

# **755-A**

## **Sequence Charts**



**EASTERN AREA—PLANT DEPARTMENT**

**THE BELL TELEPHONE COMPANY OF PENNSYLVANIA**

**THE DIAMOND STATE TELEPHONE COMPANY**

**MARCH 1956**

## REFERENCES

### CIRCUIT

Central Office Trunk  
Charge and Discharge  
Line, Line Switch and Call Allotter  
Link and Link Allotter (Original)  
Link and Link Allotter (Revised)  
Station and Control Key  
Tie Trunk, Dial Repeating 2-way  
Tone, Ringing, Alarm and Common Timing

### DRAWING

SD-66503-01  
SD-80588-01  
SD-66504-01  
SD-66505-01  
SD-66611-01  
SD-66507-01  
SD-66601-01  
SD-66506-01

### MISCELLANEOUS FEATURES

Class of Service Leads (N.L., L.O., R.S.)

CD-66503, para. 5 and 9  
SD-66503-01

Common Ringers - Trunk and Station

SD-66504-01  
CD-66503, para. 11.1  
CD-66504 para. 5.34

Control Key - Modifications

SD-66503-01  
CD-66504, para. 7

Emergency Trunk Service

SD-66504-01  
CD-66507, para. 9

Keyless Station

SD-66507-01  
CD-66504, para. 6

Line Hunting

SD-66504-01  
CD-66505 or 66611, para. 14

Pick-up Key

SD-66505 or 66611-01  
CD-66504, para. 5.35

Station Line Lamps

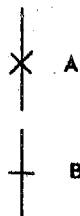
SD-66504-01  
CD-66504 para. 5.34  
SD-66504-01

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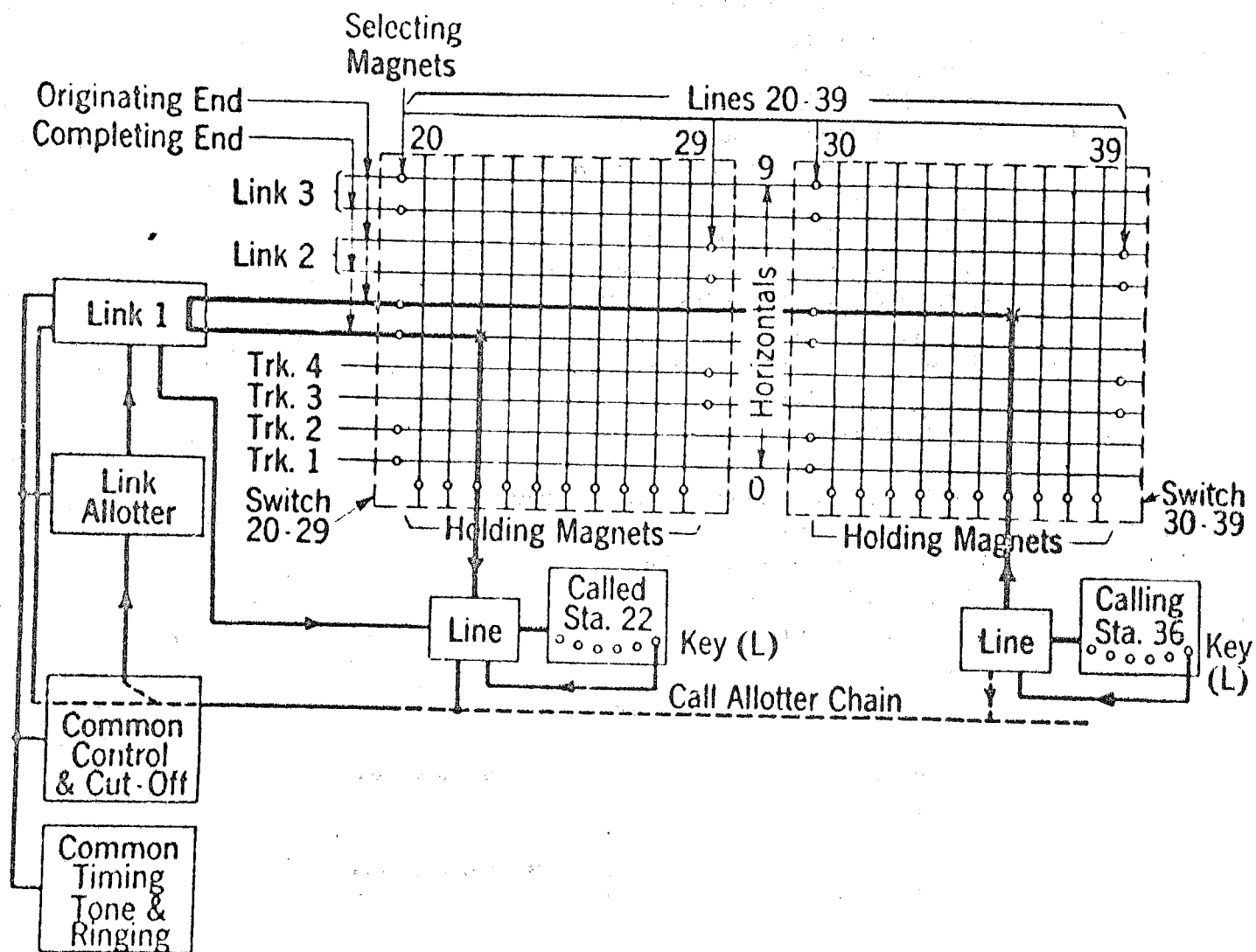
|       |  |
|-------|--|
| 2     | Typical Local Call                           |
| 3     | Typical Outgoing Trunk Call                  |
| 4     | Link Allotment                               |
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### LEGEND

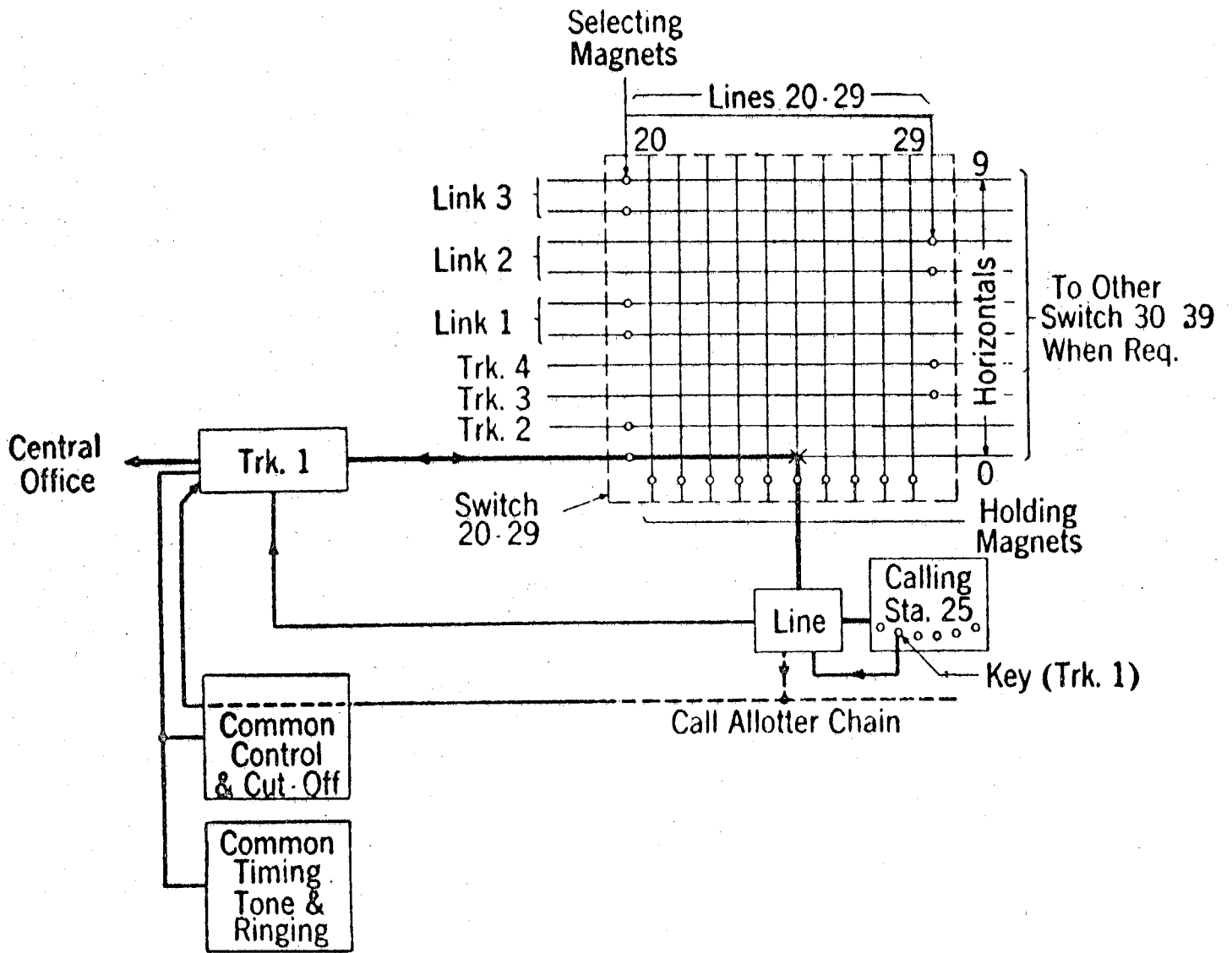


(A) Relay operates

(B) Relay releases



Typical Local Call



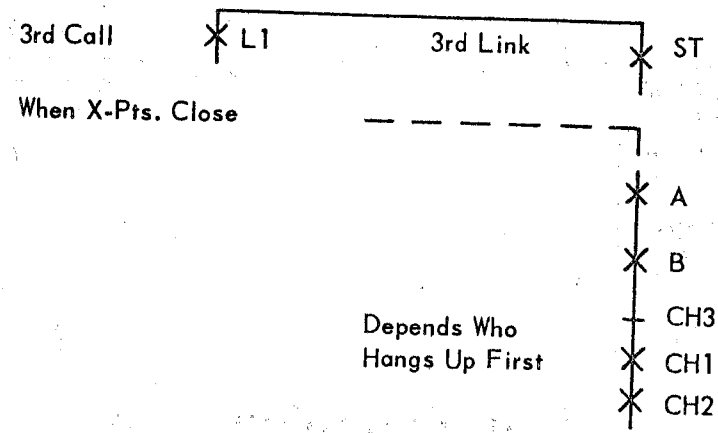
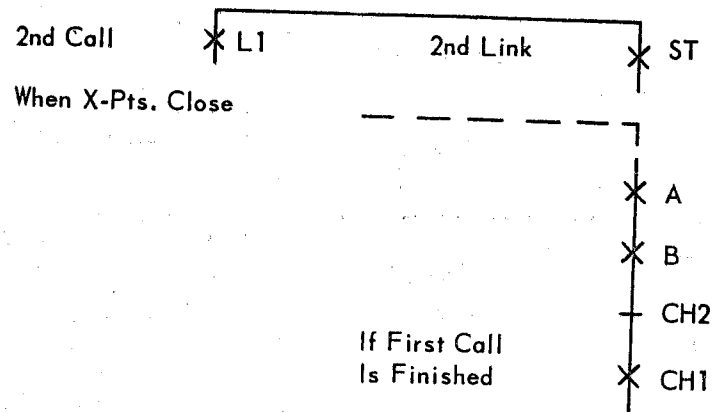
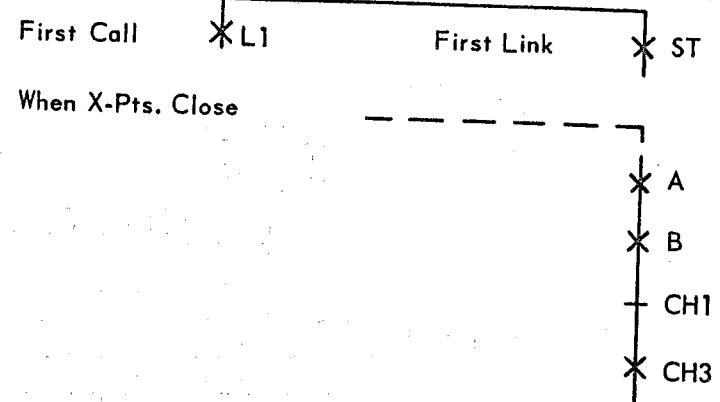
**Typical Outgoing Trunk Call.**

# LINK ALLOTMENT

Line - Line Switch  
Call Allotter Cct.  
SD66504-01

Link  
Link Allotter Cct.  
SD66505-01 or SD66611-01

CH1 & CH2 - OP. - CH3 NORM.



| RELAYS OPERATED | RELAYS NORMAL    | LINK SELECTED |
|-----------------|------------------|---------------|
| CH1             | CH2 and CH3      | First         |
| CH1 and CH2     | CH3              | First         |
| CH1 and CH3     | CH2              | Last          |
| CH2             | CH1 and CH3      | Intermediate  |
| CH2 and CH3     | CH1              | Intermediate  |
| CH3             | CH1 and CH2      | Last          |
| -               | CH1, CH2 and CH3 | None          |

# ALL LINKS BUSY

Line, Line Switch, Call Allotter  
SD-66504-01

Link, Link Allotter  
SD-66505-01  
SD-66611-01

Ringing, Tone  
Common Timing  
SD-66506-01

R.O.H. X L

L1 Relay Marginal  
Does Not Operate

X BY

X T1

X A

X T

Buzzes

X B

X D

A

B

D

X A

X B

X D

A

B

D

Cycle  
Continues

Sta.  
Hangs  
Up. L

BY

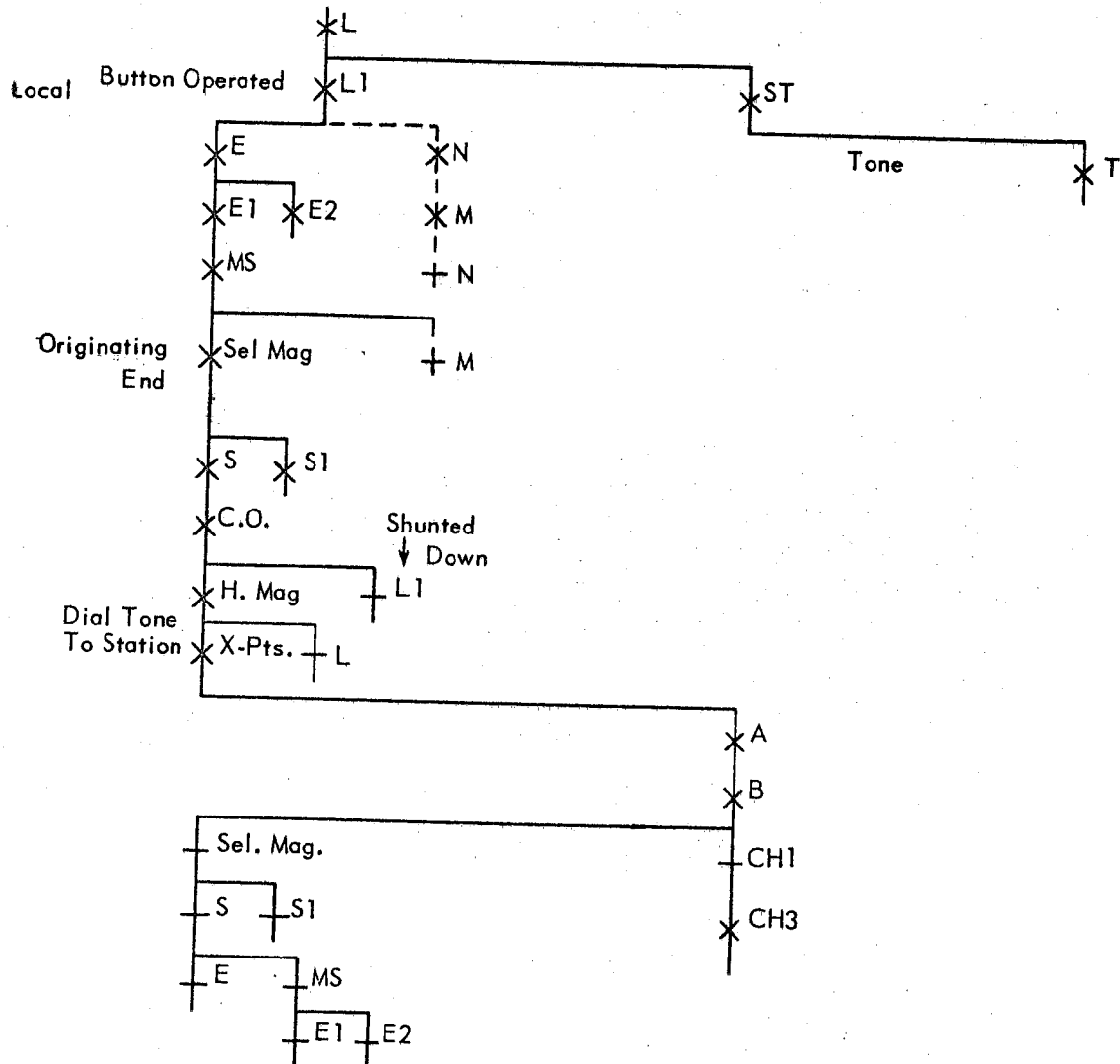
T1

A(B)(D) T

No Tone

# LINK SEIZURE FROM KEY STATION

|                    |                             |                    |
|--------------------|-----------------------------|--------------------|
| Line - Line Switch | Link                        | Ringing Common     |
| Call Allotter Cct. | Link Allotter Cct.          | Timing & Tone Cct. |
| SD 66504-01        | SD66505-01<br>or SD66611-01 | SD66506-01         |
| R.O.H.             |                             |                    |

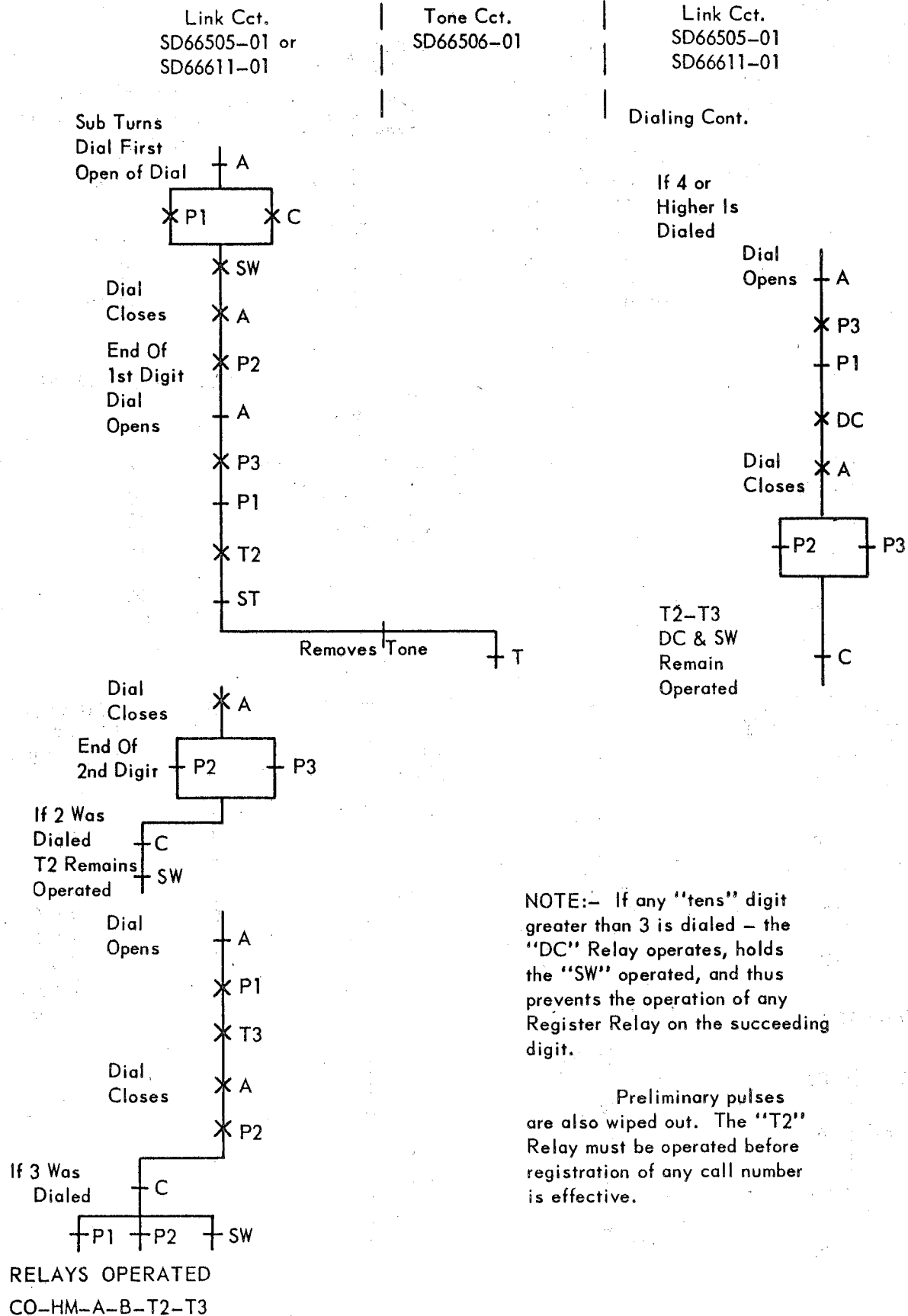


STATION READY TO DIAL

Relays Operated  
C.O.-HM-A-B-ST-T



## DIALING TENS DIGIT



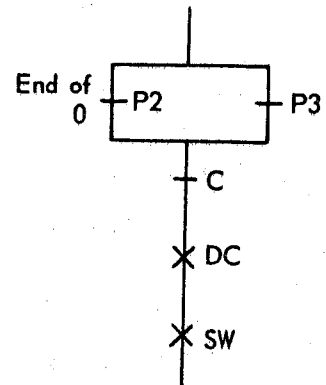
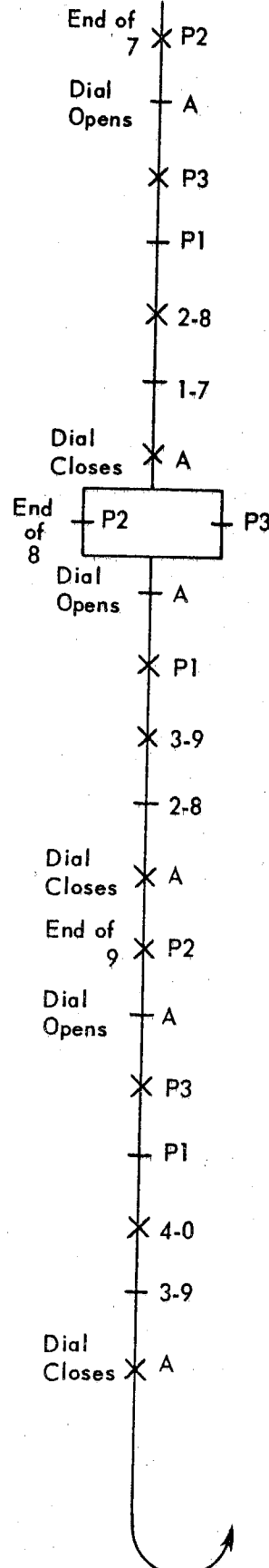
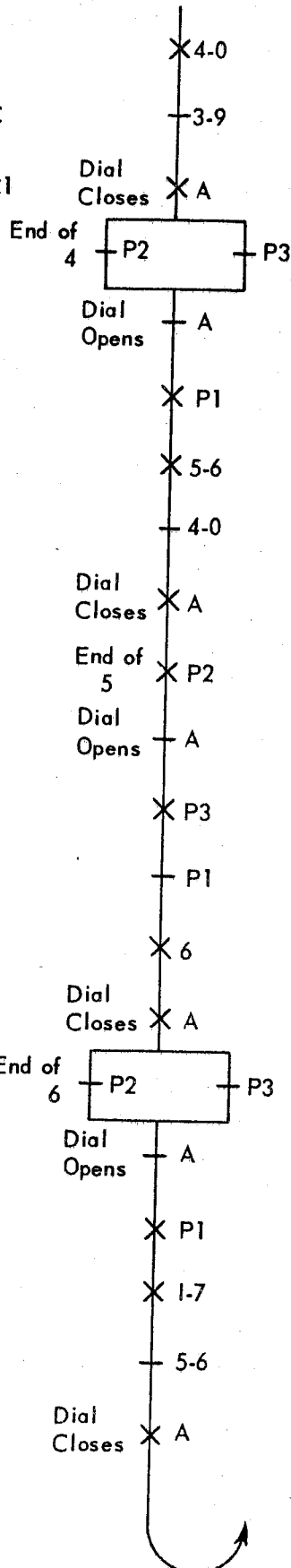
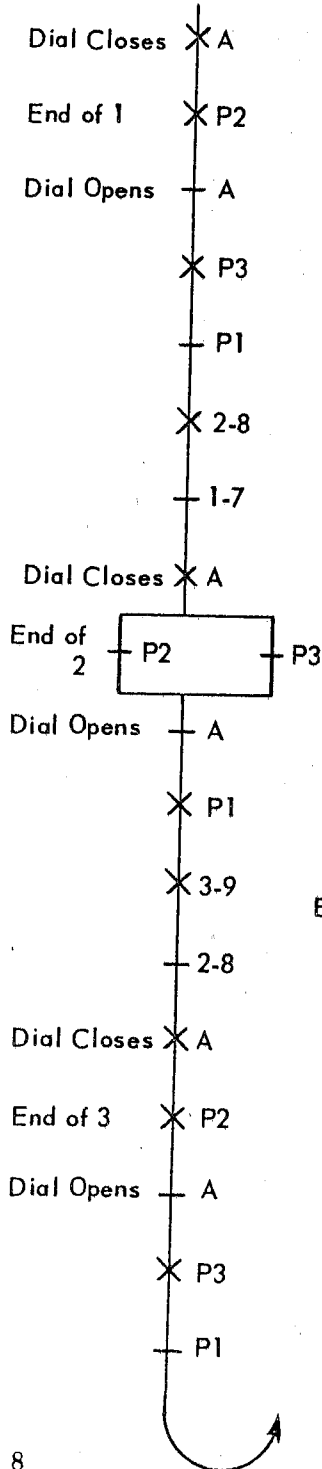
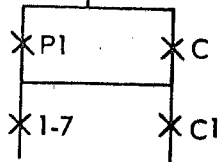
NOTE:- If any "tens" digit greater than 3 is dialed - the "DC" Relay operates, holds the "SW" operated, and thus prevents the operation of any Register Relay on the succeeding digit.

Preliminary pulses are also wiped out. The "T2" Relay must be operated before registration of any call number is effective.

# DIALING UNITS DIGIT

Link, Link Allotter  
SD-66505-01  
SD-66611-01

First open  
of dial



RELAYS OPERATED

CO  
HM  
A  
B  
T2  
T3  
SW  
DC  
C1

DIGIT  
DIALED

REGISTER  
RELAYS  
OPERATED

|   |         |
|---|---------|
| 1 | 1-7     |
| 2 | 2-8     |
| 3 | 3-9     |
| 4 | 4-0     |
| 5 | 5-6     |
| 6 | 5-6 & 6 |
| 7 | 1-7 & 6 |
| 8 | 2-8 & 6 |
| 9 | 3-9 & 6 |
| 0 | 4-0 & 6 |

# TEST OF BUSY LINES

Line, Line Switch, Call Allotter  
SD66504-01

Link, Link Allotter;  
SD66505-01  
SD66611-01

Ringling, Tone, Common Timing  
SD-66506-01

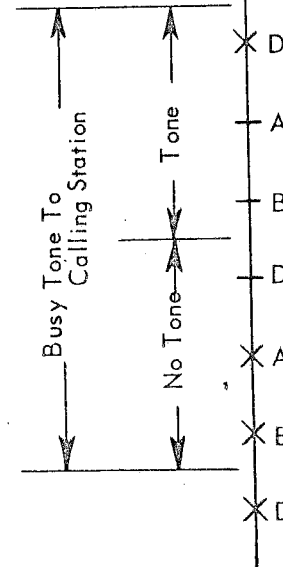
Called Station  
being busy -  
GRD.  
on CO lead.

X CO  
X H MAG.

X BY

X T1

X A X T  
X B Tone



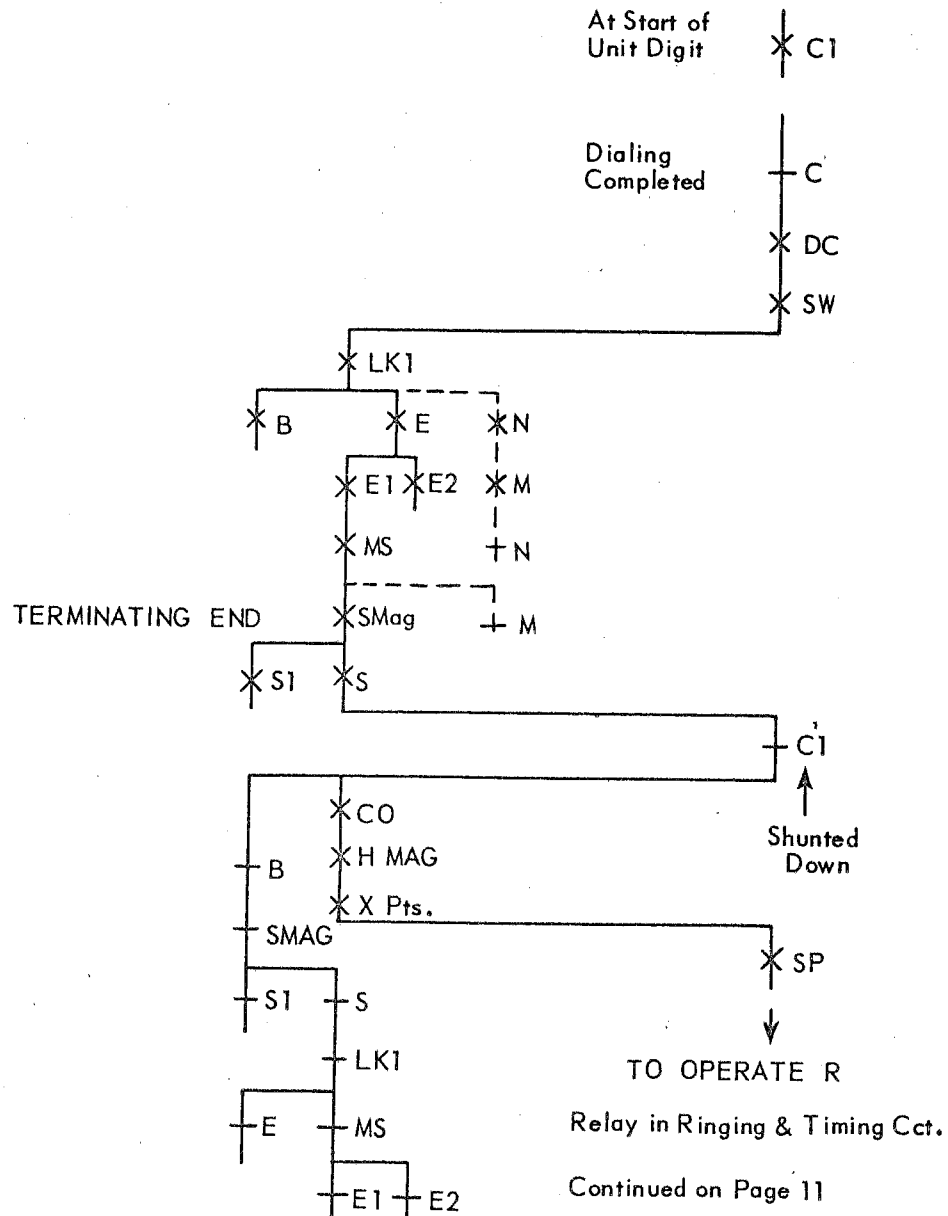
Cycle  
Continues  
Until  
Calling Sta.  
Hangs Up.

# LINK CONNECTION TO IDLE LINE

Using Link #1 Connecting to #28

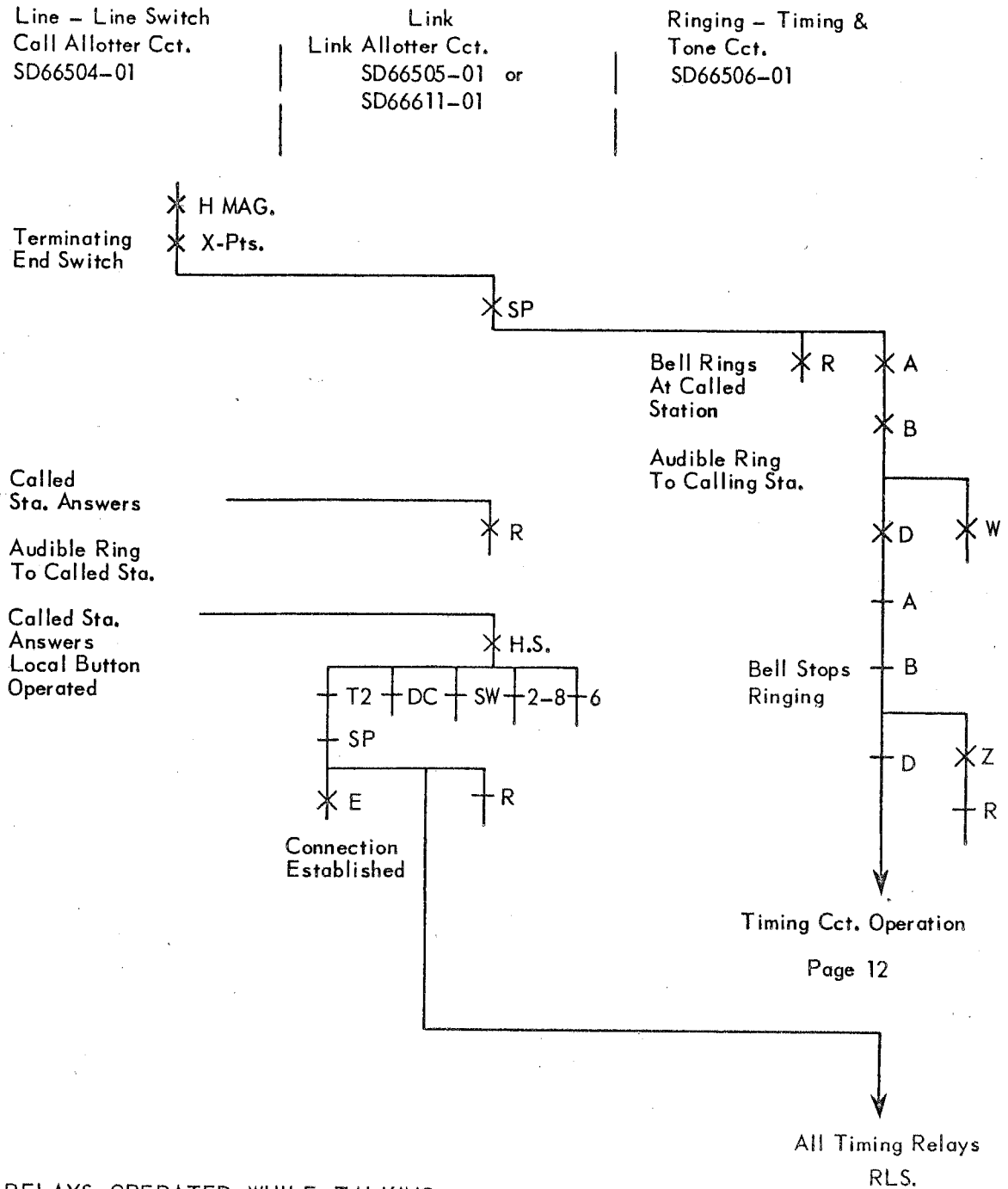
Line - Line Switch  
Call Allotter Cct.  
SD66504-01

Link  
Link Allotter Cct.  
SD66505-01 or  
SD66611-01



Relays Operated During  
"Ringing Period":- A-B-T2-DC  
SW-2-8-6-SP-CO & HM of Both  
Calling & Called Subs & R Relay  
in Ringing & Timing Cct.

# RINGING AND ANSWERING AT CALLED KEY STA. #28

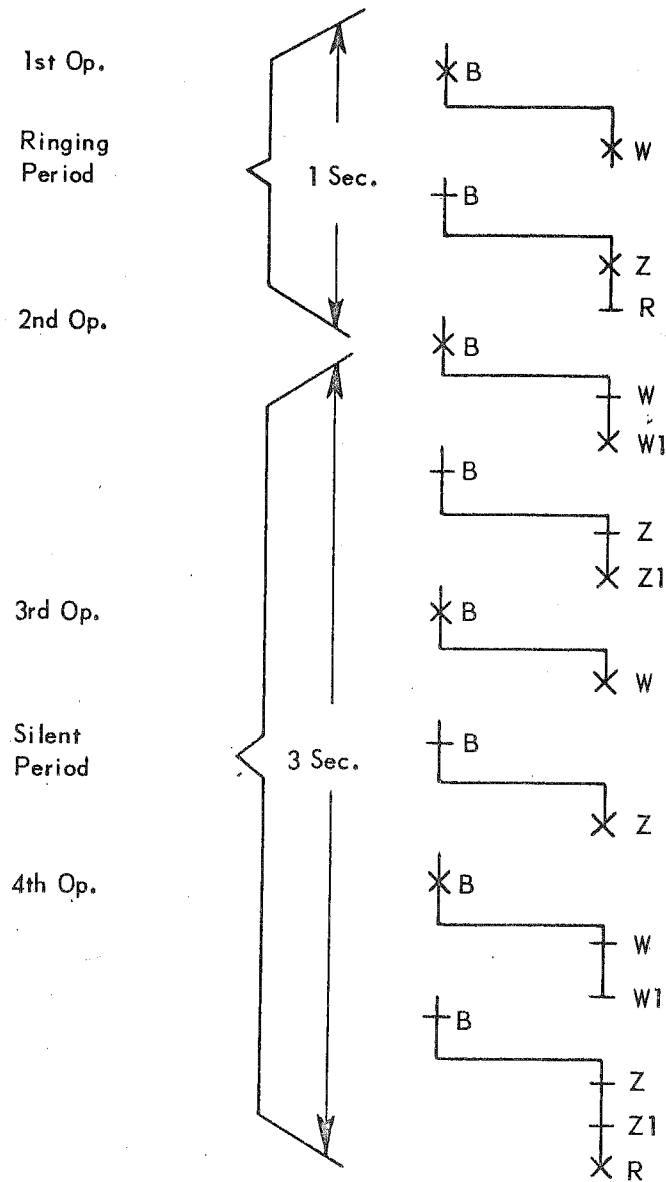


RELAYS OPERATED WHILE TALKING

E-A-B-HS-BOTH CO & HM Relays

# RINGING AND ANSWERING AT CALLED KEY STA. TIMING CCT. OPERATION

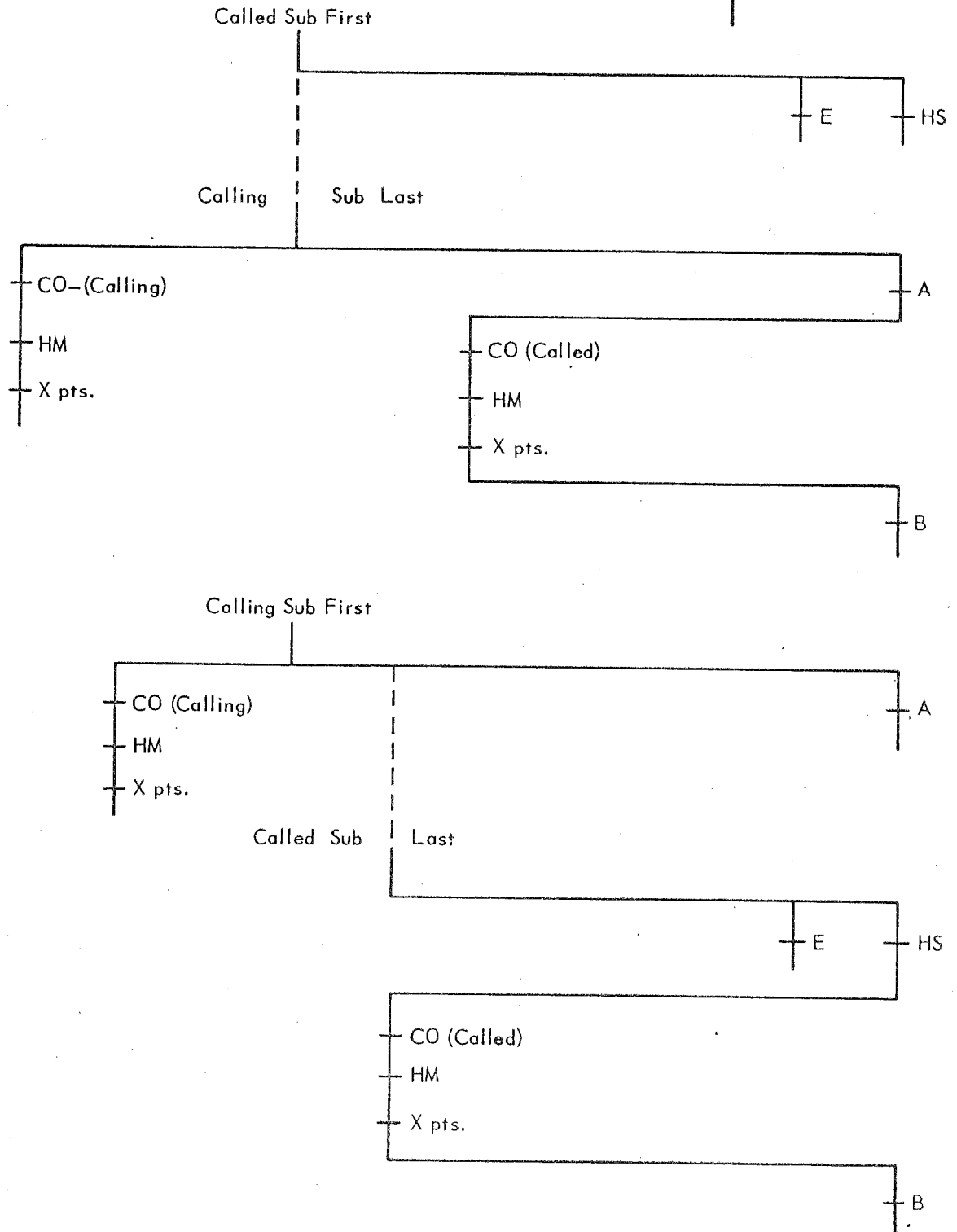
RINGING - TIMING & TONE CCT.  
SD66506-011



# DISCONNECTION

LINE, LINE SWITCH & CALL ALLOTTER CCT.  
SD-66504-01

Link  
Link Allotter Cct.  
SD66505-01  
SD66611-01

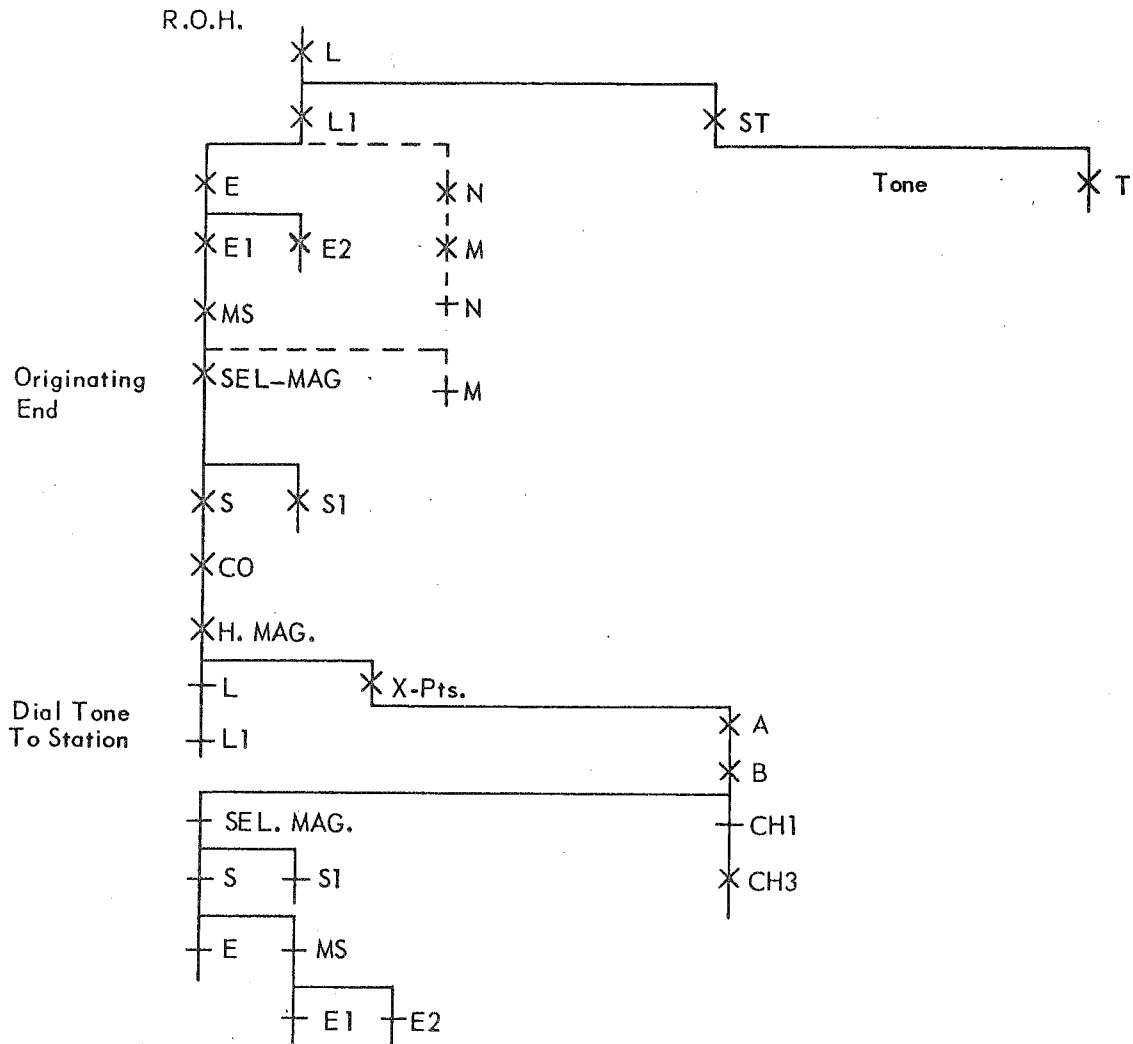


# LINK SEIZURE FROM KEYLESS STA.

Line - Line Switch &  
Call Allotter Cct.  
SD66504-01

Link and  
Link Allotter Cct.  
SD66505-01  
or SD66611-01

Ringing - Common  
Timing & Tone Cct.  
SD66506-01

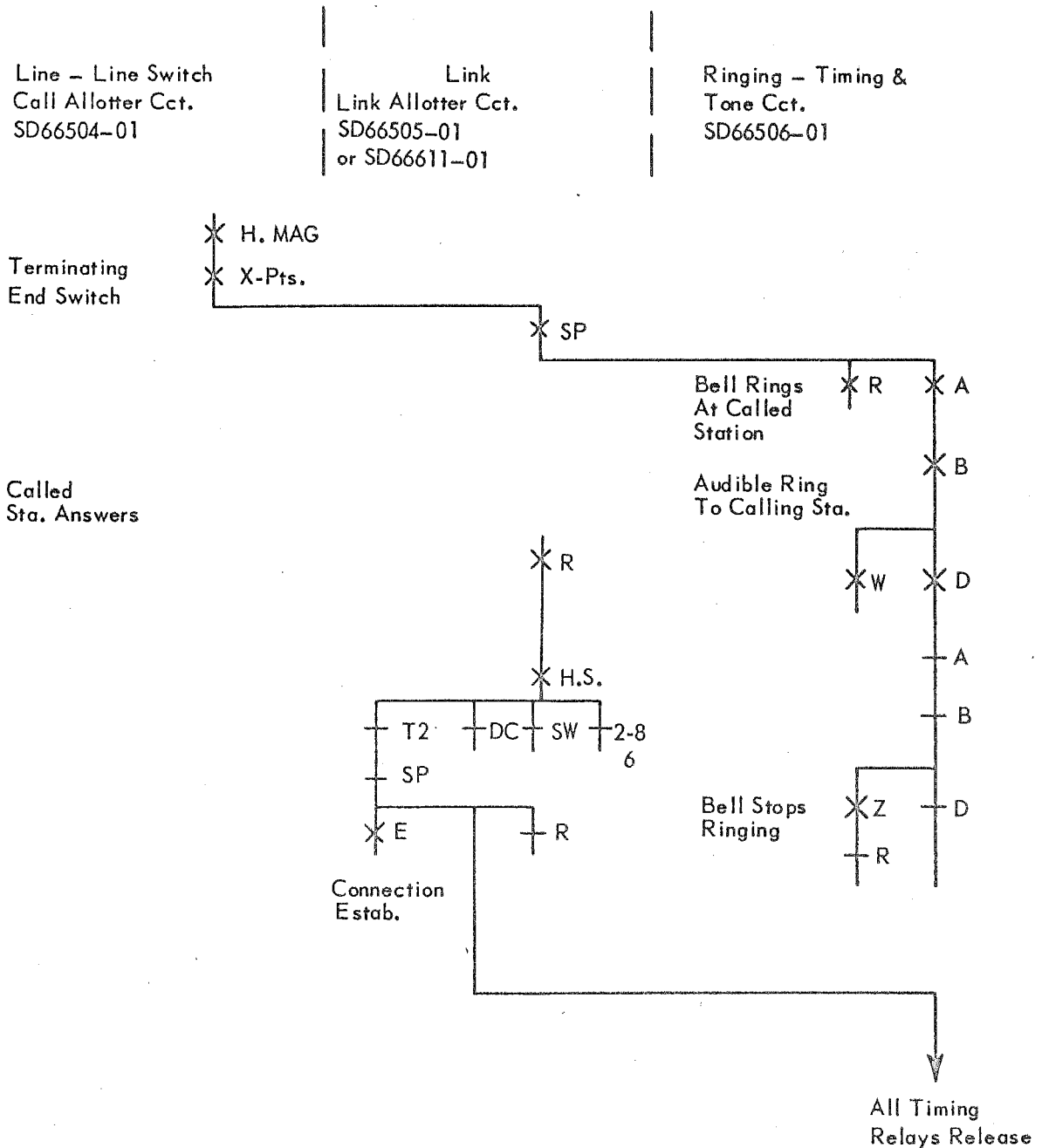


STATION READY TO DIAL  
RELAYS OPERATED

C.O. - H.M. A - B - ST - T



# RINGING AND ANSWERING AT CALLED KEYLESS STA. #28



RELAYS OPERATED WHILE TALKING:

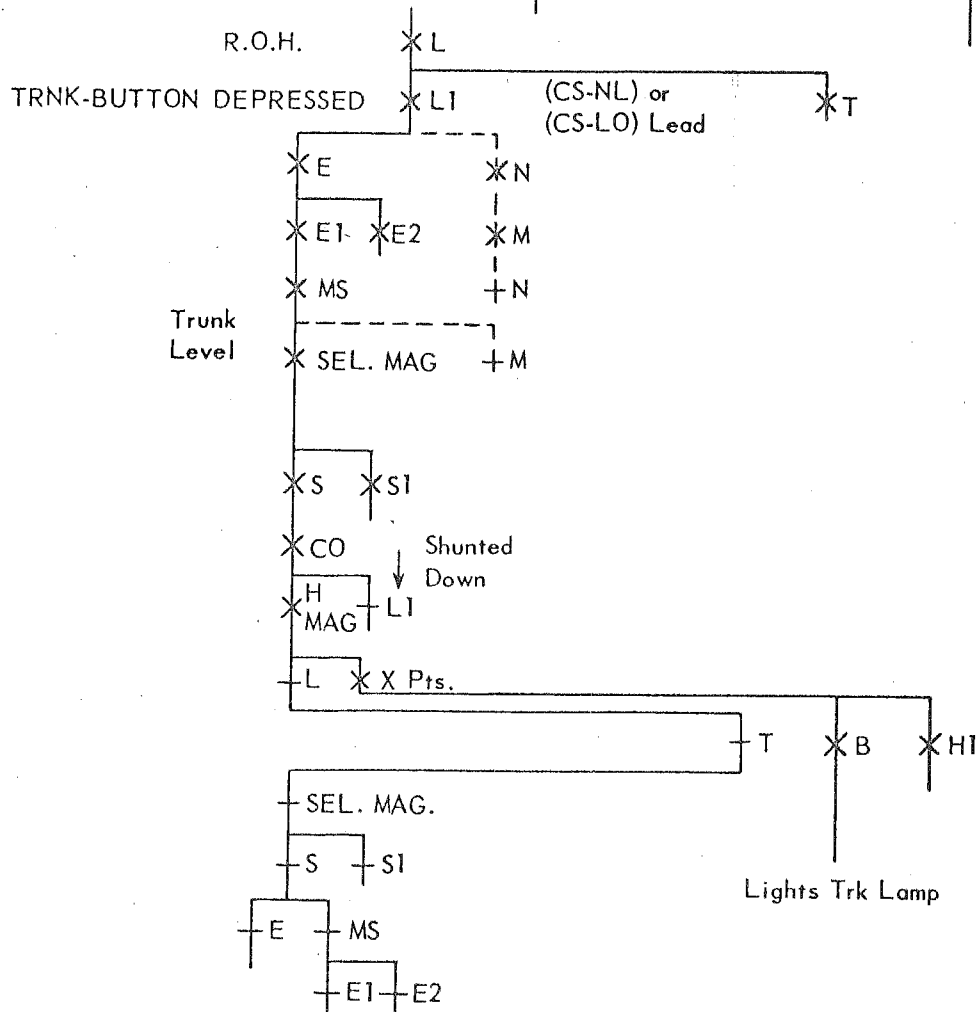
A-E-B-HS.-Both CO & HM Relays.

# OUTWARD CALL TO CENTRAL OFFICE

Line-Line Switch  
Call Allotter Cct.  
SD 66504-01

Trunk Cct.  
SD 66503-01

Ringing-Timing &  
Tone Cct.  
SD 66506-01

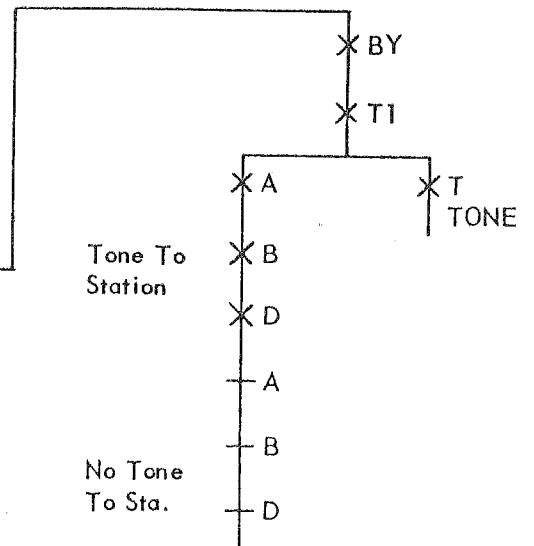


RELAYS OPERATED  
WHILE TALKING:  
CO-HM-HI-B

(CSLO) Sta. Attempts  
To Use BSY. Trk.

(B-HI Operated  
Trk. Lamp Lighted)

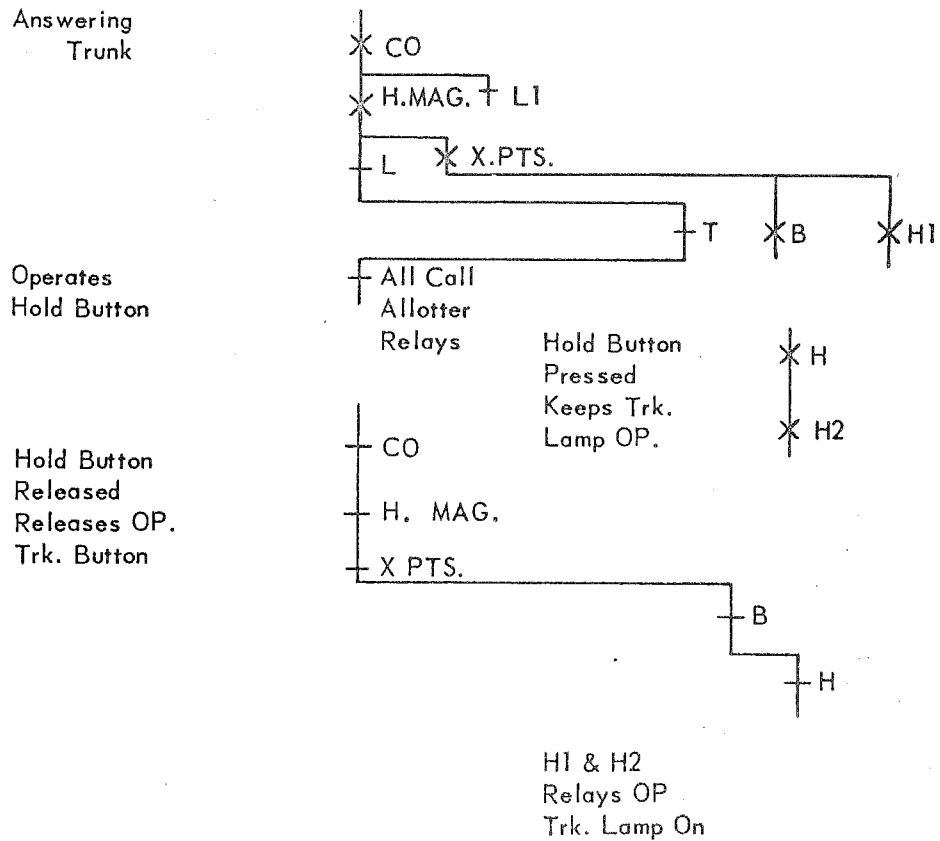
L1 Relay Marg.  
Will Not Op.



# HOLDING TRUNK CALL

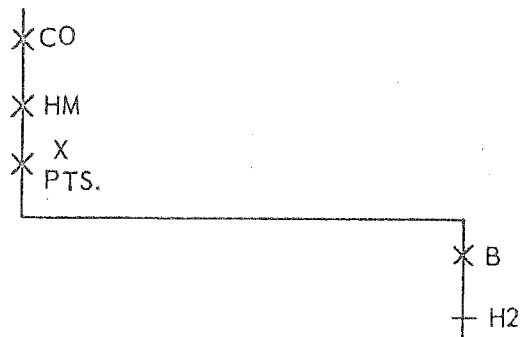
Line-Line Switch  
Call Allotter Cct.  
SD 66504-01

Trunk Cct.  
SD 66503-01



## RESEIZURE OF HELD TRUNK

OPERATES  
Trk. Button

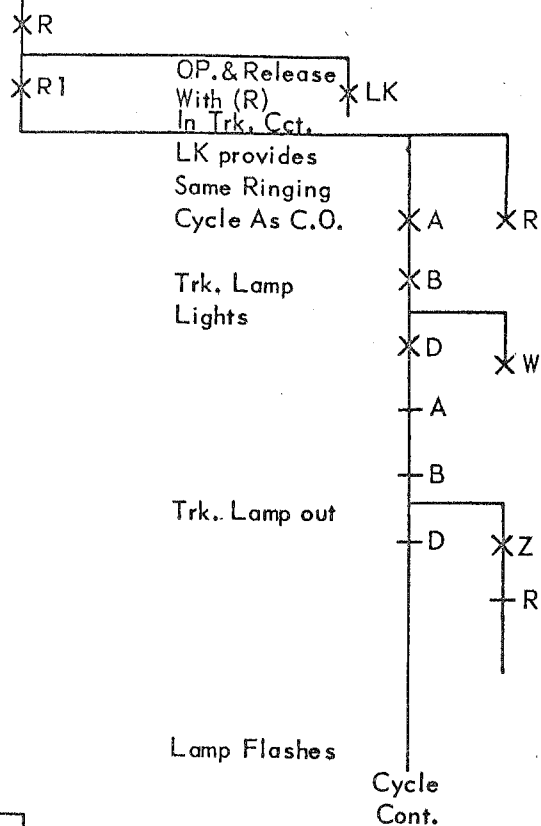


Line-Line Switch  
Call Allotter Cct.  
SD 66504-01

Trunk  
Cct.  
SD66503-01

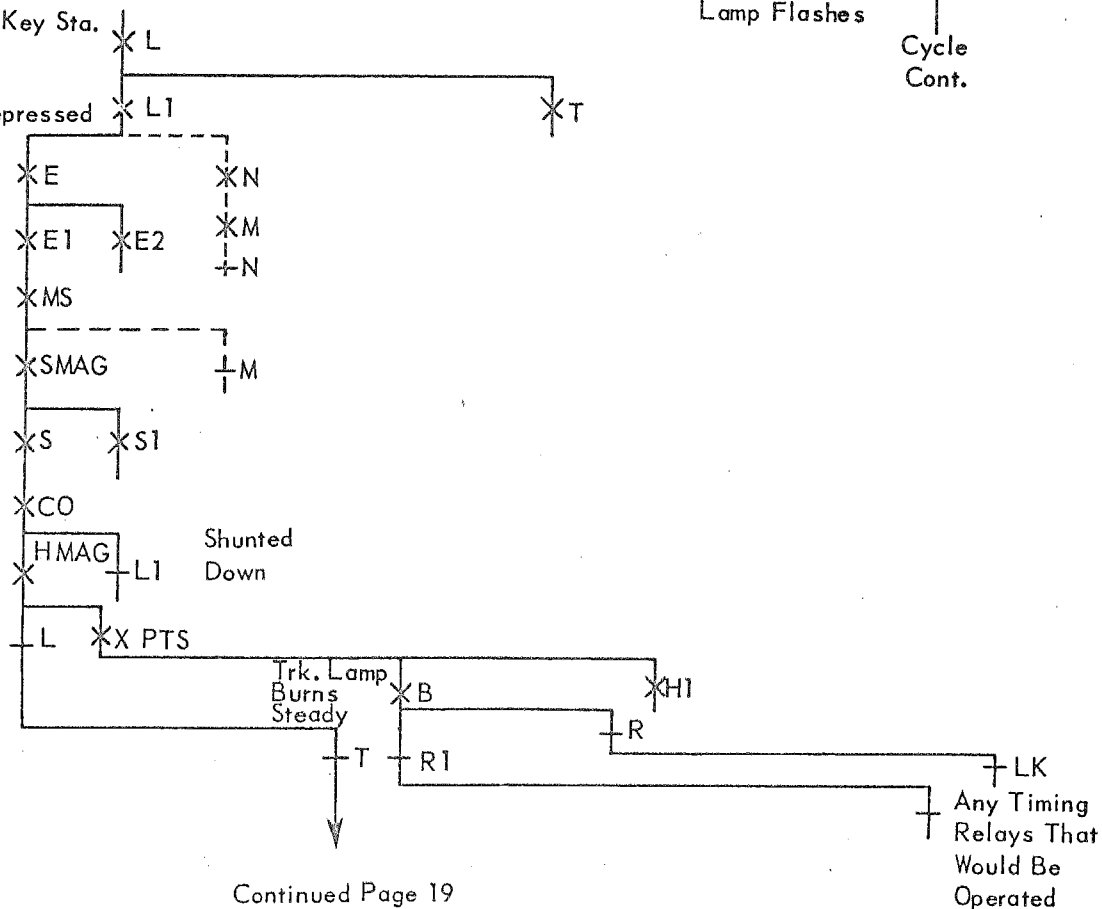
Ringing Timing &  
Tone Cct.  
SD 66506-01

Ringing Cur. T & R  
OP. & Release  
With Gen. Cycle



R.O.H. Any Key Sta.

Trnk. Button Depressed



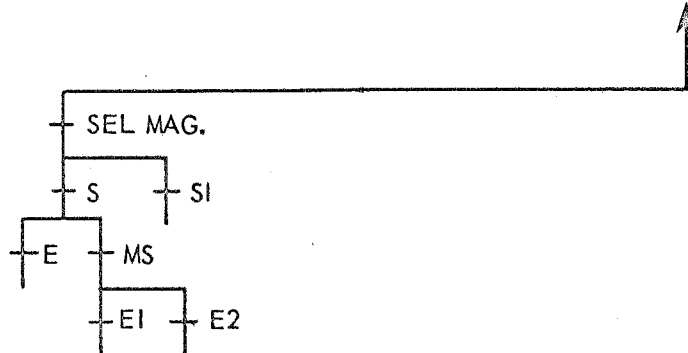
# INCOMING CALL - FROM CENTRAL OFFICE

Line-Line Switch  
Call Allotter Cct.  
SD 66504-01

Trunk Cct.  
SD 66503-01

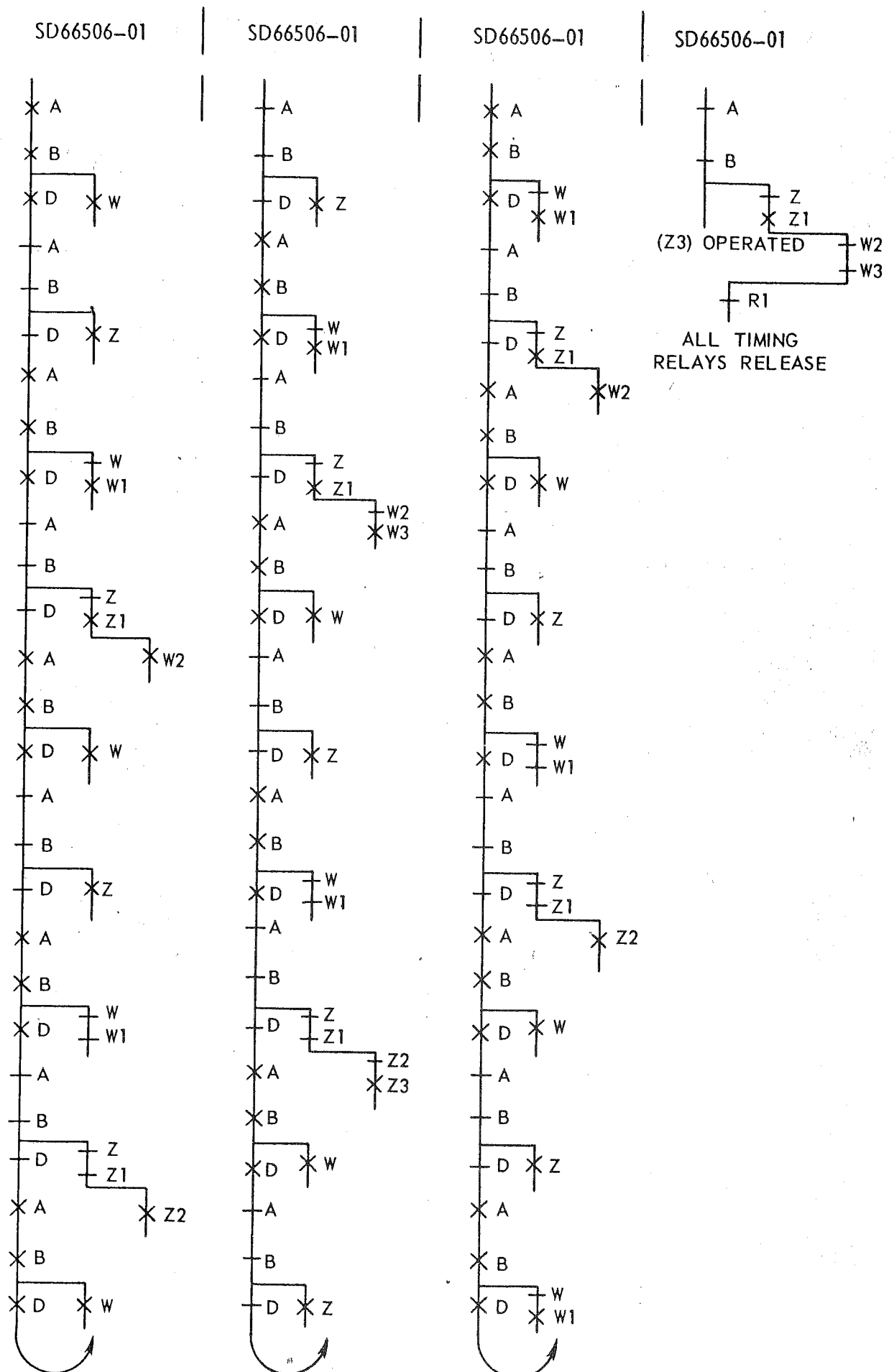
Ringing-  
Timing & Tone  
Cct.  
SD 66506-01

From (T) Page 18

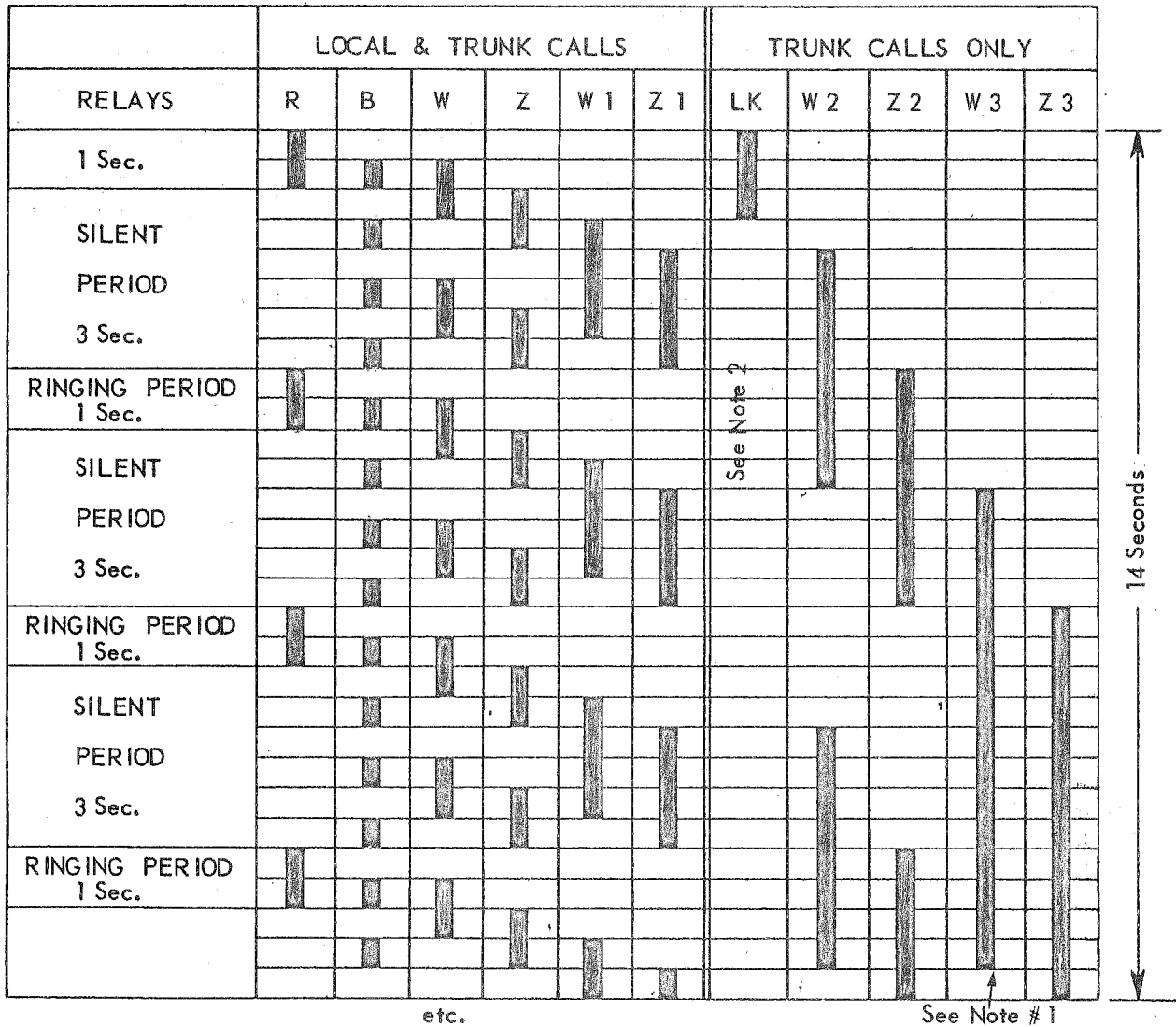


Relays Operated  
While Talking  
CO-H.M.-B-HI

OPERATION OF TIMING CIRCUIT TO RELEASE (RI) RELAY  
ON ABANDONED TRUNK CALL RINGING-TIMING + TONE CCT.



## TIMING INTERVALS



Note #1 Release of W 3, releases R 1 in Trunk Circuit, which in turn releases all timing relays.

Note #2 After a Trunk Call is abandoned, the "R" Relay in the Trunk Circuit releases, which in turn releases the "LK" Relay in the timing circuit.

CD66504-01

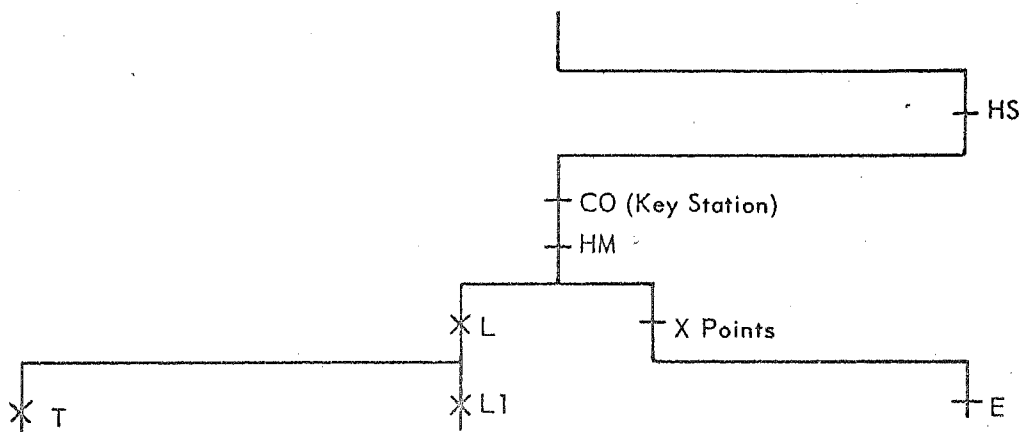
The principal functions of the "Control Key" are as follows:—

1. Opens path of "CO" Relay to release local X-points of Keyless Station.
2. Opens "L" & "G" Leads to prevent Keyless Station from seizing a Link Cct.
3. Completes operating path of "L1" Relay (Keyless Station), & "T" Relay (Trunk Cct.).
4. Places ground on "CO" Lead (Keyless Station) during the release of the local X-points, & the operation of the trunk X-points.

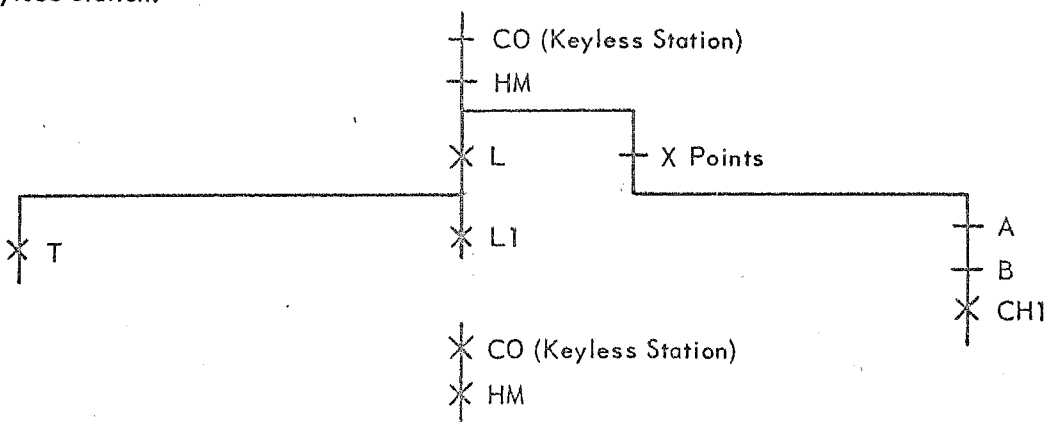
Line - Line Switch  
Call Allotter Cct.  
SD66504-01

Link  
Link Allotter  
SD66505-01 - SD66611-01

1. Keyless Station calls "Controlling" Key Station for assistance in making Trunk call. The "CO" Relay of the Keyless Station is held operated thru the normal control key contacts, "A" & "SW" Leads, & operated "A" & "B" Relays of the Link Cct.
2. Key Station depresses Trunk Key, which automatically releases the Local Key.



3. After Key Station dials the desired call No., the "Control Key" is operated momentarily. This opens the "L" Lead of the Keyless Station; grounds the "CO" Lead of the Keyless Station; & opens "A" Lead of the Keyless Station.



4. Control Key is released, & the Key Station hangs up, which releases X-points of Key Station & places Trunk Cct. in control of Keyless Station.



## MODIFICATIONS NECESSARY FOR CONTROL KEYLESS STATION

S.D.66504-012 - S.D.66504-013

### AT EQUIPMENT CABINET

Remove R-W wire from bottom #4 contact of LI relay. Place a R-B-W wire from #4 bottom contact of LI relay to #3 contact at cross points of station to be controlled, then strap to #3 contact of same station on all trunk levels.

Remove wiring at #4 cross points of controlled station.

Place wires from "N" punchings of the CS terminal block to the #4 swinging contact of the cross points of controlled station, one wire to each trunk.

Strap "H" and "L" leads of the controlled station, at the station terminal block.

Place wires from terminals 43, 44, 45 and 46 of the misc. connecting block to the #3 swinging contact of the controlling station cross points in trunks 1, 2, 3 and 4.

Connect the "SW" lead of the controlled station from #0 contact at the cross points to terminal 37 of the misc. connecting block.

Remove R-W wire at #0 contact of controlled station cross points.

Connect "A" lead from #4 bottom contact of the LI relay of controlled station to terminal 38 of the misc. connecting block.

### AT CONTROL KEY OF CONTROLLING STATION

Place the following wires to the corresponding terminal numbers of the control key at the controlling station:

Wires 1, 2, 3 and 4 from terminals 1, 2, 3 and 4 on the controlled station terminal strip.

Wires 5, 6, 7 and 8 from terminals 43, 44, 45 and 46 on the misc. terminal strip.

Wires 9 and 10 from terminals 37 and 38 on misc. terminal strip.

Wire 12 from the "G" punching at the controlled station terminal strip.

Wire 11 from the "L" punching at the controlled station terminal strip.

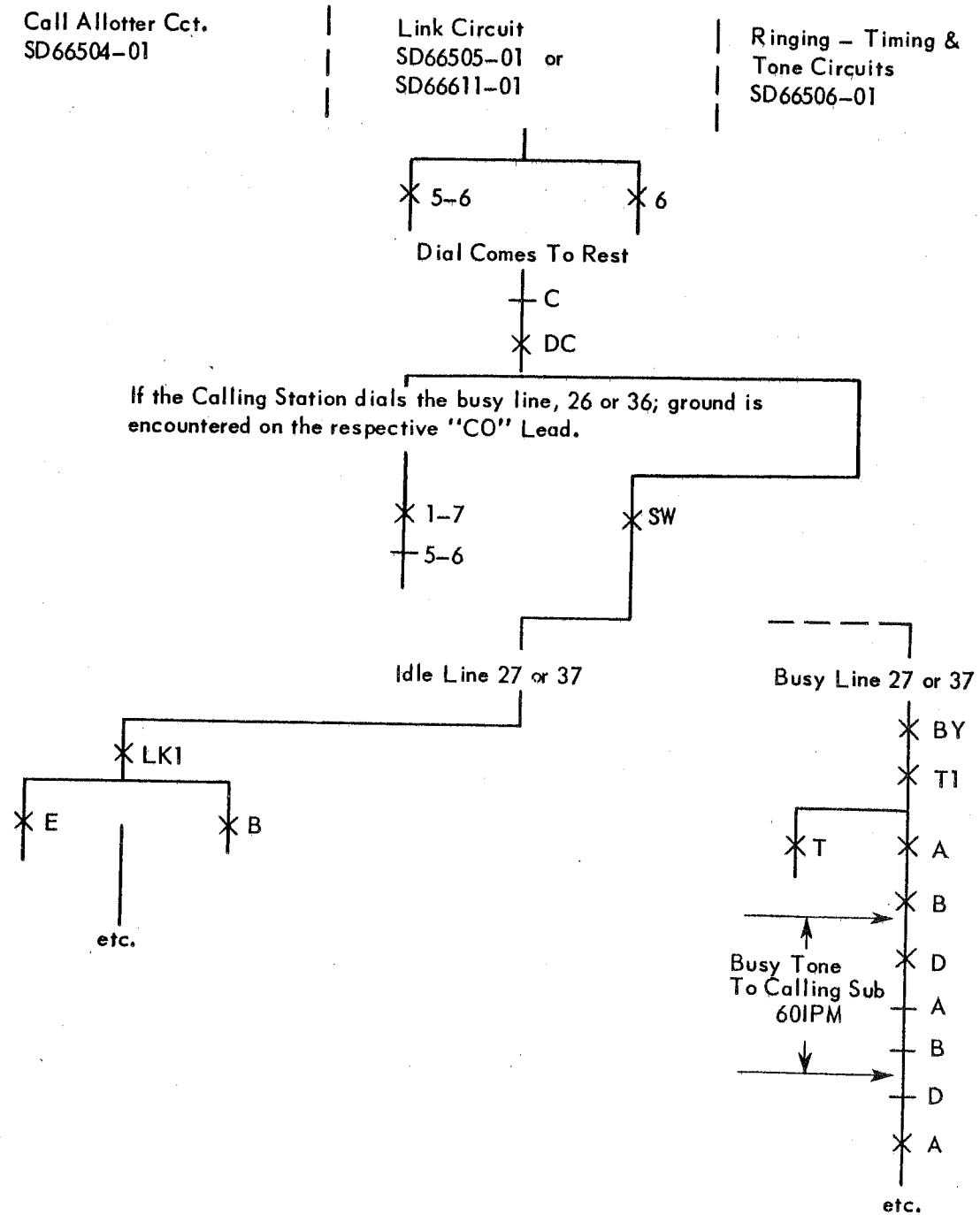
Wire 13 from terminal 12 at misc. terminal strip.

Wire 14 is "L" lead from sub-set of controlling station.

# AUTOMATIC LINE HUNTING FEATURE

SD66611-01 OR SD66505-01

NOTE - The Line Hunting Feature on Lines 26 and 27 is provided by the use of "S" wiring; and for Lines 36 and 37 by the use of "Z" wiring.



NOTE - Consult T-66611-30, or T-66505-11 for Wiring information.

Including the use of "Trunk Key", or "Separate Key",  
and "Line Lamp".

Consult T-66504-14 and T-66504-15  
for Wiring information.

Local Call Terminating  
on Sta. To Be Picked Up.

 $+ C_1$ 

Ground Thru Register  
Relays to CO Lead.



For "Trunk Key" – use  
Figs. 8, 9, 12, & 13; Wiring  
"H", "F", & "X"; & Remove  
Wiring "Y".

For "Separate Key" use  
Figs. 8, 9, & 12; Wiring  
"H", "F" & "X"; Remove  
Wiring "Y".

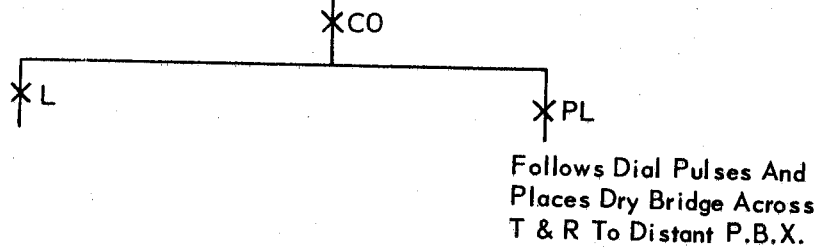
# TIE TRUNK - 2 WAY DIAL

Tie Trunk Circuit  
SD66601-01

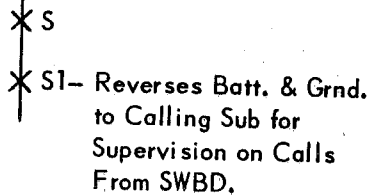
Line-Line Sw.-  
Call Allotter.  
SD-66504-012  
Figs. 10 & 11

## OUTGOING CALL

755-A Station Dials Tie Line # (26). Operated  
"HM" of Tie Line places Battery on "LL" Lead.



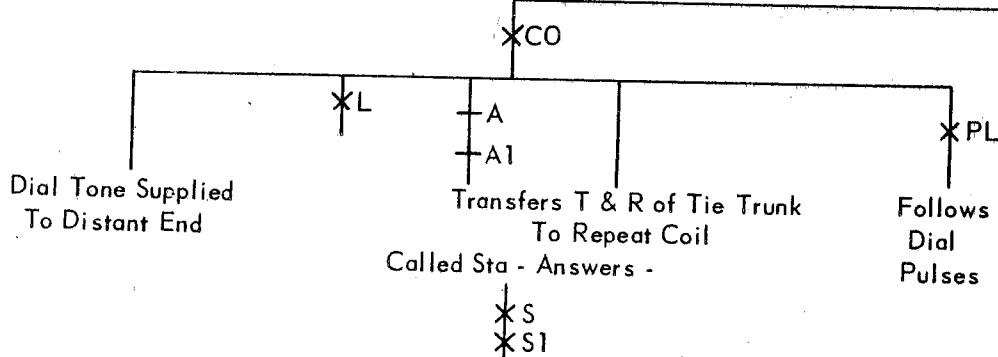
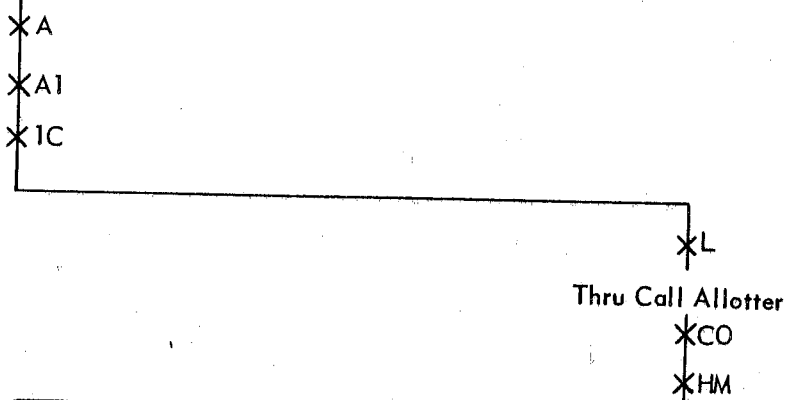
Called Sub Answers



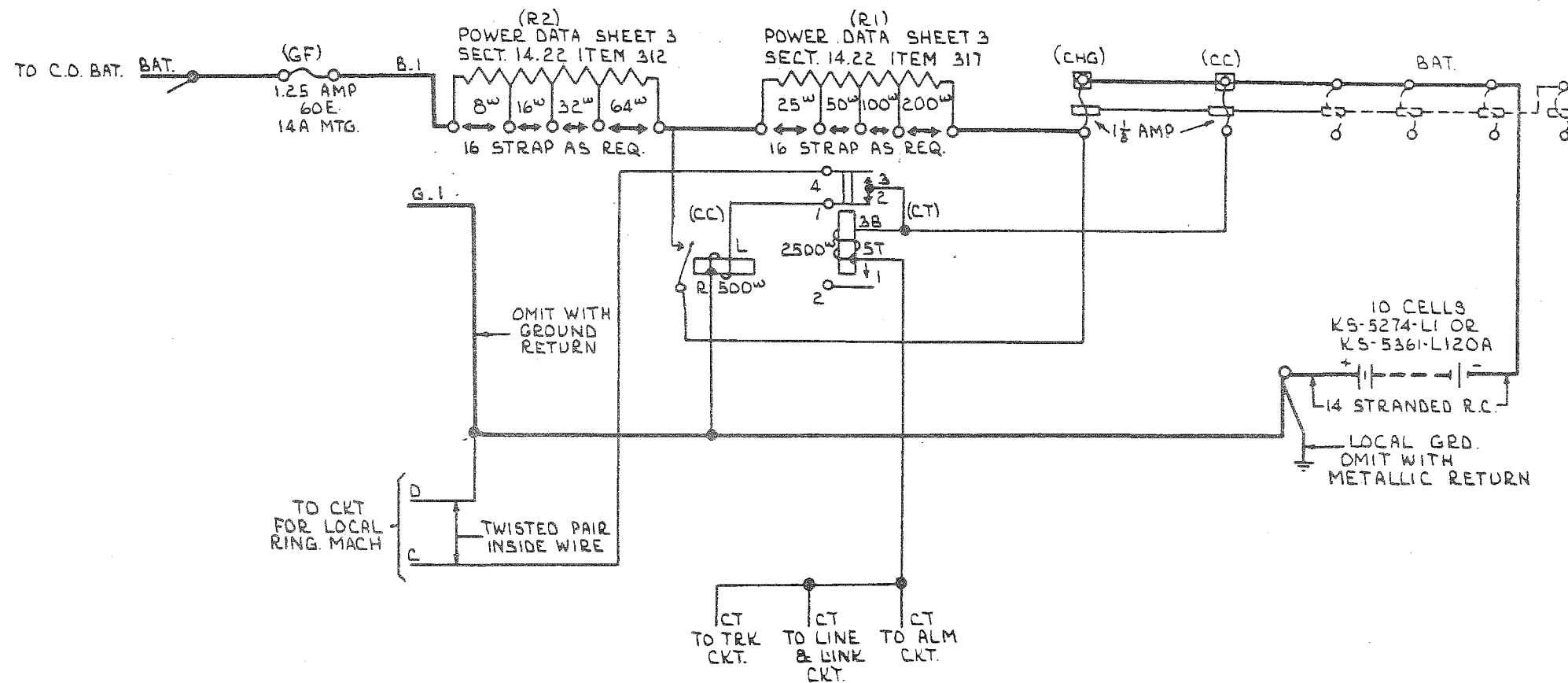
RELAYS OPERATED WHILE TALKING-CO-L-PL-S-S1

## INCOMING CALL

Operator or Subscriber at distant end, places  
low resistance dry bridge across T & R of Trunk



Relays Operated While Talking - CO-IC-PL-L-S-S1



**CHARGE AND DISCHARGE CIRCUIT**  
WITH RELAY FOR CHARGE CONTROL



## How To Use This Telephone

To make or answer an inside call—Depress "LOCAL" button before using telephone.

To make an outside call—Depress a "TRUNK" button before calling. If you find the trunk busy, select another one. Be sure that no outside party is waiting on a trunk, before selecting another; answer and dispose of any unanswered incoming call you encounter, or operate "HOLD" button if trunk is held for transfer on a call previously answered elsewhere.

To answer a call from outside—Depress "TRUNK" button indicated by tone of bell or flashing trunk lamp before answering.

Inside and outside calls received simultaneously—Answer inside call first.

To hold an outside connection while making another call—Ask party to hold the line. Depress "HOLD" button. Then proceed with other call. Return to first connection by depressing button on that trunk.

To transfer a call from outside—Hold, as above. Call desired extension and ask called party to answer on trunk you are holding.

When he agrees, hang up; if he is not available, report fact to calling party.

To signal the operator on an established outside connection—Flash slowly.

To establish an inside conference connection—Limited to three phones. Call first party to make sure he is available. Then call second party and inform him of your intention. Ask him to hang up, and answer again when his bell has rung at least twice.

Then without hanging up, dial the first number again.

System out of Order—At telephone No. \_\_\_\_\_ there is an emergency key which connects to the central office. This permits maintaining outside service at that telephone until trouble can be corrected.

An alarm bell is provided to indicate burning out of fuse. To silence bell, operate key associated with it.

Report any trouble immediately to the Telephone Company.

## How To Control Outside Calls For \_\_\_\_\_

Incoming calls—Hold as on any transfer. Call desired telephone, announce call and ask called party not to hang up. Return to incoming call and operate control key for called telephone until you hear a click (about 1 second). Release key, if necessary inform parties that they are connected, and hang up.

If desired party is not available, report the fact to calling party.

Outgoing calls—Ask calling party not to hang up. Then select idle trunk and make call.\* Immediately operate control key for calling telephone until you hear a click (about 1 second). Release key and hang up.

\*You must dial outside dial calls before operating control key; either you or calling party can give orders to an operator.

After a call to or from a controlled telephone—Your telephone is free for other calls.

