batt)



H

E4, CD3, DN6 to PA batt
H4 busies CALLED EXTN and ops CO&LS

← Ring tone
N2, E1, DN3, H1, F5

→ E6 Ringing current

CALLED EXTN answers

Loop

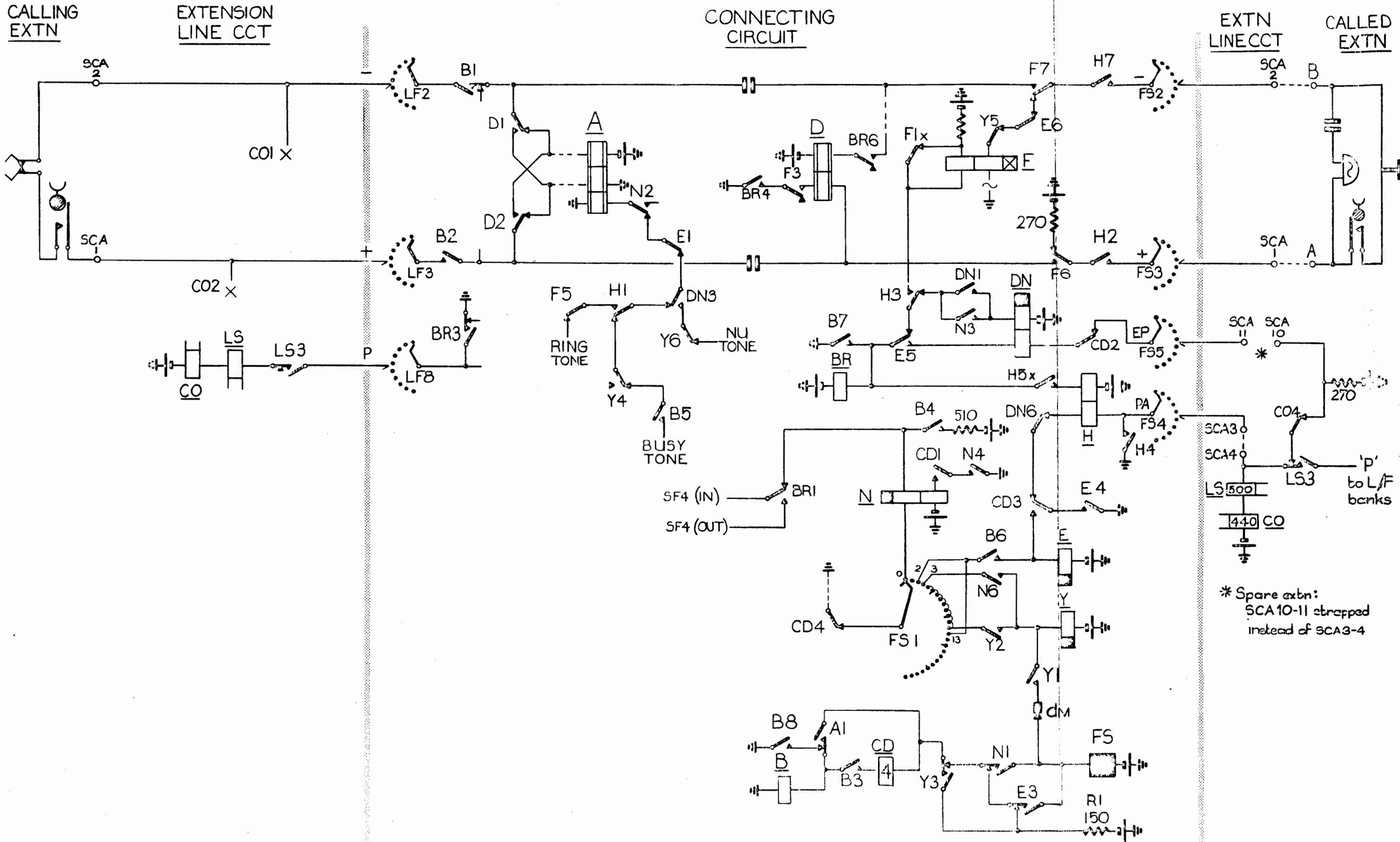
Fic holds F to B7 eth

← Ring tone off E5



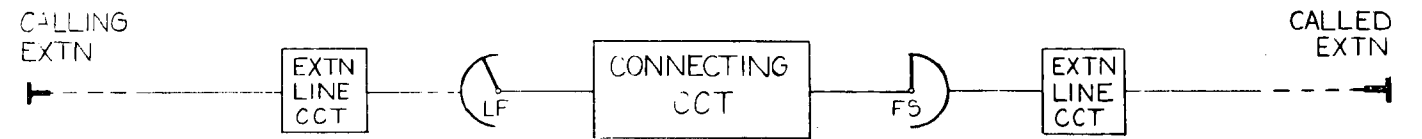
← Reverse current towards caller D1, D2

Dialling, Testing, Ringing and Answering



* Spare extn:
SCA10-11 strapped
instead of SCA3-4

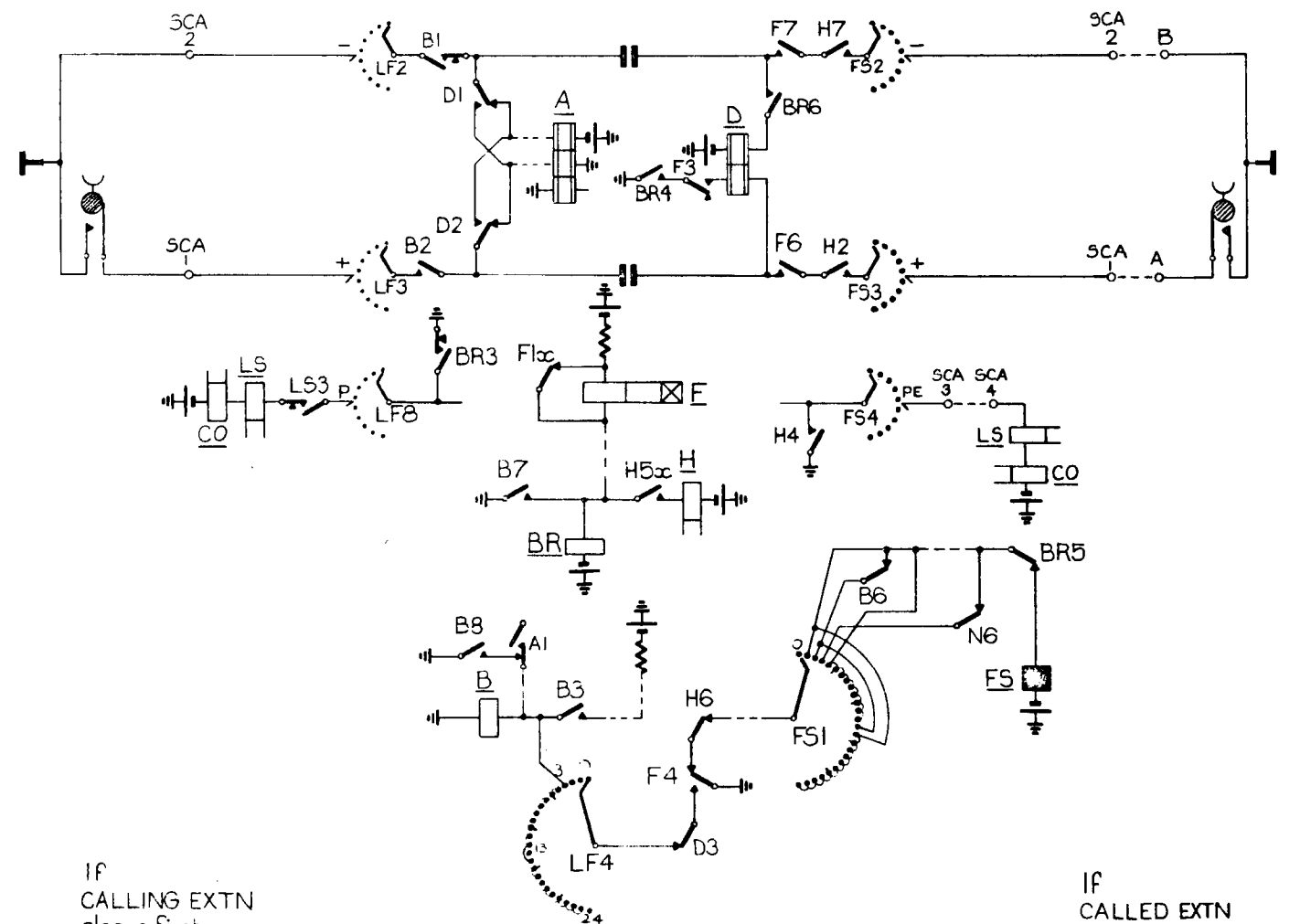
Release at End of Call



EXTN LINE CCT
 Busying & holding eth disconnected when CONNECTING CCT. released by first extn to clear - if associated extn is not first to clear EXTN LINE CCT becomes P.G. until clear received.

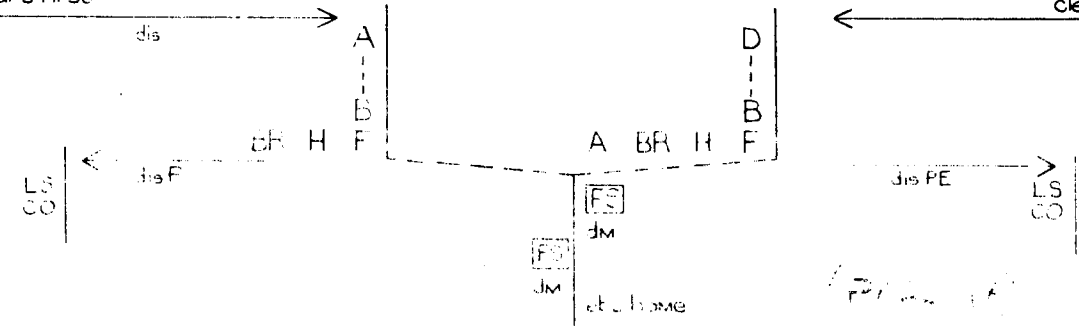
CONNECTING CCT
 When either CALLING or CALLED EXTN clears releases both EXTN LINE CCTS and homes FS

EXTN LINE CCT
 Busying & holding eth disconnected when CONNECTING CCT released by first extn to clear - if associated extn is not first to clear EXTN LINE CCT becomes P.G. until clear received.



IF CALLING EXTN clears first

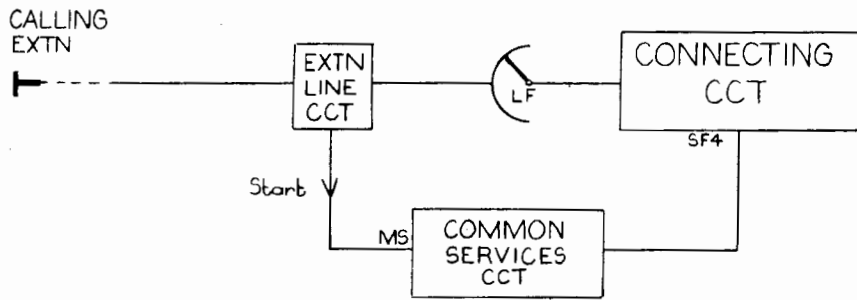
IF CALLED EXTN clears first



OUTGOING EXCHANGE LINE CALLS

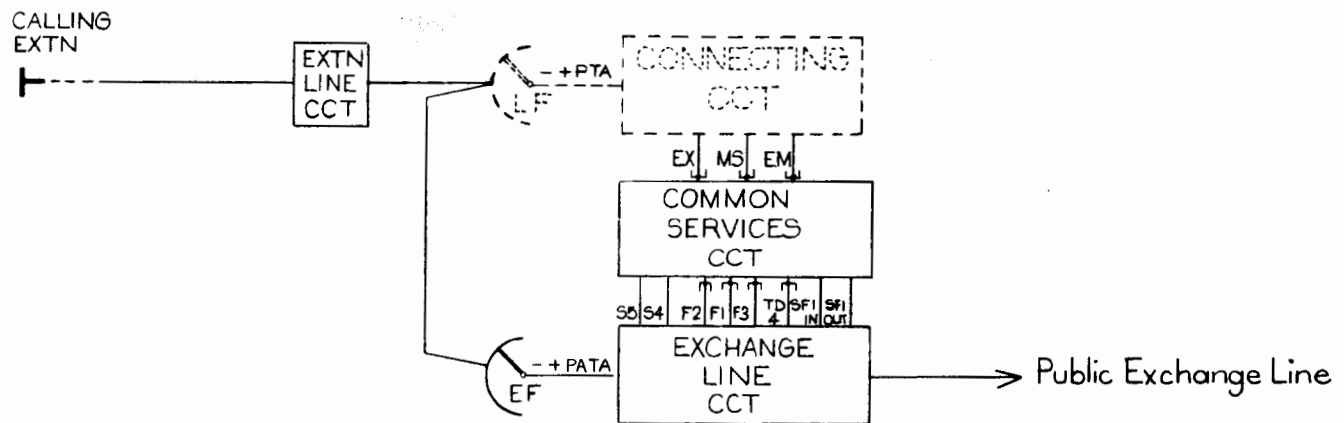
Seizure of Public Exchange Line

Stage 1: Dial Tone from Connecting Circuit



CALLING EXTN
Receives dial tone from CONNECTING CCT as in 'EXTN TO EXTN CALLS'

Stage 2: Seizure of Exchange Line Circuit



CALLING EXTN
Presses button to obtain Public Exchange Line — eths loop to CONNECTING CCT

CONNECTING CCT
Eth's MS lead to keep COMMON SERVICES CCT running — on receiving button signal from CALLING EXTN puts demand for Public Exchange Line on EX common — connects EM common to TA lead to mark CALLING EXTN'S position on LF/EF banks — is fully released when EF finder lines up with LF finder.

COMMON SERVICES CCT
Uniselector kept running by eth on MS common — on receiving demand on EX common connects start to EXCH LINE CCTS start chain (SFI-IN/OUT) and connects S4 to S5 — button EM lead to CONNECTING CCT

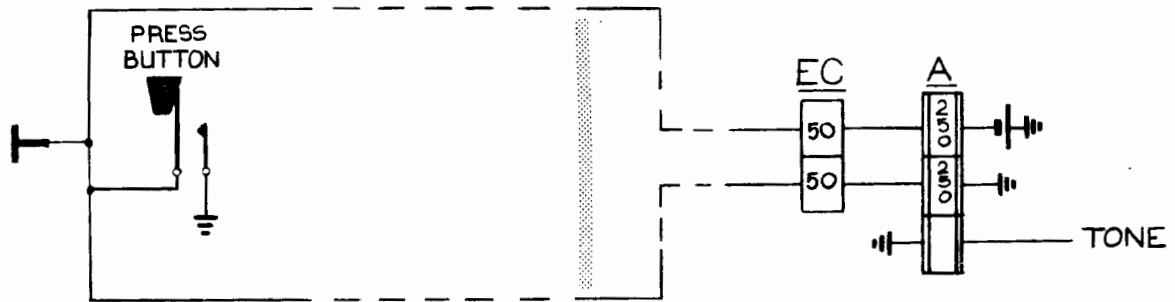
EXCHANGE LINE CCT — On receiving start from COMMON SERVICES CCT drives EF finder to position marked by LF finder — causes release of CONNECTING CCT — seizes Public Exch. Line ready for call.

Telephone Press Button Signaling

CALLING

EXTN

CONNECTING CCT



PRESS BUTTON

Ekhs extn loop — shunts current from one winding of EC and A — A holds over one winding — EC (not operated by loop current due to opposing windings) operates.

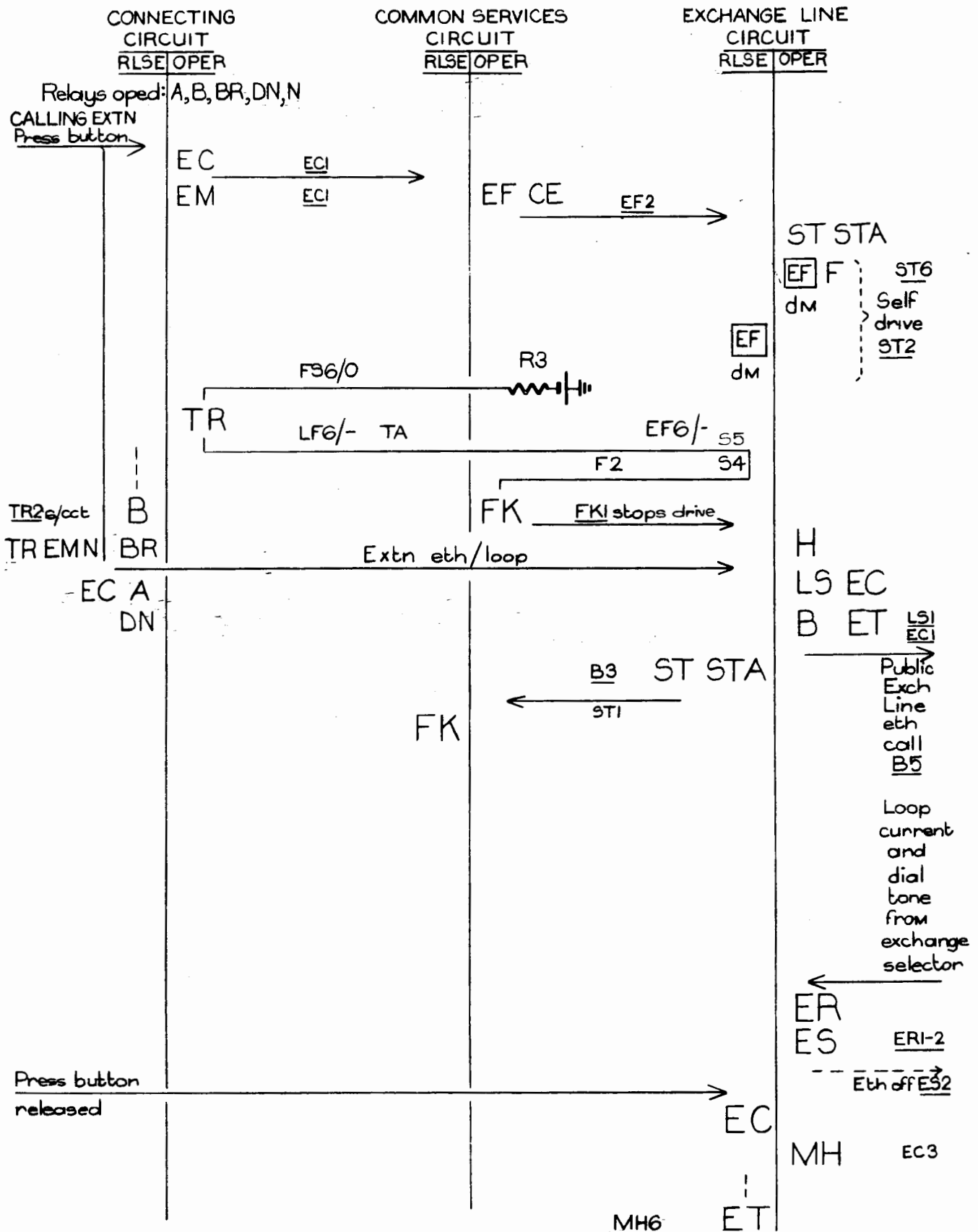
EC RELAY

EC = Exchange Call — not operated by loop current — windings connected to oppose. Operated by current in one winding when extn loop earthed.

A RELAY

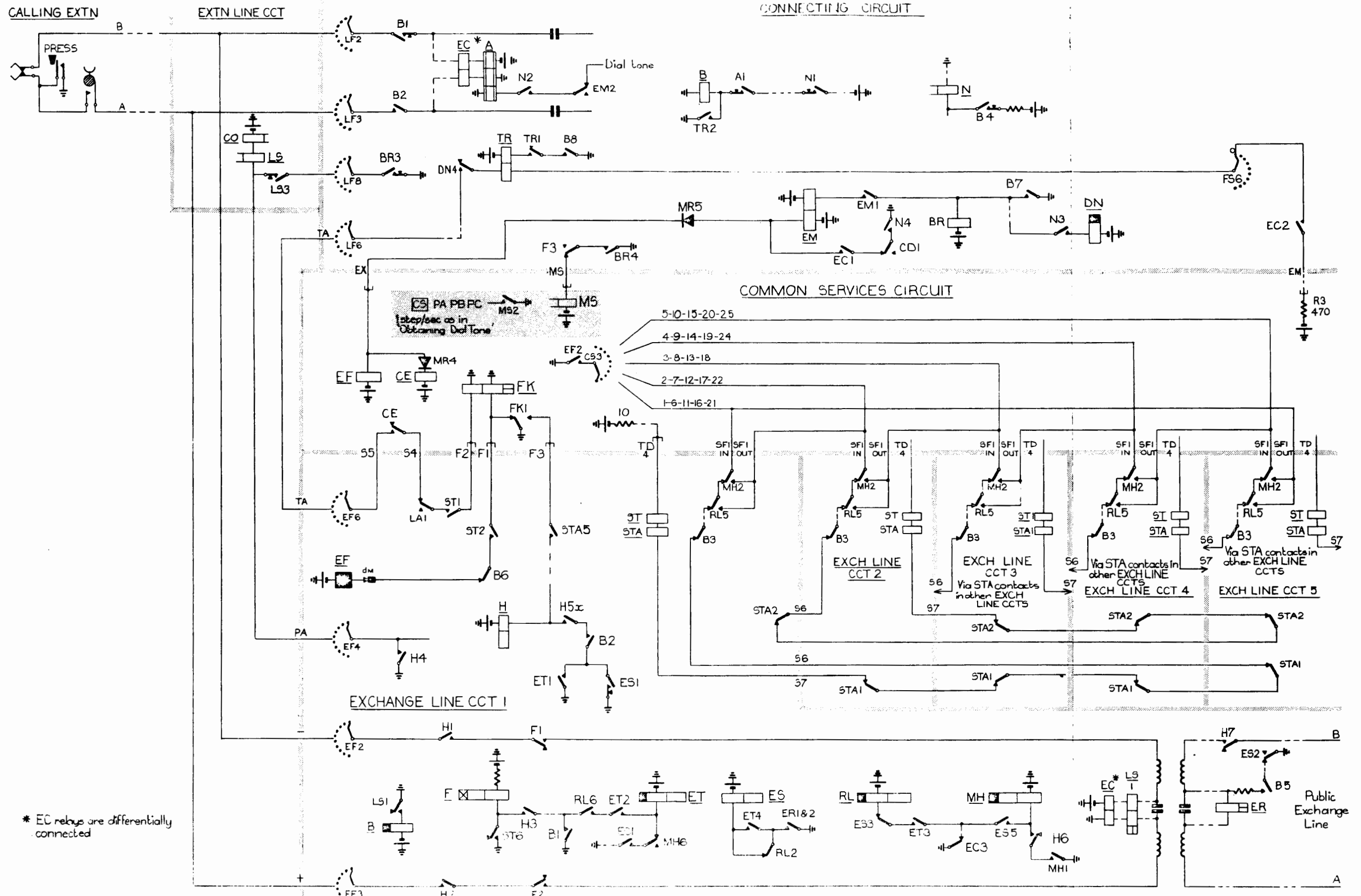
Operated by loop current, or current in one winding only.

Seizure of Public Exchange Line



If extn releases press button after seizure of EXCHANGE LINE CIRCUIT but before public exchange dial tone received-EC3 ops RL-RL6 holds ET- ET1 holds H- H7 maintains eth call until ER & ES operate.

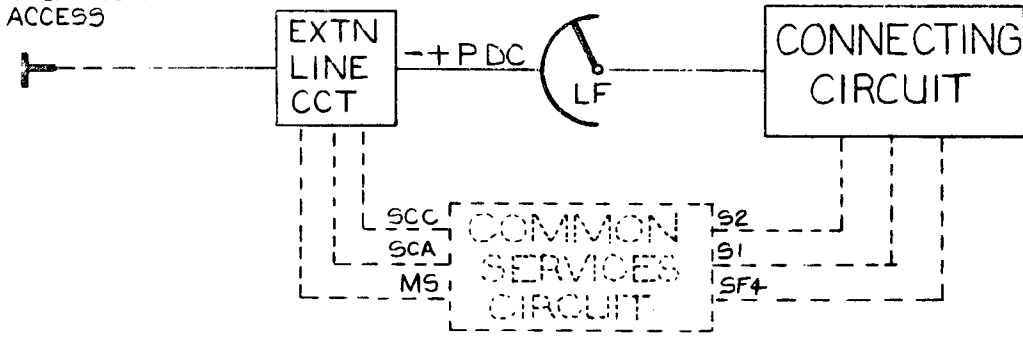
Seizure of Public Exchange Line



* EC relays are differentially connected

Extension Barred Public Exchange Access

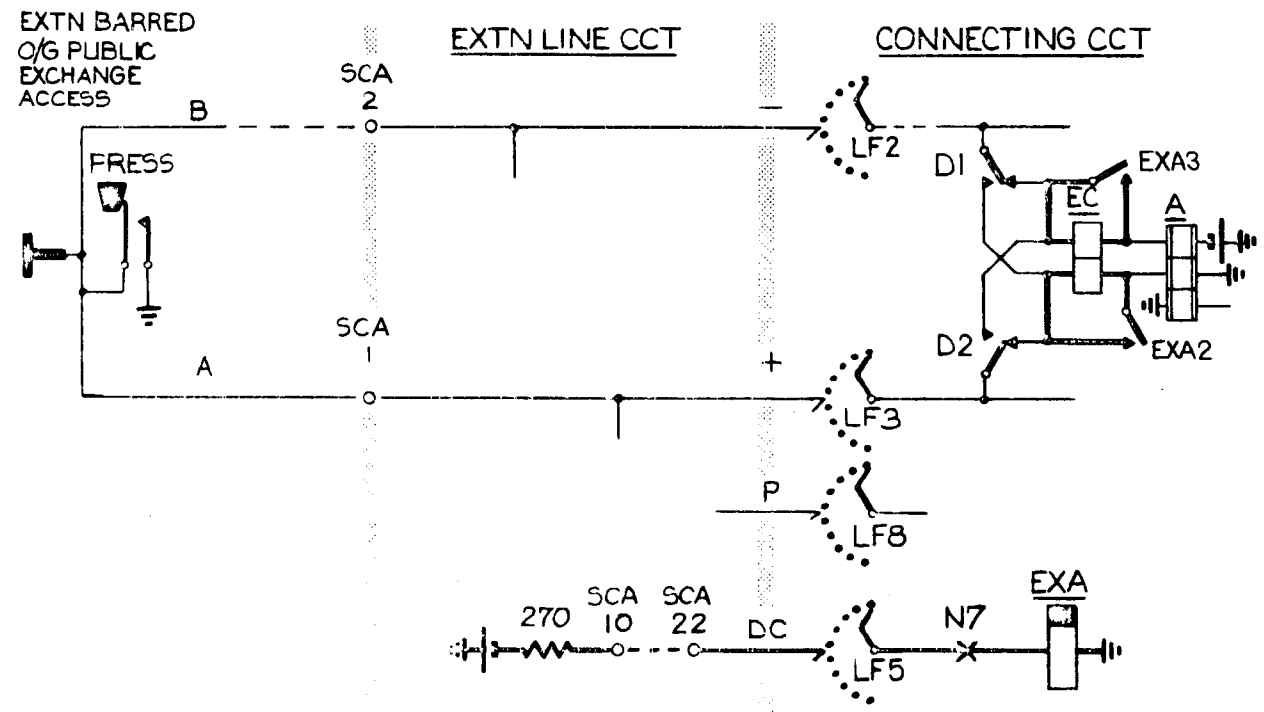
EXTN
BARRED
O/G PUBLIC
EXCHANGE
ACCESS



EXTN LINE CCT
Barring of access to public exchange is done by battery signal on DC lead to CONNECTING CIRCUIT

CONNECTING CIRCUIT
Presence of public exchange access barring signal on DC lead renders extn press button signals ineffective

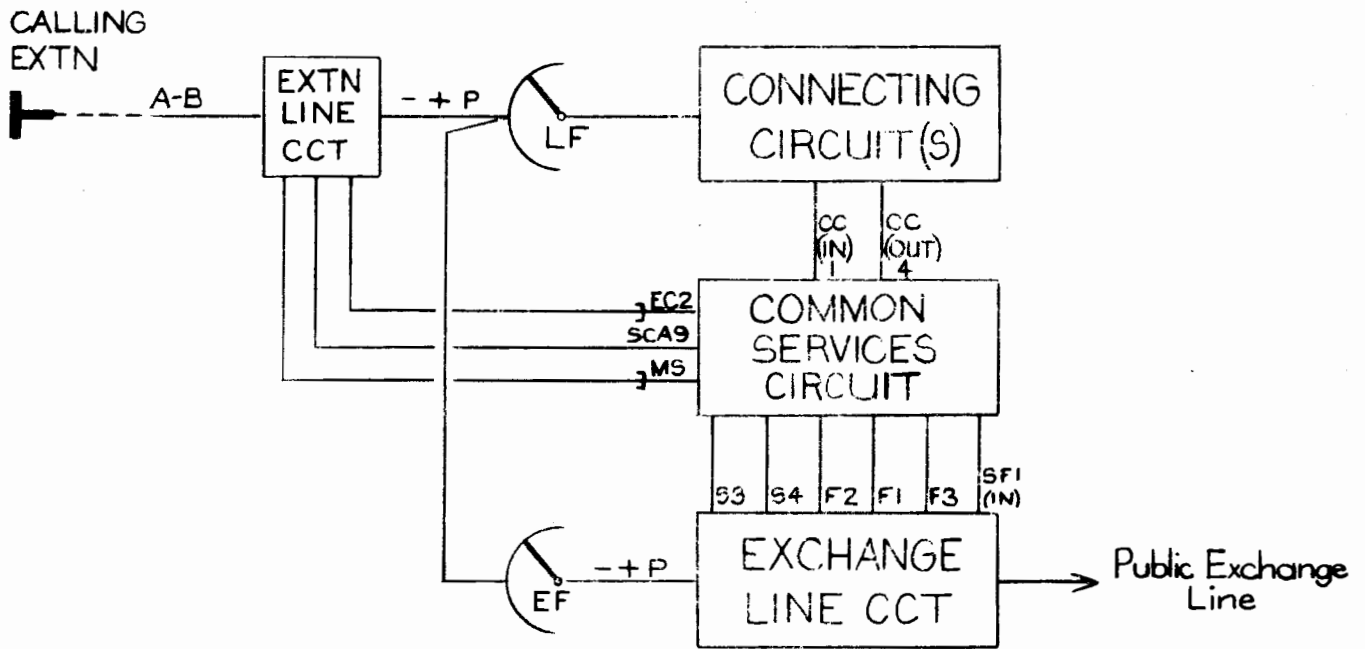
EXTN BARRED
O/G PUBLIC
EXCHANGE
ACCESS



Strap SCA 10-22 in EXTN LINE CCT operates EXA on seizure of CONNECTING CCT

EXA 2 & 3 s/cct relay EC preventing its operation to extn press button signals & preventing connexion to an EXCHLINE CCT [see "Seizure of Public Exchange Line"]

Seizure of Public Exchange Line with all Connecting Circuits Busy



CALLING EXTN
Even when dial tone not received on lifting handset, due to all CONNECTING CCTS busy, caller may PRESS button for Public Exchange Line.

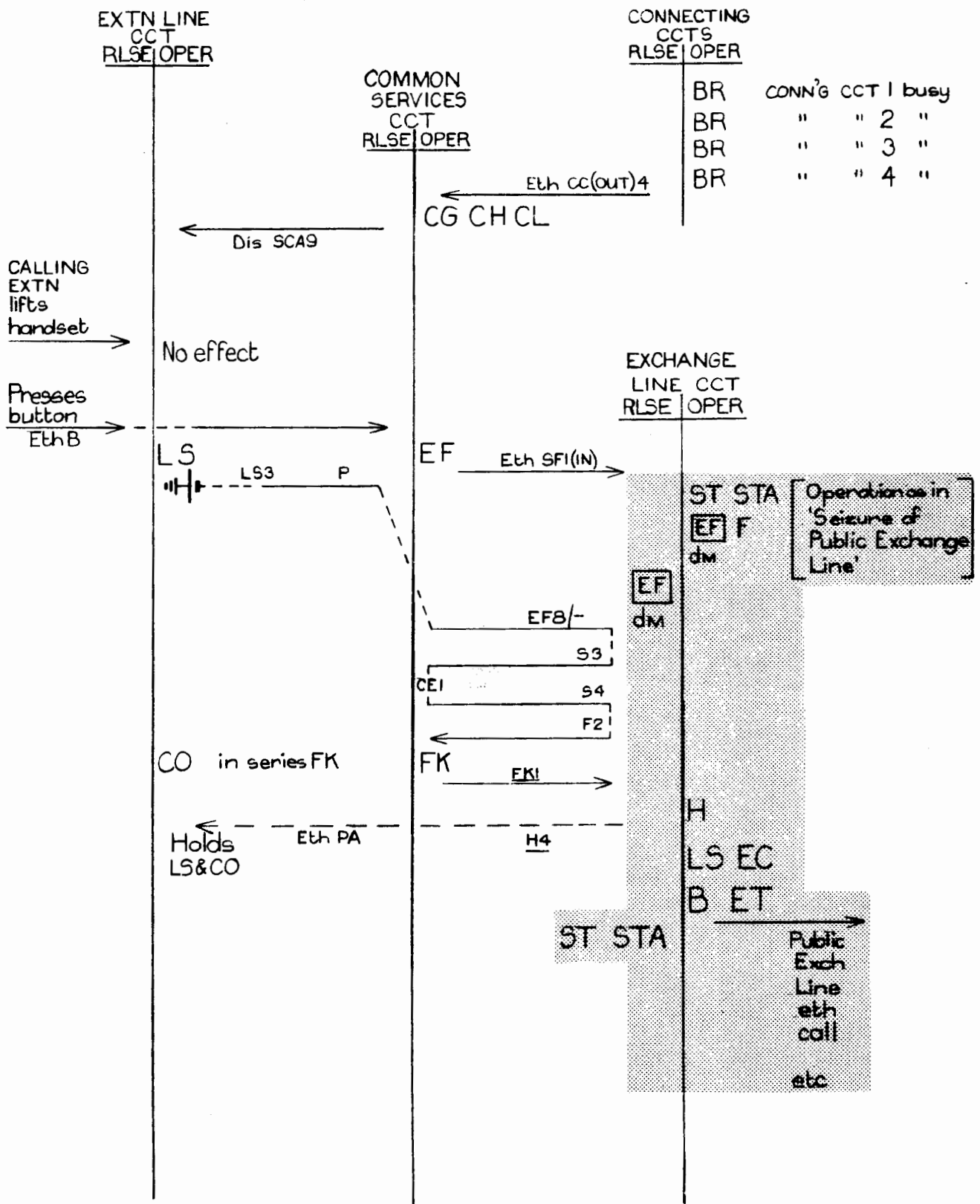
EXTN LINE CCT
Inoperative to extn loop due to dis on SCA9 - responds to extn PRESS button signal, which is also passed over EC2 lead to COMMON SERVICES CCT - provides marking for EF finder on P wire.

CONNECTING CIRCUIT(S)
Leads CC(IN)1 and CC(OUT)4 looped as signal to COMMON SERVICES CIRCUIT that all CONNECTING CIRCUITS are busy

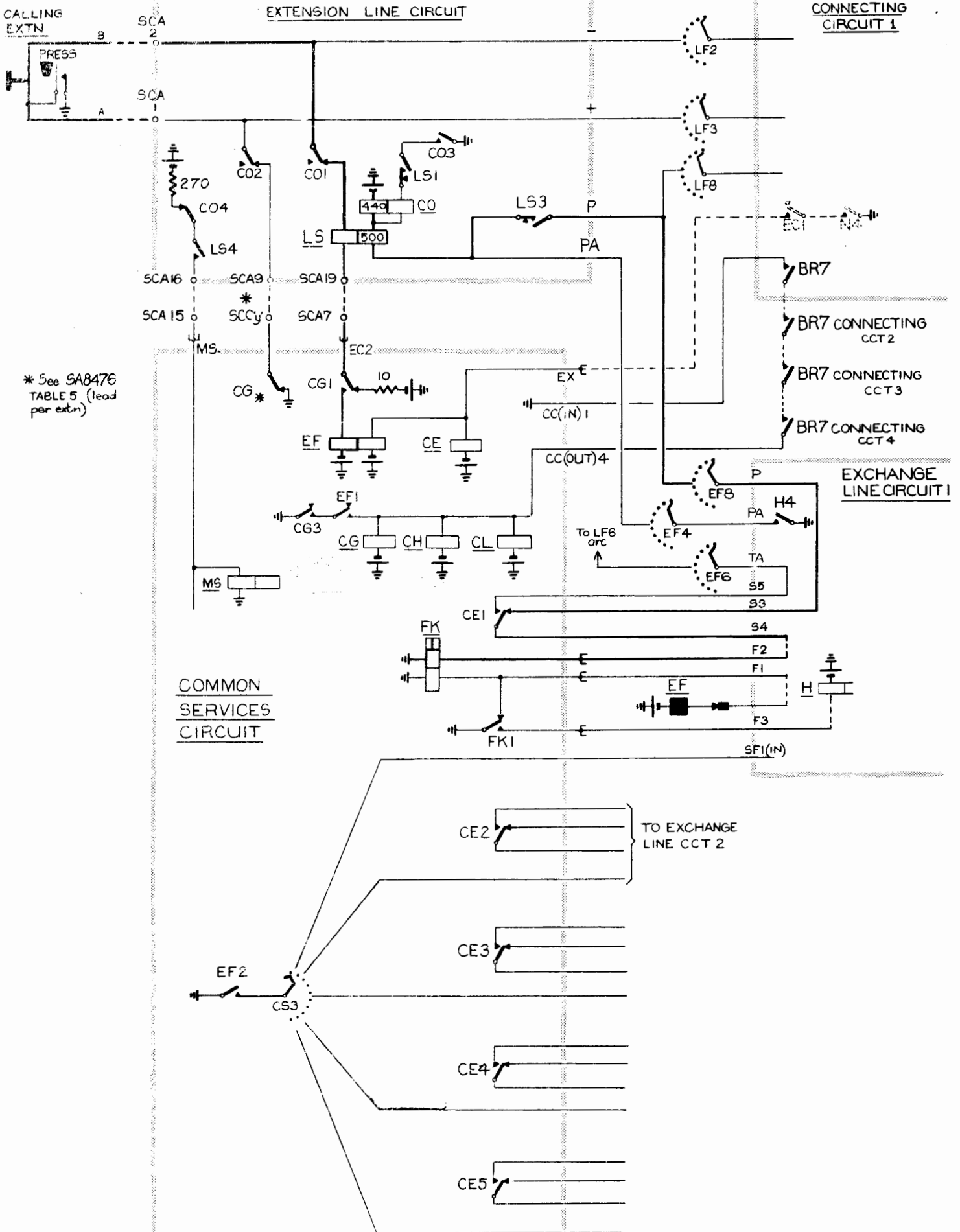
COMMON SERVICES CIRCUIT
CC(IN)1 & CC(OUT)4 looped indicates all CONNECTING CCTS busy - disconnects SCA9 lead to EXTN LINE CCT(S) - prepares EC2 lead to receive PRESS button signals from CALLING EXTNS - when signal received allocates EXCHANGE LINE CCT via start chain SFI(IN) - connects S3 to S4 so that P wire used to position EF finder on CALLING EXTN'S bank position

EXCHANGE LINE CCT
Receives start from COMMON SERVICES CIRCUIT over SFI(IN) [as in Seizure of Public Exchange line] however S4 connected to S3 & EF finder positioned over P wire.

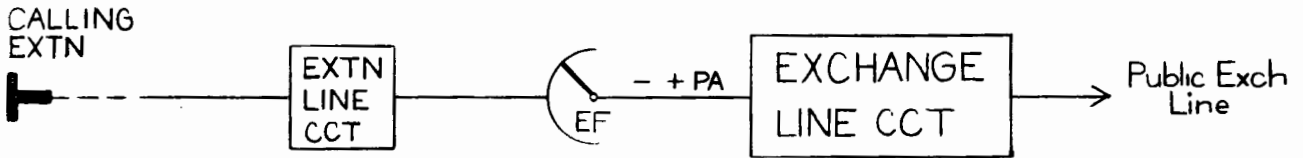
Seizure of Public Exchange Line with all Connecting Circuits Busy



Seizure of Public Exchange Line with all Connecting Circuits Busy



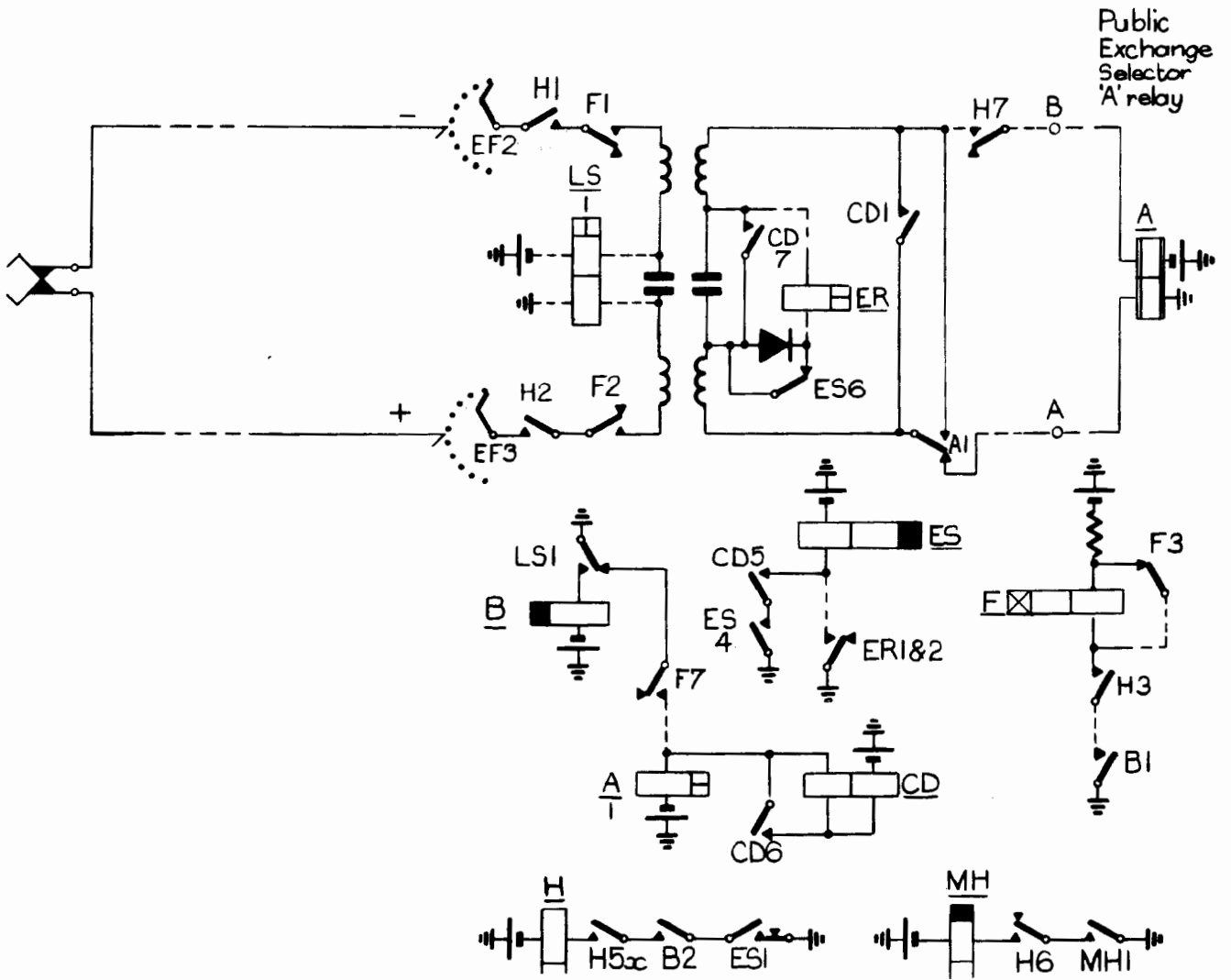
Dialling to Public Exchange



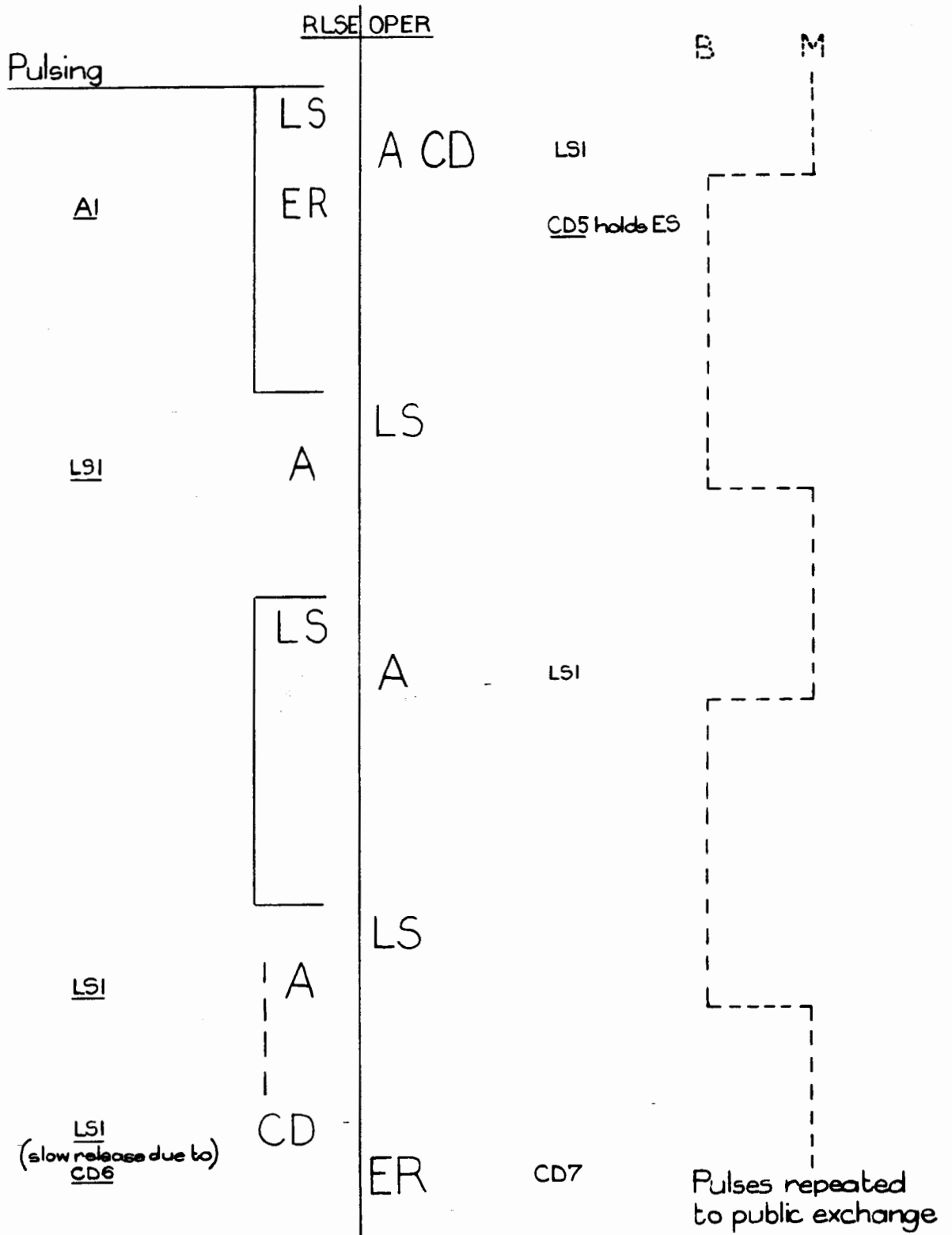
CALLING EXTENSION
Continues dialling on hearing public exchange line dial tone.

EXTN LINE CCT
CO&LS relays held over PA lead.

EXCHANGE LINE CCT
Detects dial pulses - repeat dial pulses to exchange line with zero resistance make periods.



Dialling to Public Exchange

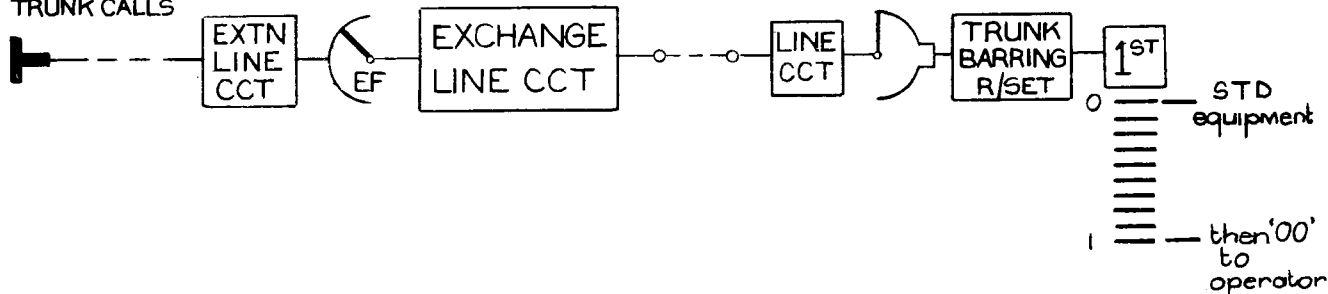


Trunk Barring

P.A.B.X.6

PUBLIC EXCHANGE

CALLING
EXTN
BARRED
TRUNK CALLS



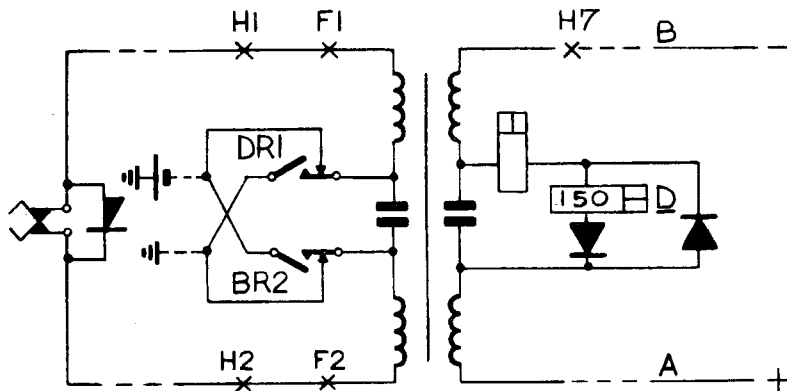
CALLING EXTN BARRED TRUNK CALLS
Presses button to get public exchange line — dials '0' if making STD call, or '10' if making trunk call via operator. Dialling only effective while line conditions normal — dial short circuited if line conditions reversed.

EXCHANGE LINE CCT
Provides normal C.B. conditions towards CALLING EXTN unless reverse C.B. conditions received from PUBLIC EXCHANGE, then reverses conditions towards CALLING EXTN.

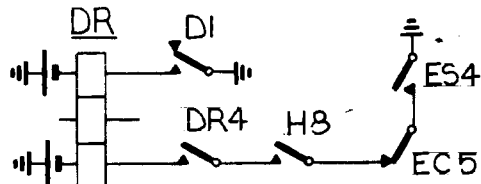
TRUNK BARRING R/SET
Monitors first digit/s dialled into PUBLIC EXCHANGE — if first digit '0' or '1' followed by '0', reverses line conditions towards caller.

EXCHANGE LINE CCT

Relays oped at end of dialled digits : F, H, LS, B, ER, ES, MH



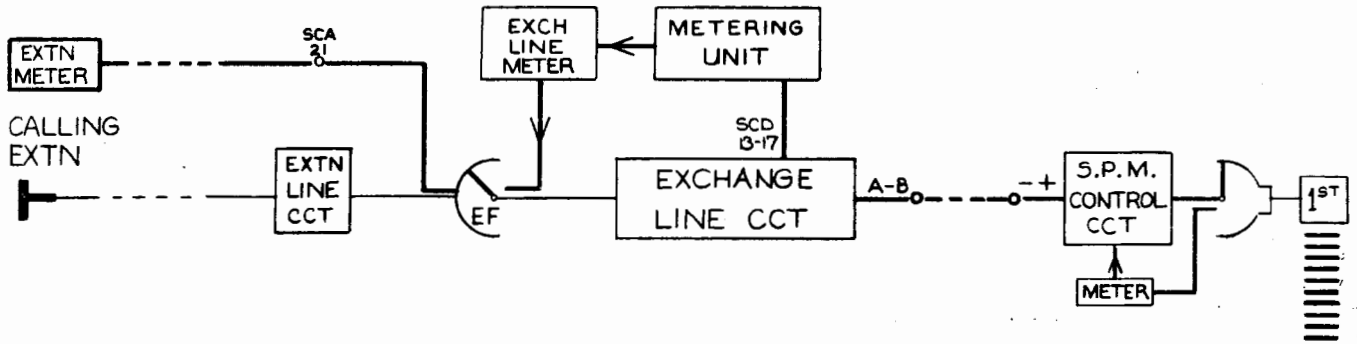
Normally batt on B wire, eth on A wire from selector, but if first digit/s '0' or '10' dialled TRUNK BARRING R/SET crosses - & + wires returning batt on A wire & eth on B wire



Subscribers Private Metering

P.A.B.X. 6

PUBLIC EXCHANGE



EXTN METER
Resettable — provides extn with call charge information.

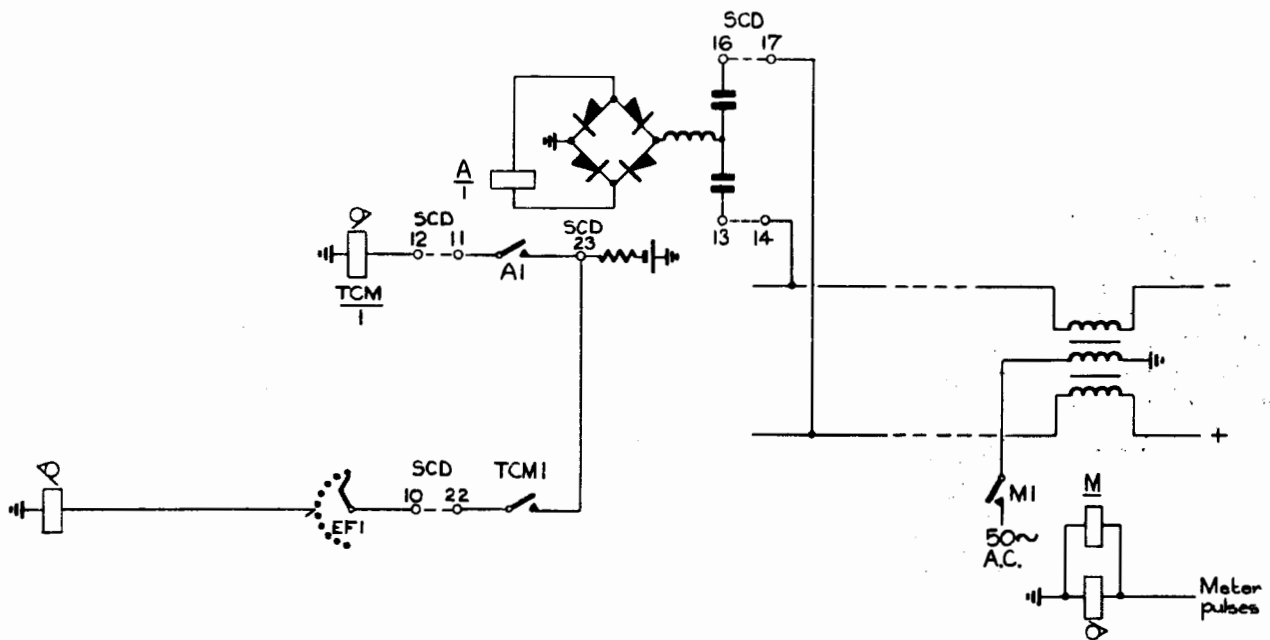
EXCH LINE METER
Total Calls Meter (TCM) registers total meter pulses incurred on exchange line by Q/G call/s (if required)

METERING UNIT
Connected to EXCHANGE LINE CCT if sub's private metering required — converts 50 \sim A.C. phantom line signals to D.C. meter pulses

EXCHANGE LINE CCT
Straps SCD 13-14 & 16-17 connect line side of transmission bridge to METERING UNIT if sub's private metering required.

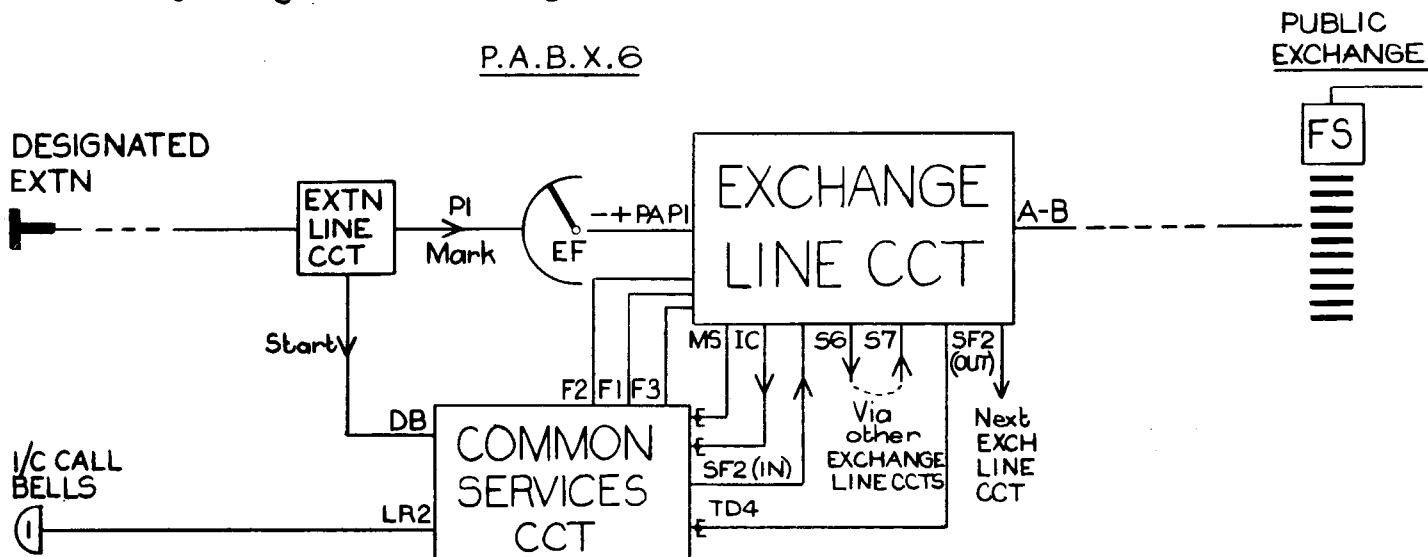
SUBS PRIVATE METER CONTROL CCT
Repeats meter pulses as 50 \sim A.C. signals over line phantom with earth return — no interference with conversation.

METER
Registers total fees for calls made on this line — data for customer's account



INCOMING EXCHANGE LINE CALLS

Incoming Ring & Answer by Designated Extension



DESIGNATED EXTN

Answers incoming PUBLIC EXCHANGE line call by lifting handset when I/C CALL BELLS ring

EXCHANGE LINE CCT

Seized by PUBLIC EXCHANGE ringing—signals Incoming Call to COMMON SERVICES CCT on IC lead. Receives 'start' on SF2 (IN) lead when DESIGNATED EXTN lifts handset—EF Finder drives to connect EXCHANGE LINE CCT to answering DESIGNATED EXTN—COMMON SERVICES CCT controls EF driving & switching over leads F1,2&3—chain cct S6-S7 prevents simultaneous drive of two EF finders—start passed on via SF2 (OUT) if this EXCH LINE CCT is not the one with a waiting I/C call.

FINAL SELECTOR

Ringng conditions:
eth ringng on B wire
return batt " A "
Ringng tripped by loc
Speaking conditions:
batt on B wire
eth " A "

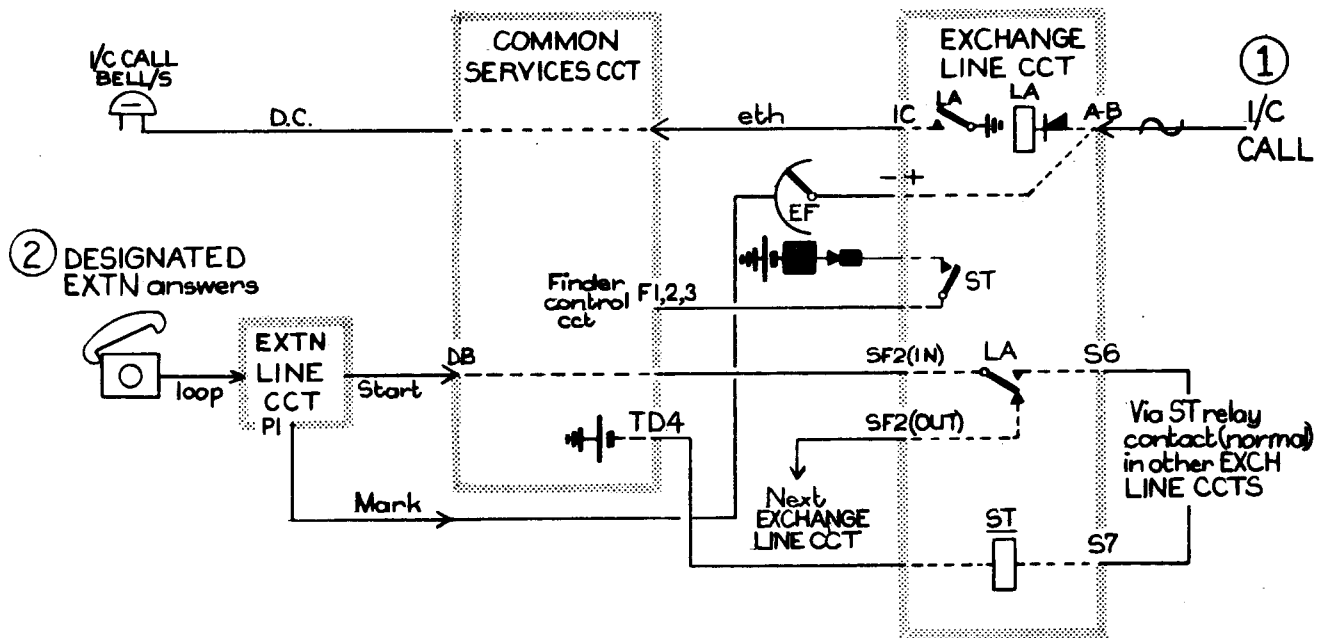
I/C CALL BELLS

Rung by COMMON SERVICES CCT when signal on IC lead from EXCHANGE LINE CCT/S indicates incoming call/s awaiting answer

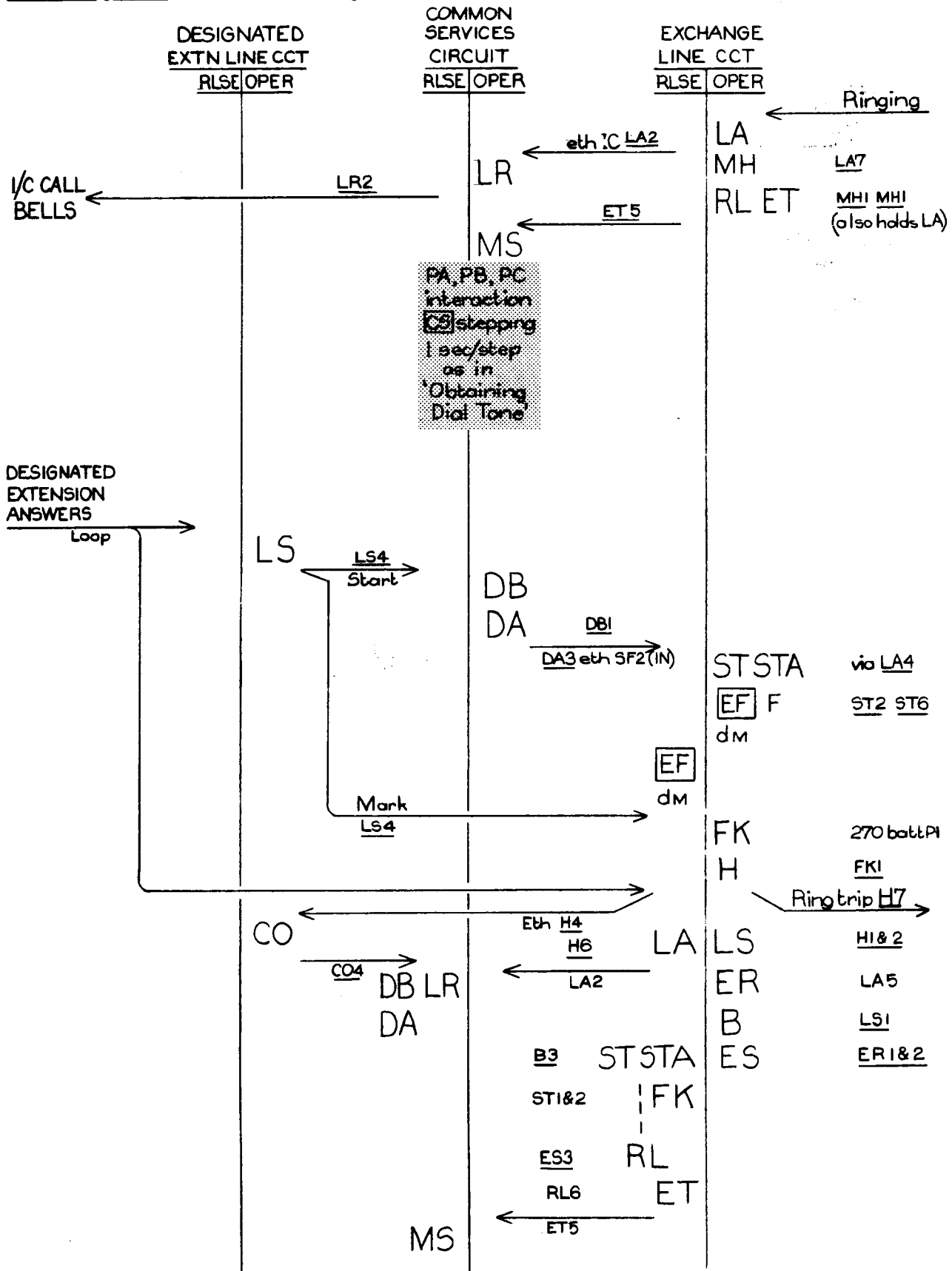
COMMON SERVICES CCT

Started over MS lead—rings I/C CALL BELLS when signal received on IC lead from EXCHANGE LINE CCT/S.
Receives 'start' from EXTN LINE CCT when DESIGNATED EXTN handset lifted—passes 'start' to waiting EXCHANGE LINE CCT over SF2 (IN) lead—controls EF finder over F1,2&3 leads.

Incoming Ring & Answer by Designated Extension



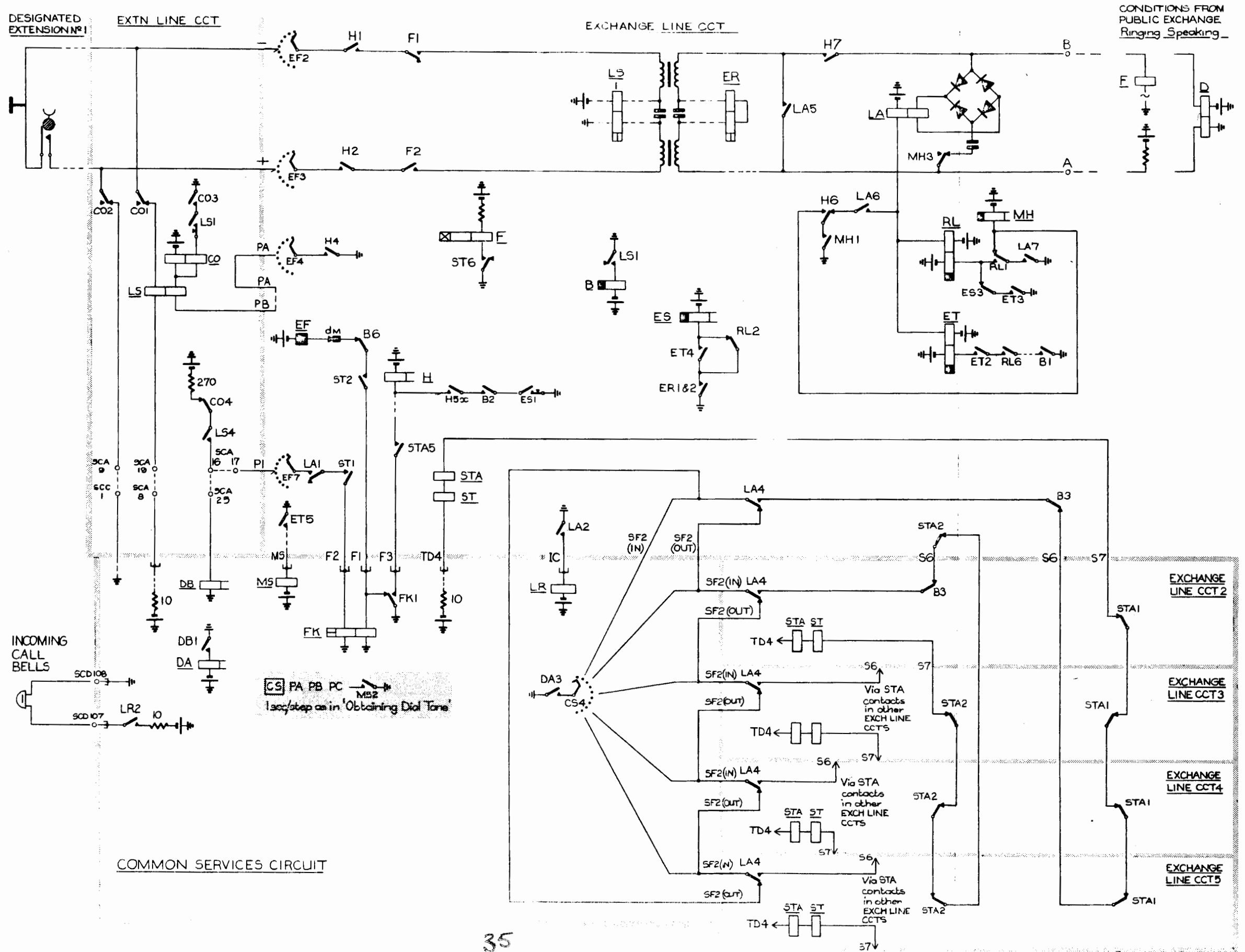
Incoming Ring & Answer by Designated Extension



Relays operated:-
LS, CO

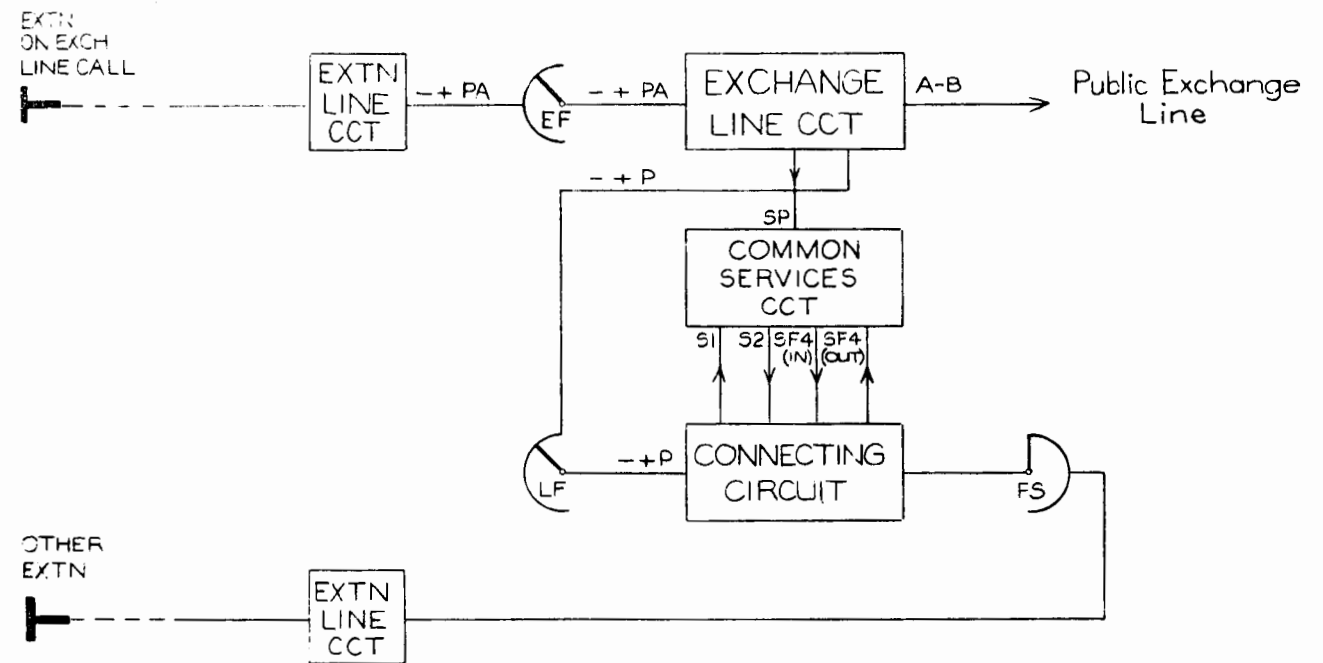
LS, B, ER, ES, F, H, M & MF*
*see 'POWER FAULT'

Incoming Ring & Answer by Designated Extension



ENQUIRY CALL

Enquiry of Another Extension by Extension on Exchange Line Call



EXTN ON EXCH LINE CALL
 Makes enquiry of ANOTHER EXTN by :
 asking Public Exchange call to wait
 pressing tele button & obtaining dial tone from CONNECTING CIRCUIT
 dialling extn number required.
 After enquiry reverts to Public Exch call by pressing button again

EXCHANGE LINE CCT
 On first enquiry button signal:
 holds Public Exchange Line call
 marks its position on LF finder P bank
 demands CONNECTING CIRCUIT over SP lead to COMMON SERVICES CCT
 diverts extn speech path from Public Exch Line to CONNECTING CIRCUIT
 repeats dialled digits to CONNECTING CIRCUIT
 On second enquiry button signal:
 releases CONNECTING CIRCUIT and OTHER EXTN
 reconnects EXTN to EXCH LINE CALL

COMMON SERVICES CCT
 Receives demand for CONNECTING CCT on SP lead from EXCHANGE LINE CCT — cyclically changes order of choice of CONNECTING CIRCUITS — extends demand to CONNECTING CCT over SF4(IN) lead — leads S1 & S2 ensure only one finder drives at any one time.

CONNECTING CIRCUIT
 Receives demand from COMMON SERVICES CCT on SF4(IN) lead — if busy, returns demand on SF4(OUT) lead for extension to next CONNECTING CIRCUIT — if free, instructs LF, via S1 & S2 leads through COMMON SERVICES CCT, to drive to marked EXCHANGE LINE CCT — dial tone indicates readiness of CONNECTING CIRCUIT to receive required extension number

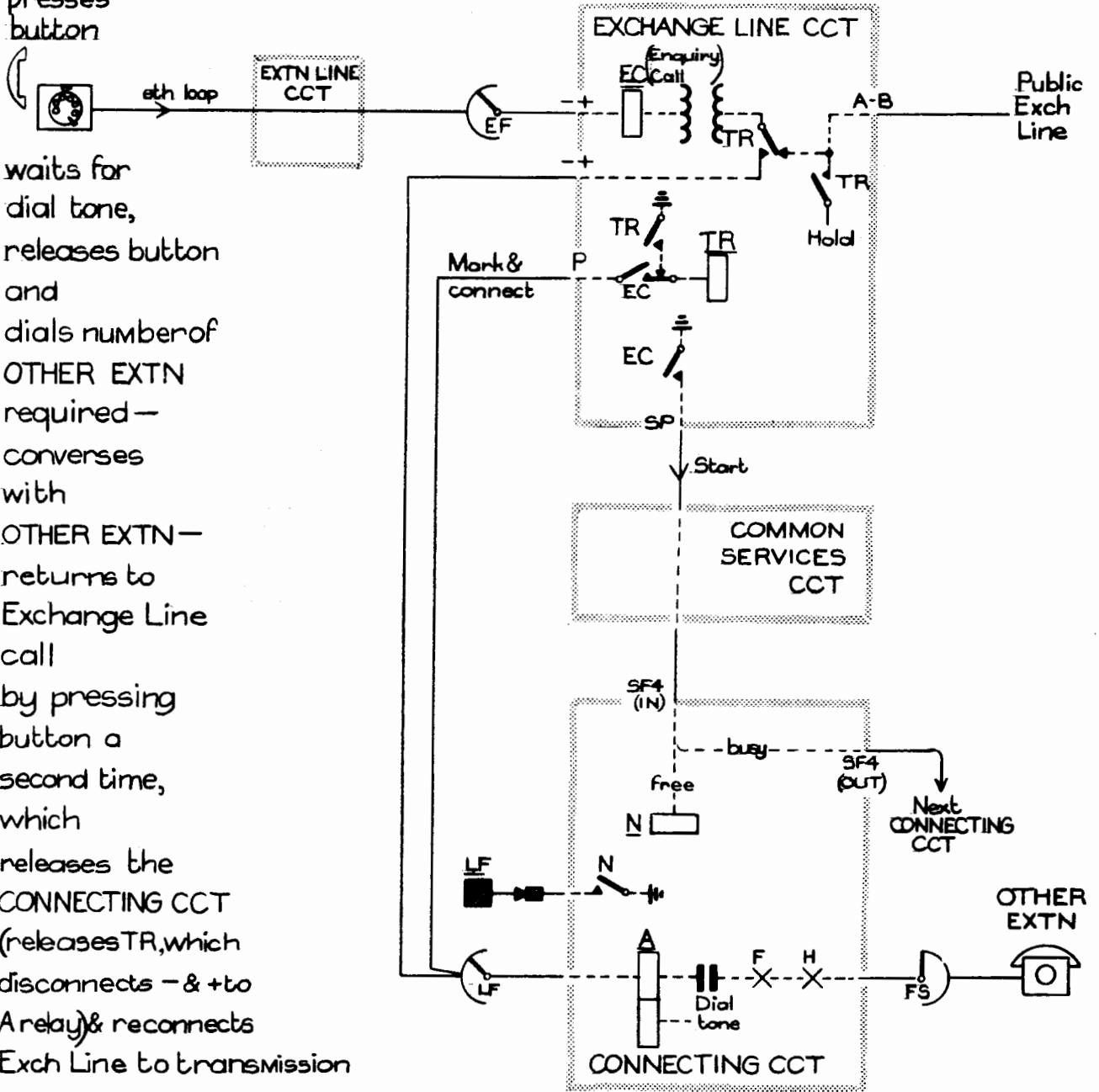
Enquiry of Another Extension by Extension on Exchange Line Call

EXTENSION
ON EXCHANGE

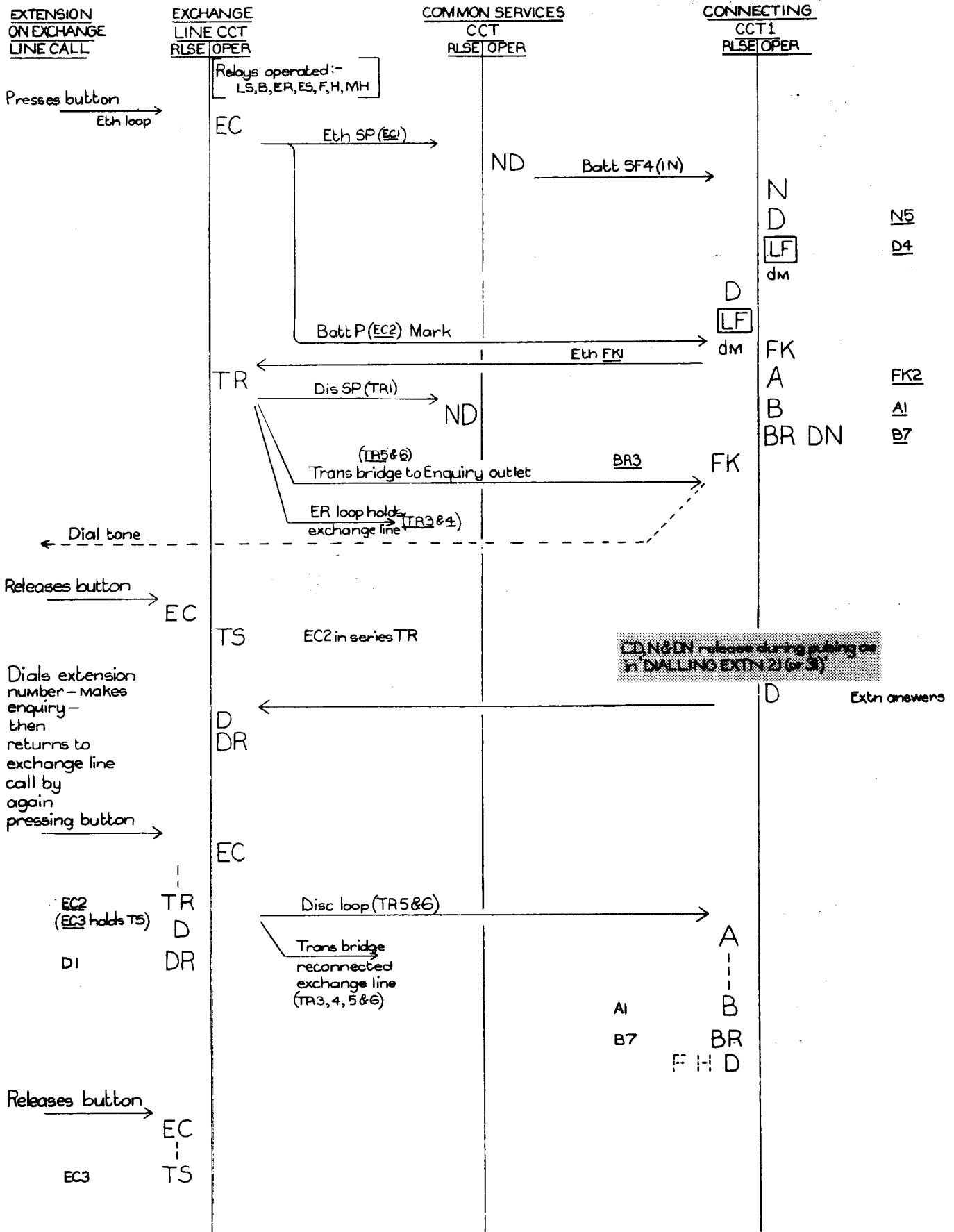
LINE CALL
presses
button

waits for
dial tone,
releases button
and
dials number of
OTHER EXTN
required -
converses
with
OTHER EXTN -
returns to
Exchange Line
call

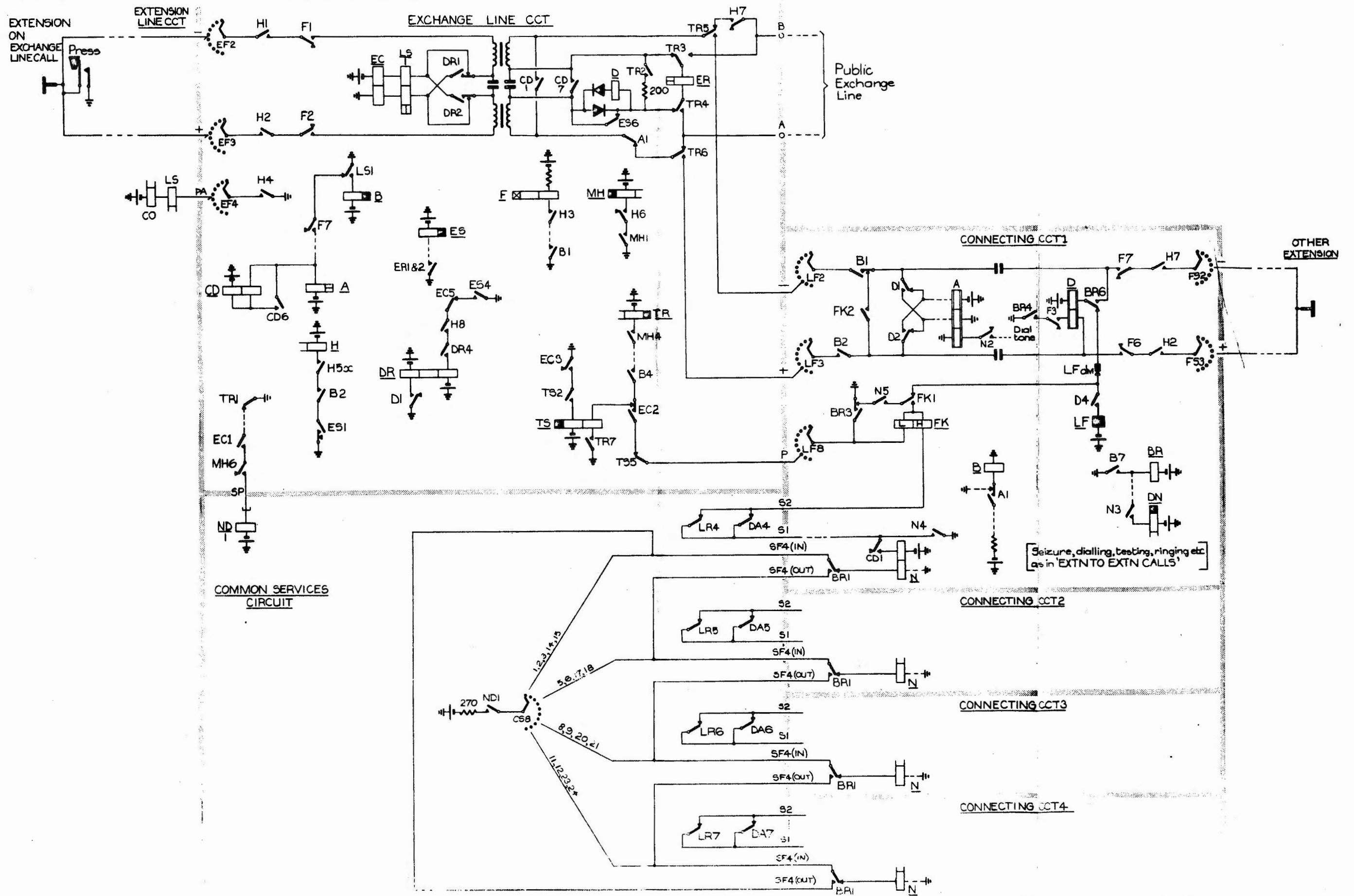
by pressing
button a
second time,
which
releases the
CONNECTING CCT
(releases TR, which
disconnects - & + to
A relay) & reconnects
Exch Line to transmission
bridge of EXCH LINE CCT



Enquiry of Another Extension by Extension on Exchange Line Call

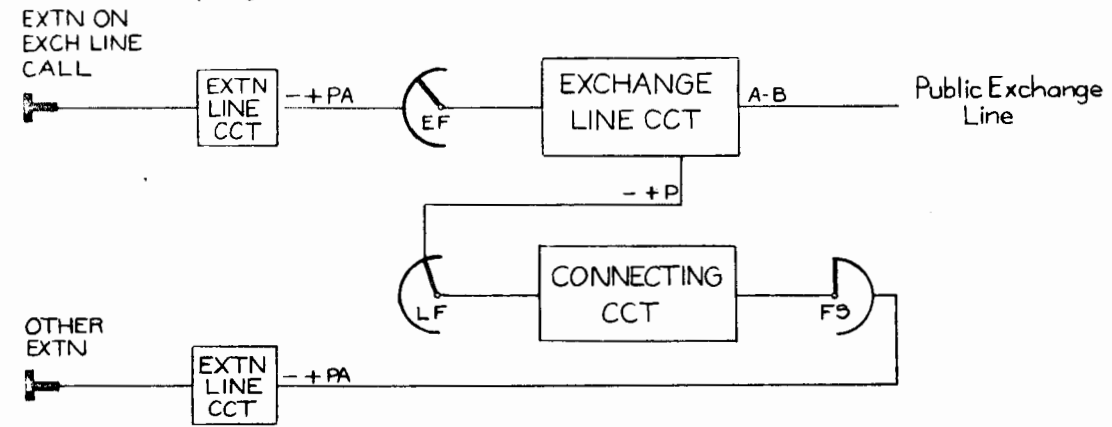


Enquiry of Another Extension by Extension on Exchange Line Call



Transfer of Exchange Line Call to Another Extension

Stage 1 - Enquiry



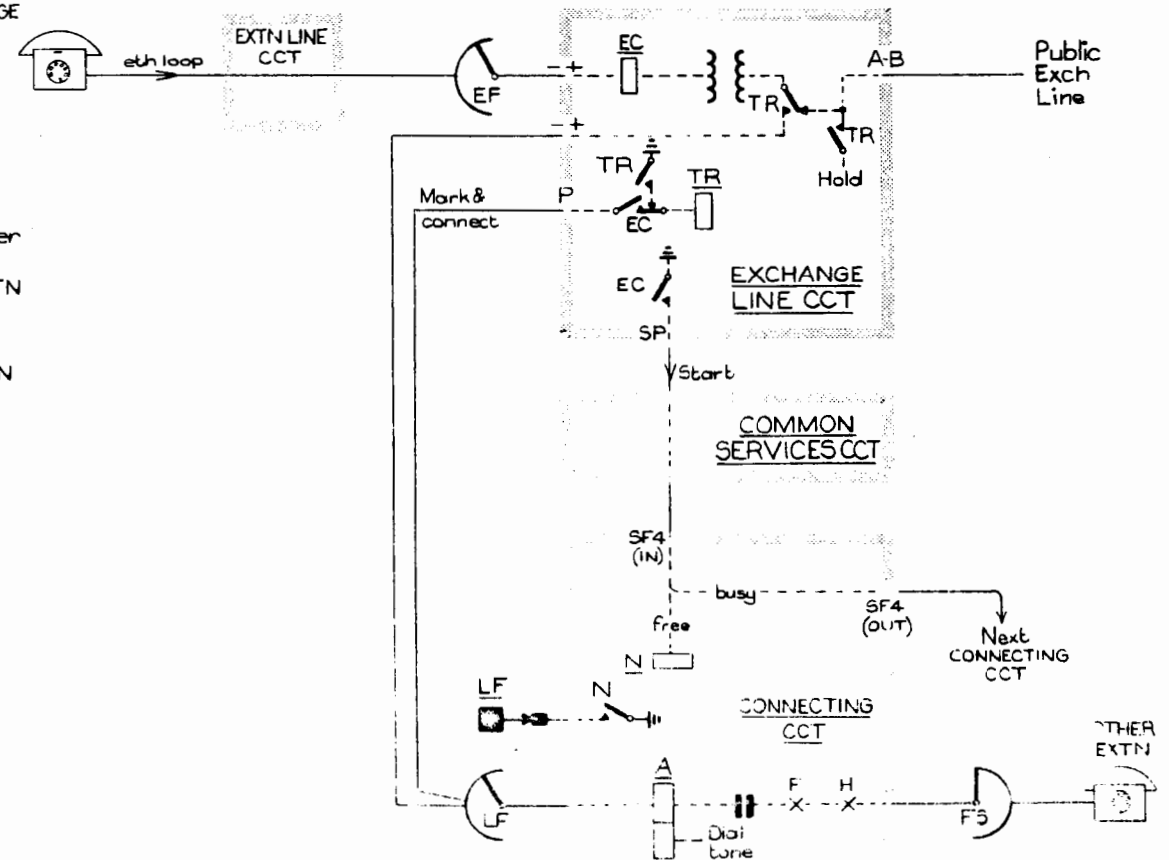
EXTN ON EXCH LINE CALL
 Makes enquiry of OTHER EXTN by asking Public Exchange Line call to wait pressing tele button & obtaining dial tone from CONNECTING CCT dialling number of OTHER EXTN required.

EXCHANGE LINE CCT
 On first button signal holds Public Exchange Line call seizes free CONNECTING CCT and diverts EXTN-ON-EXCH-LINE-CALL to it

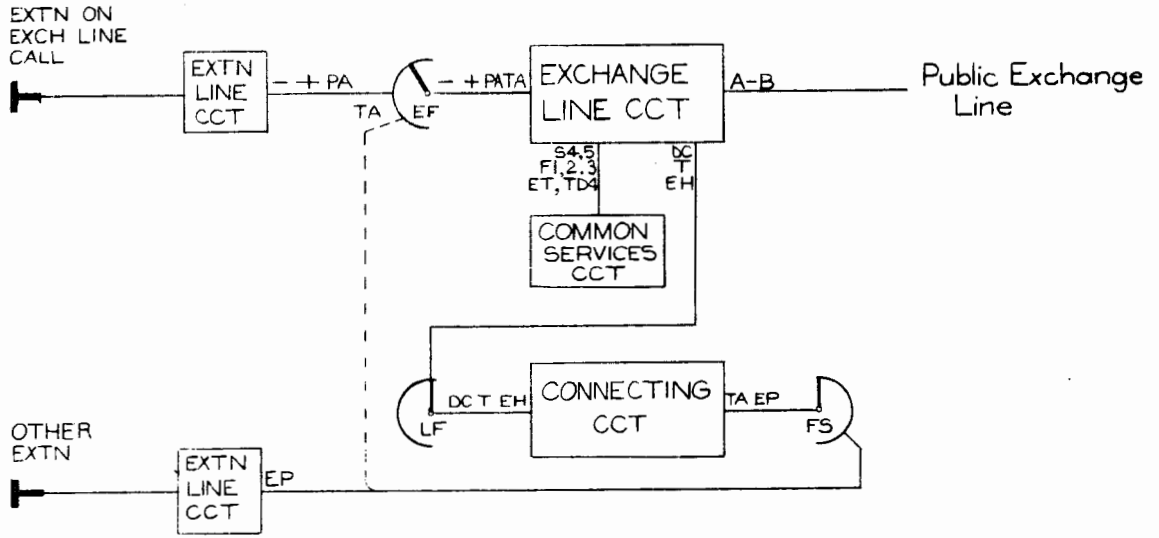
CONNECTING CCT
 Provides EXTN-ON-EXCH-LINE-CALL with normal EXTN-TO-EXTN CALL facilities

For details see "Enquiry of Another Extn by Extn on Exchange Line Call"

EXTENSION ON EXCHANGE LINE CALL presses button waits for dial tone, releases button and dials number of OTHER EXTN required - asks OTHER EXTN to wait for Public Exchange Line call.



Stage 2 - Transfer



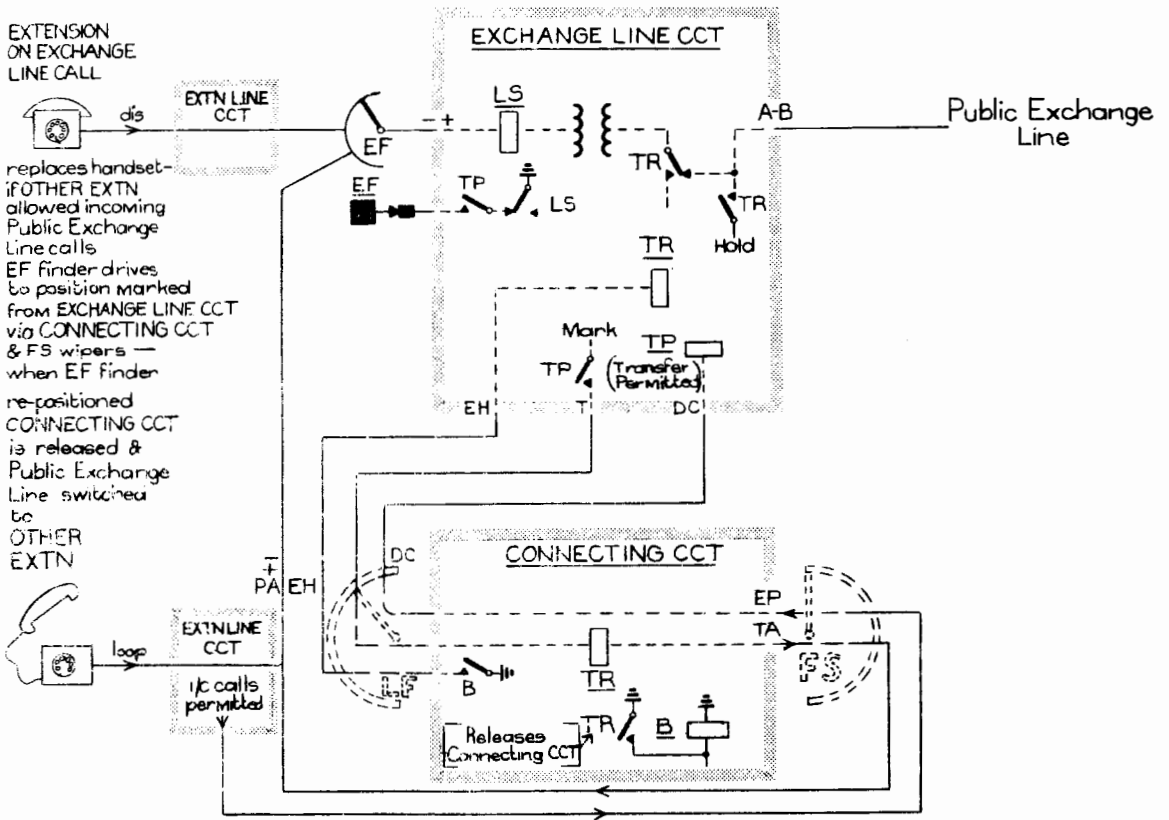
EXTN ON EXCH LINE CALL
 IF OTHER EXTN agrees to take Public Exchange Line call: asks OTHER EXTN to wait with handset off replaces own handset.

EXCHANGE LINE CCT
 Condition on DC lead indicates whether transfer is permitted. Clear by EXTN-ON-EXCH-LINE-CALL starts EF finder driving to marked (TA) OTHER EXTN bank position

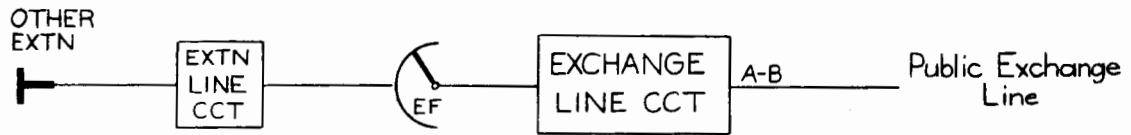
COMMON SERVICES CCT
 Leads S4, S5, F1, F2, F3, ET & TD4 control positioning of EF finder as usual (see "Incoming Ring & Answer by Designated Extn")

OTHER EXTN LINE CCT
 Condition on EP lead indicates whether it is allowed to accept Public Exch Line calls

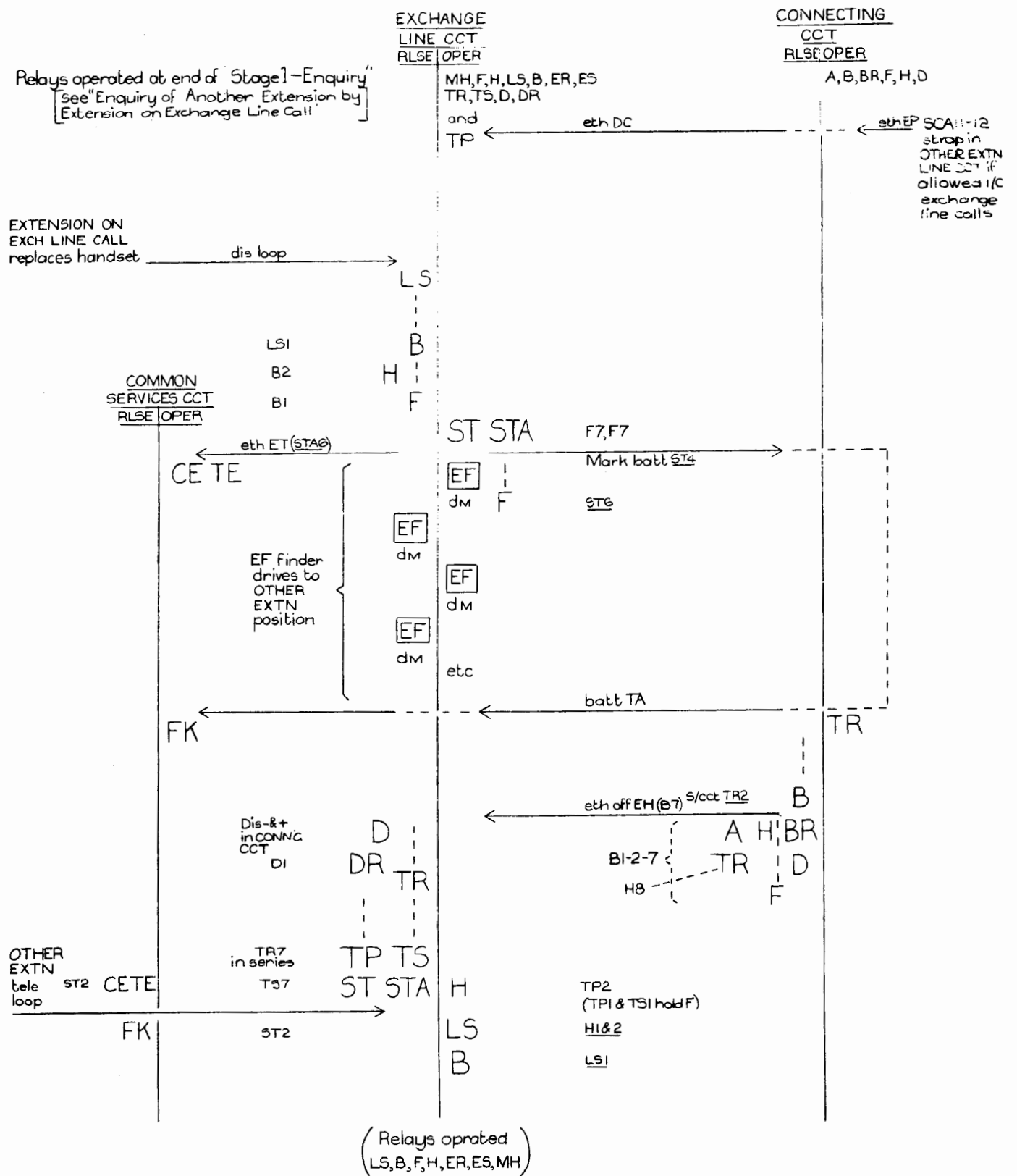
CONNECTING CCT
 Connects EP lead from OTHER EXTN LINE CCT to DC lead - prepares EXCHANGE LINE CCT for transfer if OTHER EXTN allowed incoming exchange line calls - connects T lead from EXCH LINE CCT to TA wiper of FS to mark contact for re-positioning of EF Finder. CONNECTING CCT release signalled to EXCH LINE CCT on EH lead



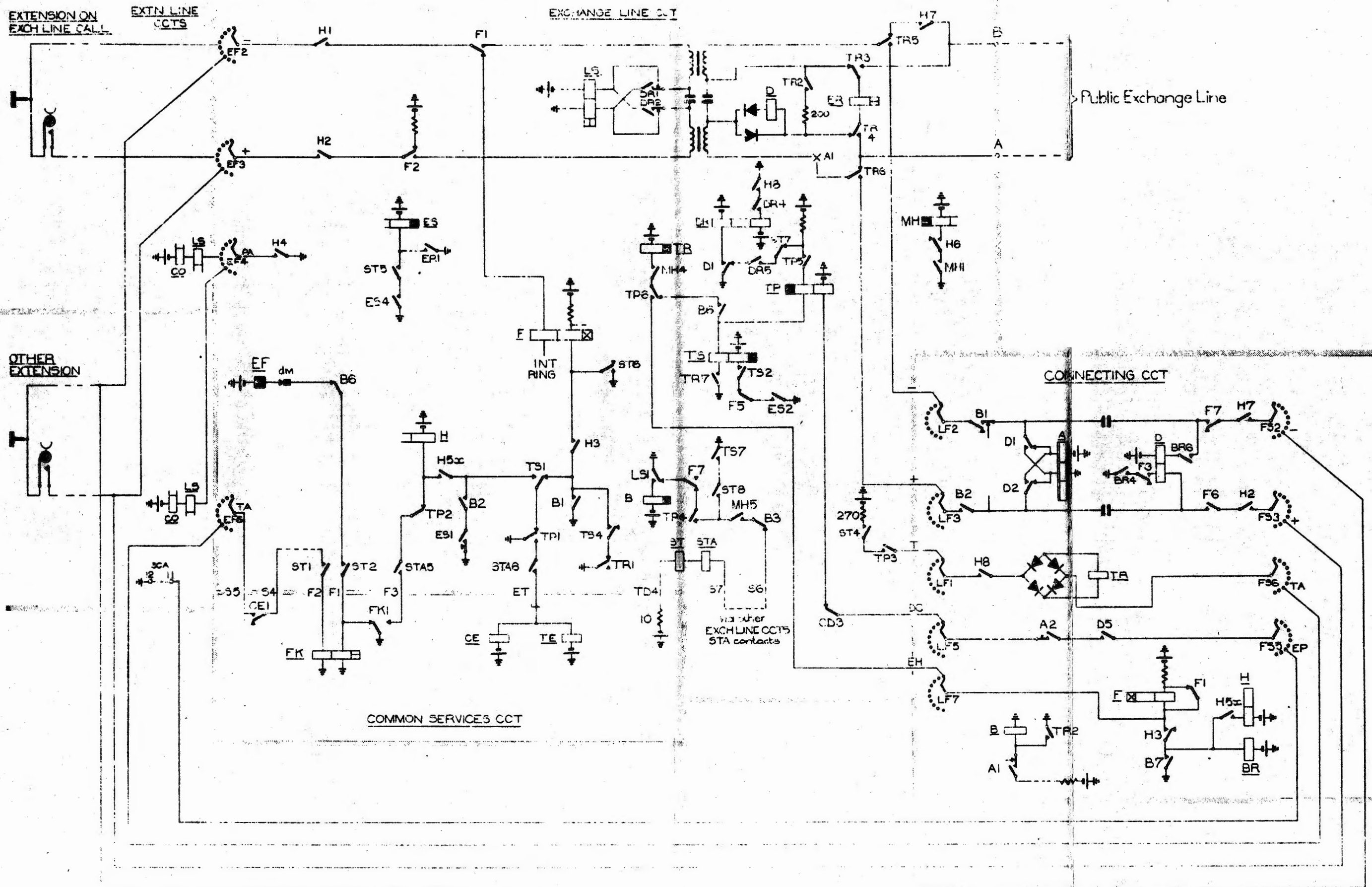
Stage 3 - Transfer Completed



Transfer of Exchange Line Call to Another Extension

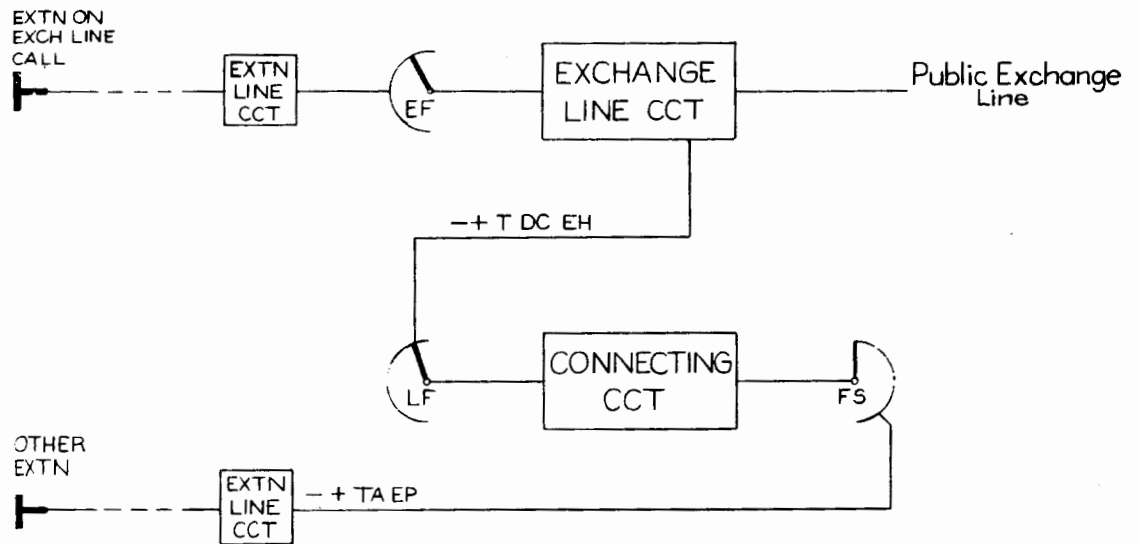


Transfer of Exchange Line Call to Another Extension



Incorrectly Manipulated Transfers

(a) Transfer attempt to OTHER EXTN not allowed incoming exchange calls



EXCH LINE CALL
 After setting up 'enquiry' connection to OTHER EXTN replaces handset to initiate transfer of exchange line call to OTHER EXTN

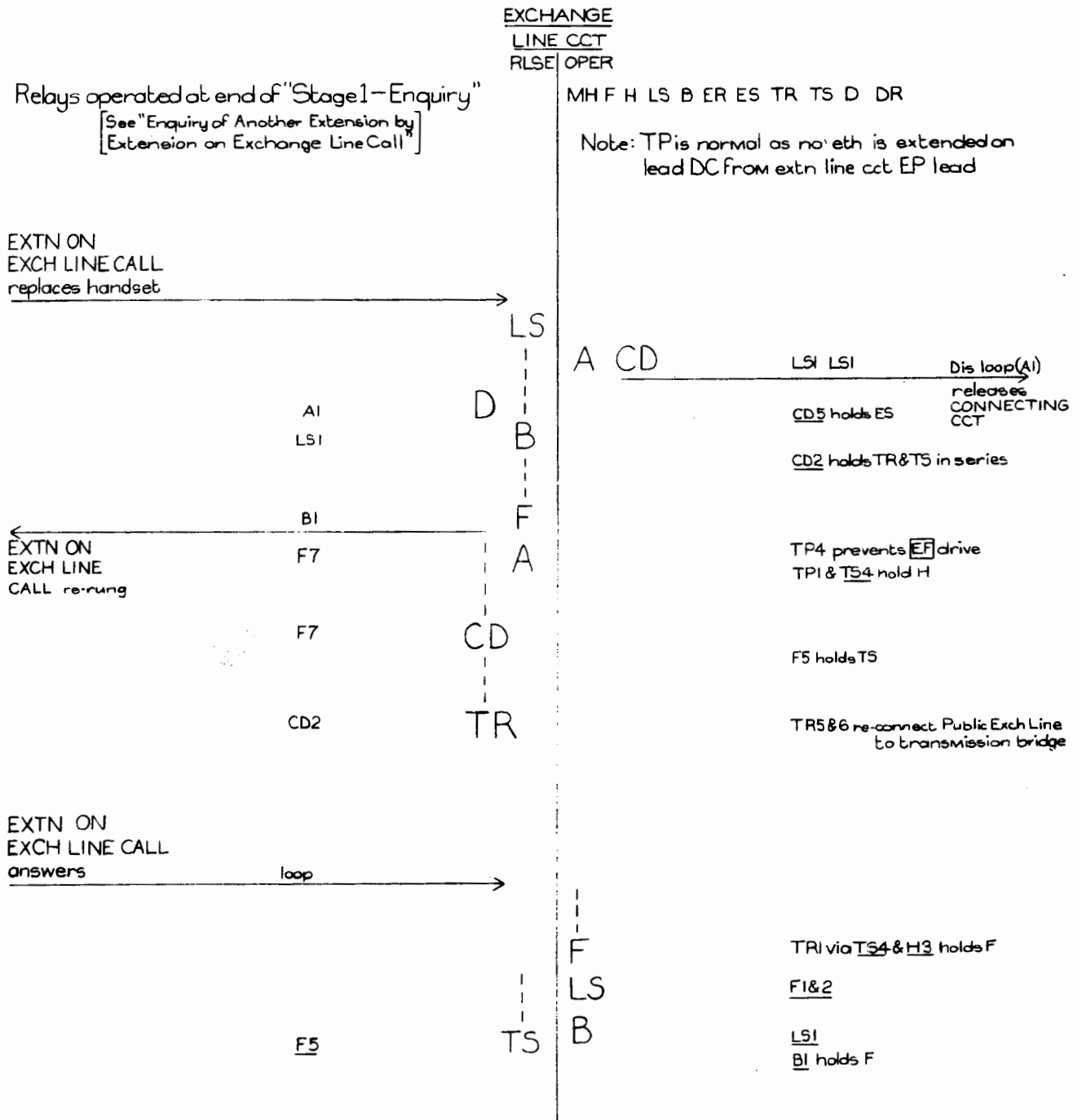
EXCHANGE LINE CCT
 DC lead condition indicates transfer of exchange line call to OTHER EXTN not allowed — EXCH LINE CALL re-rung & exchange line call reconnected to it.

OTHER EXTN
 No incoming Exchange call Permission (EP)

EXTN LINE CCT
 No strap SC11-12 leaves EP lead disconnected — no condition on EP shows lack of permission to receive incoming exchange line calls

CONNECTING CCT
 Connects EP lead from EXTN LINE CCT to DC lead to EXCH LINE CCT to indicate whether or not OTHER EXTN allowed to receive incoming exchange line calls.

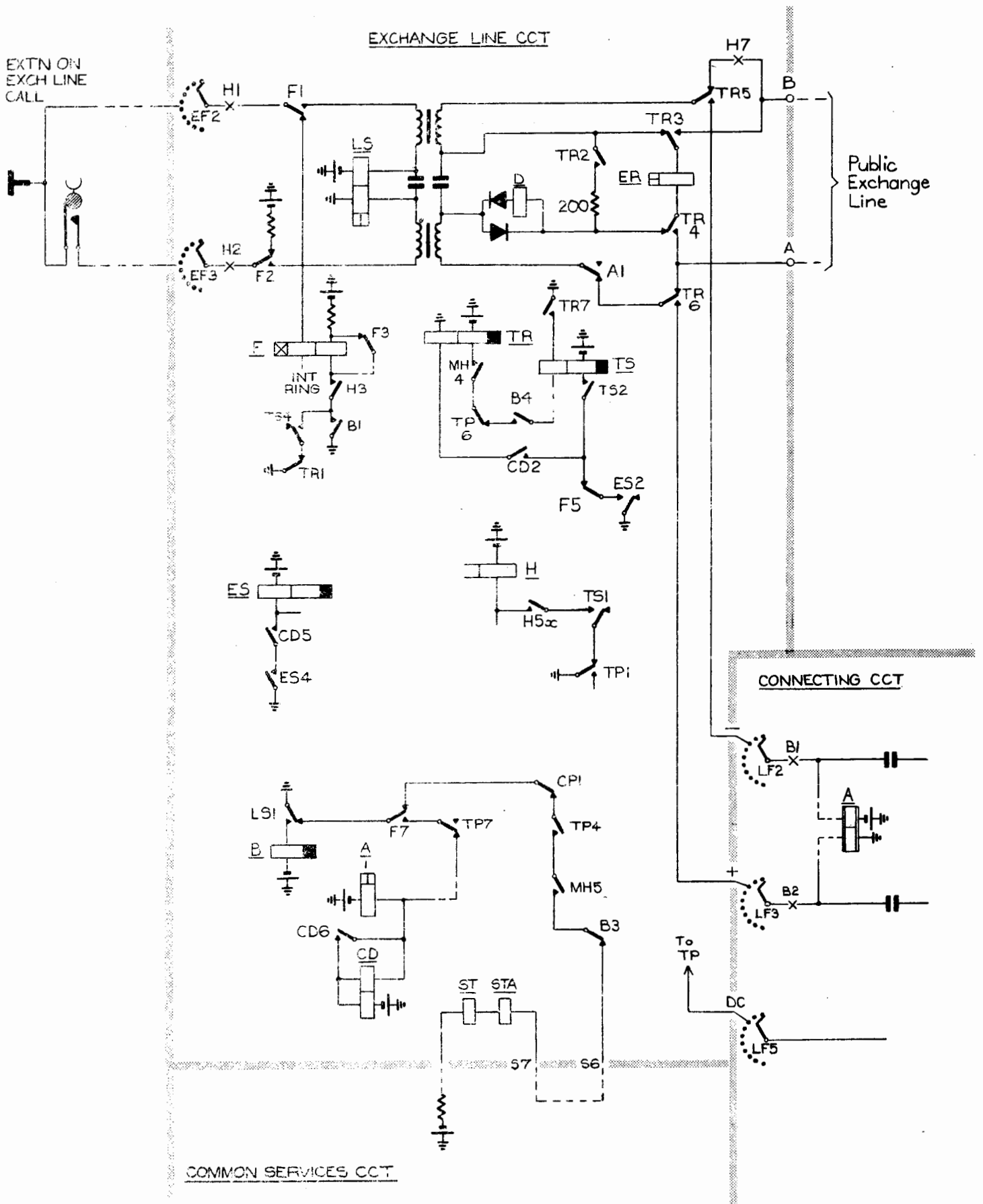
(a) Transfer attempt to OTHER EXTN not allowed incoming exchange line calls



(b) Transfer attempt before OTHER EXTN has answered

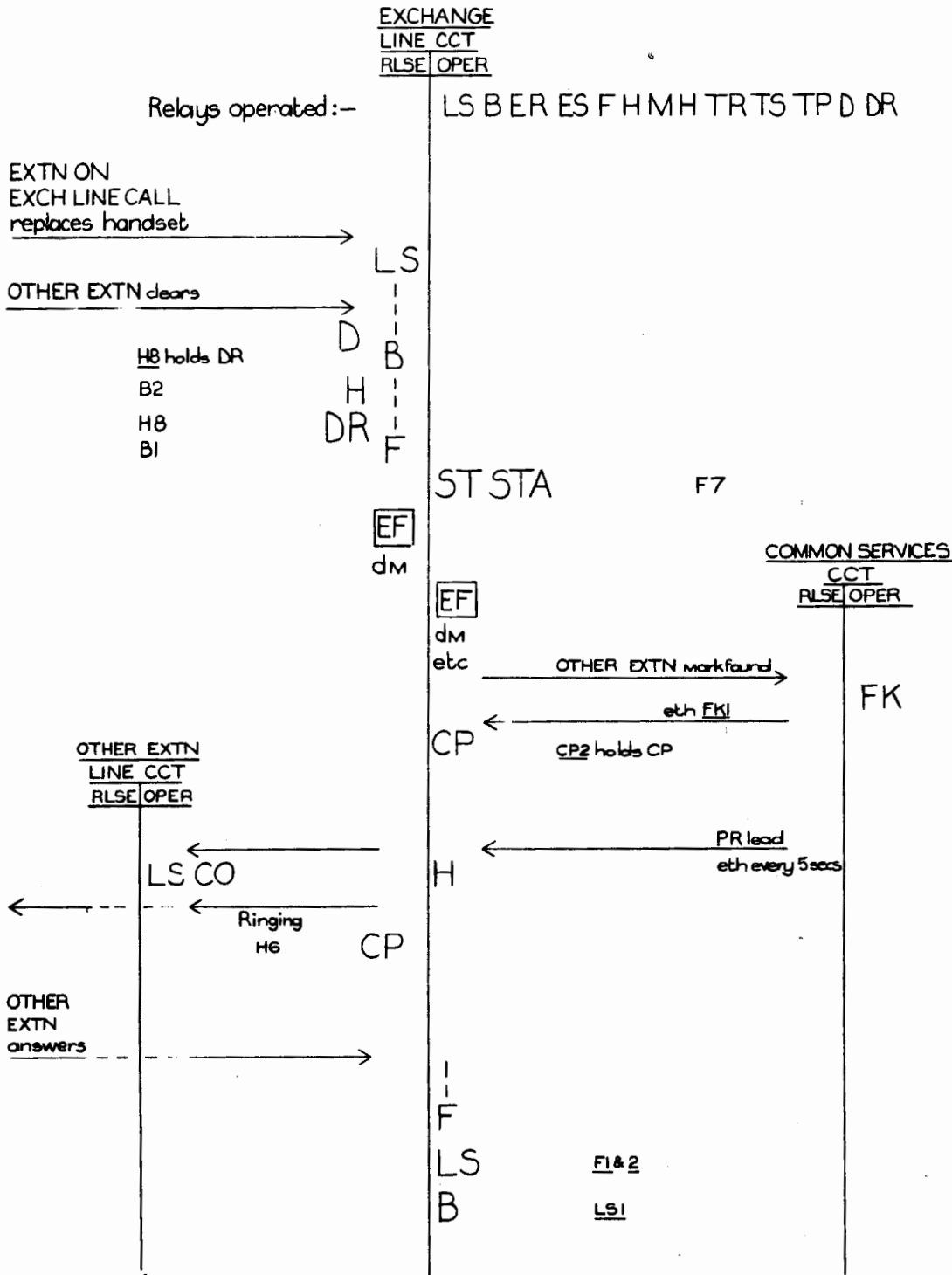
As the OTHER EXTN has not answered relay D is normal in the CONNECTING CCT and the EP lead earth does not reach the DC lead to operate relay TP. The result is similar to (a)

(a) Transfer attempt to OTHER_EXTN not allowed incoming exchange line calls

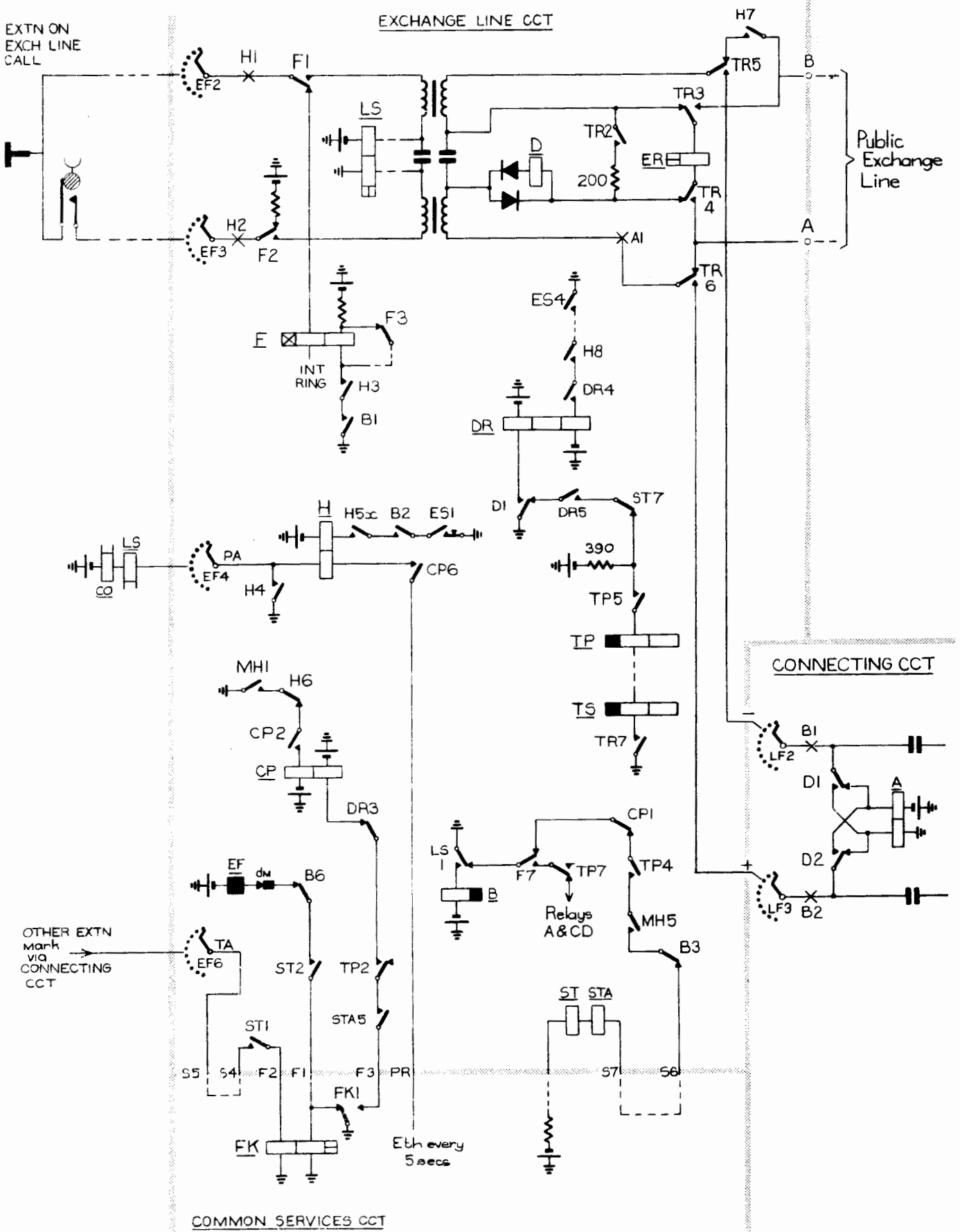


(c) Transfer attempt to OTHER EXTN allowed incoming exchange calls but which hangs up before transfer completed

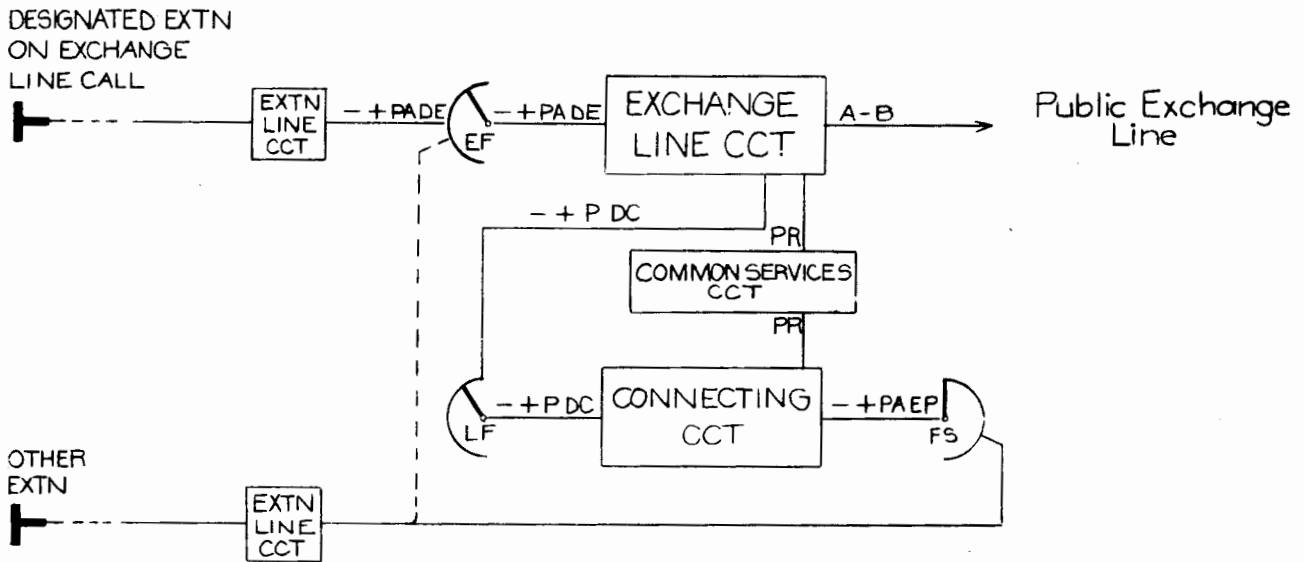
If release of relay D in the EXCH LINE CCT occurs before EF drive starts TP is released by short circuit from D1 normal (see page 45) & the sequence continues similar to (a). If EF drive has started (ST & STA operated) D1 is prevented by ST7 from releasing TP and drive continues to the OTHER EXTN position which is rung after a short interval.



(c) Transfer attempt to OTHER EXTN allowed incoming exchange line calls, but which hangs up before transfer completed



Intrusion on Required Busy Extension by Designated Extension on Exchange Line Call



DESIGNATED EXTN ON EXCHANGE LINE CALL
 Dials enquiry call to OTHER EXTN but receives busy tone—dials additional '1'—hears warn tone and conversation—asks OTHER EXTN to accept exchange line call—waits till OTHER EXTN clears & is re-rung—then replaces handset to effect transfer

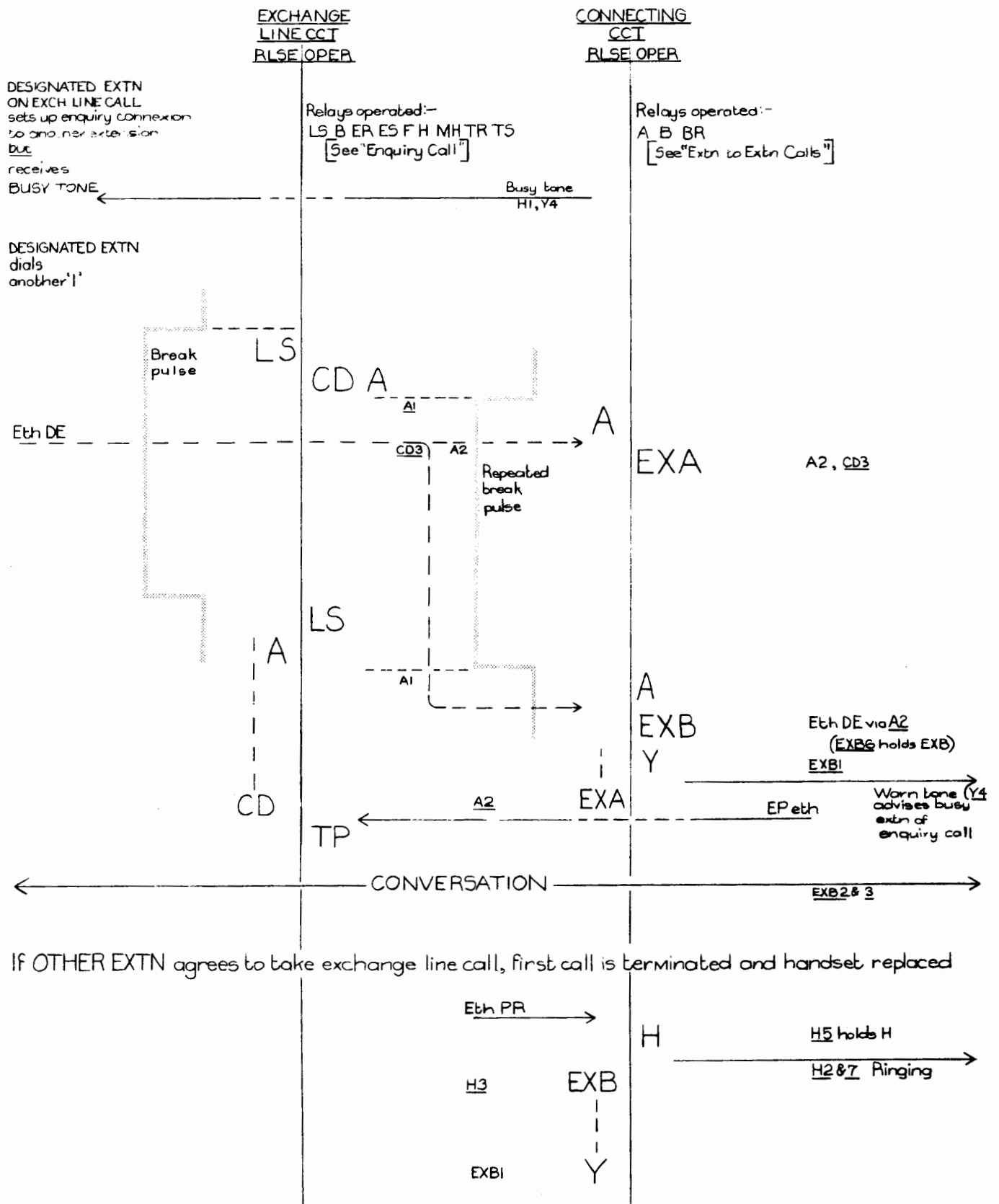
EXCHANGE LINE CCT
 Functions as in "Transfer of Exchange Line Call to Another Extension" for setting up connexion to OTHER EXTN via CONNECTING CCT and for re-positioning EF Finder on OTHER EXTN position & ringing etc—during dialling extends DE (Designated Extn) lead to DC lead to CONNECTING CCT—repeats additional dialled '1' to CONNECTING CCT.

COMMON SERVICES CCT
 Provides eth pulse every 5 secs on PR common for re-testing of previously busy PA wires.

OTHER EXTN
 Engaged in conversation when warn tone heard (clicks at 1/2 sec intervals)—speaks to intruding designated extension—agrees to take exchange line call—clears other connexion—bell rings & on answering is connected to exchange line call.

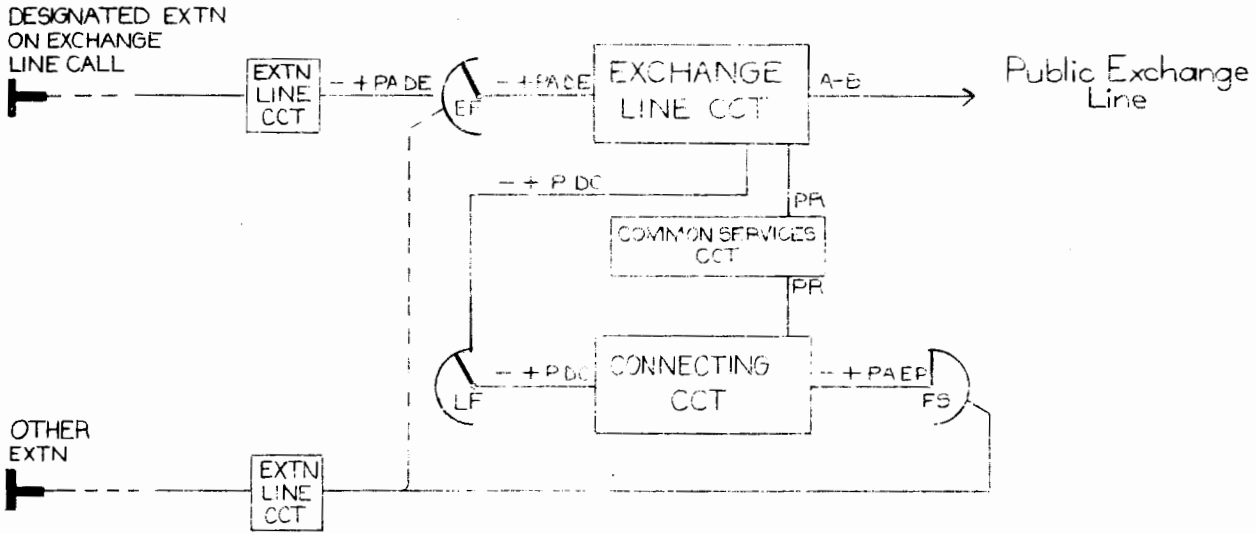
CONNECTING CCT
 Returns busy tone to DESIGNATED EXTN ON EXCH LINE CALL if OTHER EXTN engaged—extra digit '1' only effective if EXTN ON EXCH LINE CALL is 'designated extn' (signal on DC lead)—additional '1' gives connexion to OTHER EXTN, even though busy, with 'warn tone'—connects EP lead from OTHER EXTN LINE CCT to DC lead to EXCH LINE CCT to signal permission to receive incoming exchange line calls—rings OTHER EXTN after previous connexion cleared.

Intrusion on Required Busy Extension by Designated Extension on Exchange Line Call



OTHER EXTN answers and then DESIGNATED EXTN ON EXCH LINE replaces handset to effect transfer [see "Transfer of Exch Line Call to Another Extn"]

Transfer of Exchange Line Call to Other Extension by 'Ring When Free' Facility



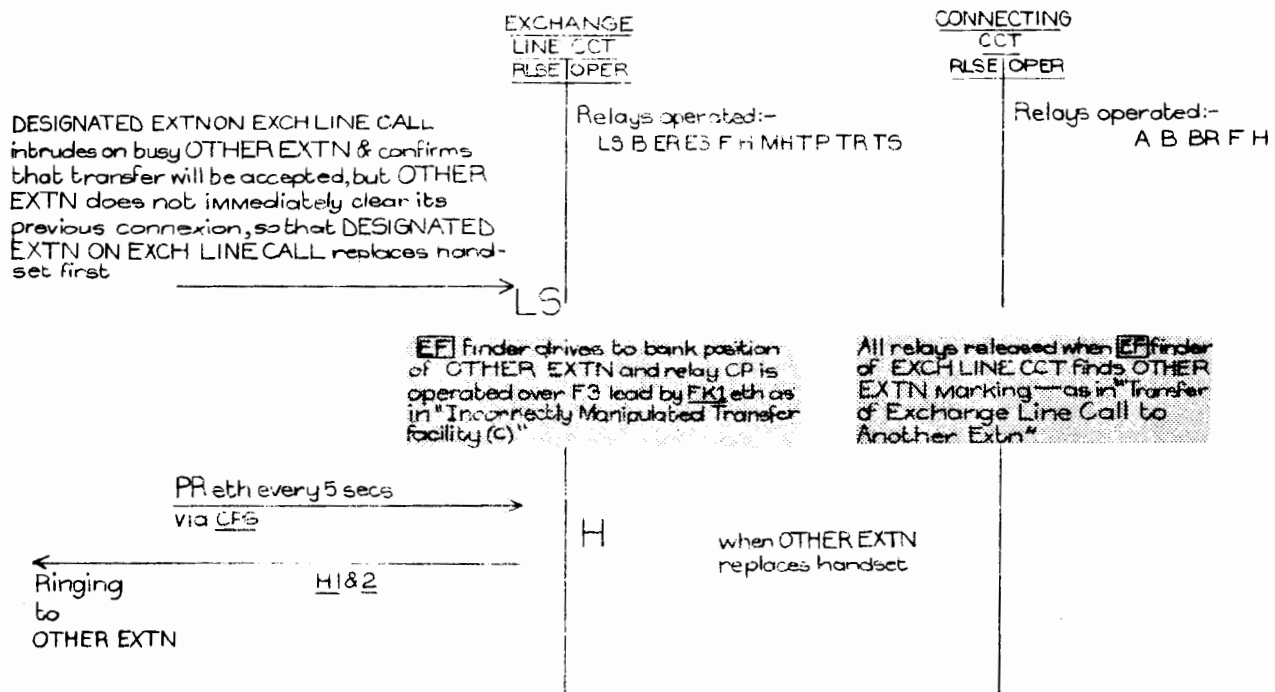
DESIGNATED EXTN ON EXCHANGE LINE CALL
 Same procedure followed for transferring exch line call to another busy extn as in "Intrusion on Required Busy Extn by Designated Extension" but handset replaced before OTHER EXTN clears previous call.

EXCHANGE LINE CCT
 As in "Transfer of Exchange Line Call to Another Extension" except that after positioning EF finder on OTHER EXTN bank position connexion to OTHER EXTN has to wait till it becomes free.

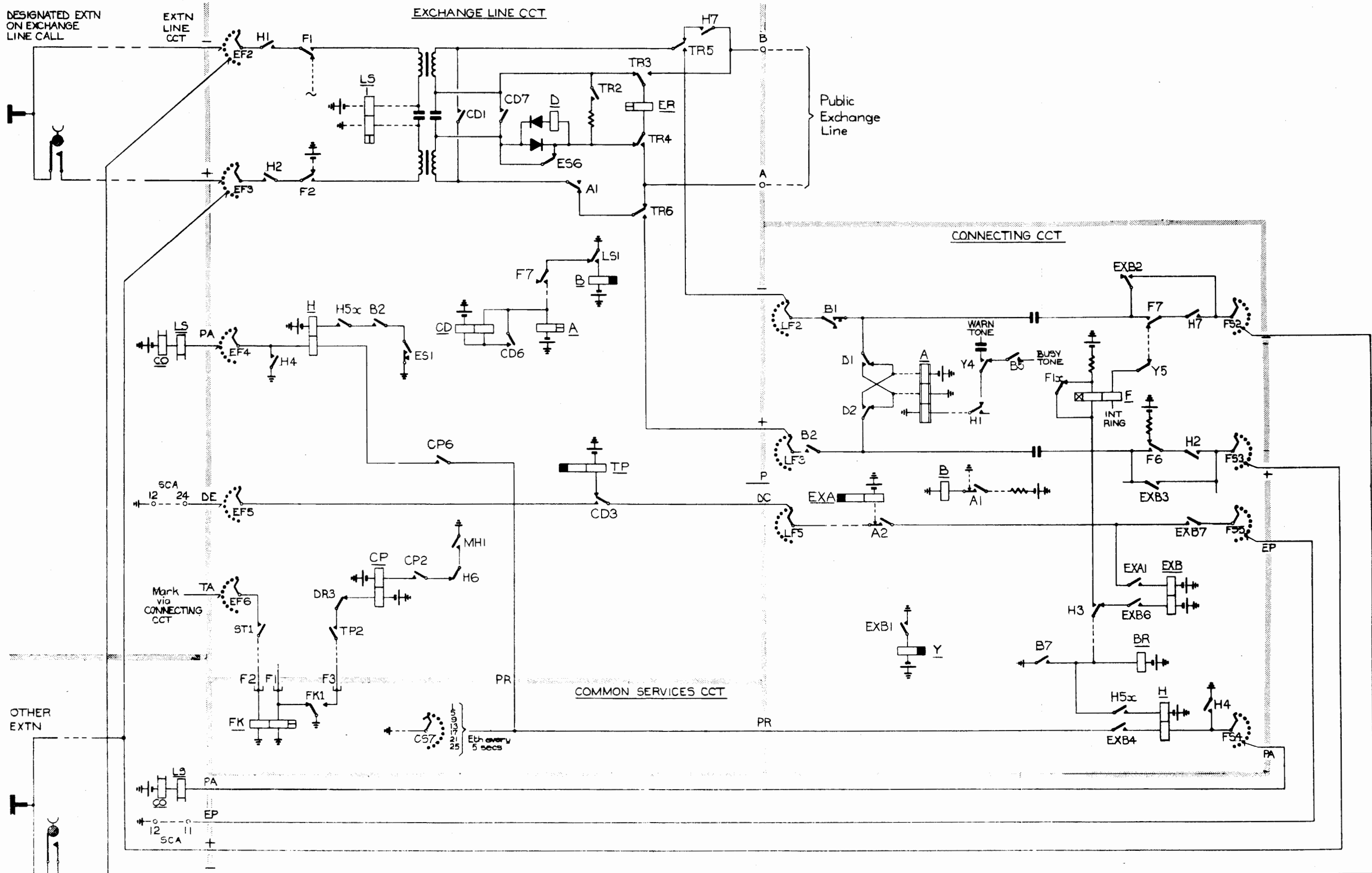
COMMON SERVICES CCT
 Provides eth pulse every 5 secs on PR leads to CONNECTING & EXCH LINE CCTS to initiate re-test of extns, previously busy, for 'Ring When Free' facility.

OTHER EXTN
 As in "Intrusion on Required Busy Extension by Designated Extension" but with clearance of previous call delayed until after clearance by Designated Extn.

CONNECTING CCT
 As in "Intrusion on Required Busy Extension by Designated Extension".

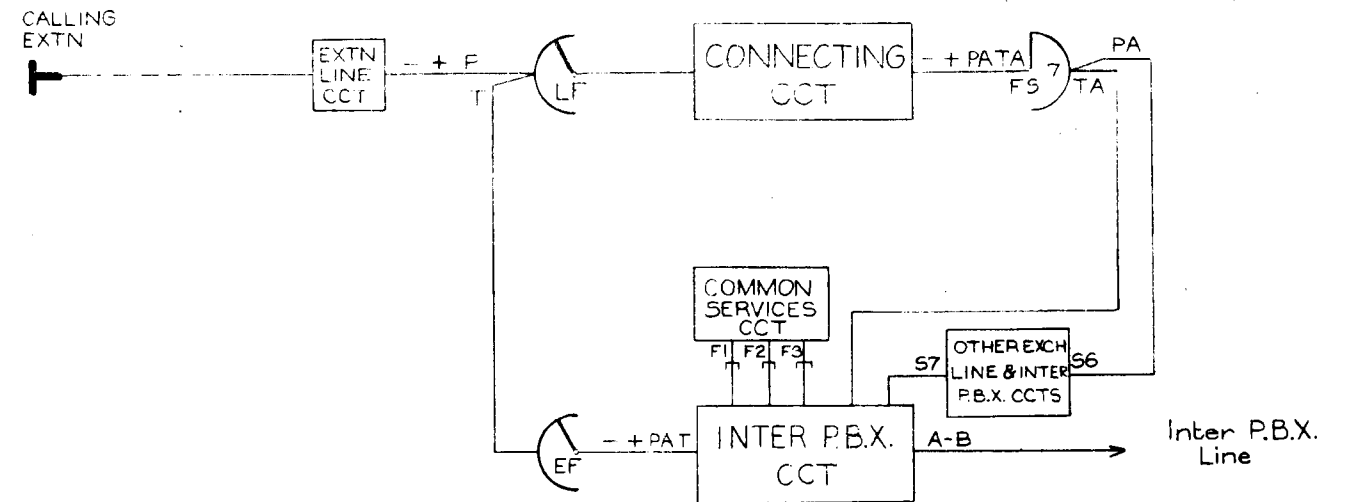


Intrusion Required Busy Extension by Designated Extension on Exchange Line Call
& Transfer of Exchange Line Call to Other Extension by 'Ring When Free' Facility



CUTGOING INTER P.B.X. CALL

Stage 1



CALLING EXTN
Dials '7' for connexion to distant PABX

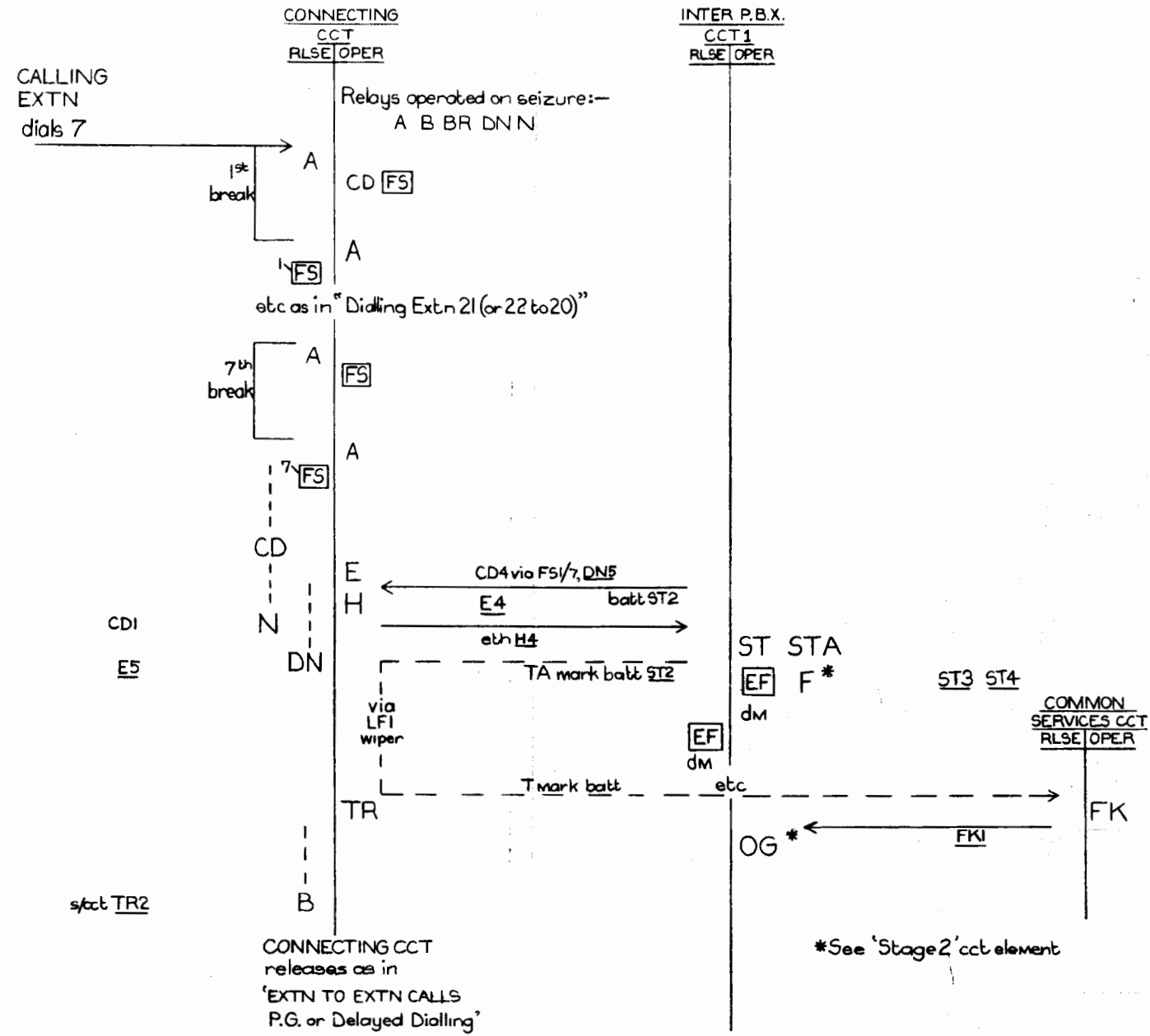
CONNECTING CCT
Seized by CALLING EXTN as in 'EXTENSION TO EXTENSION CALLS' — at end of dialled digit 7 tests INTER PBX CCT over PA lead:
if busy — returns busy tone
if free — seizes INTER PBX CCT & connects TA lead via current detecting relay to [LF] T wiper

COMMON SERVICES CCT
Controls drive & positioning of INTER PBX CCT [EF] Finder over F1, F2 & 3 commons

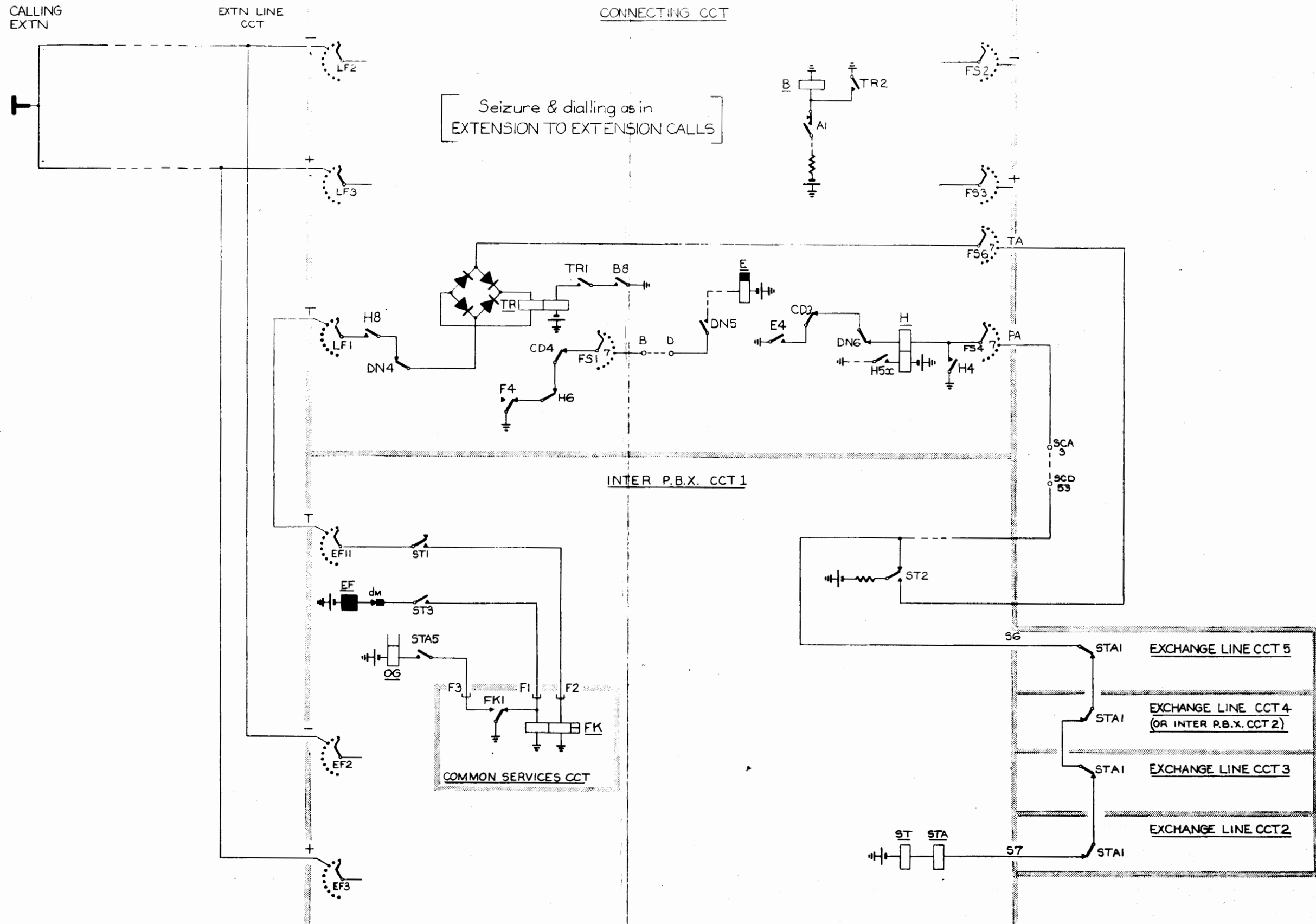
OTHER EXCH LINE & INTER PBX CCTS
Disconnects S6 from S7 while seizure relays (S7 & STA) operated in any other EXCH LINE or INTER PBX CCT — ensures only one finder drives at any one time

INTER PBX CCT
Seized over S7 lead — marks TA lead — Mark passes via current detecting relay in CONNECTING CCT & [LF] wiper to appear on [EF] bank contact of CALLING EXTN — [EF] drives to find marked CALLING EXTN — seizes distant equipment ready for dialling.

Outgoing Inter P.B.X. Call - Stage 1

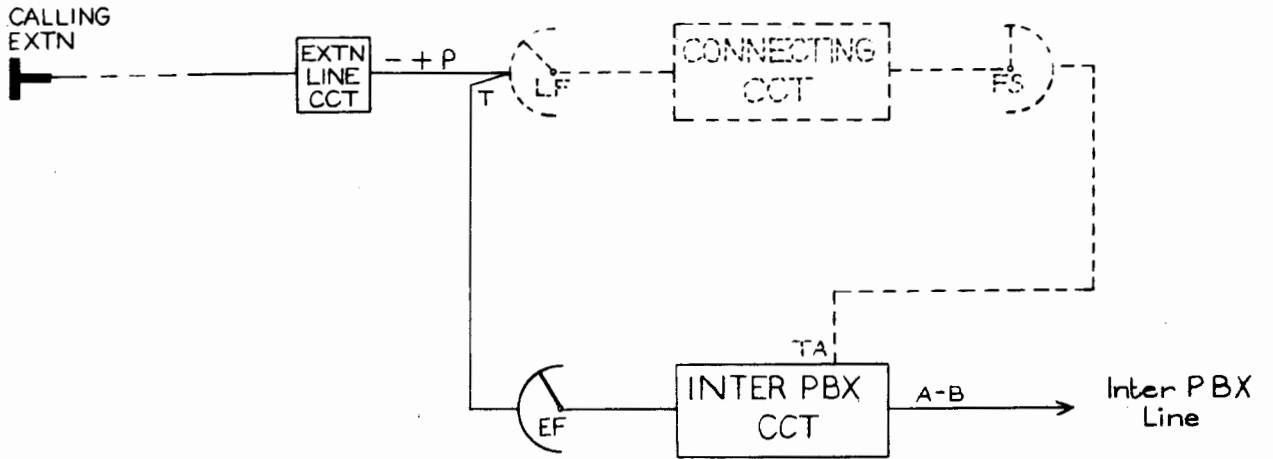


OUTGOING INTER P.B.X. CALL — Stage 1



OUTGOING INTER P.B.X. CALL

Stage 2

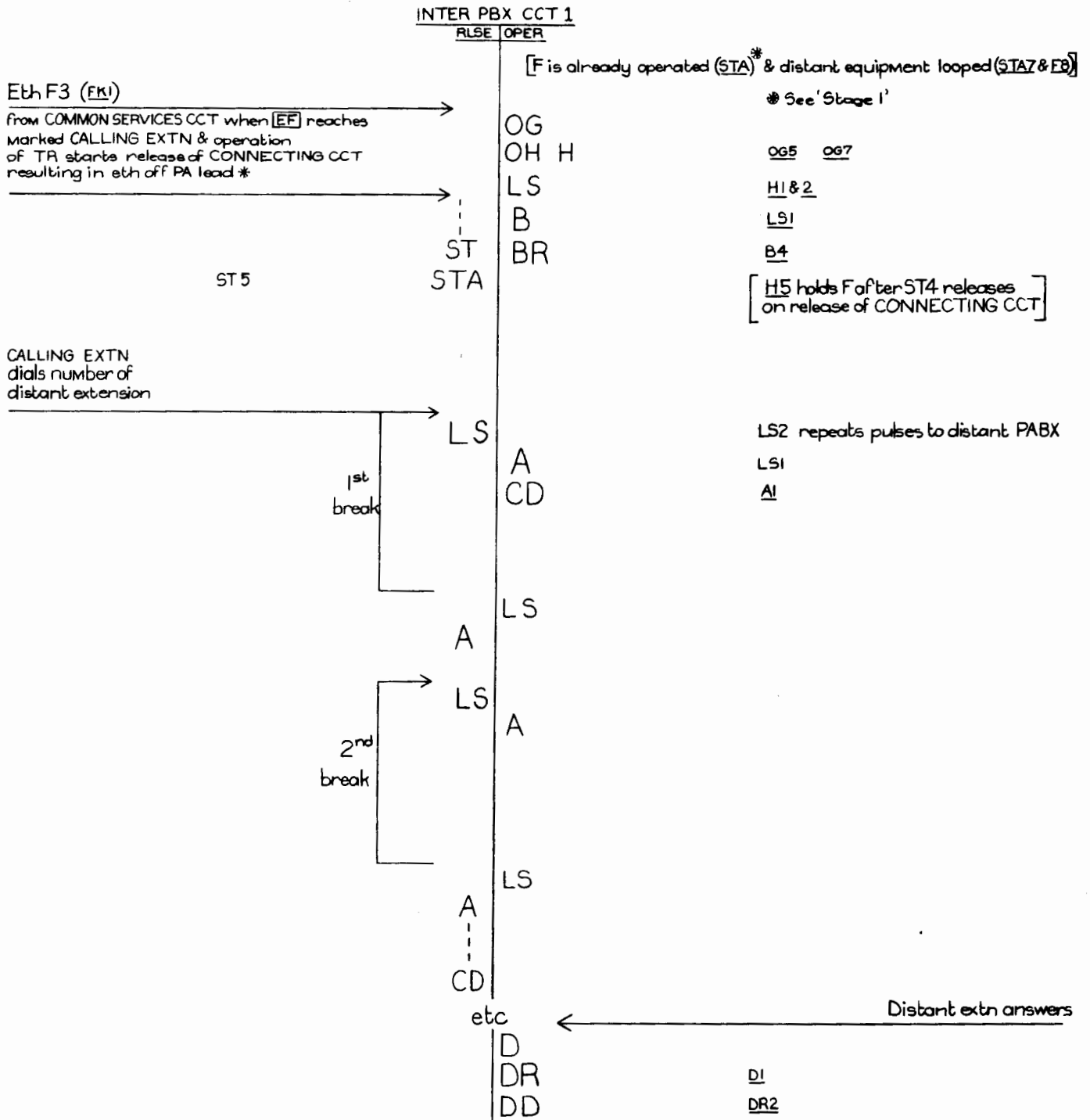


CALLING EXTN
On hearing distant dial tone dials extension number required.

CONNECTING CCT
Released when current detecting relay indicates direct connexion established between CALLING EXTN and INTER PBX CCT

INTER PBX CCT
When [EF] finds marking the CALLING EXTN is directly connected to the INTER PBX CCT — provides usual auto-auto relay set facilities i.e.
transmission bridge
dial pulse repetition
C.S.A reversal repetition

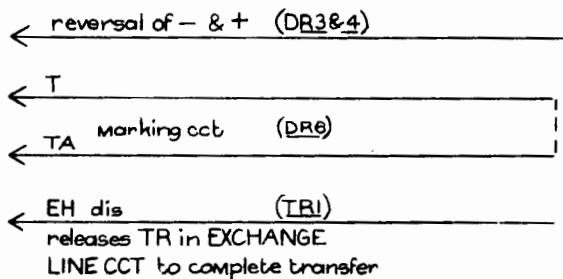
Outgoing Inter-P.B.X. Call — Stage 2



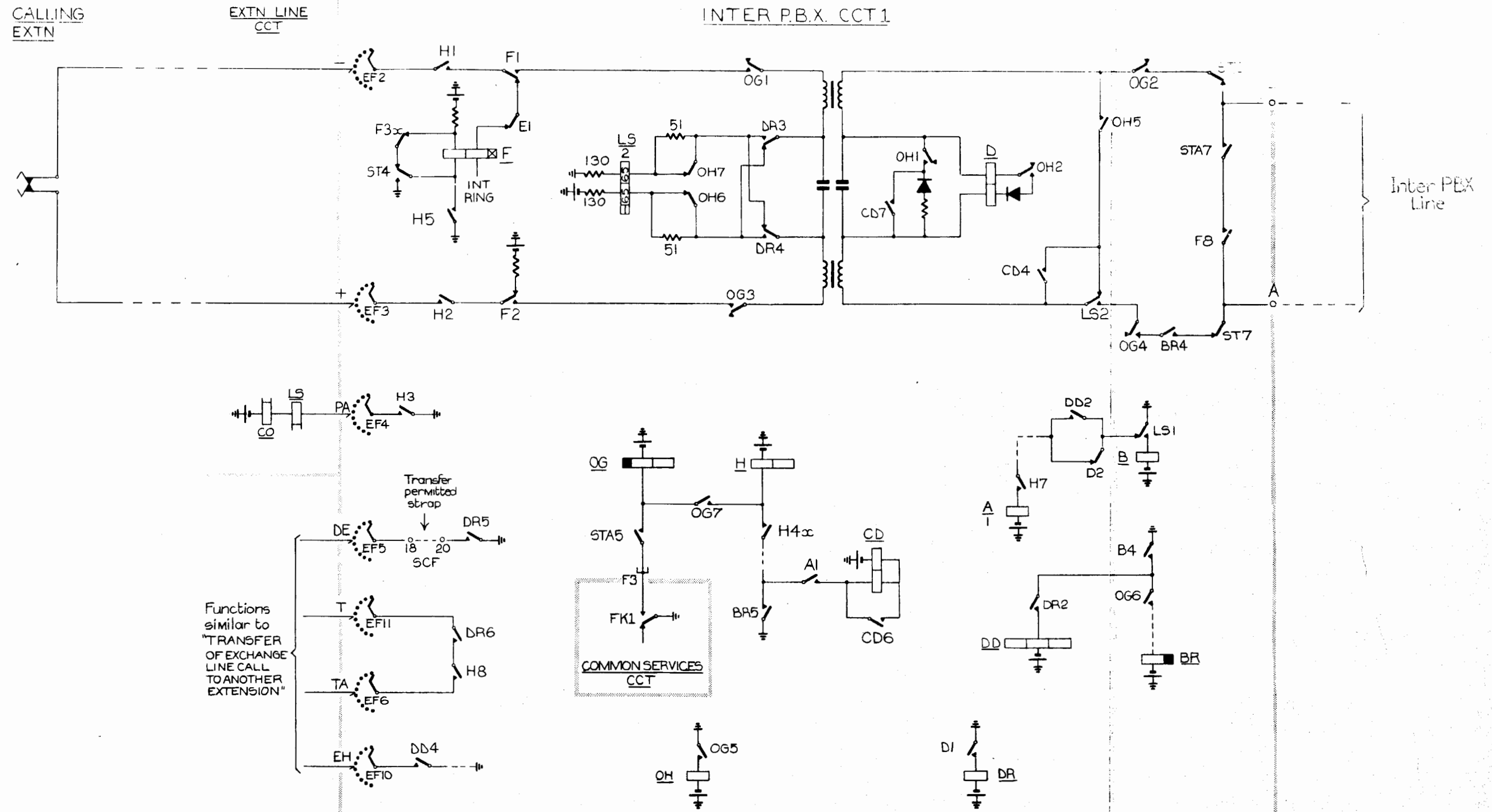
Relays operated during conversation

F OG OH H LS B BR D DD DR

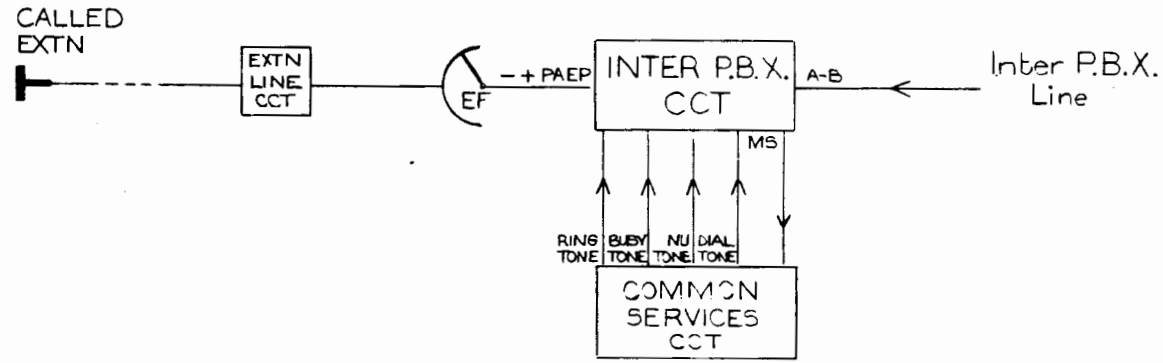
If transfer required & permitted
and call set up via enquiry outlet
of EXCHANGE LINE CCT:-



OUTGOING INTER P.B.X. CALL - Stage 2



INCOMING INTER P.B.X. CALL



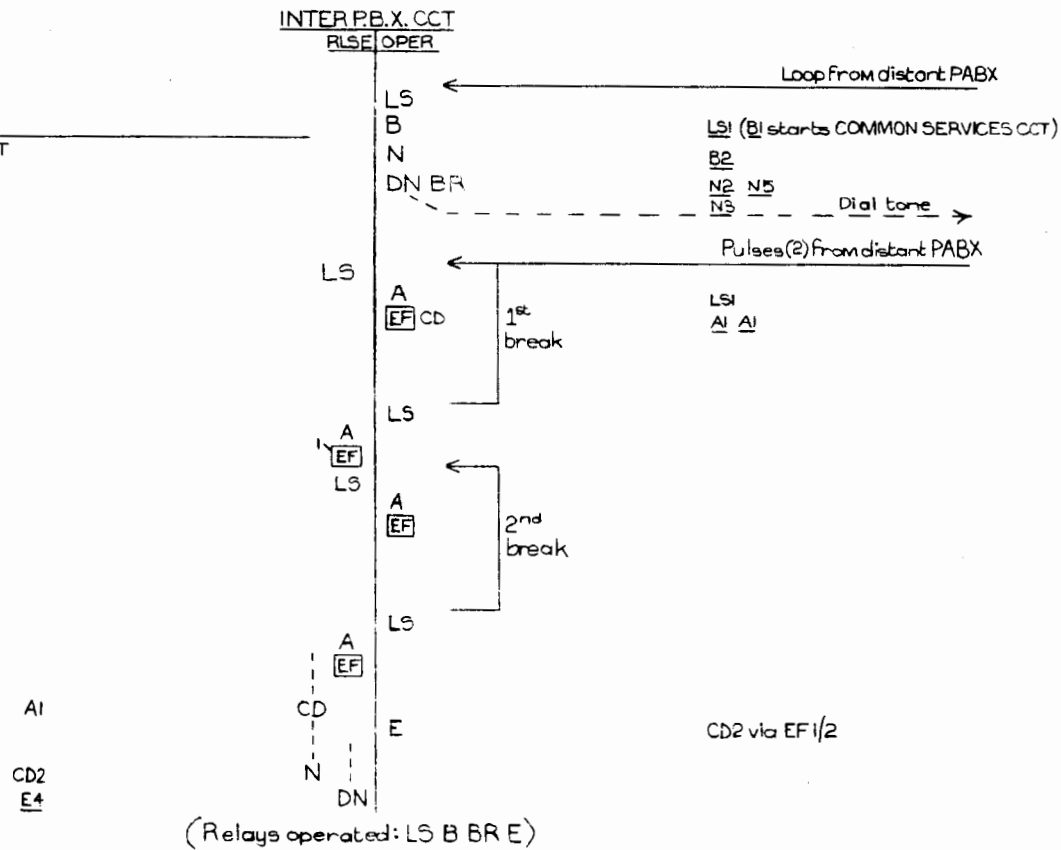
INTER P.B.X. CCT
 Seized over A-B Line wires from distant PABX
 — starts COMMON SERVICES CCT over MS lead
 — connects DIALTONE to Line. EF uniselector positioned by number of CALLED EXTN (21-20 or 31-30) dialled from distant PABX — if CALLED EXTN: — free: rings CALLED EXTN & returns ring tone busy or P.G.: returns busy tone spare: " NU "

COMMON SERVICES CCT
 Started by INTER PBX CCT over MS lead — supplies RING, BUSY, NU & DIALTONE on common leads

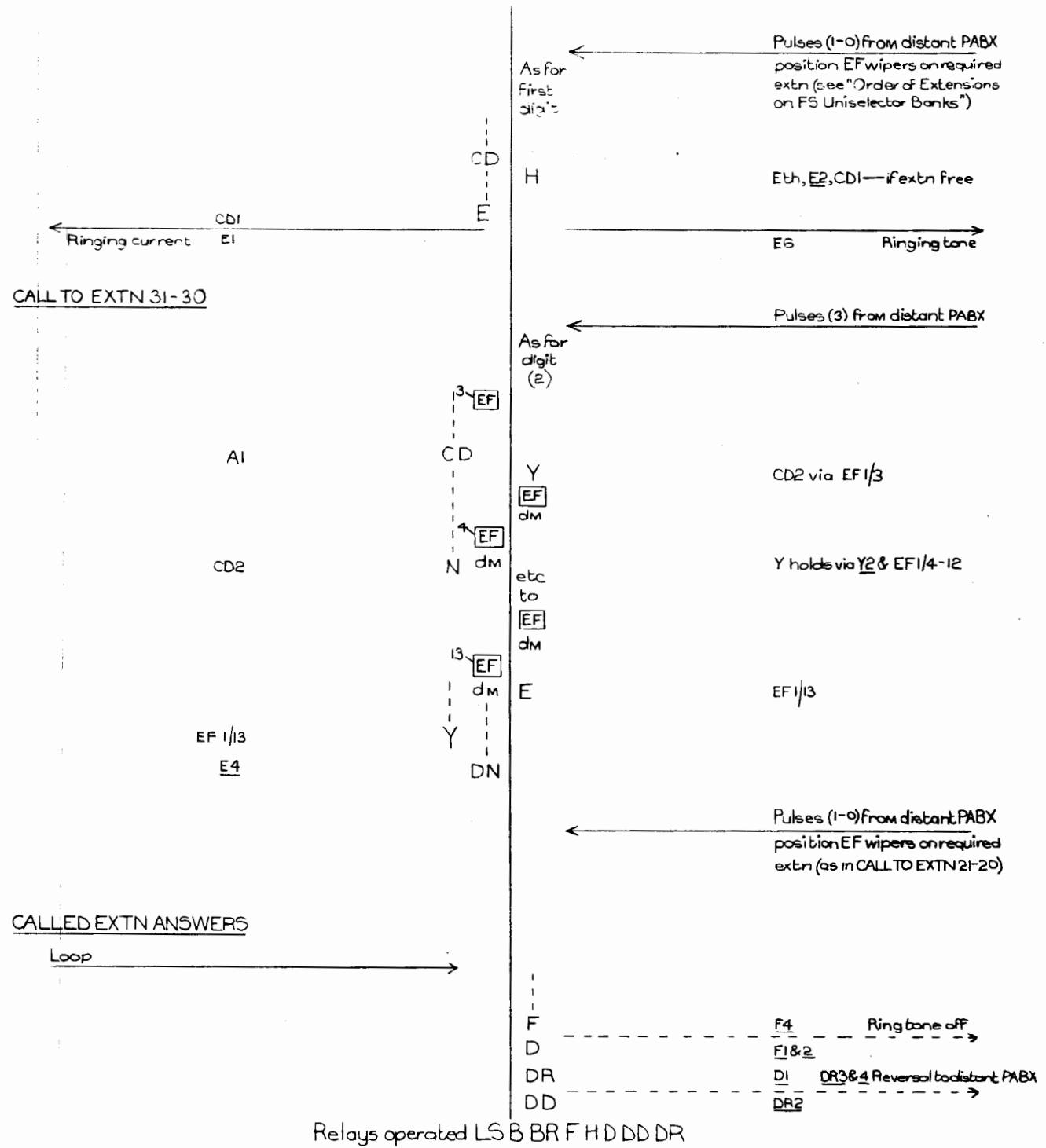
SEIZURE

PA dis B3
 busies INTER PBX CCT against seizure for o/g call

CALL TO EXTN 21-20



CALL TO EXTN 31-30



CALLLED EXTN ANSWERS

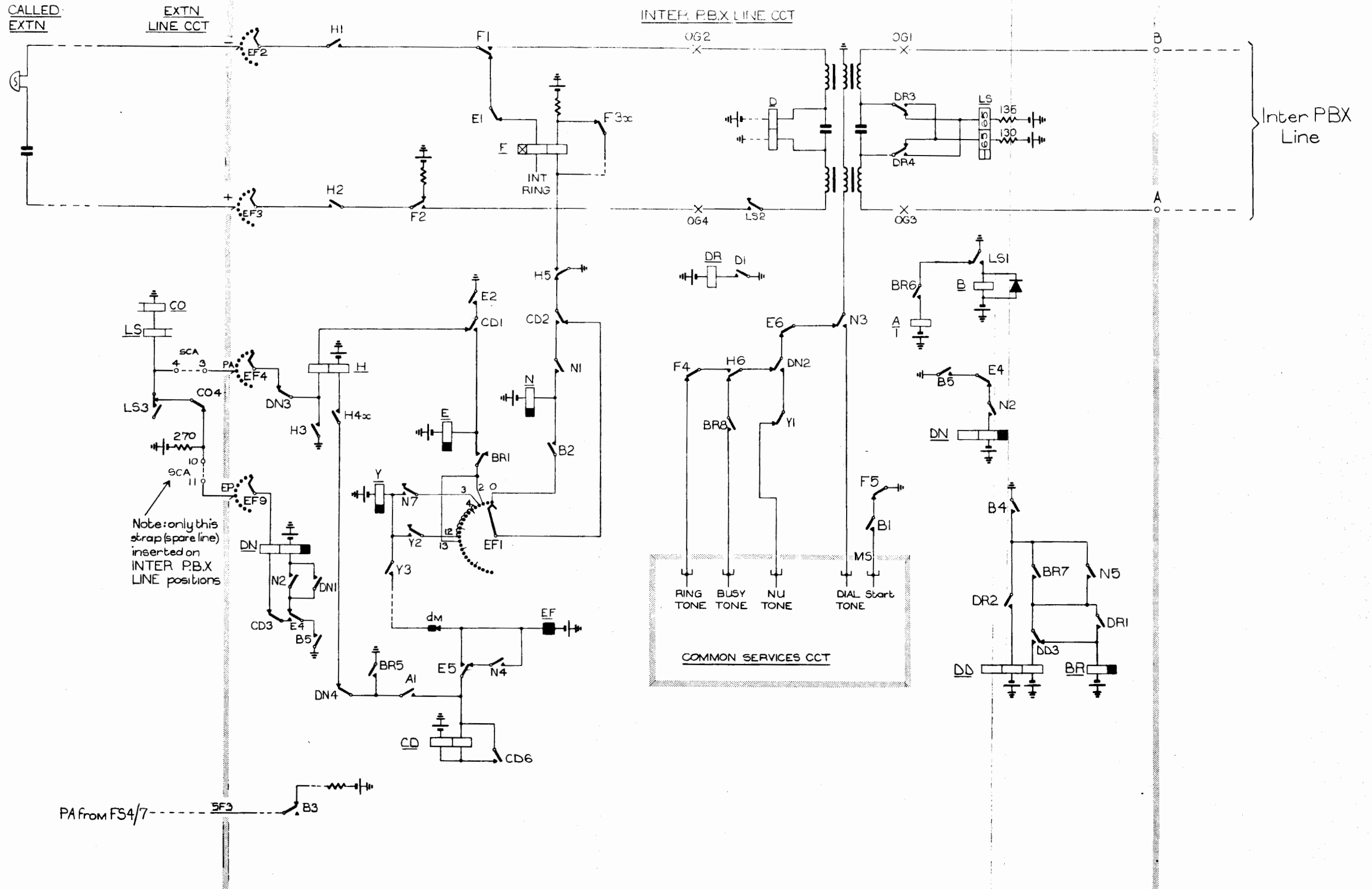
IF CALLED EXTN BUSY (or P.G.)

No operation of H when line tested — when E releases, busy tone returned via H6

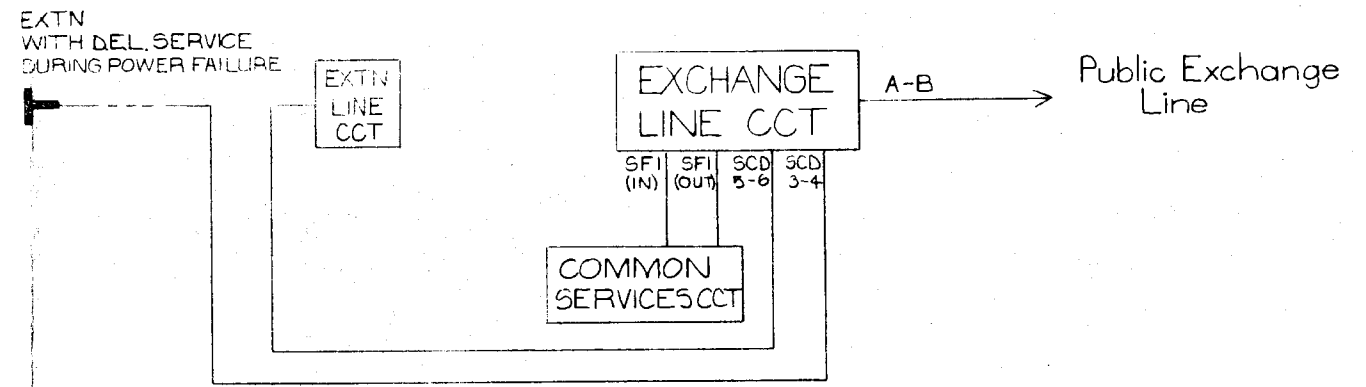
IF CALLED EXTN SPARE

PA lead disconnected — 270Ω batt on EP lead — when line tested H remains normal & DN operates — DN1 holds DN when E releases — DN2 connects NU tone to caller.

INCOMING INTER P.B.X. CALL



PUBLIC EXCHANGE SERVICE DURING POWER FAULT



EXCHANGE LINE CCT
 50V D.C. off if mains fail — diverts Public Exchange Line to EXTN WITH DEL. SERVICE DURING POWER FAILURE & buses SF1(IN) start cct — mains 'on' reconnects Public Exch Line to EXCHANGE LINE CCT (but not while call in progress) & unbuses SF1(IN) start cct.

