

PANEL SYSTEM
(GROUND CUT-OFF)

TRAINING MANUAL
SEQUENCE CHARTS AND OPERATIONAL SKETCHES

THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY
OPERATION AND ENGINEERING DEPARTMENT
PLANT OPERATION DIVISION
FOR TRAINING PURPOSES ONLY

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MARCH 1955

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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GENERAL NUMBERING

100-109 LINE,TRIP,START,LINK (LINK TYPE)
110-119 LF-DIST SEL. CKTS (" ")
120-139 SUB. SENDER (" ")
140-145 OFFICE SEL. CKTS
146-149 MISC. OUTGOING TRUNKS
150-155 INCOMING SEL. CKTS (FULL MECH.)
156-159 " " " (MANUAL)
160-169 FINAL SEL. CKTS
170-179 "B" LINK AND ALLOTTER CKTS.
180-189 KEY CONTROL AND "B" SENDER
190-199 MISCELLANEOUS CKTS

200-209 LINE, TRIP, START (SDR SEL. TYPE)
210-219 LF-DIST SEL. CKTS (" " ")
220-239 SUB. SENDER (" " ")

INDEX

CIRCUIT	TYPE	SKETCHES FROM	RELATED CIRCUITS
000A INDEX 000B LEGEND			
100.1-109.1 LINE,TRIP, START, LINK	LINK TYPE	ES-20298-01	
110.1-119.1 LF-DIST SEL. CKT - MRI 110.2-119.2 " " " " - COIN	LINK TYPE " "	ES-21030-01 ES-21031-01	
120.1-139.1 SUB. SENDER (SEL. TYPE)	WITH LINK & DECODER	ES-20012-02	
140.1-145.1 OFFICE SEL. CKT 140.2-145.2 " " "	1 CALL PER REV. 2 CALLS PER REV.	ES-195575 ES-240252	
150.1-155.1 INC. SEL CKT (1 AND 2-PTY) 150.2-155.2 " " " (1 AND 2-PTY)	FULL MECH. (NON-REPT) " " (REPT)	ES-21036-01 ES-20292-01	ES-226524
156.1-159.1 INC. SEL. CKT (1 AND 2-PTY) 156.2-159.2 " " " (1 AND 2-PTY)	MANUAL-POS.DISTR. "B" " - CORDLESS "B"	SD-21796-01 ES-20070	
160.1-169.1 FINAL SEL. CKT	WITH TIME MEASURE RELEASE	ES-239664-01	
170.1-179.1 "B" LINK, ALLOTTER, POS. FINDER 170.2-179.2 "B" LINK, ALLOTTER	POS. DISTR. "B" CORDLESS "B"	SD-21801-01 ST-51029-04	
180.1-189.1 KEY CONTROL AND "B" SENDER 180.2-189.2 " " " " "	POS. DISTR. "B" CORDLESS "B"	SD-21802-01 SD-20033-01 ST-51029-04	
190.1-199.1 SERVICE OBSERVING 190.2-199.2 " " " 190.3-199.3 " " "	FOR LOCAL ORIG. TRAFFIC FOR USE WITH #10 S.O. DESK FOR OBSERVING ON TRUNKS (LOCAL OPRE)	SD-90242-01 AND SD-21425-01 SD-90580-01 SD-20219-011	
200.1-209.1 LINE, TRIP, START 200.2-209.2 " " "	SDR SEL. TYPE - 400 PT. LF " " " - 300 PT. LF	ES-240292-3 T-501003	T-512374, T-431434, ES-207197
210.1-219.1 LF-DIST. SEL. CKT - MRI	SDR SEL. TYPE	ES-240071	T-501003, T-512374, T-431434, ST-52005 ES-207198-9
220.1-239.1 SUB. SENDER (SEL. TYPE) 220.2-239.2 " " (" ")	WITH SDR SEL. & TRANSLATOR " " " & DECODER	ES-240053 SD-21826-01	

GENERAL NUMBERING
AND
INDEX

PANEL GROUND CUT-OFF OS-000A

OPERATIONAL SKETCHES

 INDICATES CONTACTS 1T AND 2T OF (A) RELAY (CLOSED WHEN RELAY IS OPERATED).

 INDICATES CONTACTS 3T AND 4T OF (A) RELAY (CLOSED WHEN RELAY IS NORMAL).

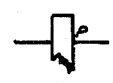
 INDICATES TRANSFER CONTACTS OF (B) RELAY

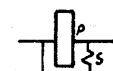
RELAY DESIGNATIONS:

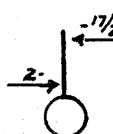
A/B (A) RELAY OR (B) RELAY

A(0-9) ALL OF A SERIES OF RELAYS A0 TO A9

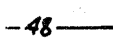
A- ONE OF A SERIES OF (A) RELAYS

 RELAY HAS MORE THAN ONE WINDING. ONLY PRIMARY WINDING IS USED IN THE PARTICULAR OPERATIONAL SKETCH.

 SECONDARY WINDING IS NON-INDUCTIVE.

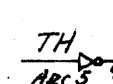
 SEQUENCE SWITCH CAMS (BRUSHES 1 & 3) MAY HAVE ADDITIONAL CUTTINGS, BUT ONLY THOSE ARE SHOWN WHICH ARE OF INTEREST IN THE PARTICULAR OPERATIONAL SKETCH.

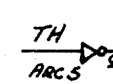
NOTE: A-CAM BRUSH 2 IS OMITTED ON SKETCHES EXCEPT WHEN USED AS AN ADVANCE PATH FOR A PASS-BY POSITION OF THE SWITCH.

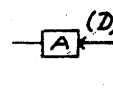
 48 VOLT NEGATIVE BATTERY.

 "OFF-NORMAL" BATTERY.

 "OFF-NORMAL" GROUND.

 ROTARY TYPE SELECTOR (DESIGNATION "TH") IS ON TERMINAL 9.

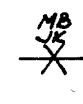
 ROTARY TYPE SELECTOR IS ON TERMINAL 9, 11, OR 13 (WHICH ARE STRAPPED TOGETHER)

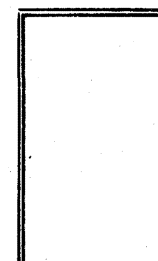
 INDICATES DISTRICT COMMUTATOR SEGMENTS "A" AND "G" (WITH CORRESPONDING COMMUTATOR BRUSHES STRAPPED TOGETHER).

 INDICATES OPTIONAL WIRING (NOTES ON SD-DRAWING)

 INDICATES OPTIONAL APPARATUS FIG. (NOTES ON SD-DRAWING)

 INDICATES NORMALLY CLOSED CONTACTS IN MAKE-BUSY JACK

 INDICATES CONTACTS IN MAKE-BUSY JACK WHICH ARE CLOSED WHEN JACK SPRINGS ARE OPERATED

 INDICATES PORTION OF OTHER CIRCUIT INCLUDED IN ORDER TO MAKE THE CIRCUIT PATH AS COMPLETE AS POSSIBLE. THE ENCLOSED PORTION IS USUALLY NOT SHOWN IN DETAIL, BUT REFERENCE IS GENERALLY MADE TO THE PARTICULAR OS-SHEET WHERE THE DETAILS MAY BE FOUND.

SEQUENCE CHARTS

 (A) RELAY OPERATES.

 (A) RELAY RELEASES.

 DISTRICT SEQ. SWITCH HAS MOVED TO POS. 3.

 (B) ROTARY TYPE SELECTOR (200-TYPE AND OTHERS) IS ENERGIZED.

 (B) ROTARY TYPE SELECTOR IS DE-ENERGIZED AND STEPS (ONE STEP UNLESS OTHERWISE INDICATED).

 LINE-FINDER UP-DRIVE OPERATES. (SELECTOR TRAVELS UP)

 LINE-FINDER UP-DRIVE RELEASES. (SELECTOR STOPS)

 SELECTOR HAS MOVED AND IS CONTACTING "A" COMMUTATOR SEGMENT.

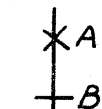
 SELECTOR HAS MOVED AND CONTACT WITH "A" COMMUTATOR SEGMENT IS BROKEN.

 MULTIPLE BRUSH MAKES CONTACT WITH "H" BANK TERMINAL.

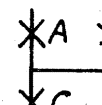
 "CHG" INTERRUPTER CLOSES FRONT CONTACT.

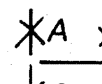
 "CHG" INTERRUPTER OPENS FRONT CONTACT.

SEQUENCE CHART PROGRESSION IS DOWNWARD:

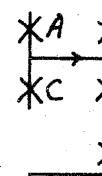
 RELAY (B) RELEASES AS A RESULT OF RELAY (A) OPERATING.

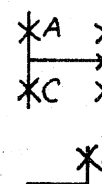
HORIZONTAL LINES ARE USED TO INDICATE MULTIPLE CAUSES OR MULTIPLE EFFECTS:

 RELAY (C) OPERATES AS A RESULT OF BOTH RELAY (A) AND RELAY (B) OPERATING.

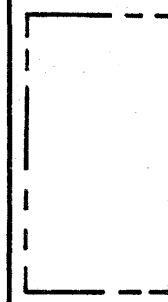
 RELAY (C) OPERATES AS A RESULT OF EITHER RELAY (A) OR RELAY (B) OPERATING.

USE OF DIRECTIONAL ARROWS OR STAGGERING:

 RELAY (C) OPERATES FROM RELAY (A) ALONE, BUT RELAYS (D) AND (E) REQUIRE BOTH RELAYS (A) AND (B).

 RELAY (C) OPERATES FROM RELAY (A) ALONE AND RELAY (E) OPERATES FROM RELAY (B) ALONE, BUT RELAY (D) REQUIRES BOTH RELAYS (A) AND (B).

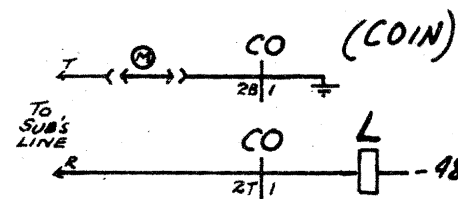
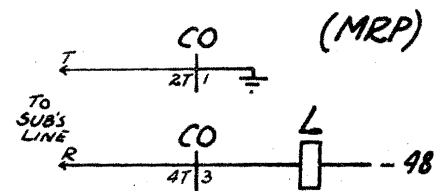
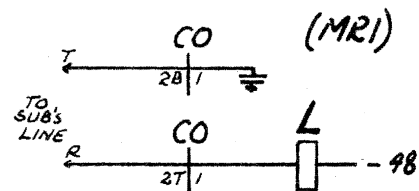
INCLUSION OF OTHER CIRCUITS:

 INDICATES PORTION OF OTHER CIRCUIT ACTION INCLUDED IN ORDER TO GIVE MEANING TO THE CIRCUIT ACTION DEPICTED ON THE SEQUENCE CHART. THE ENCLOSED PORTION IS USUALLY NOT SHOWN IN DETAIL, BUT REFERENCE IS GENERALLY MADE TO THE PARTICULAR OS-SHEET WHERE THE DETAILED SEQUENCE CHART MAY BE FOUND. THE ENCLOSURE IS ALSO USED AS A TRANSITION FROM ANOTHER SEQUENCE CHART TO INDICATE DUPLICATION.

LEGEND FOR
OPERATIONAL SKETCHES
AND SEQUENCE CHARTS

PANEL SYSTEM OS-000B

ISSUE	1
DATE	4-54
BY	GHH

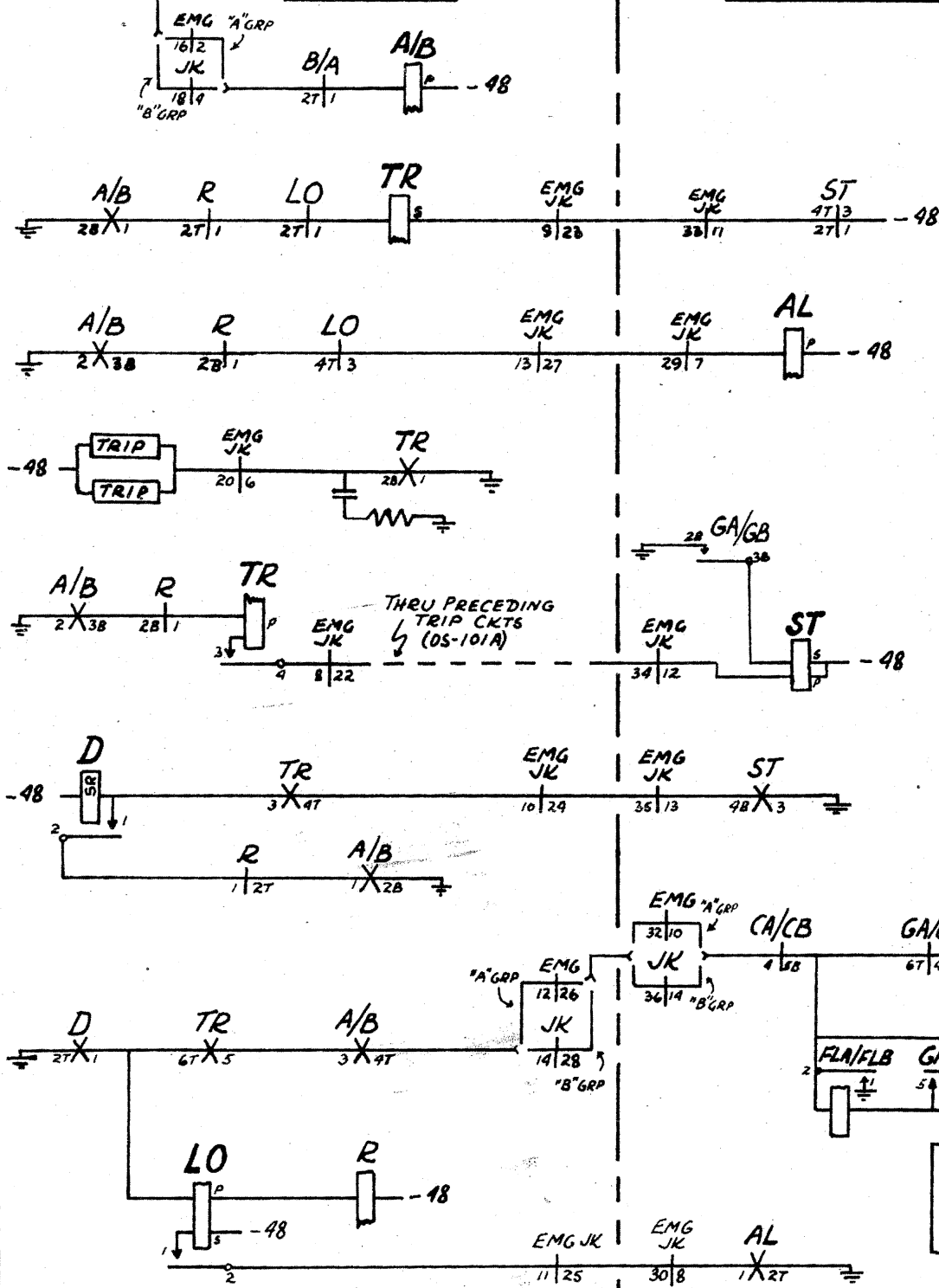


WIRING FOR "COIN LAST"

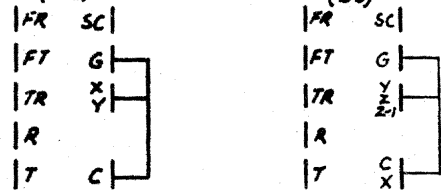
TRIP CKT

START CKT

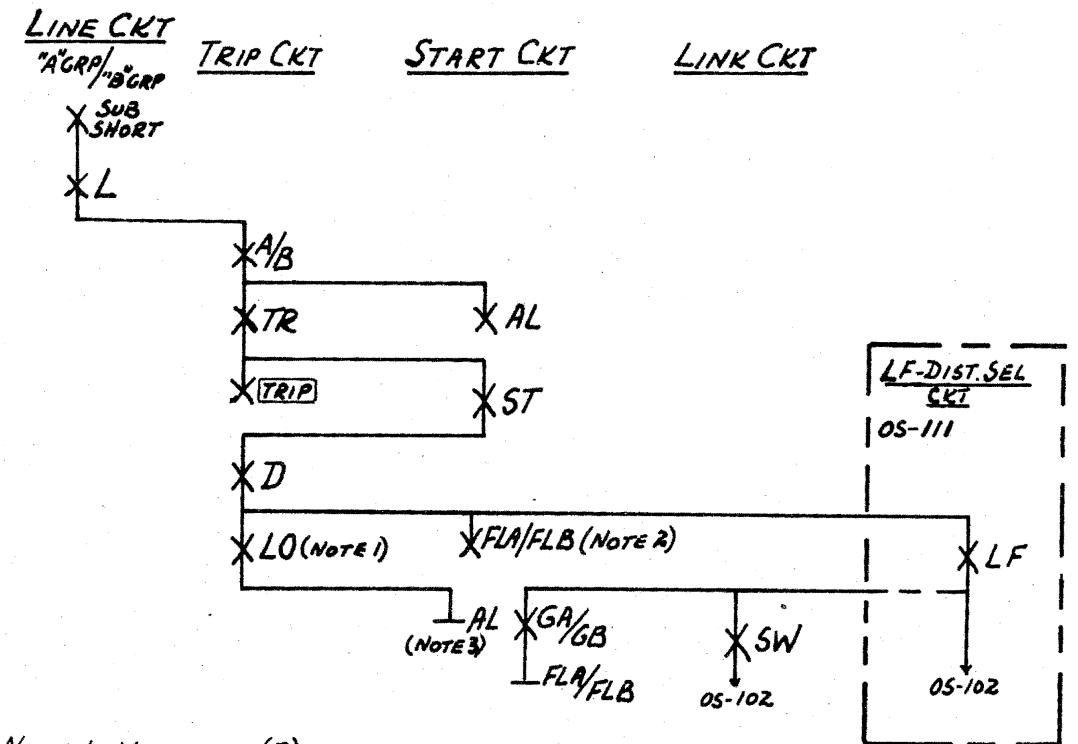
LINK CKT



STRAPPING OF COMMUTATOR BRUSHES



SEQUENCE CHART



NOTE 1: MARGINAL (R) DOES NOT OPERATE.

NOTE 2: (GA/GB) DOES NOT OPERATE DUE TO HIGH RES. OF (FLA/FLB) WINDING. (FLA/FLB) HOLDS GRD ON "ST" LEAD TO OPERATE TIME ALARM IN CASE (GA/GB) SUBSEQUENTLY FAILS TO OPERATE.

NOTE 3: (AL) RELEASES UNLESS HELD BY OTHER TRIP CKT

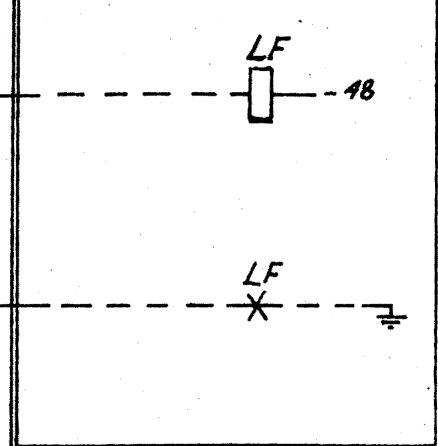
DIST. SEQ. SWITCH

1. NORMAL (AWTG. LINK)
2. AWTG. CALL

LINK SEQ. SWITCH

- 1-10. AWTG. CALL

LF-DIST. SELECTOR CKT



ES-20298-011 ISSUE 34AR LINE, TRIP, START

LINE, TRIP, START, LINK
START OF CALL

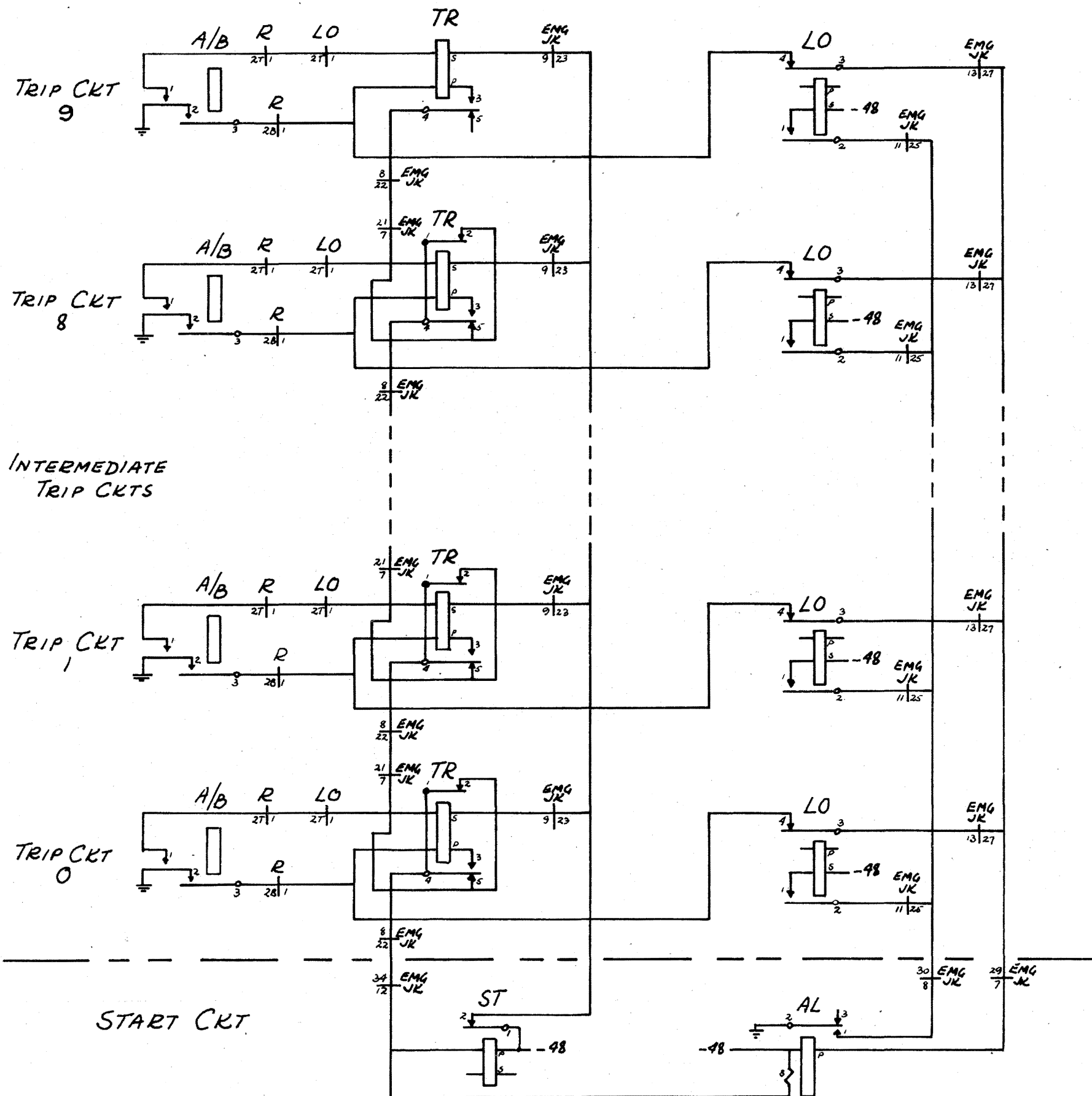
PANEL G.C.O. LINK TYPE OS-101

ILL. BELL TEL. CO. - PLANT SCHOOL

TRIP CKT PREFERENCE AND LOCK-OUT

LINK ALLOTING

ISSUE	1
DATE	9-54
BY	GHH



LAST LINK

INTERMEDIATE LINK

FIRST LINK

LINK SEQ. SWITCH

- 1-10 AWTG. CALL
- 2-11 HUNT SENDER
- 3-12 AWTG. SENDER
- 4-13 PASS-BY
- 5-14 CUT-THRU
- 6-15 PASS-BY (OR RETURN FROM LAST 10 OR 20 SDRS)
- 7-16 HUNT DIST. (OR OUT-OF-SERV)
- 8-17 AWTG. DIST.
- 9-18 AWTG. ALLOTMENT

ES-20298-011 ISS. 3AAR LINE, TRIP, START, L

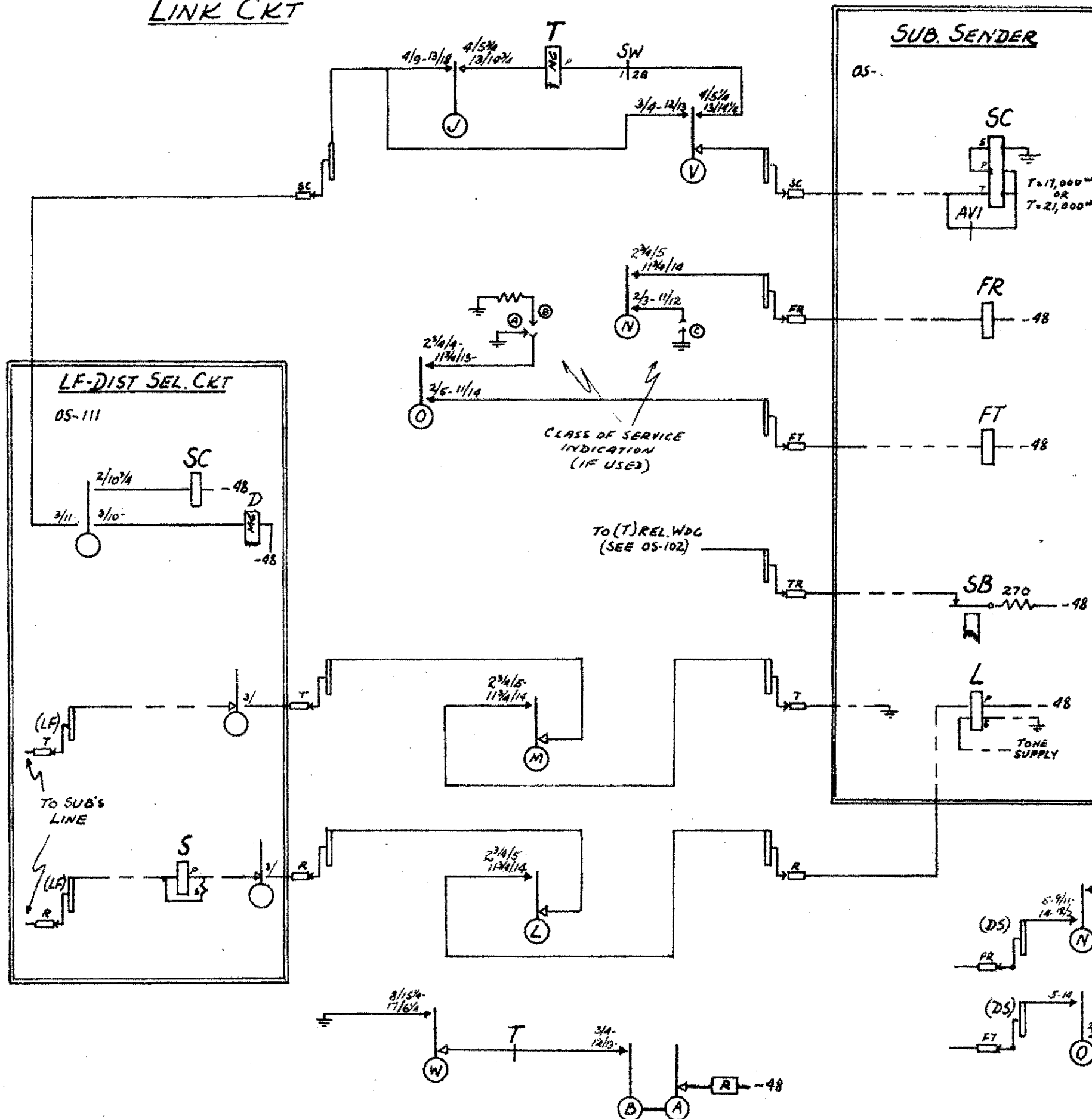
TRIP CKT PREFERENCE & LOCK-OUT
LINK ALLOTING

PANEL GCO LINK TYPE OS-10

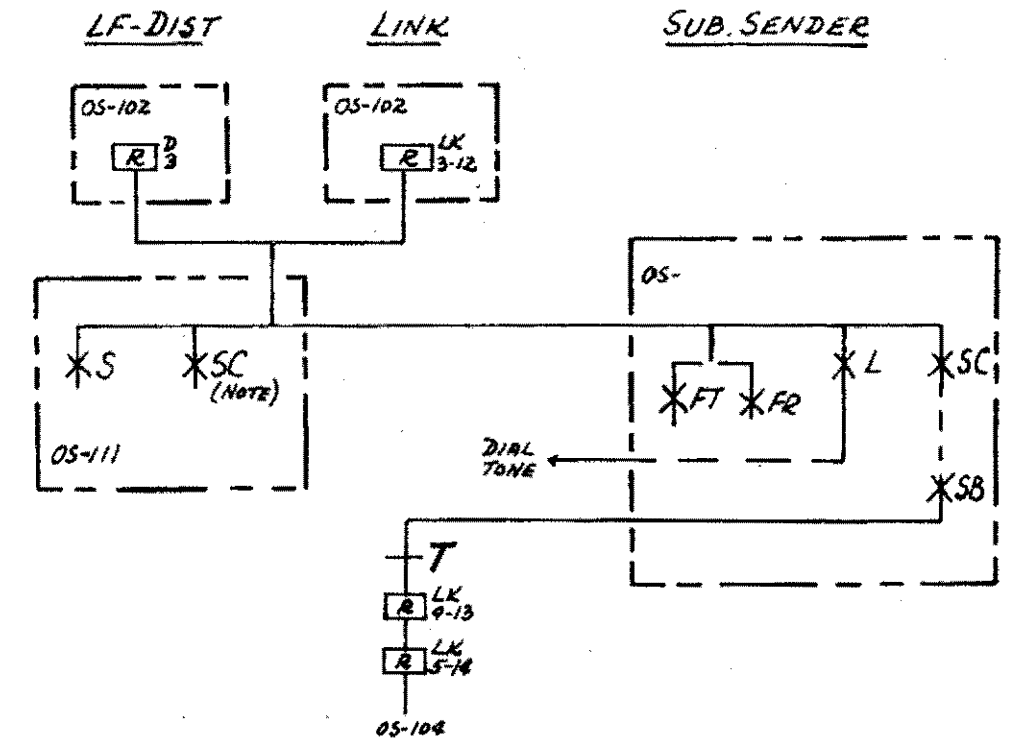
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ISSUE	1
DATE	4-52
BY	GHH

LINK CKT



SEQUENCE CHART



NOTE. MARGINAL (D) RELAY DOES NOT OPERATE AT THIS TIME

DIST. SEQ. SWITCH
3. AWTC. SENDER

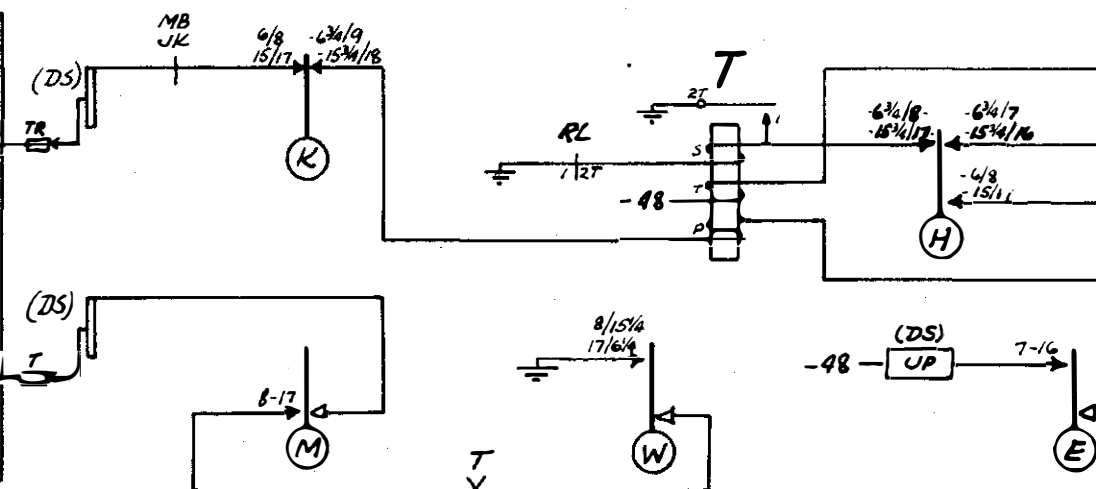
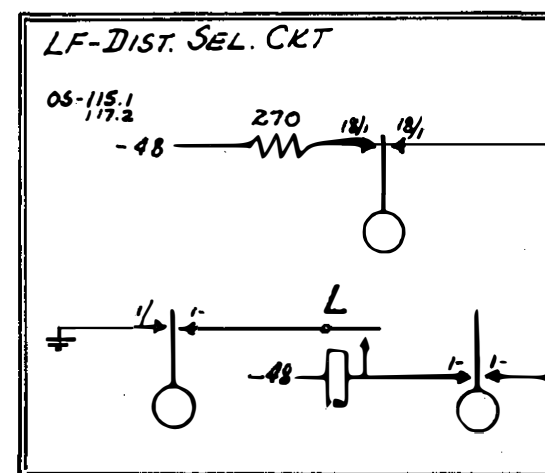
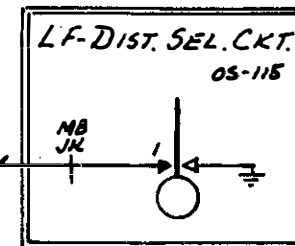
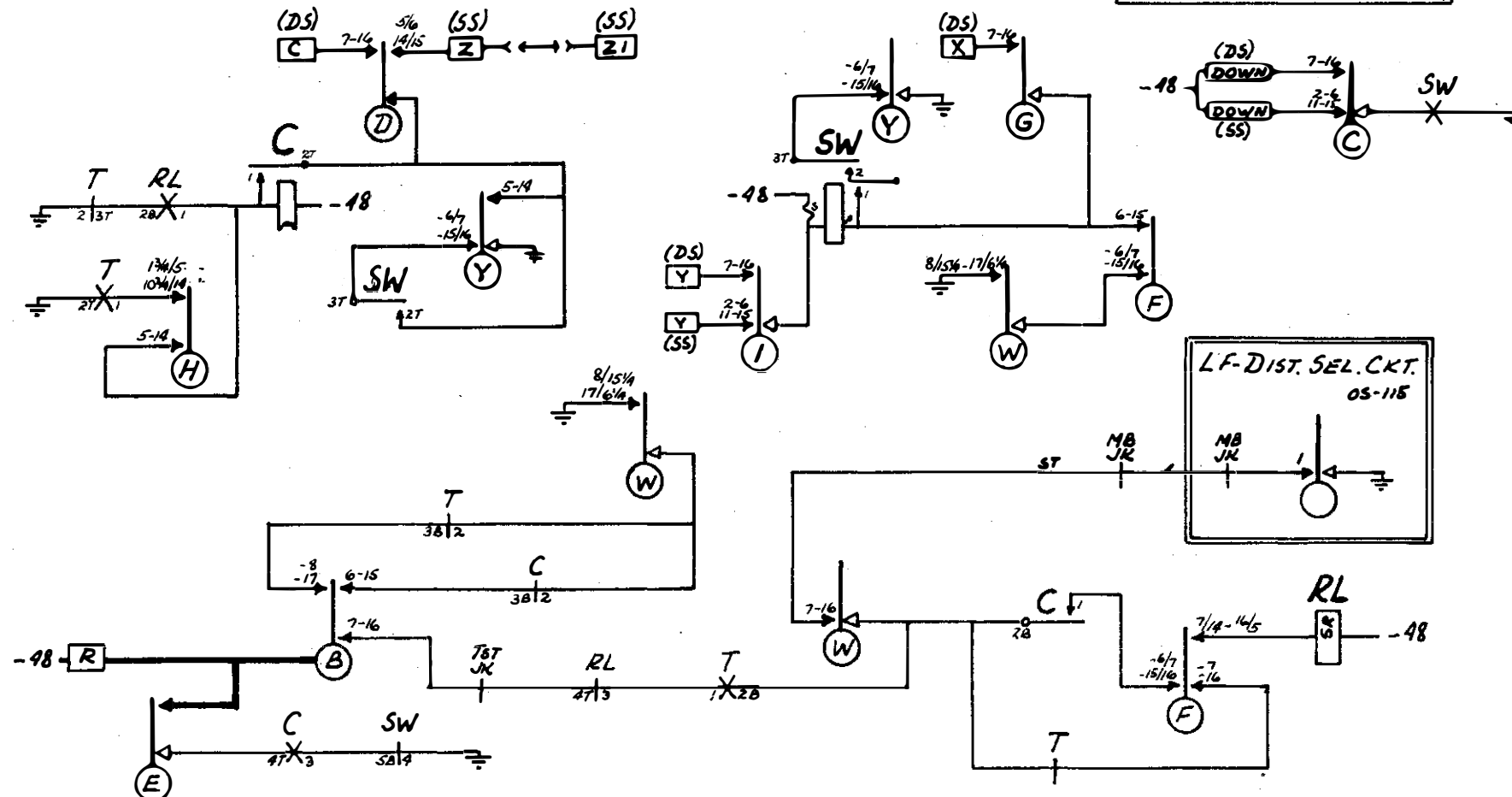
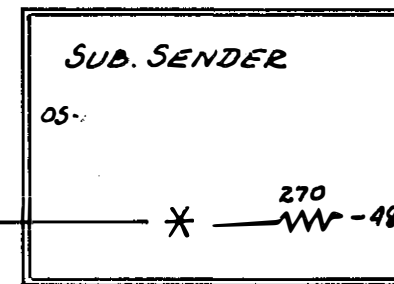
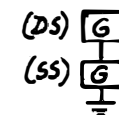
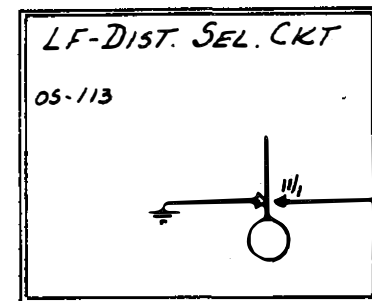
LINK SEQ. SWITCH
3-12. AWTC. SENDER
4-13. PASS-BY (CUT T-RELAY INTO "SC" LEAD)
5-14. CUT THRU

ES-20298-011 1SS. 34AR LINK CKT

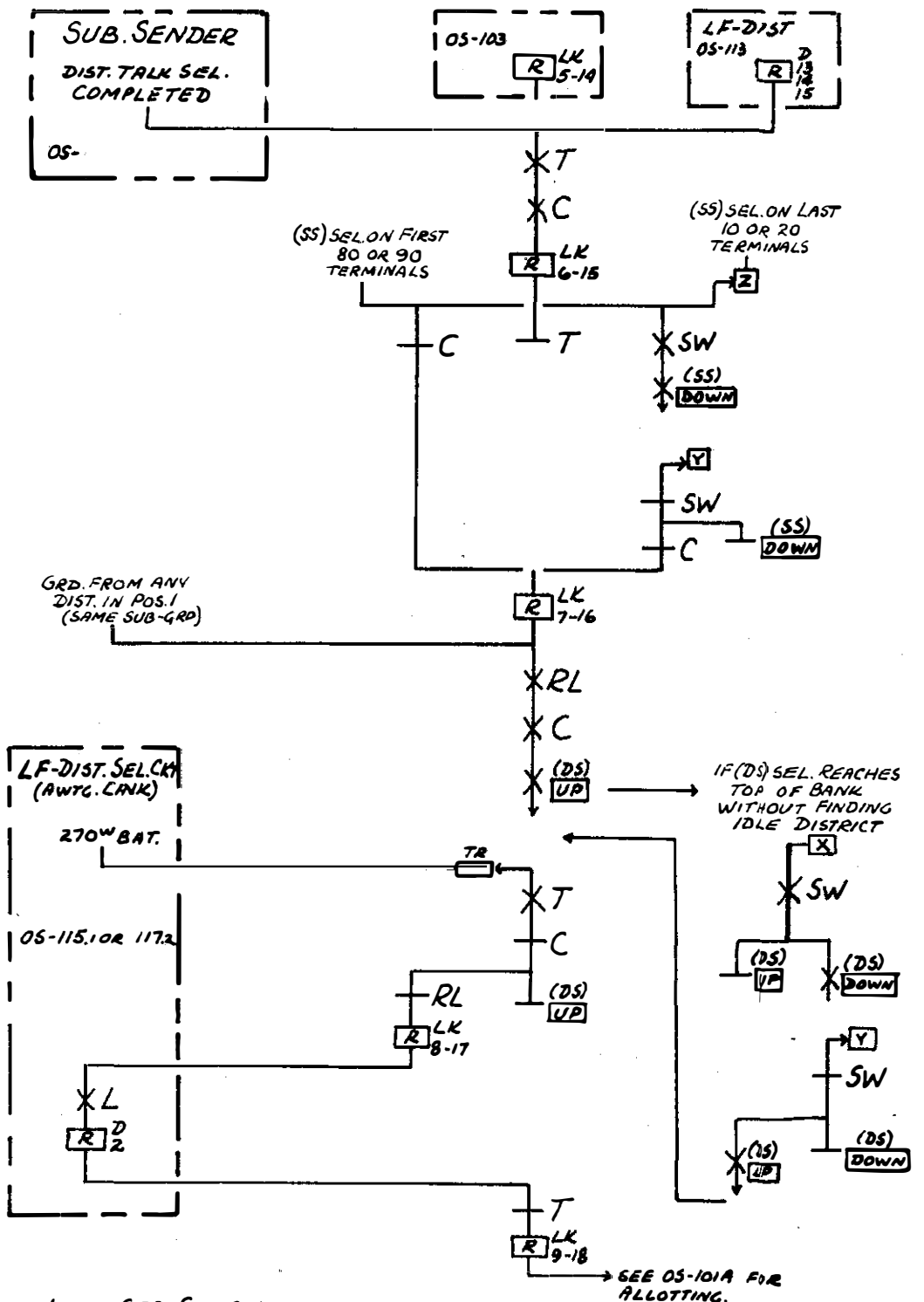
SENDER SEIZED
LINK CUT DIST. THRU TO SENDER
CLASS OF SERVICE INFORMATION TO SENDER

PANEL 600 LINK TYPE OS-102.1

LINK CKT



SEQUENCE CHART



LINK SEQ. SWITCH

- 5-14 CUT THRU
- 6-15 PASS-BY (OR RETURN FROM LAST 10 SS TERMS)
- 7-16 HUNT DISTRICT (OR OUT-OF-SERVICE)
- 8-17 AWTG. DISTRICT
- 9-18 AWTG. ALLOTMENT

DIST. SEQ. SWITCH

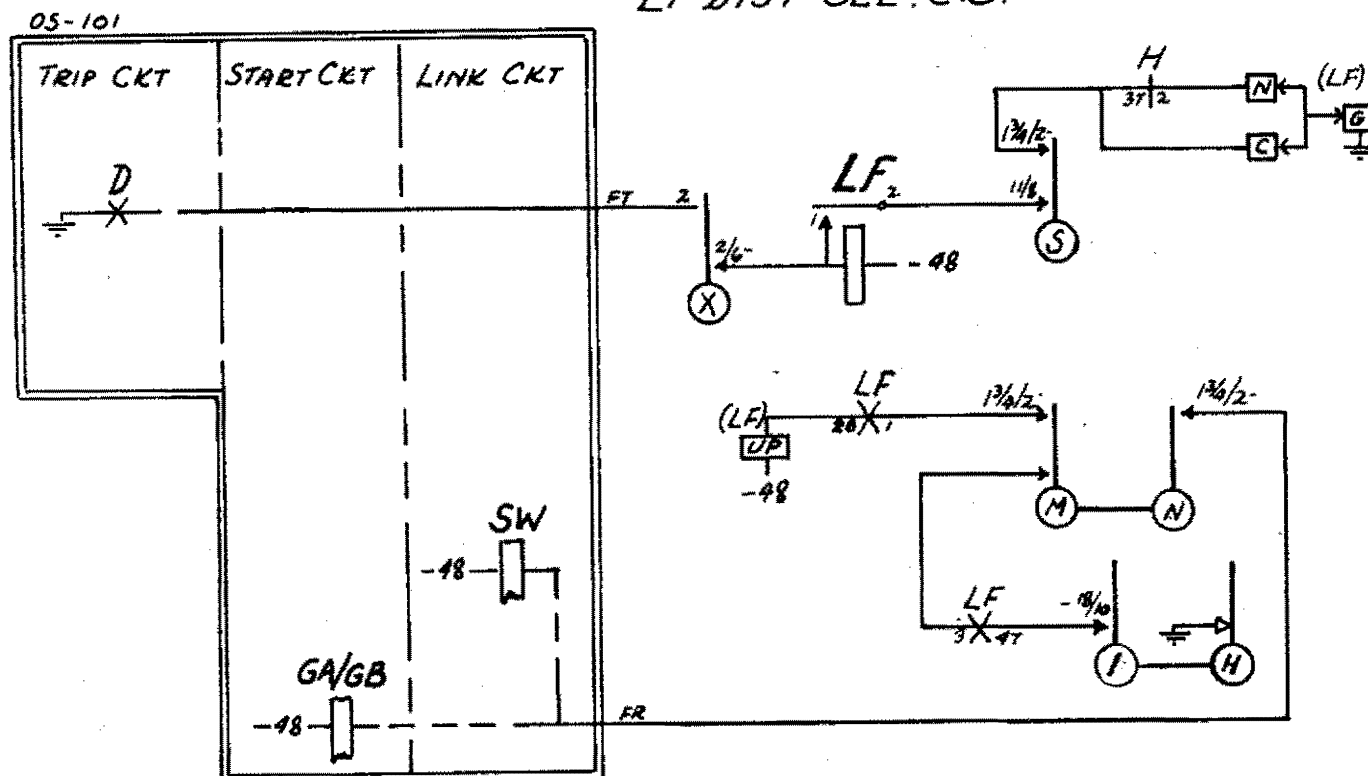
1. AWTG. LINK
2. AWTG. CALL

ES-20298-01 ISS. 39AR LINK CKT

LINK ADVANCE FROM 'CUT-THRU' PRESELECTION OF DISTRICT

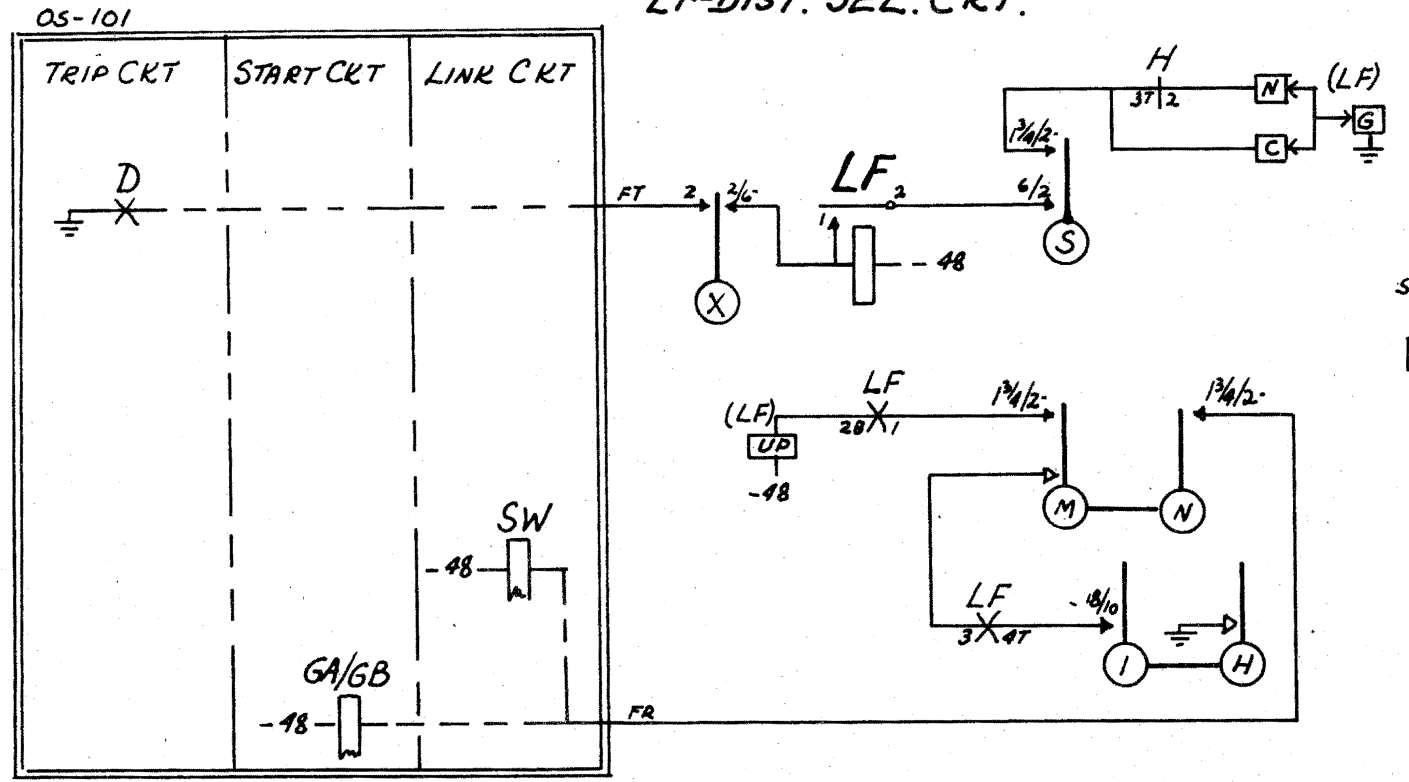
PANEL GCO LINK TYPE OS-104.1

SEQUENCE CHART

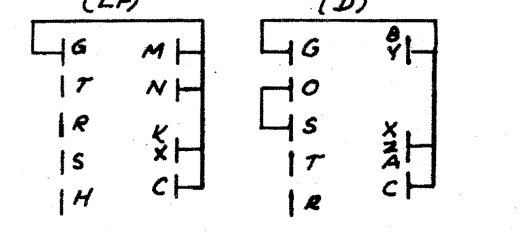


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23	7-34	GHH
24	7-34	GHH
25	7-34	GHH
26	7-34	GHH
27	7-34	GHH
28	7-34	GHH
29	7-34	GHH
30	7-34	GHH
31	7-34	GHH
32	7-34	GHH
33	7-34	GHH
34	7-34	GHH
35	7-34	GHH
36	7-34	GHH
37	7-34	GHH
38	7-34	GHH
39	7-34	GHH
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98	7-34	GHH
99	7-34	GHH
100	7-34	GHH

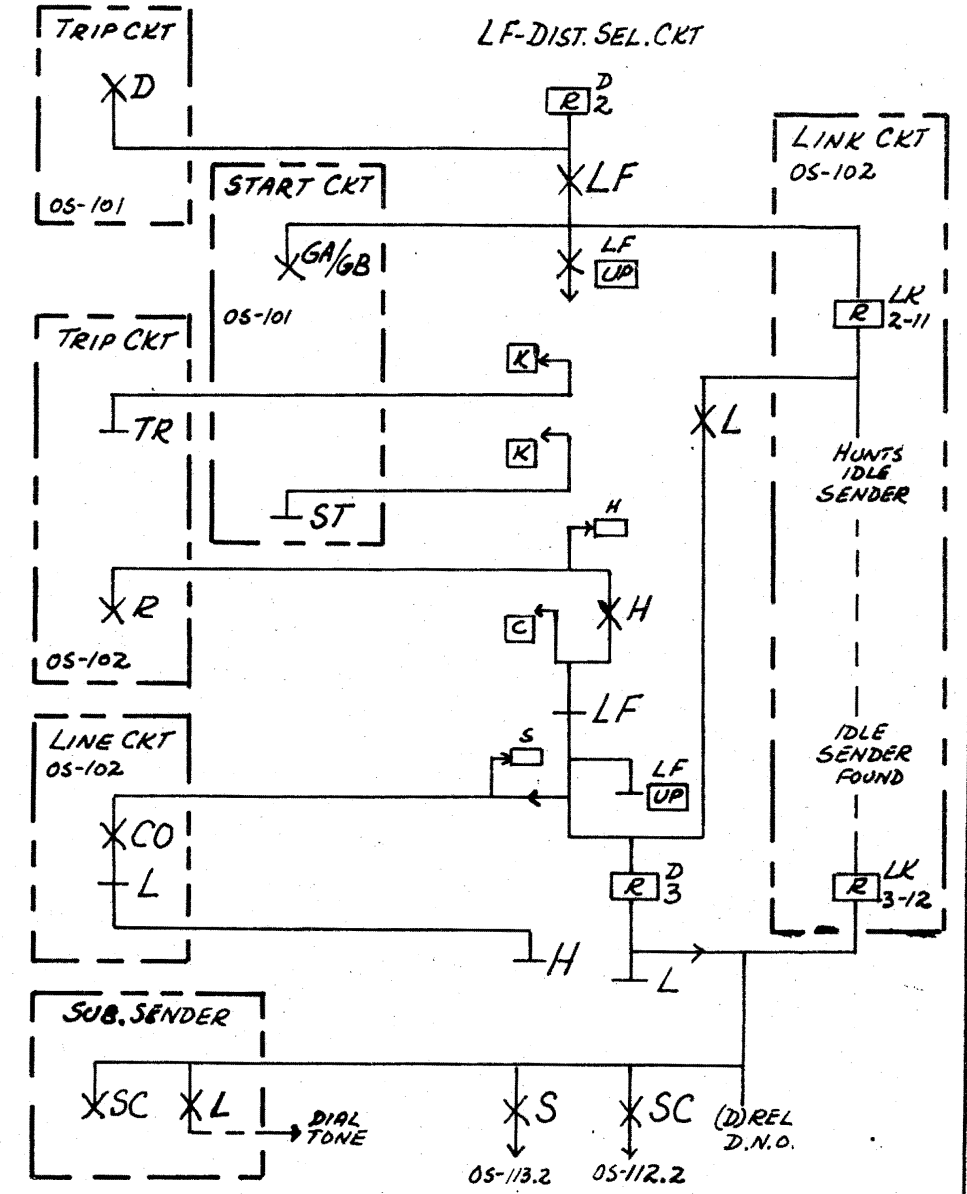
LF-DIST. SEL. CKT.



STRAPPING OF COMMUTATOR BRUSHES



SEQUENCE CHART



DIST. SEQ. SWITCH

2. AWTG. CALL
3. AWTG. SENDER

LINK SEQ. SWITCH

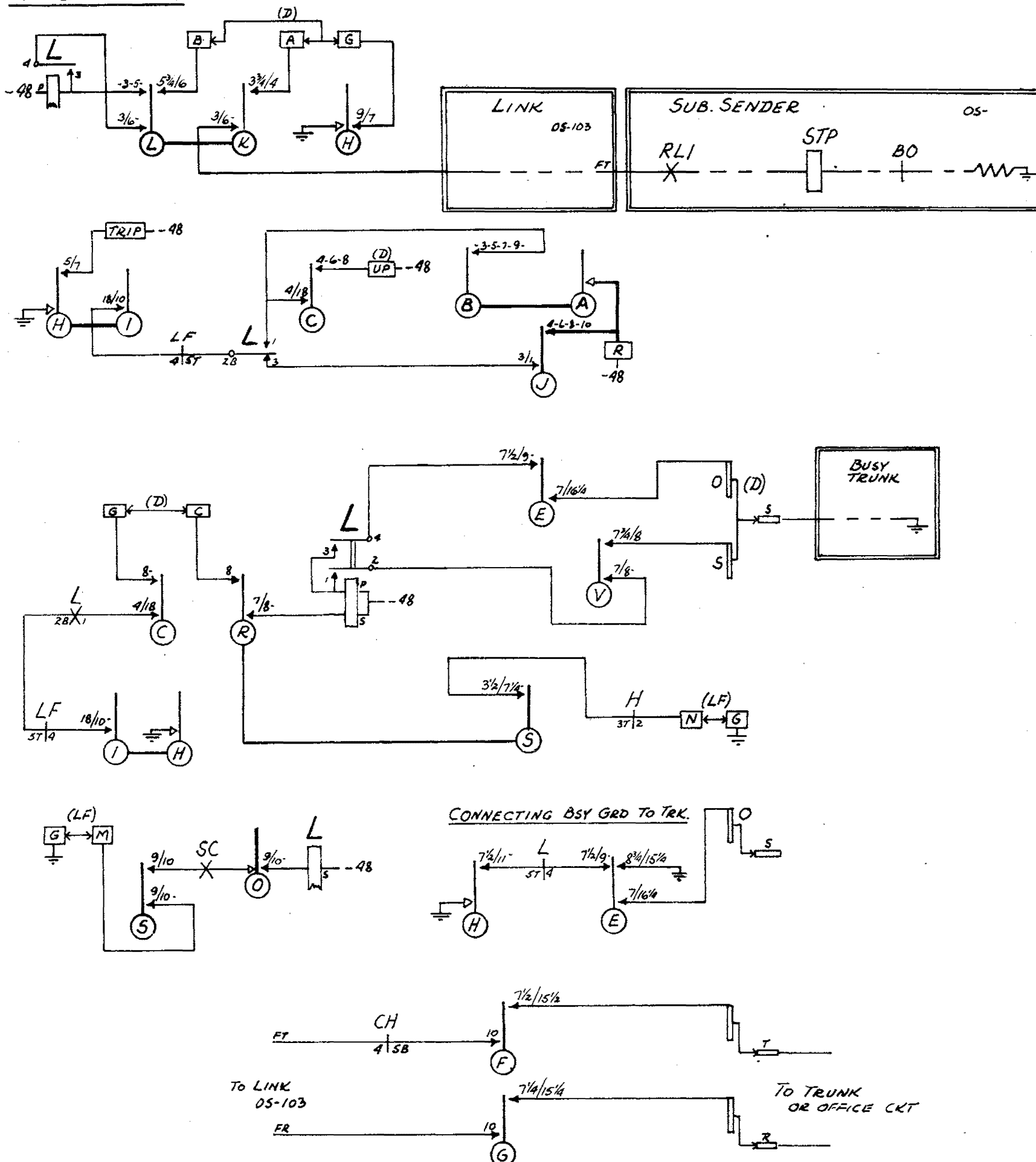
- 2-11. HUNT SENDER
- 3-12. AWTG. SENDER

ES-21021-010 155.14 D LF-DIST. SEL. CKT

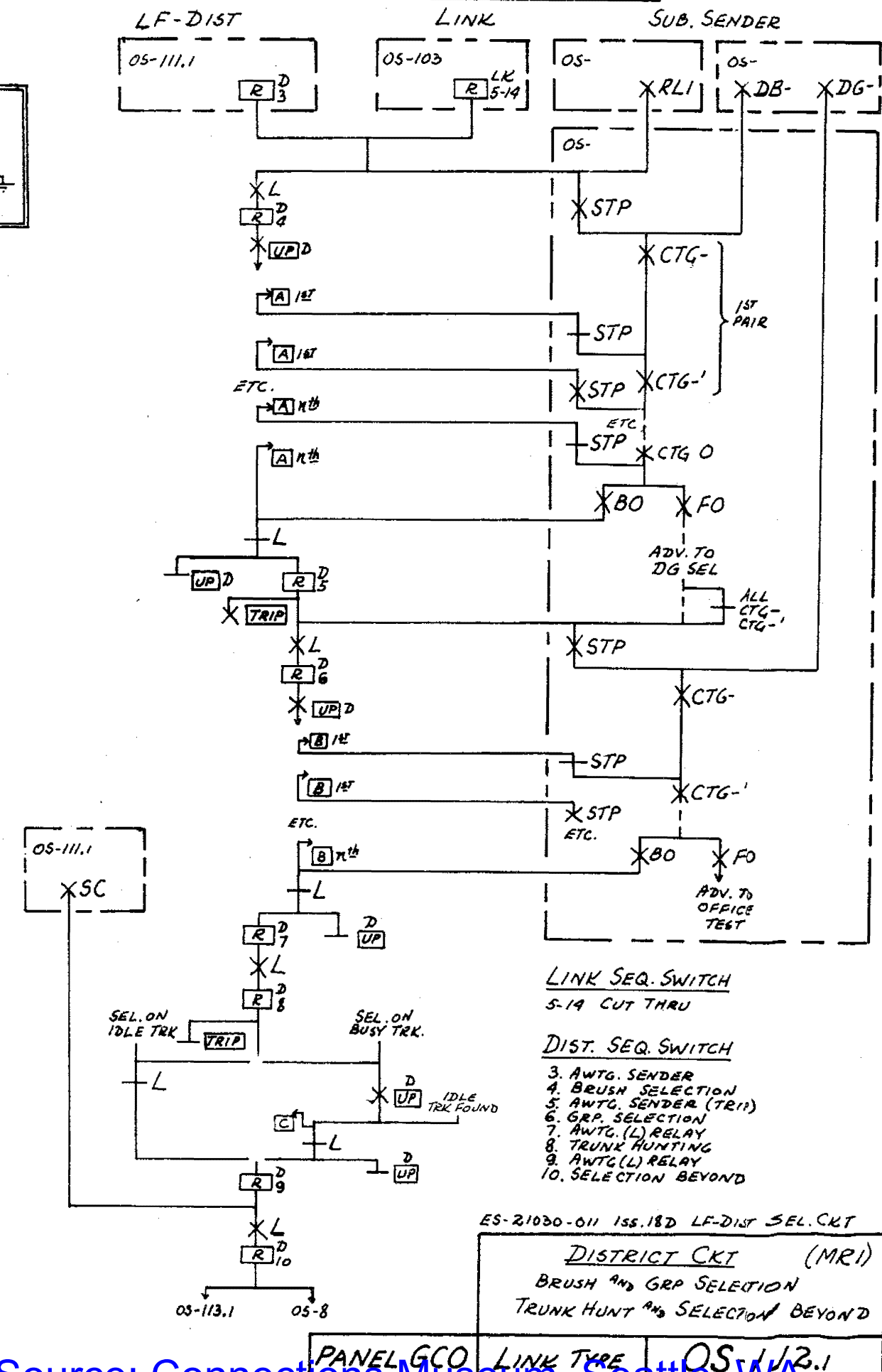
FIND CALLING LINE
DIAL TONE TO CALLING SUB.

PANEL 500 LINK TYPE OS 11/2

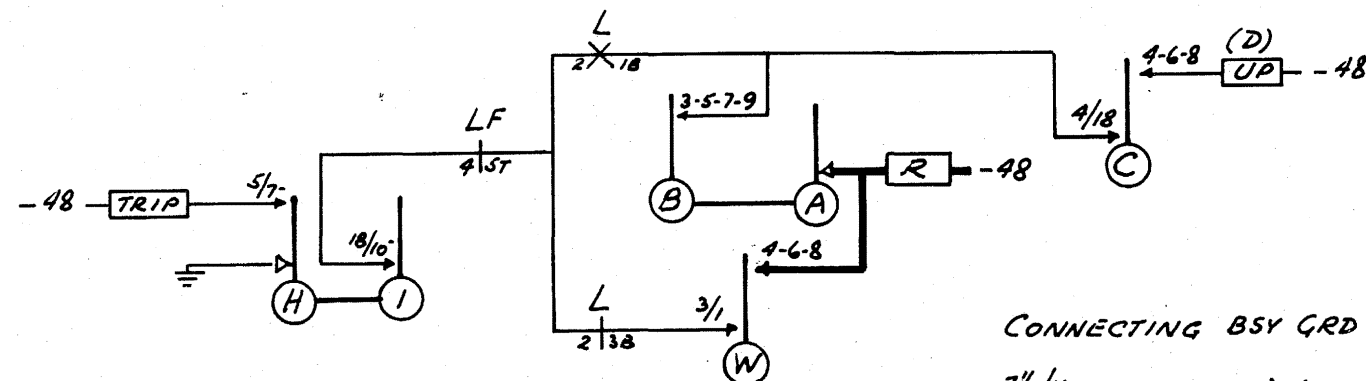
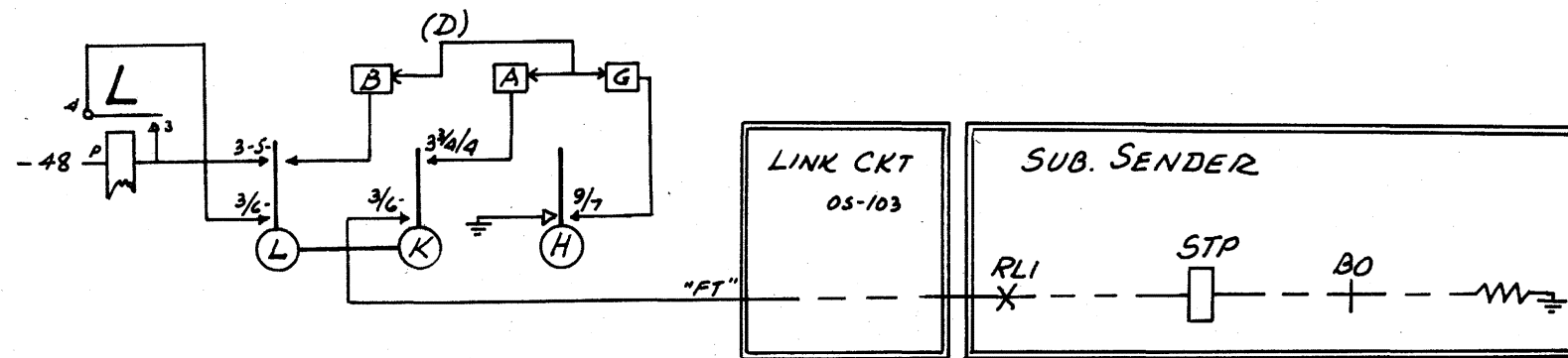
LF-DIST CKT



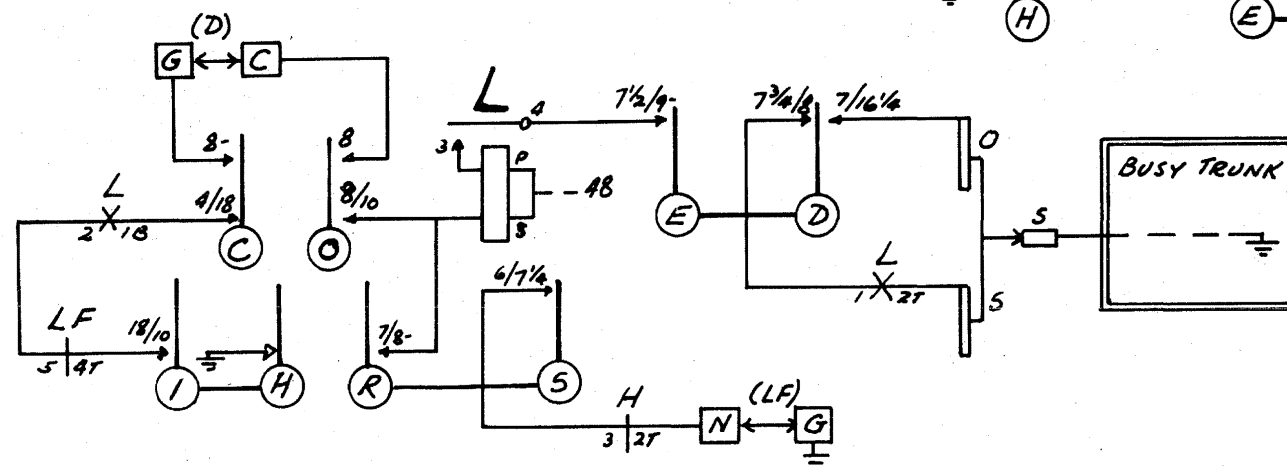
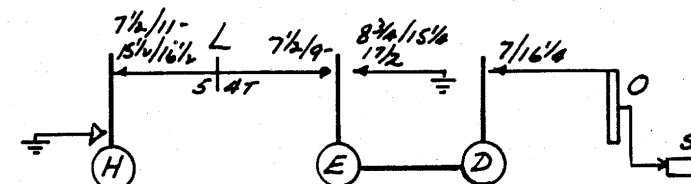
SEQUENCE CHART



LF-DIST. SEL. CKT.

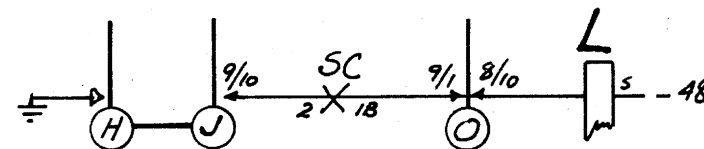
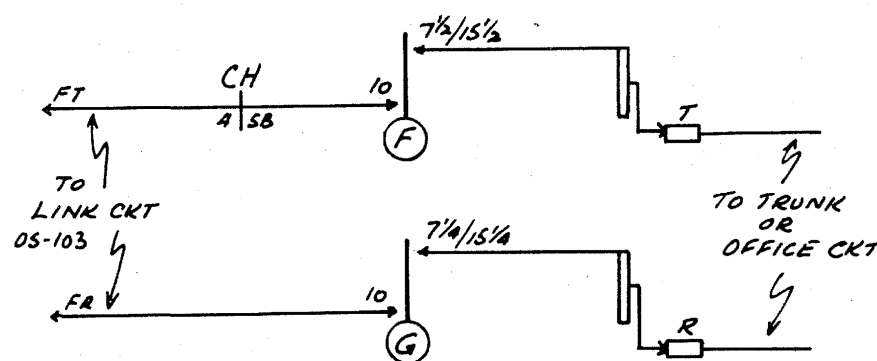


CONNECTING BSY GRD TO TRUNK

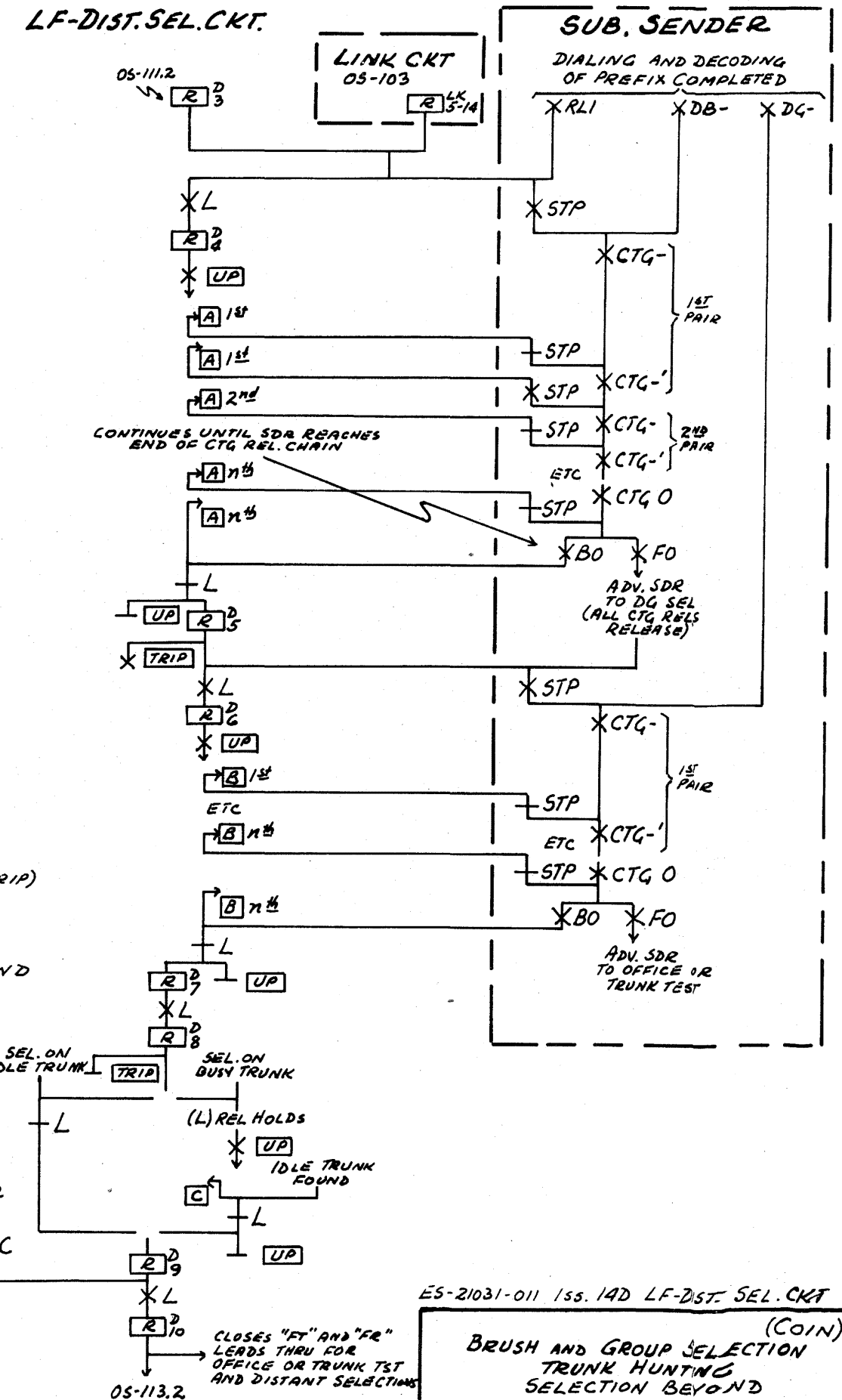


DIST. SEQ. SWITCH

3. AWG. SENDER
4. BRUSH SELECTION
5. AWG. SENDER (TRIP)
6. GROUP SELECTION
7. AWG (L) RELAY
8. TRUNK HUNTING
9. AWG (L) RELAY
10. SELECTION BEYOND



SEQUENCE CHART



ES-21031-011 155.14D LF-DIST. SEL. CKT

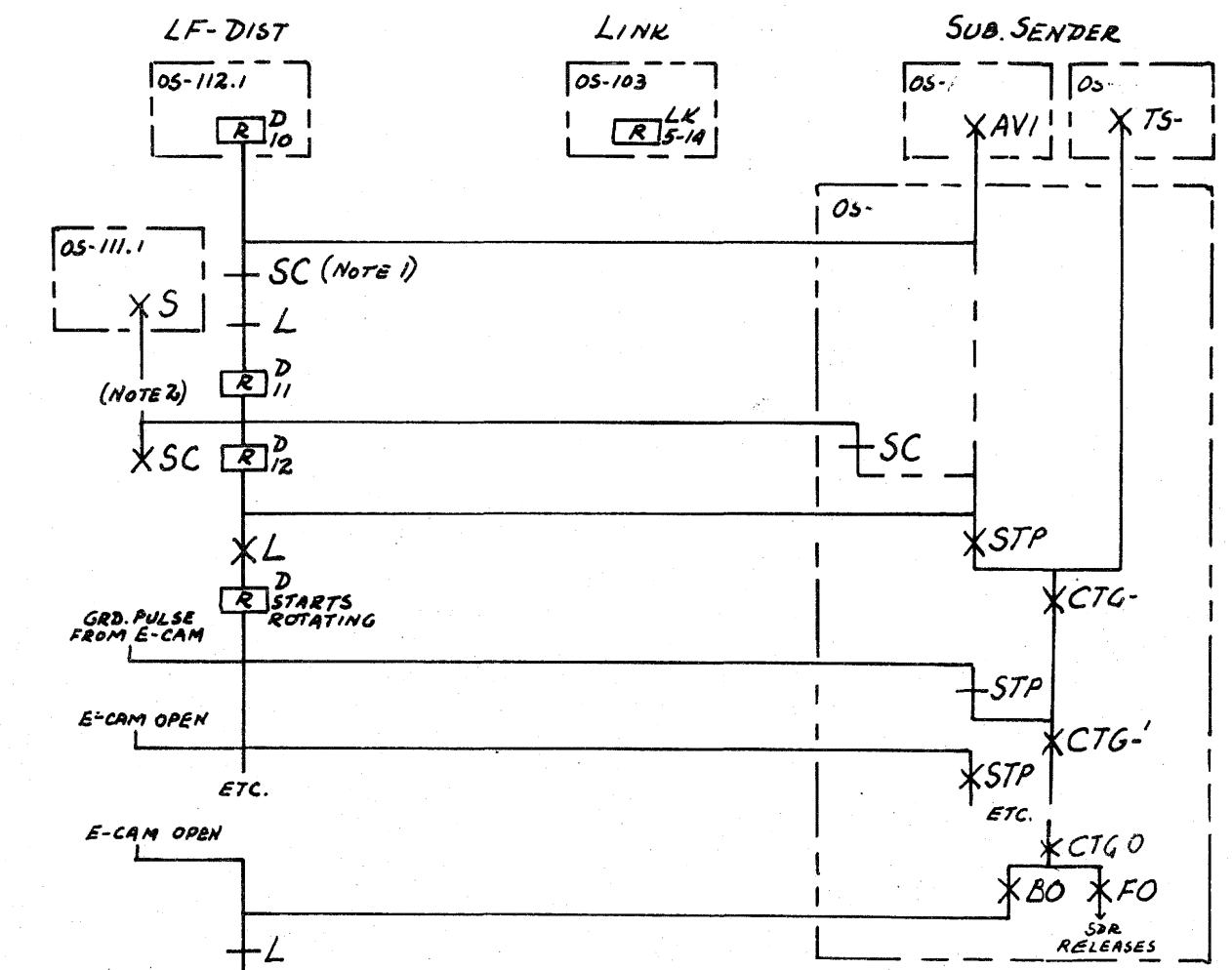
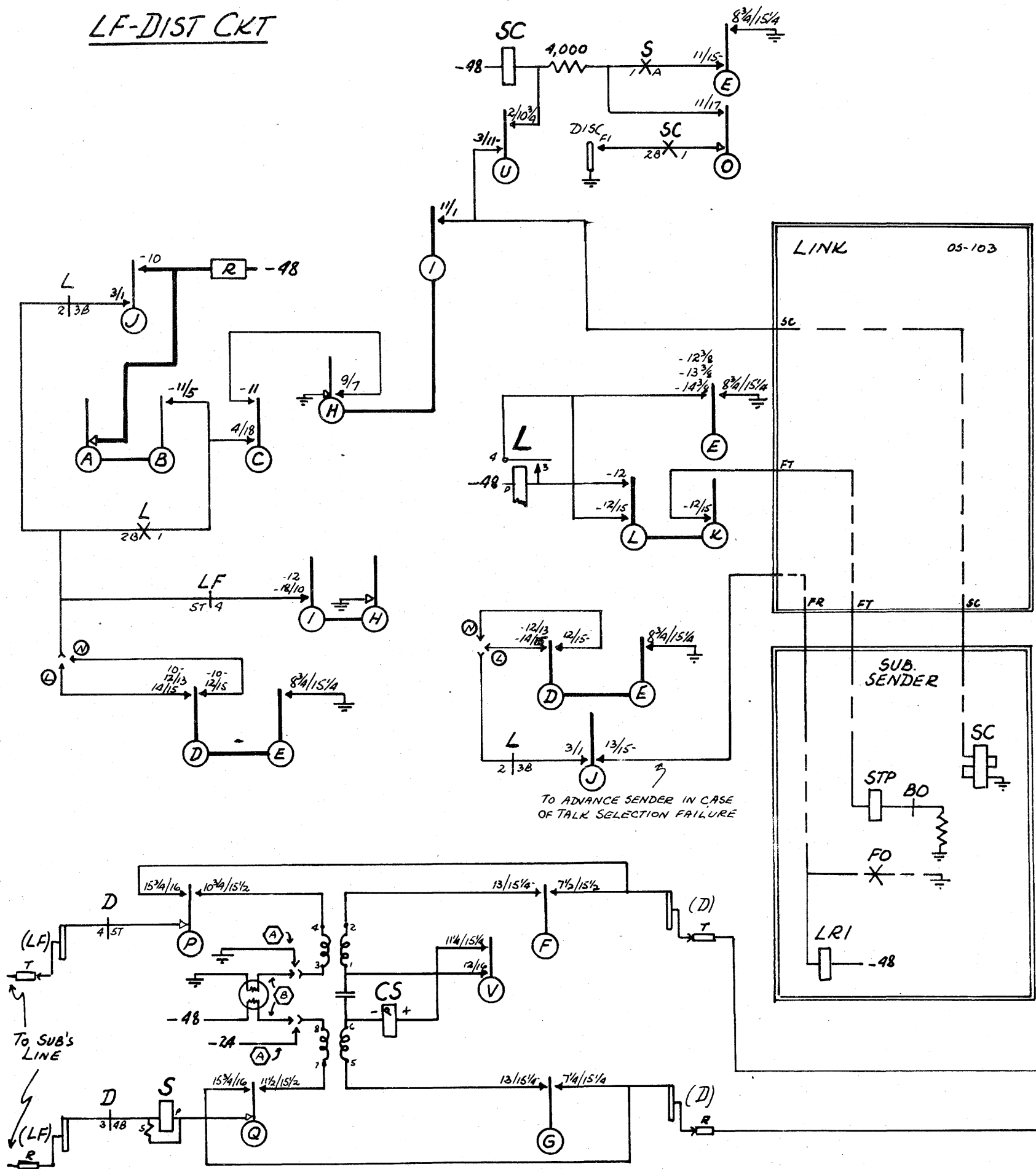
BRUSH AND GROUP SELECTION
TRUNK HUNTING
SELECTION BEYOND

PANEL GCO LINK TYPE 05-112.2

LF-DIST CKT

SEQUENCE CHART

ISSUE	DATE	BY
1	5-54	GWH



NOTE 1: (AVI) REL. RELEASES D(SC) REL. BY CUTTING HIGH RESISTANCE TERTIARY WDG OF S (SC) REL. INTO "SC" LEAD. (OS-111.1)
 NOTE 2: (S) RELAY HOLDS (SC) RELAY AFTER SWITCH LEAVES POS. 11.
 NOTE 3: SWITCH STOPS IN POS 13, 14, OR 15, DEPENDING ON TALK SELECTION SET UP IN SENDER.

LINK SEQ. SWITCH
 5-14. CUT THRU

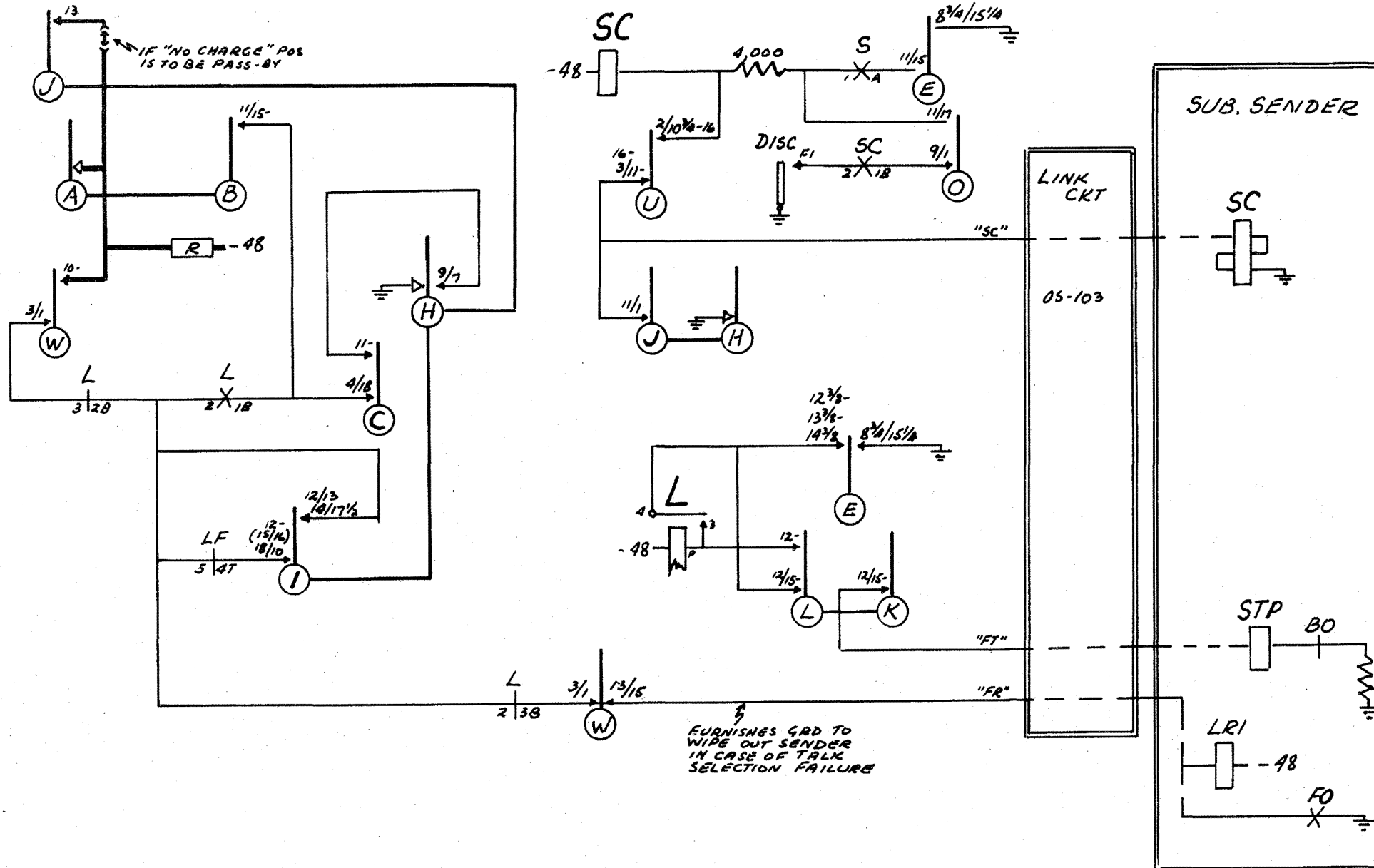
DIST. SEQ. SWITCH
 10. SELECTION BEYOND
 11. PASS-BY (ADVANCE SENDER)
 12. ANTG. SENDER
 13. TALKING (NO CHARGE OR CHARGE)
 14. TALKING (CHARGE)
 15. ANTG. OPERATOR
 16. TALKING (OPERATOR)

TRUNK OS-154
 REVERSED BAT. & GRD AFTER CALLED PTY ANSWERS.

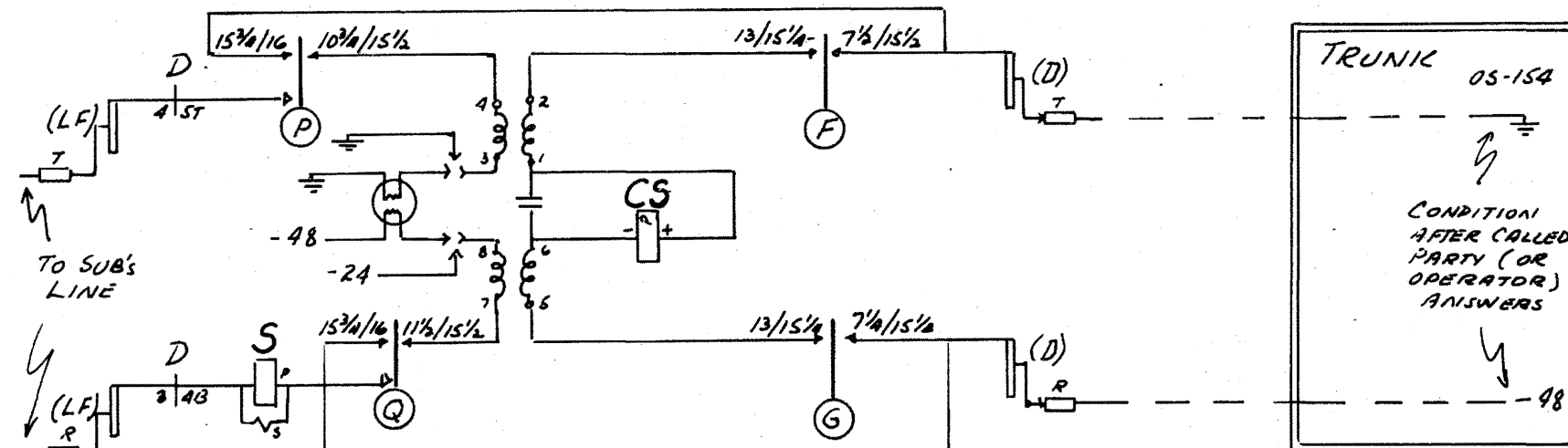
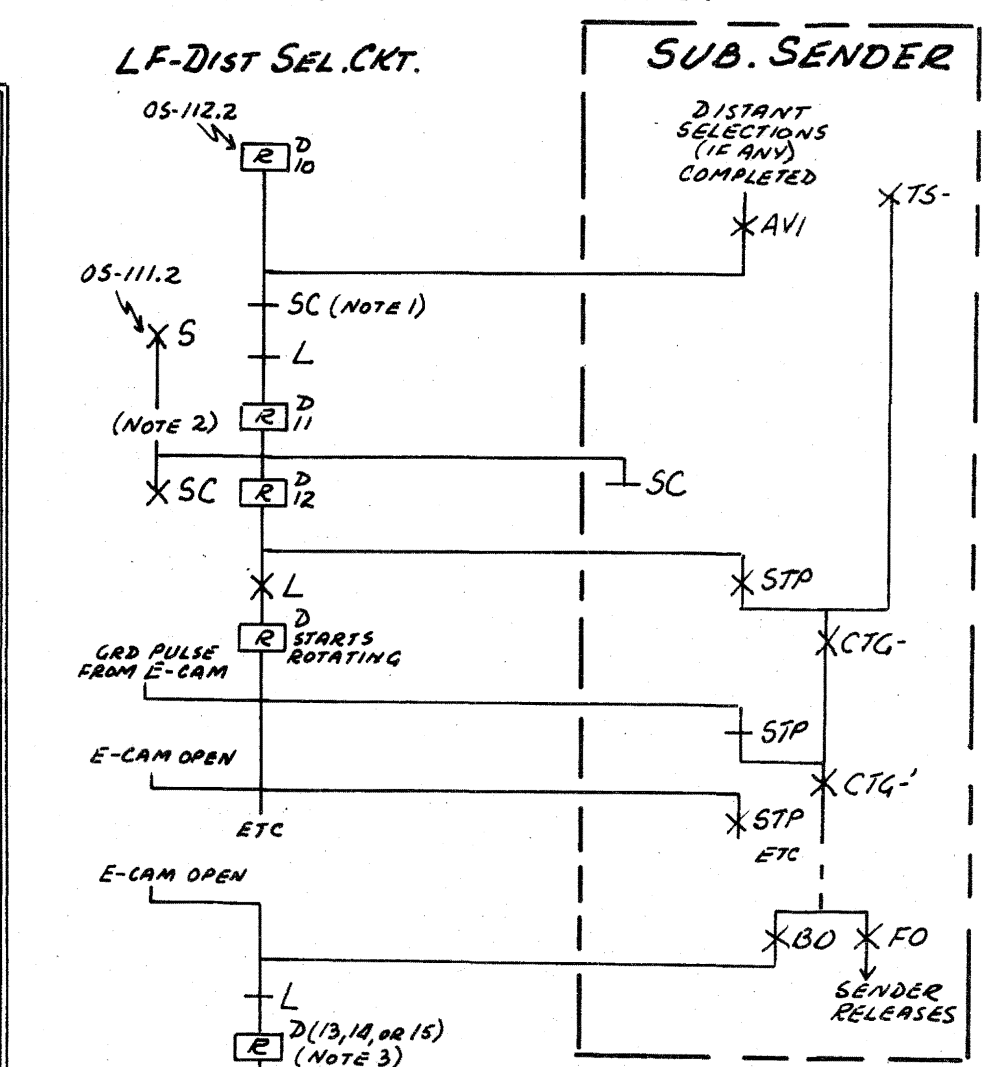
ES-21030-011 155.182 LF-DIST SEL. CKT
 DISTRICT ADVANCE (MRI)
 TALK SELECTION
 TALKING

PANEL GCO LINK TYPE OS-113.1

LF-DIST SEL. CKT



SEQUENCE CHART



DIST. SEQ. SWITCH

10. SELECTION BEYOND
11. PASS-BY (ADVANCE SENDER)
12. AWTG. SENDER
13. TALKING: NO CHARGE (OR PASS-BY)
14. TALKING: CHARGE
15. AWTG. OPERATOR.

ES-21031-011 135.14D LF-DIST SEL CKT

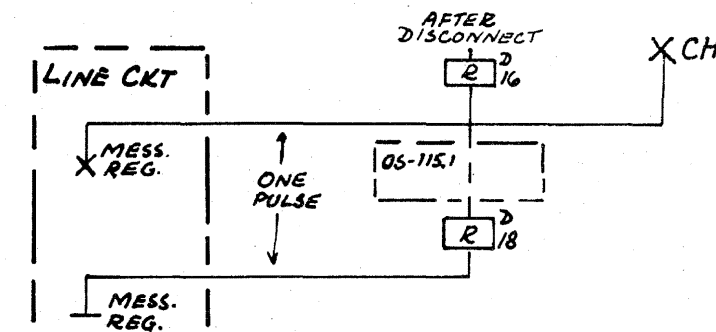
DISTRICT ADVANCE (COIN)
TALK SELECTION
TALKING

PANEL GCO LINK TYPE 05-113.2

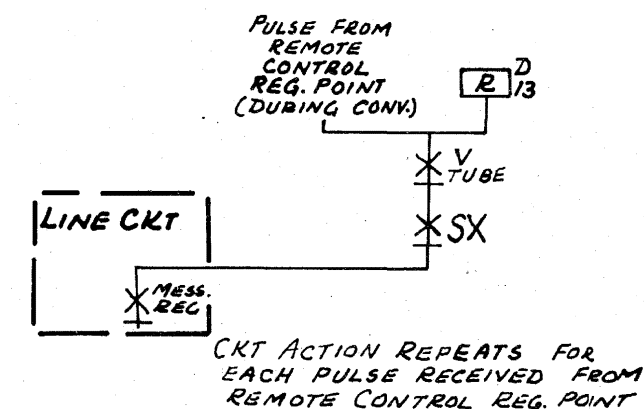
LF-DIST. SEL. CKT

SEQUENCE CHART

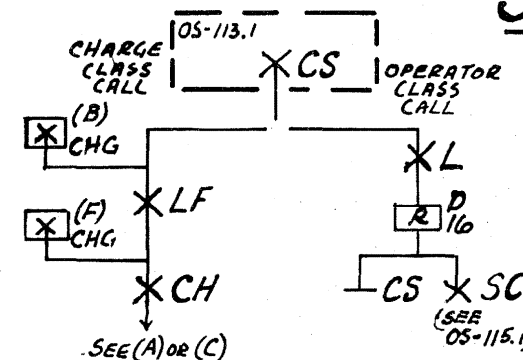
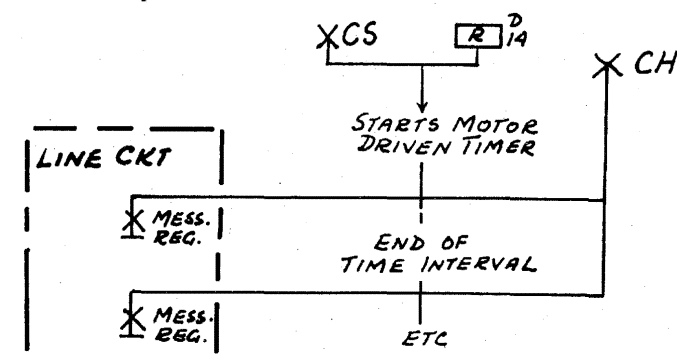
(A) LOCAL CHARGE (NON-OVERTIME)



(B) REMOTE CONTROL ZONE CHARGE

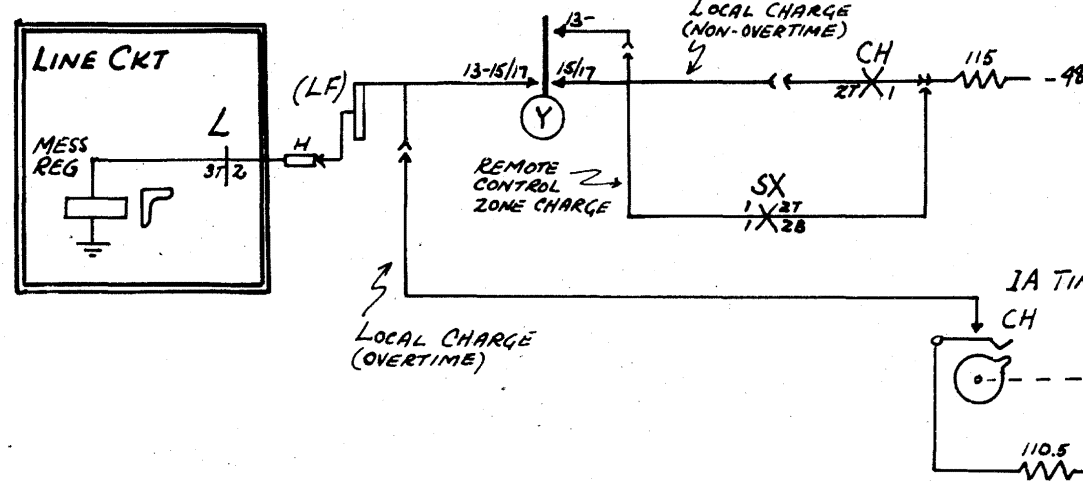
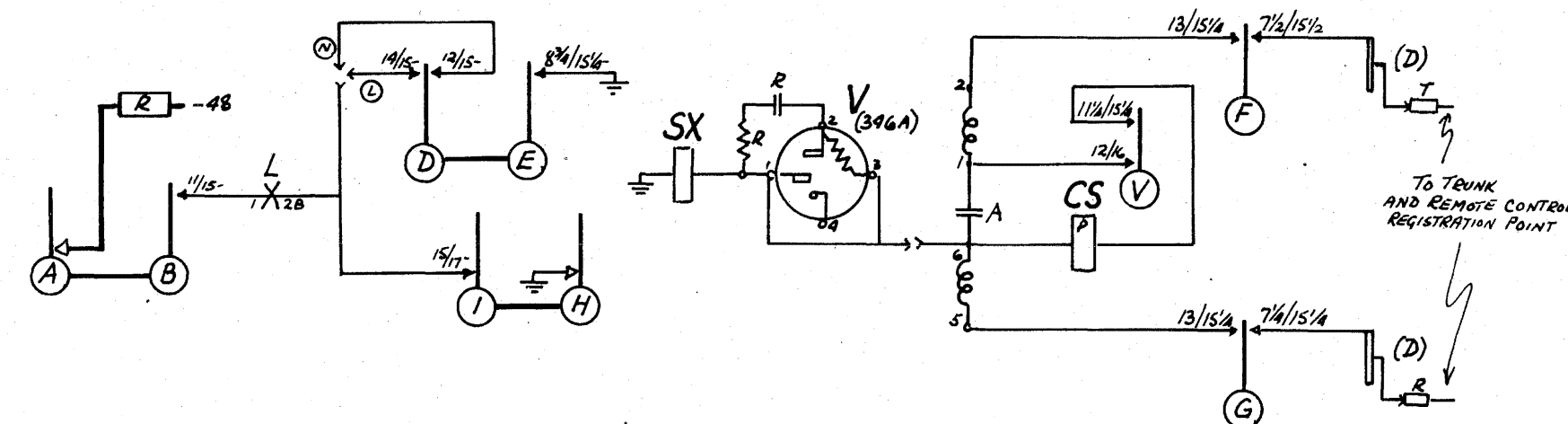
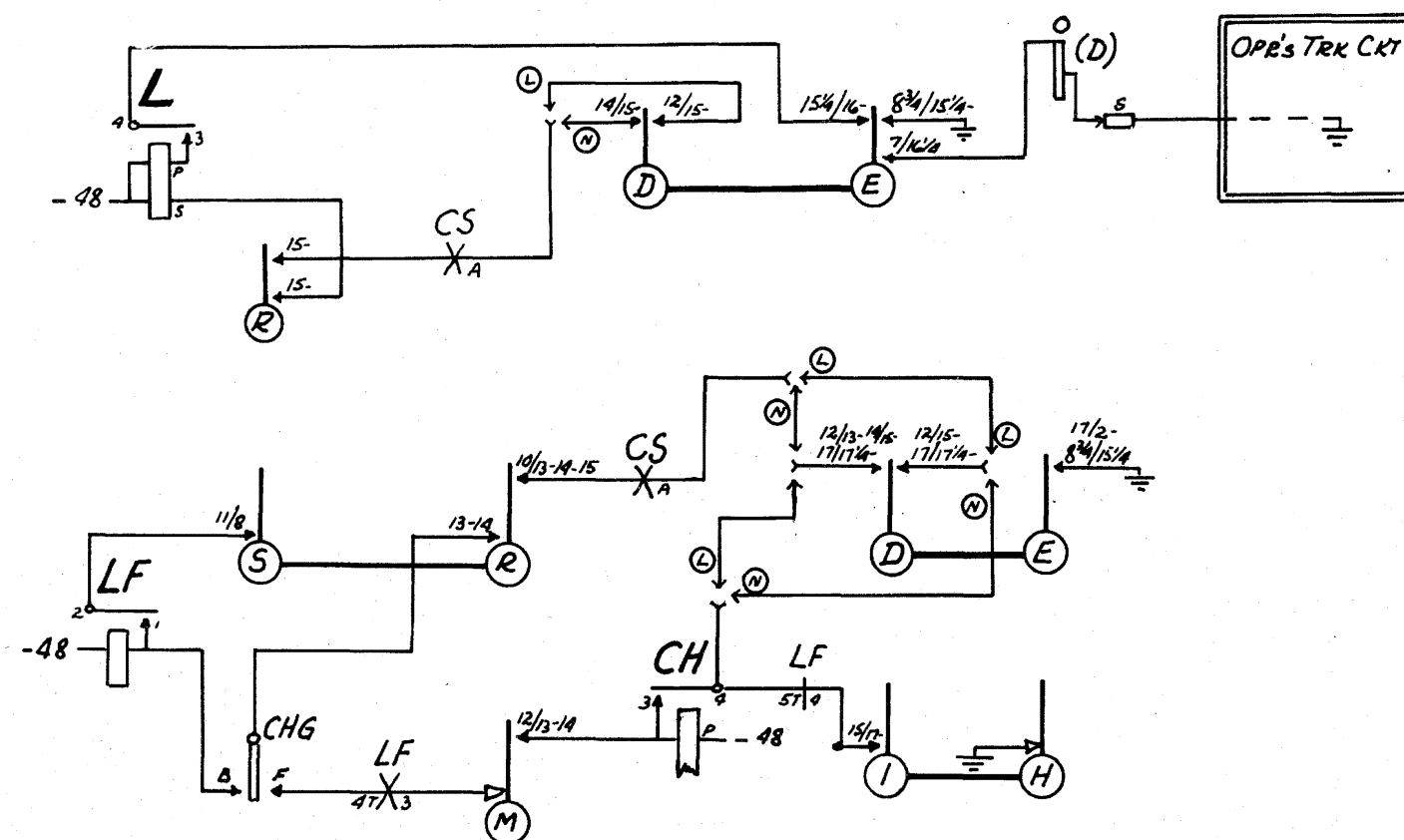


(C) LOCAL OVERTIME CHARGE

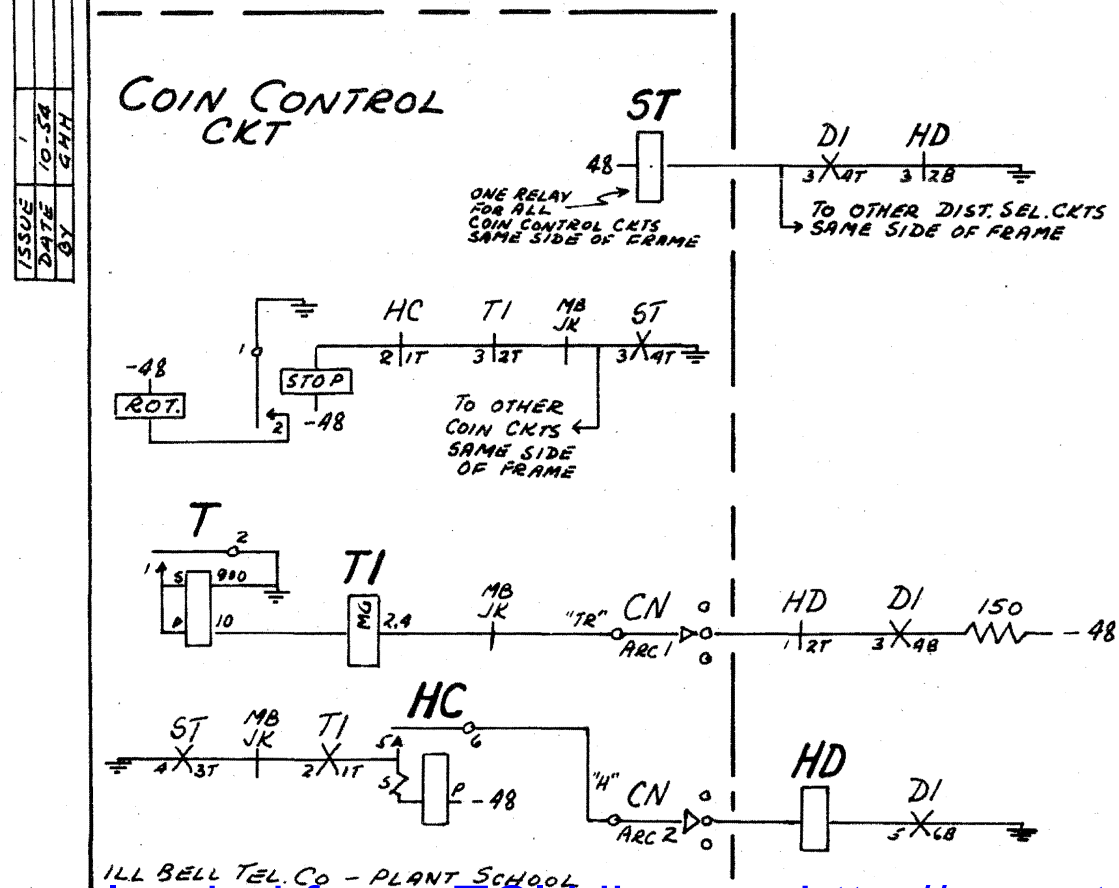


DIST. SEQ. SWITCH

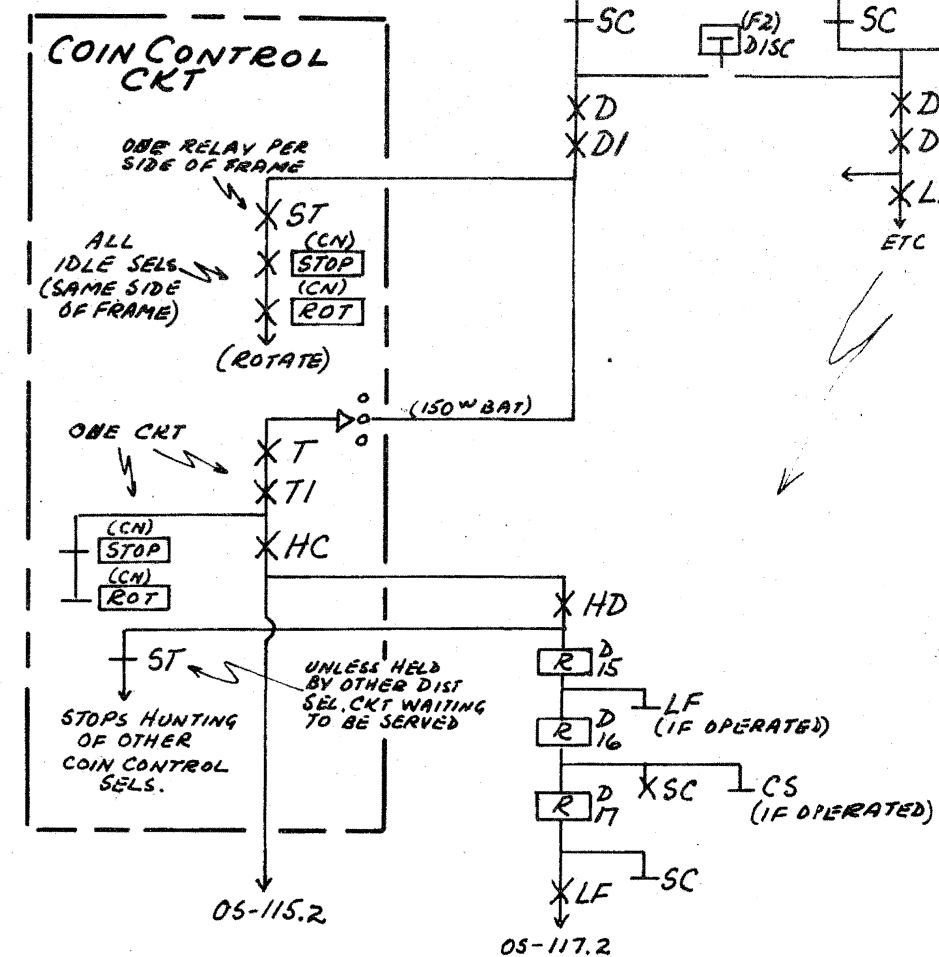
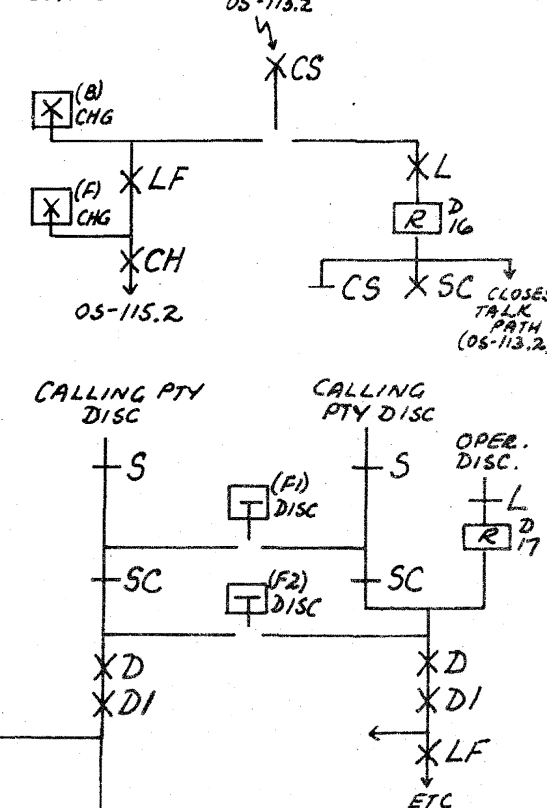
- 13. TALKING
- 14. " "
- 15. AWTG OPERATOR
- 16. TALKING (OPERATOR) } MR PERIOD
- 17. OVERFLOW



ISSUE	1								
DATE	10-54								
BY	GHH								



CHARGE CLASS CALL	OPERATOR CLASS CALL
10-11-12	10-11-12



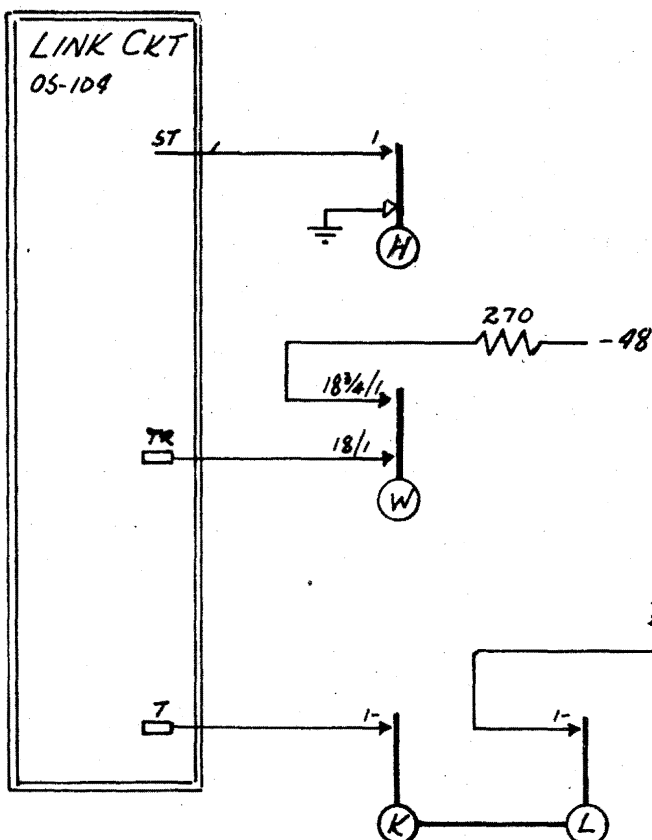
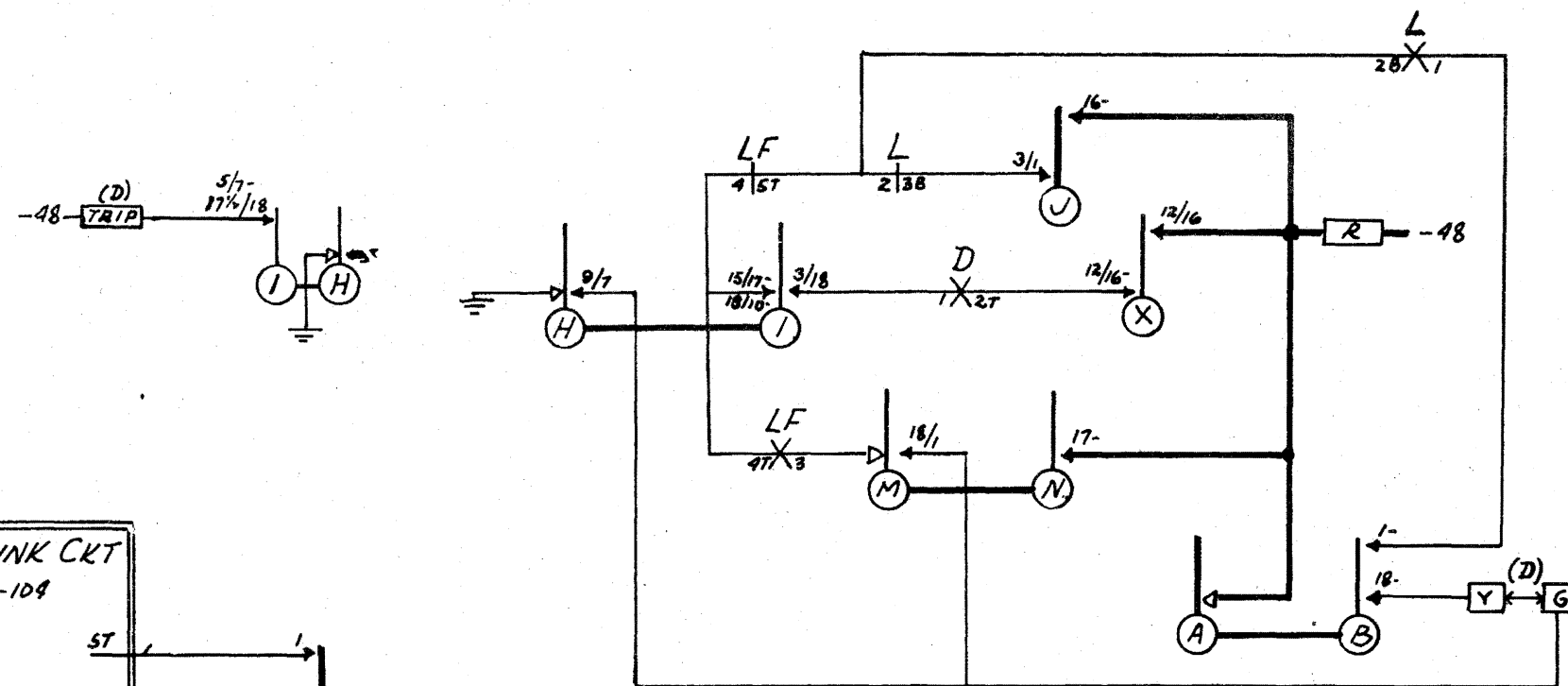
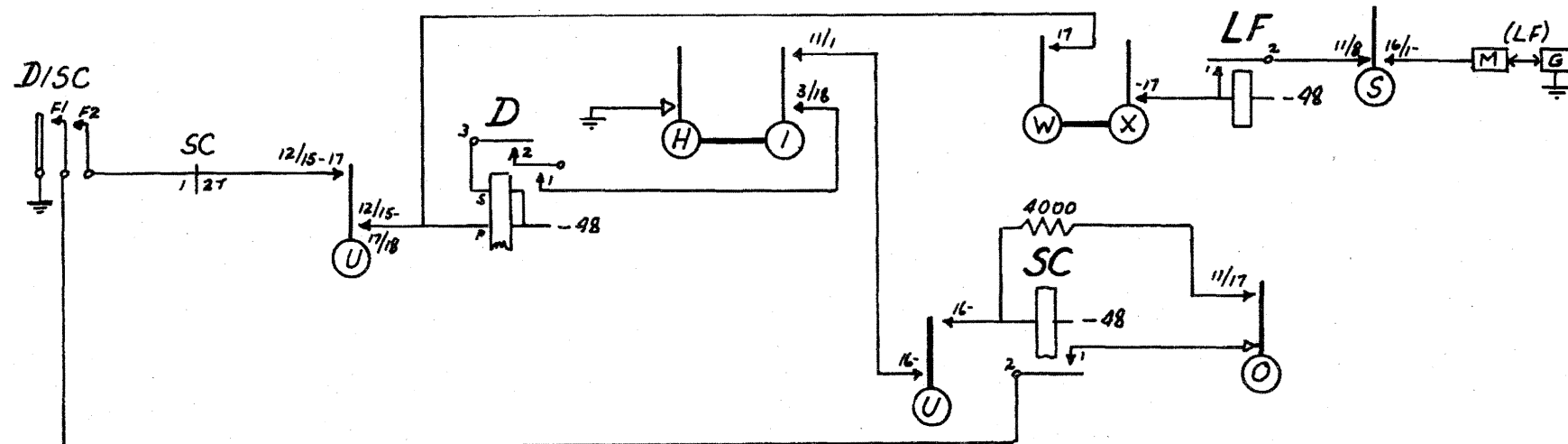
13. TALKING (NO CHARGE) OR PASS-BY
14. " (CHARGE)
15. AWITG. OPERATOR
16. TALKING (OPERATOR)
17. OVERFLOW OR AWITG. COIN CONTROL

ES-21031-011 ISS. 14D LF-DIST. SEL. CKT

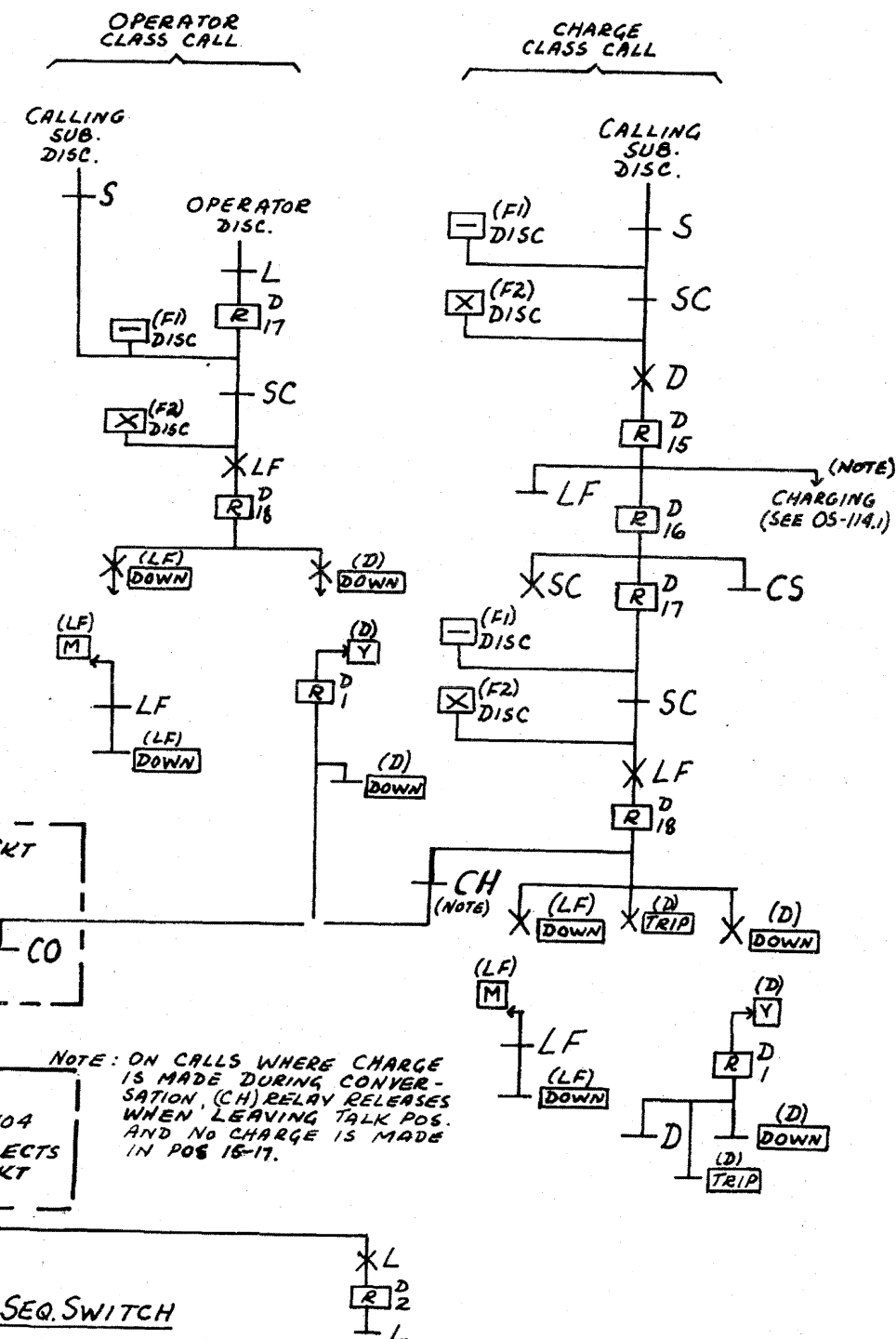
(COIN)
SETTING UP CHARGE CONDITION
CALLING PARTY DISC.
COIN CONTROL HUNTS DISTRICT

PANEL GCO	LINK TYPE	OS-114.2
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LF-DIST. CKT



SEQUENCE CHART

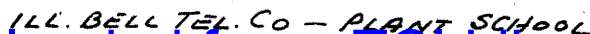


NOTE: ON CALLS WHERE CHARGE IS MADE DURING CONVERSATION, (CH) RELAY RELEASES WHEN LEAVING TALK POS. AND NO CHARGE IS MADE IN POS 15-17.

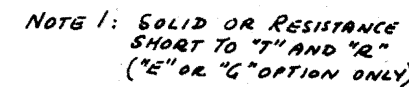
DIST. SEQ. SWITCH
15. AWTC. OPERATOR
16. TALKING (OPERATOR) } MR PERIOD
17. OVERFLOW
18. DIST. AND LF RETURN
1. AWTC. LINK (LF RETURN)
2. AWTC. CALL

ES-21030-011 155.18D LF-DIST SEL CKT
CALLING SUB. DISC
LF-DISTRICT RETURN

ISSUE	1			
DATE	10-54			
BY	GHN			

[illegible]

LF-DIST. SEL.



(COIN)

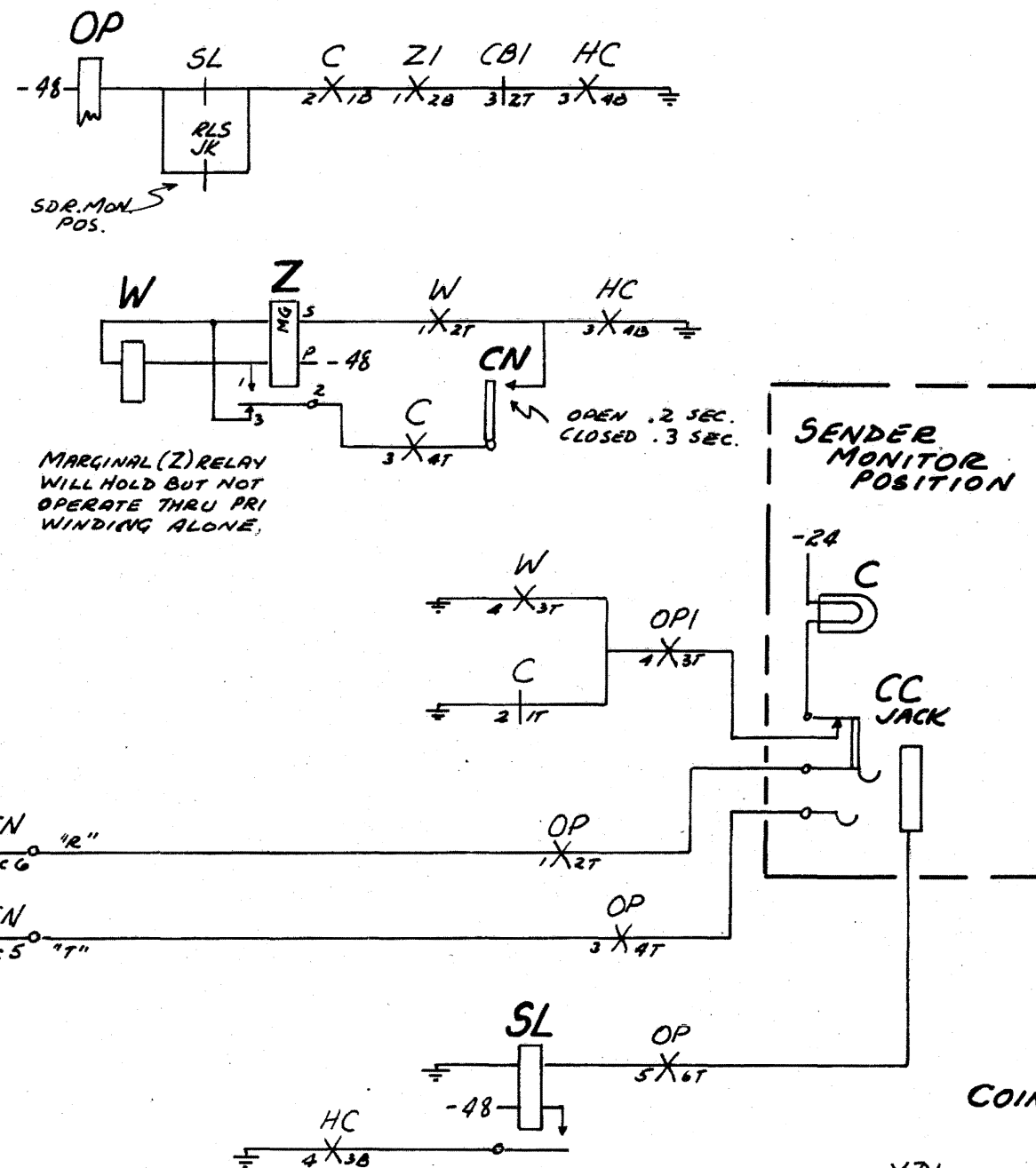
COIN COLLECT AND RETURN
LINE TEST

PANEL GCO

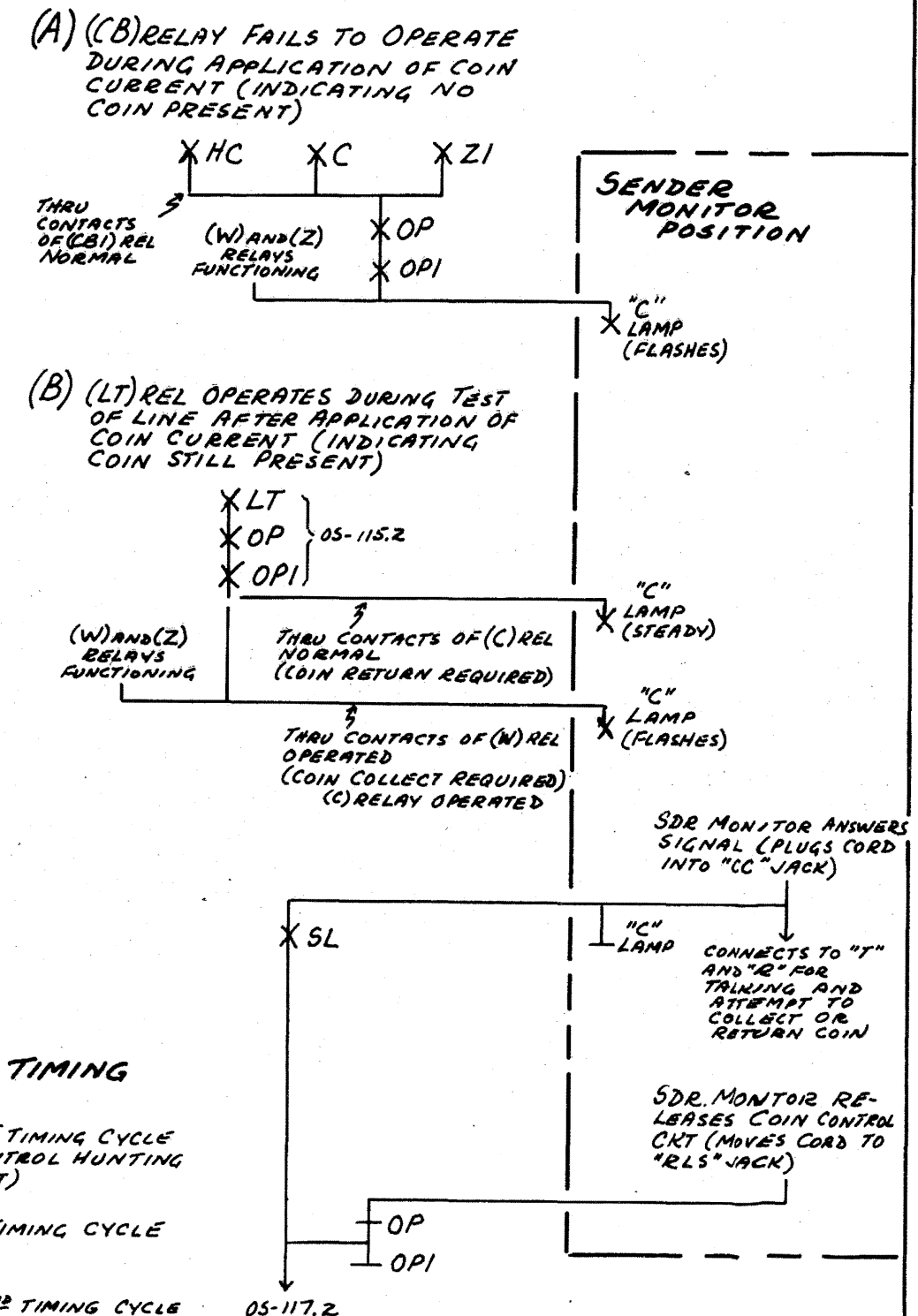
LINK TYPE

OS-115.2

COIN CONTROL CKT



SEQUENCE CHART COIN CONTROL CKT

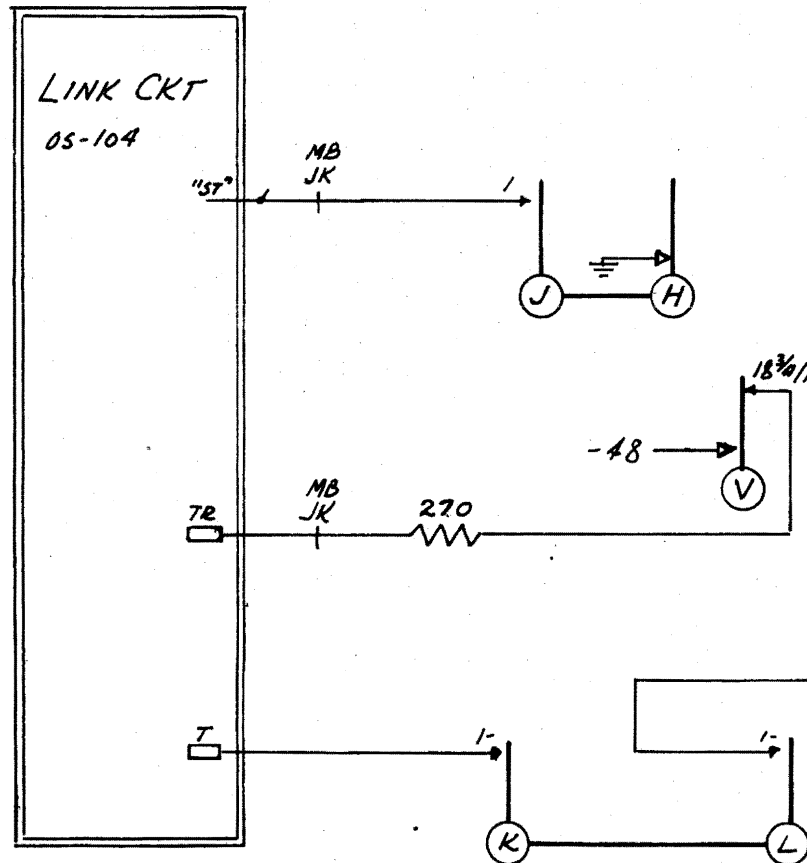


ES-21031-011 155.14D COIN CONTROL & LF-DIST SEL. CKT

(COIN)
COIN SIGNALS TO SDR MONITOR
COIN CONTROL TIME ALARM

PANEL GCO LINK TYPE OS-116.2

HC OP SL CN "5"



COIN CONTROL
CKT

The diagram illustrates the control logic for a line circuit breaker (LINE CKT) and a link circuit breaker (LINK CKT). The LINE CKT is controlled by a coil labeled 'CO'. The LINK CKT, labeled 'LINK CKT 05-104 PRE-SELECTS DIST. CKT', is controlled by a coil labeled 'L'. The circuit includes several interlocking relays and contacts: R18 (a 2-pole relay), R1 (a 1-pole relay), and R2 (a 2-pole relay). Key contacts include SL (normally closed), D2 (normally open), DI (normally open), HD (normally open), HC (normally open), LF (normally open), L (normally open), and CH (normally open, labeled 'IF OPERATED'). The logic ensures that the line circuit breaker can only operate if the link circuit breaker is in a safe state, and vice versa, preventing simultaneous operations that could cause a fault.

17. OVERFLOW OR AWTG. COIN CONTROL
18. DISTRICT AND L.F. RETURN

1. AWTG. LINK
2. AWTG. CALL

COIN CONTROL RELEASE (COIN)
LF-DISTRICT RELEASE

LINK TYPE

OS-117.2

1	12-54	GMH
ISSUE	DATE	BY

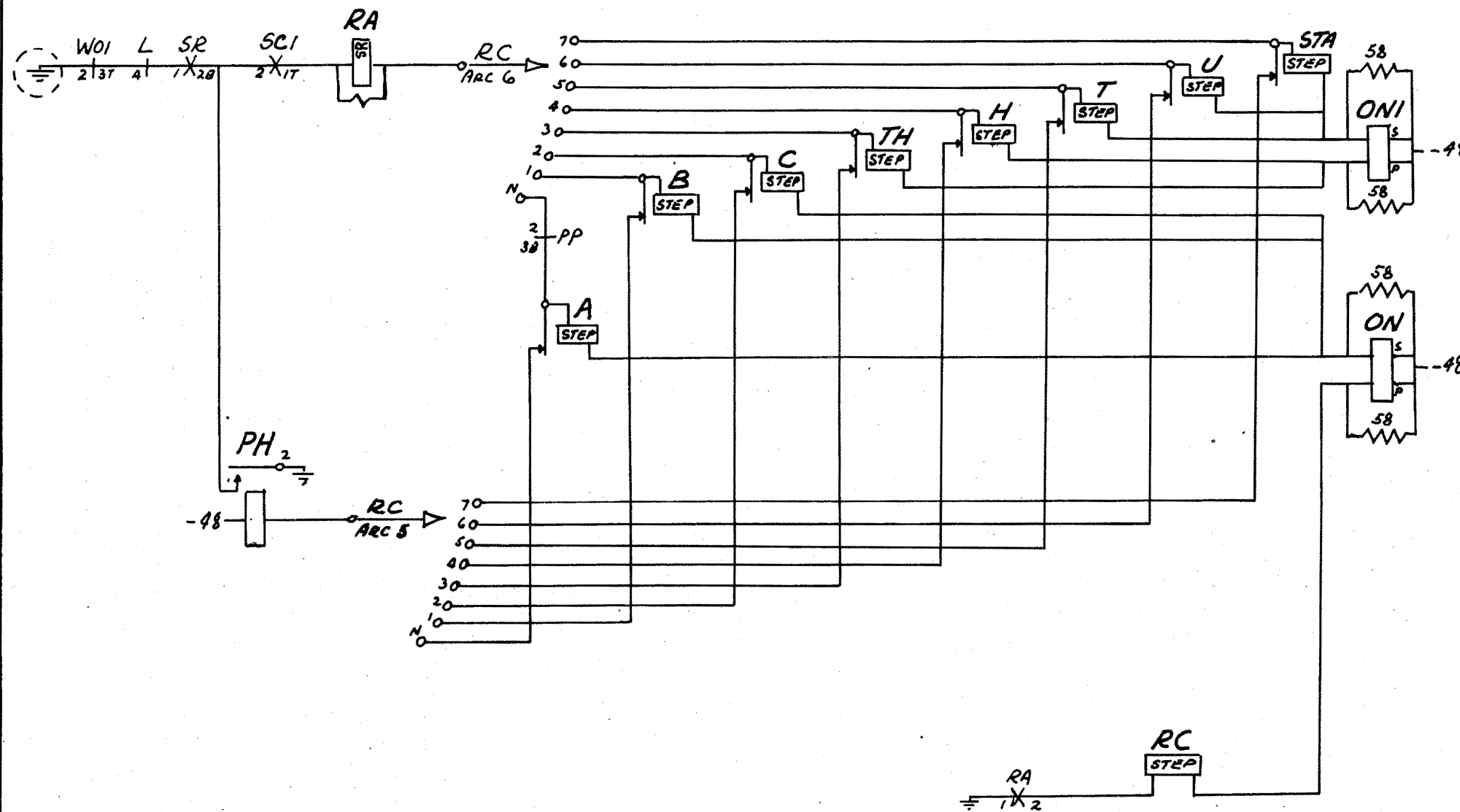
OS PAGE	CIRCUIT FUNCTION	SW. POS.	
		R2	R1
121.1	SENDER SEIZED ; DIAL TONE	1	1
122.1	DIALING	1	1
123.1(A)	CONNECTING TO DECODER CONNECTOR	2	8
123.1(B)	SENDING INFORMATION TO DECODER	2	8
123.1(C)	DECODING PREFIX	2	8
124.1	SETTING R-3 CLASS SWITCH	2	9
125.1	DISTRICT BRUSH SELECTION	2	9
	" GROUP "	4	9
126.1	OFFICE TEST	6	9
	" BRUSH SELECTION	7	9
	" GROUP "	9	9
127.1	TRUNK TEST	11	9
128.1	INCOMING BRUSH SELECTION	12	9
	" GROUP "	14	9
129.1	FINAL BRUSH SELECTION	16	10
	" TENS "	16	12
	" UNITS "	16	14
130.1	INCOMING ADVANCE	16	16
131.1(A)	PCI PULSING - FUNDAMENTAL CIRCUIT	16	15
131.1(B)	" " - POSITIVE PULSES		
131.1(C)	" " - NEGATIVE "		
132.1	DISTRICT ADVANCE ; TALK SELECTION	16	18
133.1	SENDER RELEASE		
134.1	REGISTER RESTORAL		
135.1	"M" REG. FUNCTION ; SYNCHRONIZING (S) RELAY		

ES-20012-02 SUBSCRIBER'S SENDER
NON-ZONE

COIN OR NON-COIN
INDEX TO
OPERATIONAL SKETCHES

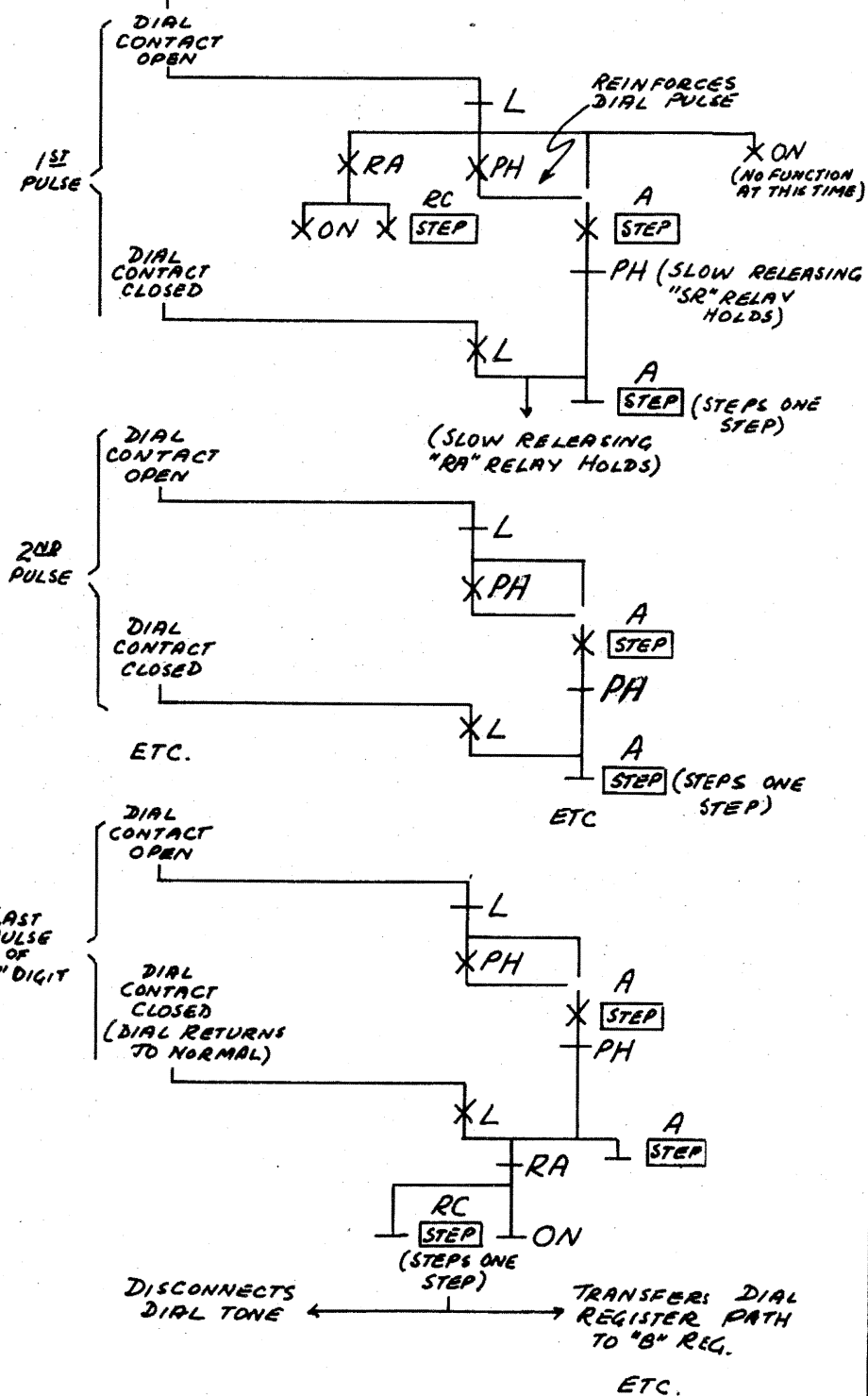
PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-120.1
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ISSUE	1
DATE	12-54
BY	G.H.H.



SEQUENCE CHART

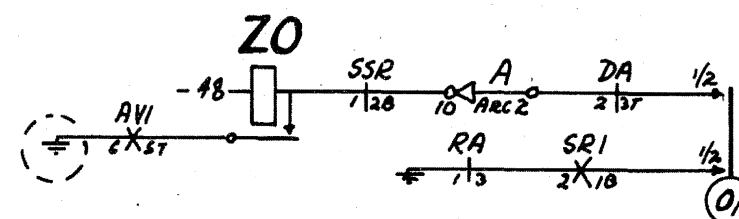
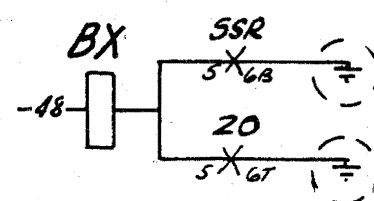
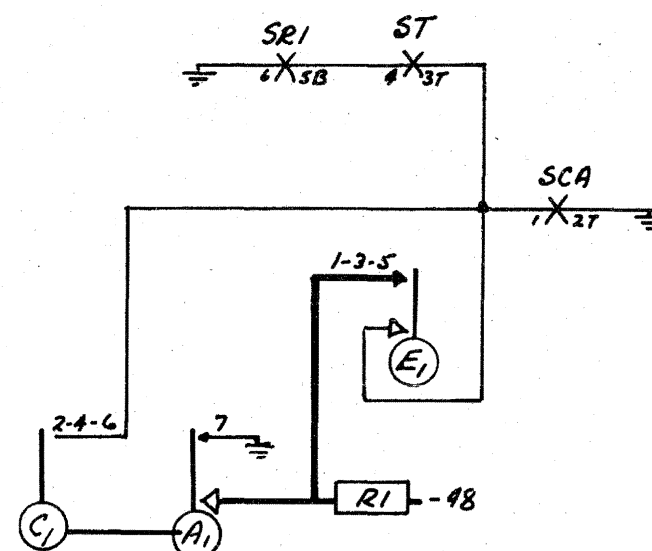
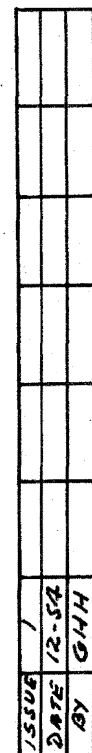
CALLING SUB. STARTS
DIALING



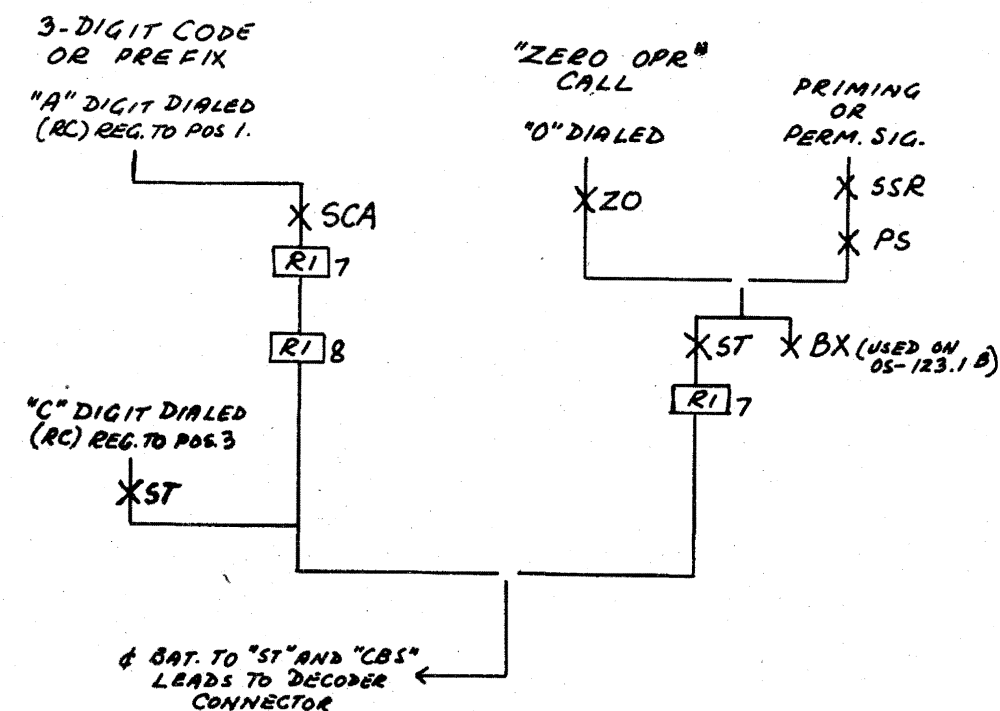
ES-20012-02 ISS. 10D SUBSCRIBER'S SENDER
NON-ZONE
COIN OR NON-COIN

DIALING

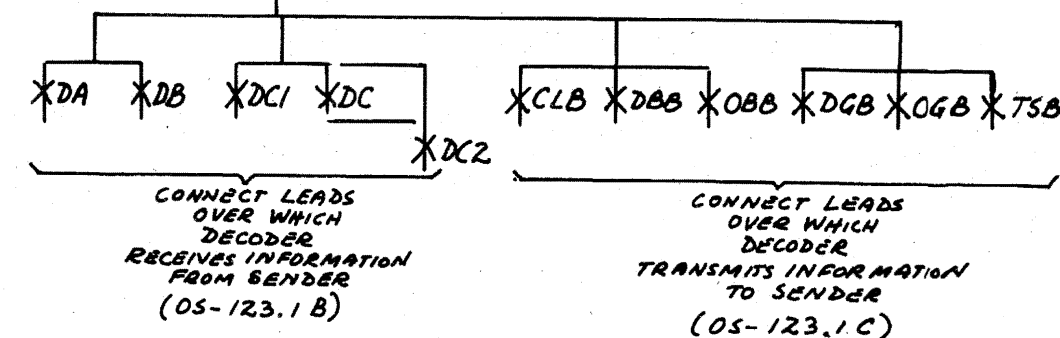
PANEL GCO SEL. TYPE WITH LINK & DECODER 05-122.1



3-DIGIT CODE
OR PREFIX
"A" DIGIT DIALED
(RC) REG. TO POS 1.



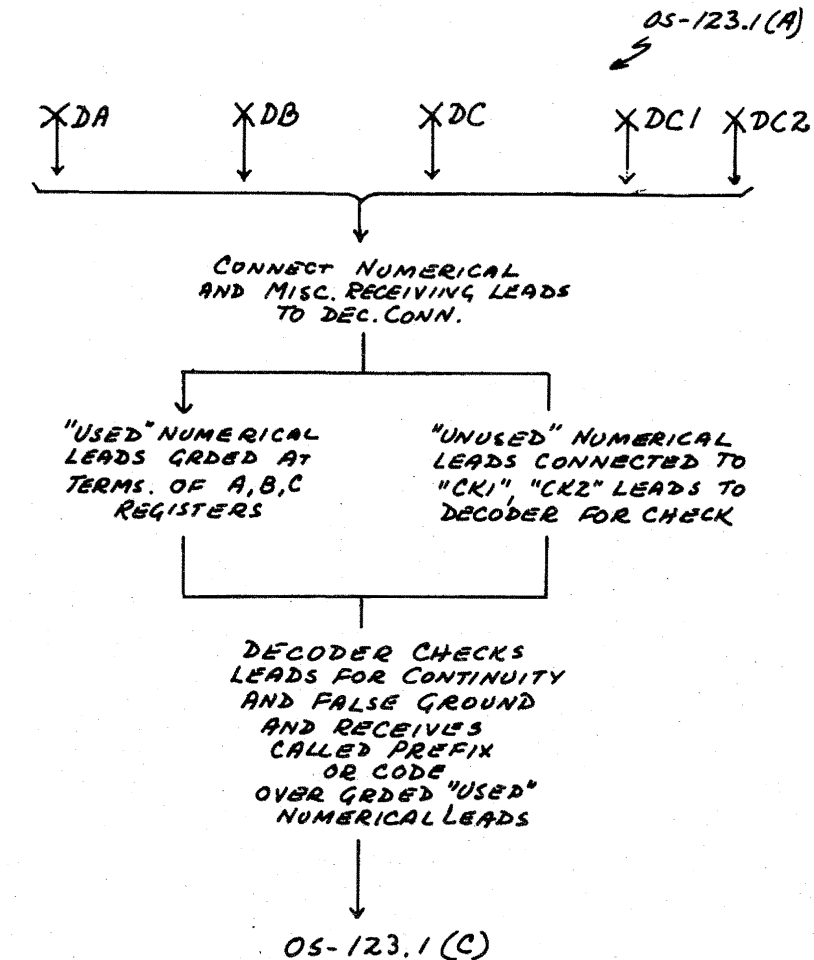
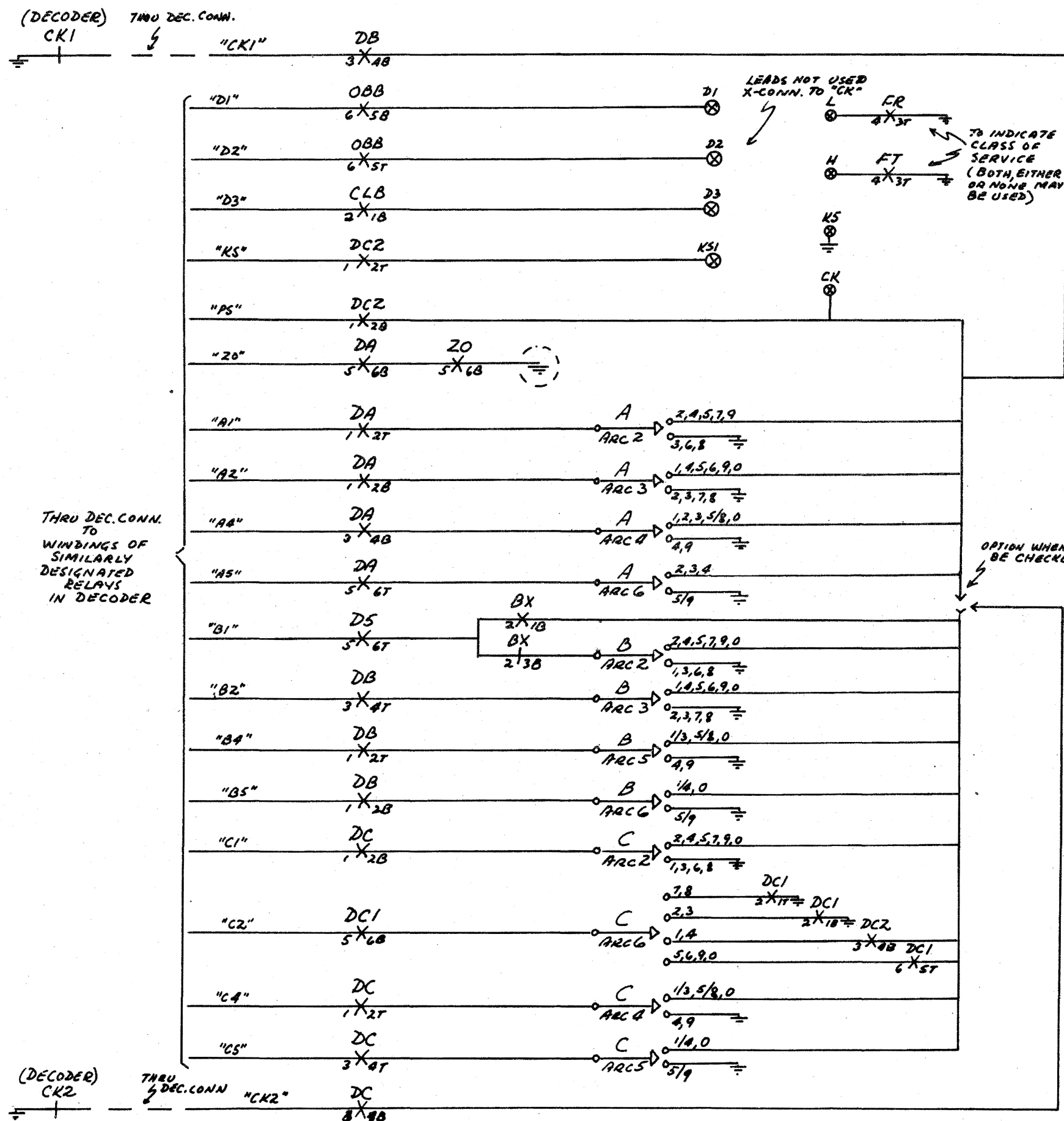
CONNECTING
RELAYS
IN DEC. CONN.
OPERATED



COIN OR NON-COIN

CONNECTING TO	R ₂ -2
DECODER CONNECTOR	R ₁ -8

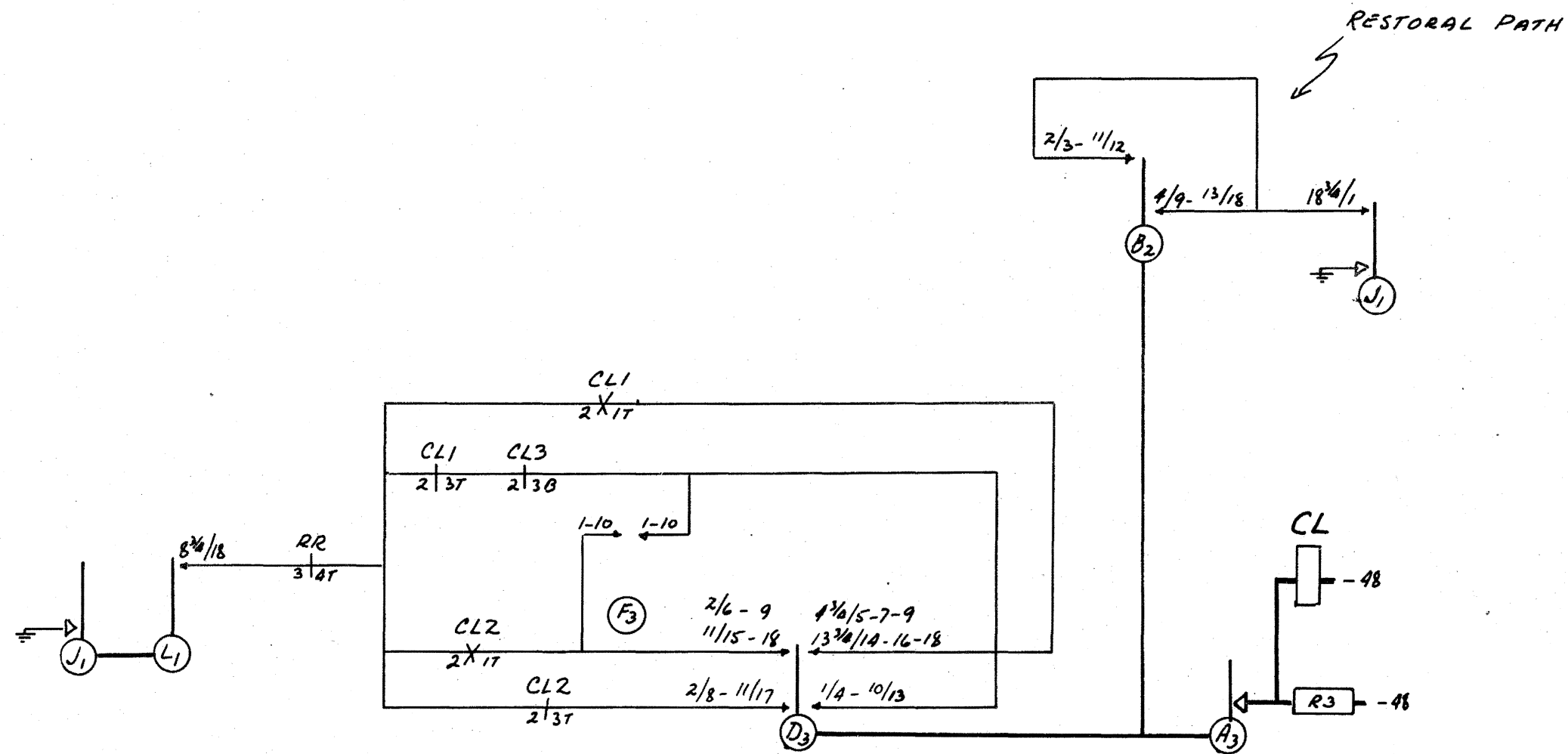
PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-123.1 (A)
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ES-20012-02 Iss. 100 SUBSCRIBER'S SENDER
NON-ZONE

COIN OR NON-COIN
SENDING INFORMATION TO DECODER R2-2
R1-8

PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-123.1(B)
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R-3 CLASS SWITCH

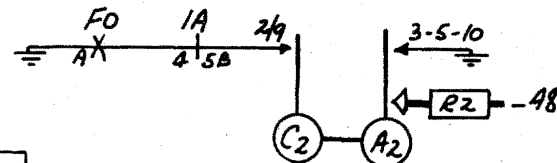
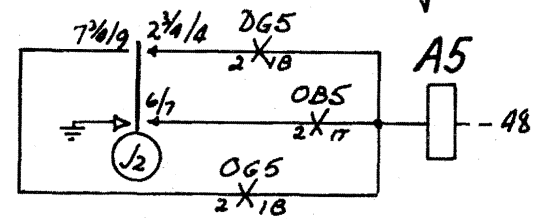
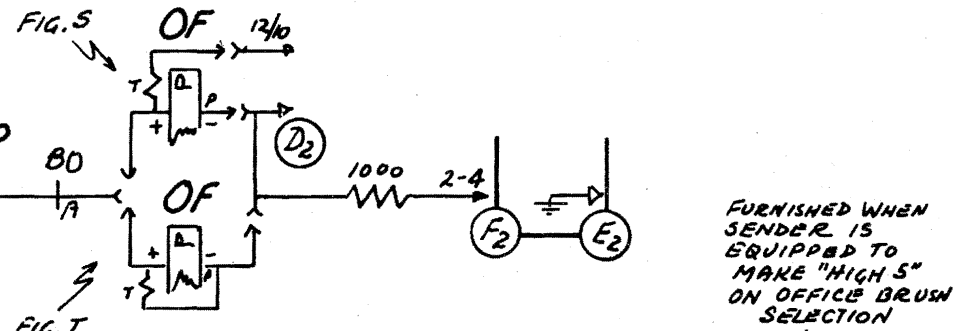
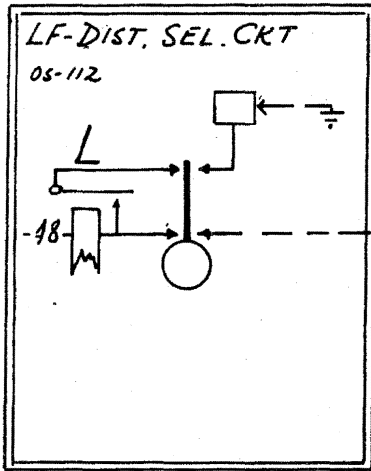
SW. POS	CLASS OF CALL	RELAYS
1-10	ZERO OPERATOR 3-DIGIT OPERATOR PERM. SIGNAL	CL3
1-10	OPERATOR (RESTRICTED ZONE)	CL1
7-16	TANDEM PCI	CL2 or CL2-CL3
8-17	DIRECT PCI	CL1-CL2
9-18	FULL MECHANICAL	NONE

ES-20012-02 / ss.100 SUBSCRIBER'S SENDER
NON-ZONE

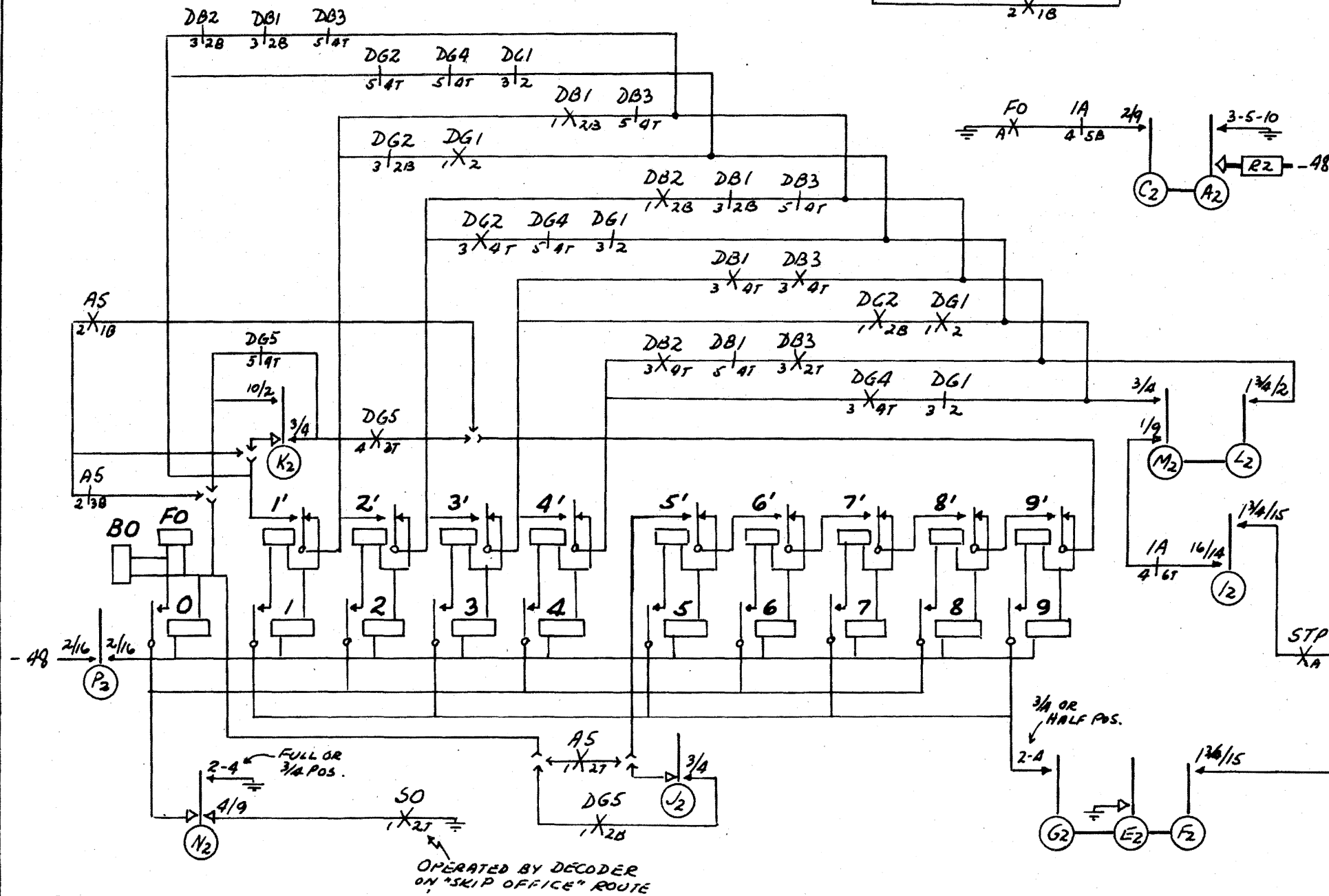
COIN OR NON-COIN

SETTING R-3 CLASS	R ₂ -2
SWITCH	R ₁ -9

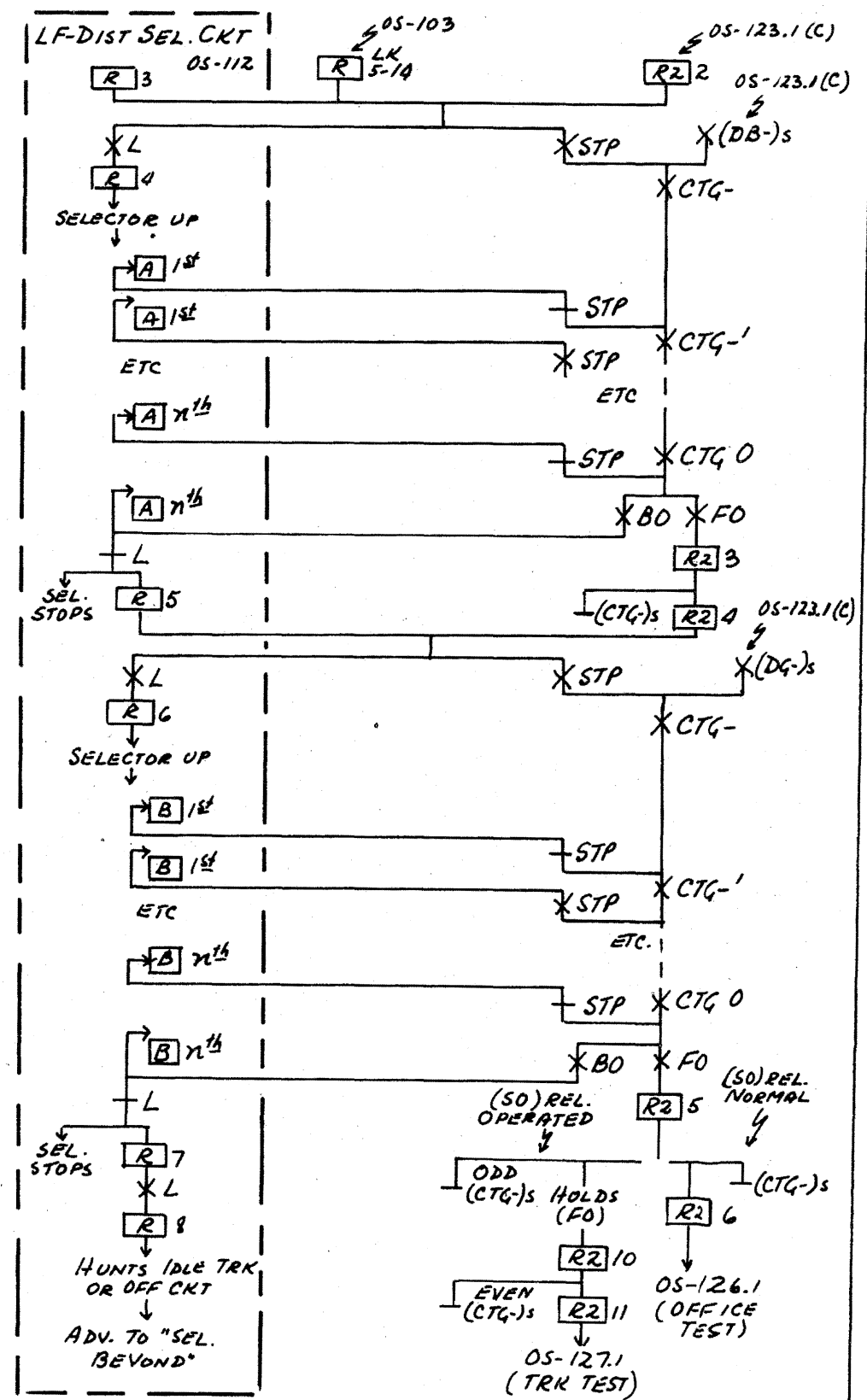
PANEL GCO	SEL. TYPE WITH LINK & DECODER	05-124.1
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SEQUENCE CHART



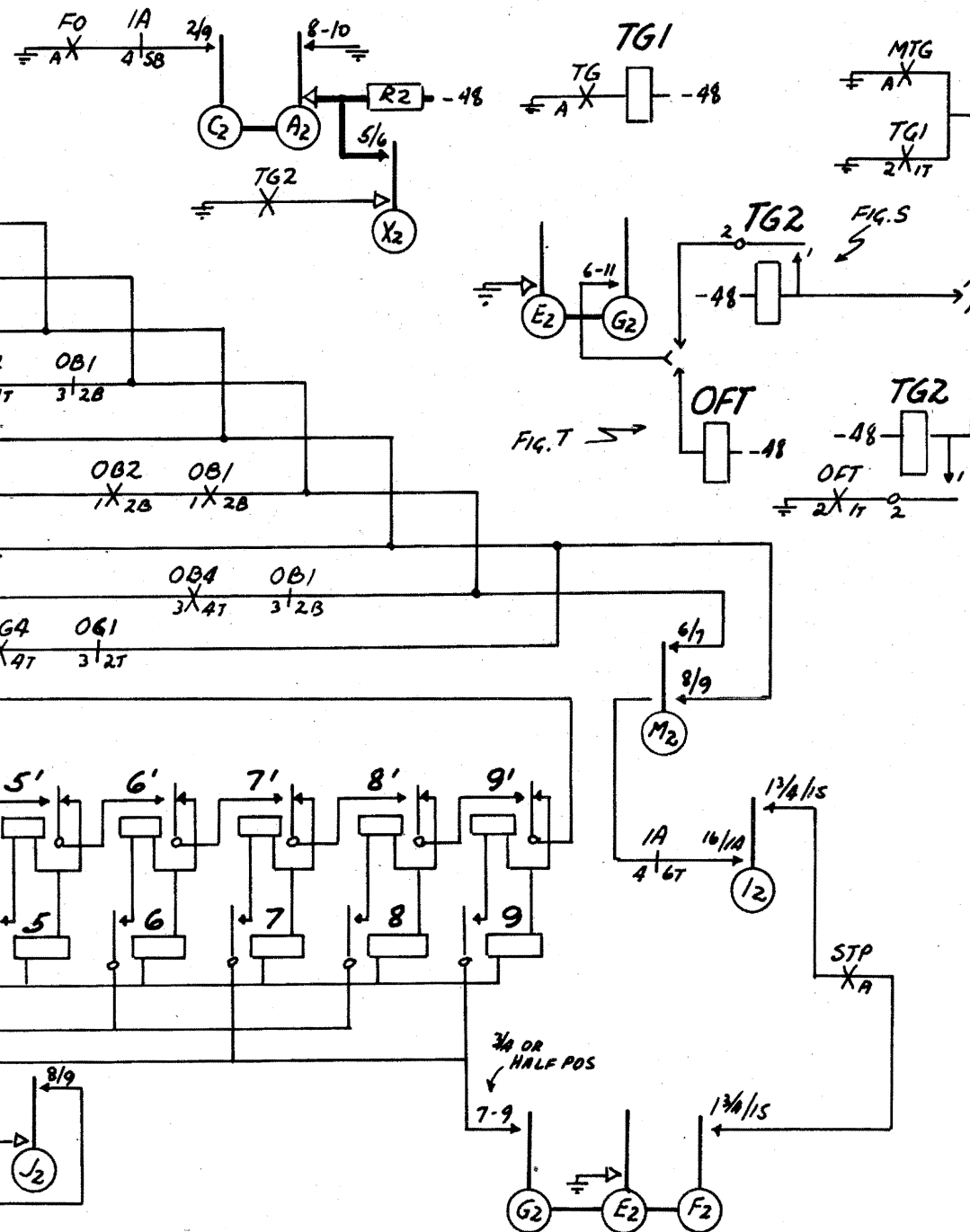
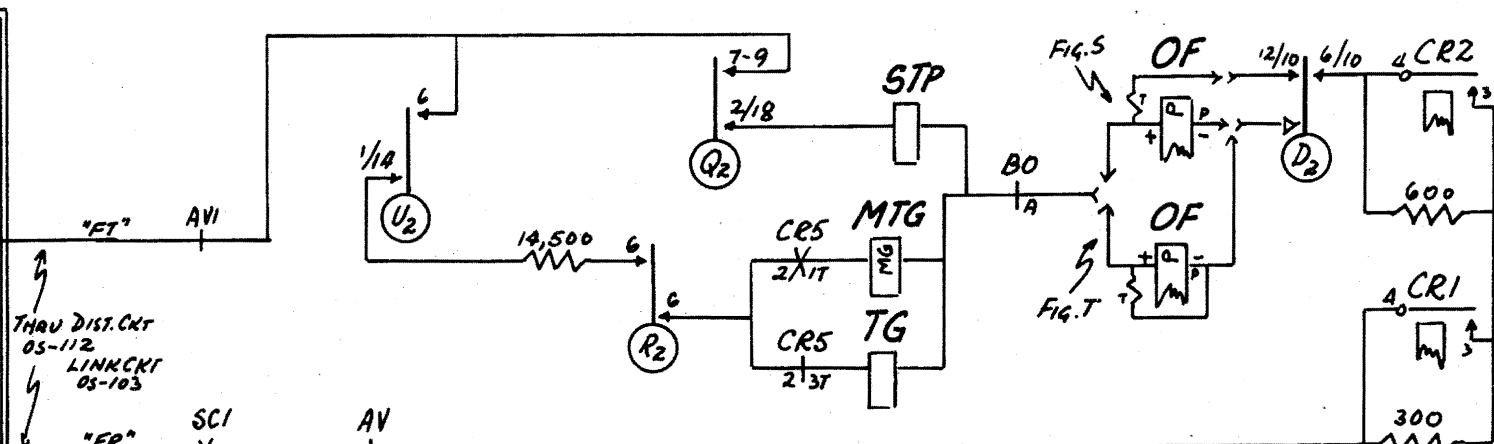
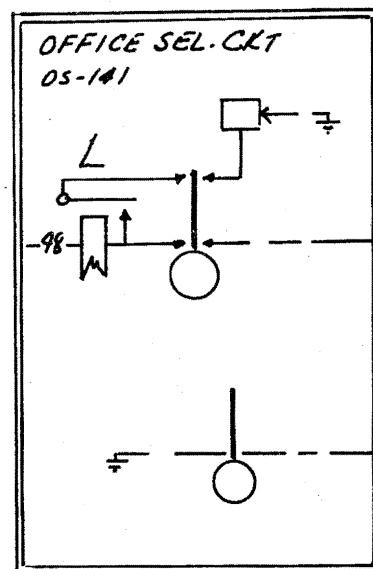
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COIN OR NON-COIN

DISTRICT BRUSH SELECTION R2-2 R1-9

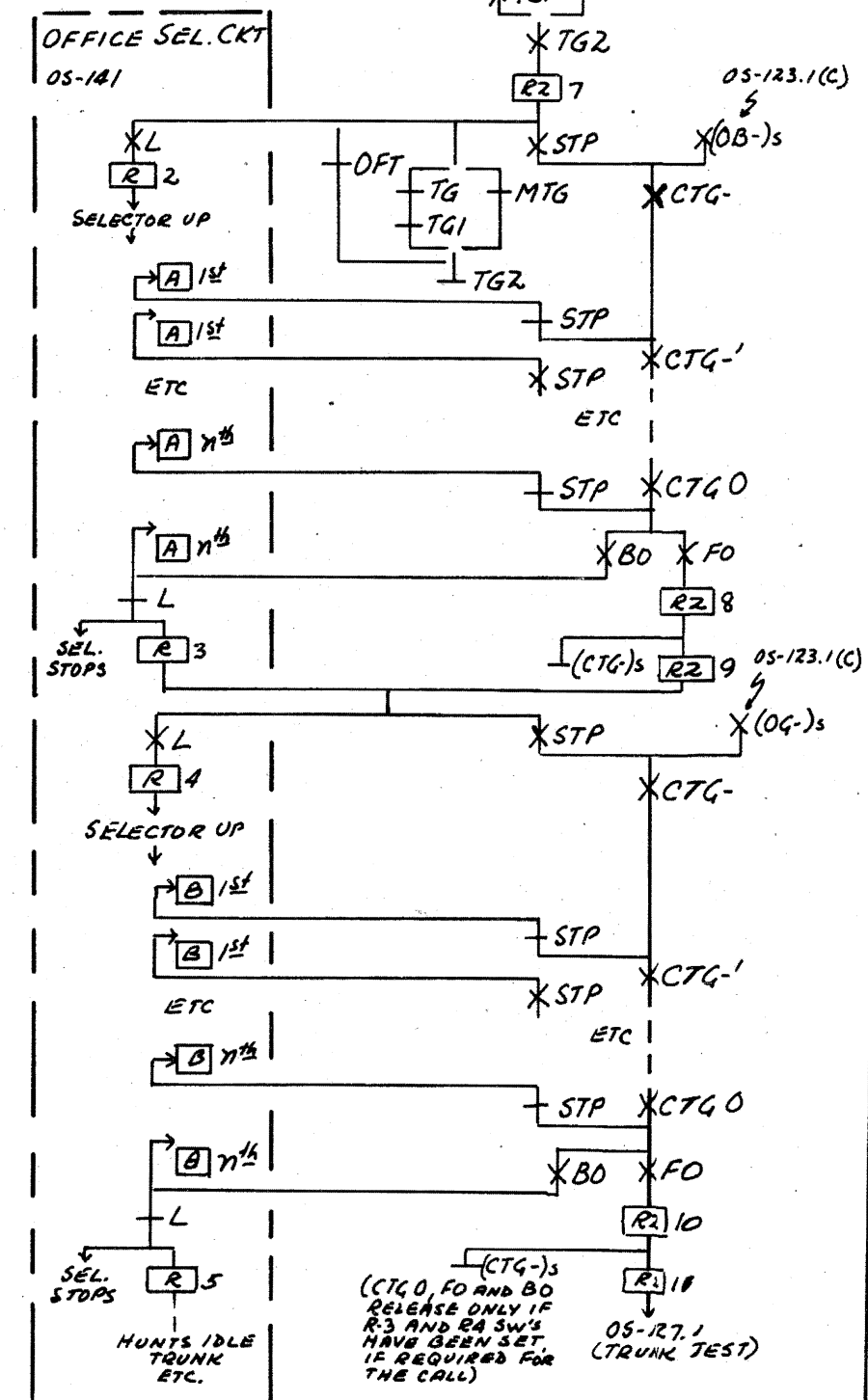
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PANEL GCO SEL. TYPE WITH LINK & DECODER OS-125.1



SEQUENCE CHART

DIST. CKT. HAS
FOUND IDLE OFF CKT



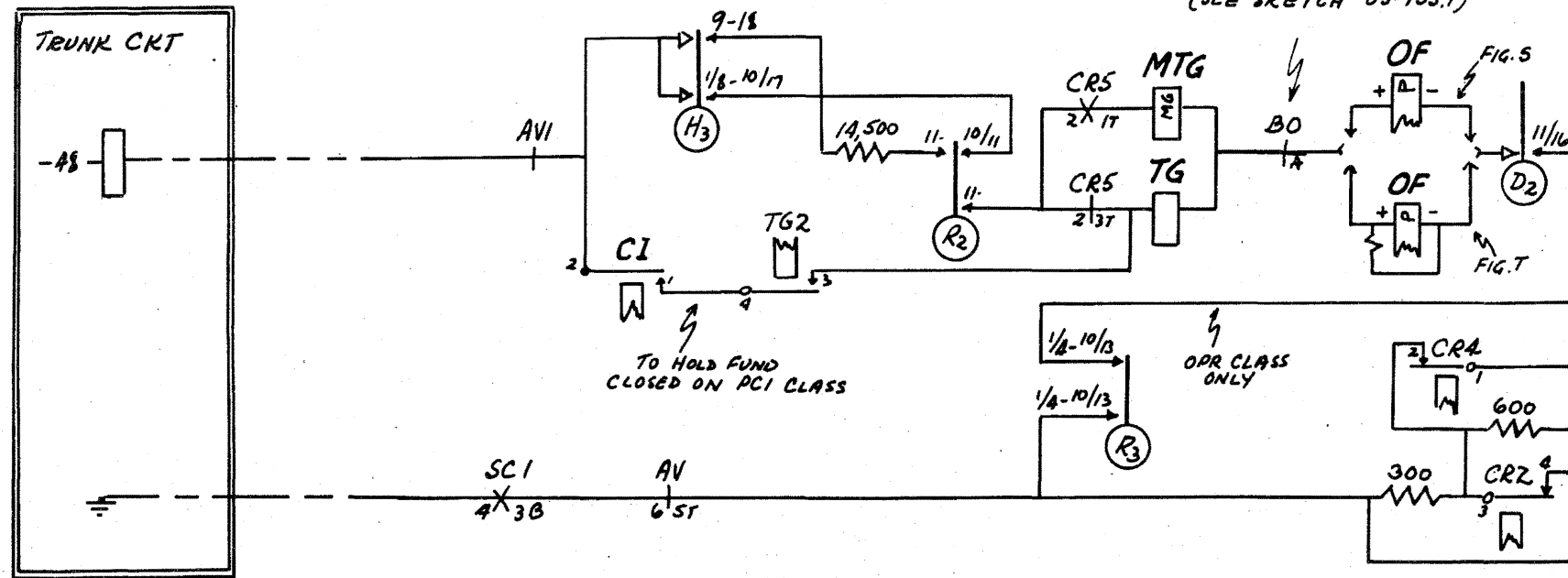
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NON-ZONE

COIN OR NON-COIN
OFFICE TEST R2-6 R1-9
OFFICE BRUSH & GROUP R2 7/9 R1-9
SELECTIONS

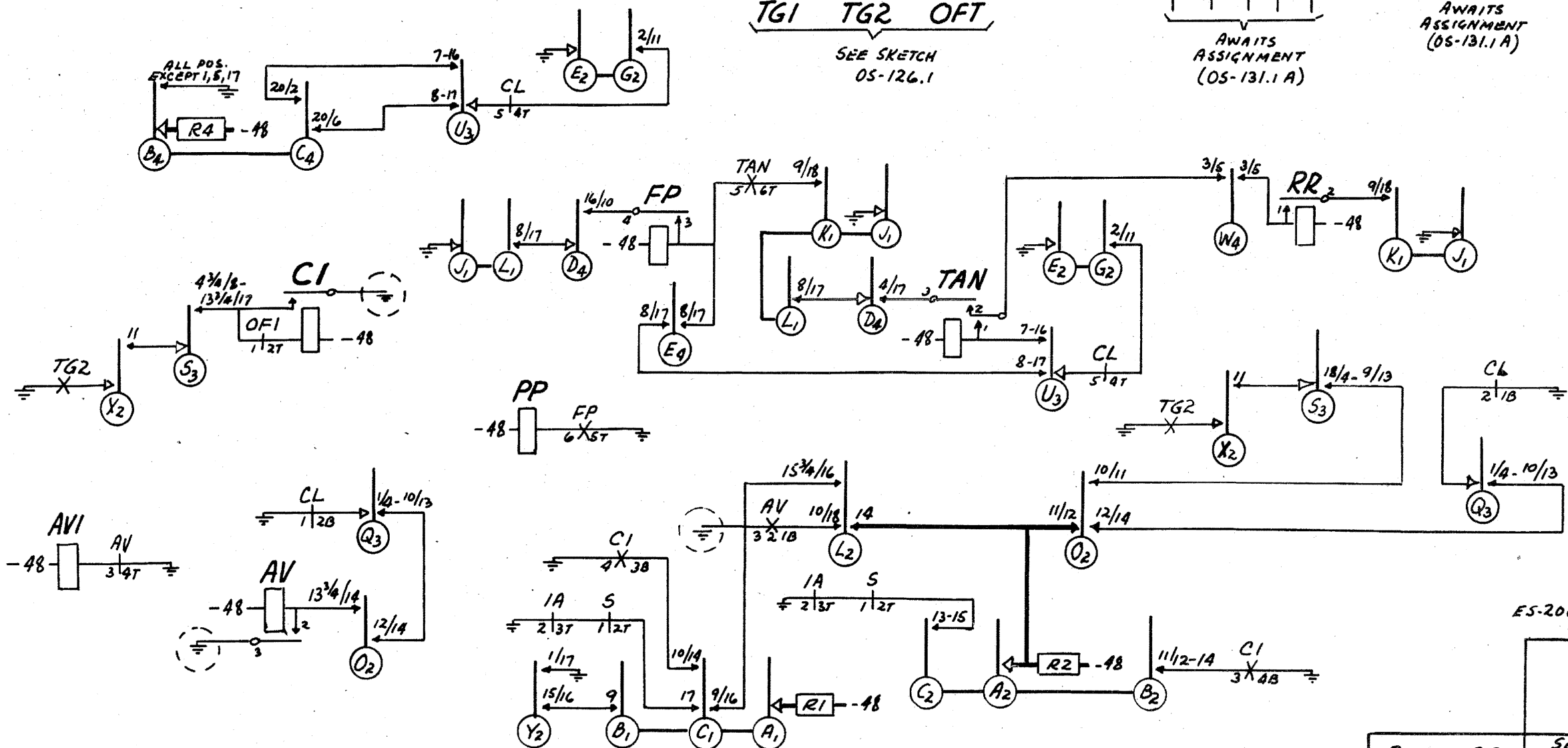
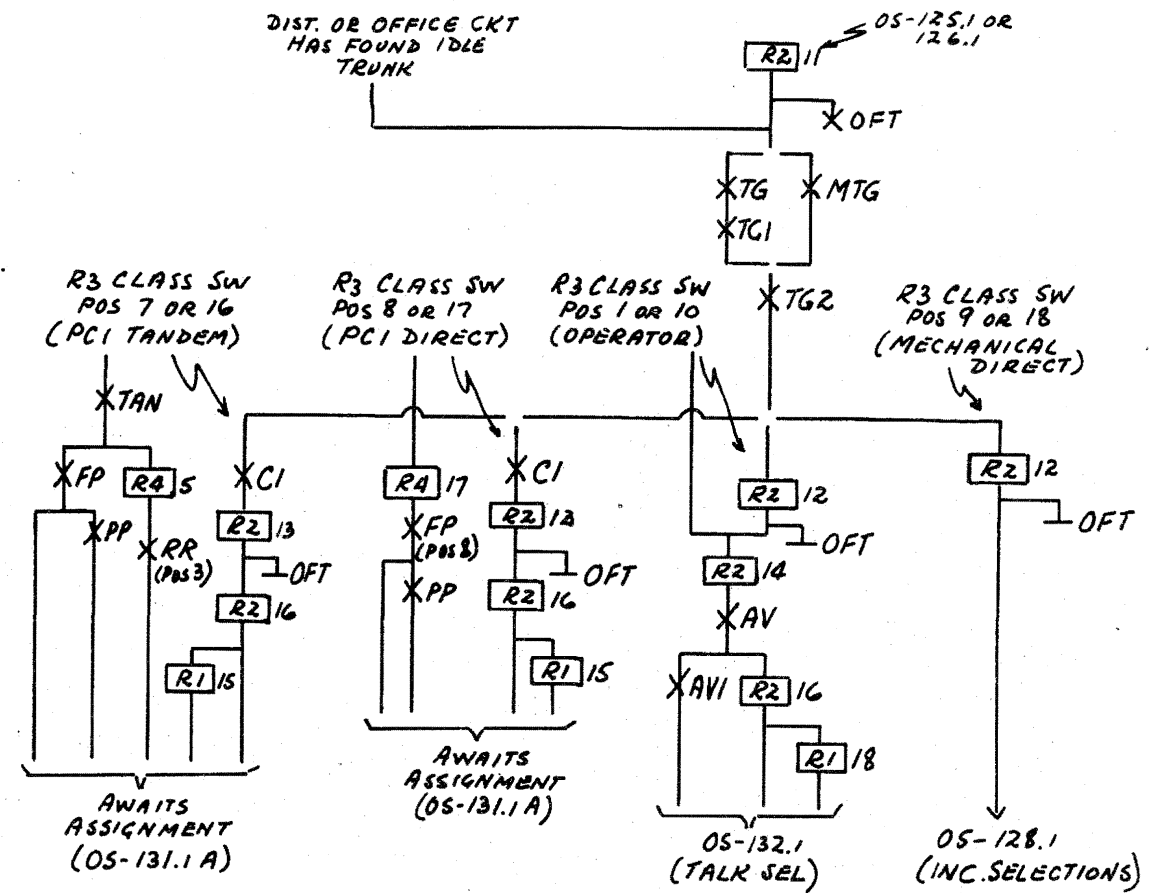
PANEL GCO SEL. TYPE WITH
LINK & DECODER OS-126.1

ILL. BELL TEL. CO - PLANT SCHOOL

15508	12-54	GH
DATE		
BY		

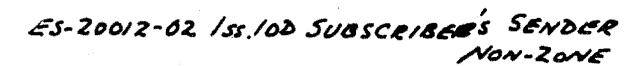
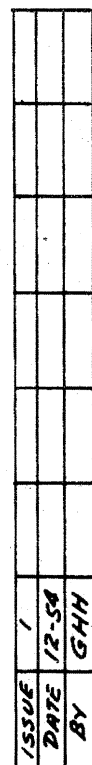


SEQUENCE CHART



ES-20012-02 1ss.100 SUBSCRIBER'S SENDER NON-ZONE

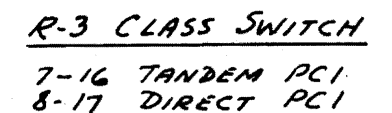
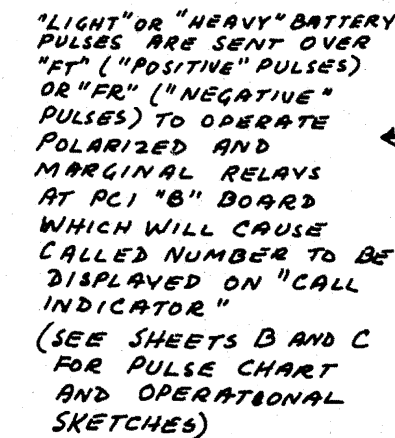
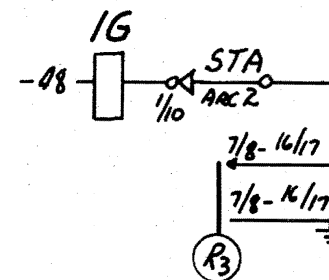
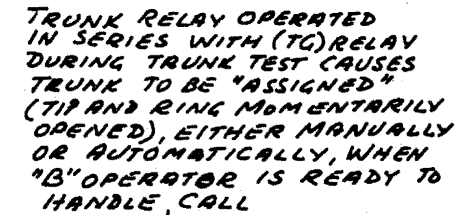
COIN OR NON-COIN	
TRUNK TEST	R2-11 R1-9
PANEL GCO	SEL. TYPE WITH LINK & DECODER
	05-127.1



	COIN	OR Non-COIN
FINAL BRUSH, TENS	R2-16	
AND	R1- ¹⁰⁰ 1/2 1/4	
UNITS SELECTIONS	R3-9-18	

PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-129.1
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PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-131.1 (A)
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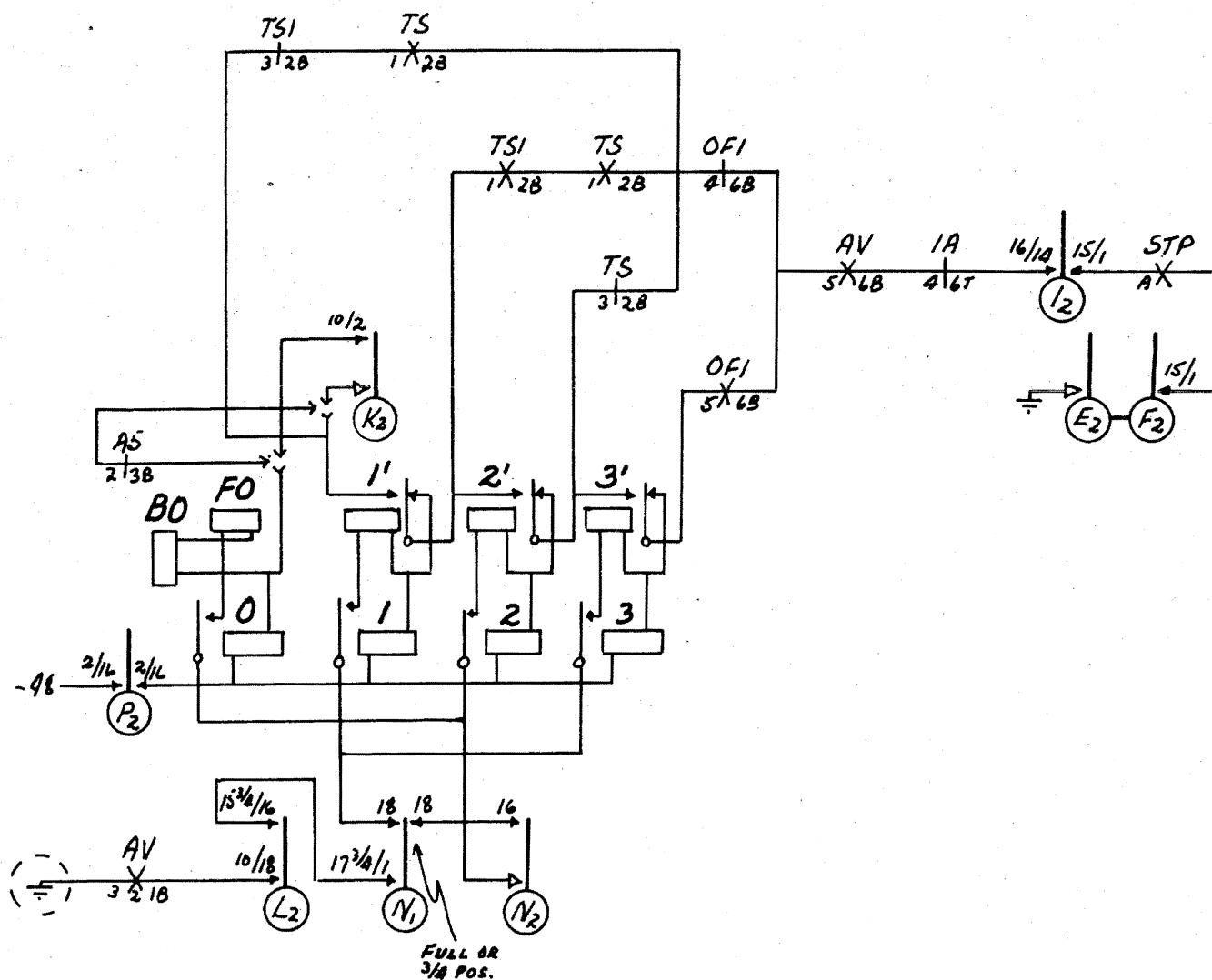
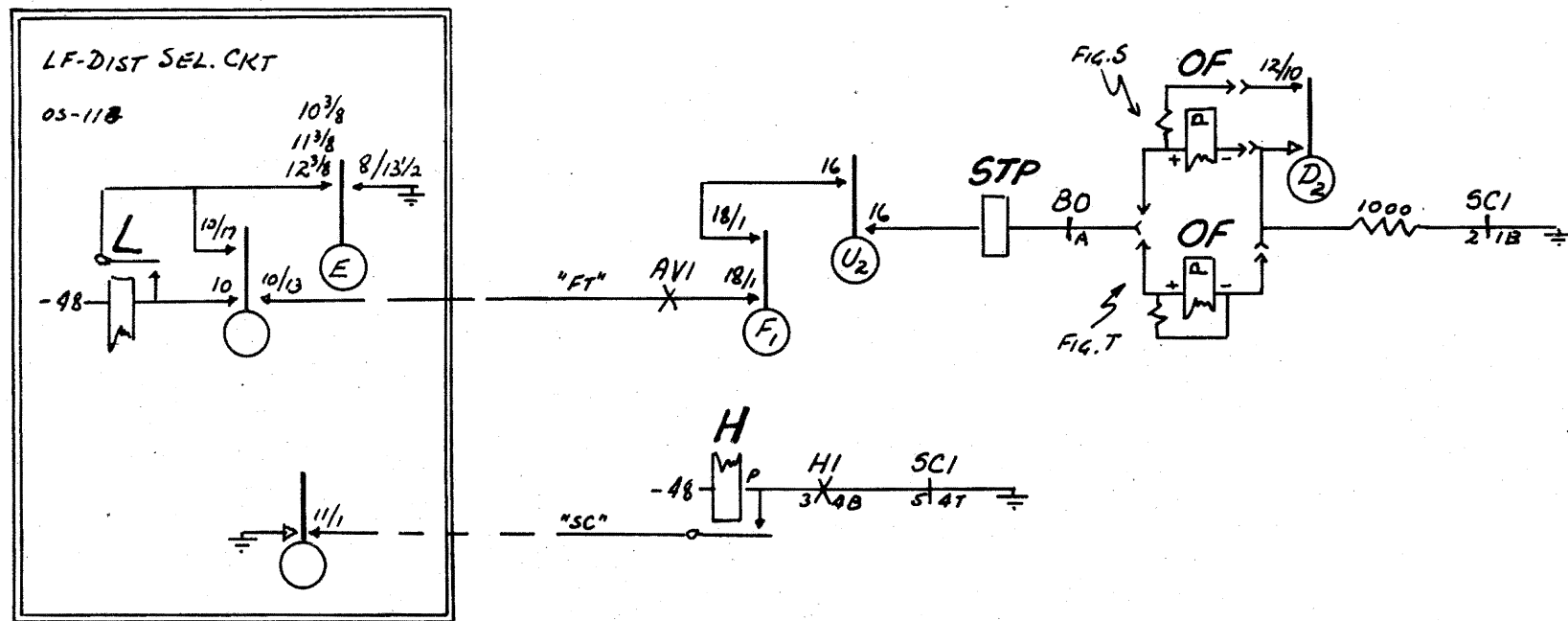
ES-20012-02 155.100 SUBSCRIBER'S SENDER
NON-ZONE

COIN OR NON-COIN
PCI PULSING R2-16
FUNDAMENTAL CIRCUIT R1-15

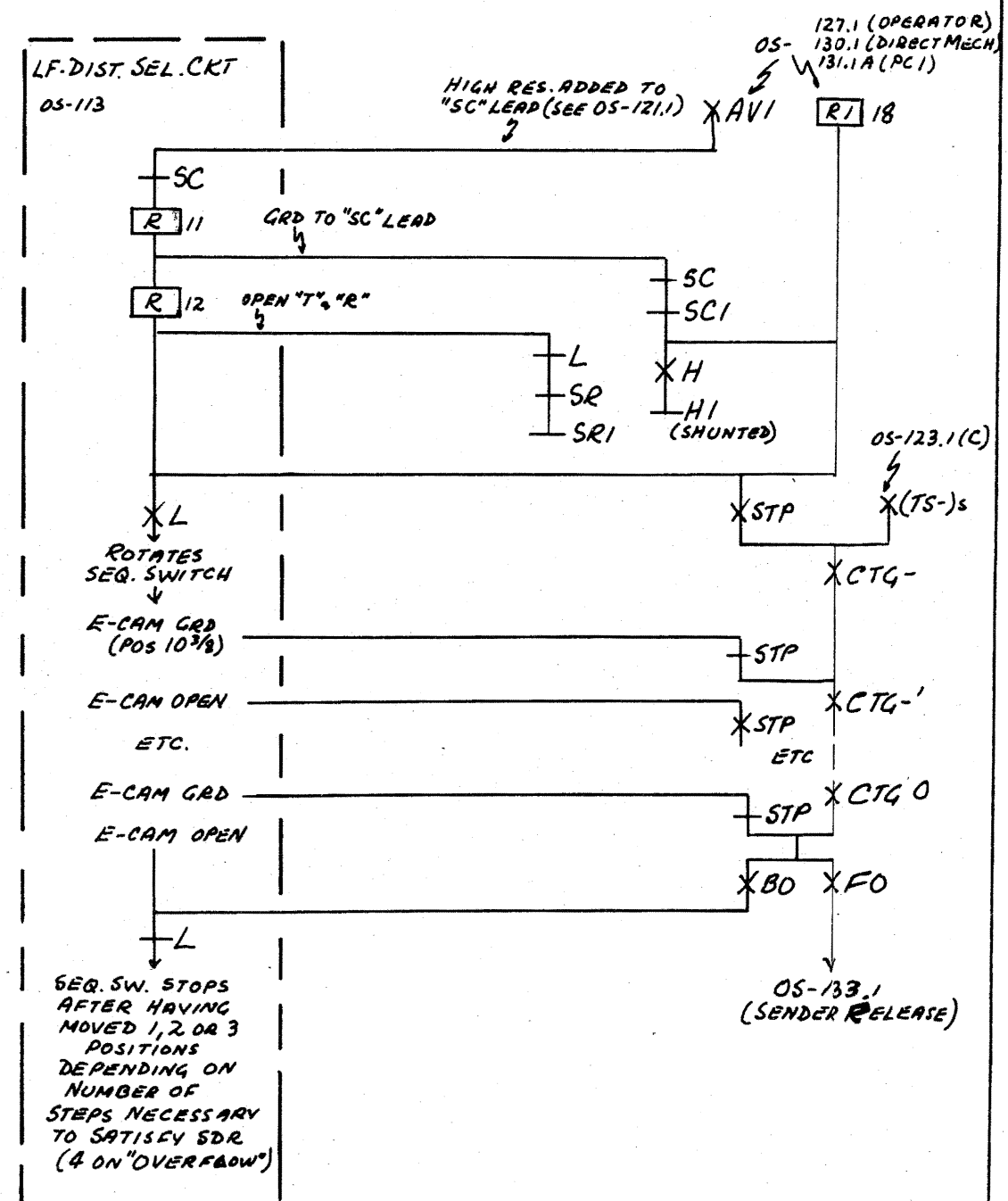
PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-131.1 (A)
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ISSUE	1
DATE	12-54
BY	GHH



SEQUENCE CHART

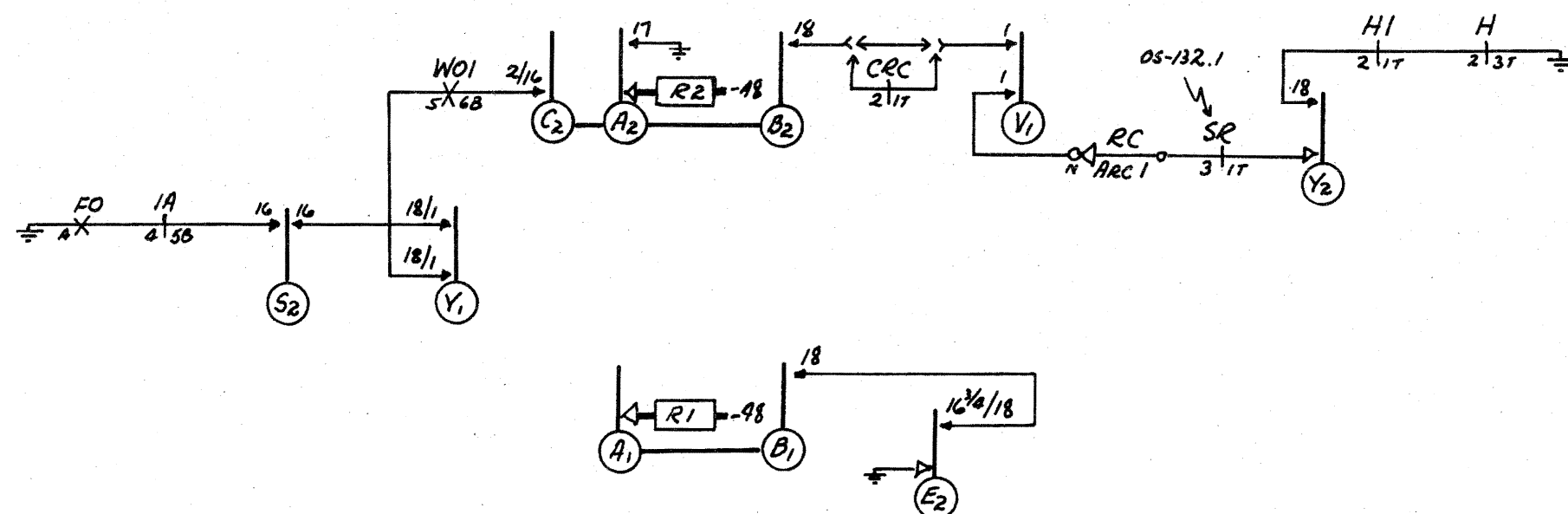
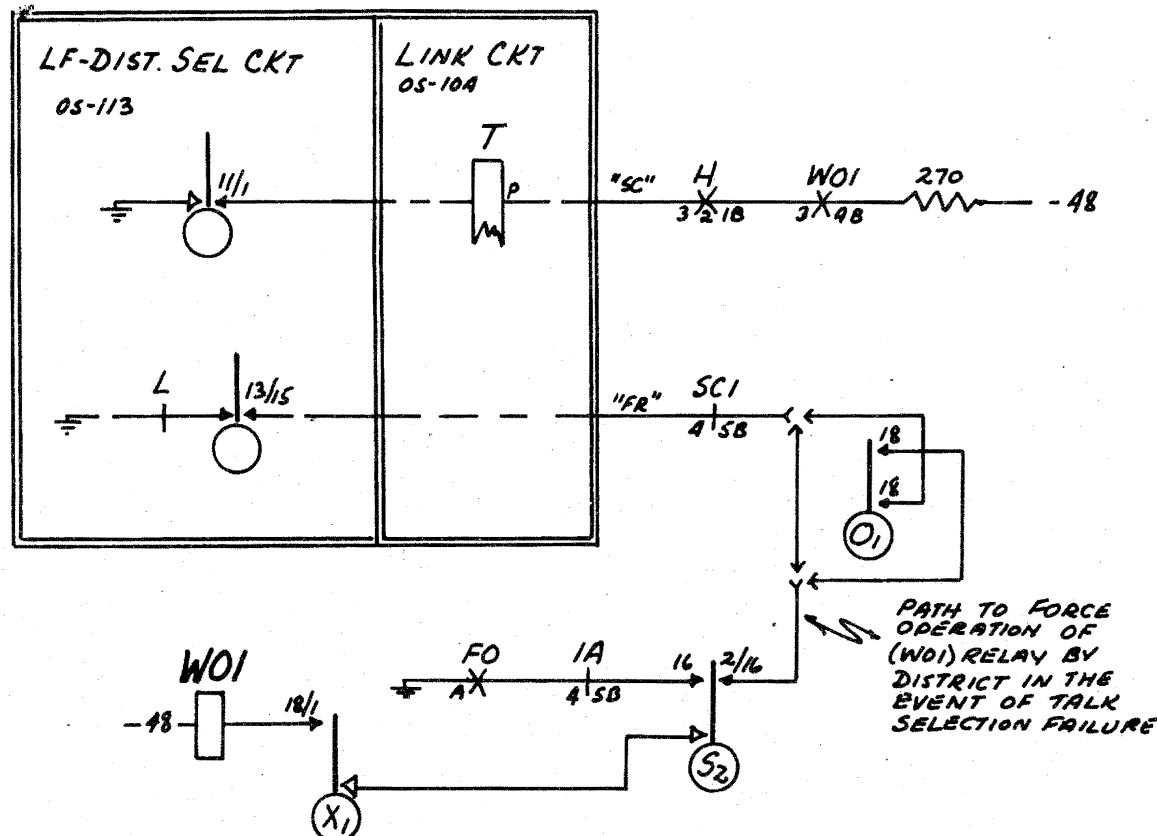


ES-20012-02 1ss.10D SUBSCRIBER'S SENDER
NON-ZONE
COIN OR NON-COIN

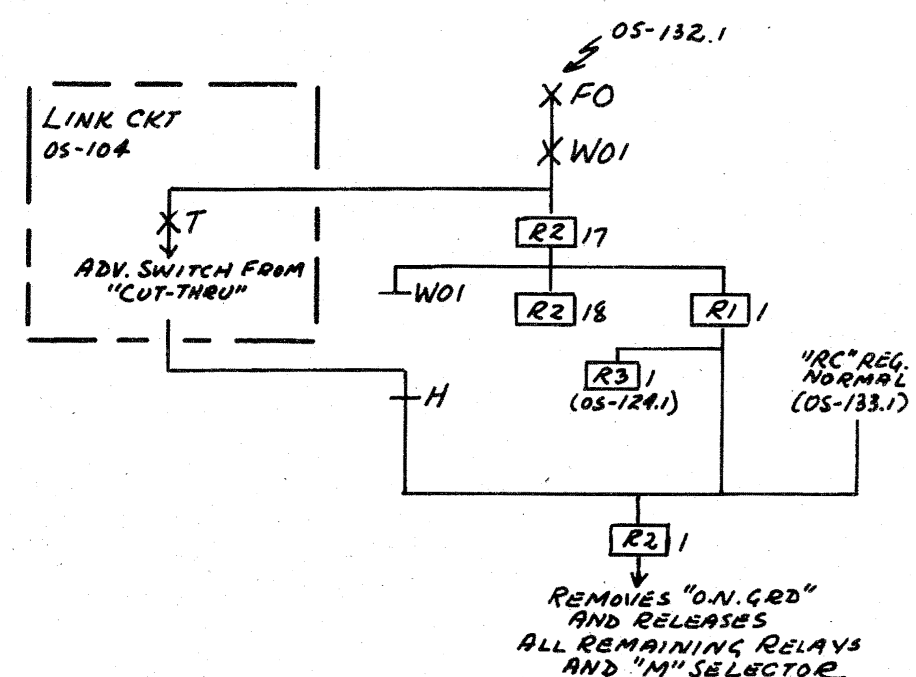
TALK SELECTION R₂-16
R₁-18

PANEL GCO	SEL. TYPE WITH LINK & DECODER	OS-132.1
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1	12-58	GMH
2	12-58	GMH
3	12-58	GMH
4	12-58	GMH
5	12-58	GMH
6	12-58	GMH
7	12-58	GMH
8	12-58	GMH
9	12-58	GMH
10	12-58	GMH
11	12-58	GMH
12	12-58	GMH
13	12-58	GMH
14	12-58	GMH
15	12-58	GMH
16	12-58	GMH
17	12-58	GMH
18	12-58	GMH
19	12-58	GMH
20	12-58	GMH
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27	12-58	GMH
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29	12-58	GMH
30	12-58	GMH
31	12-58	GMH
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35	12-58	GMH
36	12-58	GMH
37	12-58	GMH
38	12-58	GMH
39	12-58	GMH
40	12-58	GMH
41	12-58	GMH
42	12-58	GMH
43	12-58	GMH
44	12-58	GMH
45	12-58	GMH
46	12-58	GMH
47	12-58	GMH
48	12-58	GMH
49	12-58	GMH
50	12-58	GMH
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52	12-58	GMH
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85	12-58	GMH
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88	12-58	GMH
89	12-58	GMH
90	12-58	GMH
91	12-58	GMH
92	12-58	GMH
93	12-58	GMH
94	12-58	GMH
95	12-58	GMH
96	12-58	GMH
97	12-58	GMH
98	12-58	GMH
99	12-58	GMH
100	12-58	GMH

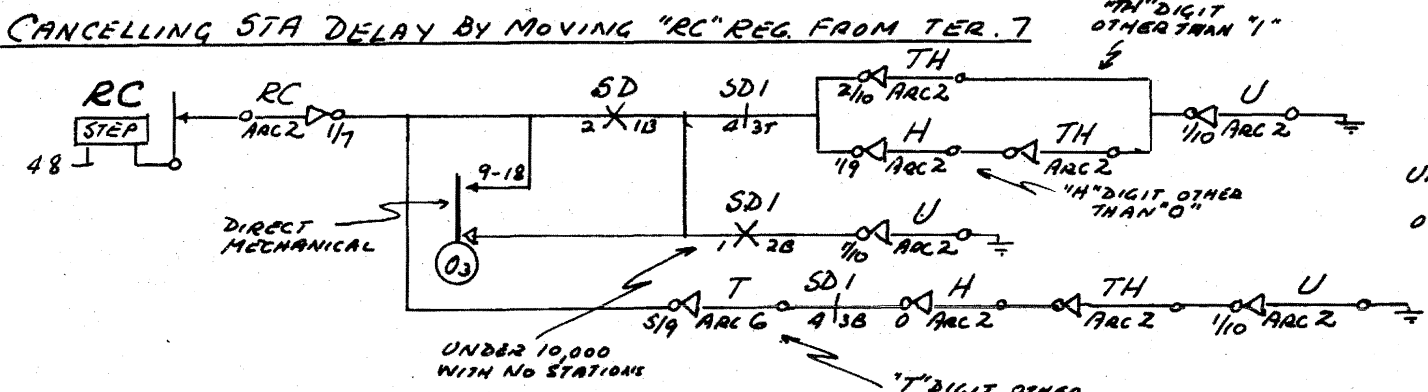
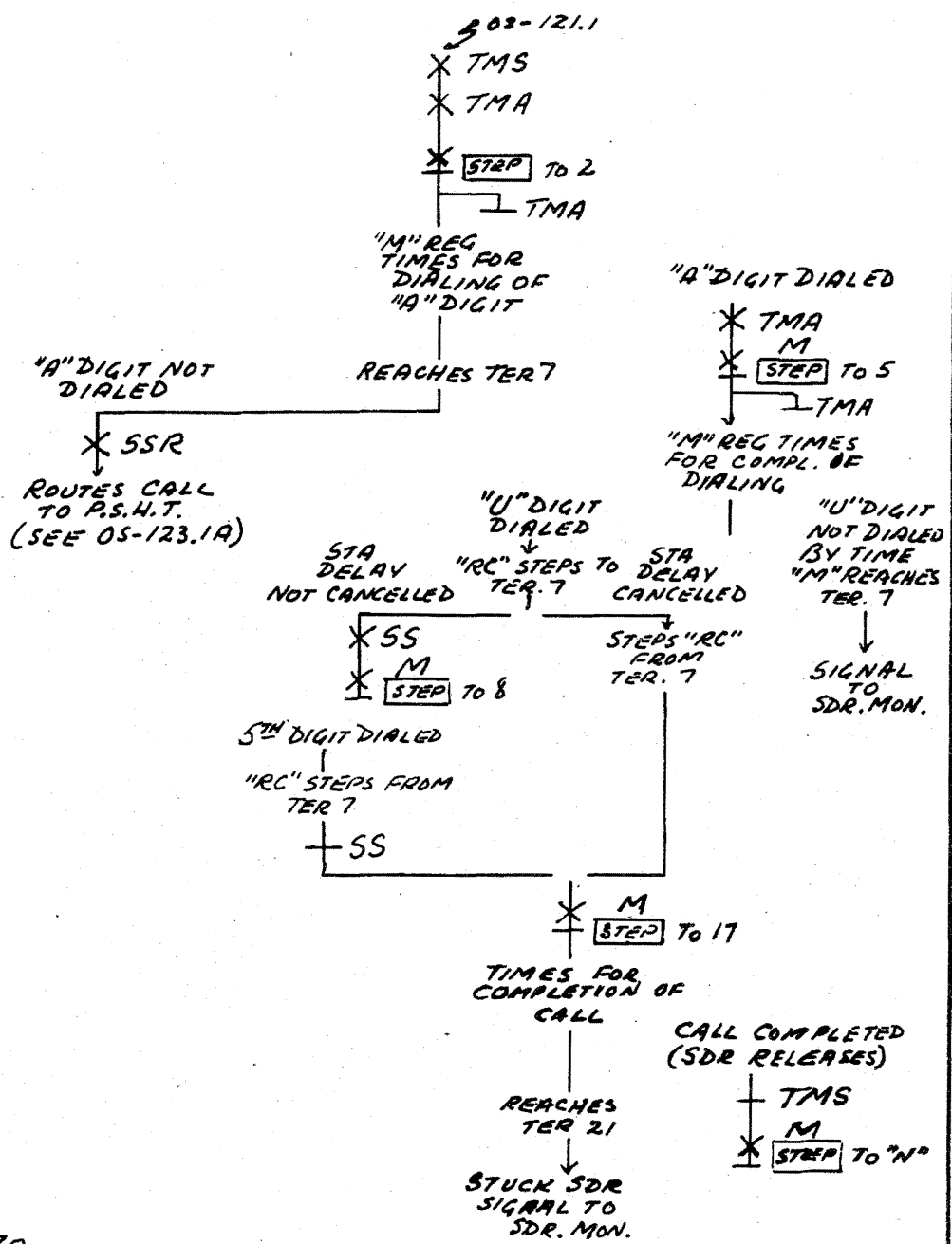
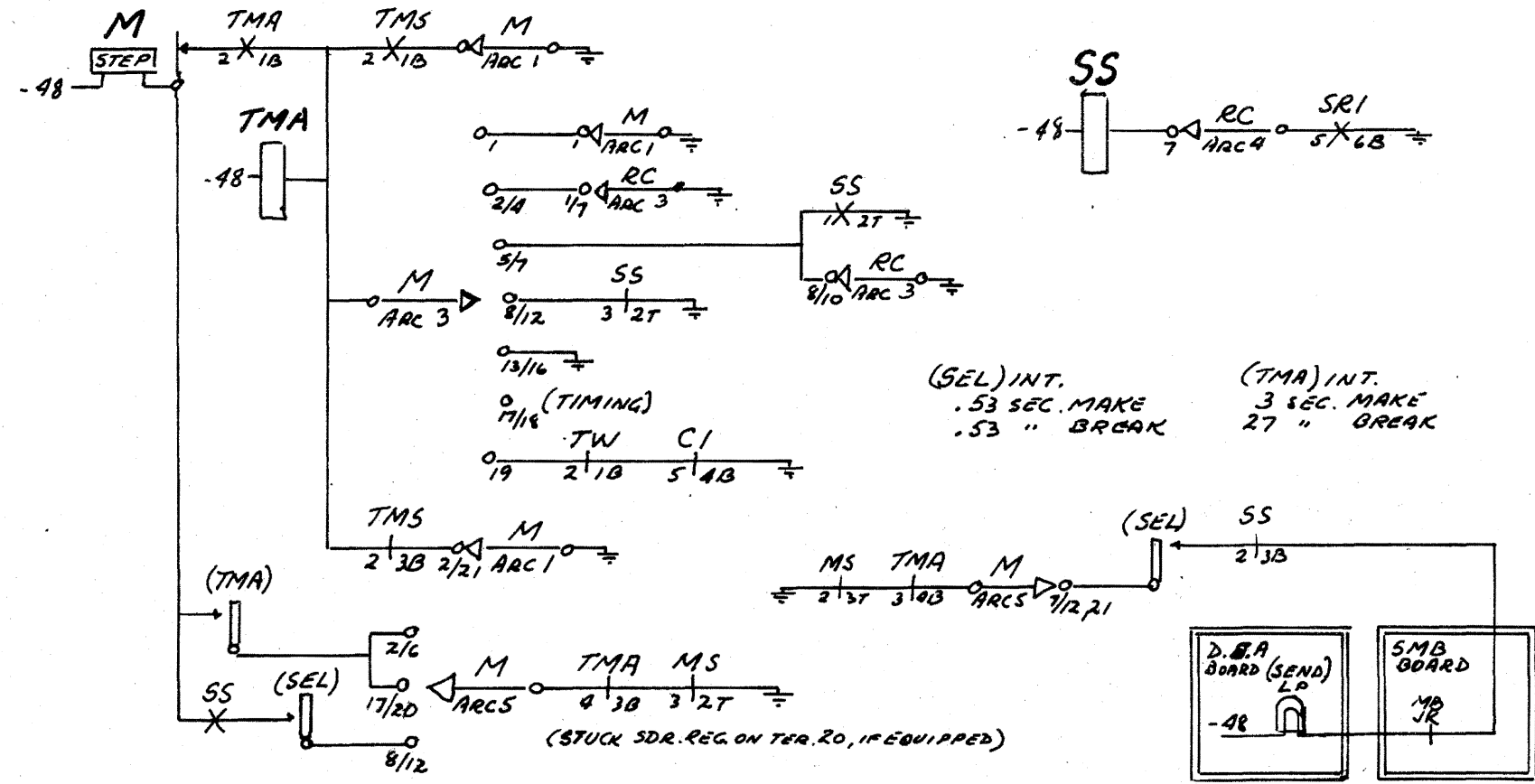


SEQUENCE CHART



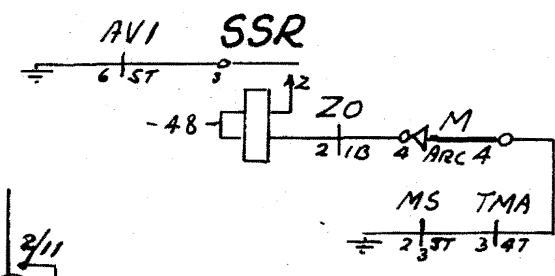
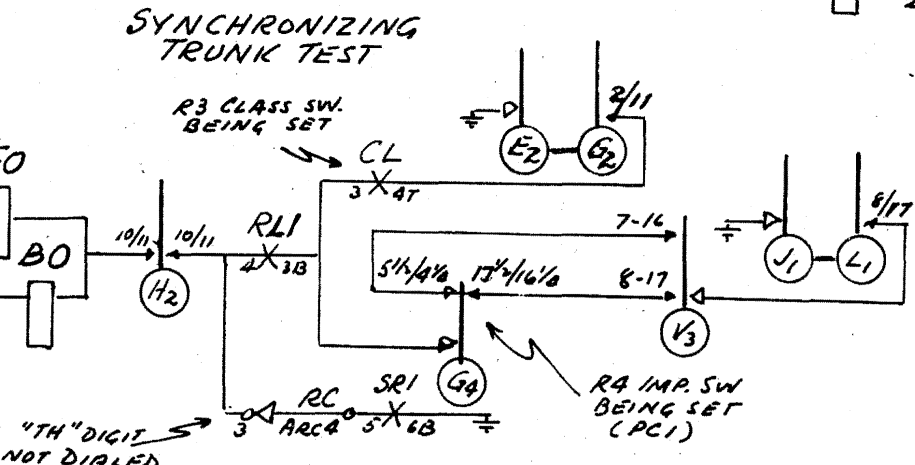
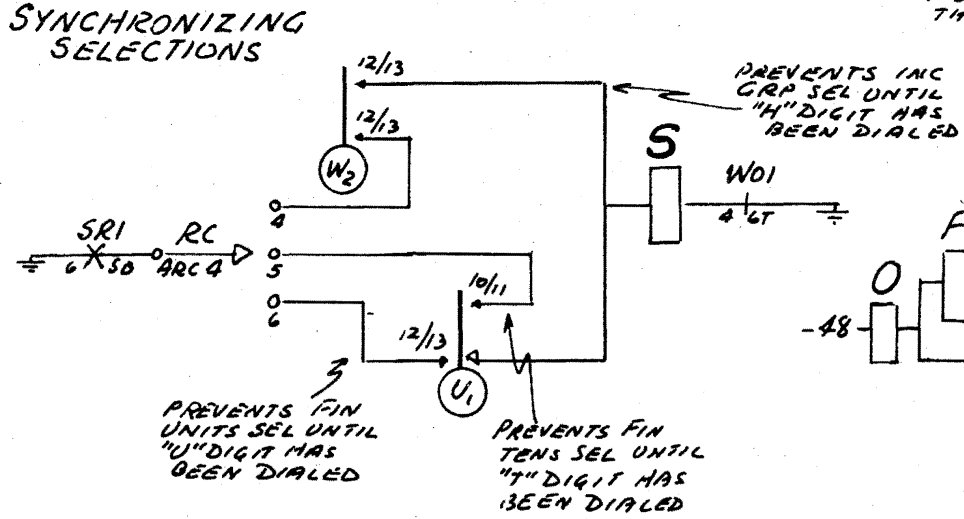
ES-20012-02 1/8, 100 SUBSCRIBER'S SENDER NON-ZONE	
COIN OR NON-COIN	
SENDER RELEASE	
PANEL GCO	SEL. TYPE WAN LINK & DECODER
OS-133.1	

SEQUENCE CHART



RELAY OPERATION GOVERNING STATION DELAY

UNDER 10,000 WITH STA	SD1
" " NO STA	SD - SD1
OVER " WITH STA	NONE
" " NO STA	SD

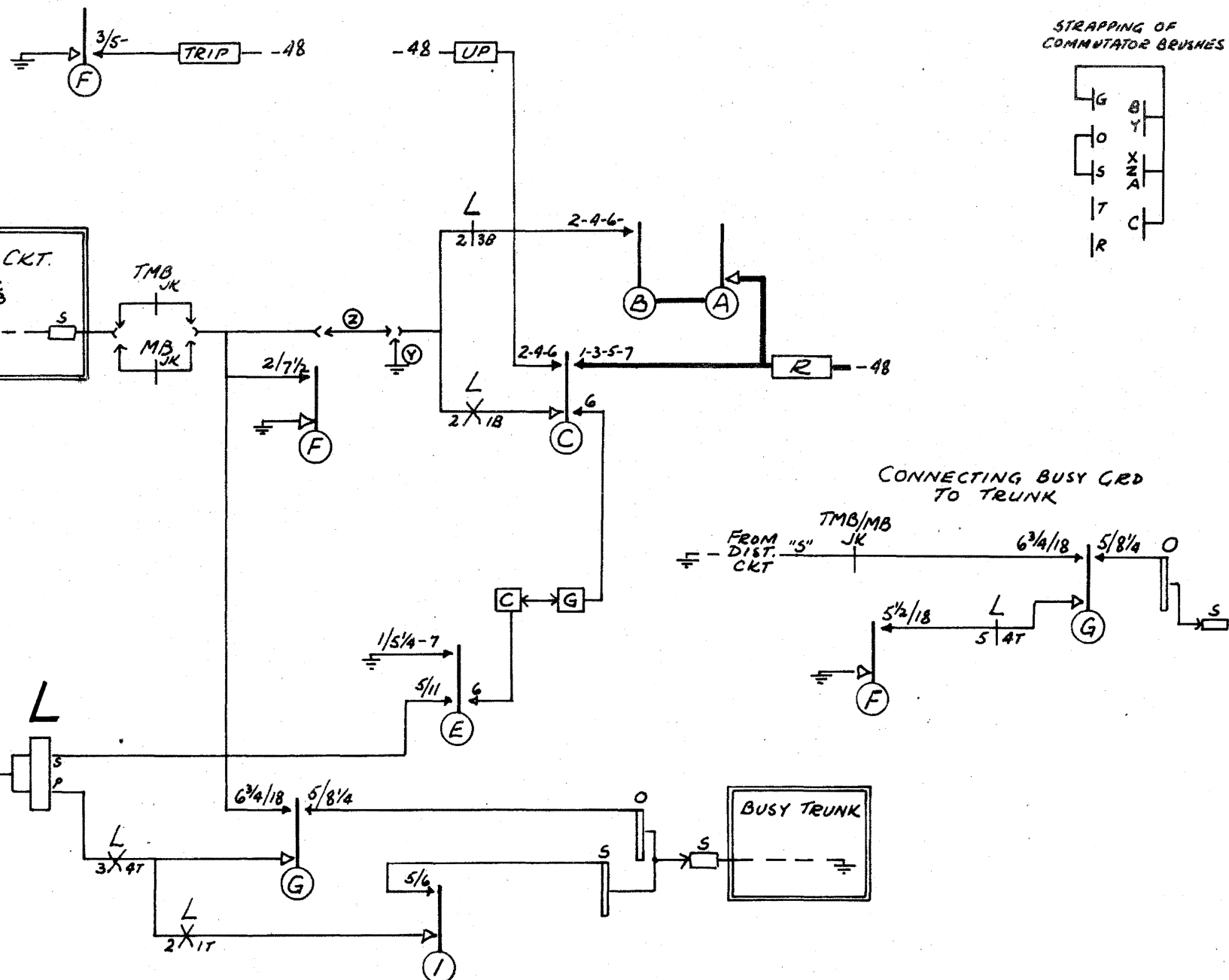
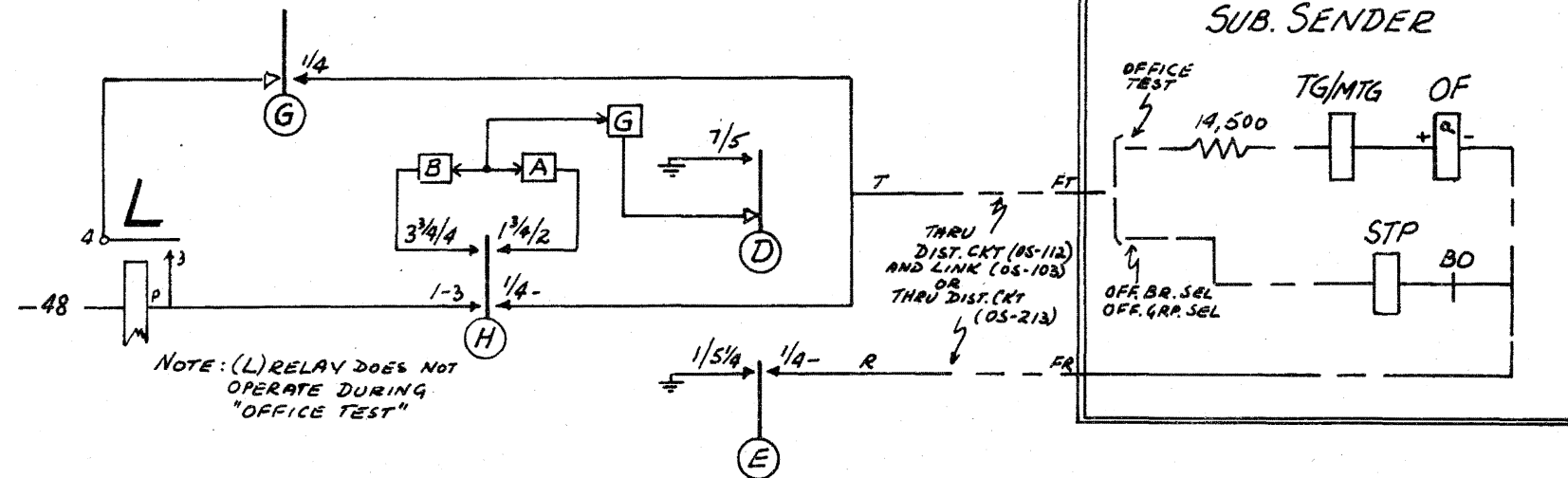


ES-20012-02 1SS, 100 SUBSCRIBER'S SENDER NON-ZONE NON-COIN

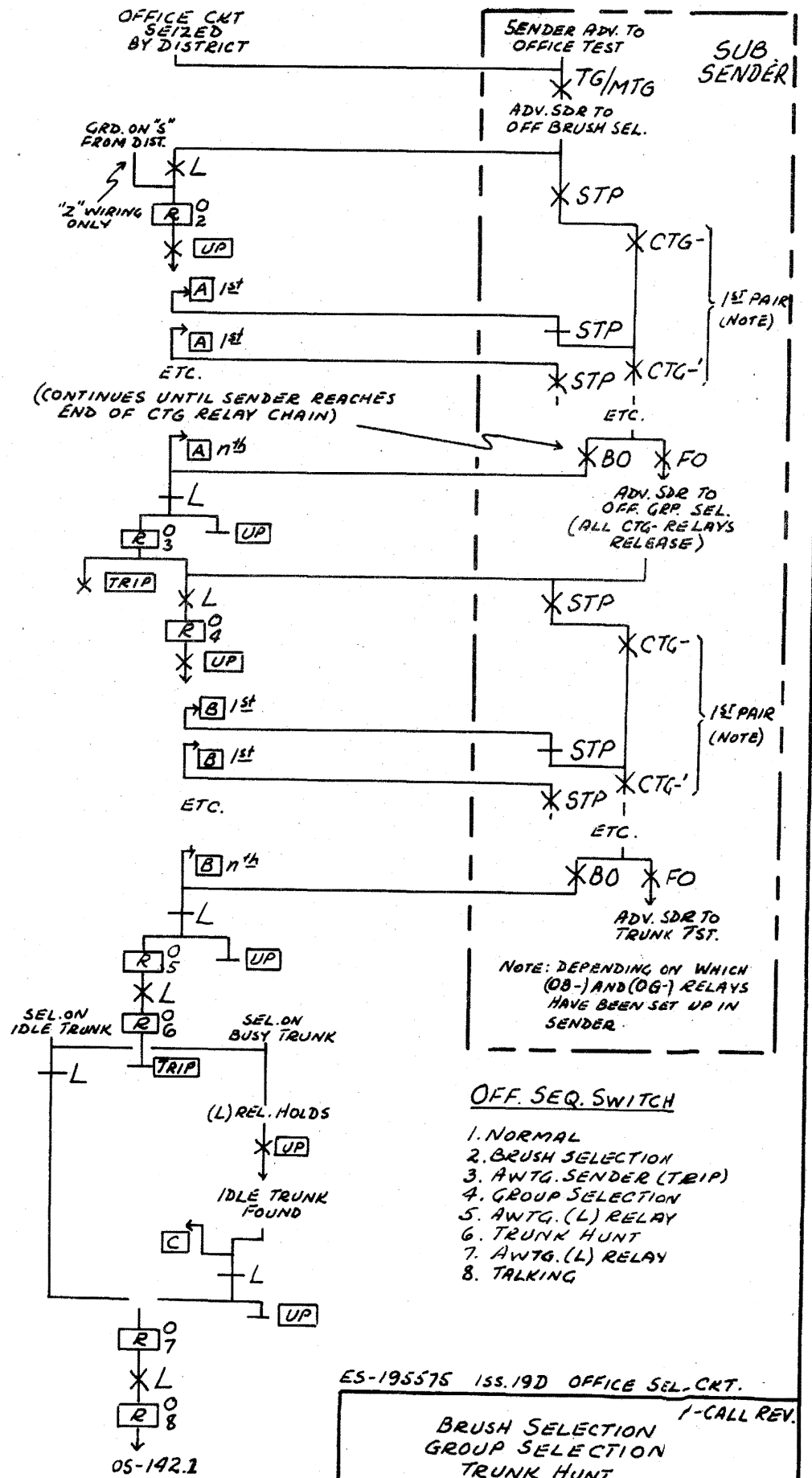
"M\" REGISTER FUNCTION SYNCHRONIZATION

PANEL GCO SEL. TYPE WITH LINK & DECODER 05-135.1

OFFICE SEL. CKT

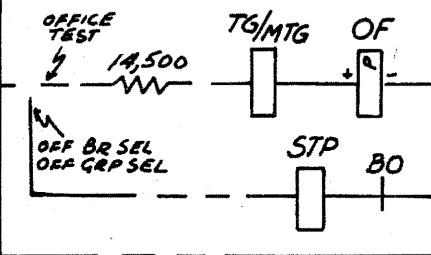


SEQUENCE CHART



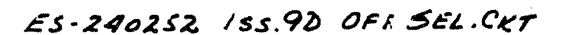
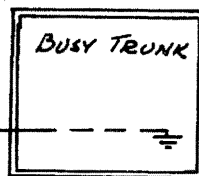
SEQUENCE CHART

SUB. |
GENDER |



- LF-DIST SEL
CKT
- 
- 05-112
05-213

WHEN STOPPED ON
OVERFLOW TERMINAL
"O" COMMUTATOR IS
OPEN AND NO BUSY
GRD WILL BE CONNECTED
TO "S" TERM.

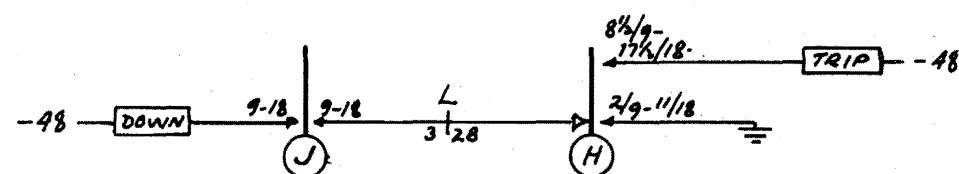
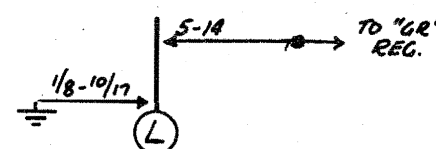
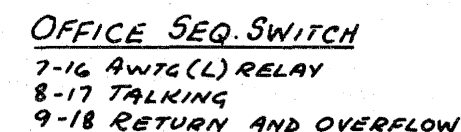
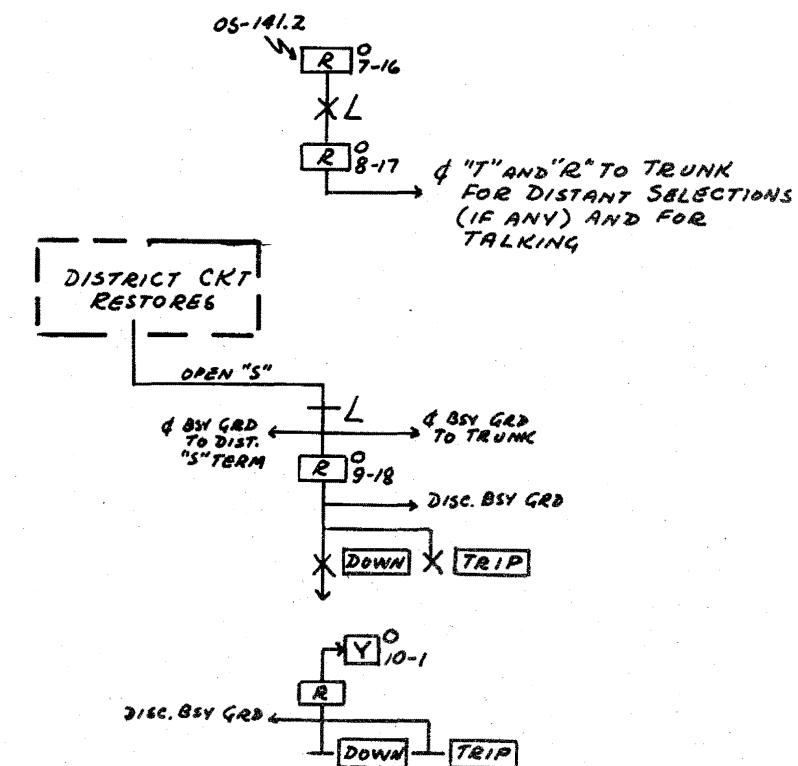


2-CALLS
PER REV.
BRUSH AND GROUP SELECTION
TRUNK HUNT

PANEL GCO

OS-141.2

SEQUENCE CHART



ES-240252 1ss. 9D OFF. SEL. CKT

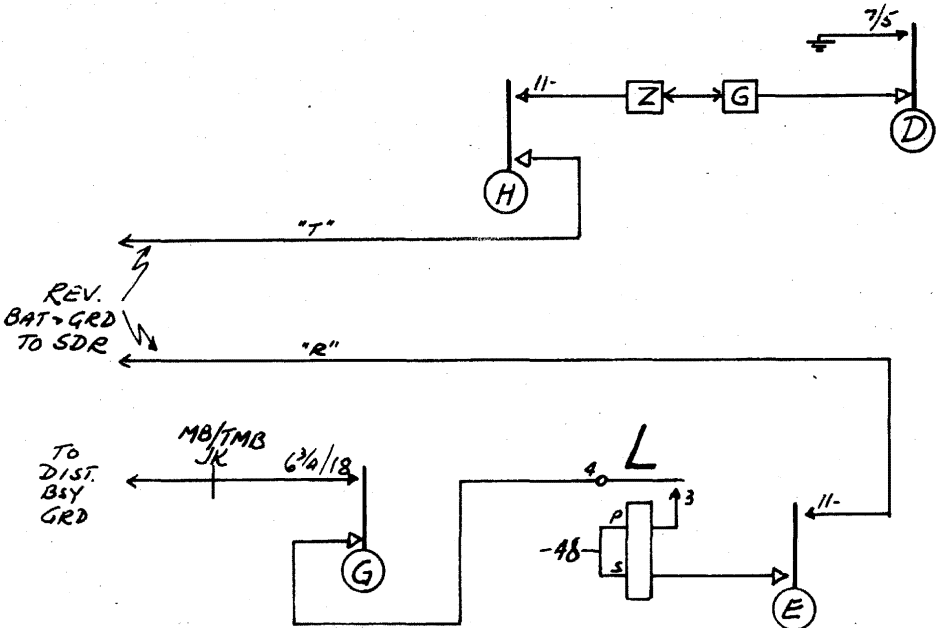
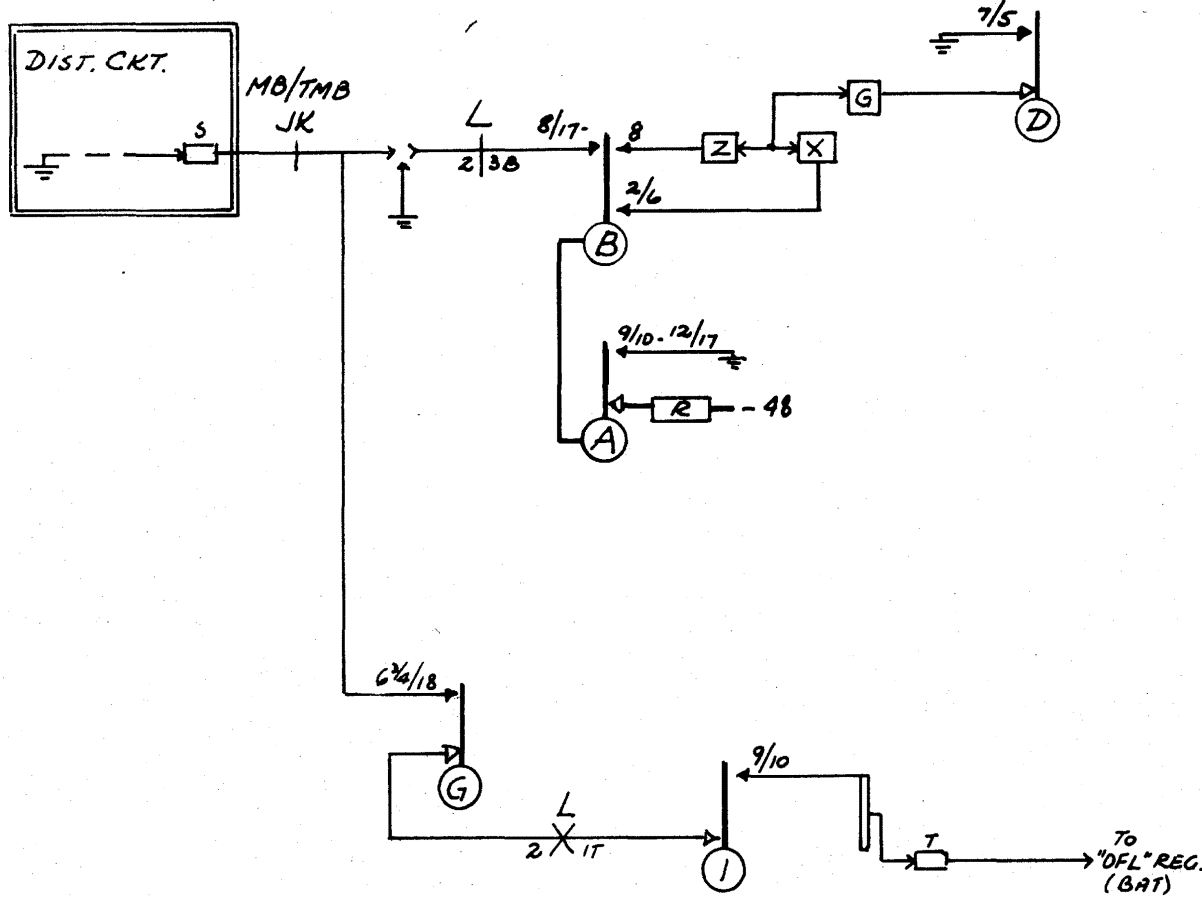
2 CALLS
PER REV.

TALKING
RELEASE

PANEL GCO

OS-142.2

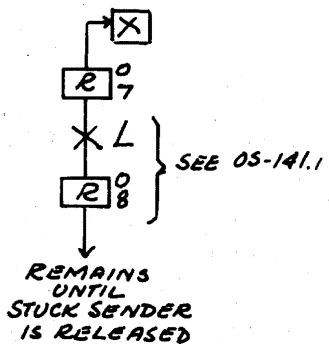
OFFICE SEL. CKT.



SEQUENCE CHART

TELL-TALE

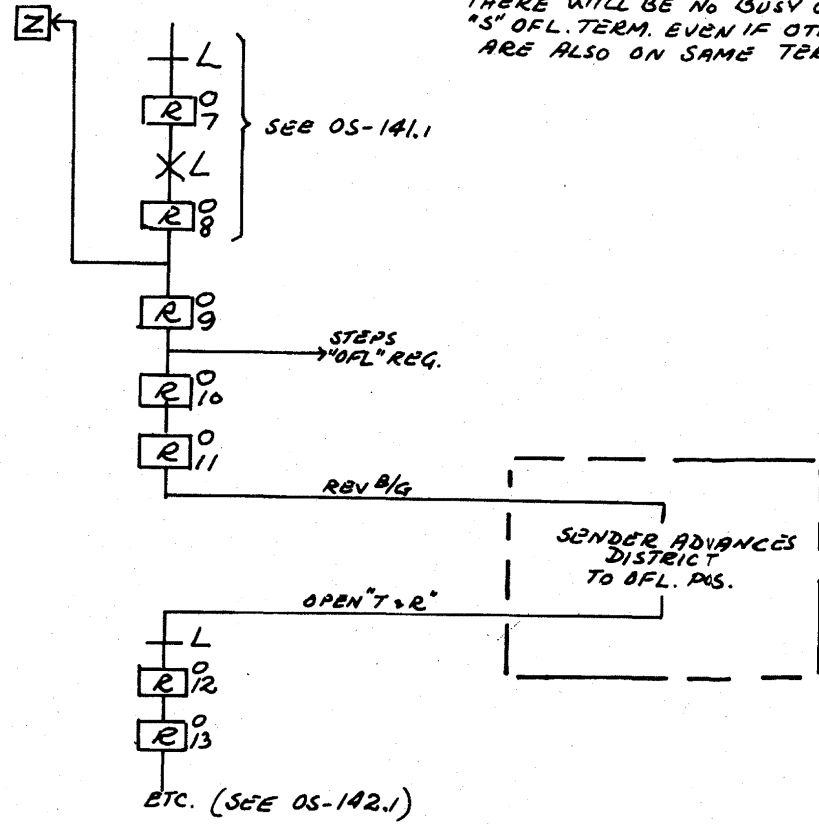
SELECTOR TRAVELS TO TOP OF BANK (TELL-TALE)



OVERFLOW

OFFICE SELECTOR HUNTS TRUNK FINDS ALL TRUNKS BUSY (STOPS ON "OFL" TERM, WHICH TESTS IDLE)

NOTE: SINCE "O" COMMUTATOR SEGMENT IS OPEN WHEN SEL. IS ON OFL. TERM, THERE WILL BE NO BUSY GRD. ON "S" OFL. TERM, EVEN IF OTHER SELS. ARE ALSO ON SAME TERM.



OFFICE SEQ. SWITCH

- 7. ANTQ. (L) RELAY
- 8. TALKING
- 9. PASS-BY
- 10. " "
- 11. OVERFLOW
- 12. PASS-BY
- 13. " "
- 14. " "
- 15. " "
- 16. " "
- 17. " "
- 18. RETURN

ES-195575 1ss.19D OFFICE SEL. CKT

MISC. FEATURES
(1) TELL-TALE
(2) OVERFLOW

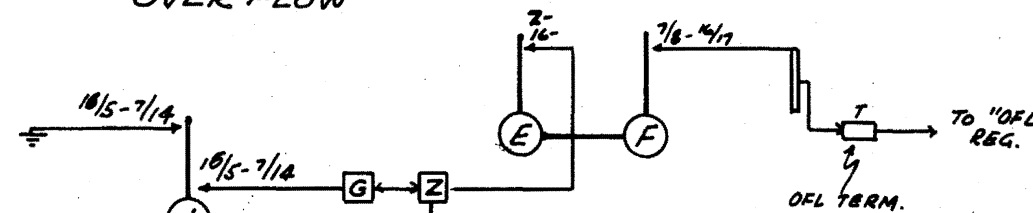
PANEL GCO

OS-143.1

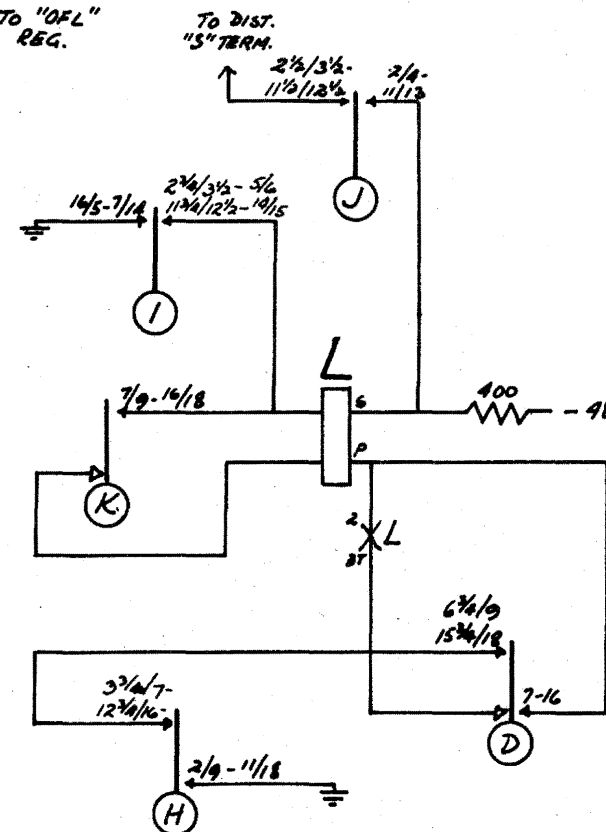
ILL. BELL TEL. CO. - PLANT SCHOOL

OFFICE SEL. CKT

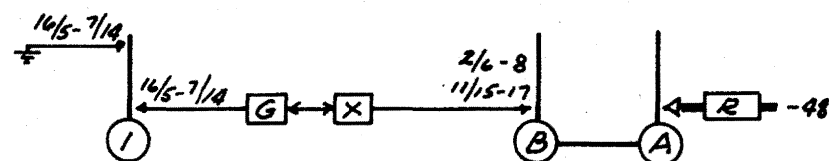
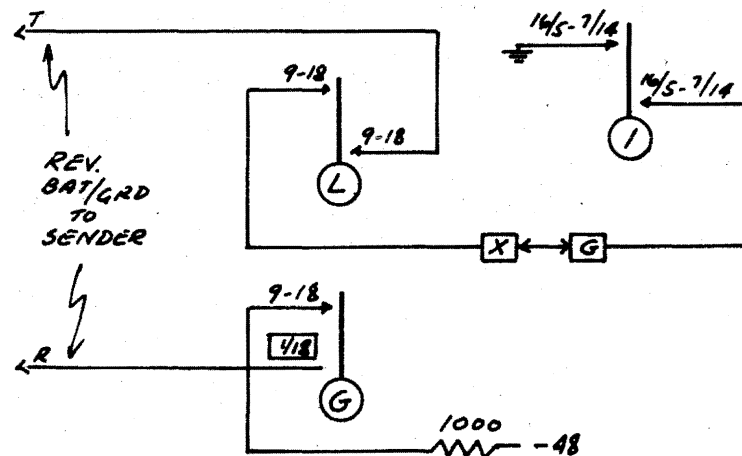
OVER FLOW



SELF-RESTORAL



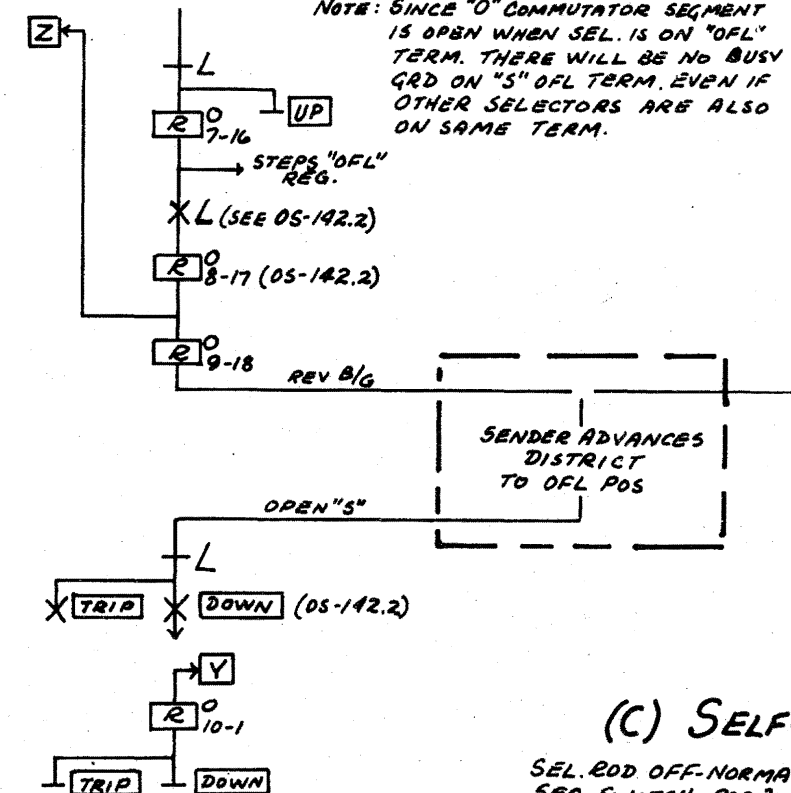
TELL-TALE



SEQUENCE CHART

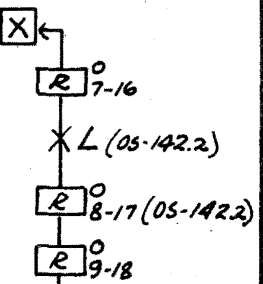
(A) OVERFLOW

OFFICE SELECTOR HUNTS TRUNK
FINDS ALL TRUNKS BUSY
(STOPS ON "OFL" TERM. WHICH
TESTS IDLE)



(B) TELL-TALE

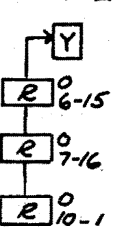
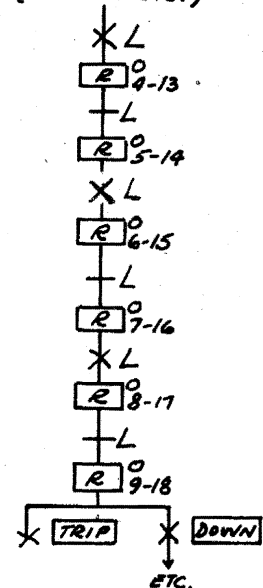
SELECTOR TRAVELS
TO TOP OF BANK
(TELL-TALE)



(C) SELF-RESTORAL

SEL. ROD OFF-NORMAL.
SEQ. SWITCH POS 3
(NO DISTRICT)

SEL. ROD NORMAL.
SWITCH MOVED
OFF-NORMAL



OFFICE SEQ. SWITCH

- 1-10 NORMAL
- 2-11 BRUSH SELECTION
- 3-12 AWTG. SENDER
- 4-13 GROUP SELECTION
- 5-14 AWTG (L) RELAY
- 6-15 TRUNK HUNT
- 7-16 AWTG (L) RELAY
- 8-17 TALKING
- 9-18 OVERFLOW - RETURN

ES-240252 1ss. 9D OFF.SEL. CKT

MISC. FEATURES:

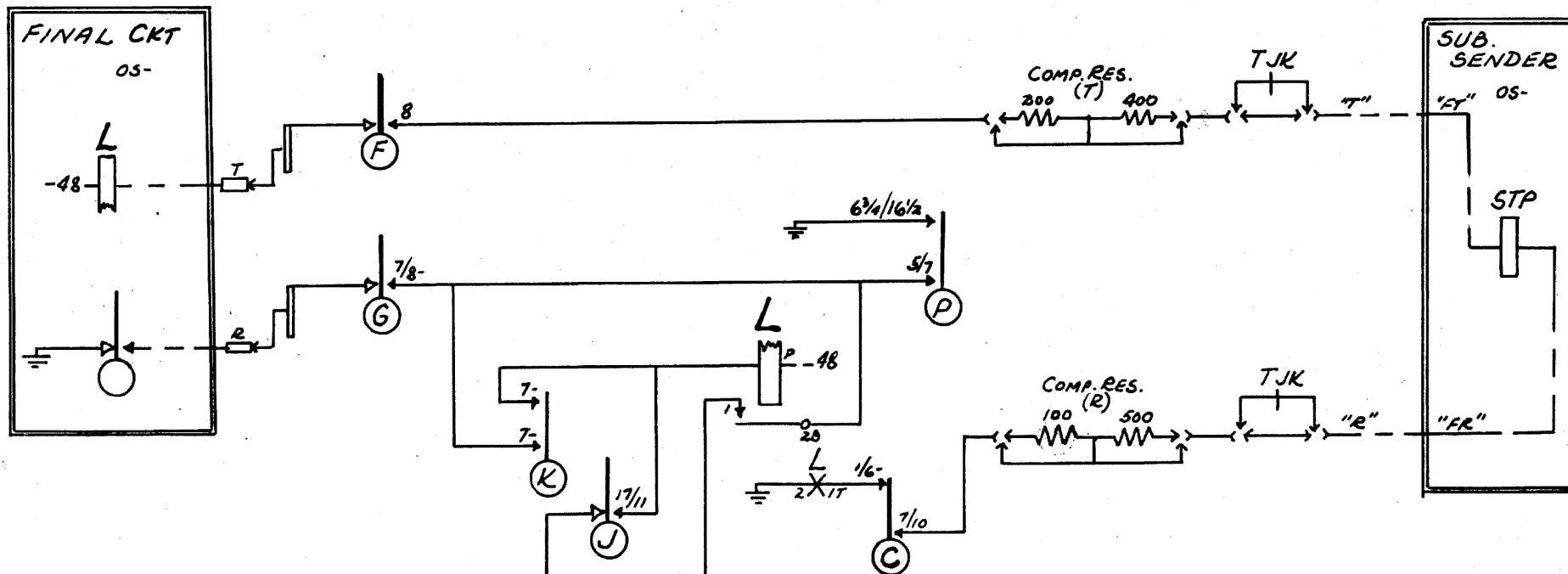
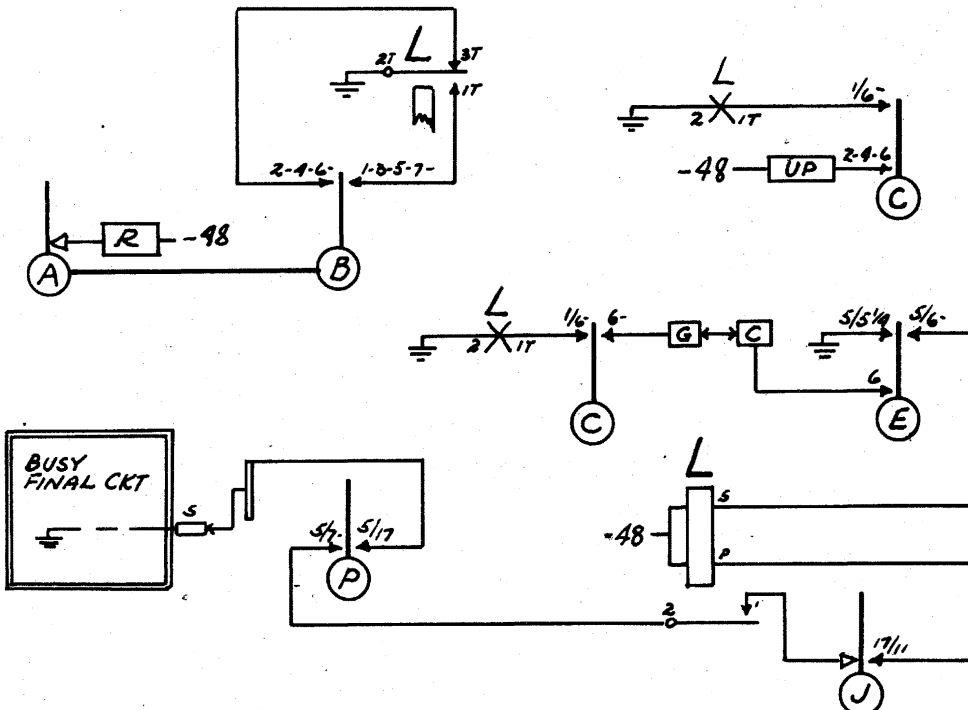
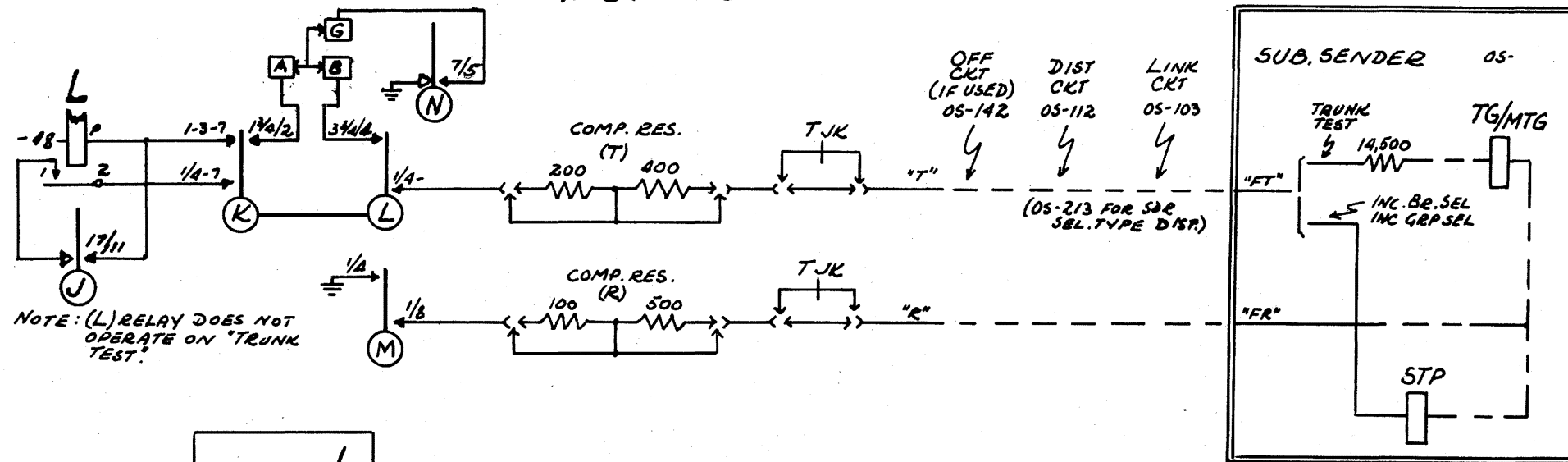
- (A) OVERFLOW
- (B) TELL-TALE
- (C) SELF-RESTORAL (POS 3)

2 CALLS
PER REV.

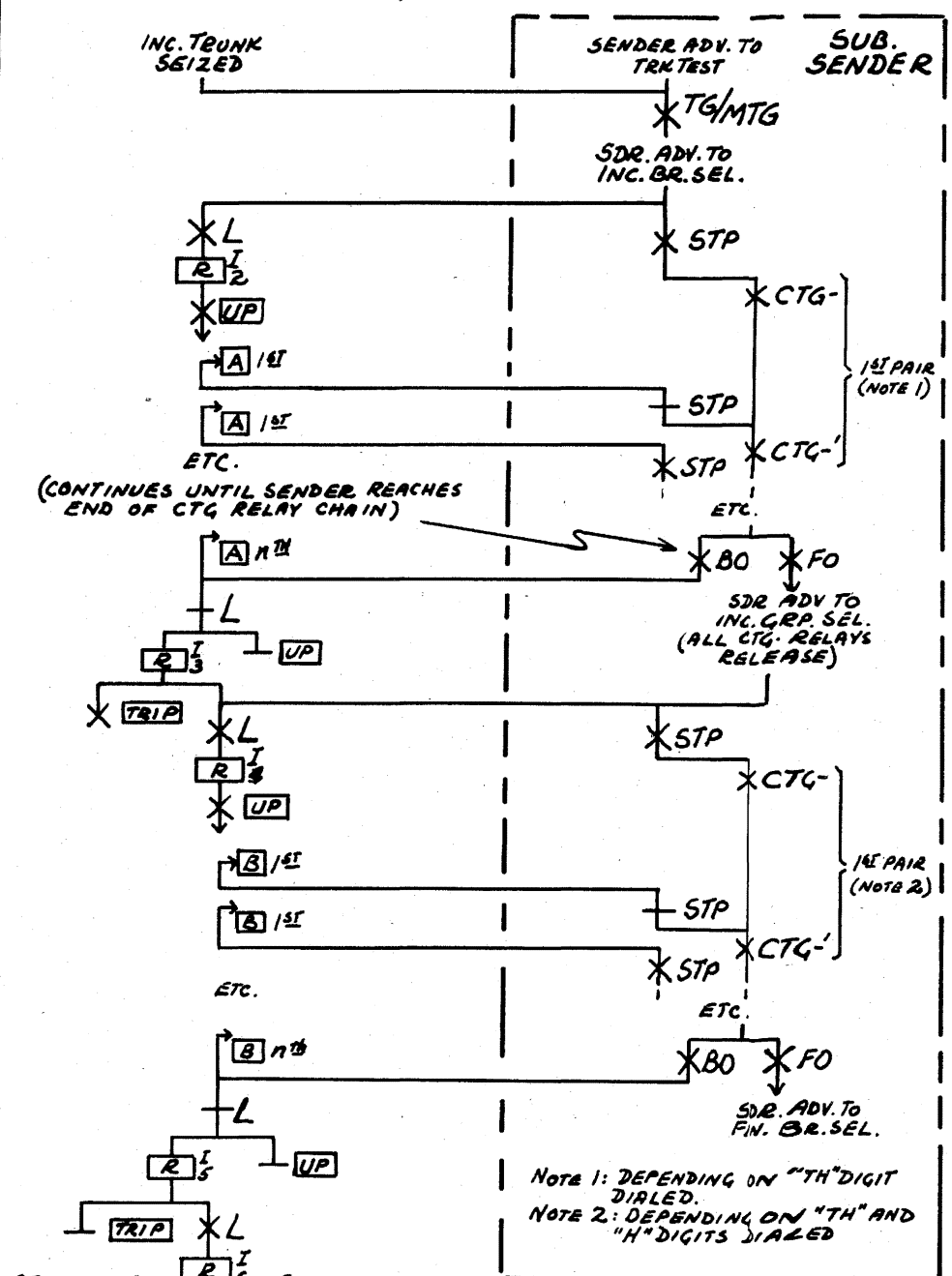
PANEL GCO

OS-143.2

INC. SEL. CKT



SEQUENCE CHART



INC. SEQ. SWITCH

1. NORMAL
2. INC. BRUSH SELECTION
3. AWTC. SENDER (TRIP)
4. INC. GRP. SELECTION
5. AWTC. (L) RELAY
6. TRUNK HUNTING
7. AWTC. (L) RELAY
8. SELECTION BEYOND

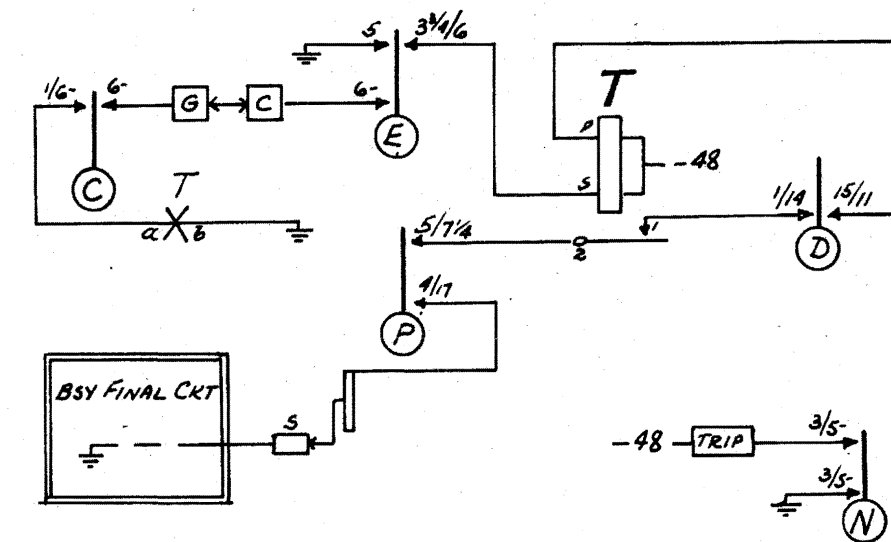
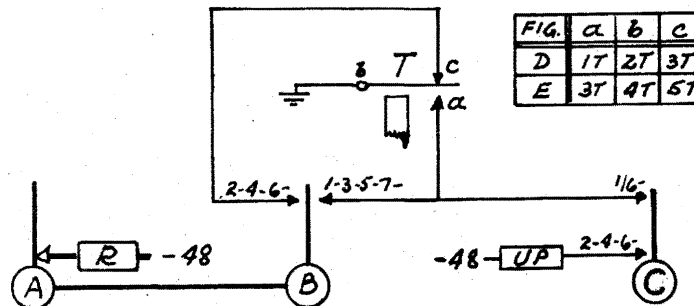
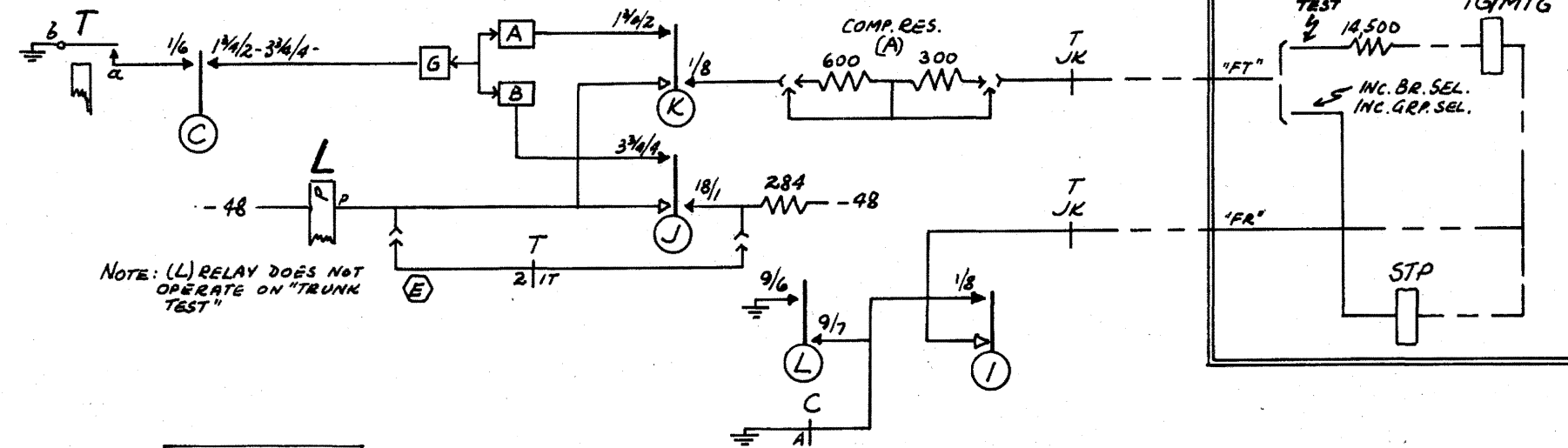
ES-21036-011 165.19D INC SEL CKT

TRUNK TEST FM
BRUSH AND GROUP SELECTION
TRUNK HUNT - SELECTION BEYOND

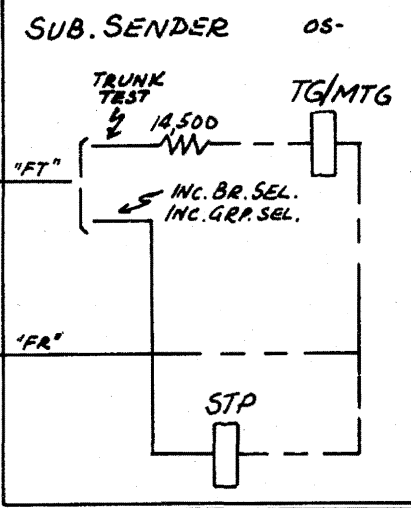
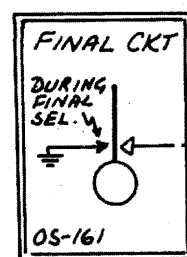
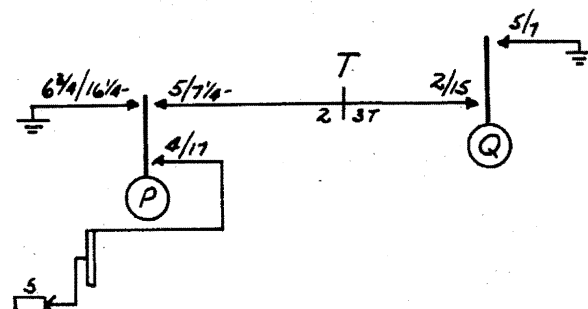
PANEL GCO

OS 15.1

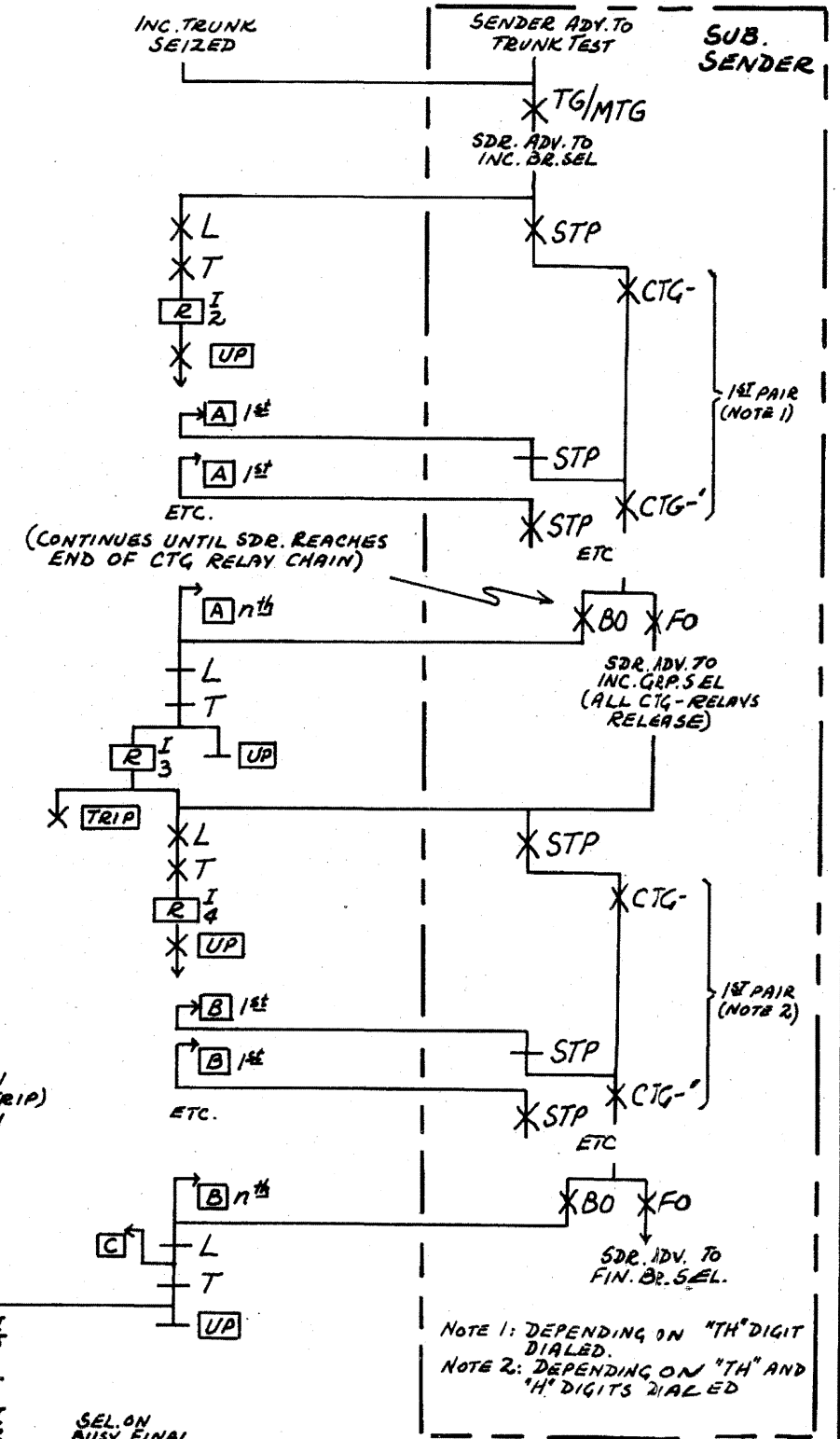
INC. SEL. CKT



CONNECTING BSY GRD TO FINAL:



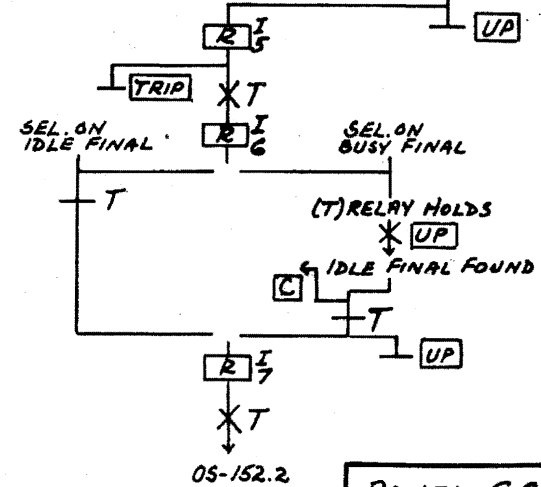
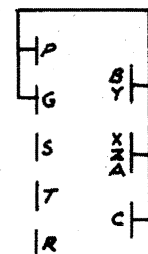
SEQUENCE CHART



INC. SEQ. SWITCH

1. NORMAL
2. BRUSH SELECTION
3. AWTG. SENDER (TRIP)
4. GROUP SELECTION
5. AWTG. (T) RELAY
6. TRUNK HUNT
7. AWTG. (T) RELAY

STRAPPING OF COMMUTATOR BRUSHES



ES-20292-011 ISS. 22D INC. SEL. CKT

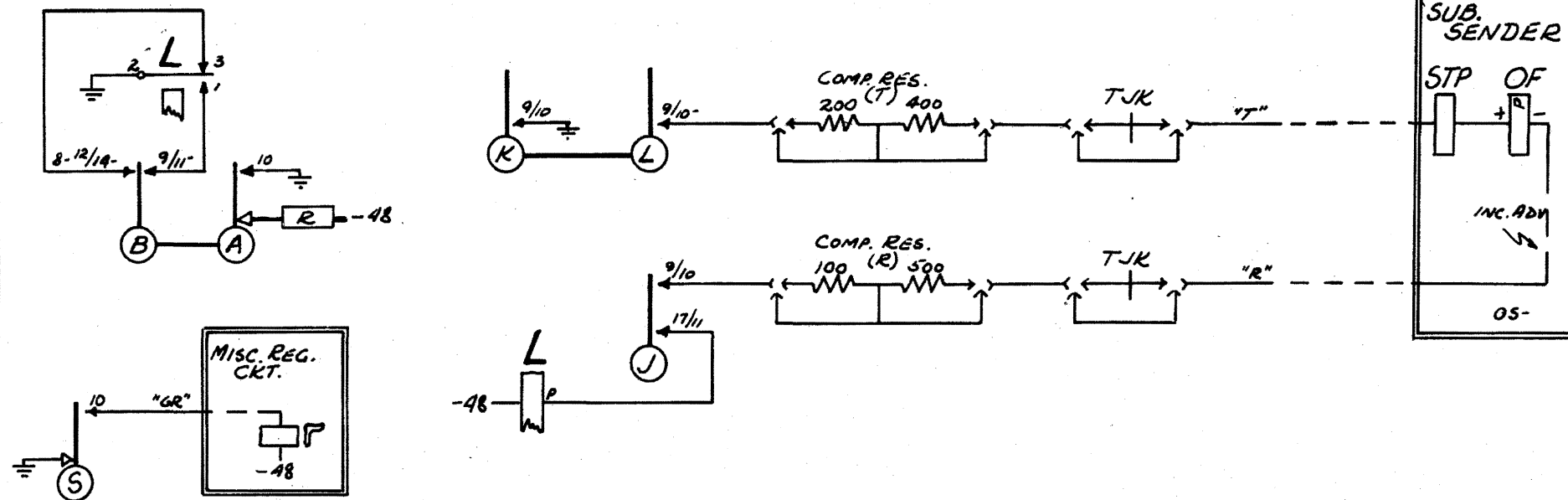
TRUNK TEST
BRUSH AND GROUP SELECTION
TRUNK HUNT

PANEL GCO

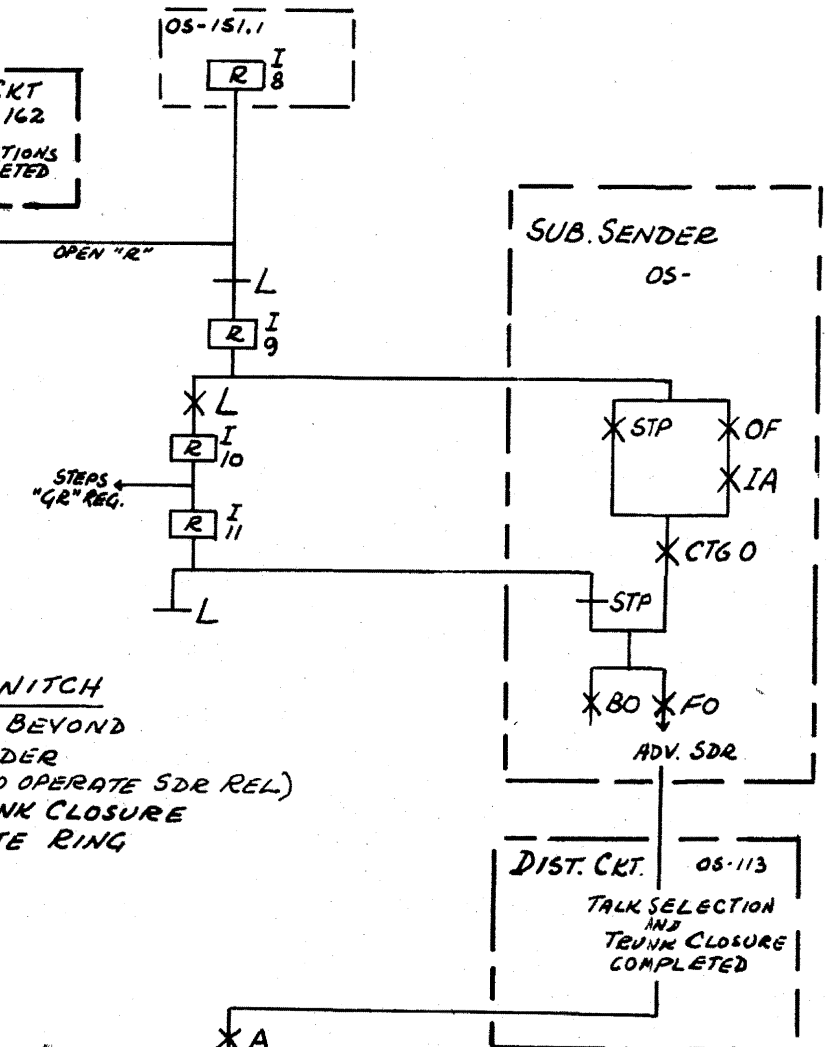
OS-1512

INC. SEL. CKT.

SEQUENCE CHART

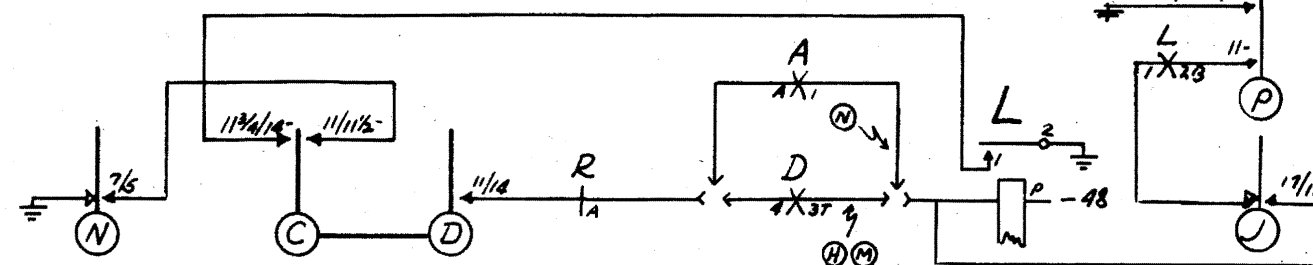
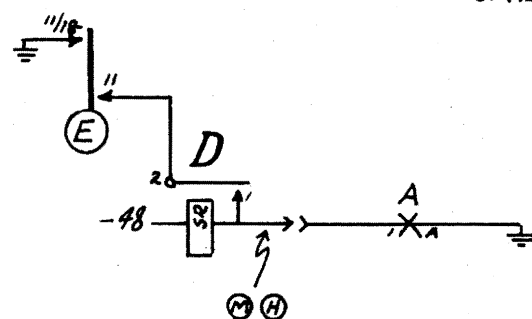
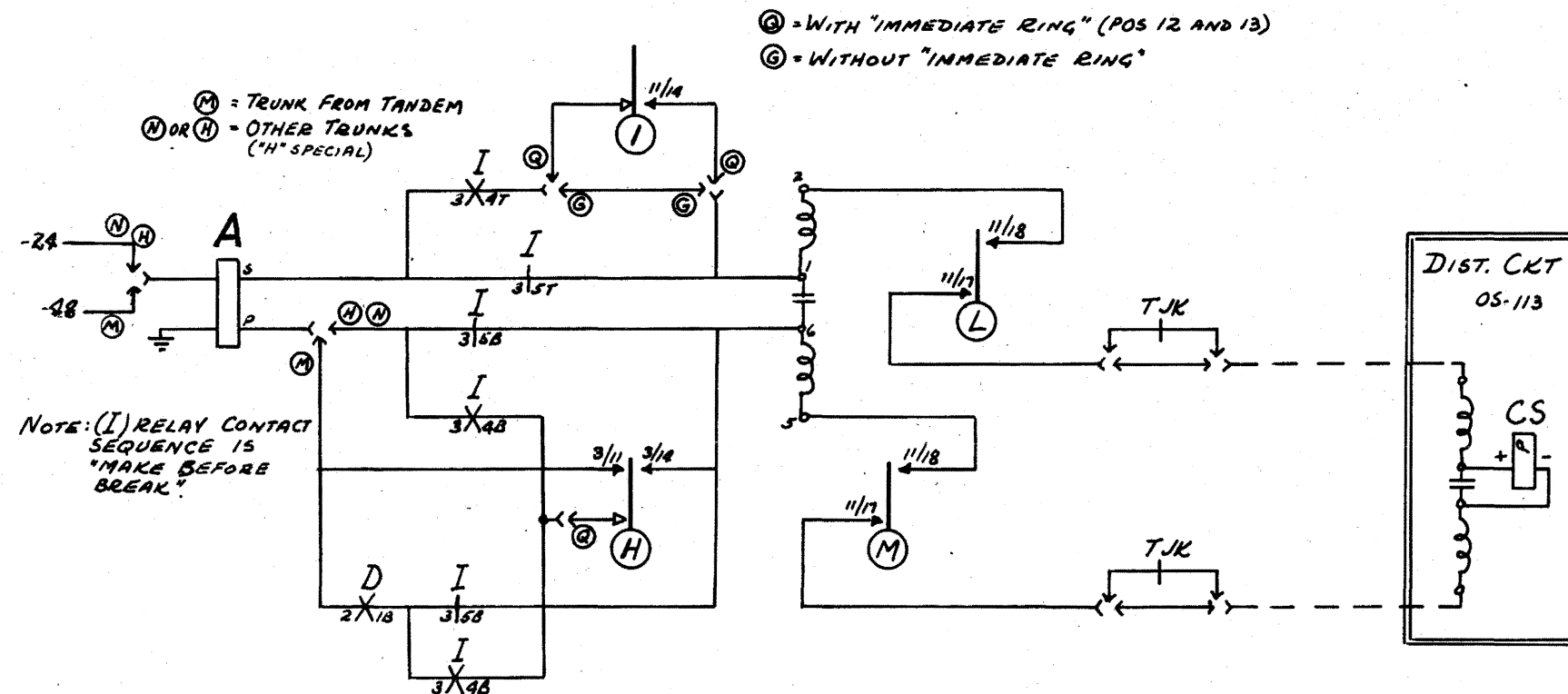


FINAL CKT
OS-162
SELECTIONS
COMPLETED



INC. SEQ. SWITCH

8. SELECTION BEYOND
9. AWTG. SENDER
10. PASS BY (TO OPERATE SDR REL.)
11. AWTG. TRUNK CLOSURE
12. IMMEDIATE RING



ES-21036-011 ISS. 19D INC. SEL. CKT

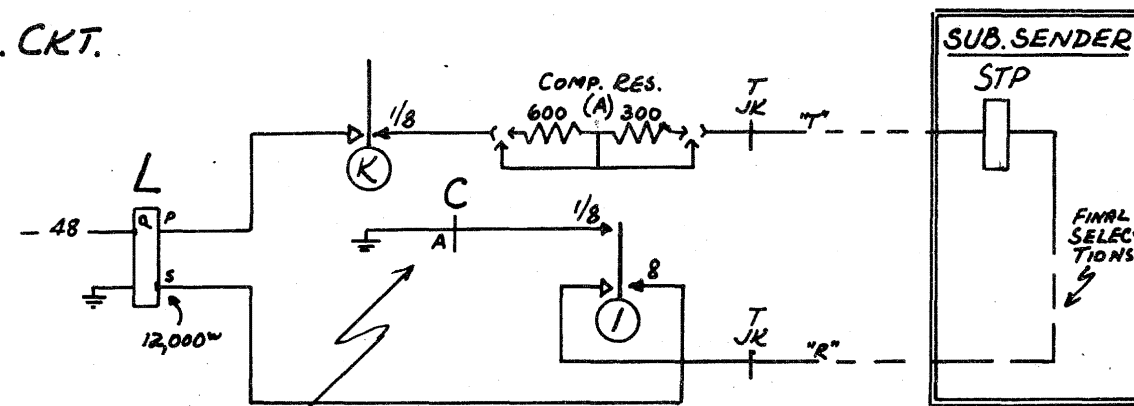
INCOMING ADVANCE
TRUNK CLOSURE

PANEL GCO

OS-152.1

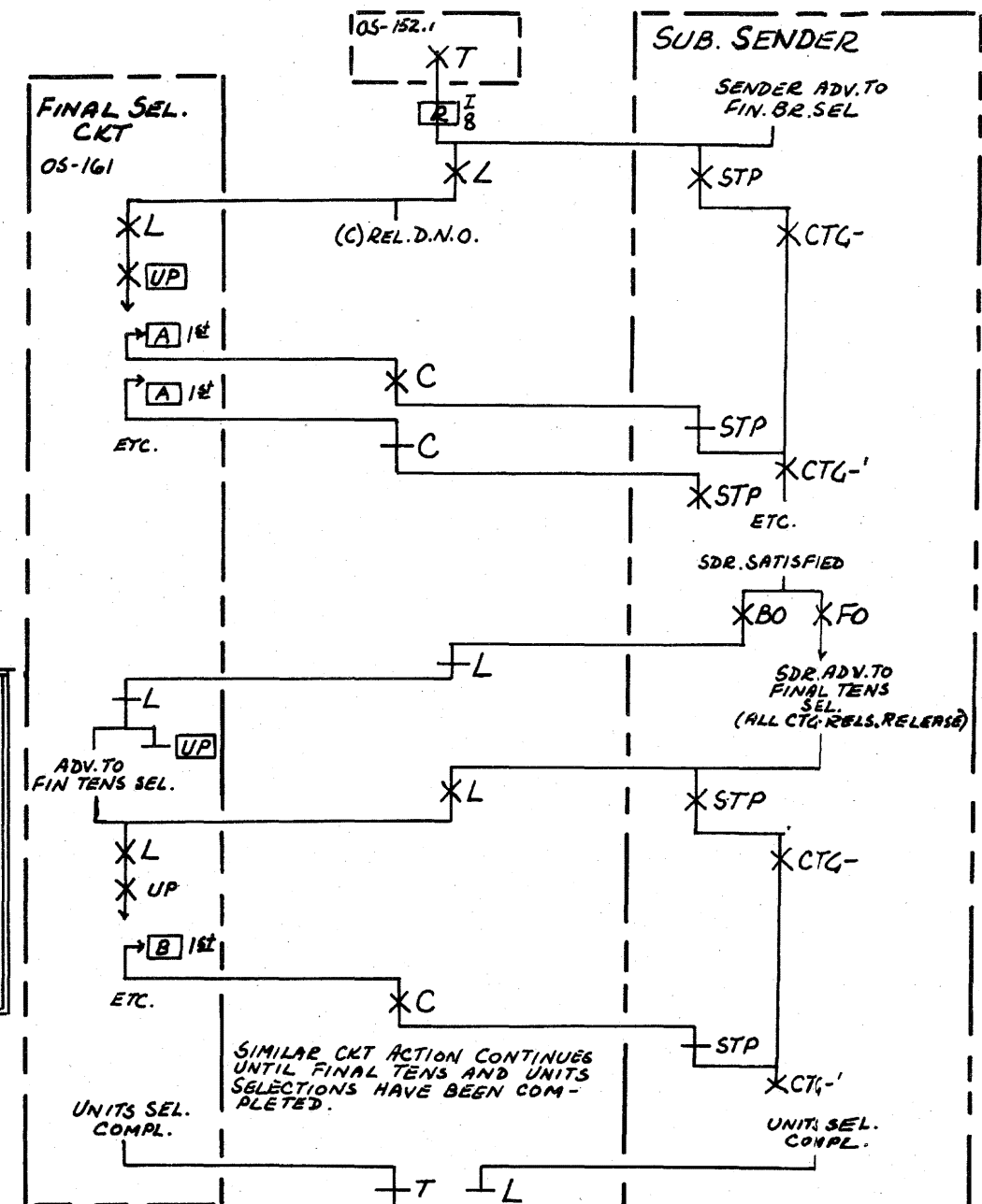
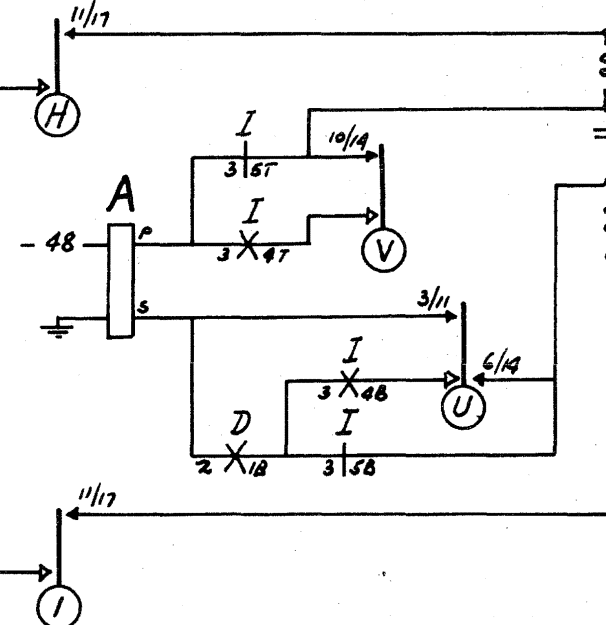
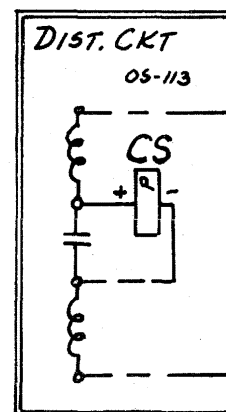
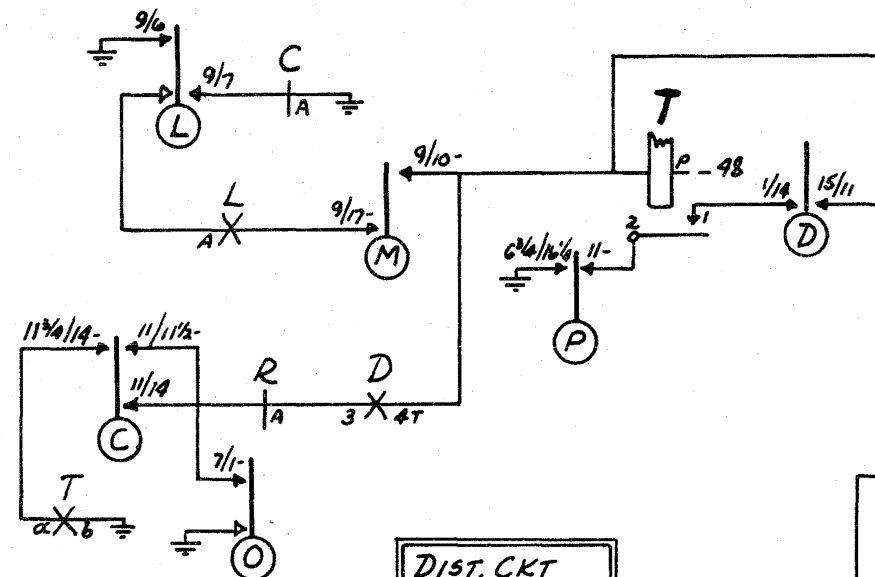
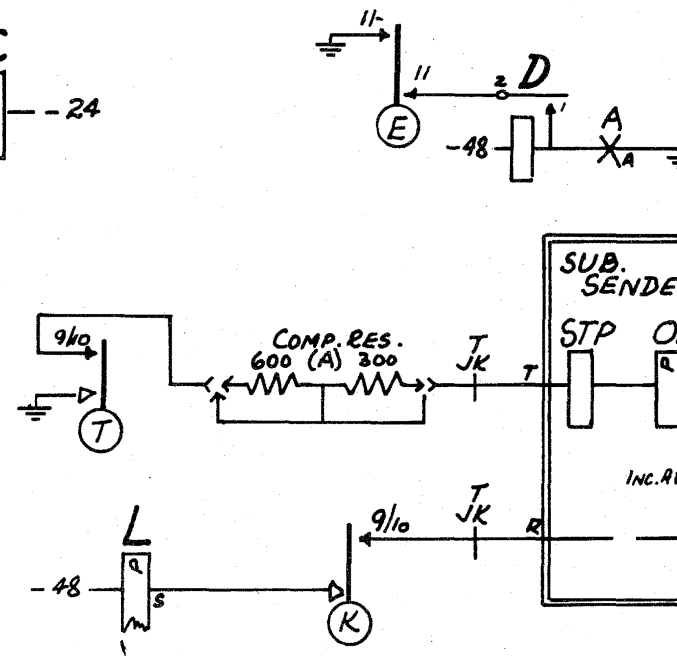
ILL. BELL TEL. CO. - PLANT SCHOOL

SEQUENCE CHART

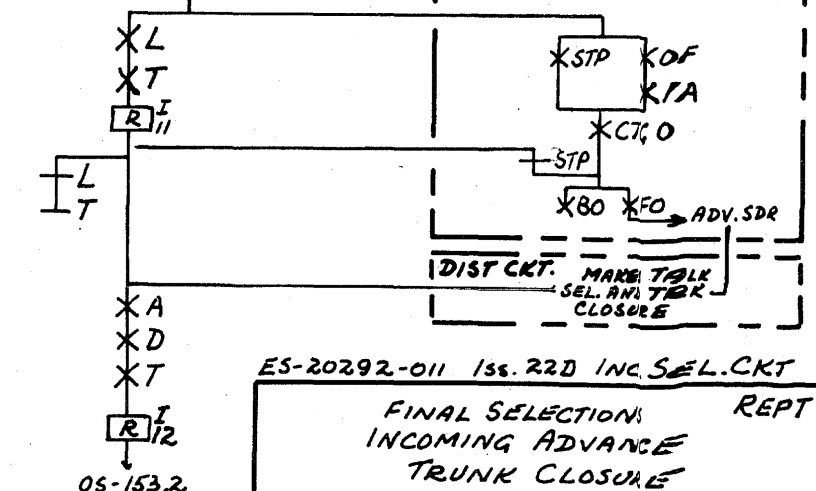


FINAL CRT 05-161

The diagram is a hand-drawn schematic of a vacuum tube circuit. It features three vacuum tubes: a 6X4 rectifier, a 6AR5 pentode, and a 6AV6 beam power tube. The 6X4 is connected to a -48V B+ supply. The 6AR5 is connected to a 250V B+ supply. The 6AV6 is connected to a 250V B+ supply. The output is taken from the 6AV6 anode through a 10K resistor to a 600Ω load.



8. SELECTION BEYOND
9. AWTG. SENDER
10. PASS-BY
11. AWTG. TRUNK CLOSURE
12. IMMEDIATE RING



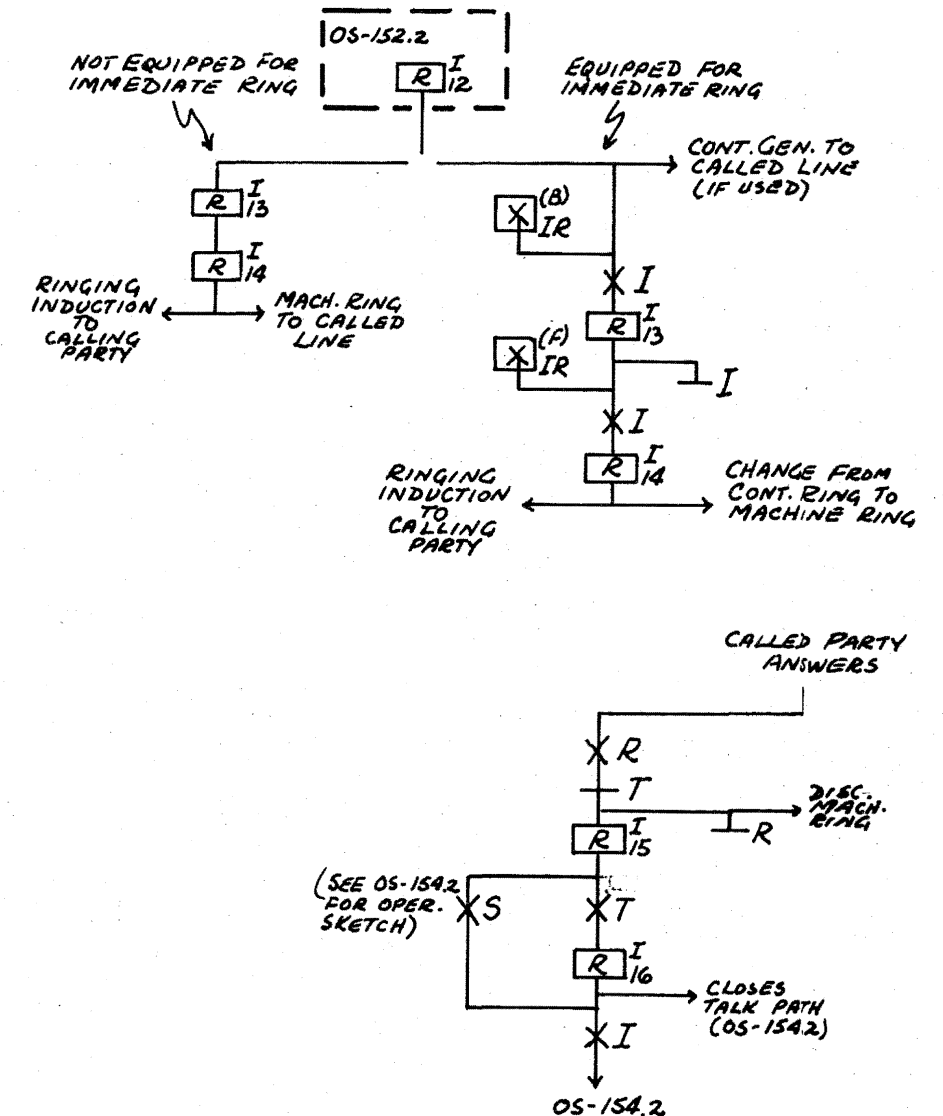
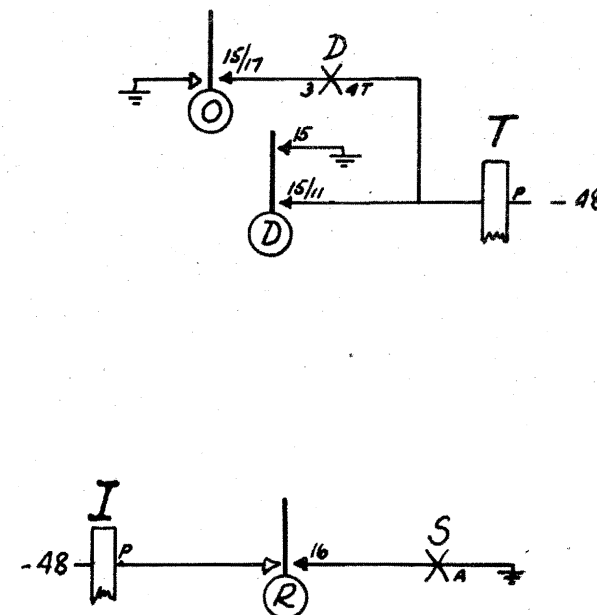
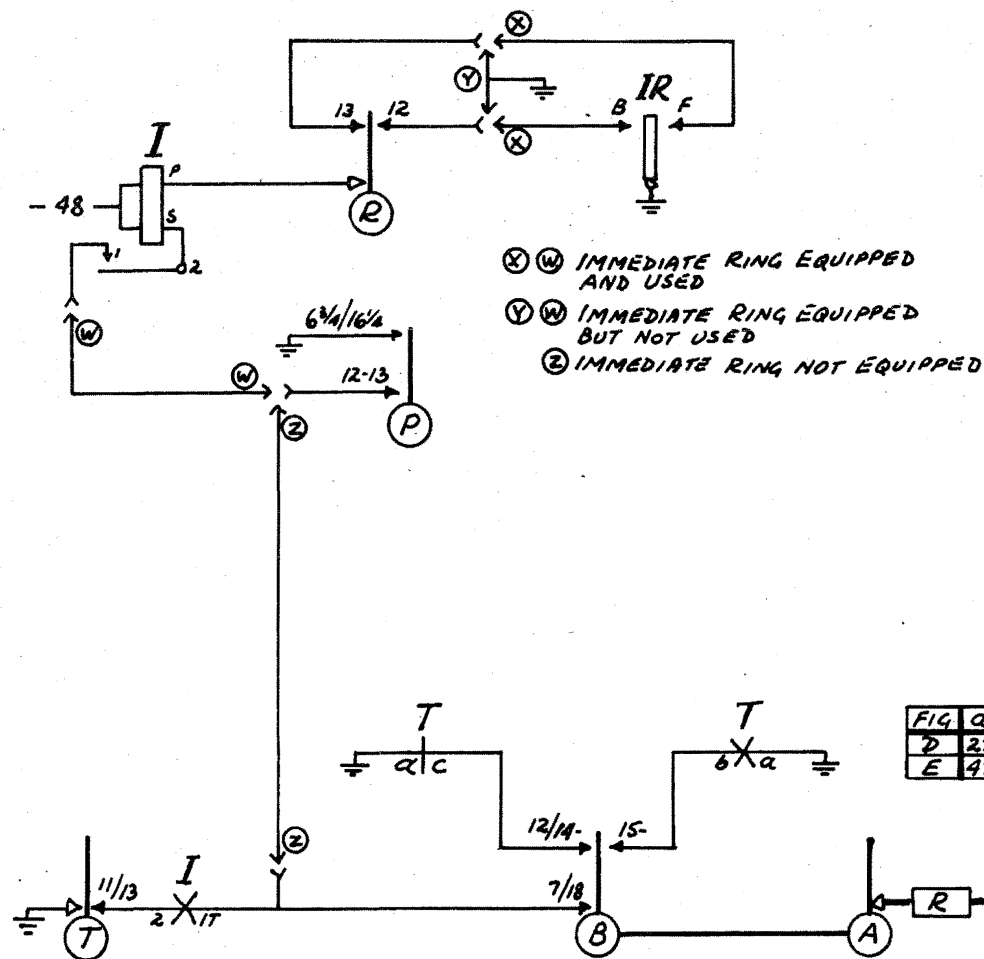
ES-20292-011 1ss. 22D INC SEL.CKT

FINAL SELECTIONS REPT
INCOMING ADVANCE
TRUNK CLOSURE

PANEL GCO

OS-152.2

ISSUE	1				
DATE	7-34				
BY	GHH				

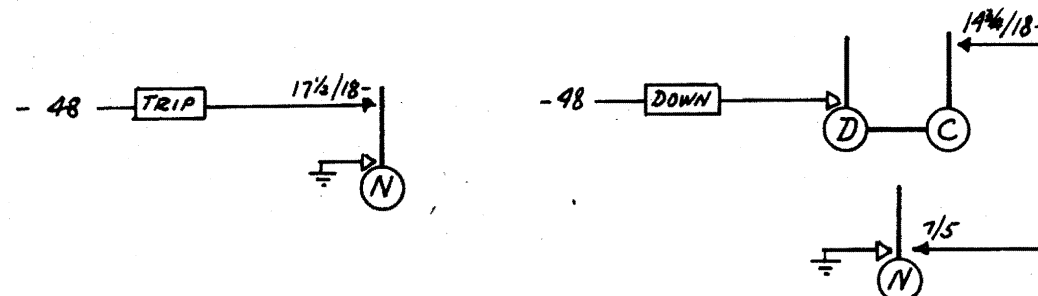
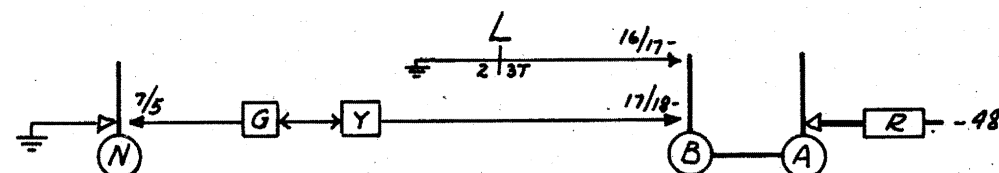
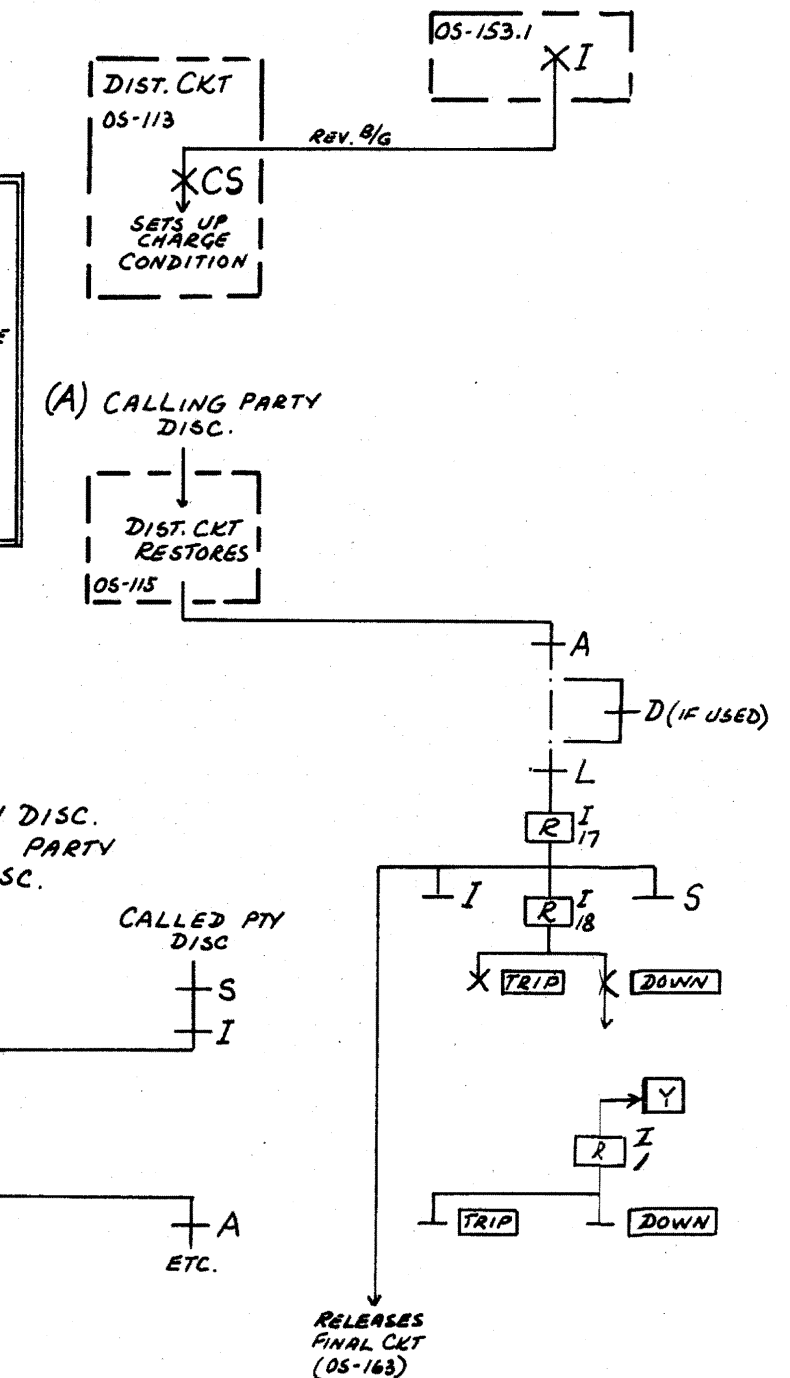
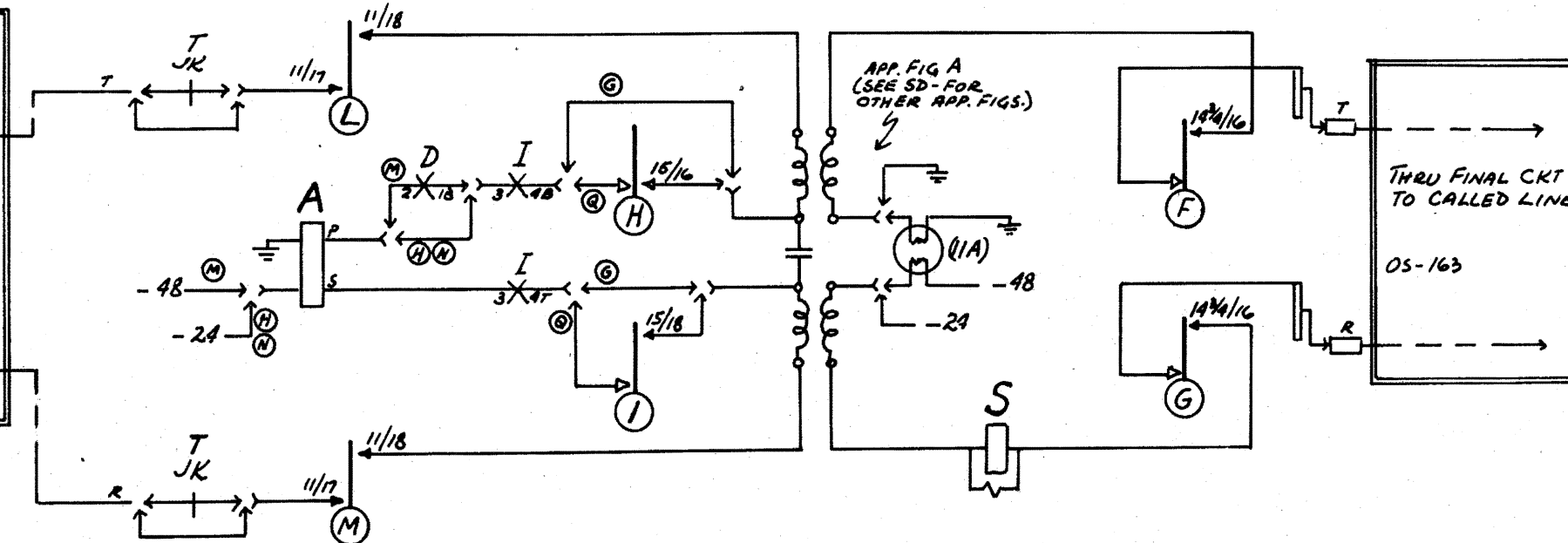


- 12. IMMEDIATE RING
(AWTG. INT. "B" CONTACT)
- 13. IMMEDIATE RING
(AWTG. INT. "F" CONTACT)
- 14. RINGING WITH INTERVALS
- 15. AWTG. (T) RELAY
- 16. TALKING

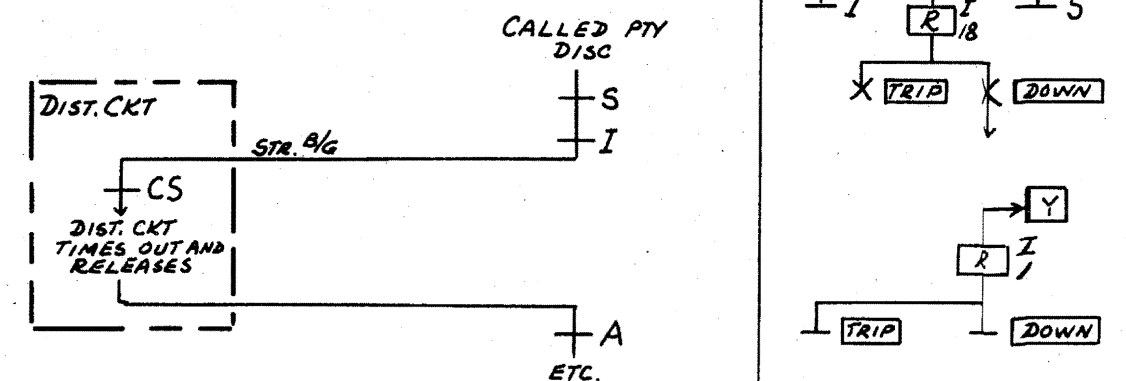
REPT
RINGING AND TRIPPING
ADVANCE TO TALK POSITION

OS-53.2

SEQUENCE CHART



(B) CALLED PARTY DISC.
BUT CALLING PARTY
FAILS TO DISC.



16. TALKING
17. PASS-BY
18. RETURN
1. NORMAL

ES-21036-011 1SS, 19D INC, SEL, CKT

TALKING
DISCONNECT

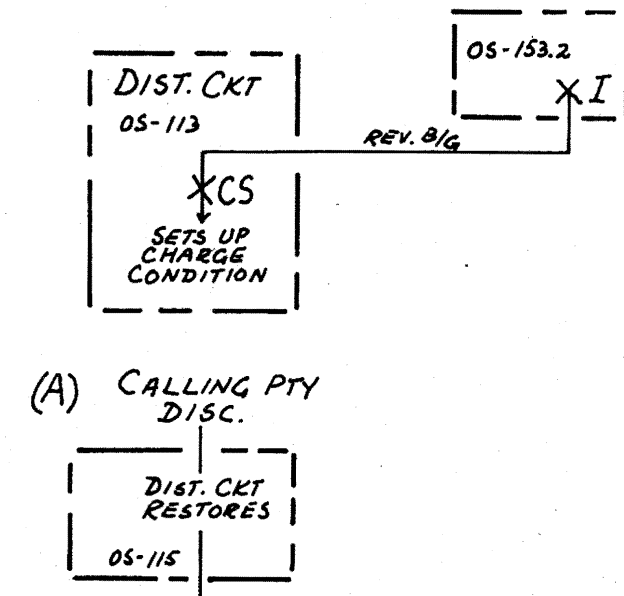
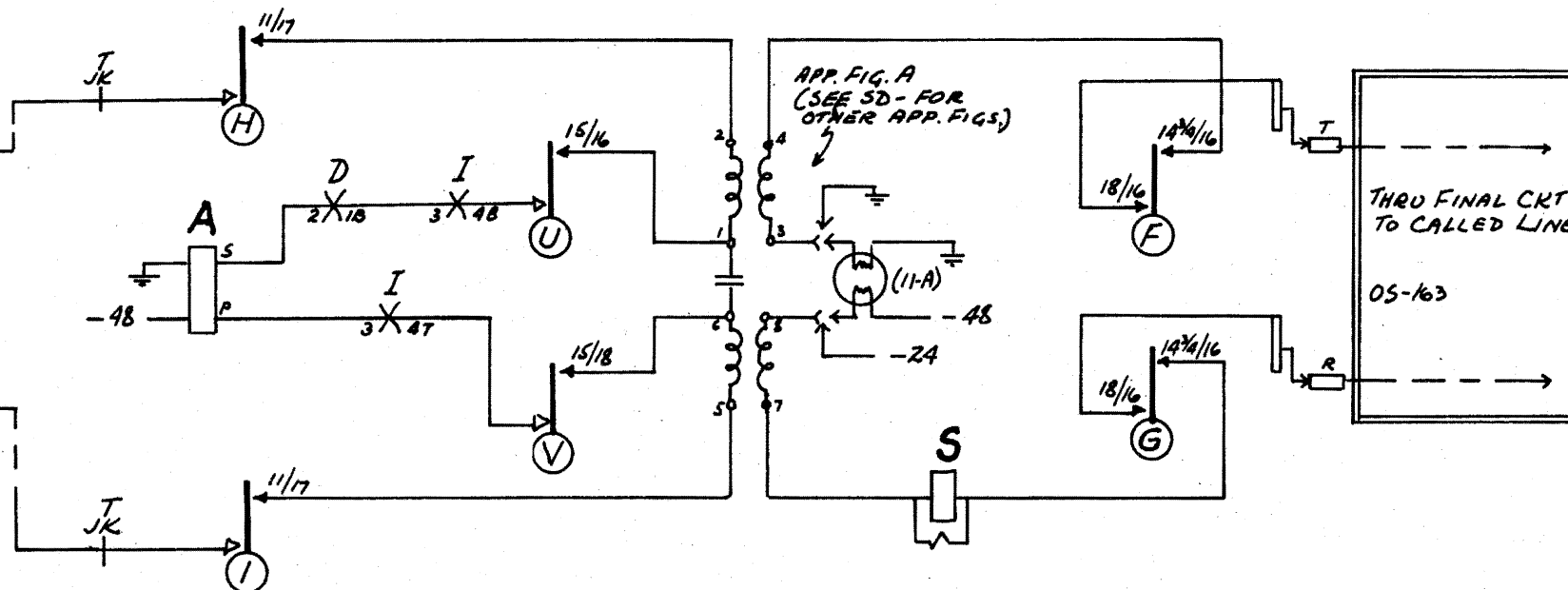
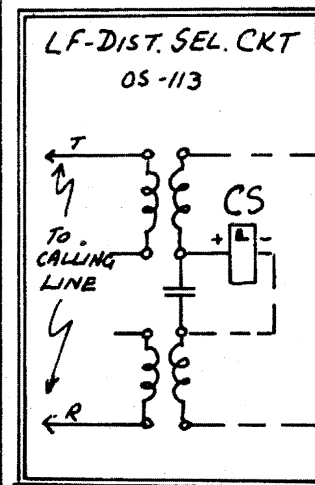
FM

PANEL GCO

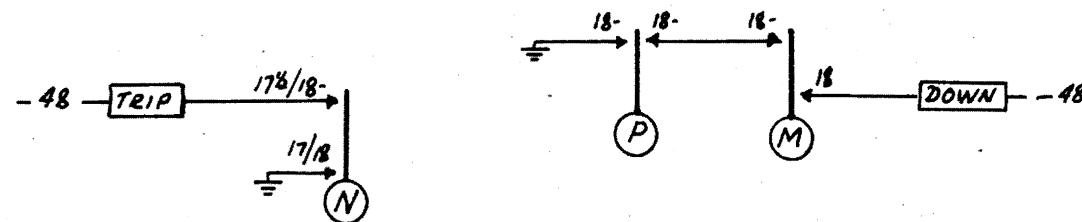
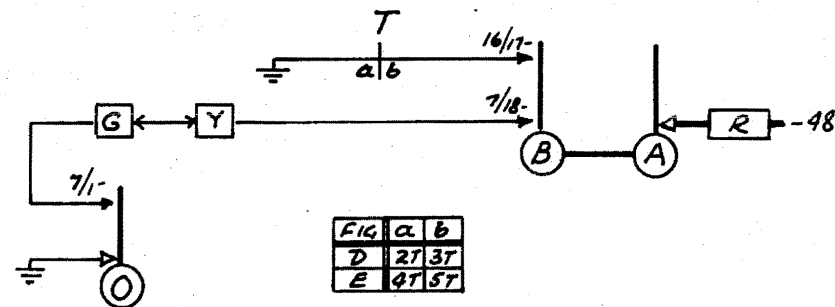
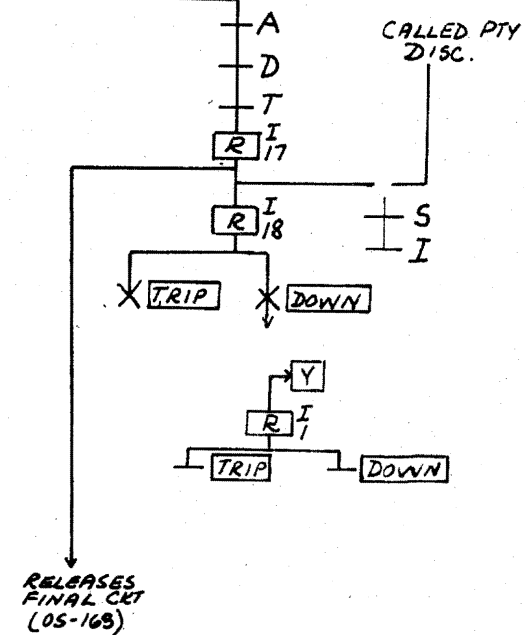
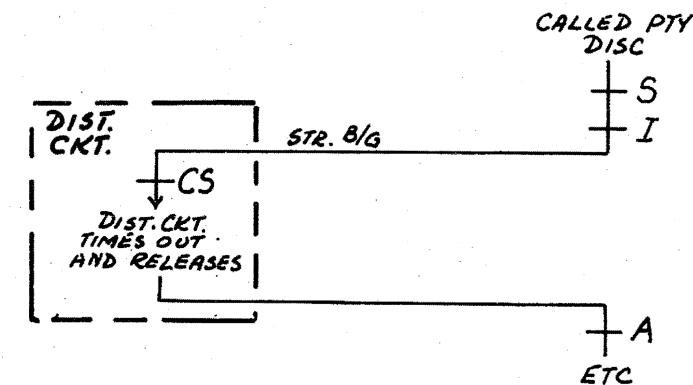
OS-154.1

INC. SEL. CKT.

SEQUENCE CHART



(B) CALLED PTY DISC.
BUT CALLING PTY
FAILS TO DISC.



INC. SEQ. SWITCH

16. TALKING

17. OVERFLOW

18. RETURN

1. NORMAL

ES-20292-011 ISS. 22-D INC. SEL. CKT

TALKING
DISCONNECT

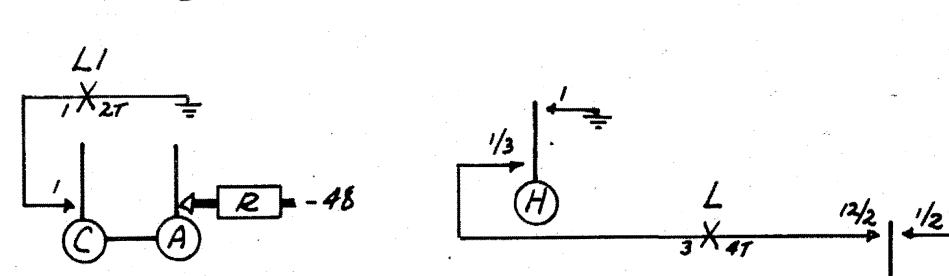
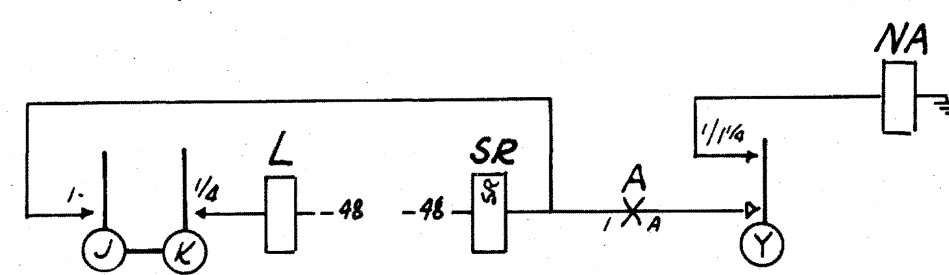
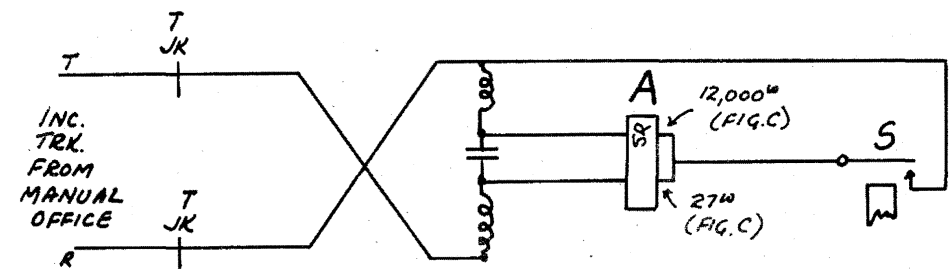
REPT

PANEL GCO

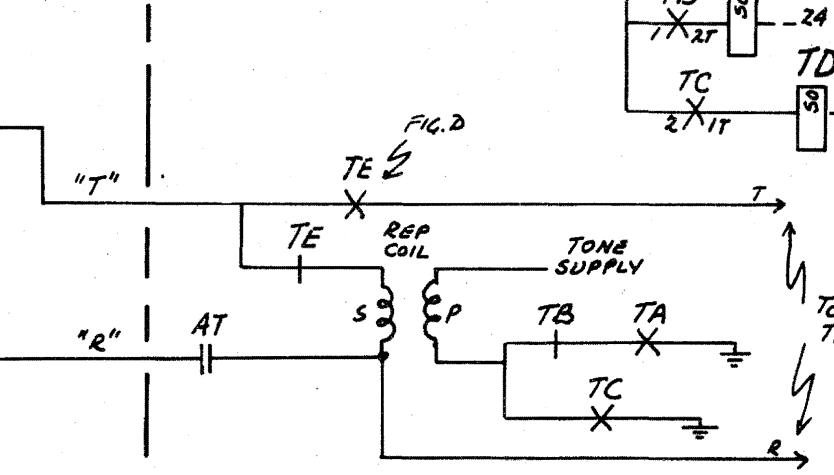
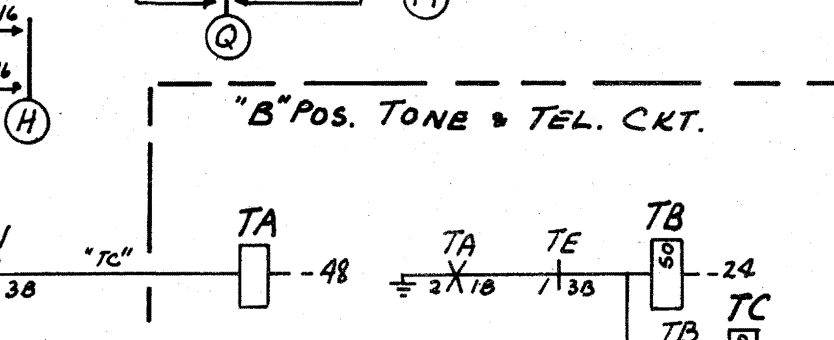
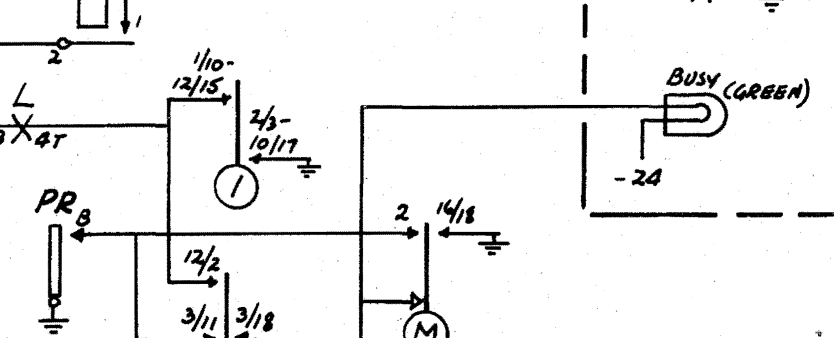
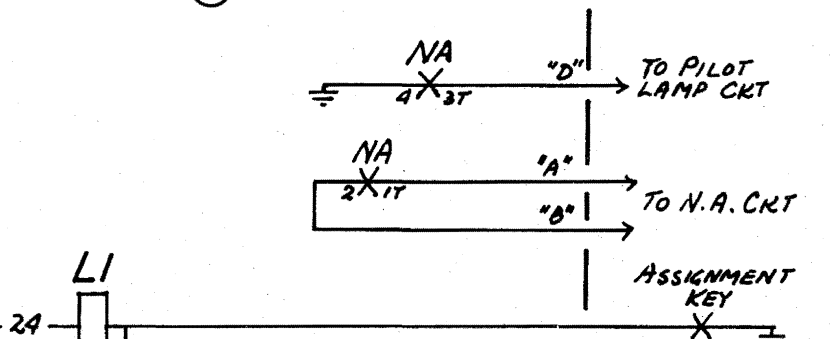
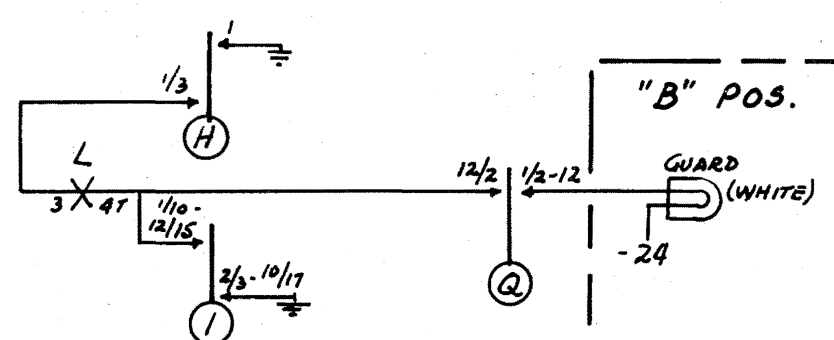
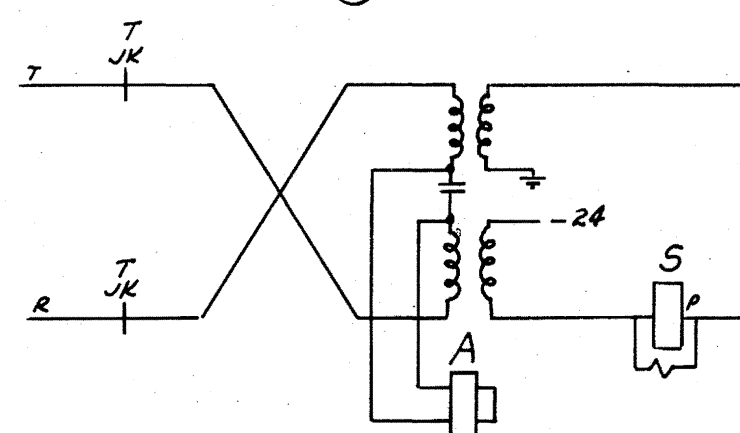
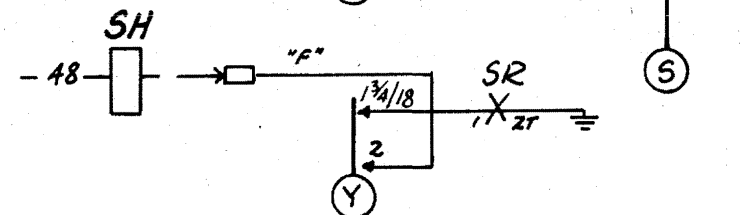
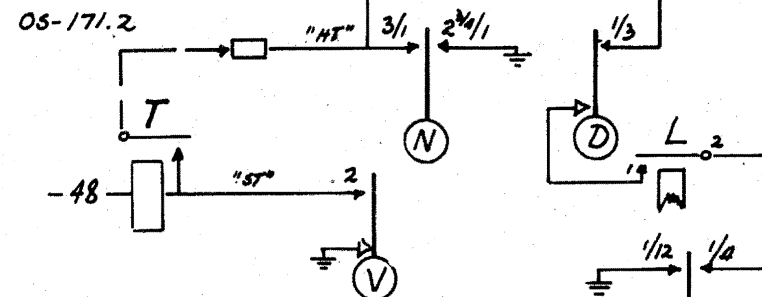
OS-154.2

INCOMING SEL. CKT

SEQUENCE CHART

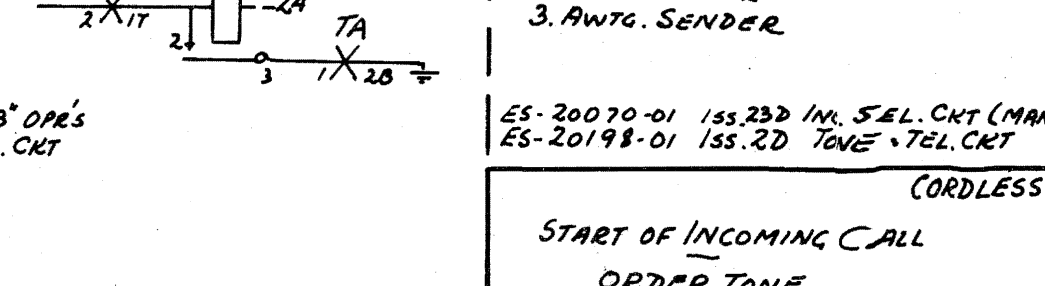
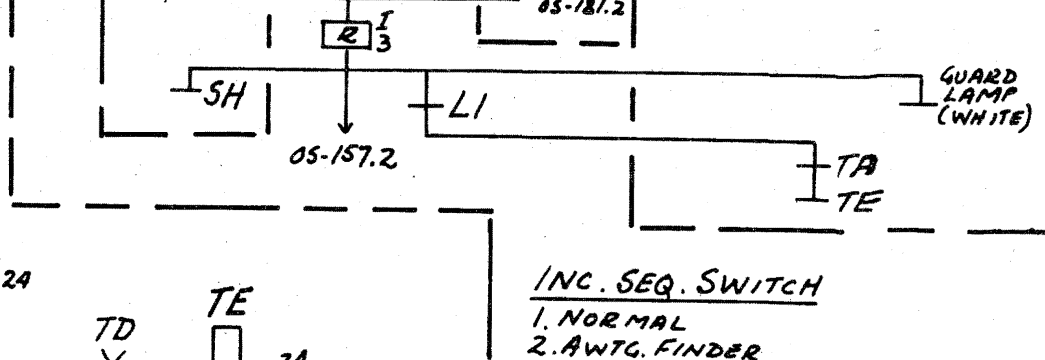
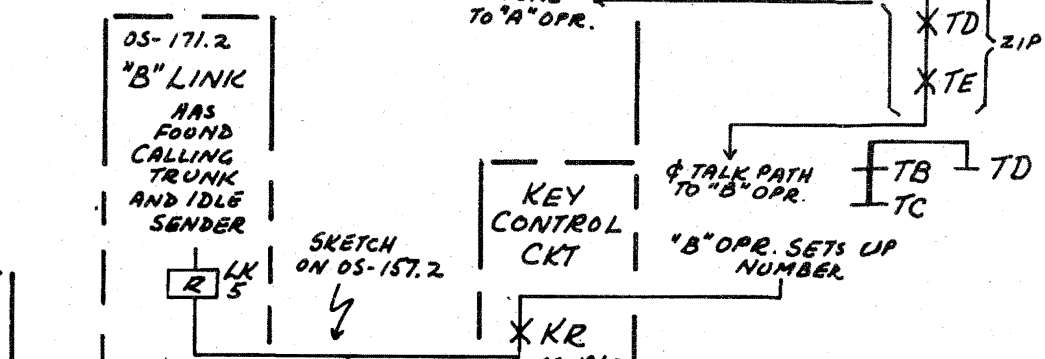
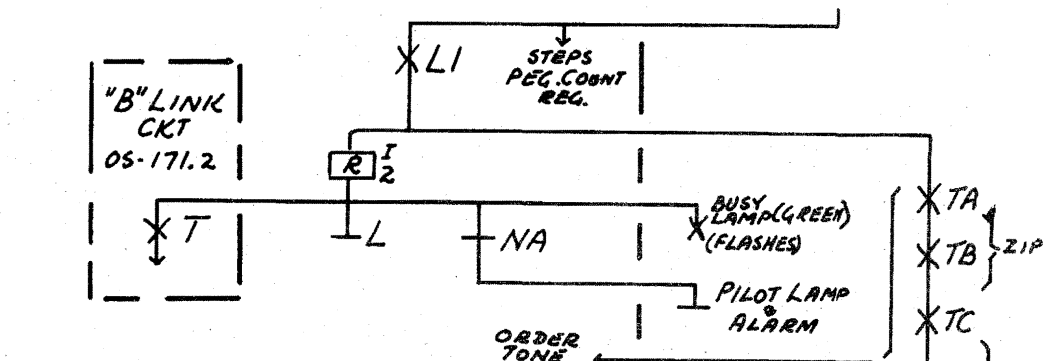
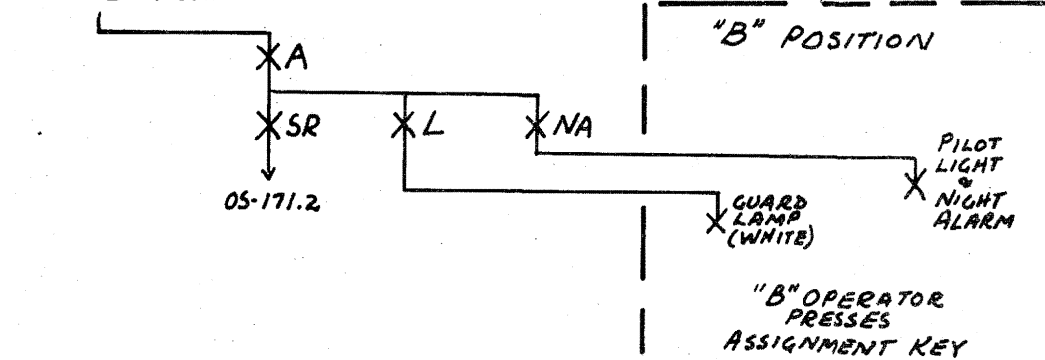


"B" LINK CKT.



INC. TRUNK
SEIZED BY
"A" OPERATOR

INC. SEL. CKT



INC. SEQ. SWITCH

1. NORMAL
2. AWTG. FINDER
3. AWTG. SENDER

ES-20070-01 1SS.23D INC. SEL. CKT (MAN)
ES-20198-01 1SS.2D TONE & TEL. CKT

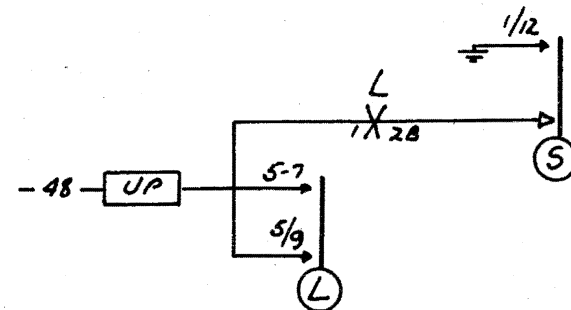
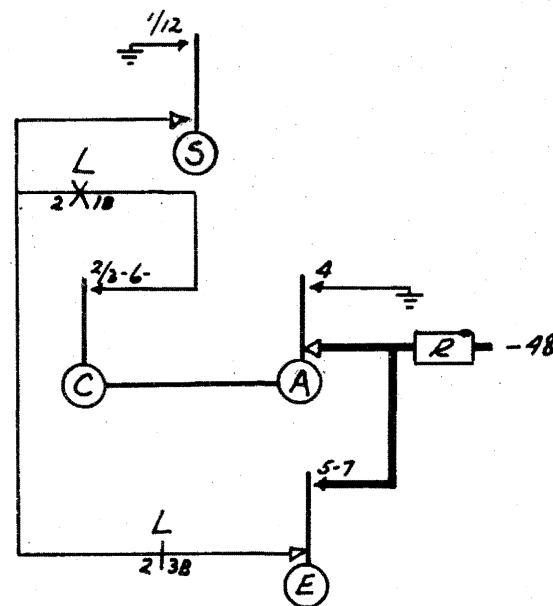
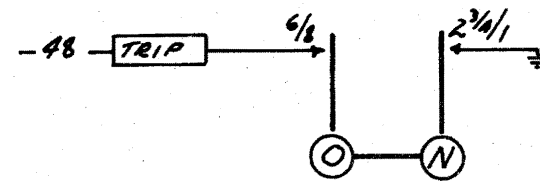
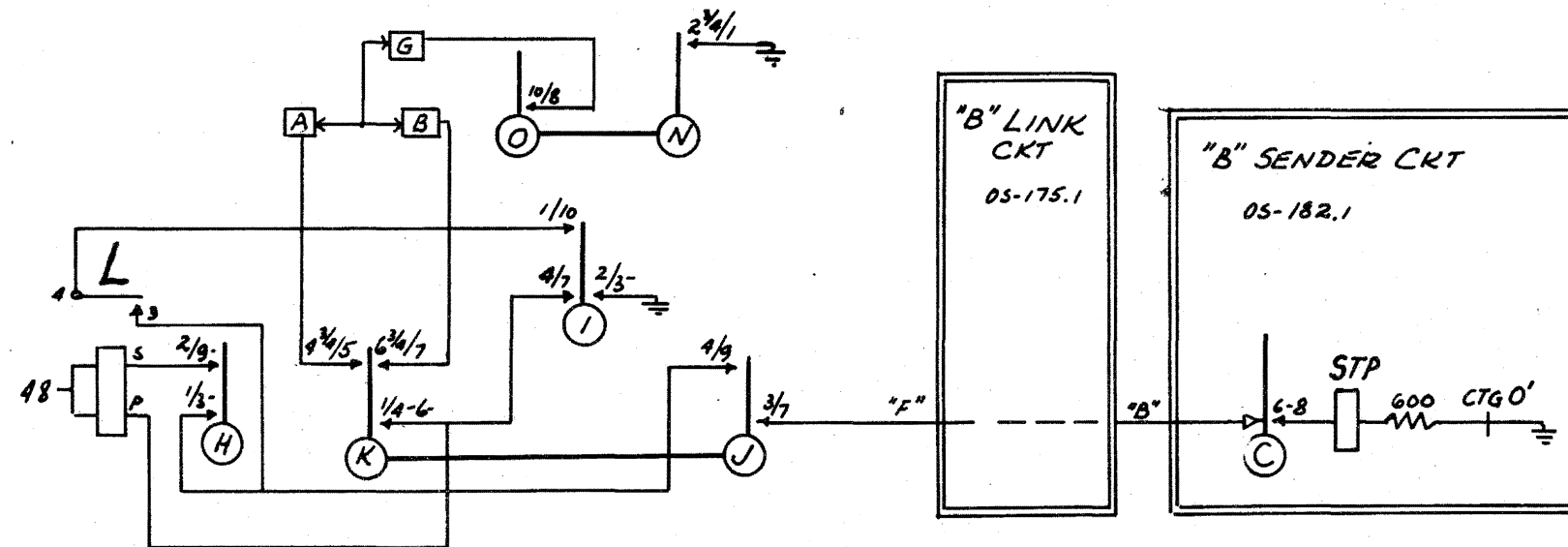
CORDLESS

START OF INCOMING CALL
ORDER TONE

PANEL GCO

OS-156.2

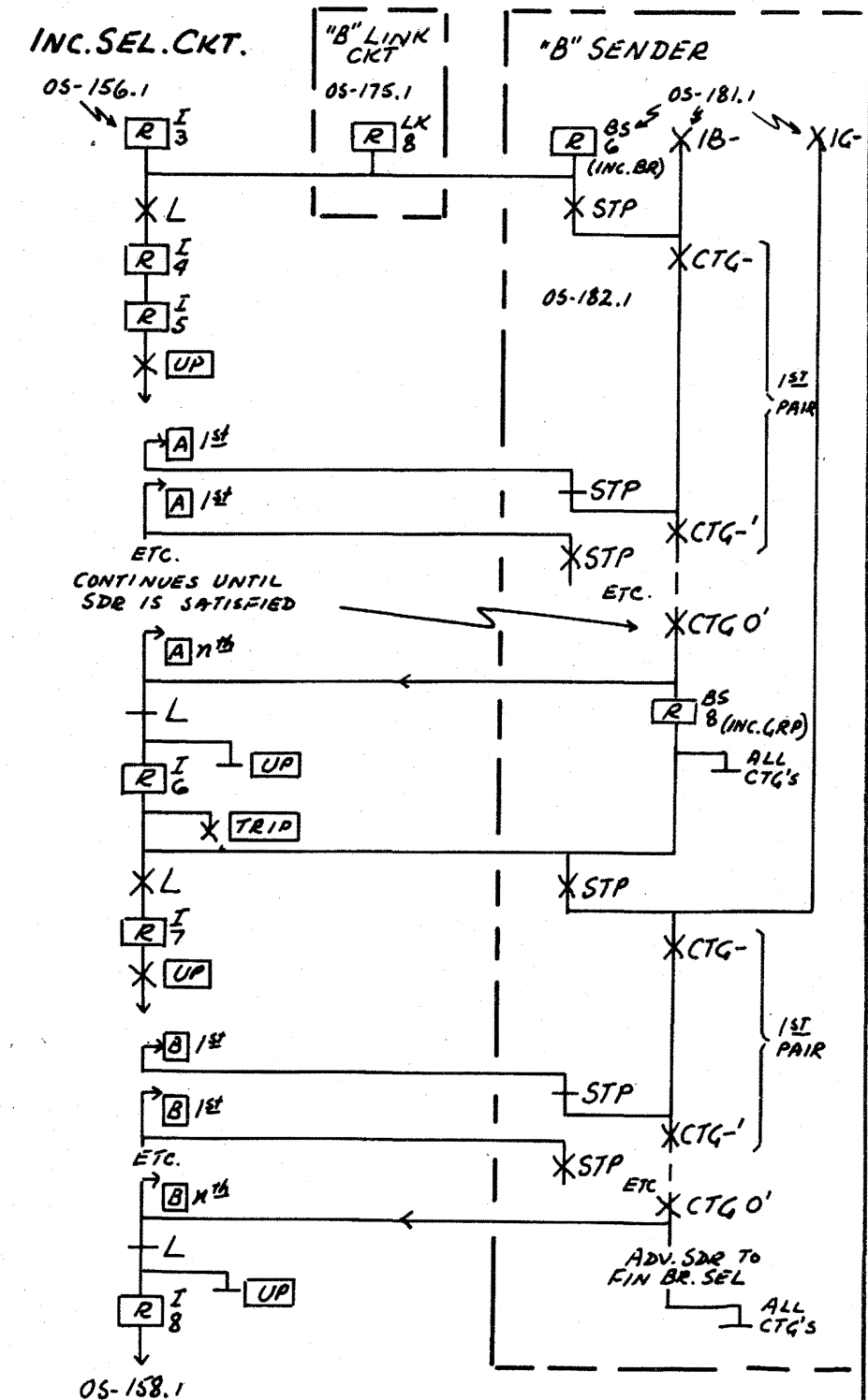
INC. SEL. CKT.



INC. SEQ. SWITCH

3. AWG. SENDER
4. PASS-BY
5. BRUSH SELECTION
6. AWG. SENDER (TRIP)
7. GROUP SELECTION
8. AWG. (L) RELAY

SEQUENCE CHART



SD-21796-011 ISS. 8D INC. SEL. CKT

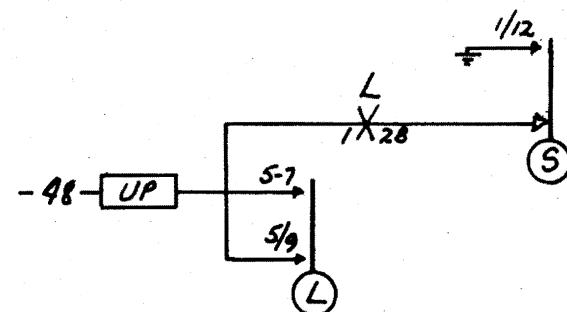
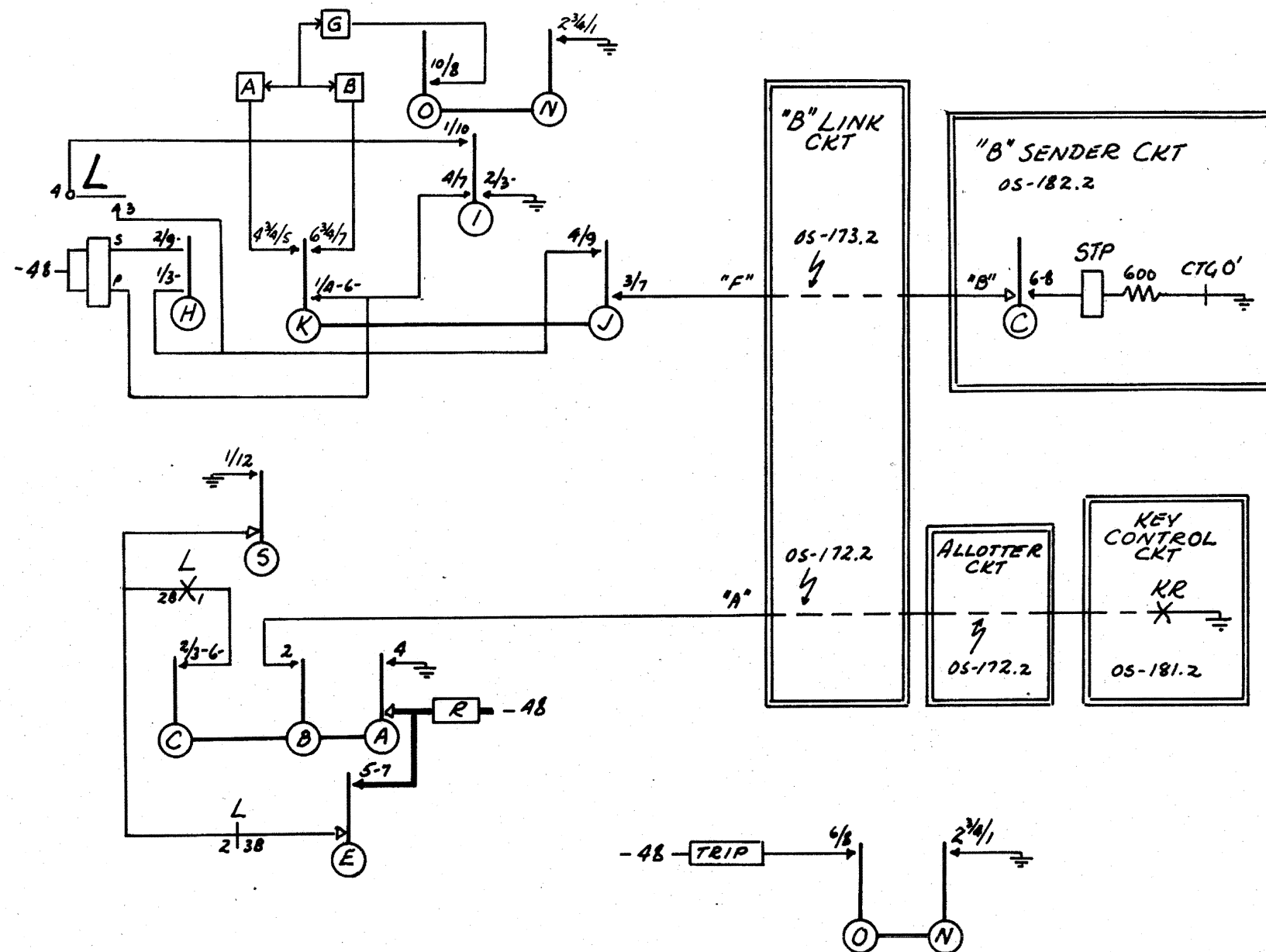
INCOMING BRUSH AND GROUP SELECTION

PANEL GCO

05-157.1

ISSUE	1
DATE	9-54
BY	GH/NS

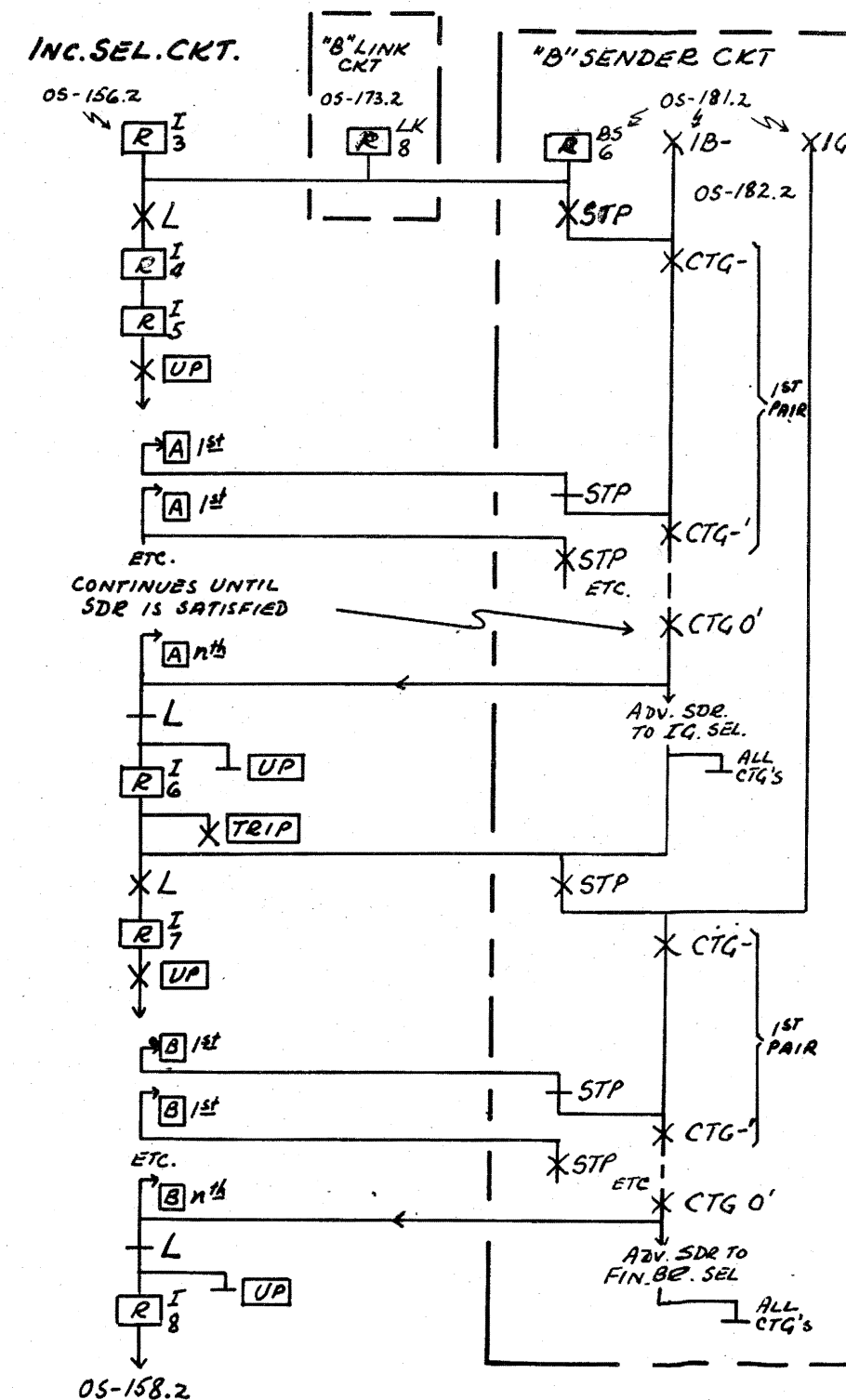
INC. SEL. CKT



INC. SEQ. SWITCH

3. AWTG. SENDER
4. PASS-BY
5. BRUSH SELECTION
6. AWTG. SENDER (TRIP)
7. GROUP SELECTION
8. AWTG. (L) RELAY

SEQUENCE CHART



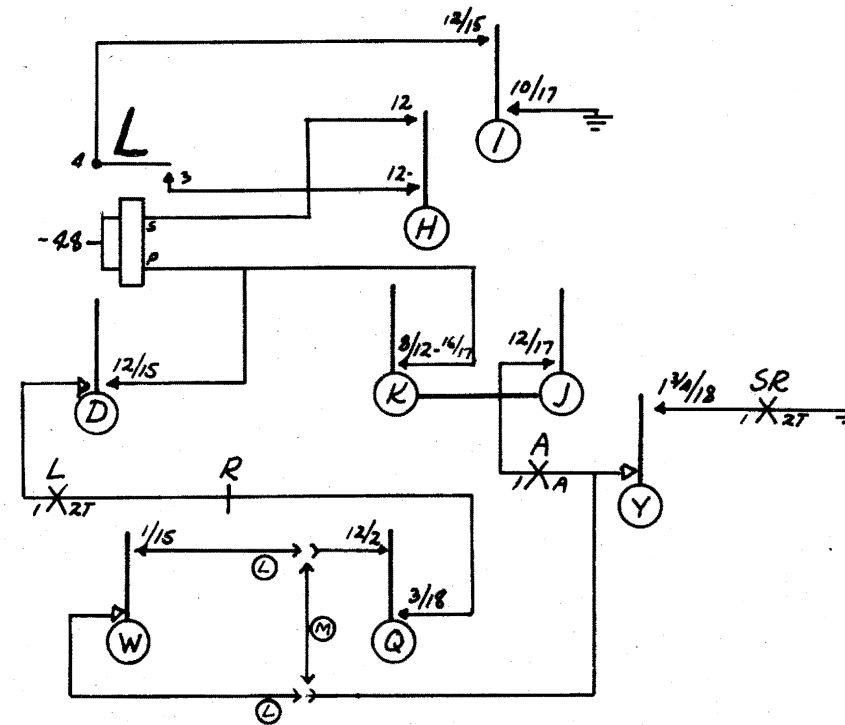
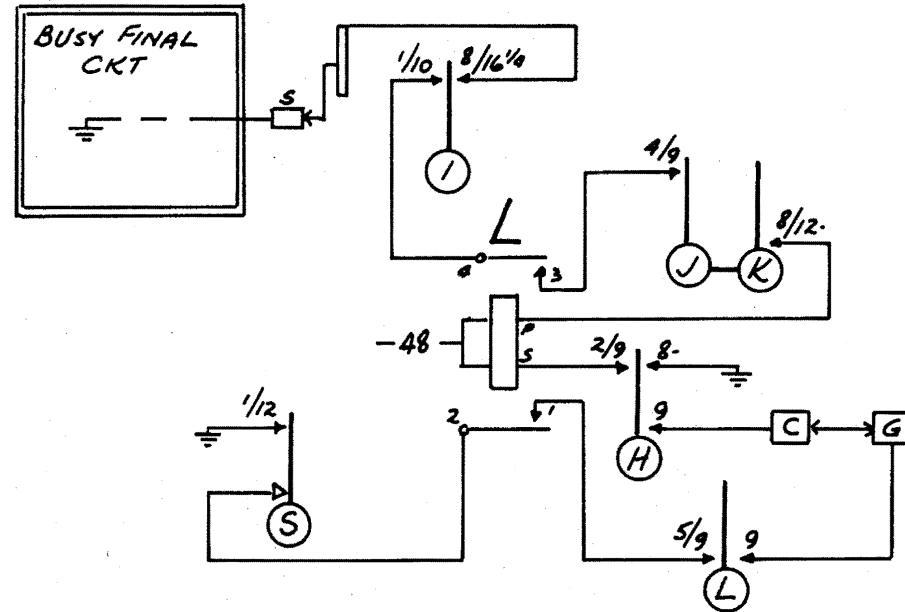
ES-20070-01 155, 23D INC. SEL. CKT (MAN)
CDLS

INCOMING BRUSH AND GROUP
SELECTION

PANEL GCO

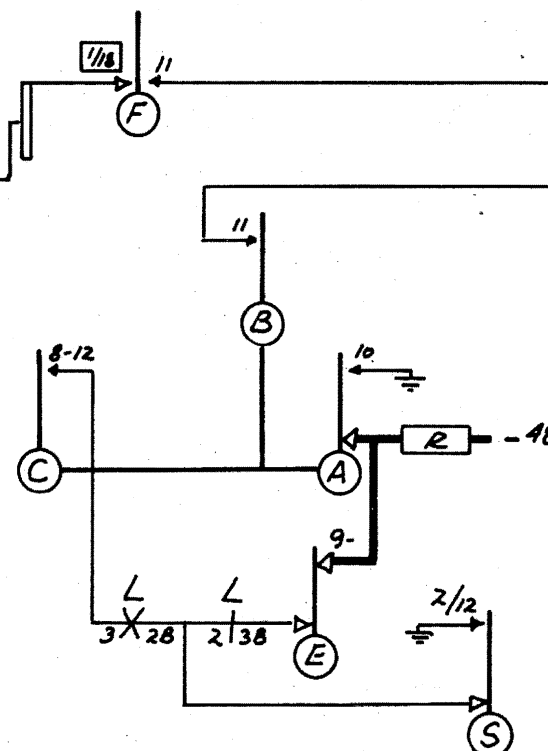
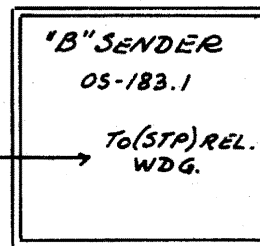
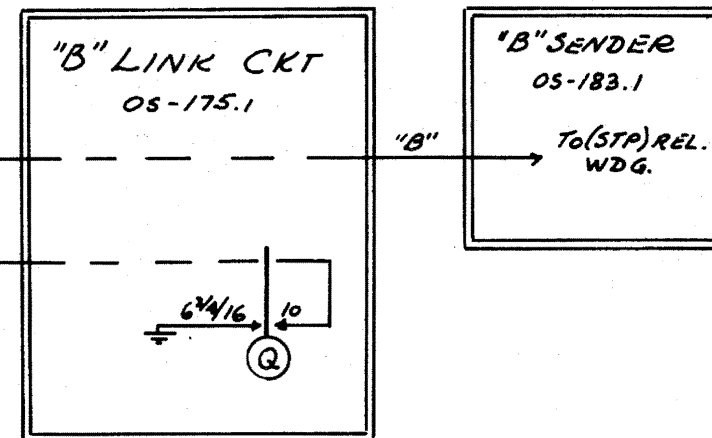
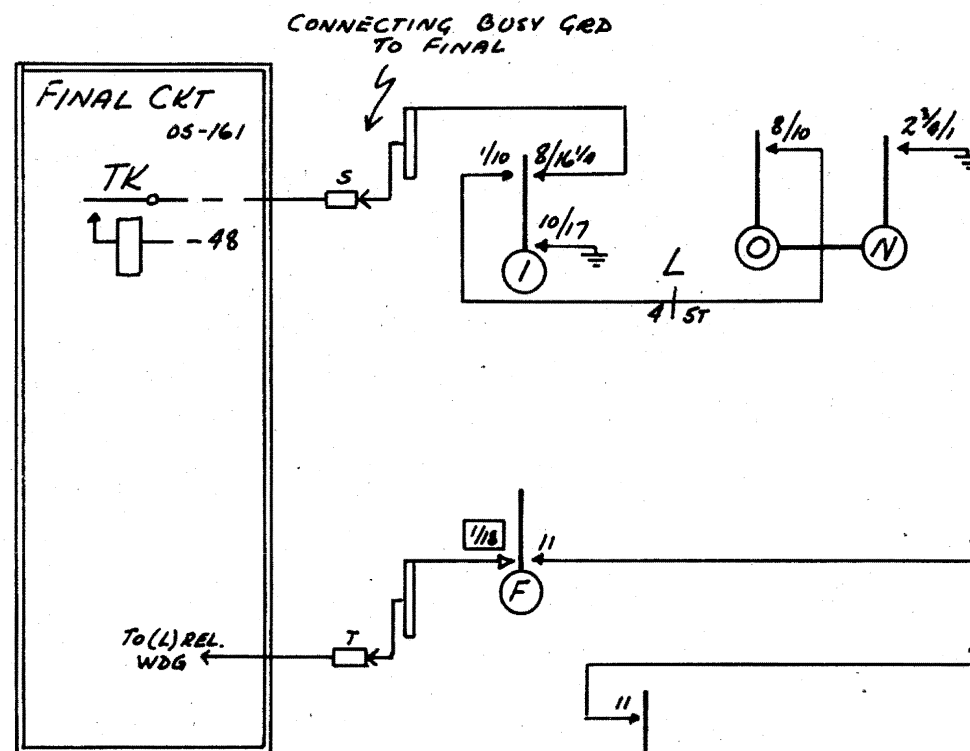
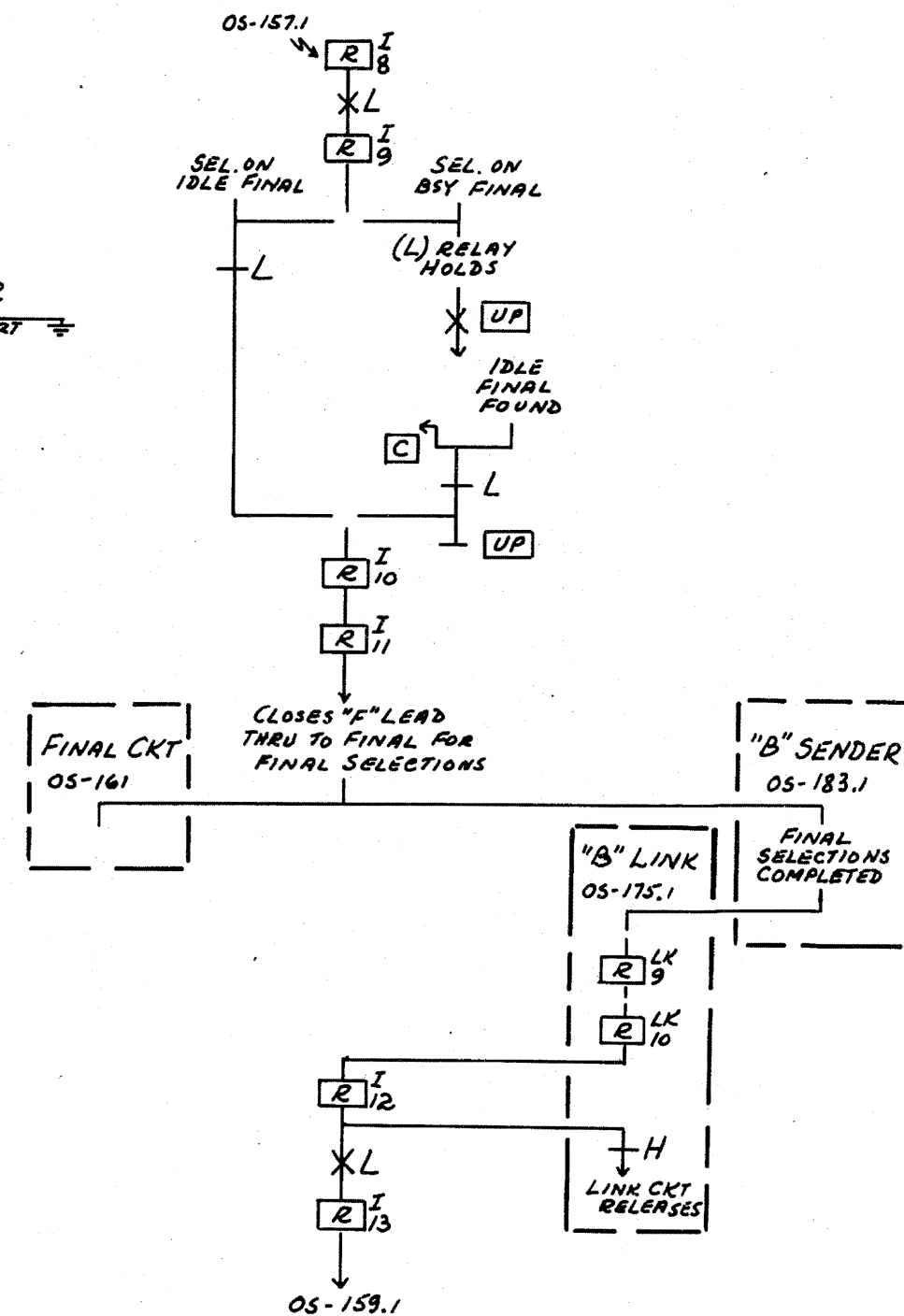
05-157.2

INC. SEL. CKT.



SEQUENCE CHART

INC. SEL. CKT.



INC. SEQ. SWITCH

- 8. AWG. (L) RELAY
- 9. TRUNK HUNTING
- 10. PASS-BY
- 11. SELECTION BEYOND
- 12. TRUNK CLOSURE

SD-21796-011 1ss.8D INC. SEL. CKT

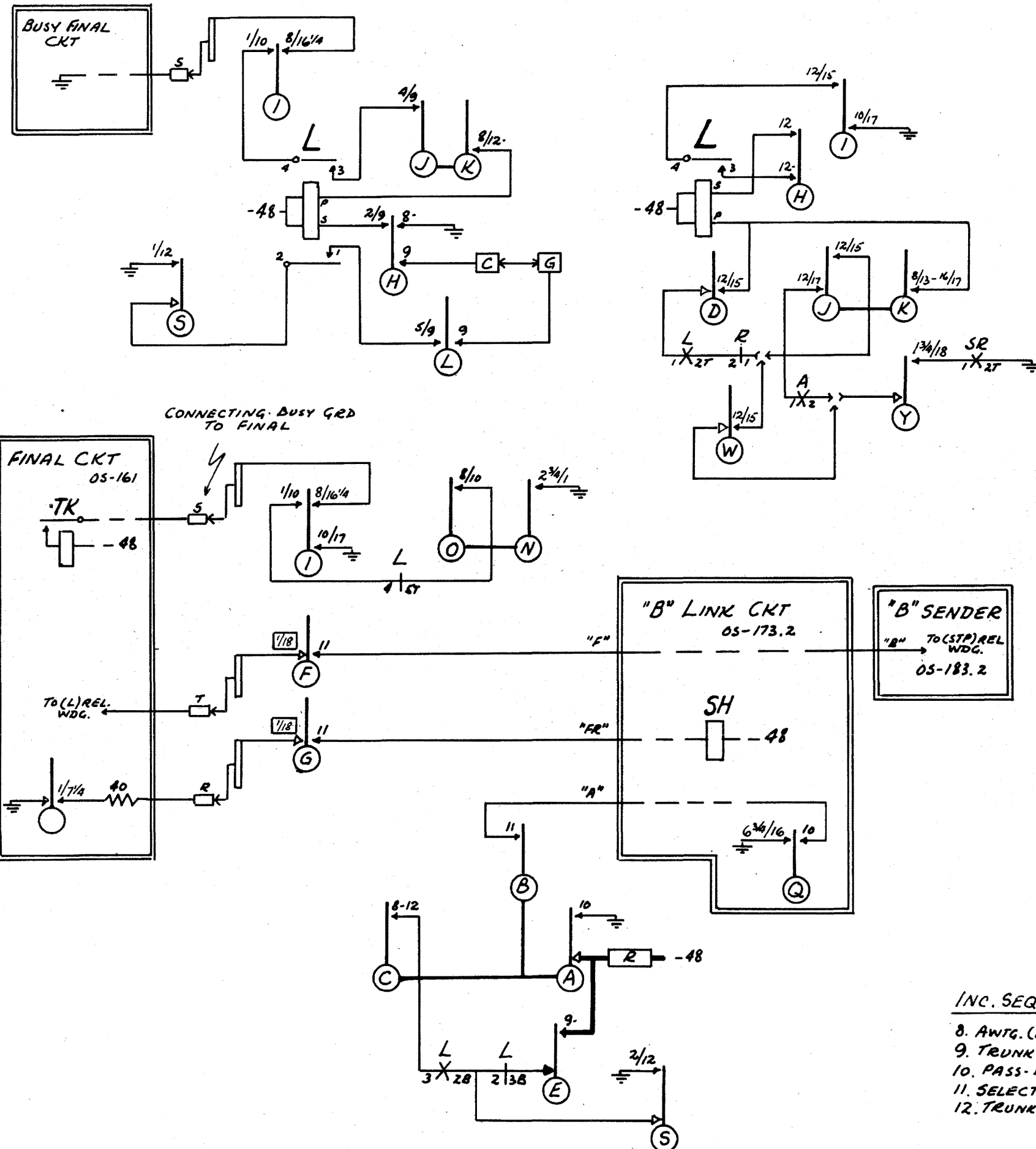
TRUNK HUNT
SELECTION BEYOND
TRUNK CLOSURE

MAN (PDB)

PANEL GCO

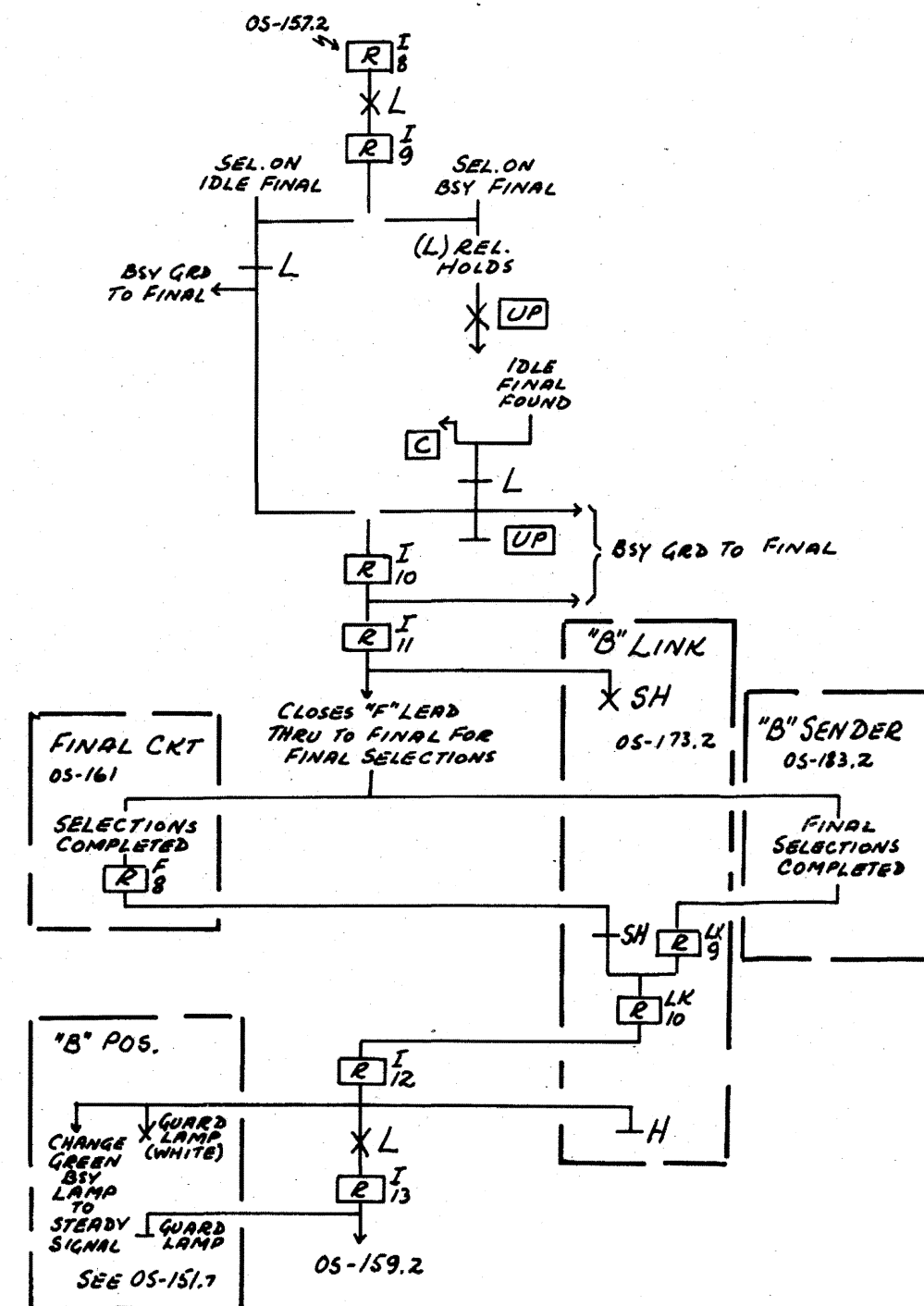
OS-158.1

INC. SEL. CKT.



SEQUENCE CHART

INC. SEL. CKT.



INC. SEQ. SWITCH

- 8. AWG. (L) RELAY
- 9. TRUNK HUNTING
- 10. PASS-BY
- 11. SELECTION BEYOND
- 12. TRUNK CLOSURE

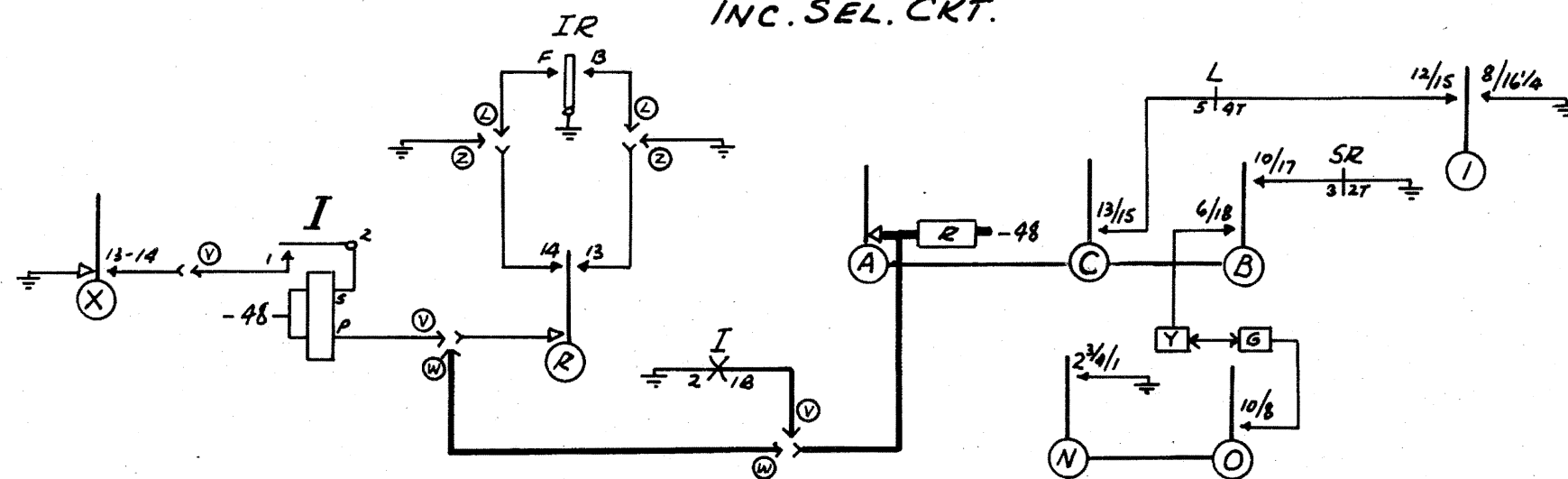
ES-20070-01 ISS. 23D INC. SEL. CKT (MAN)

TRUNK HUNT
SELECTION BEYOND
TRUNK CLOSURE

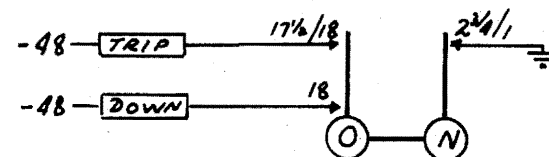
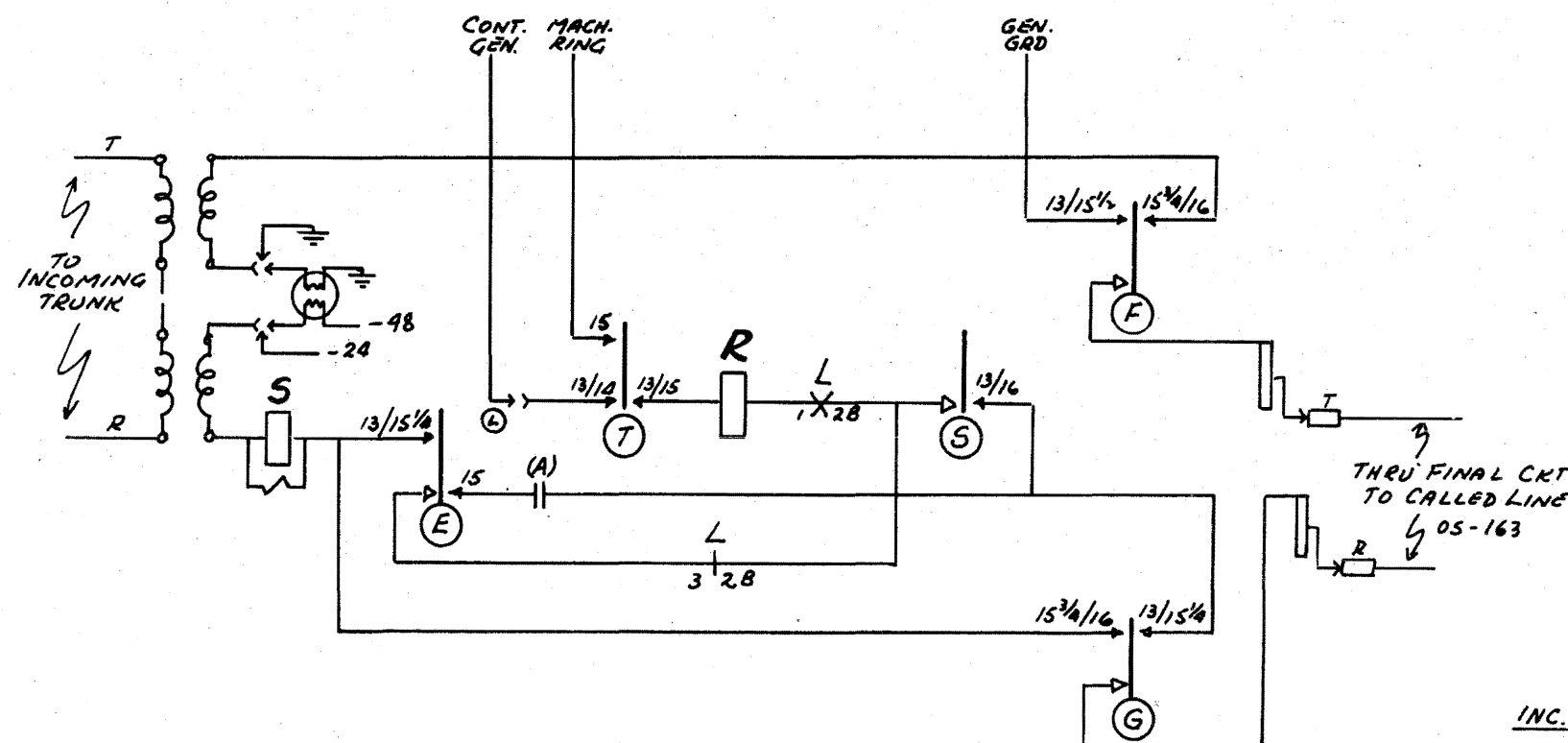
PANEL GCO

OS-158.2

SEQUENCE CHART



(V) (L) WITH IMMEDIATE RING
 (V) (Z) WITHOUT IMMEDIATE RING (I-RELAY FURNISHED)
 (W) " " " (I-RELAY NOT FURNISHED)



SD-21796-011 ISS. 8D INC. SEL. CRT

RINGING AND TRIPPING
TALKING
DISCONNECT

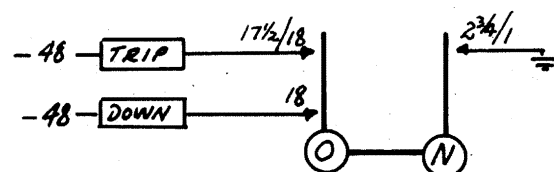
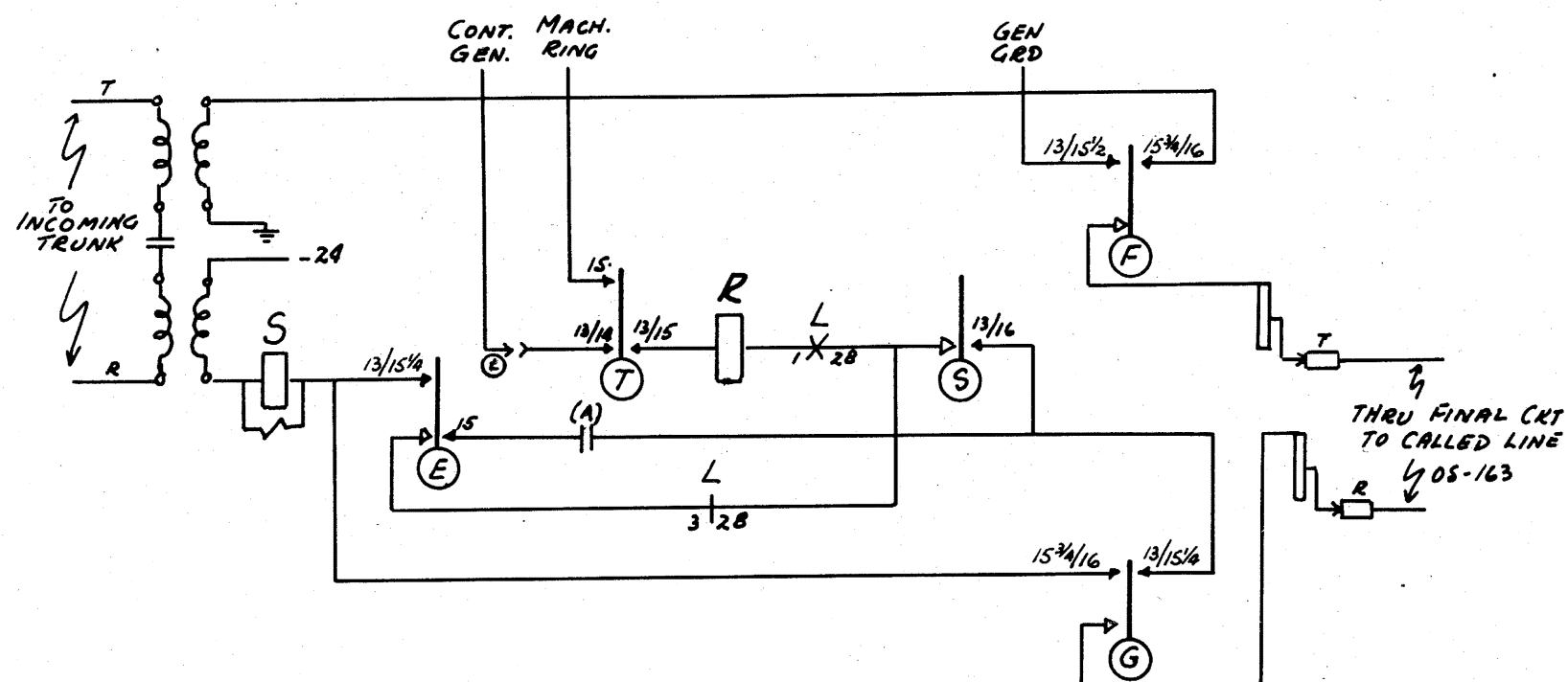
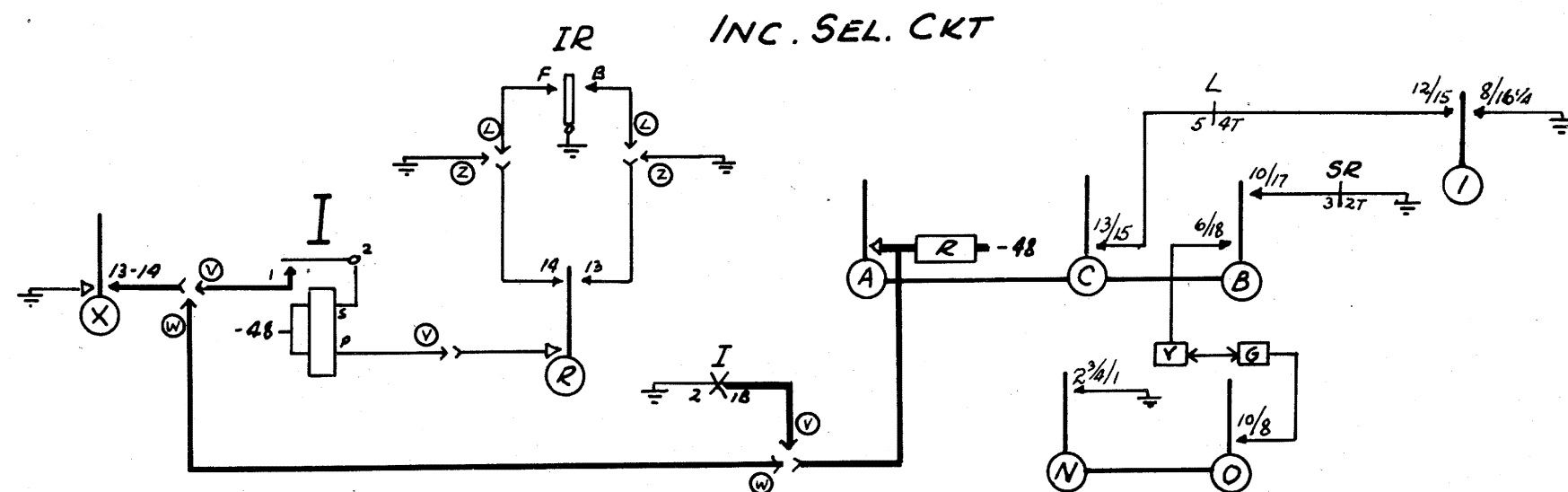
MAN
(PDB)

PANEL GCO

05-159.1

ISSUE	1						
DATE	9-54						
BY	GHN						

ISSUE	1
DATE	9-54
BY	GH/NS

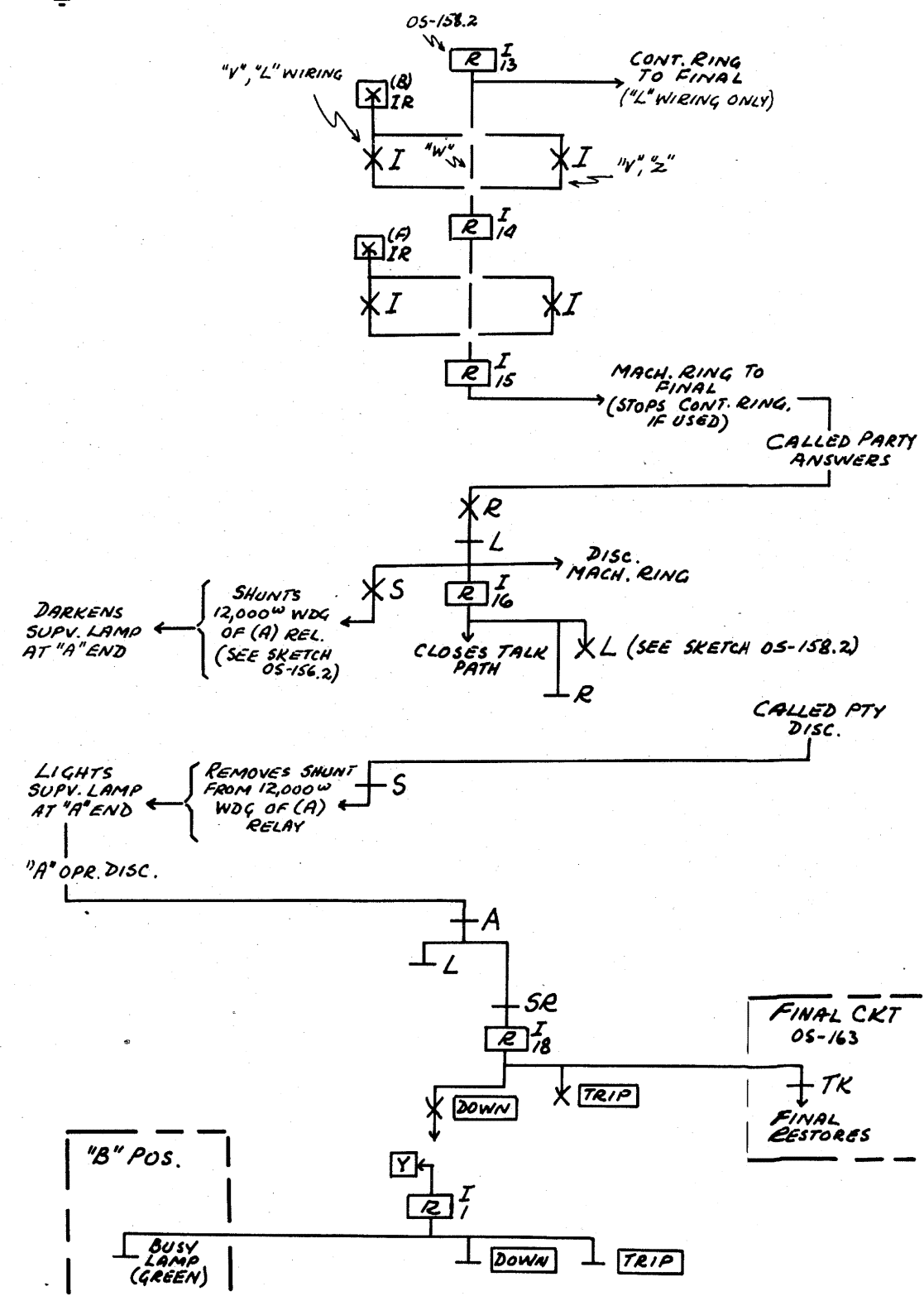


INC. SEQ. SWITCH

- 13. IMMEDIATE RING (AWTG. INT "0")
- 14. " " (" " "F")
- 15. RINGING WITH INTERVALS
- 16. TALKING
- 17. OVERFLOW
- 18. RETURN
- 1. NORMAL

SEQUENCE CHART

INC. SEL. CKT.



ES-20070-01 ISS.23D INCSEL.CKT(MAN)

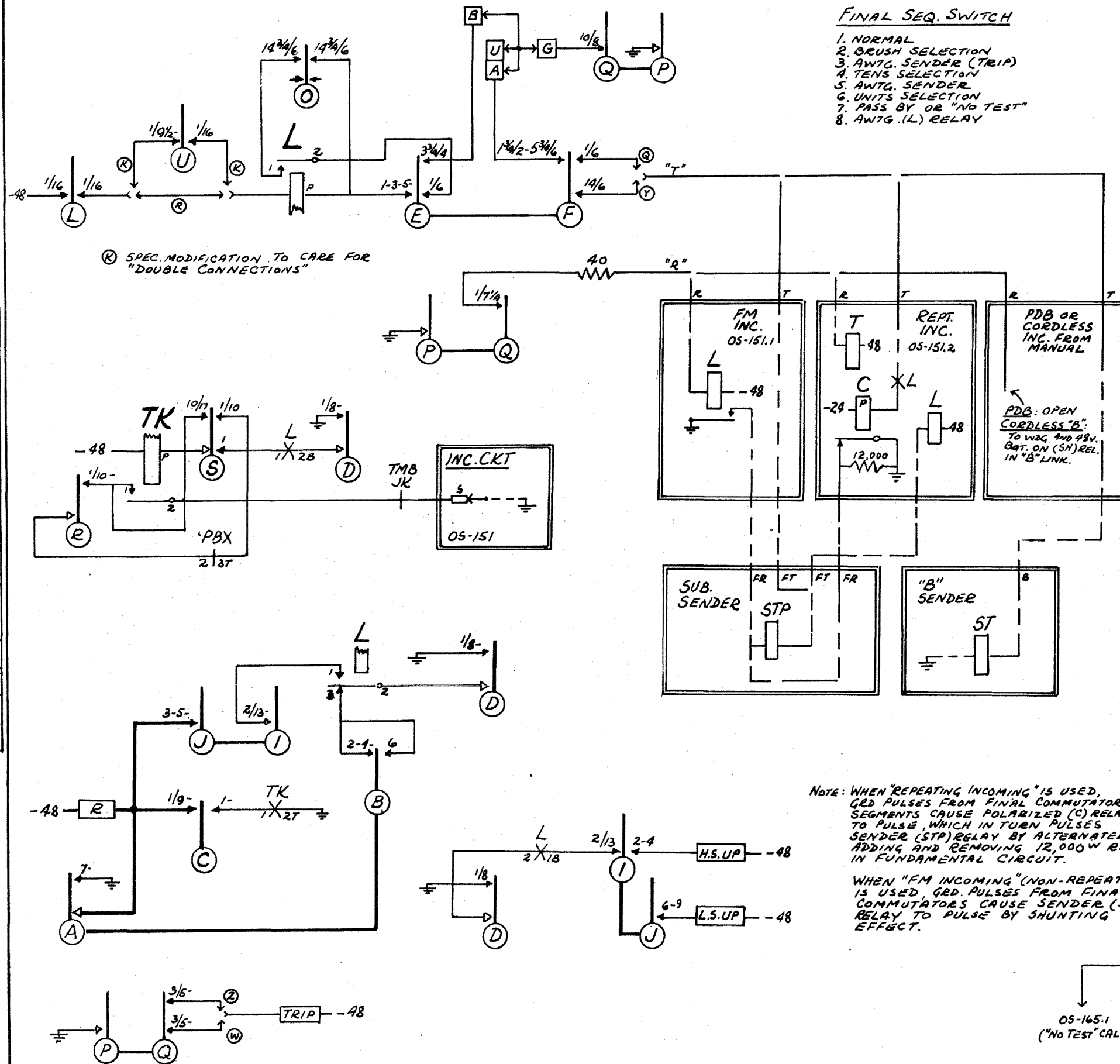
CDLS

RINGING AND TRIPPING
TALKING
DISCONNECT

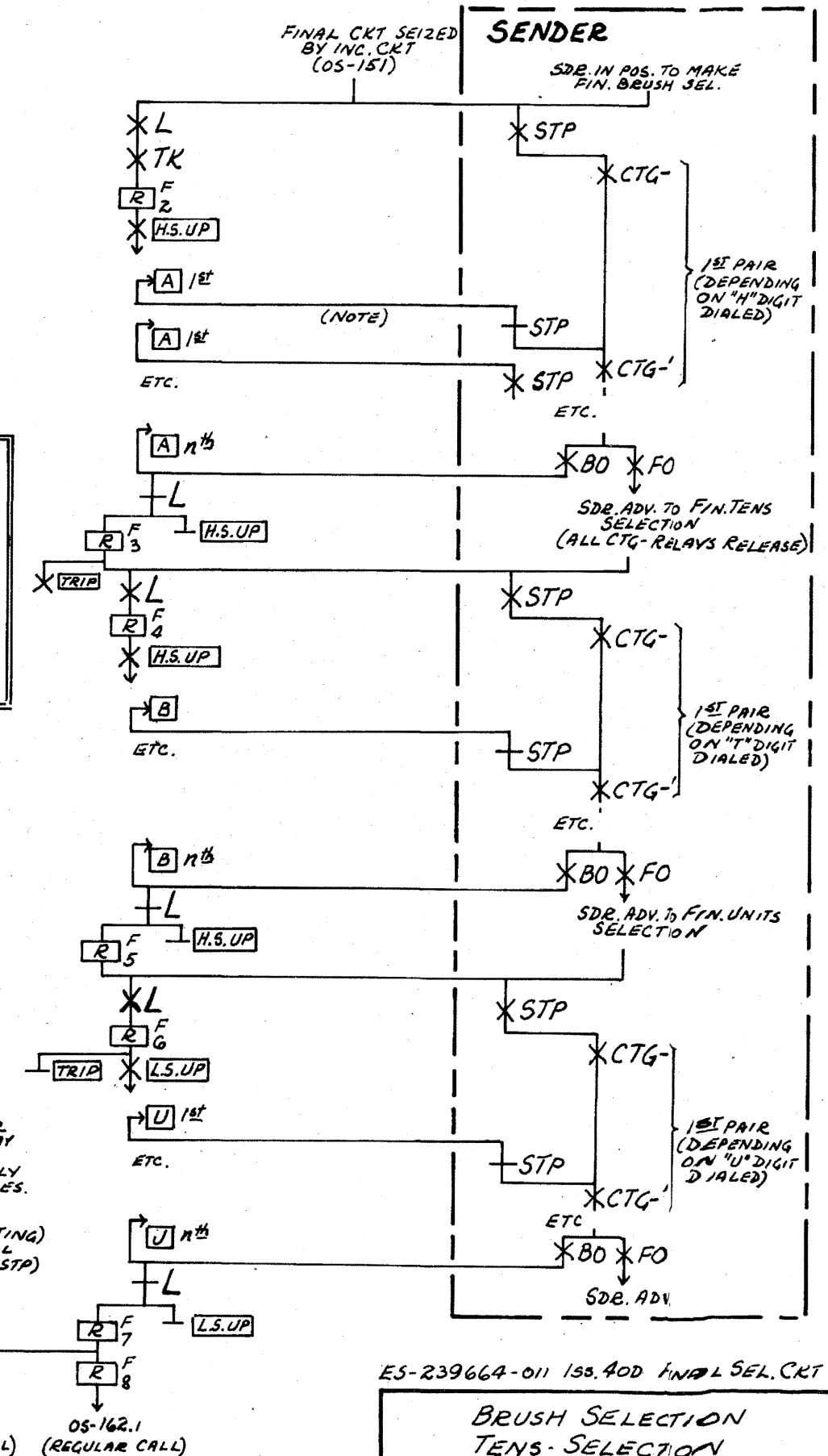
PANEL GCO

OS-159.2

FINAL CKT

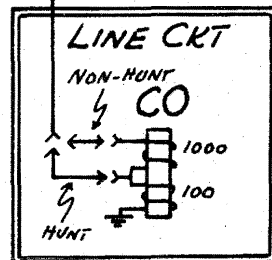
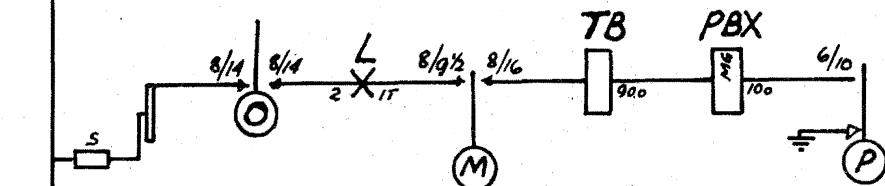
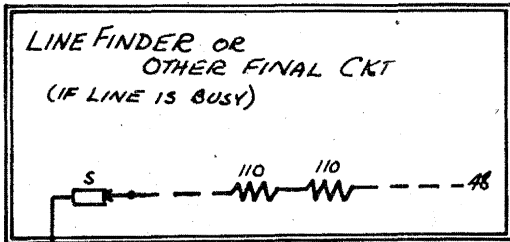
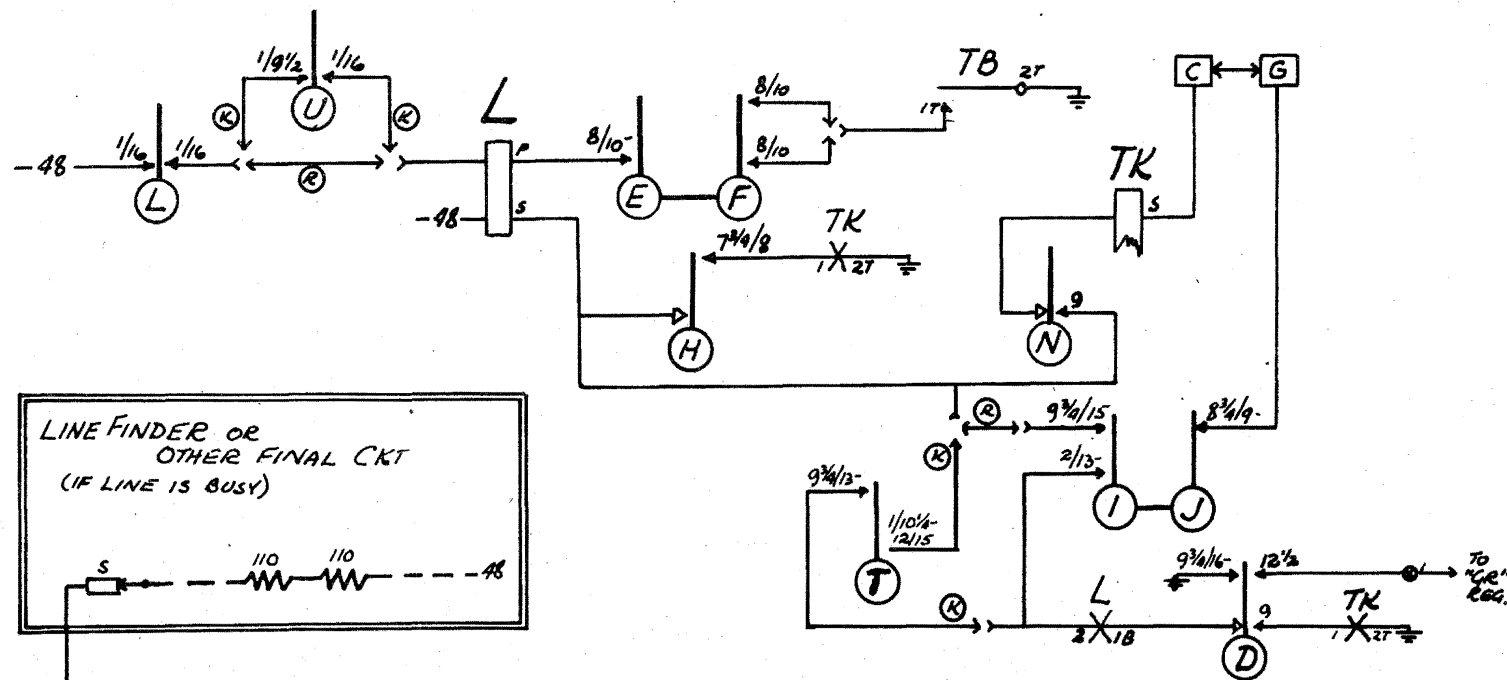


SEQUENCE CHART

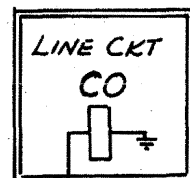
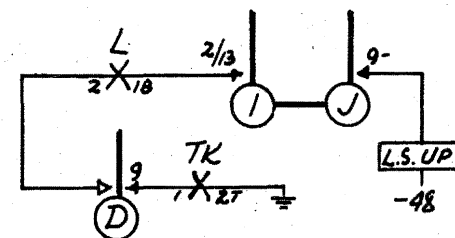


FINAL SEL. CKT

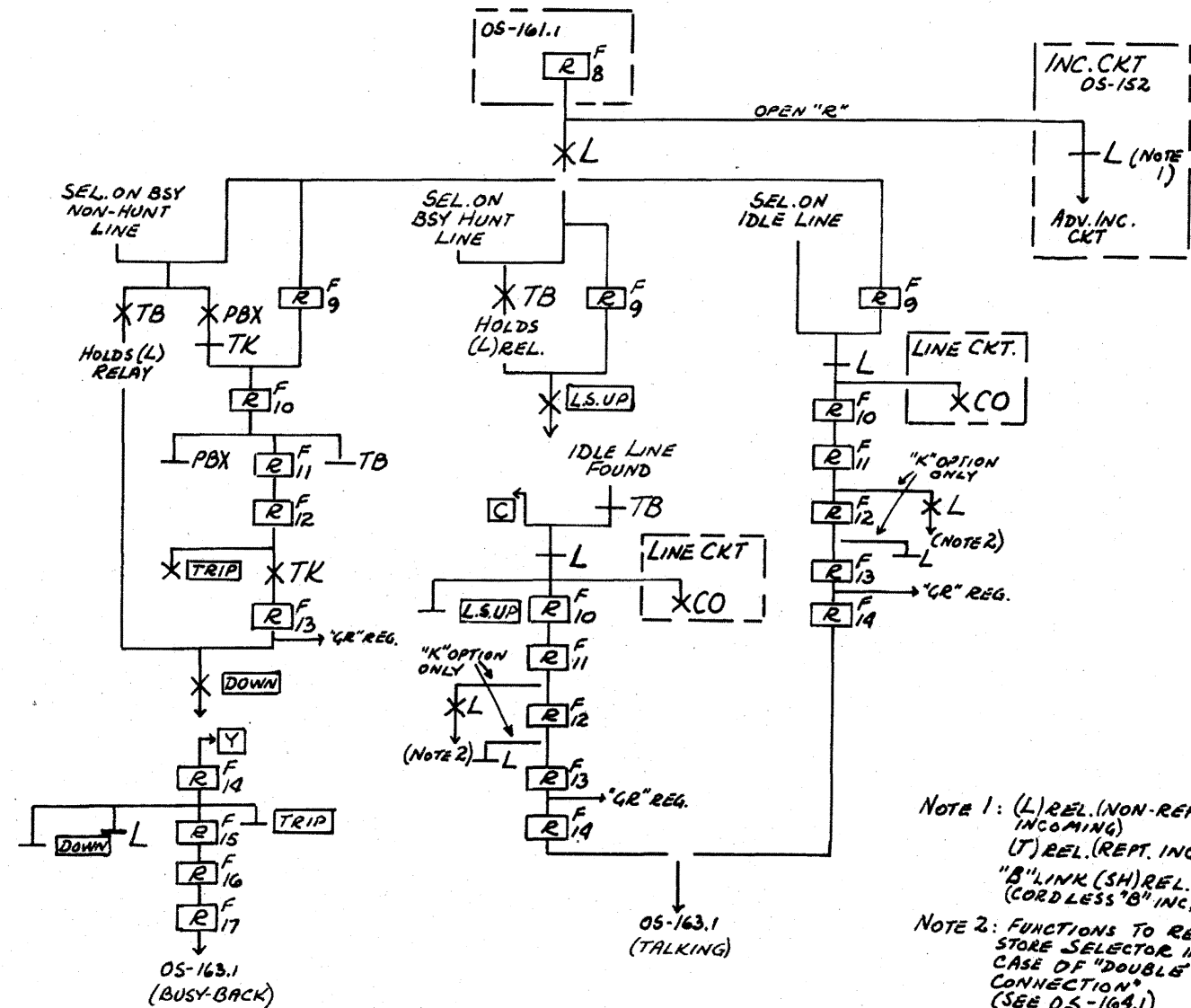
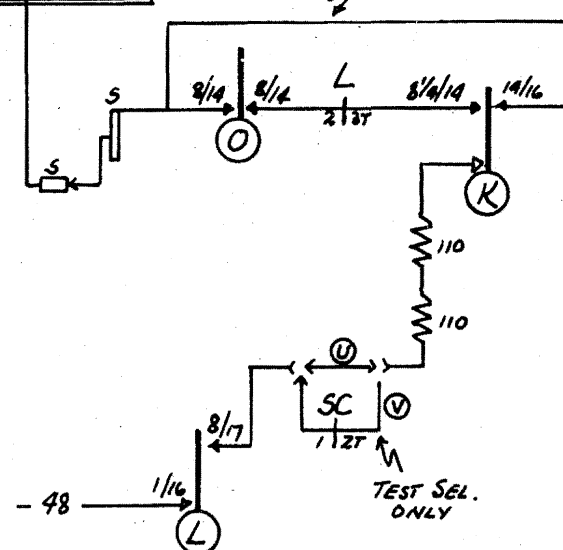
SEQUENCE CHART



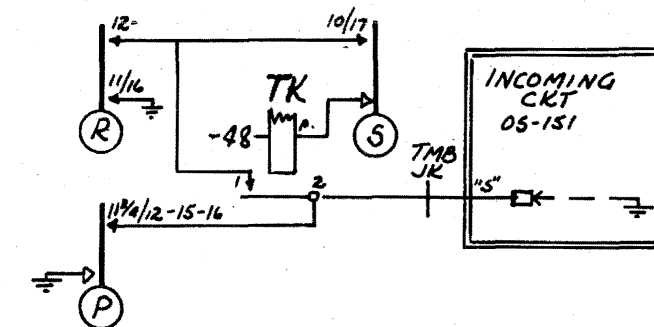
NOTE: (TB) RELAY OPERATES ON ALL BUSY CONDITIONS.
(PBX) RELAY OPERATES ON BUSY NON-HUNT ONLY.
(PBX) RELAY CURRENT FLOW REQMT:
OPERATE 24 MIL. AMP.
NON-OPERATE 22 MIL. AMP.
(E-6439)



CONNECTING BUSY BAT. TO "S" OF CALLED LINE



NOTE 1: (L) REL. (NON-REPT INCOMING)
(T) REL. (REPT. INC.)
"B" LINK (SH) REL. (CORDLESS "B" INC.)
NOTE 2: FUNCTIONS TO RE-STORE SELECTOR IN CASE OF "DOUBLE CONNECTION" (SEE OS-164.1)



FINAL SEQ. SWITCH

8. AWTG. (L) RELAY
9. TESTING. (PBX HUNT)
10. PASS-BY
11. PASS-BY
12. AWTG. (TK) RELAY
13. RETURN ON BUSY AND PREMATURE RELEASE
14. TALKING
15. AWTG. "F" INT. OR SUB. ELS
16. " " " " "
17. BUSY BACK

ES-239664-011 165.40D FINAL SEL. CKT

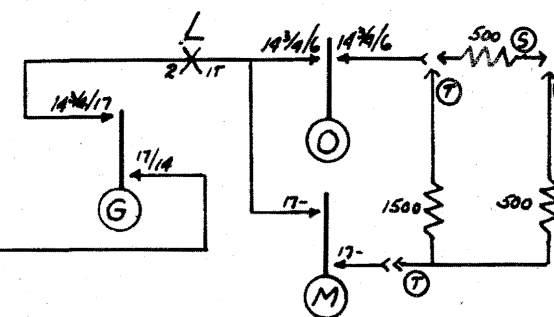
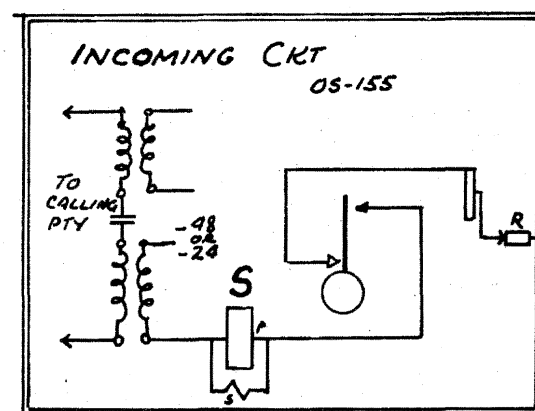
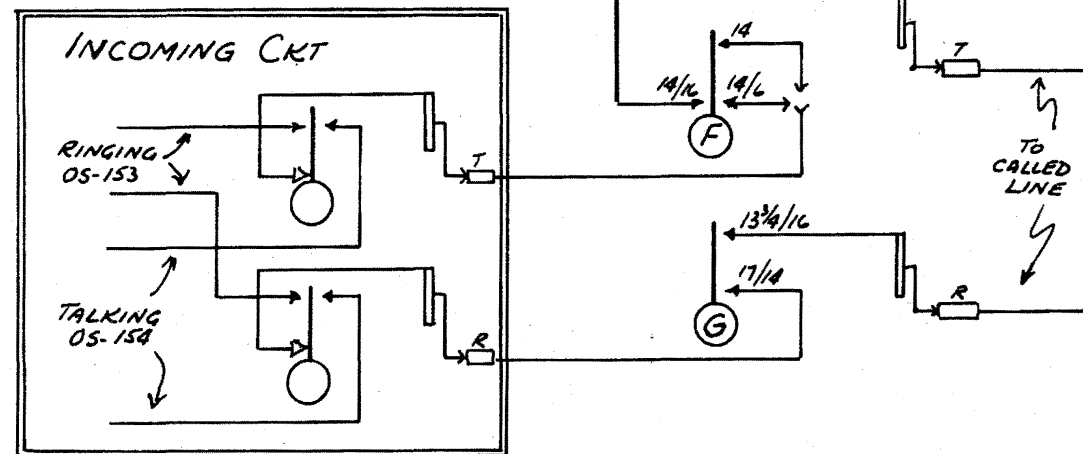
LINE TESTING
TRUNK HUNT
RESTORE ON BUSY

PANEL GCO

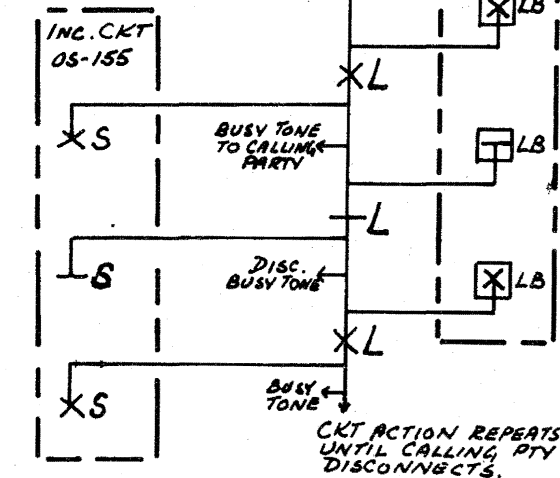
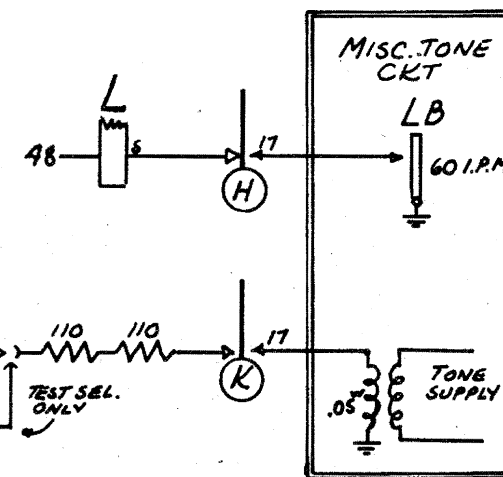
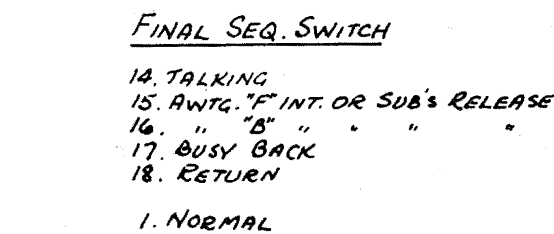
OS-162.1

FINAL SEL. CKT.

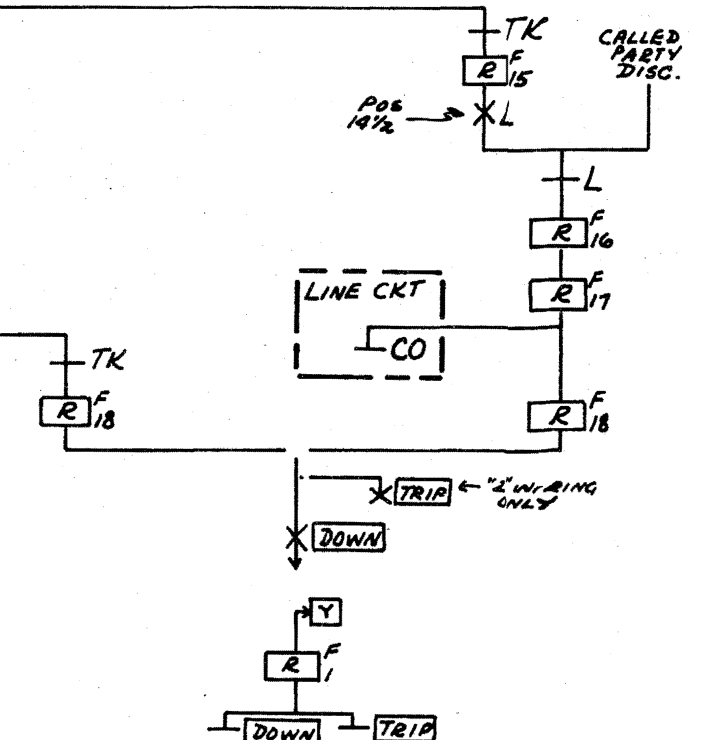
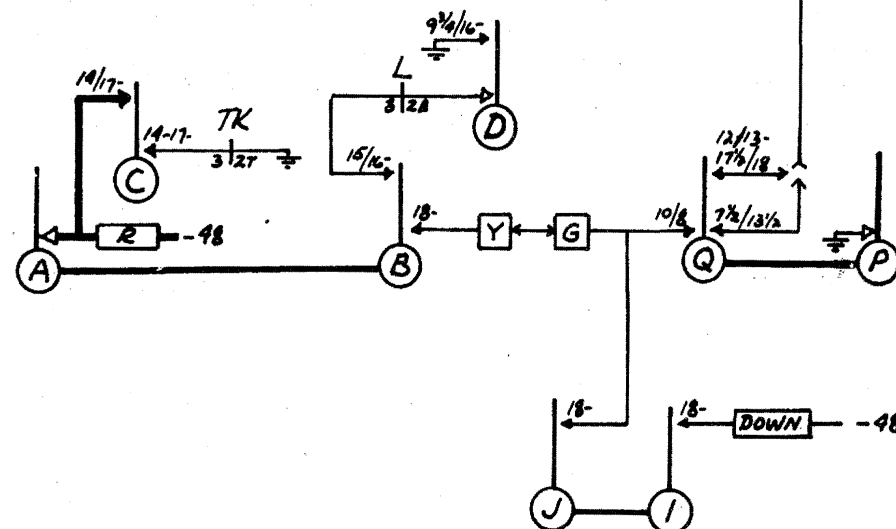
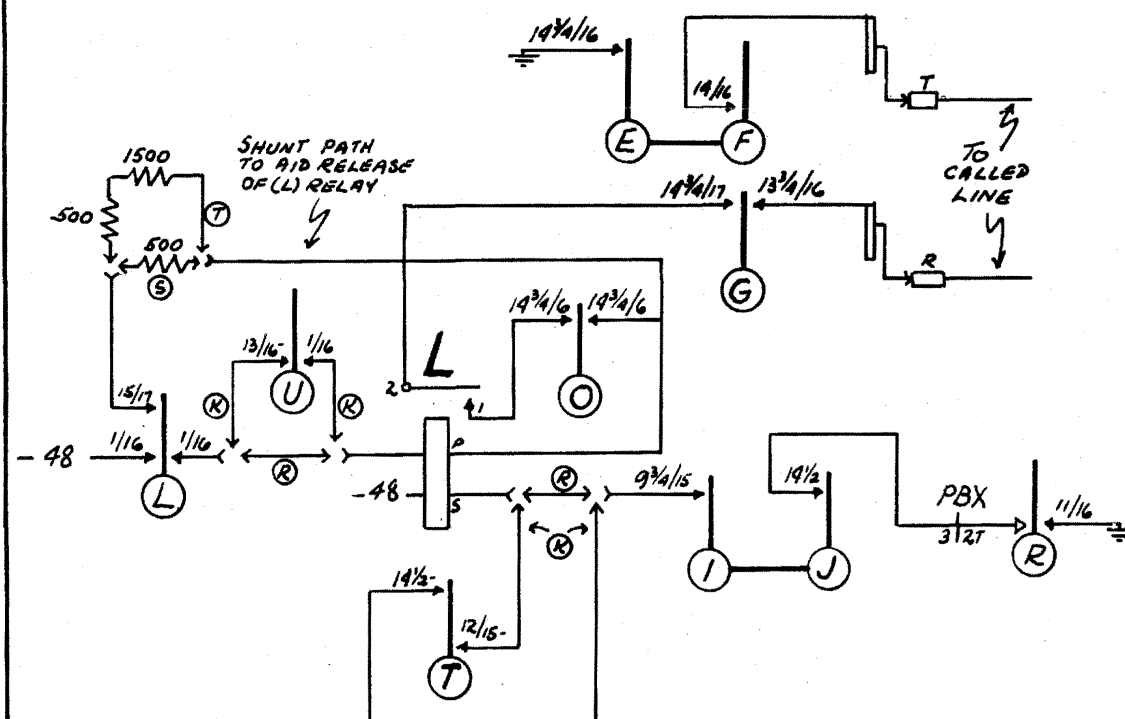
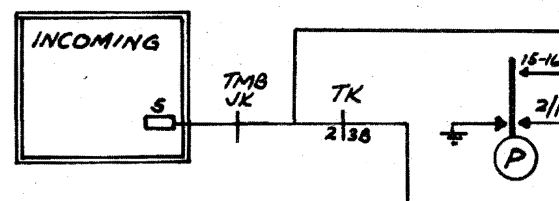
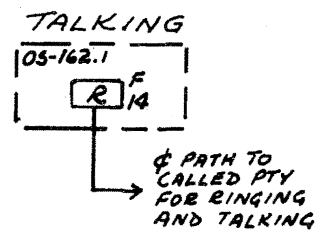
SEQUENCE CHART



⑤ SUB. MAX. EXT. LOOP 750^w
⑦ " " " " 1500^w



CALLING PTY
DISCONNECTS



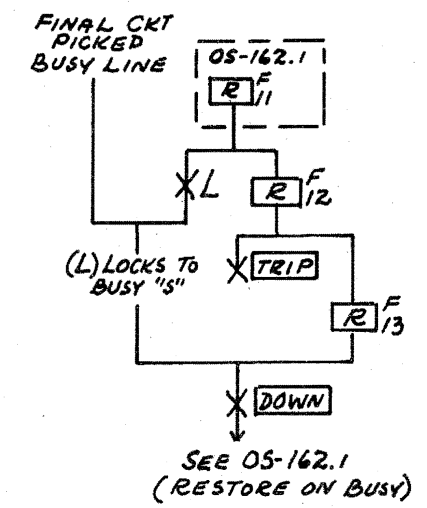
ES-239664-011 ISS. 40D FINAL SEL. CRT

TALKING
BUSY BACK
RELEASE (REGULAR)

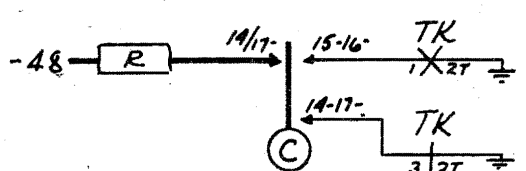
PANEL GCO

OS-163.

SEQUENCE CHART

[illegible]

- 11. PASS-BY
- 12. AWTG. (TK) RELAY
- 13. RETURN ON BUSY
- 14. TALKING
- 15. AWTG. "F"/INT. OR SUB'S RELEASE
- 16. " " " " "
- 17. BUSY BACK
- 18. RETURN
- 1. NORMAL



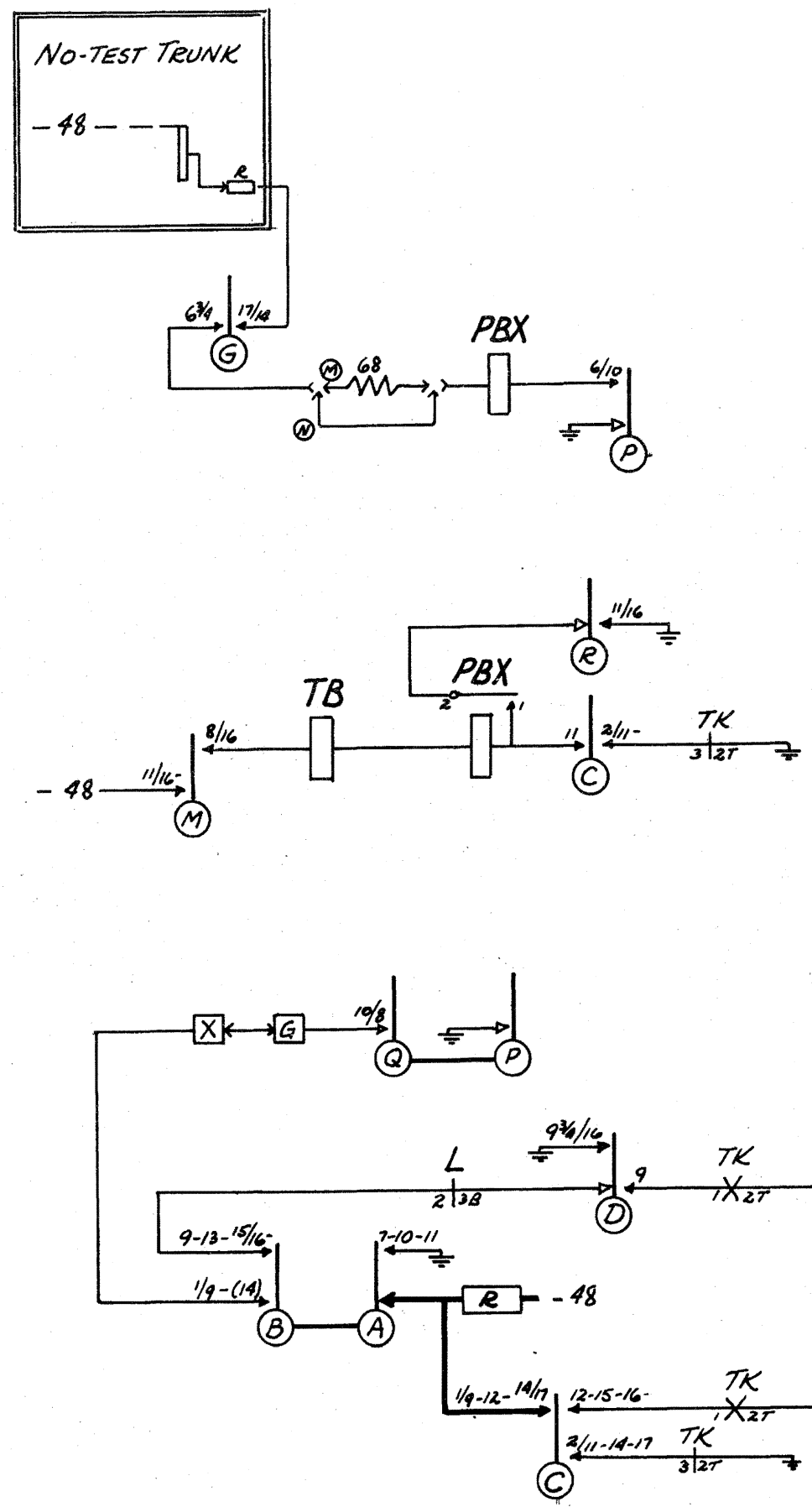
MISC. FEATURES:

- (1) DOUBLE CONNECTION ("K" WIRING)
- (2) TIME MEASURE RELEASE

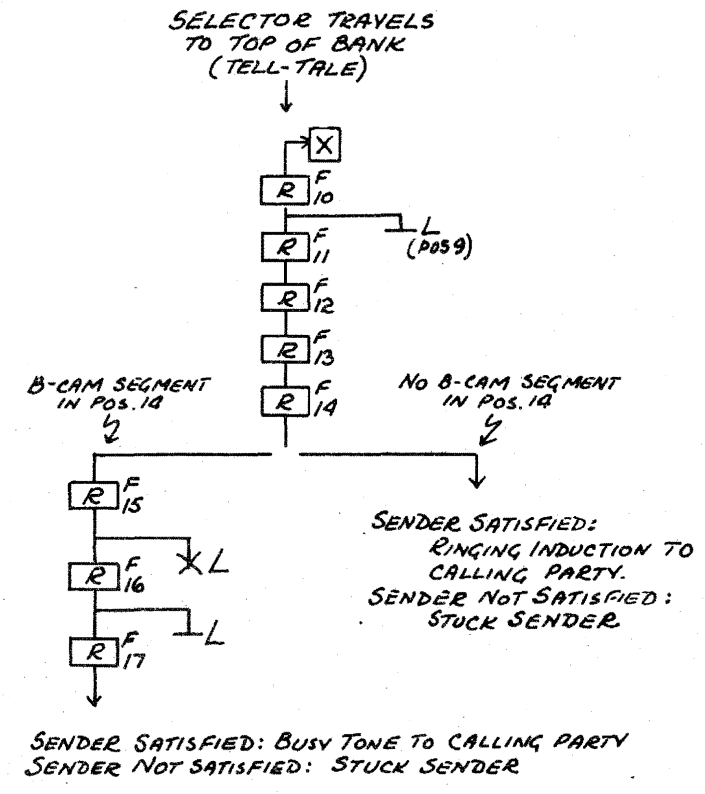
OS-164.

SEQUENCE CHART

FINAL SEL. CKT



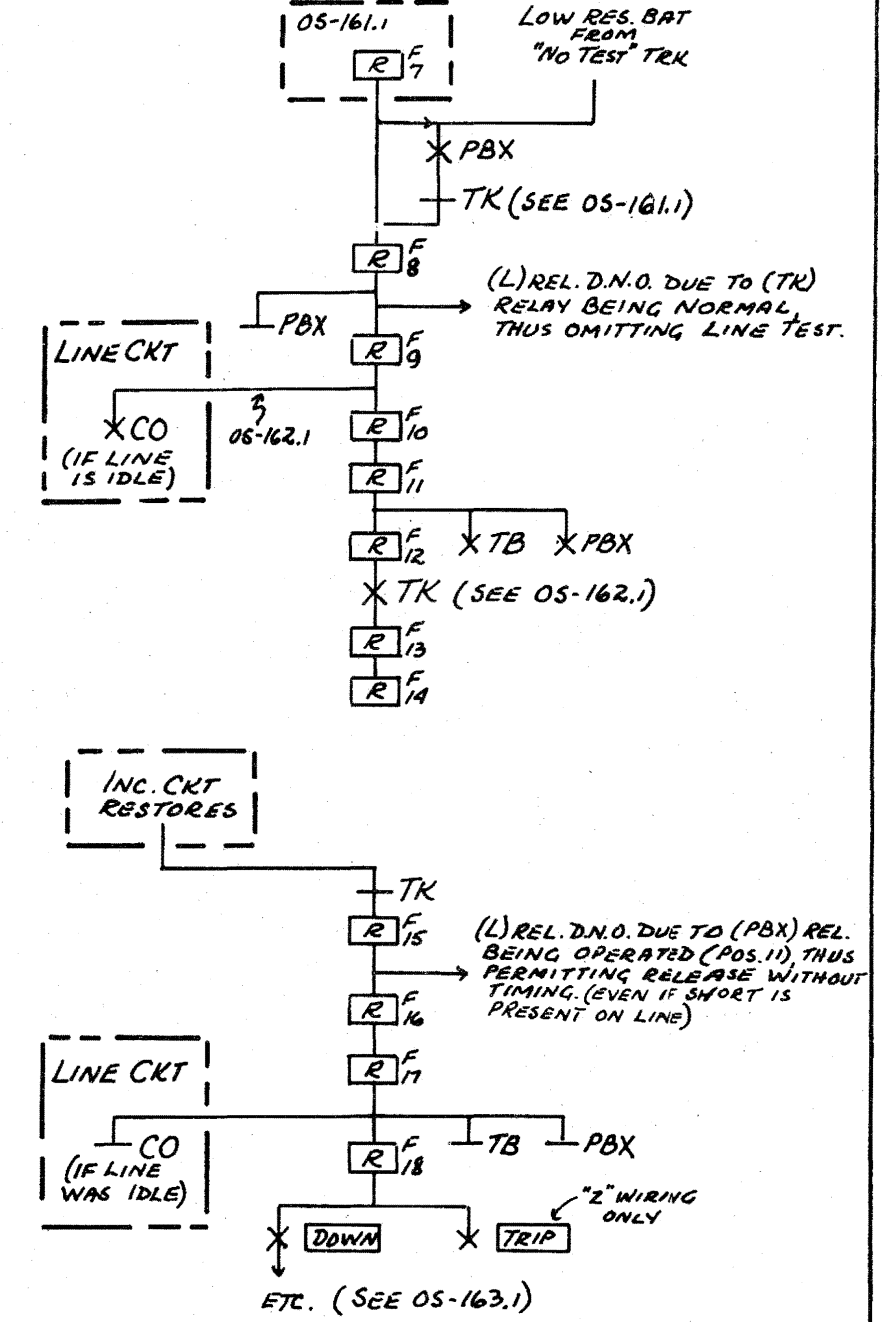
TELL-TALE



FINAL SEQ. SWITCH

1. NORMAL
2. BRUSH SELECTION
3. AWTG. SENDER
4. TENS SELECTION
5. AWTG. SENDER
6. UNITS SELECTION
7. NO TEST OR PASS-BY
8. AWTG. (L) RELAY
9. TESTING (PBX HUNT)
10. PASS-BY
11. PASS-BY (OPERATE PBX RELAY)
12. AWTG. (TK) RELAY
13. RETURN ON BUSY OR PREMATURE RELEASE
14. TALKING
15. AWTG. "F" INT. OR SUB'S RELEASE
16. " " " " " "
17. BUSY BACK
18. RETURN

NO-TEST



ES-239664-011 ISS. 400 FINAL SEL. CKT

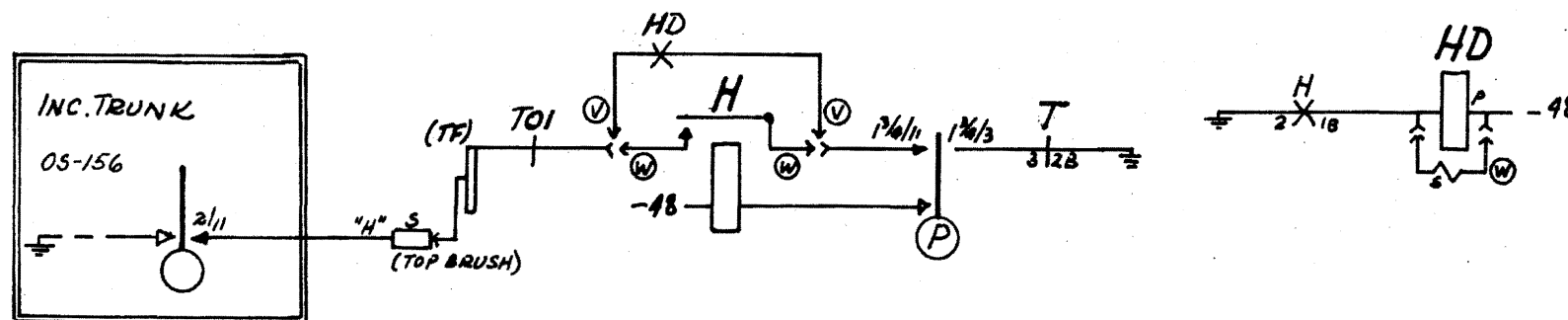
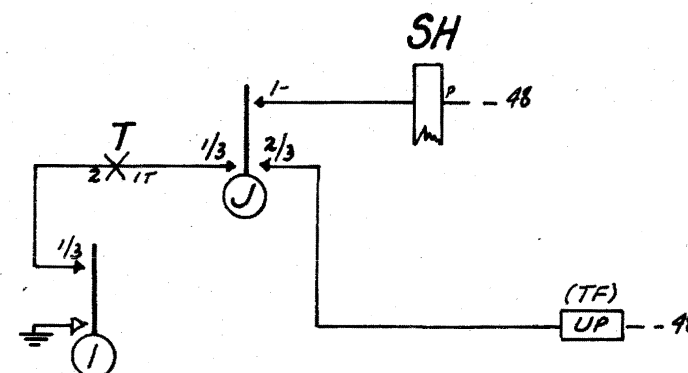
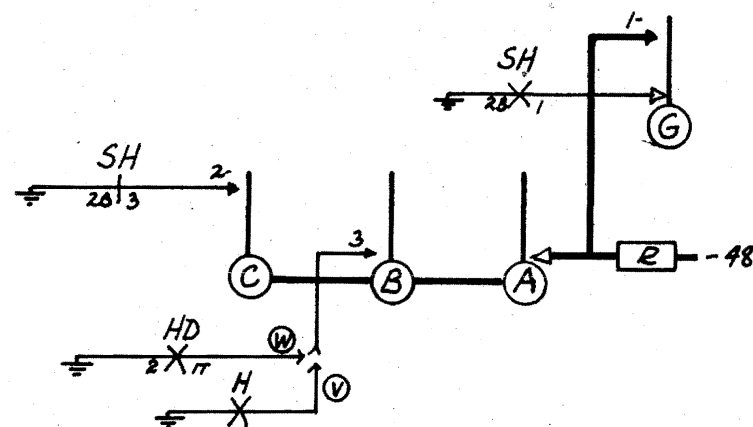
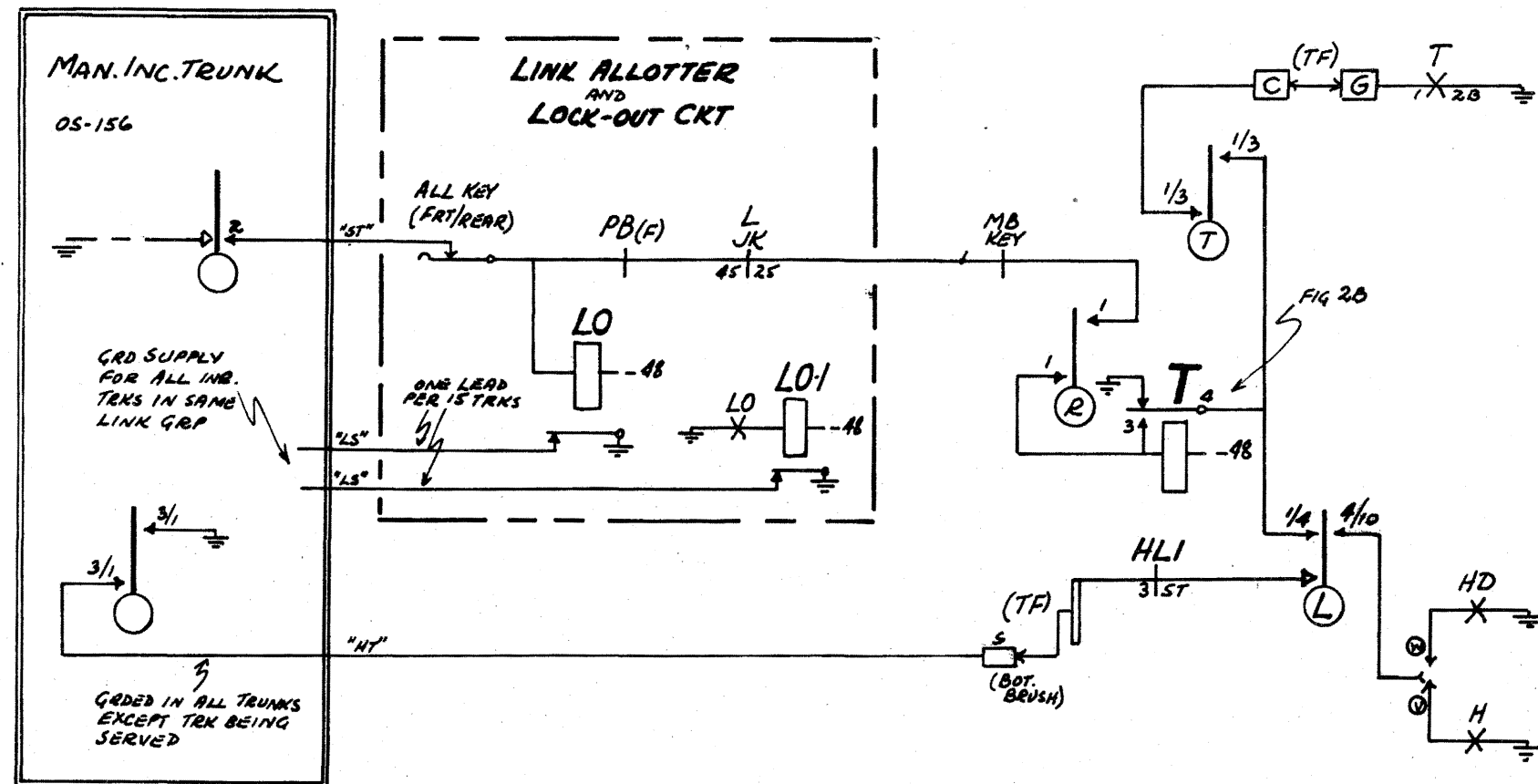
MISC. FEATURES:
(1) TELL-TALE
(2) NO-TEST

PANEL GCO

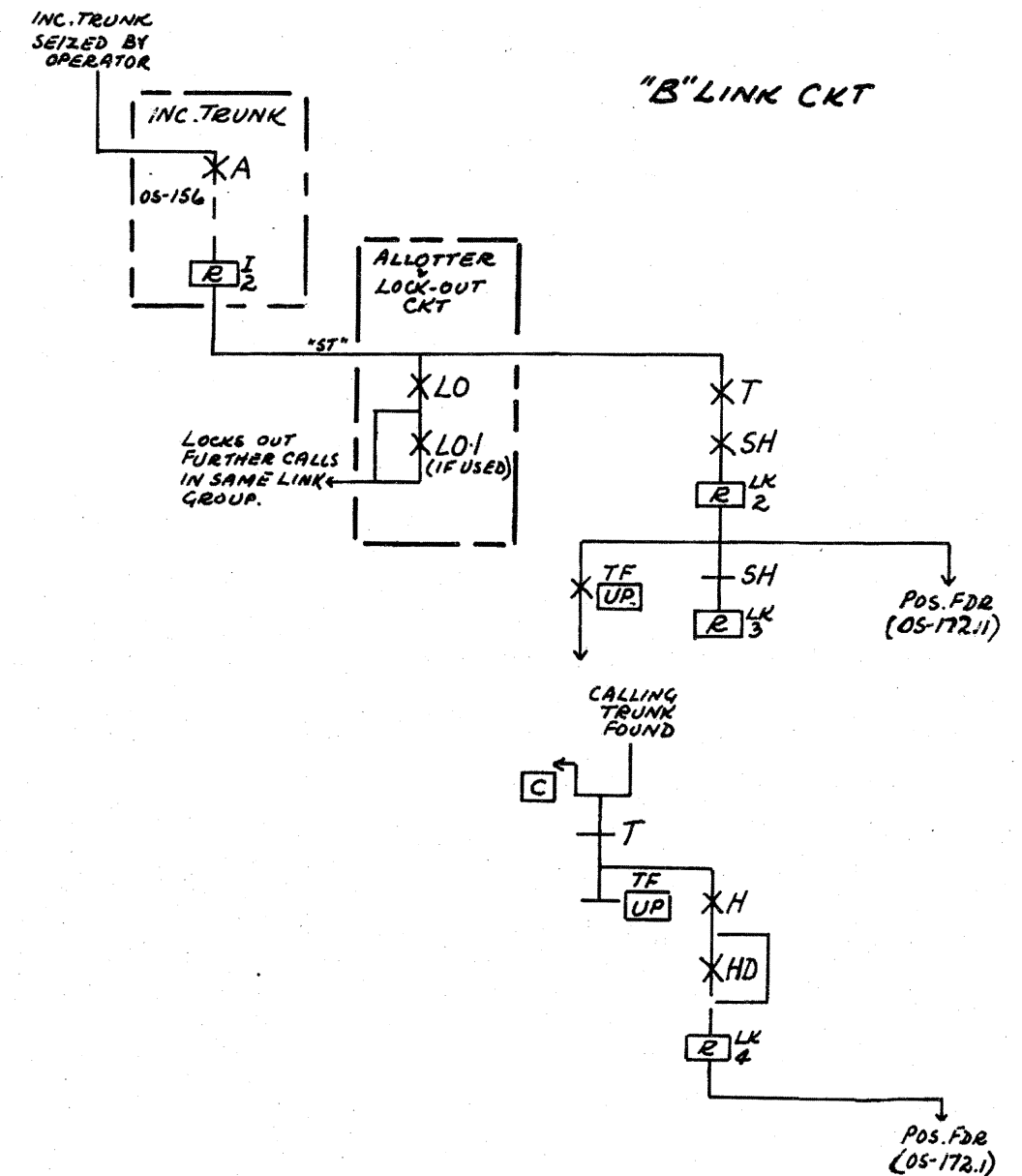
OS-165.1

ILL. BELL TEL. CO. - PLANT SCHOOL

"B" LINK CKT.



SEQUENCE CHART



LINK SEQ. SWITCH

1. NORMAL
2. PASS-BY
3. TRUNK HUNT
4. AWTG. POS. HUNT

INC. SEQ. SWITCH

1. NORMAL
2. AWTG. FINDER

SD-21801-011 1ss. 9-D LINK, LINK ALLOTTER

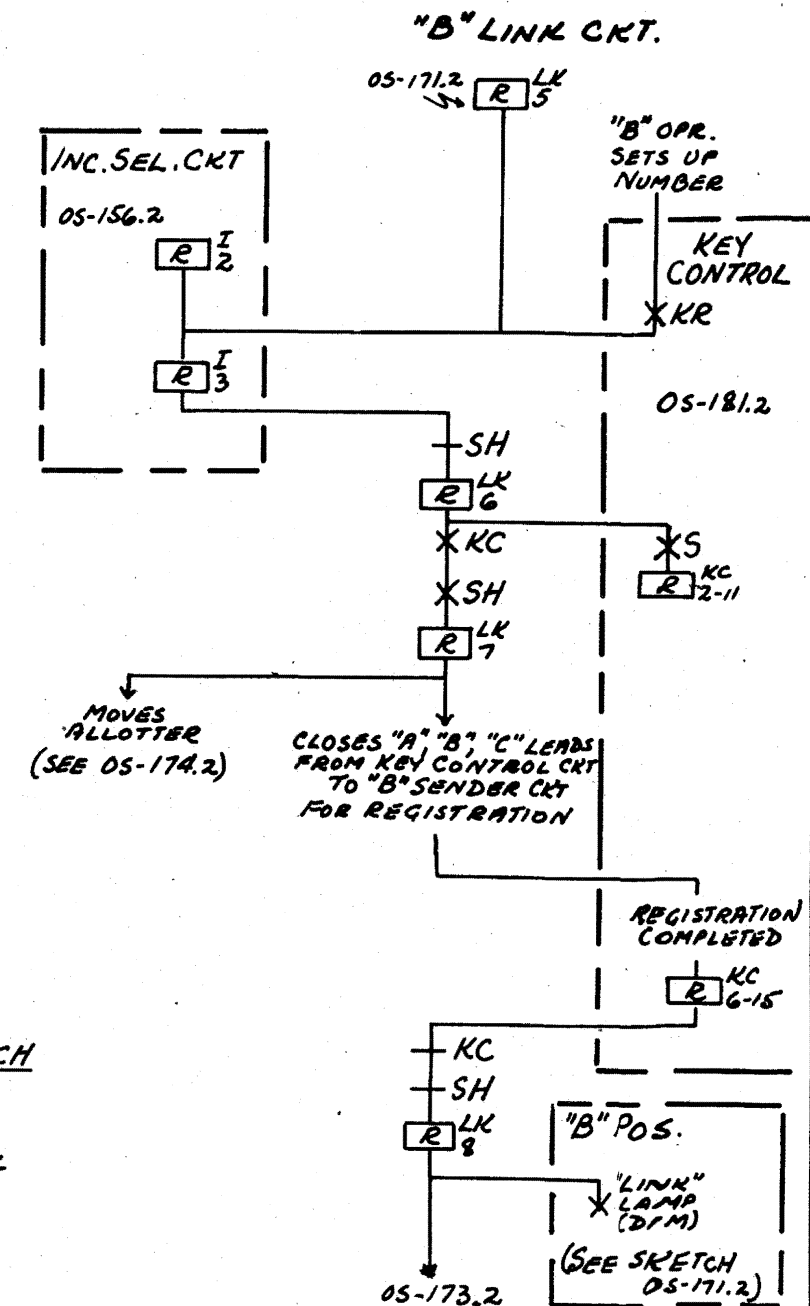
PDB
"B" LINK FINDS CALLING TRUNK

PANEL GCO

OS-171.1

ILL. BELL TEL. CO. - PLANT SCHOOL

SEQUENCE CHART



ST-51029-04 ISS. 17 "B" LINK - ALLOTTER

"B" LINK CUT THRU FOR
REGISTRATION

PANEL GCO

OS-172.2

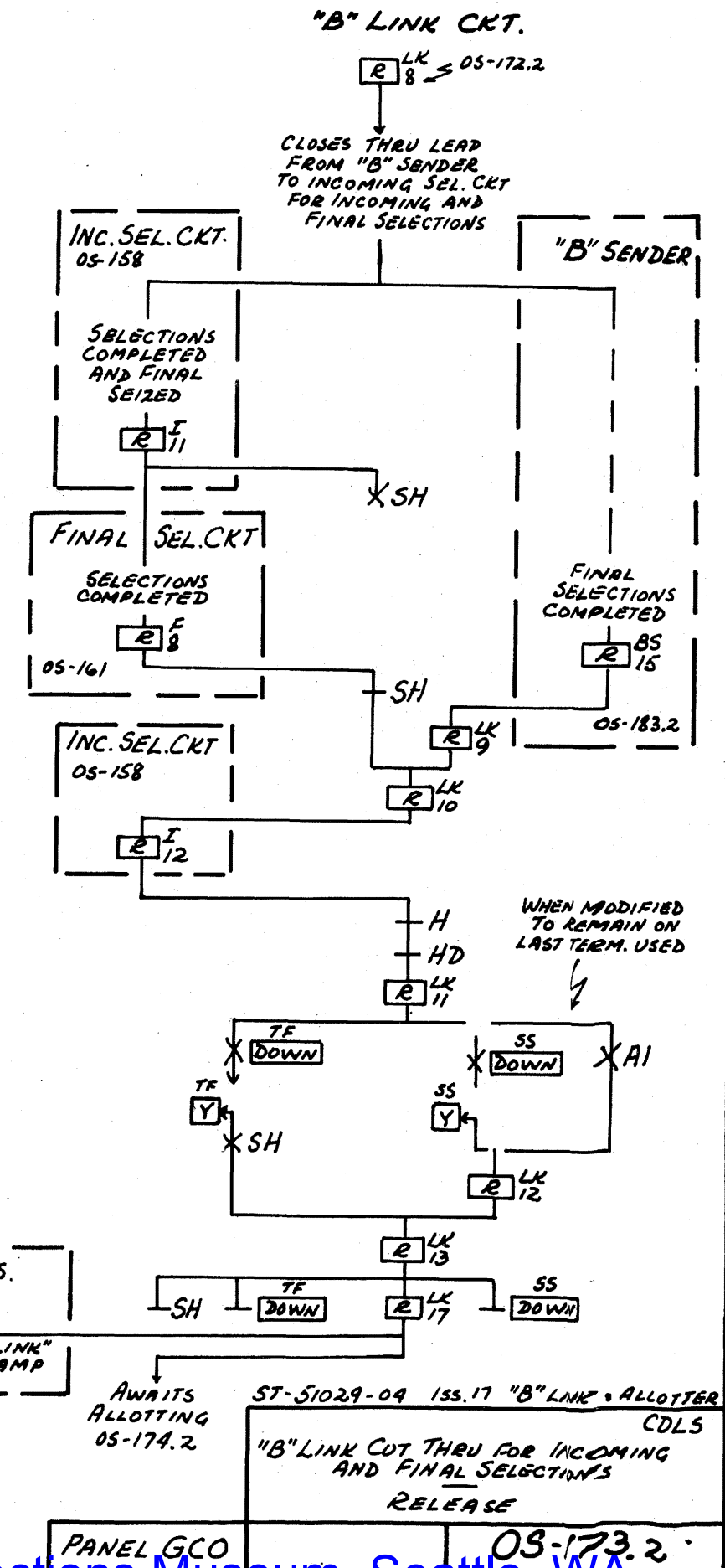
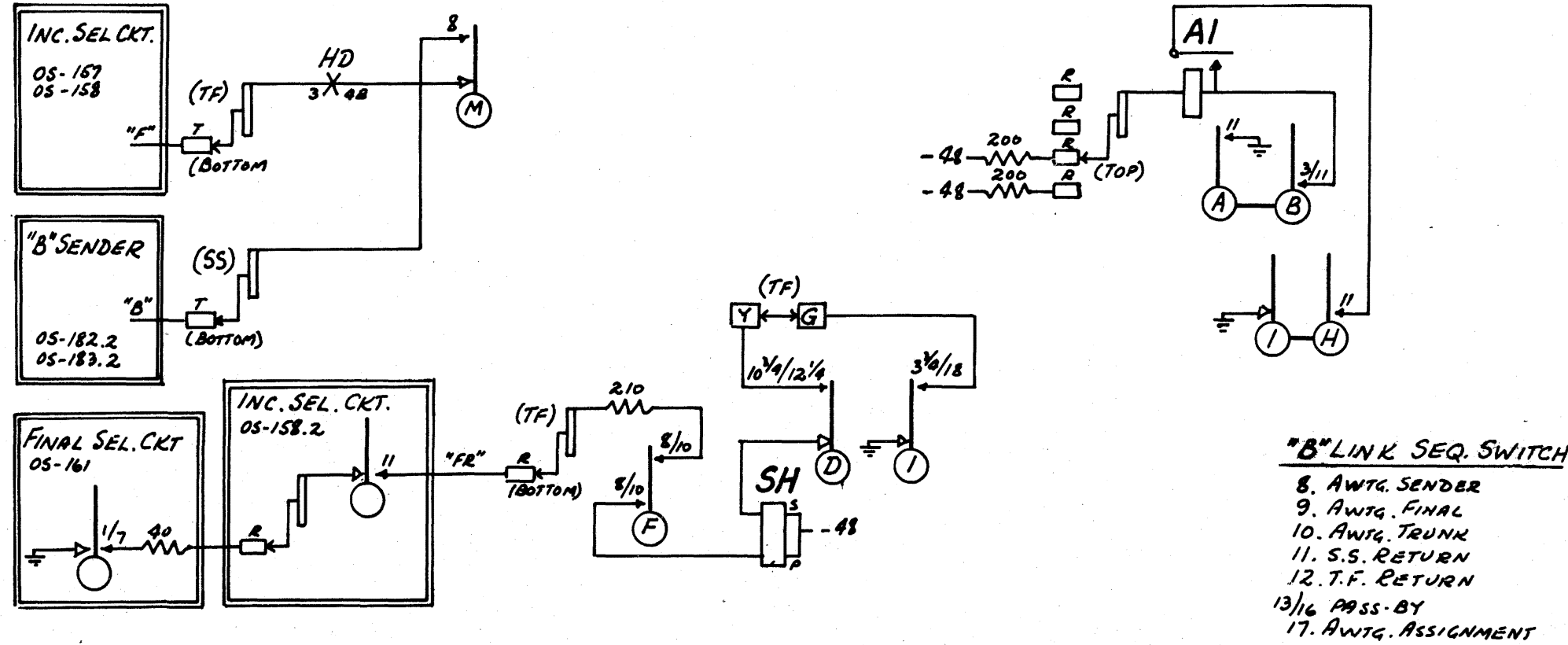
ISSUE	1
DATE	9-5-64
BY	HHG



"B" LINK CKT.

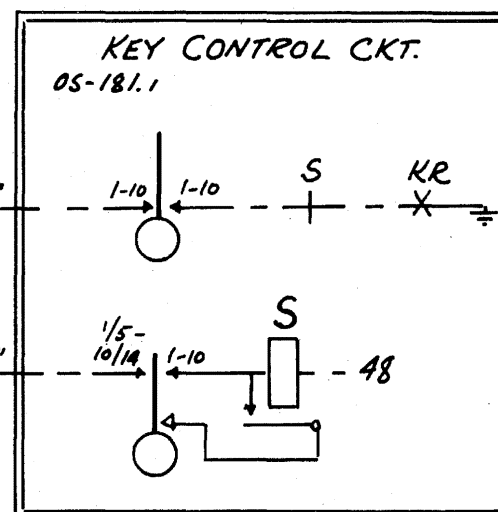
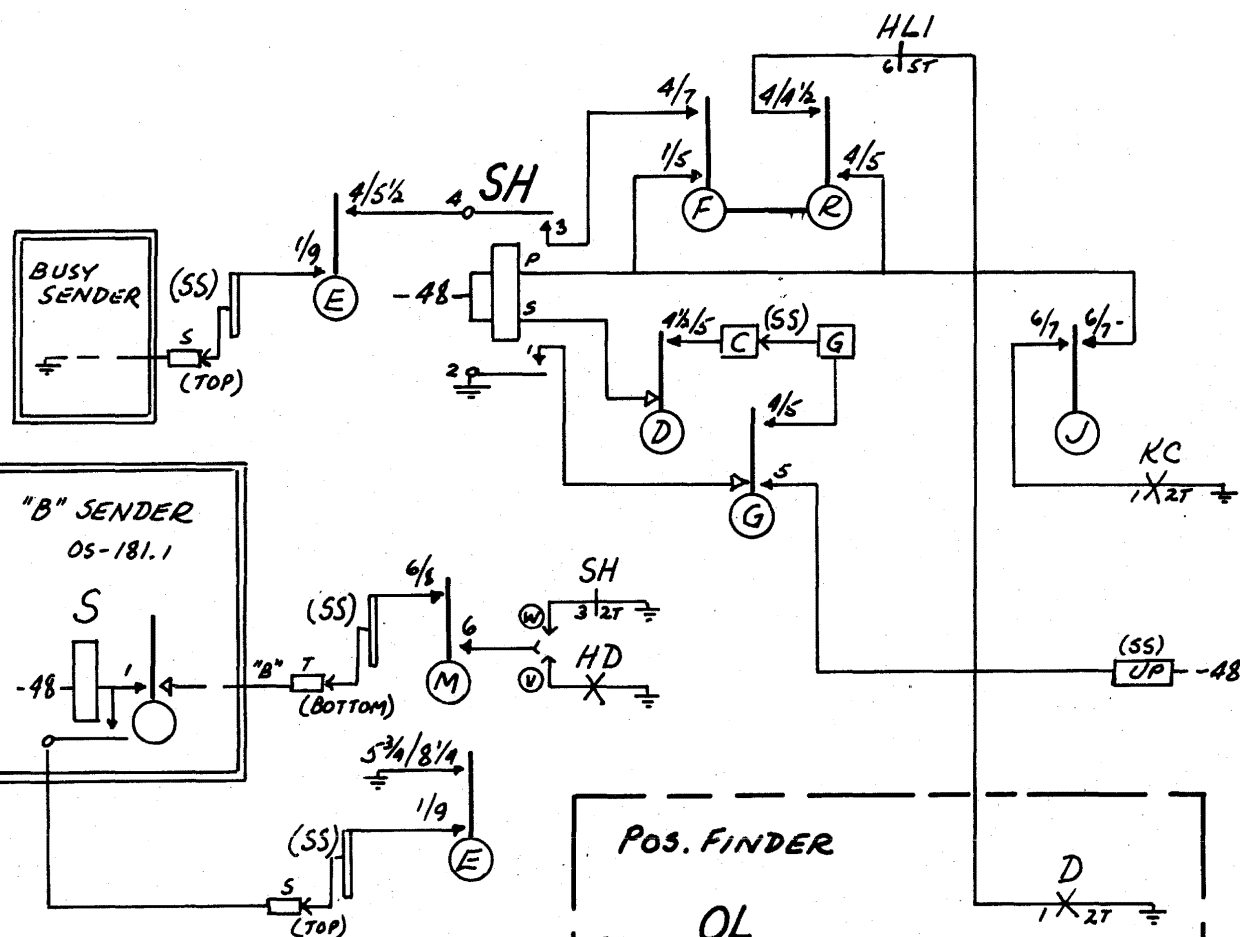
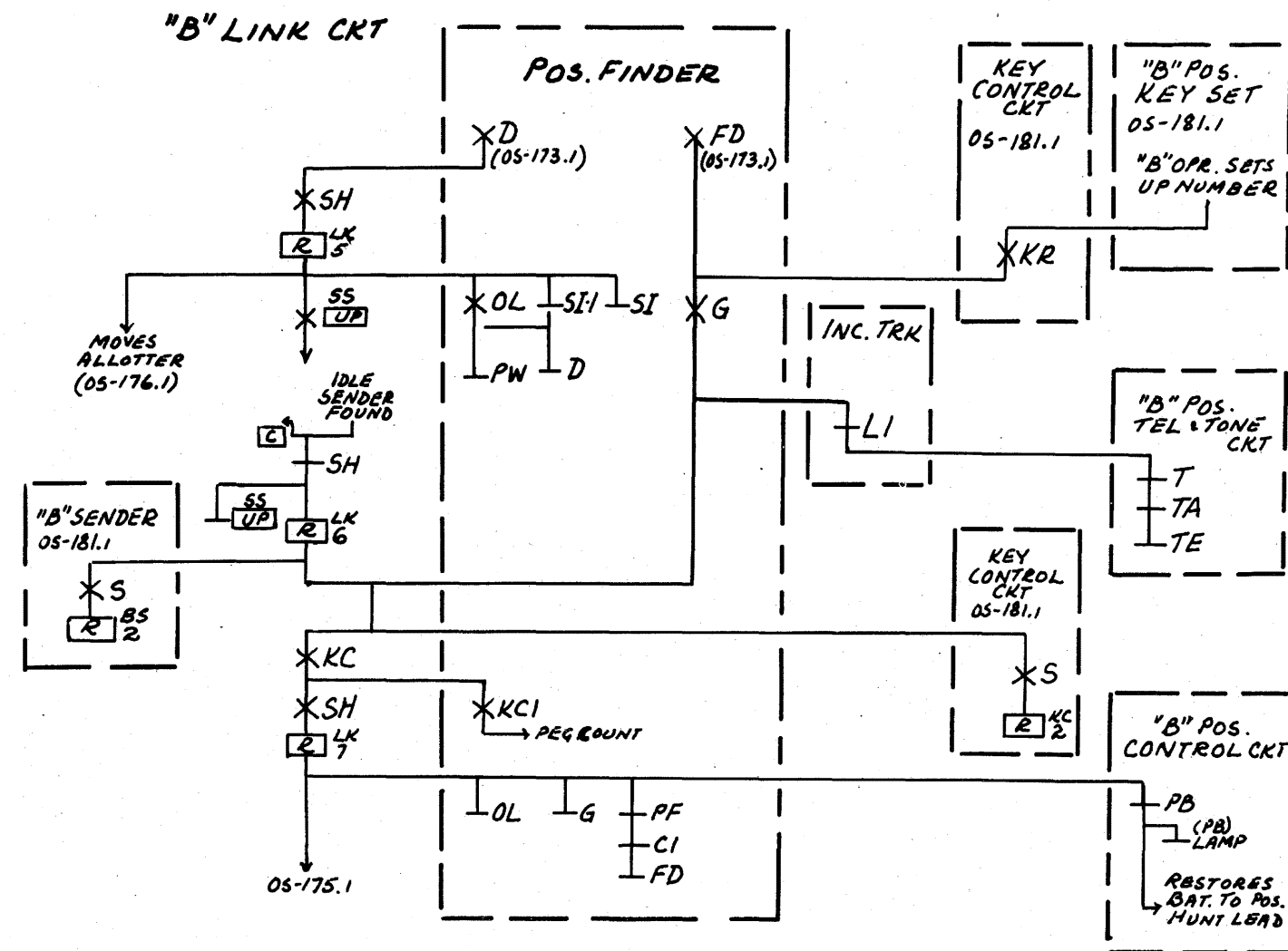
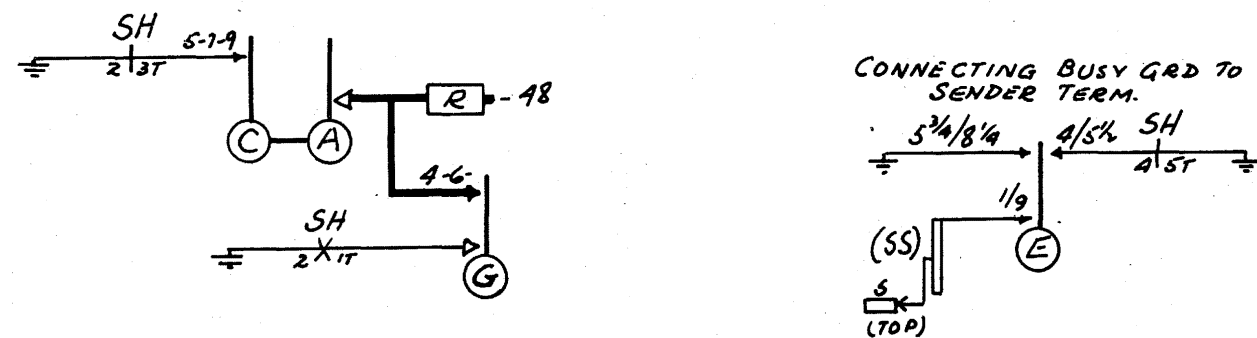
MICH. BELL TEL. CO. MODIFICATION
TO HAVE SDR. SEL. REMAIN ON
LAST SDR. TERM. USED

SEQUENCE CHART



"B" LINK CKT.

SEQUENCE CHART



"B" LINK SEQ. SWITCH
 4. AWTG. POS. HUNT
 5. SENDER HUNT
 6. AWTG. (KC) RELAY
 7. AWTG. KEY CONTROL

SD-21801-011 ISS. 9D LINK & LINK ALLOTTER
 PDB
 "B" LINK FINDS IDLE "B" SENDER
 KEY CONTROL CKT SEIZED

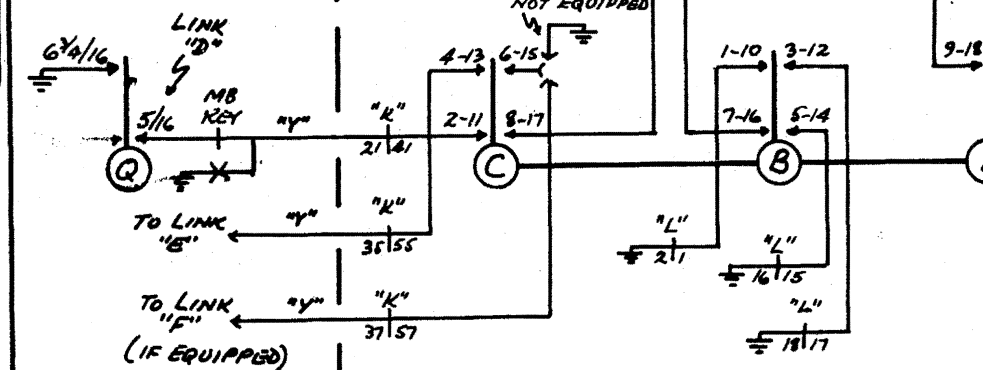
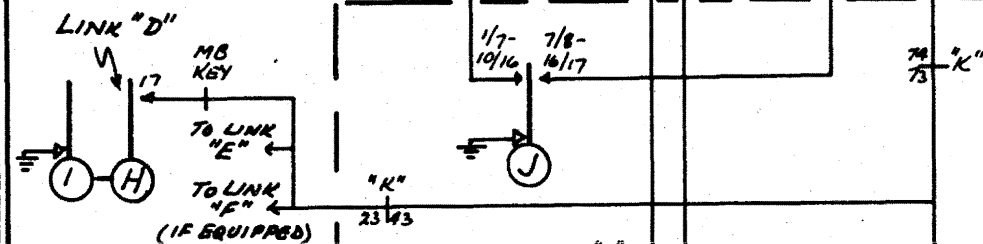
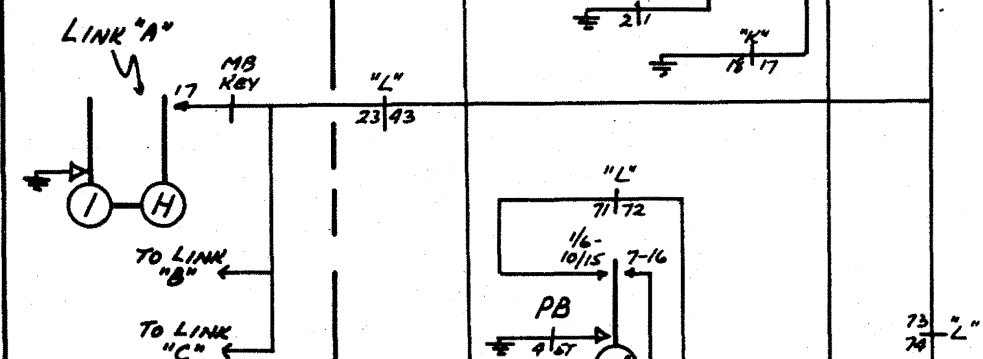
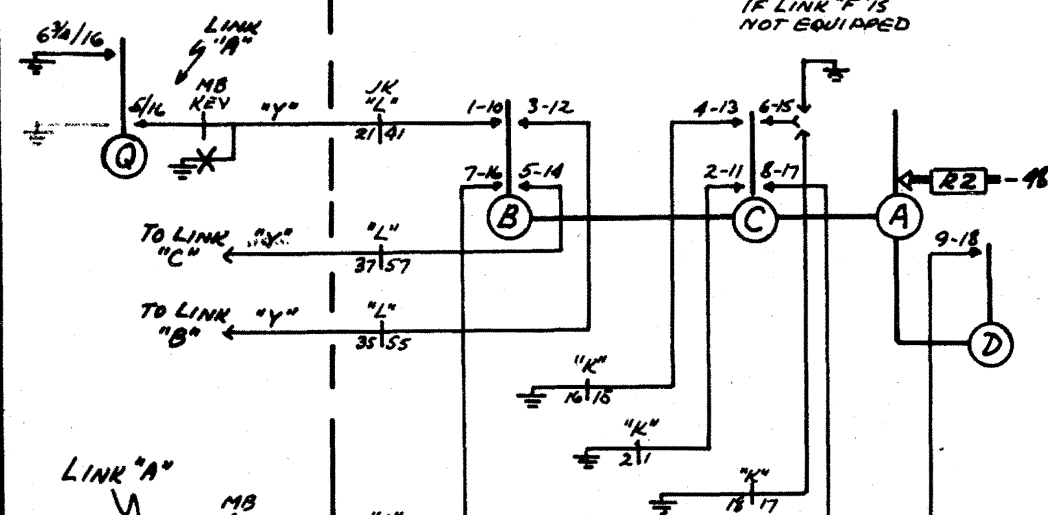
PANEL GCO

OS-174.1

MOVING ALLOTTERS

"B" LINKS

FRONT ALLOTTER



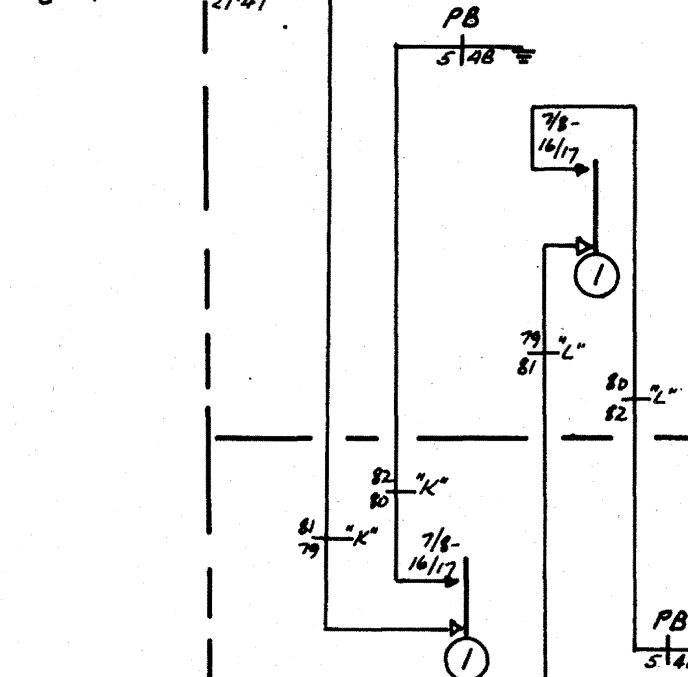
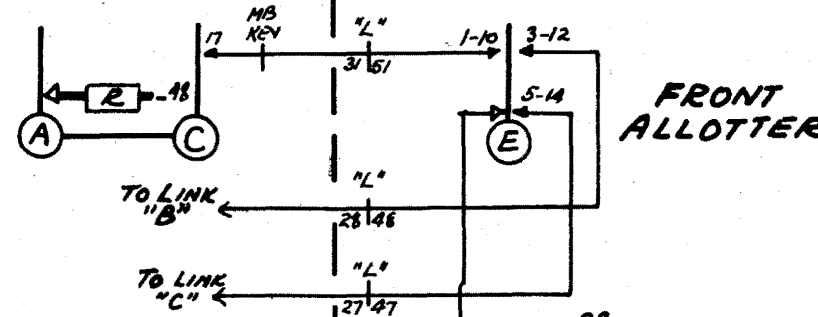
REAR ALLOTTER

"L" JACK FRONT ALLOTTER
"K" JACK REAR ALLOTTER

ALLOTING LINKS

"B" LINKS

FRONT ALLOTTER



REAR ALLOTTER

SEQUENCE CHART

ALLOTTER		LINK					
FRONT	REAR	"F"	"E"	"D"	"C"	"B"	"A"
R2 1-10	R1 17-8						R LK 7
R2 2-11							
R2 3-12							R LK 7
							R LK 7
R2 4-13							
R2 5-14							
							R LK 7
R2 6-15							R LK 7
R2 7-16							
							GRD FROM ANY LINK IN POS 17
R2 8-17	R1 18-9						
	R1 1-10						
	R1 2-11						R LK 7
							R LK 7
	R1 3-12						
	R1 4-13						R LK 7
							R LK 7
	R1 5-14						
	R1 6-15						R LK 7
							R LK 7
	R1 7-16						
							GRD FROM ANY LINK IN POS 17
R2 9-18							
R2 10-1							
	R1 8-17						R LK 7

NOTE: SEQUENCE SHOWN IS THAT FOR BOTH ALLOTTERS IN SERVICE AND ALL LINKS EQUIPPED AND AVAILABLE.

ALLOTTER SEQ. SWITCHES

FRONT (R2) REAR (R1)
1-10 ASSIGN LINK 1 (A) 2-11 ASSIGN LINK 2 (D)
3-12 " " 3 (B) 4-13 " " 4 (E)
5-14 " " 5 (C) 6-14 " " 6 (F)
7-16 MOVE OTHER ALLOTTER
8-17 AWTG. " "
9-18 ALL SDR. SELS. BUSY

ST-51029-04 ISS. 17 "B" LINKS ALLOTTER

ALLOTING OF LINKS
AND
MOVING ALLOTTERS

PANEL GCO

05-174.2

ISSUE	1				
DATE	9-54				
BY	CHH				

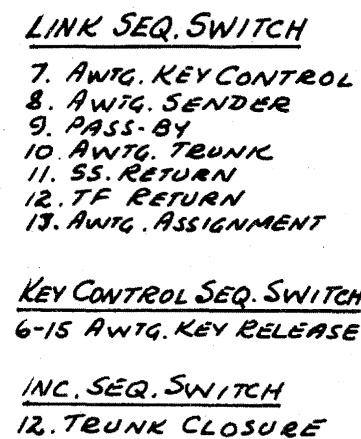


Diagram illustrating the electrical connections and logic for the "B" SENDER (OS-184.1) and related components.

Key Components and Connections:

- KEY CONTROL (OS-181.1):** Provides a signal to the "B" SENDER.
- REGISTRATION COMPLETED (KC 6-15):** Signal from the registration process.
- "B" SENDER (OS-184.1):** The central component being tested.
- INC. TEK (OS-158):** Incremental Tektonics unit.
- TF DOWN, SS DOWN:** Test Function and Stop Signal indicators.
- TF Y, SS Y:** Test Function and Stop Signal relays.
- SH, XSH:** Selection and X-Selection relays.
- LK 7, LK 9, LK 10, LK 12, LK 13, LK 17:** Linkage points.
- BS 15, BS 1:** Binary Switches.
- HD, H:** Hand/Head indicators.
- AWAITS REASSIGNMENT (OS-176.1):** Signal for reassignment.
- PANEL GCO (OS-175.1):** Panel Ground Control.

Logic Flow:

- KEY CONTROL (OS-181.1) leads to REGISTRATION COMPLETED (KC 6-15).
- REGISTRATION COMPLETED (KC 6-15) leads to KC.
- KC leads to SH (LK 9) and XSH (LK 9).
- SH (LK 9) leads to SH (LK 10).
- SH (LK 10) leads to INC. TEK (OS-158).
- INC. TEK (OS-158) leads to BS 12.
- BS 12 leads to H (LK 11).
- H (LK 11) leads to TF DOWN and SS DOWN.
- TF DOWN leads to TF Y.
- SS DOWN leads to SS Y.
- TF Y leads to XSH.
- SS Y leads to LK 12.
- XSH leads to LK 13.
- LK 12 leads to LK 13.
- LK 13 leads to SH (LK 17).
- SH (LK 17) leads to AWAITS REASSIGNMENT (OS-176.1).
- AWAITS REASSIGNMENT (OS-176.1) leads to PANEL GCO (OS-175.1).

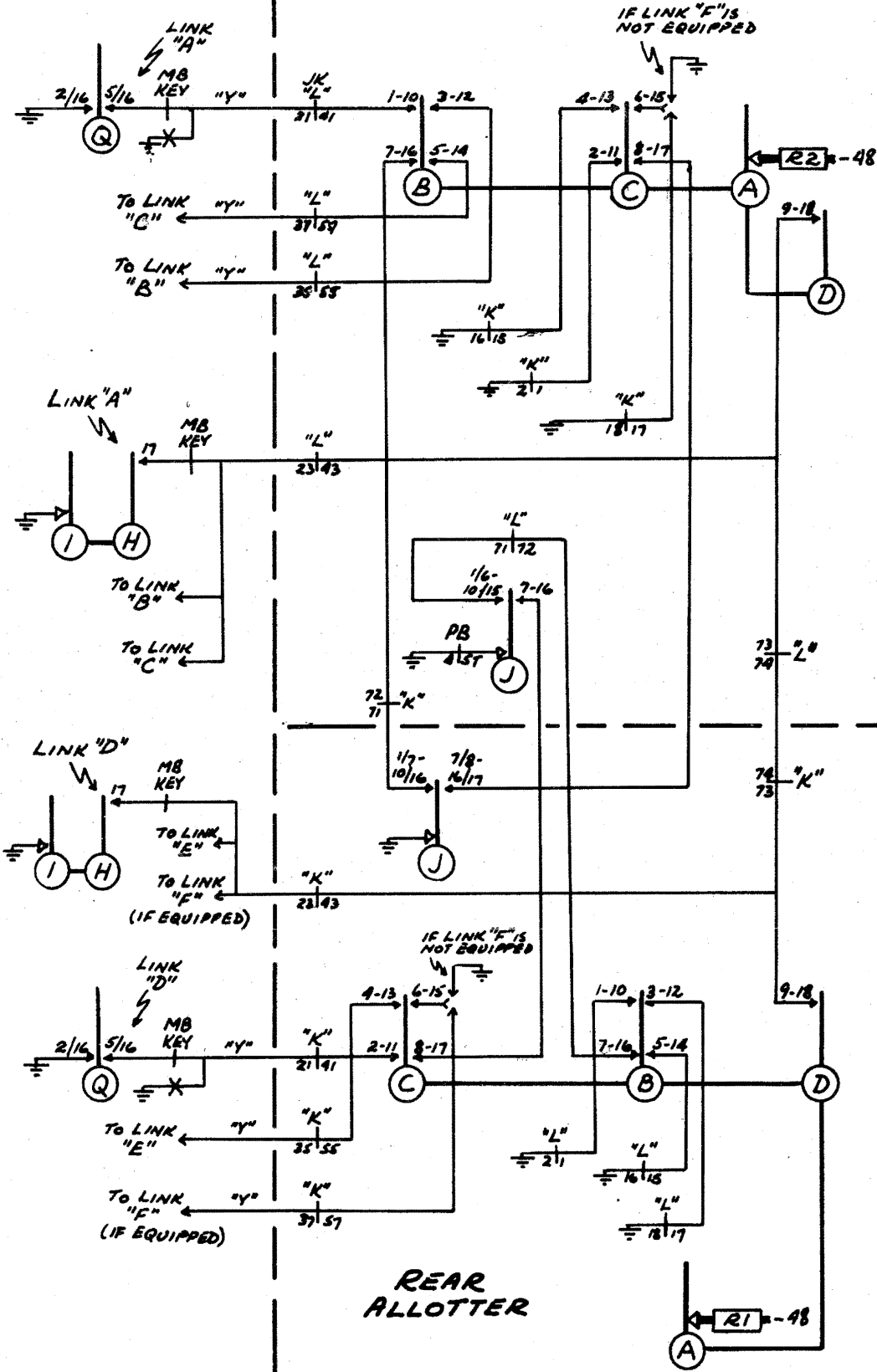
Notes:

- CLOSES THRU "A" "B" "C" LEADS FROM KEY CONTROL TO "B" SENDER FOR TRANSMITTAL OF BAT. AND GRD PULSES TO REGISTER CALLED NUMBER
- CLOSES THRU LEAD FROM "B" SDR TO INCOMING CRT FOR INCOMING AND FINAL SELECTIONS
- "B" LINK CUT THRU DURING PDB REGISTRATION AND SELECTIONS RELEASE

MOVING ALLOTTERS

"B" LINKS

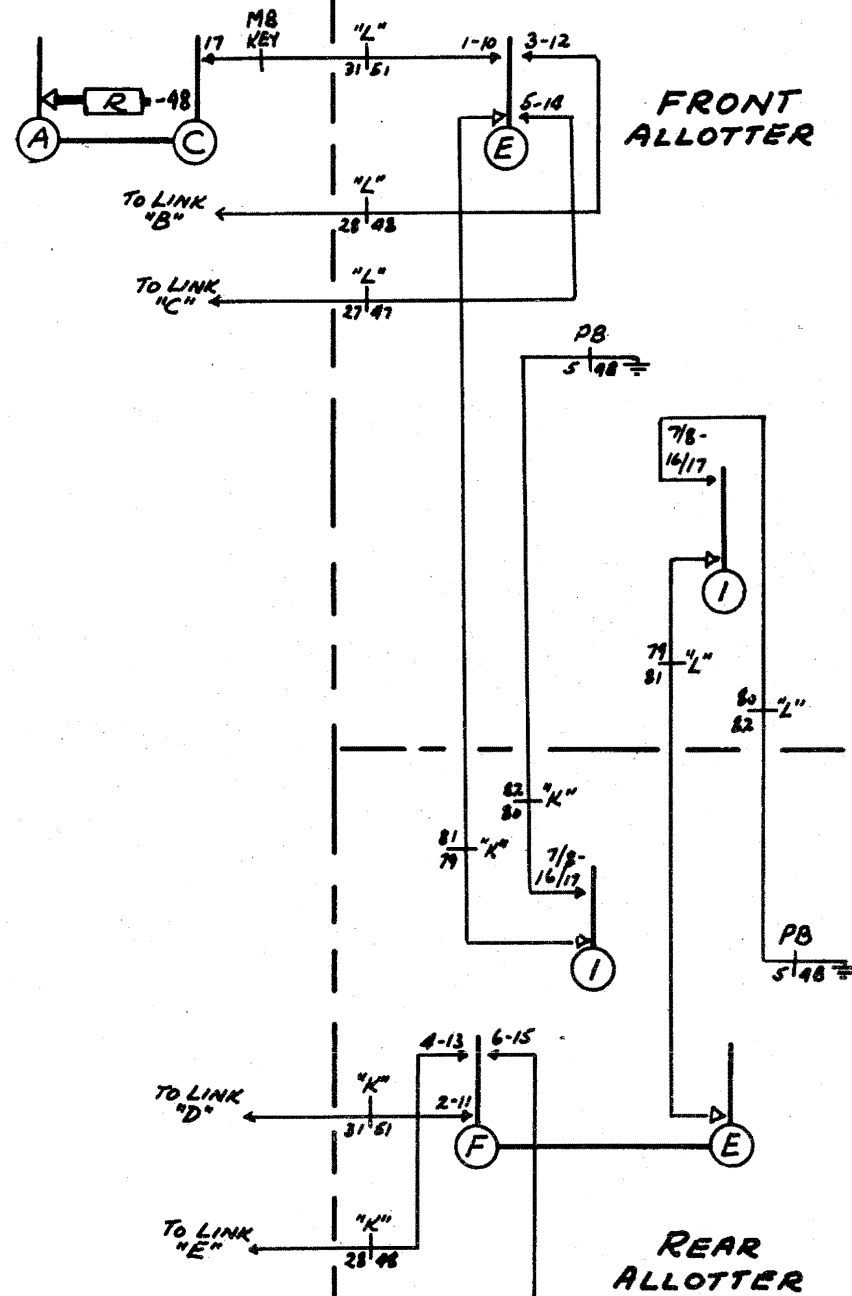
**FRONT
ALLOTTER**



"L" JACK FRONT ALLOTTER
"K" JACK REAR ALLOTTER

ALLOTING LINKS

"B" LINKS



SEQUENCE CHART

ALLOTTER		LINKS					
FRONT	REAR	"F"	"E"	"D"	"C"	"B"	"A"
R2 1-10	R1 17-8						R LK 5
R2 2-11							
R2 3-12							
						R LK 1	
						R LK 5	
R2 4-13							
R 5-14							
					R LK 1		
					R LK 5		
R2 6-15							
R2 7-16							
	R1 18-9	GRD FROM ANY LINK IN POS 17					
	R1 1-10						
R2 8-17	R1 2-11						
				R LK 1			
				R LK 5			
	R1 3-12						
	R1 4-13						
				R LK 1			
				R LK 5			
	R1 5-14						
	R1 6-15						
				R LK 1			
				R LK 5			
	R1 7-16						
R2 9-18		GRD FROM ANY LINK IN POS 17					
R2 10-1							
	R1 8-17						

NOTE: BOTH ALLOTTERS ASSUMED IN SERVICE AND ALL LINKS ASSUMED AVAILABLE

ALLOTTER SEQ. SWITCHES
 1-10 ASSIGN LINK 1 (A)
 2-11 " " 2 (B)

NOTE: BOTH ALLOTTERS
ASSUMED IN SERVICE
AND ALL LINKS
ASSUMED AVAILABLE

ALLOTTER SEQ. SWITCHES

1-10 ASSIGN LINK 1 (A)
2-11 " " 2 (B)
3-12 " " 3 (B)
4-13 " " 4 (E)
5-14 " " 5 (C) OR PASS-BY
6-15 " " 6 (F) " " "
7-16 MOVE OTHER ALLOTTER
8-17 AWTG. OTHER AL LOTTER
9-18 ALL SDR SELL. BUSY

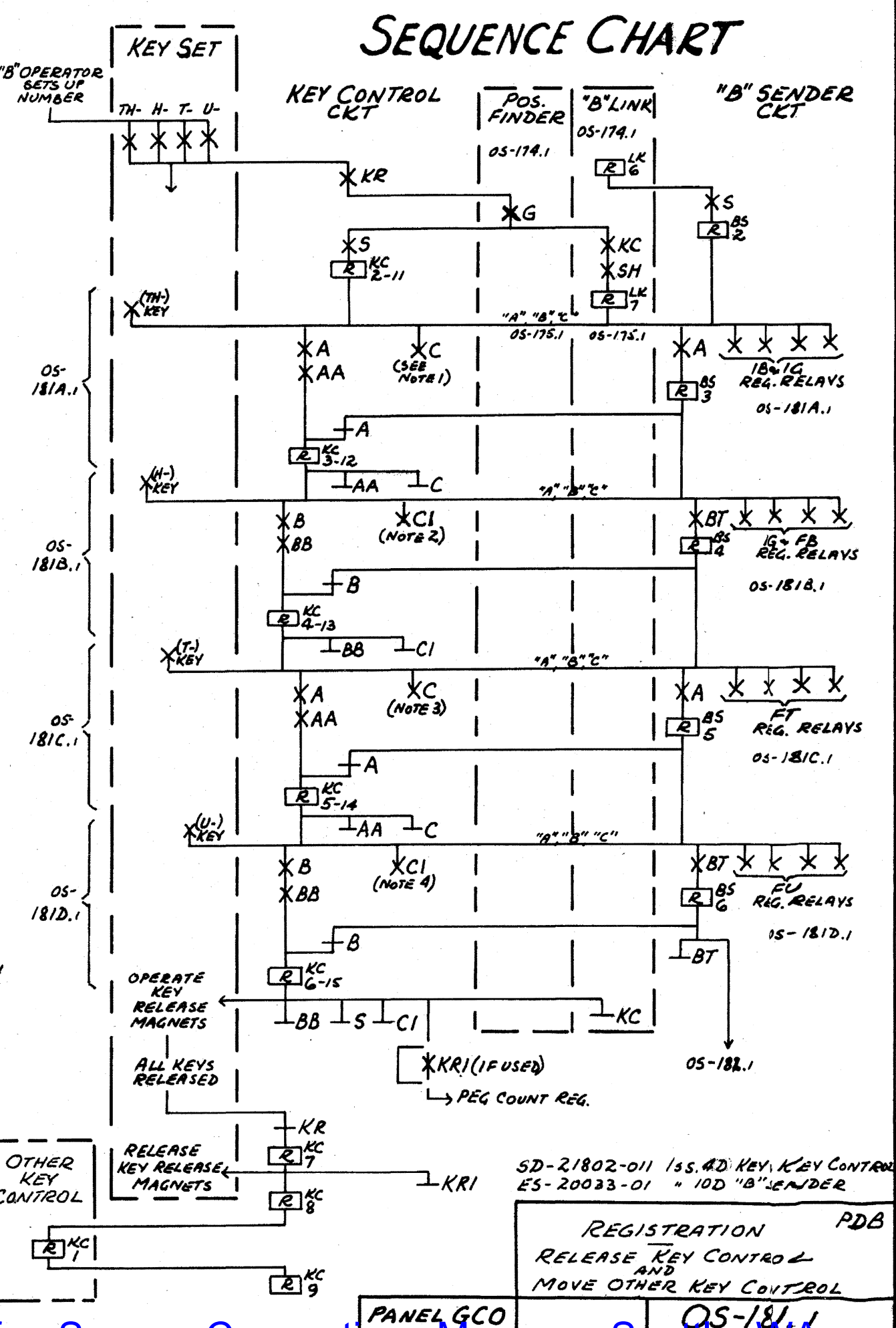
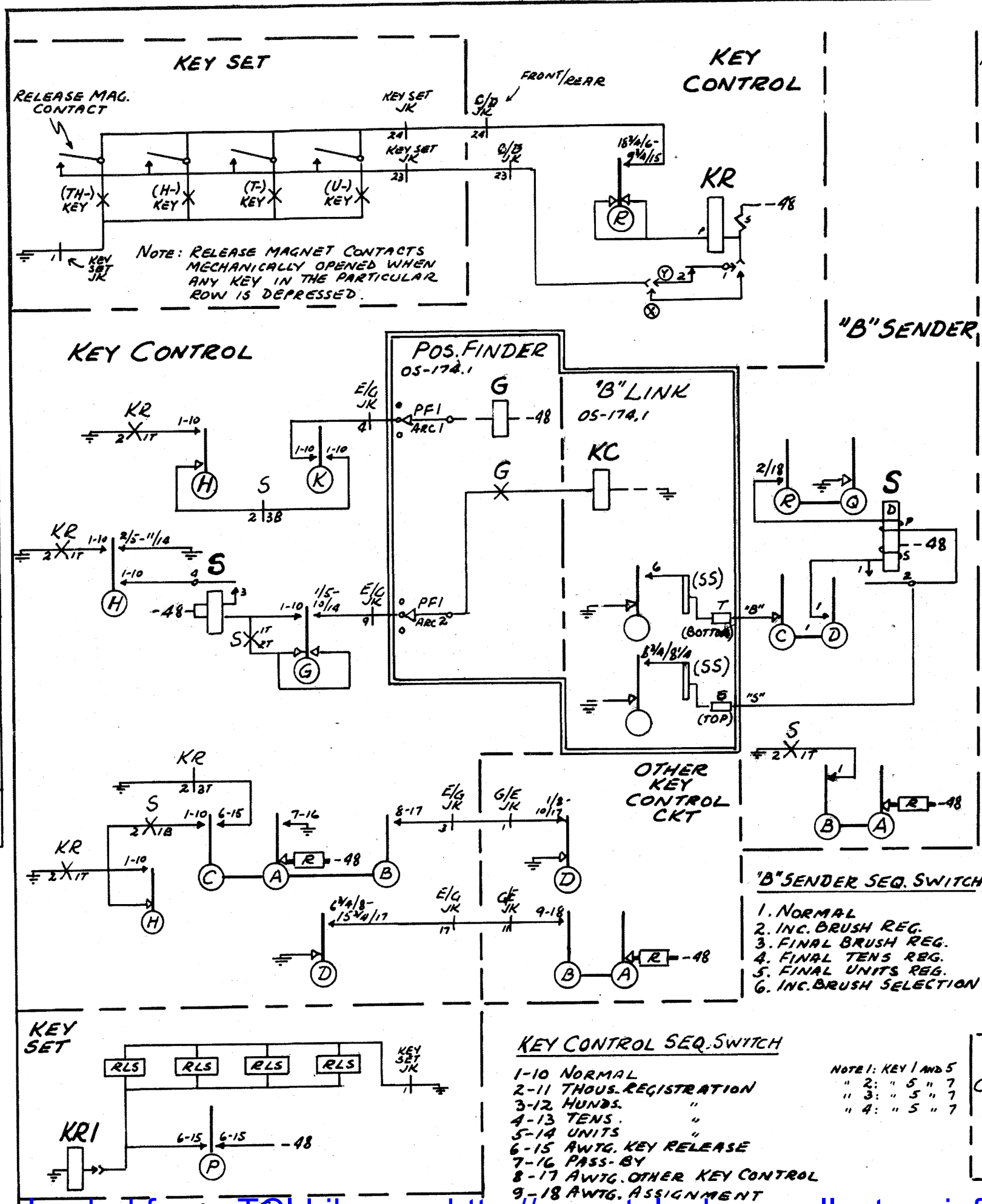
SD 21801-011 ISS. 9D LINK LINK
ALLOTTER
PDB

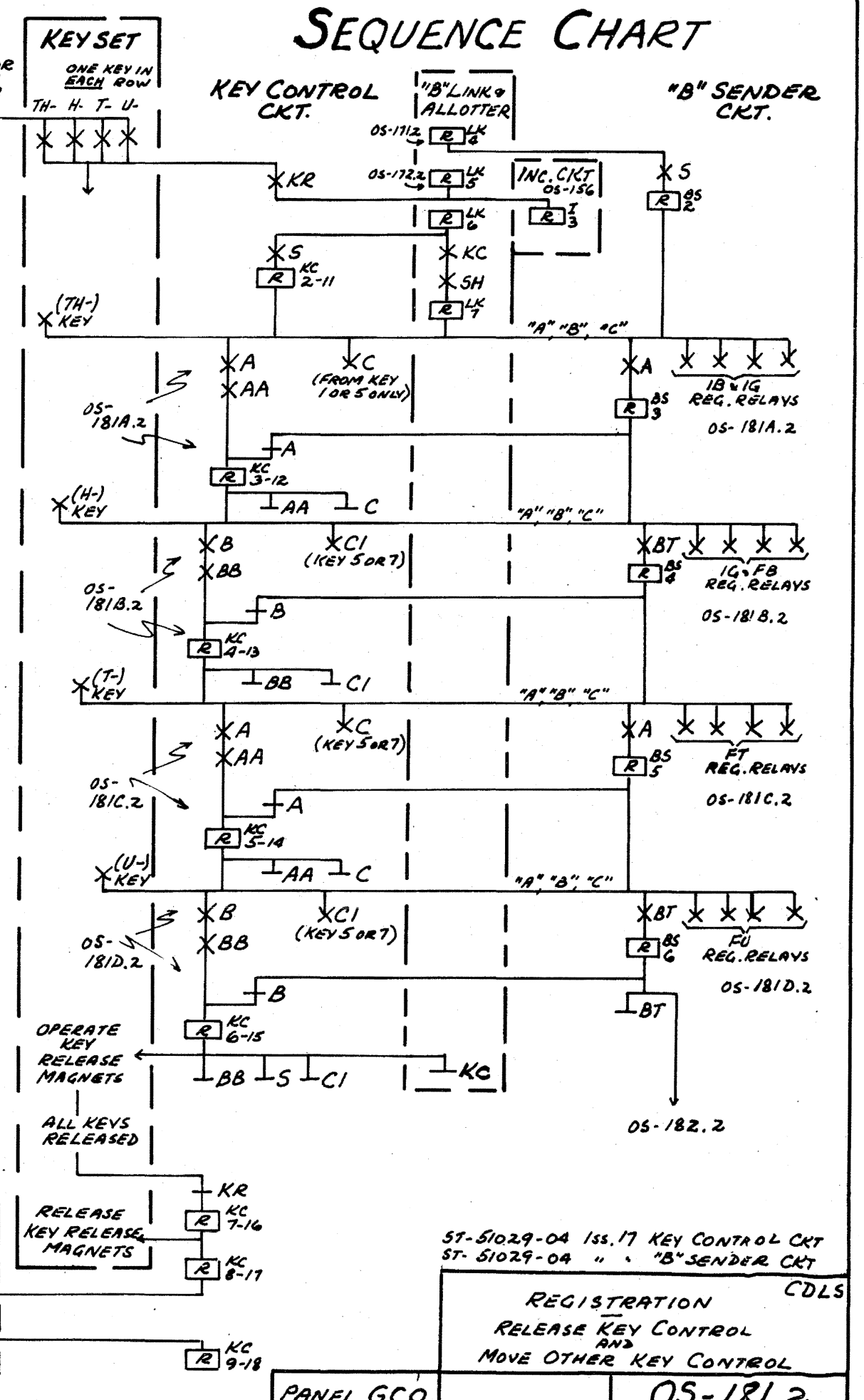
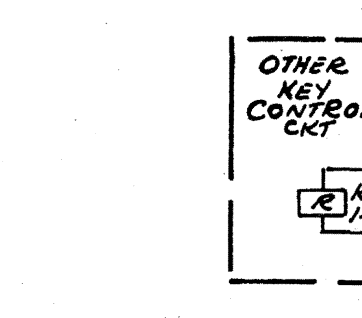
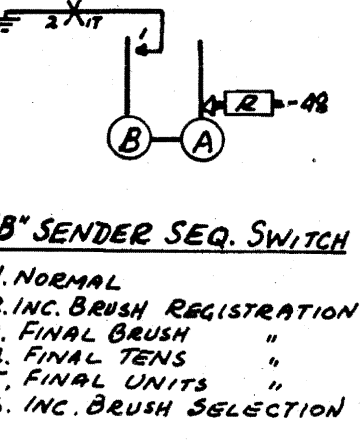
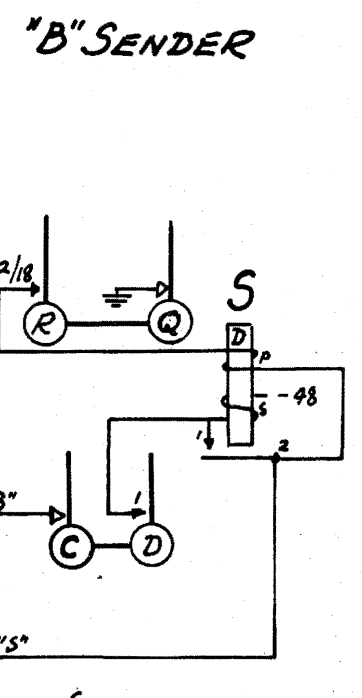
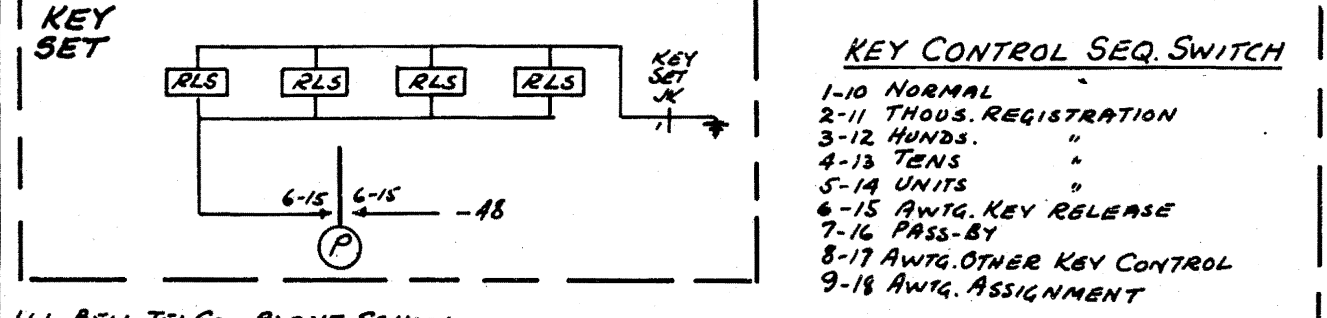
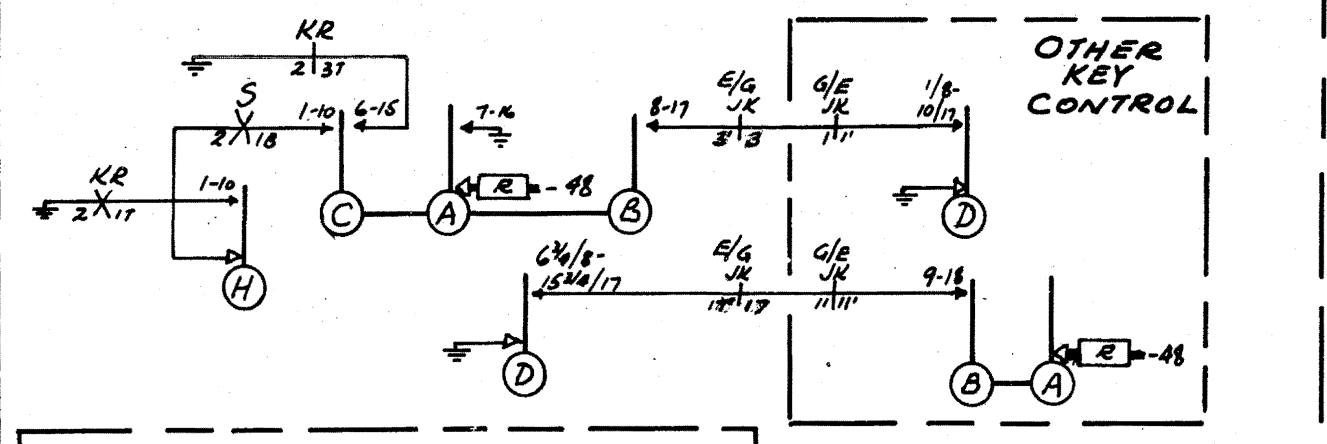
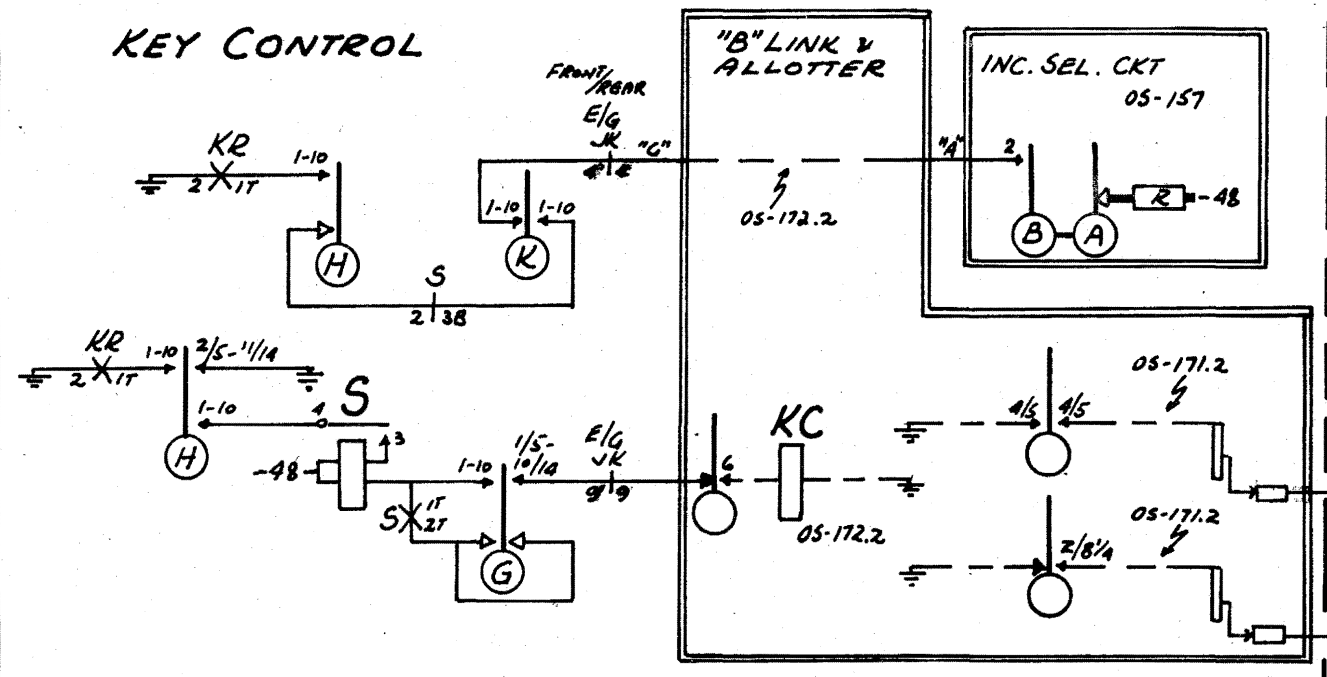
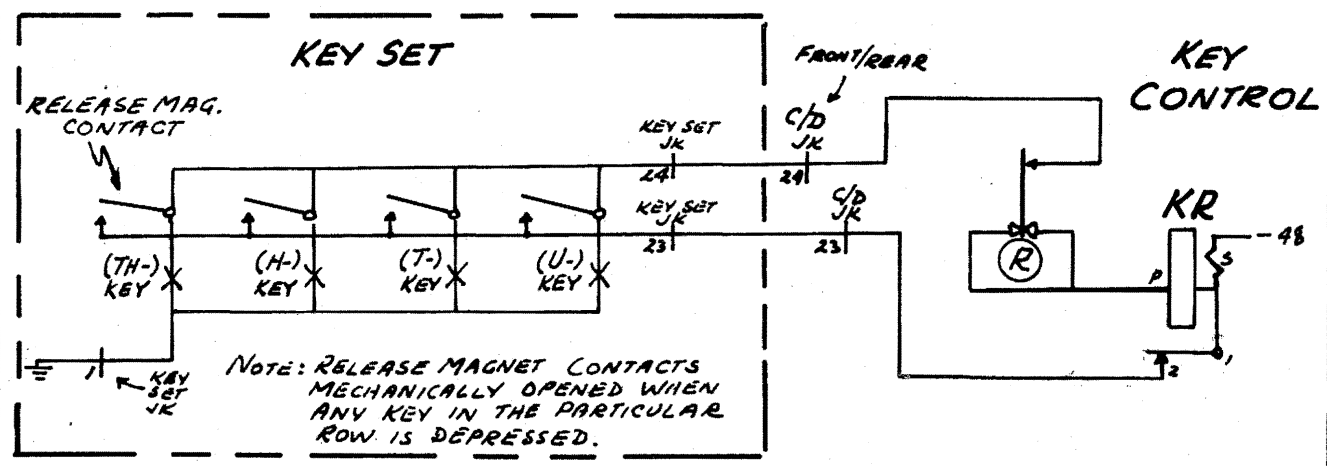
ALLOTING OF LINKS AND MOVING ALLOTTEES

PANEL GCO

OS-176.1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100





"B" SENDER



"TH" KEY	LEAD "A"	LEAD "B"	LEAD "C"
9		1B1 1B3	1GT A
8		1B1 1B3	A
7	1B2	1B1 1B3	1GT A
6	1B2	1B1 1B3	A
5	1B2		1GT A
4	1B2		A
3	1B2	1B3	1GT A
2	1B2	1B3	A
1			1GT A
0			A

ST-51029-04 135.17 KEY CONTROL @ "B" SENDER
SD-21802-011 135.4D KEY CONTROL
ES-20033-01 "10D" "B" SENDER

THOUSANDS PDB
REGISTRATION CDLS

KEY CONTROL CONDITIONS

BAT OR GRD	GRD		BAT		BAT	
TO LEAD	"A"		"B"		"C"	
KEY	RES.	THRU RELAY WDG	RES.	THRU RELAY WDG	RES.	RELAY OPERATING LOCALLY
9	H	A	L	C	L	
8	H	A	L		H	
7	L	A	L	C	L	
6	L	A	L		H	
5	L	A			L	C
4	L	A			H	
3	L	A	H	C	L	
2	L	A	H		H	
1	H	A			L	C
0	H	A			H	

$H = 1200^w$ (or 1400^w)
 $L = 200^w$
 BLANK = OPEN CKT

KEY CONTROL SEQ. SWITCH
2-11 THOUSANDS REGISTRATION

"B" SENDER SEQ. SWITCH
2. INC. BRUSH REGISTRATION

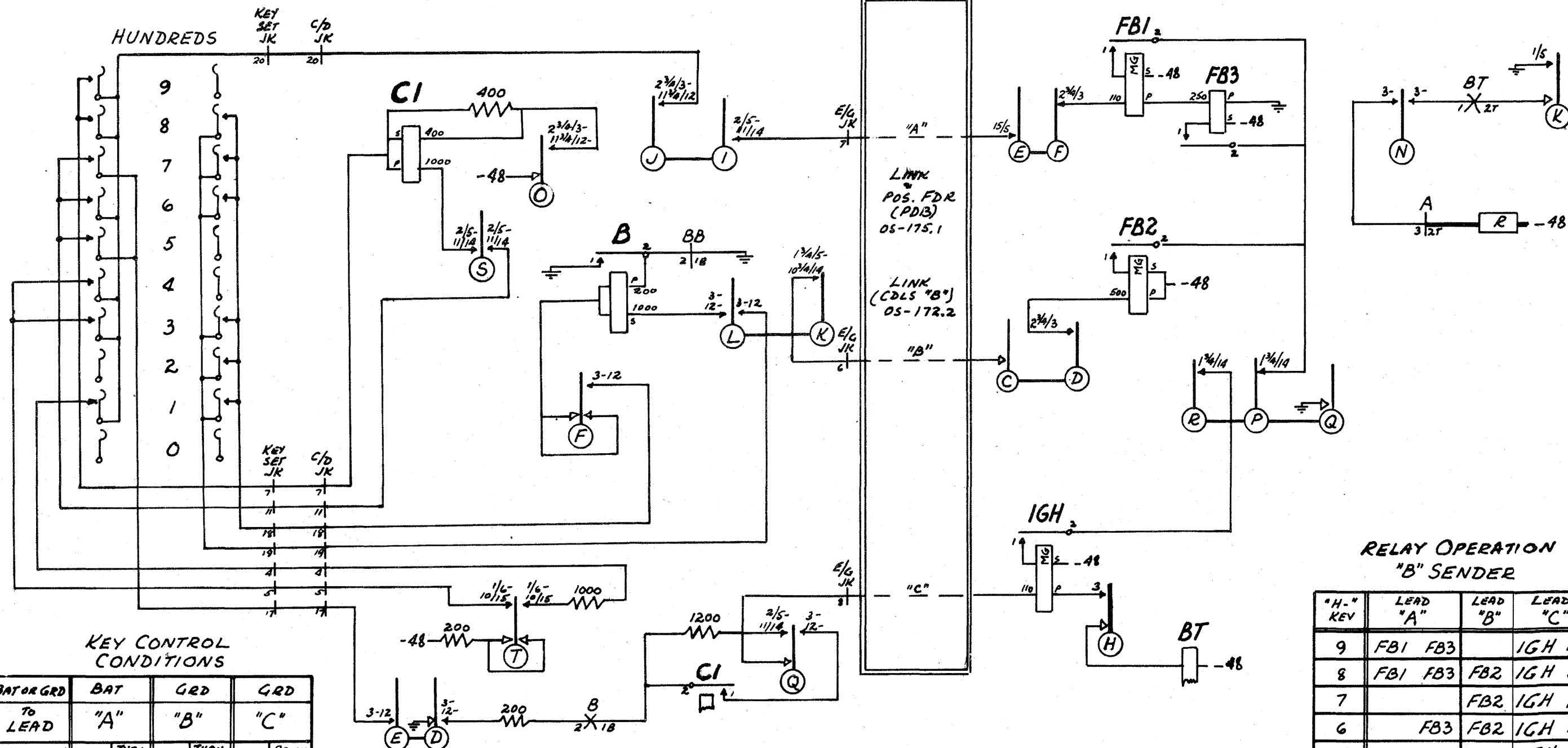
ILL. BELL TEL CO - PLANT SCHOOL

PANEL GCO

OS-18/A.1.2

KEY SET AND KEY CONTROL CKT

"B" SENDER



KEY CONTROL CONDITIONS

BAT OR GRD	BAT	GRD	GRD	GRD	GRD
TO LEAD	"A"	"B"	"C"		
KEY	RES.	THRU RELAY WDG.	RES.	THRU RELAY WDG.	RELAY OPERATES LOCALLY
9	L	CI	H	B	L
8	L	CI	L	B	L
7			L	B	L CI
6	H	CI	L	B	L
5			H	B	L CI
4	L		H	B	H
3	L		L	B	H
2			L	B	H
1	H		L	B	H
0			H	B	H

H = 1200^w (or 1400^w)
 L = 200^w
 BLANK = OPEN CKT

RELAY OPERATION "B" SENDER

"H" KEY	LEAD "A"	LEAD "B"	LEAD "C"
9	FB1 FB3		IGH BT
8	FB1 FB3	FB2	IGH BT
7		FB2	IGH BT
6	FB3	FB2	IGH BT
5			IGH BT
4	FB1 FB3		BT
3	FB1 FB3	FB2	BT
2		FB2	BT
1	FB3	FB2	BT
0			BT

ST-51029-04 ISS. 17 KEY CONTROL "B" SENDER
 SD-21802-011 ISS. 42 KEY CONTROL
 ES-20033-01 "100" "B" SENDER

KEY CONTROL SEQ. SWITCH
 3-12 HUNDREDS REGISTRATION
 "B" SENDER SEQ. SWITCH
 3. FINAL BRUSH REGISTRATION

HUNDREDS
 REGISTRATION

PANEL GCO

OS-111 B.1,2

"B" SENDER



"T-" KEY	LEAD "A"	LEAD "B"	LEAD "C"
9		FT1 FT3	FT4 A
8	FT2	FT1 FT3	FT4 A
7	FT2		FT4 A
6	FT2	FT3	FT4 A
5			FT4 A
4		FT1 FT3	A
3	FT2	FT1 FT3	A
2	FT2		A
1	FT2	FT3	A
0			A

ST-51029-04 ISS. 17 KEY CONTROL "B" SENDER
SD-21802-011 ISS. 40 KEY CONTROL
ES-20033-01 " 100 "B" SENDER

TENS REGISTRATION PDB
CDLS

PANEL GCO

OS-181C.12

KEY CONTROL CONDITIONS

BATOR GRD	GRD		BAT		BAT	
TO LEAD	"A"		"B"		"C"	
KEY	RES.	THRU RELAY WDG	RES.	THRU RELAY WDG	RES.	RELAY OPERATING LOCALLY
9	H	A	L	C	L	
8	L	A	L	C	L	
7	L	A			L	C
6	L	A	H	C	L	
5	H	A			L	C
4	H	A	L		H	
3	L	A	L		H	
2	L	A			H	
1	L	A	H		H	
0	H	A			H	

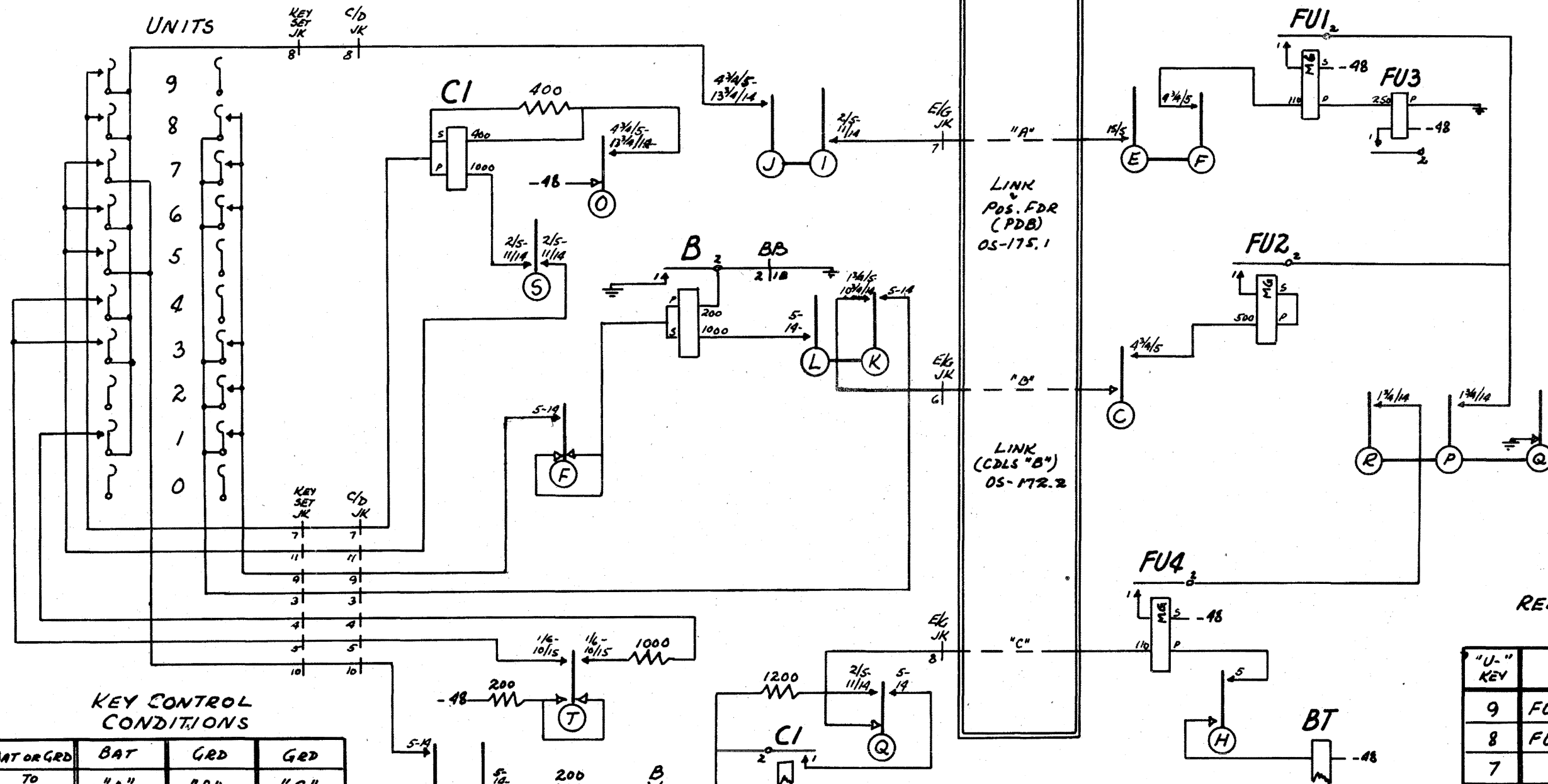
$H = 1200^w$ (or 1400^w)
 $L = 200^w$
 BLANK = OPEN CKT

KEY CONTROL SEQ. SWITCH
4-13 TENS REGISTRATION

"B" SENDER SEQ. SWITCH
4. FINAL TENS REGISTRATION

KEY SET AND KEY CONTROL CKT

"B" SENDER



KEY CONTROL CONDITIONS

BAT OR GRD	BAT	GRD	GRD		
TO LEAD	"A"	"B"	"C"		
KEY	RES.	THRU RELAY WDG	RES.	THRU RELAY WDG	RELAY OPERATION LOCALLY
9	L	CI	H	B	L
8	L	CI	L	B	L
7			L	B	L CI
6	H	CI	L	B	L
5			H	B	L CI
4	L		H	B	H
3	L		L	B	H
2			L	B	H
1	H		L	B	H
0			H	B	H

H = 1200^W (OR 1400^W)
 L = 200^W
 BLANK = OPEN CKT

RELAY OPERATION "B" SENDER

"U-" KEY	LEAD "A"	LEAD "B"	LEAD "C"
9	FU1 FU3		FU4 BT
8	FU1 FU3	FU2	FU4 BT
7		FU2	FU4 BT
6		FU3	FU4 BT
5			FU4 BT
4	FU1 FU3		BT
3	FU1 FU3	FU2	BT
2		FU2	BT
1		FU3	BT
0			BT

ST-51029-04 ISS.17 KEY CONTROL "B" SENDER
 SD-21802-011 ISS.42 KEY CONTROL
 ES-20033-01 ISS.100 "B" SENDER

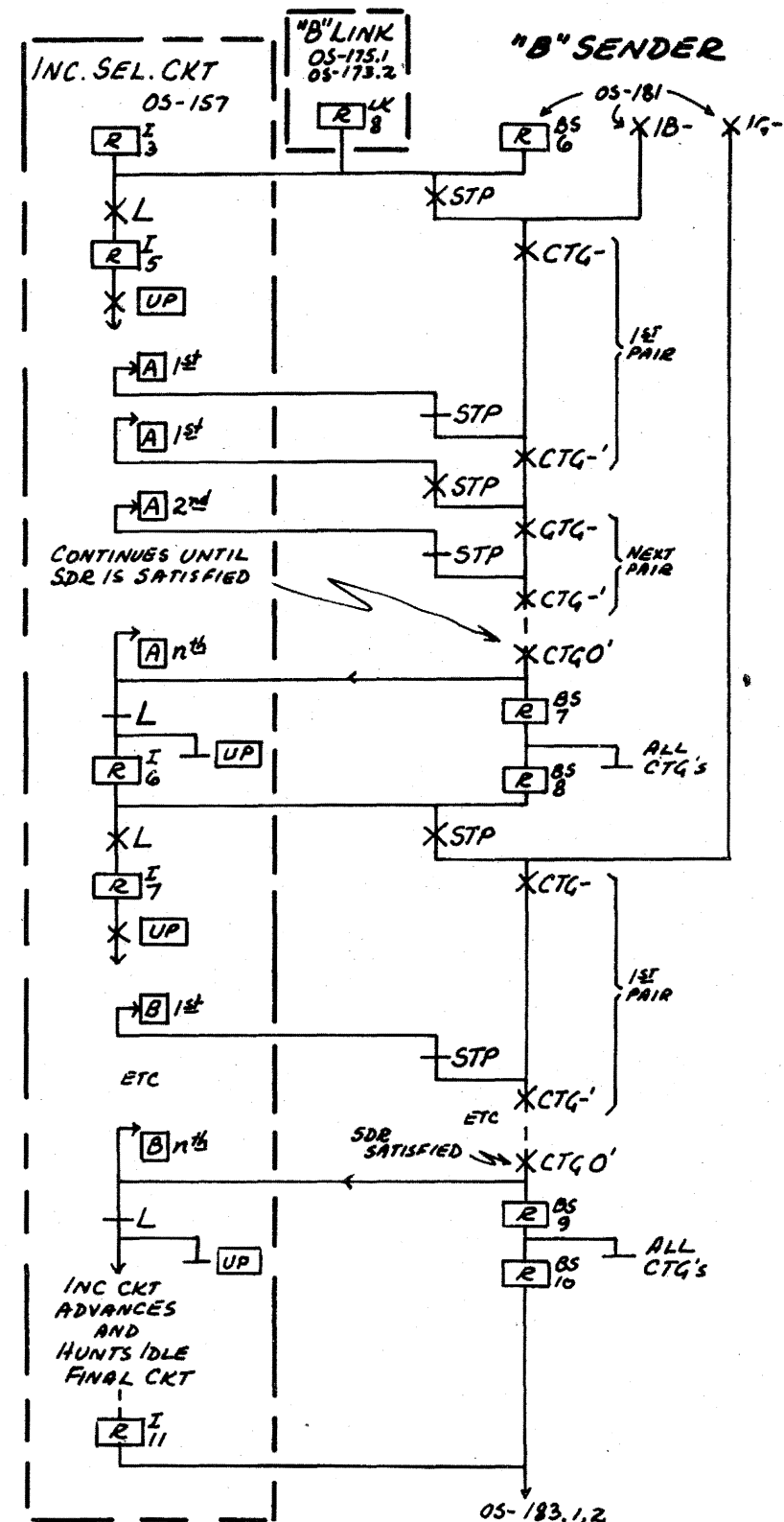
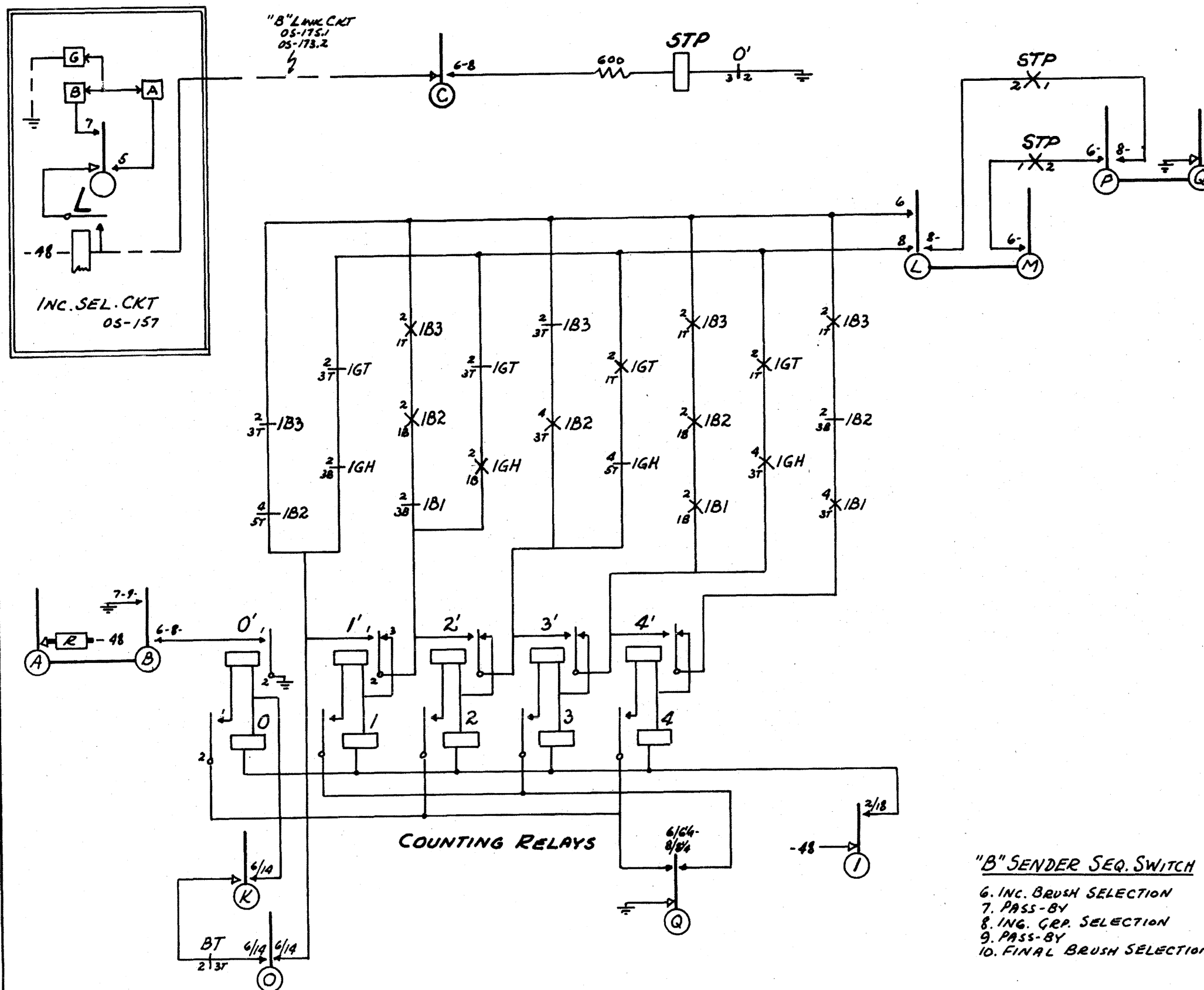
UNITS REGISTRATION PDB CDLS

KEY CONTROL SEQ. SWITCH
 5-14 UNITS REGISTRATION

"B" SENDER SEQ. SWITCH
 5. FINAL UNITS REGISTRATION

"B" SENDER

SEQUENCE CHART



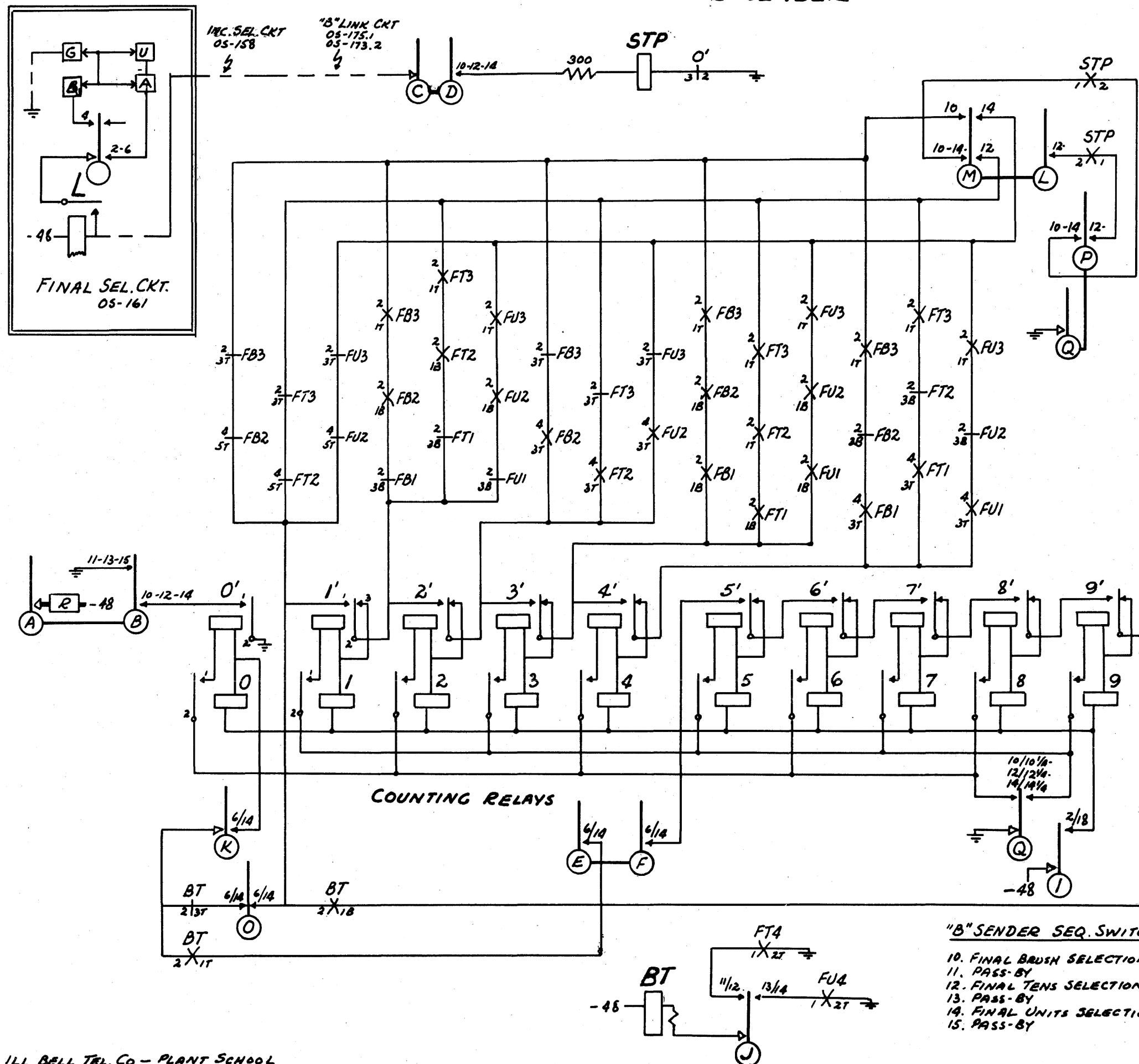
"B" SENDER SEQ. SWITCH
 6. INC. BRUSH SELECTION
 7. PASS-BY
 8. INC. GRP. SELECTION
 9. PASS-BY
 10. FINAL BRUSH SELECTION

ST-51029-04 ISS. 17 "B" SENDER
 ES-20033-01 " 10D "B" SENDER

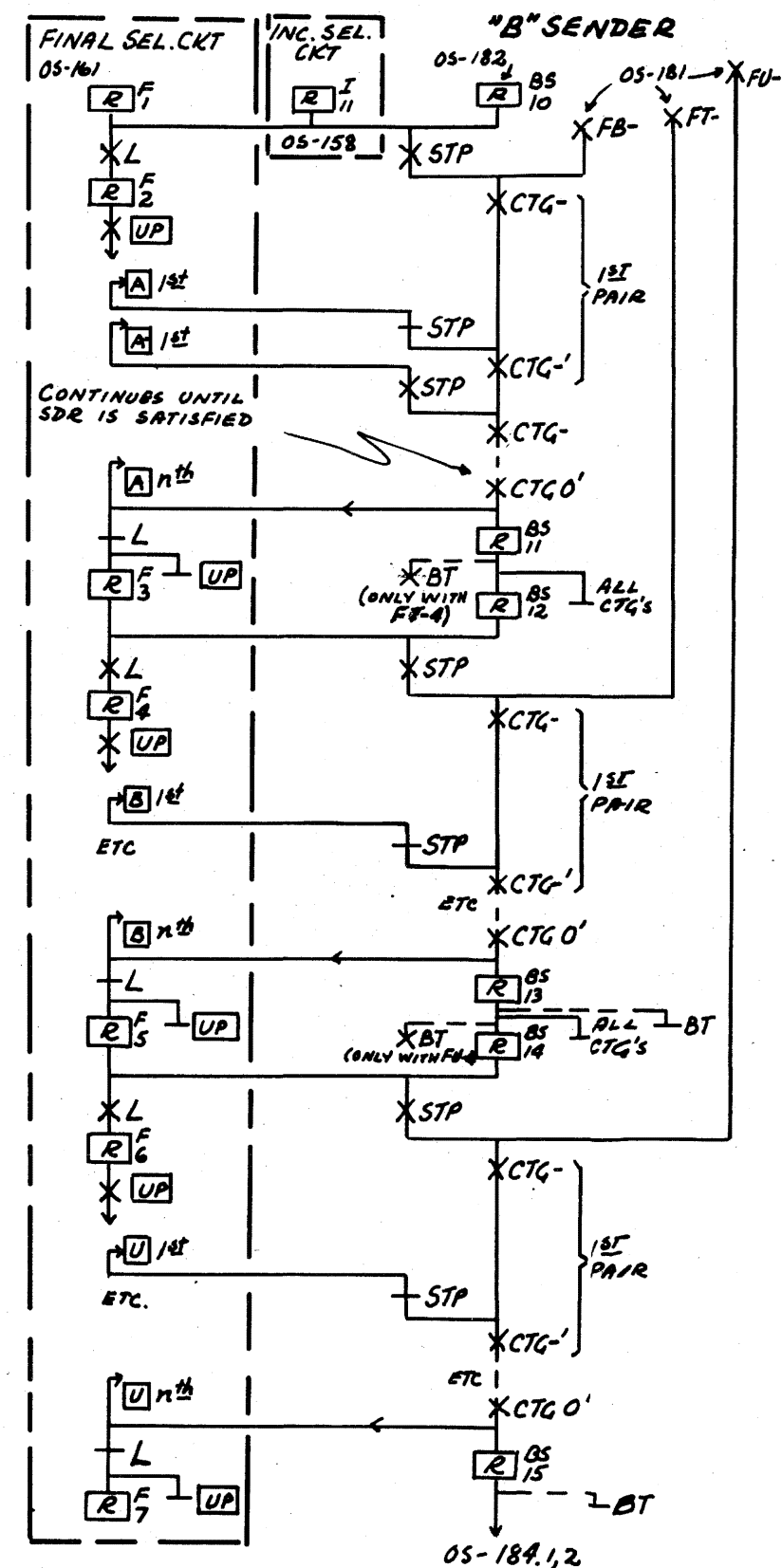
PDB
 CDLS
 INCOMING SELECTIONS

PANEL GCO OS-182.1,2

"B" SENDER



SEQUENCE CHART



ST-51029-04 133.17 "B"SENDER
ES-20033-01 " 100 "B"SENDER

FINAL SELECTIONS

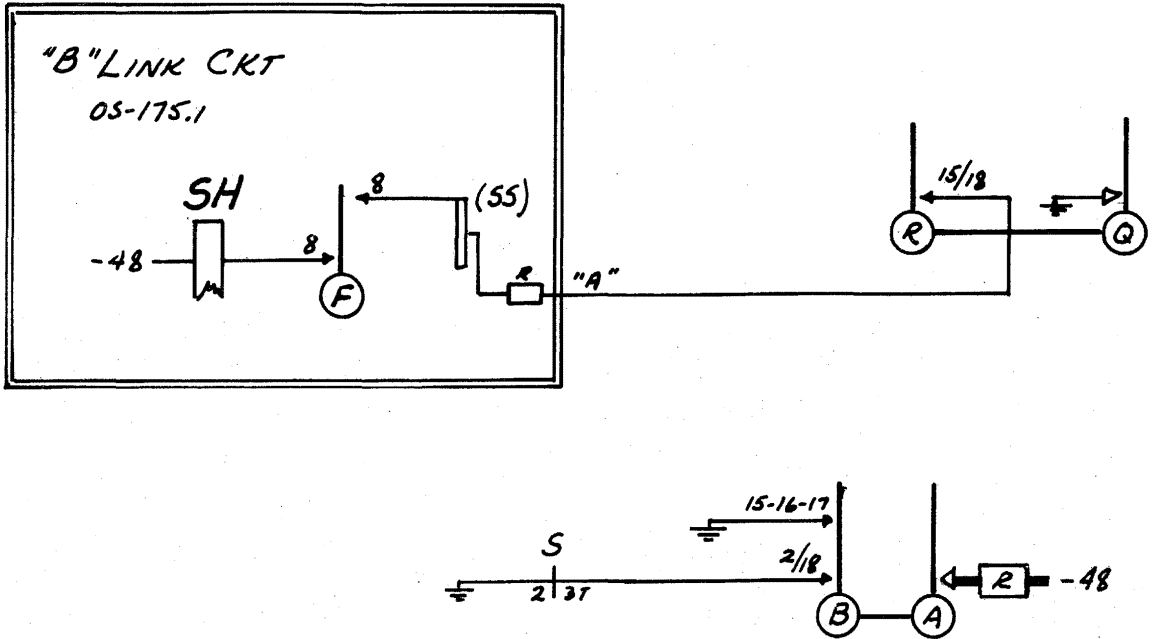
PDB
CDLS

PANEL GCO

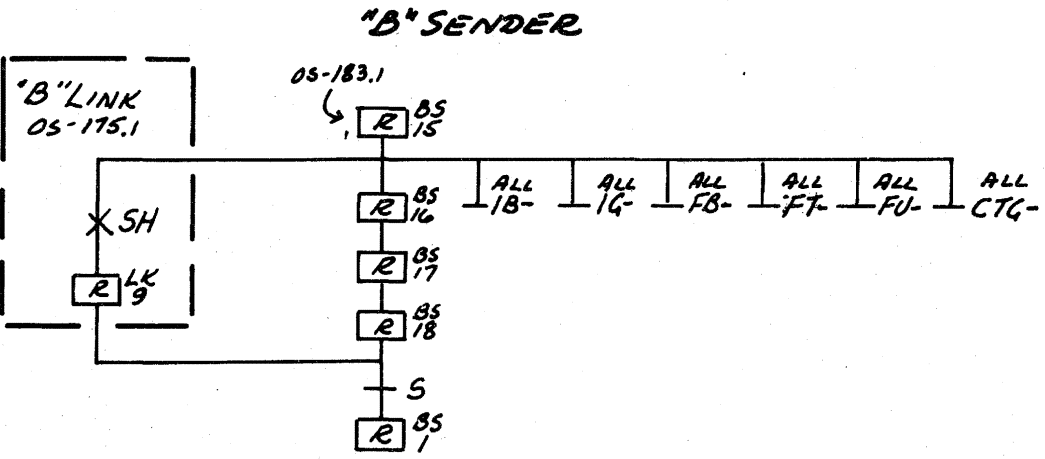
OS-183.1.2

SEQUENCE CHART

"B" SENDER

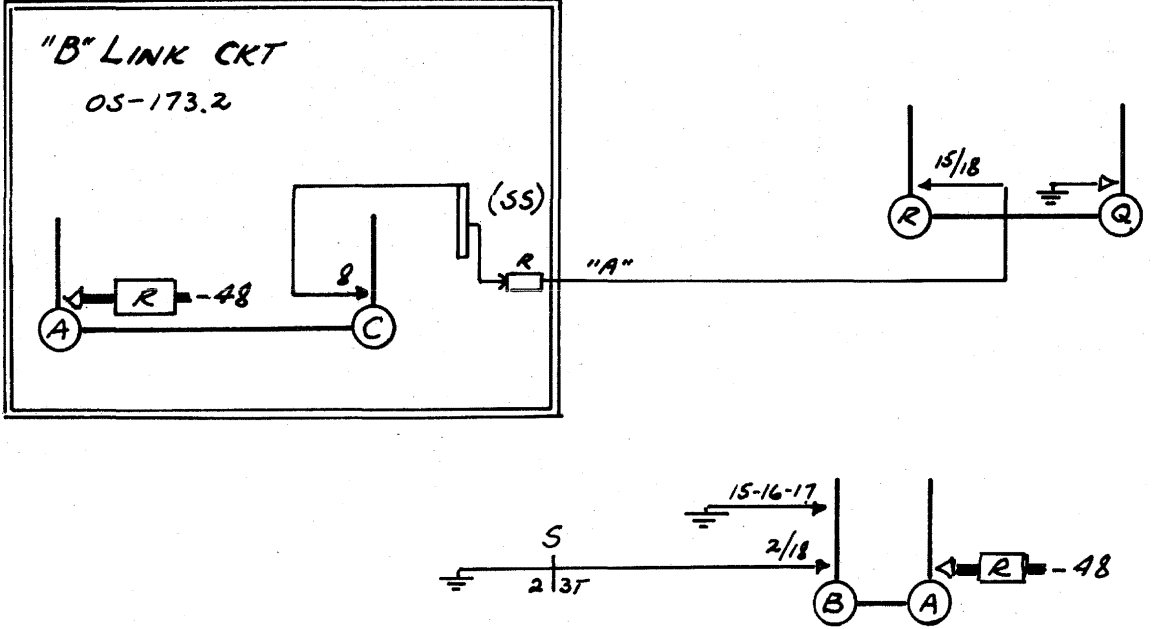


(A) POS. DISTR. "B"

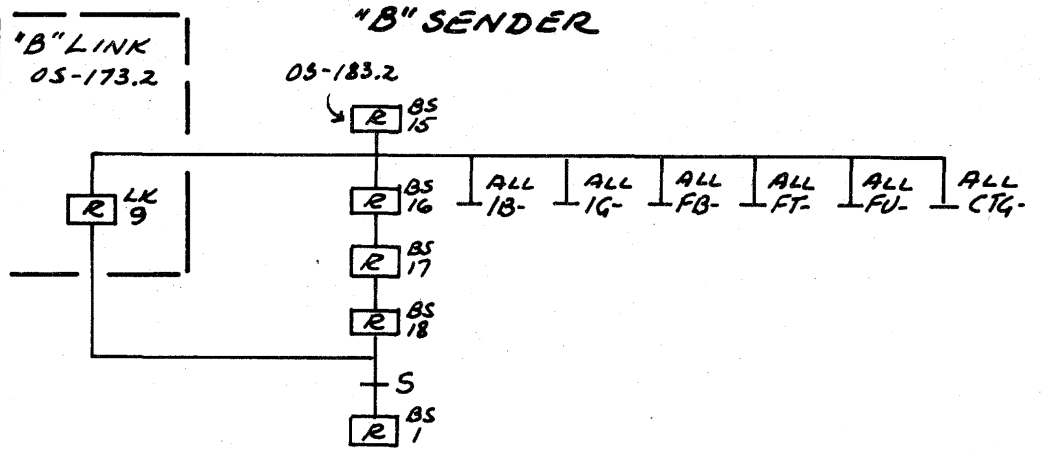


"B" SENDER SEQ. SWITCH
15. PASS-BY
16. " "
17. " "
18. AWTG. SDR. SELECTOR

"B" SENDER



(B) CORDLESS "B"

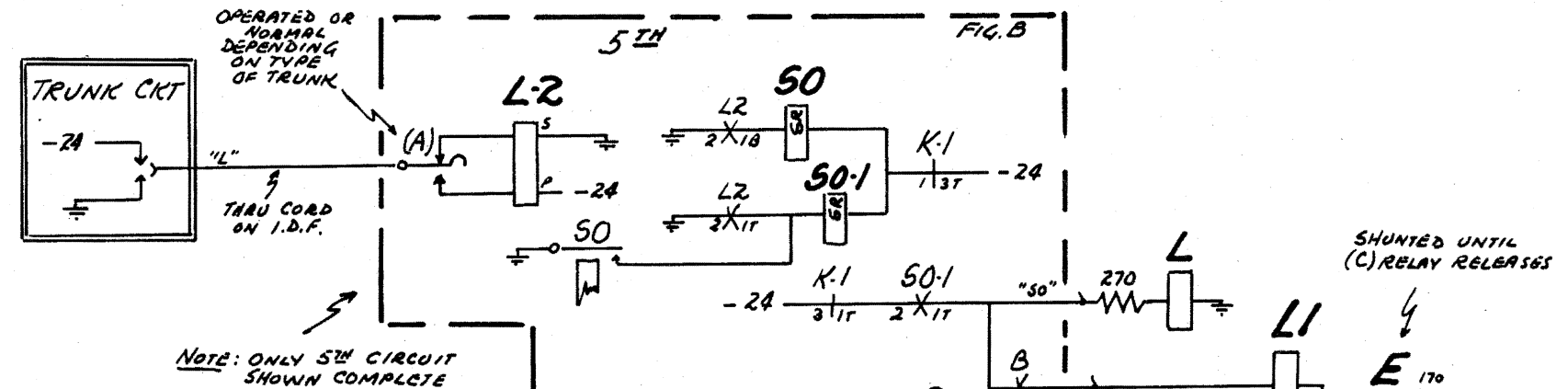


ES-20033-01 ISS 10D "B" SENDER
ST-51029-04 ISS, 17 "B" SENDER

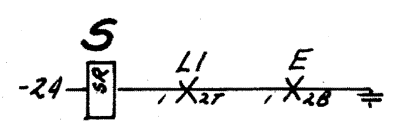
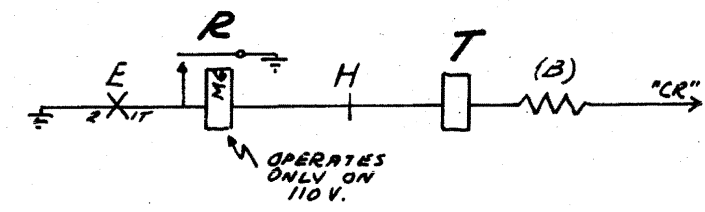
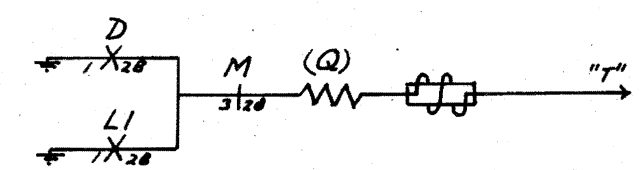
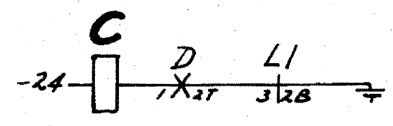
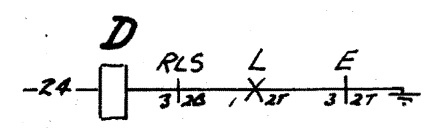
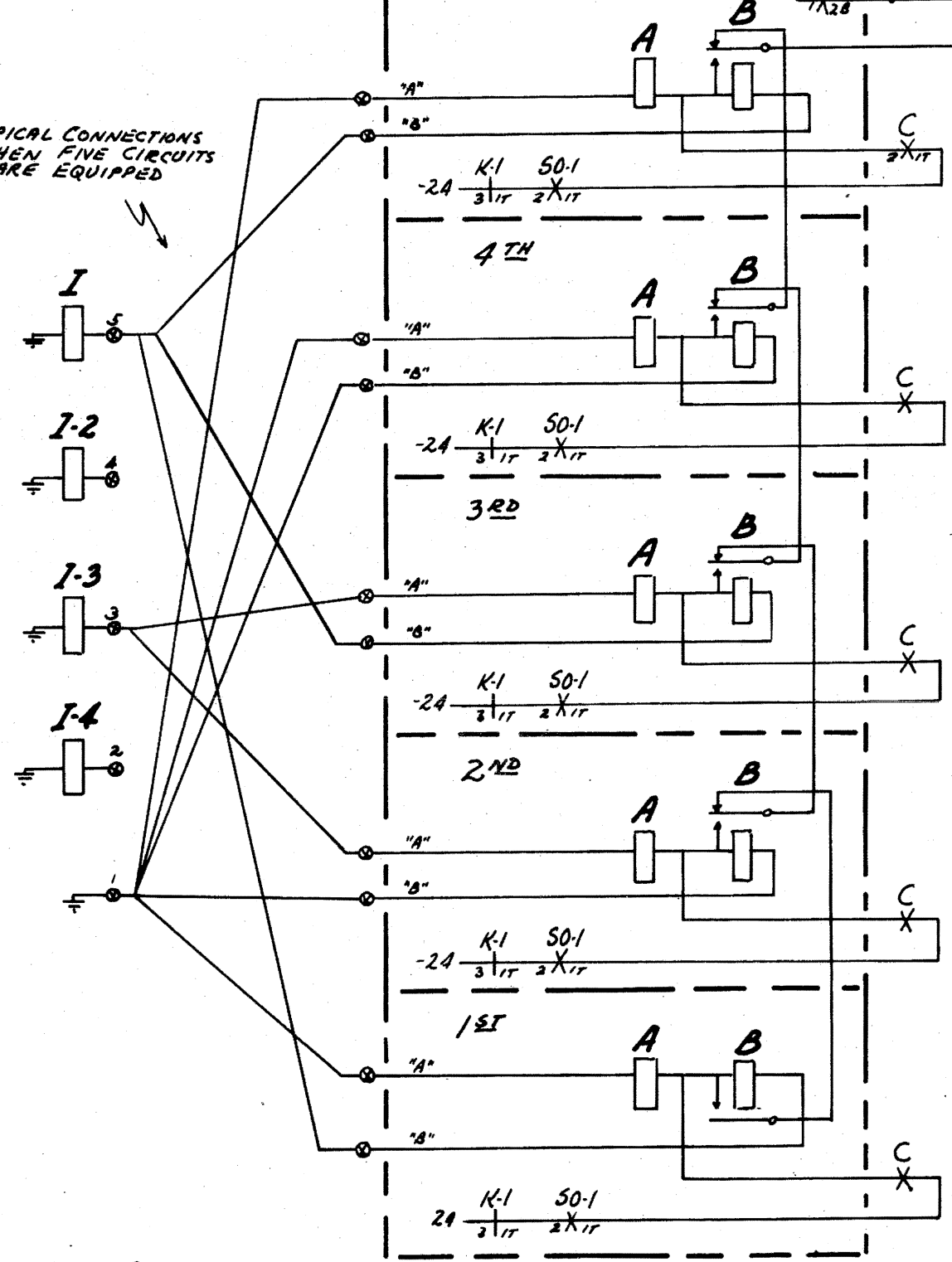
"B" SENDER RELEASE
PDB
CDLS

PANEL 6CO OS-184.1, 2

ISSUE	1
DATE	1-55
BY	GAH

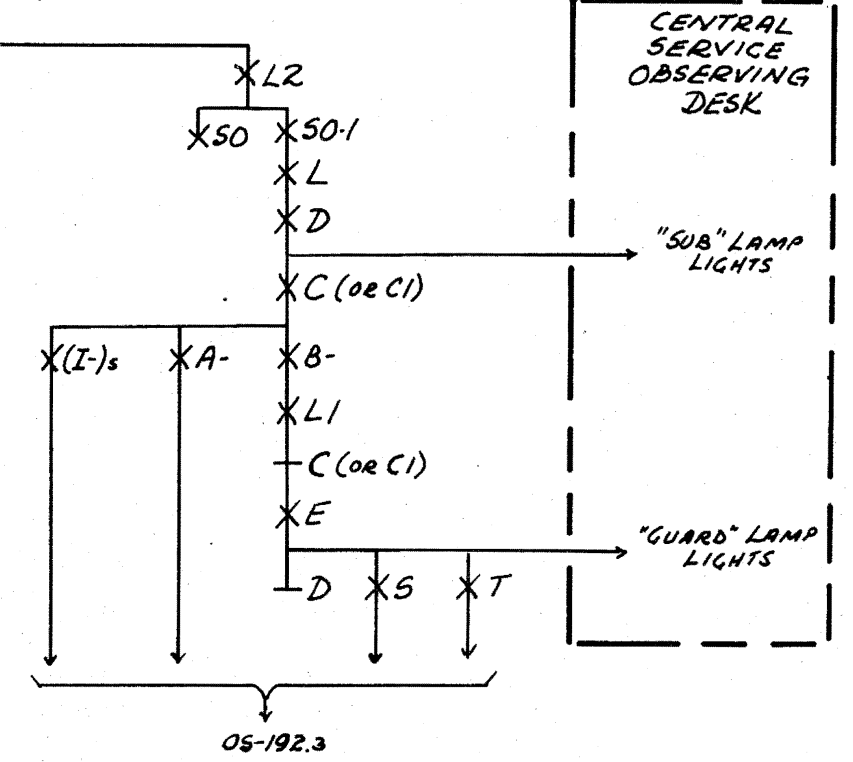


TYPICAL CONNECTIONS WHEN FIVE CIRCUITS ARE EQUIPPED



SEQUENCE CHART

INCOMING CALL ON TRUNK (LAMP SIGNAL)



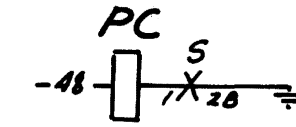
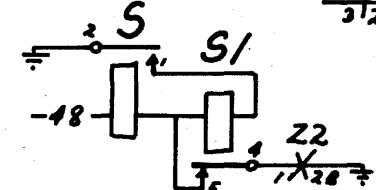
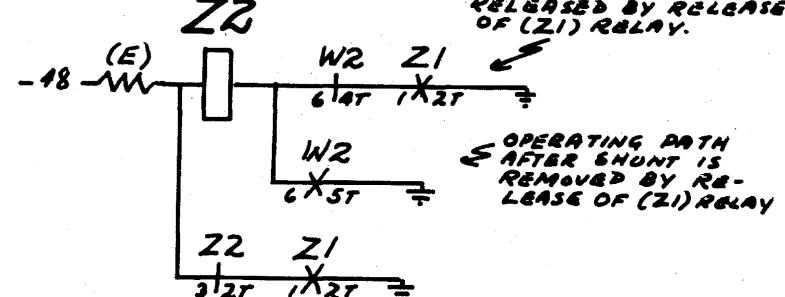
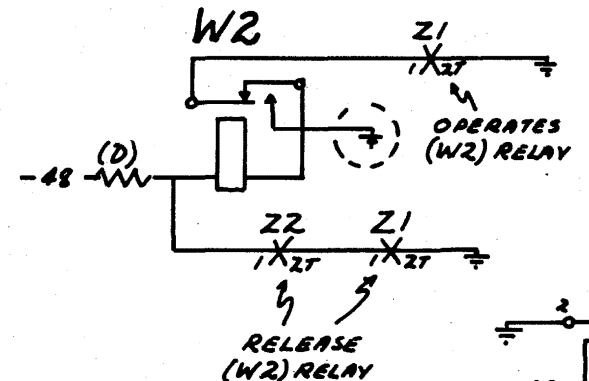
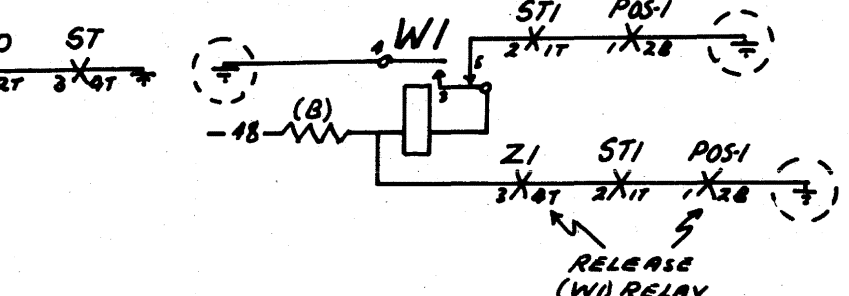
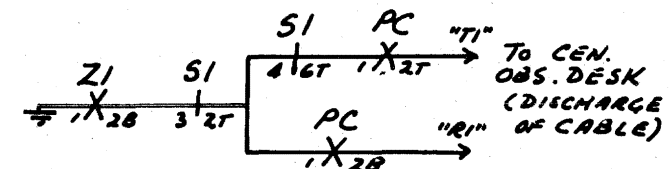
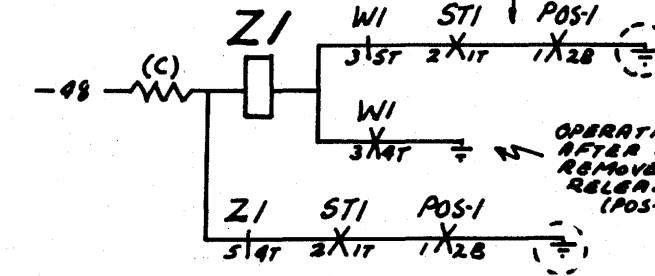
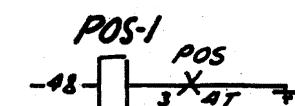
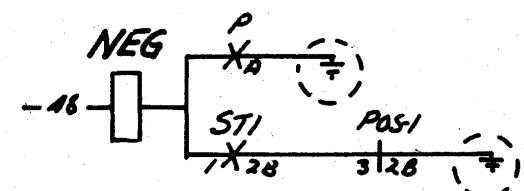
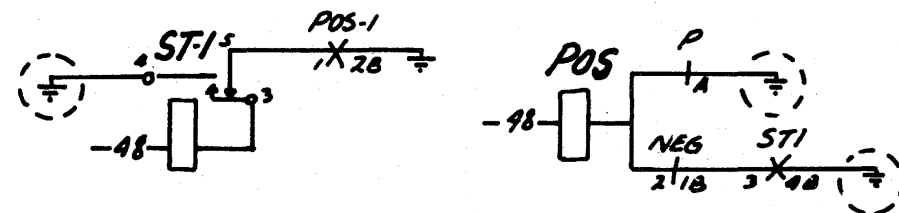
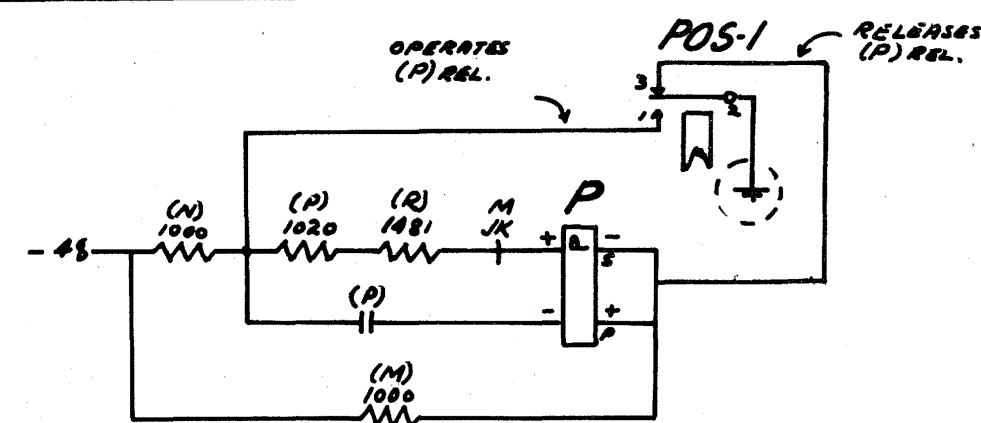
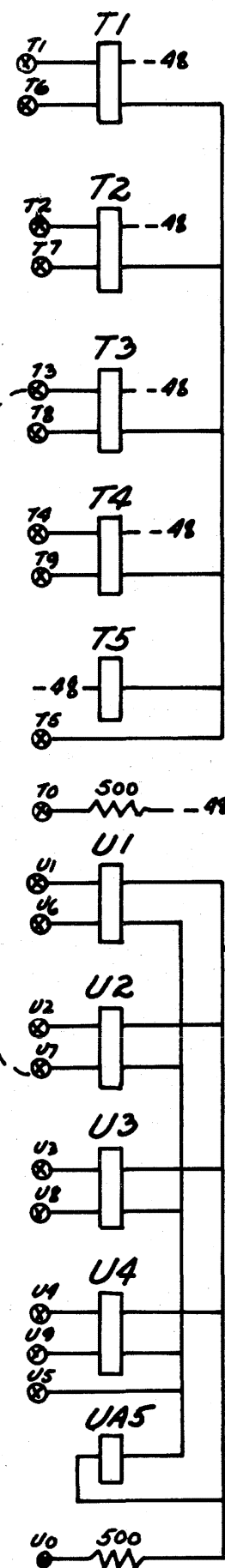
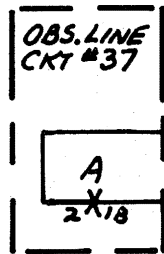
SD-20219-01 ISS. 14B SERV. OBS. CKT (MULTI-LINE)

CALL RECEIVED

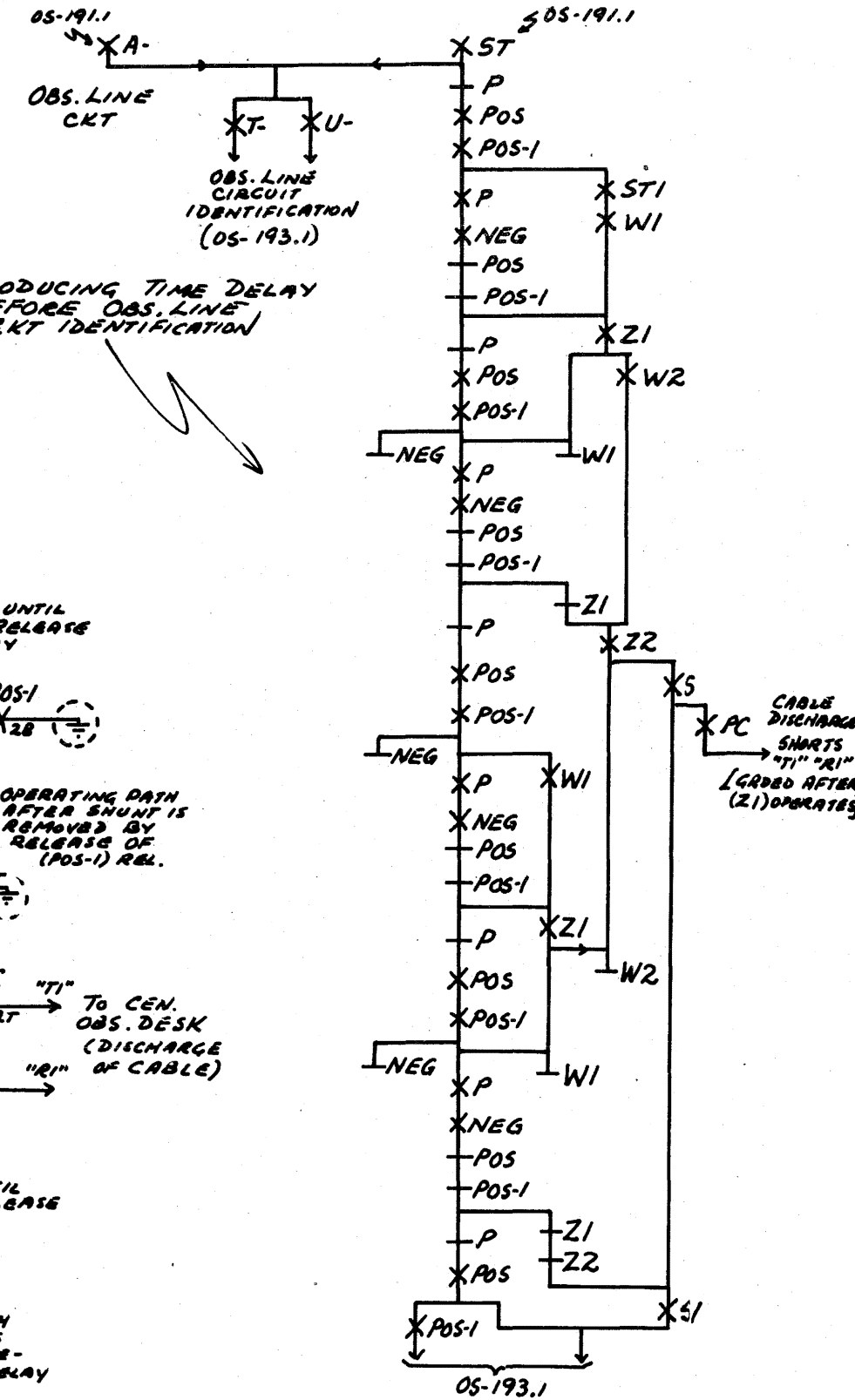
PANEL GCO

05-191.3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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SEQUENCE CHART



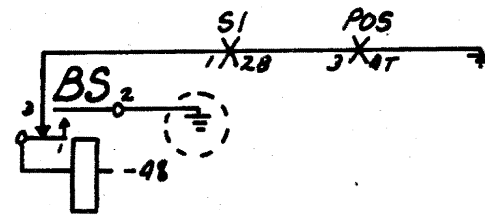
SD-90242-01 155.18D SERV. OBSERVING CKT (LOCAL ORIGINATING SERVICE)
SD-21425-01 155.5D OBSERVING LINE CKT

PANEL GCO

OS-192.1

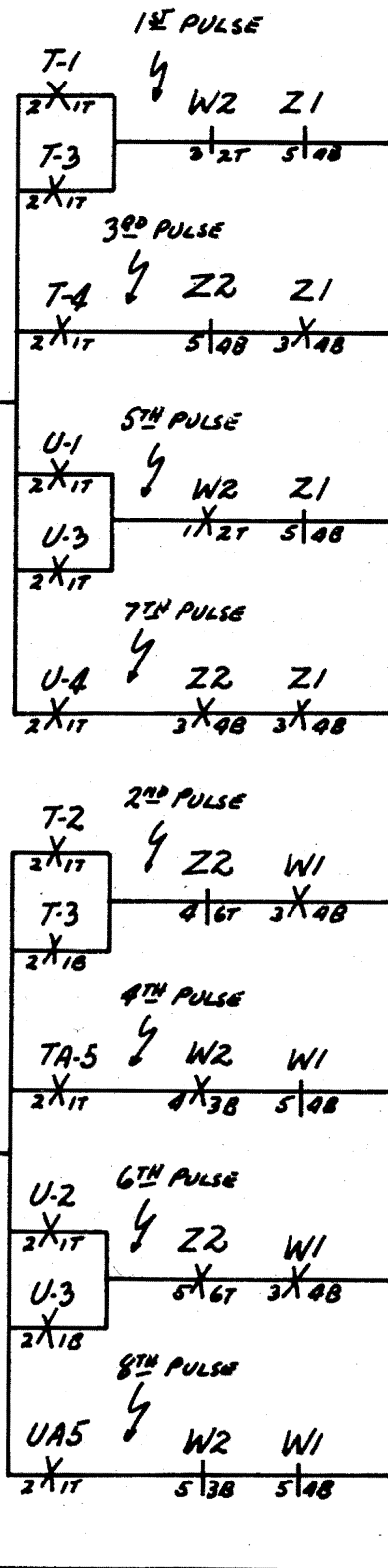
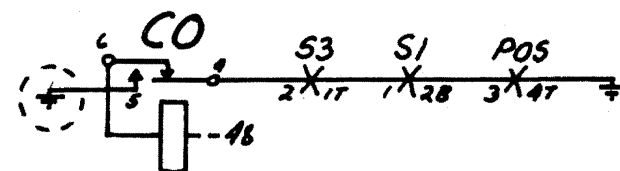
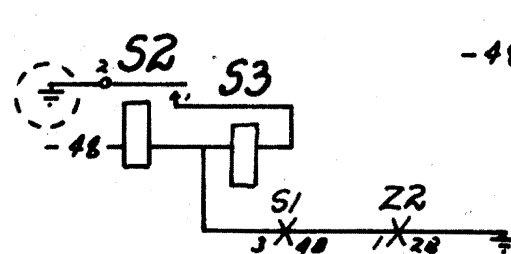
(W-)(Z-) RELAY OPERATION

	PULSE			
	1 ST	2 ND	3 RD	4 TH
TENS	NONE	W1	W1 Z1 W2	Z1 W2
	PULSE			
	5 TH	6 TH	7 TH	8 TH
UNITS	W2 Z2	W1 W2 Z2	W1 Z1 Z2	Z1 Z2



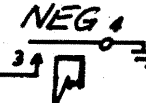
DIGIT	PULSE CHART			
0	-	-	-	-
1	+	-	-	-
2	-	-	-	-
3	+	-	-	-
4	-	-	+	-
5	-	-	-	-
6	+	-	-	-
7	-	-	-	-
8	+	-	-	-
9	-	-	+	-

+ 6500^Ω BAT. TO "T1"
= 52.5^Ω BAT. TO "R1"
- 6500^Ω BAT. TO "R1"

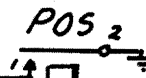


"POSITIVE" PULSES

GROUND FOR "NEGATIVE" PULSES



TO POLARIZED AND MARGINAL RELAYS IN PCI CIRCUIT OF CEN. OBS. DESK

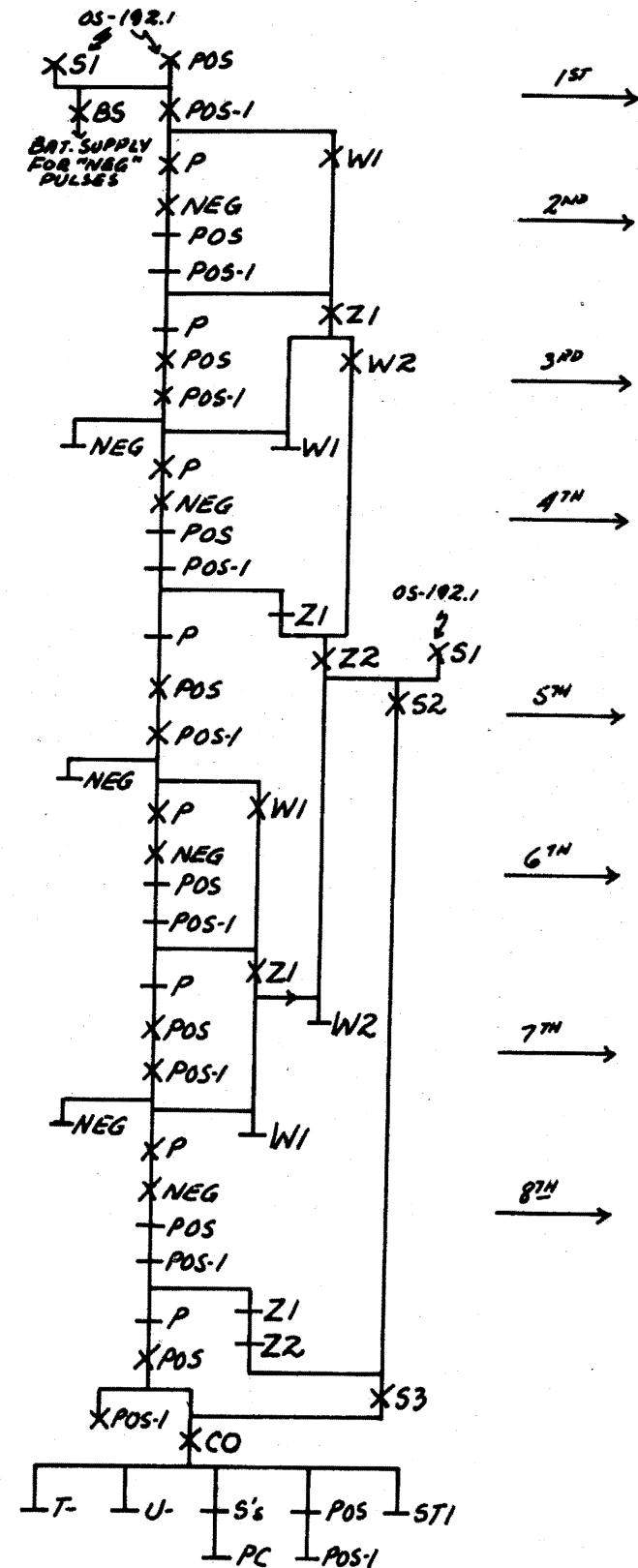


GROUND FOR "POSITIVE" PULSES

"NEGATIVE" PULSES

SEE OS-192.1 FOR (W-) AND (Z-) RELAY OPERATIONAL SKETCHES

SEQUENCE CHART



P.C.I. PULSES TO CENTRAL OBSERVING DESK FOR OBS. LINE CIRCUIT IDENTIFICATION

SD-90242-01 ISS. 18D SERV. OBS. CRT (LOCAL ORIG. SERVICE)
SD-21425-01 ISS. SD OBSERVING LINE CRT

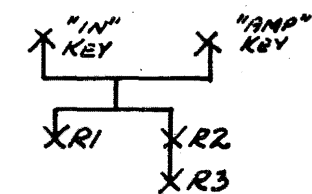
PCI PULSING FOR OBSERVING LINE CRT IDENTIFICATION

PANEL GCO

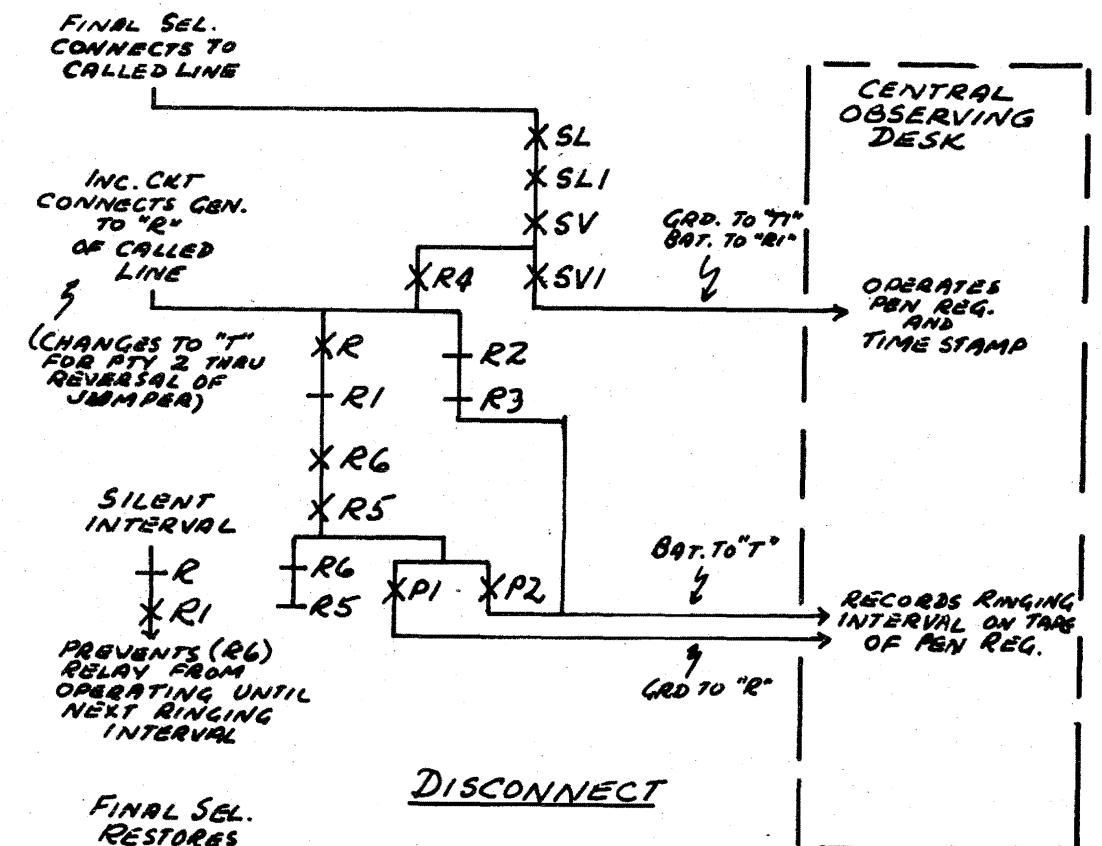
OS-193.1

SEQUENCE CHART

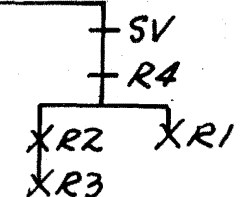
CIRCUIT PREPARATION



INCOMING CALL



DISCONNECT

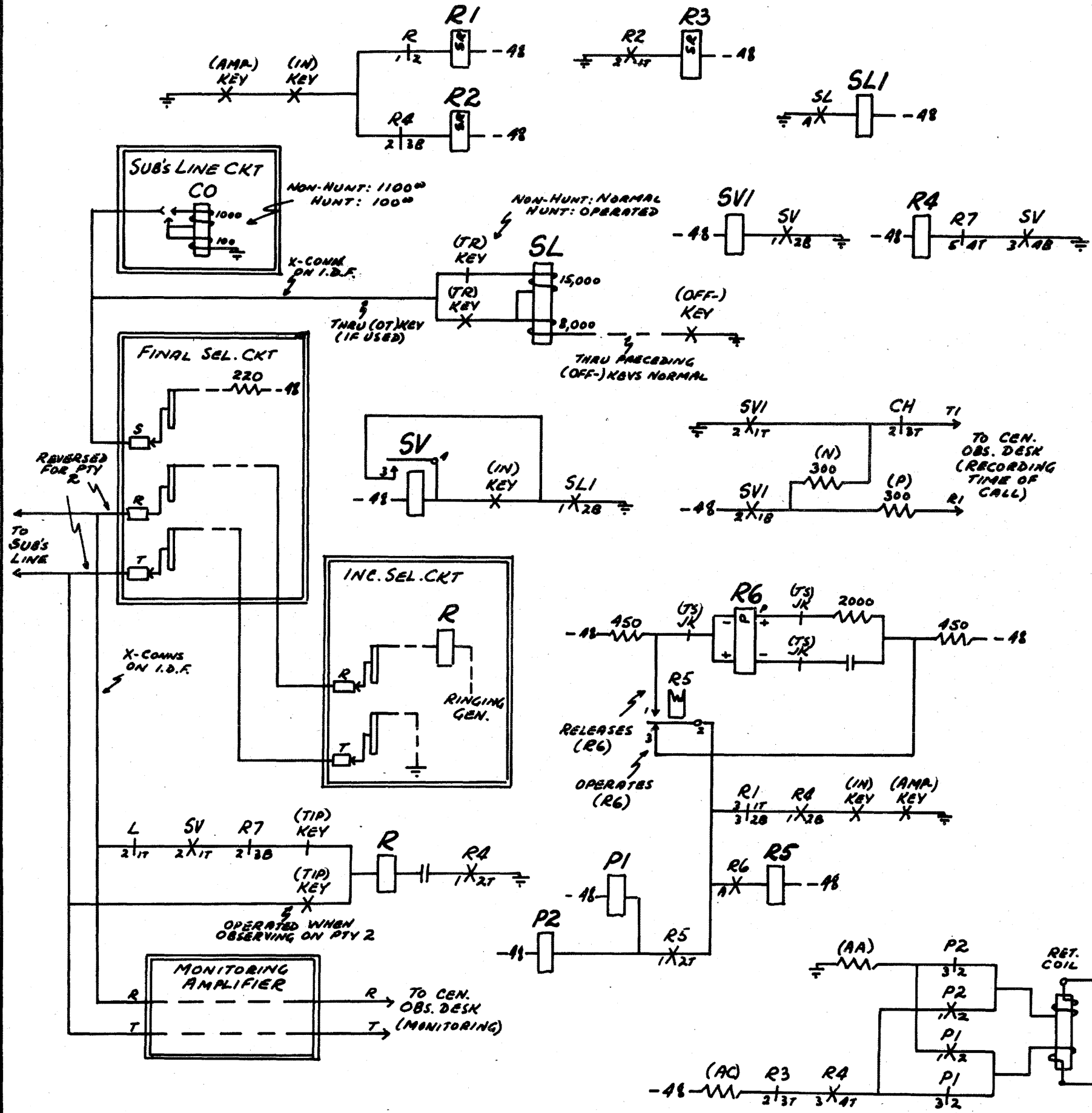


52-90580-01 155.17-D SERV. OBS. CKT
(FOR USE WITH "10 S.O. DESK")
52-90558-011 155.13AR DIAL PULSE AMP.

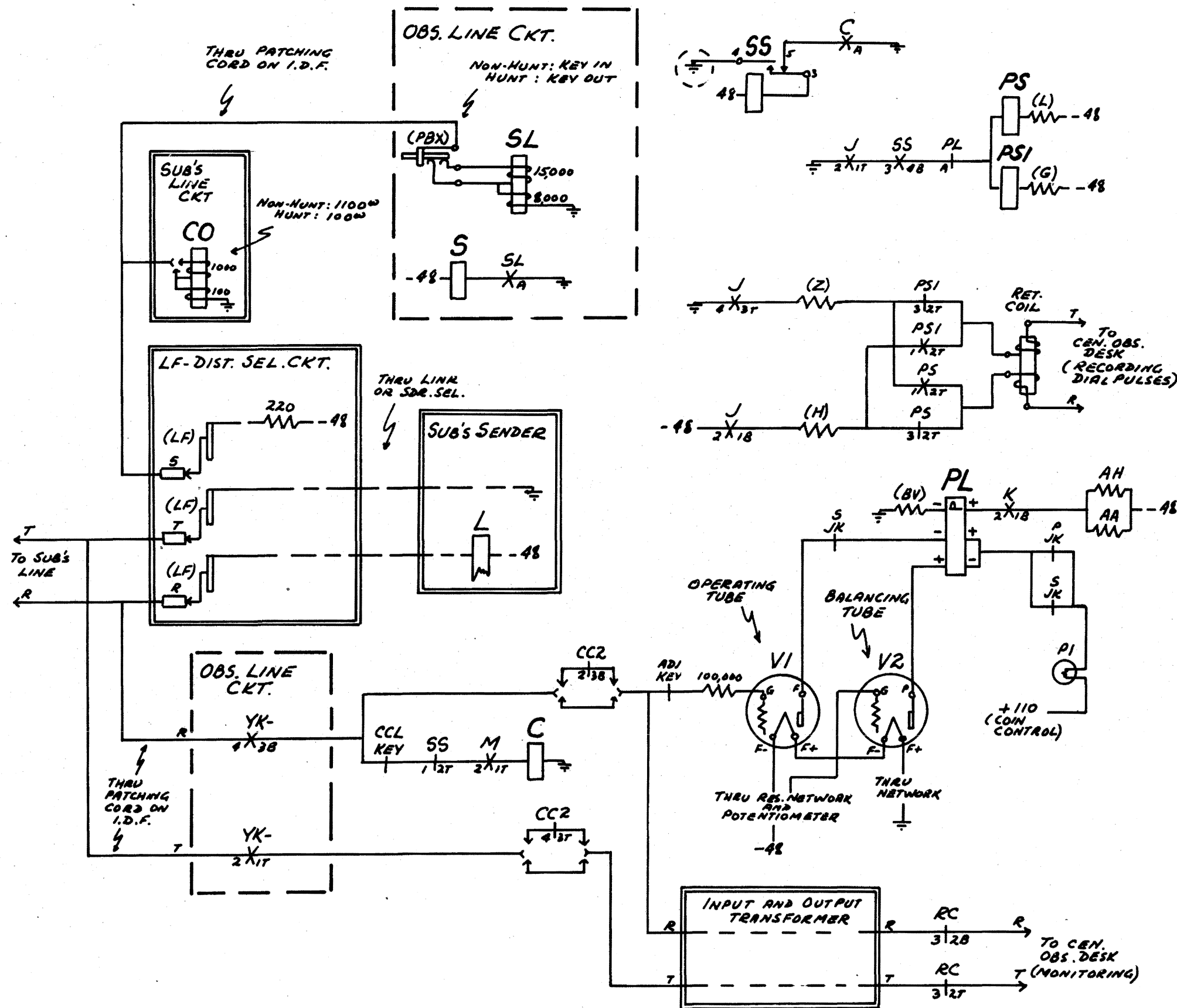
RECORDING INCOMING CALL

PANEL GCO

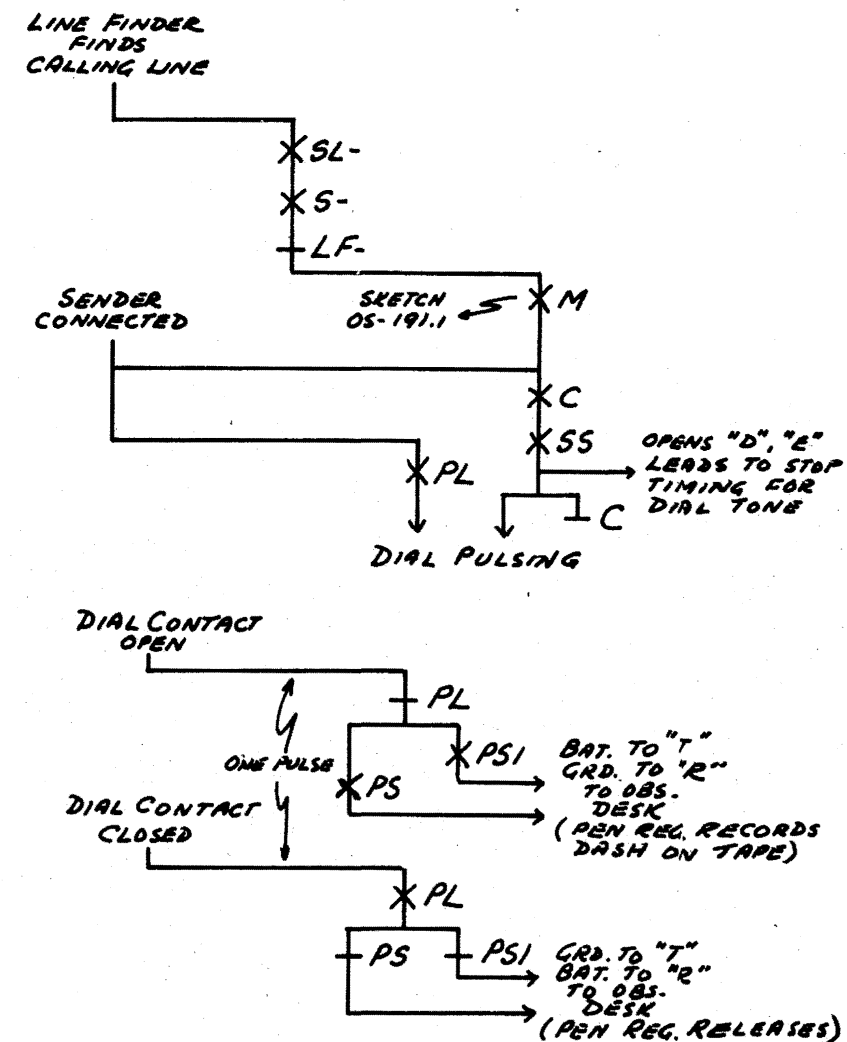
05-1932



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----



SEQUENCE CHART



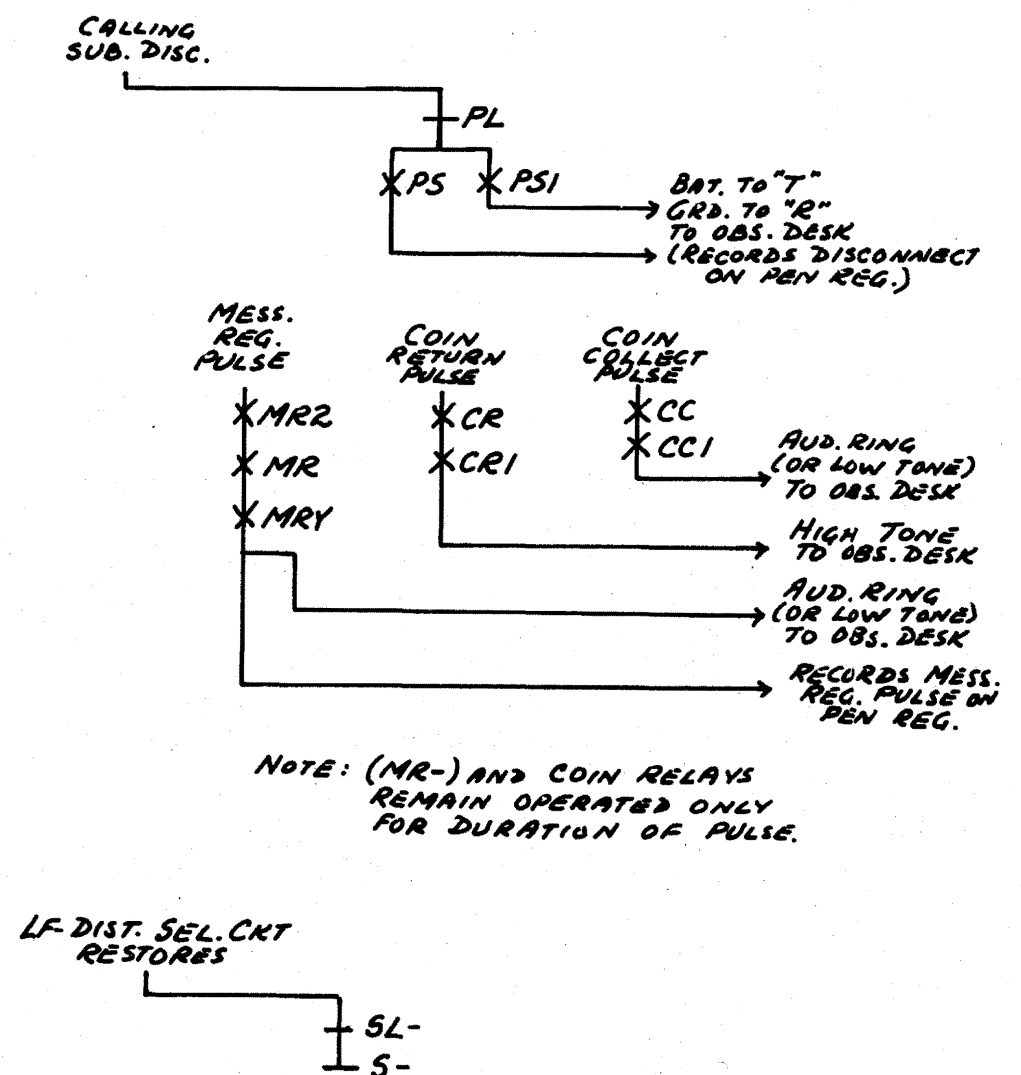
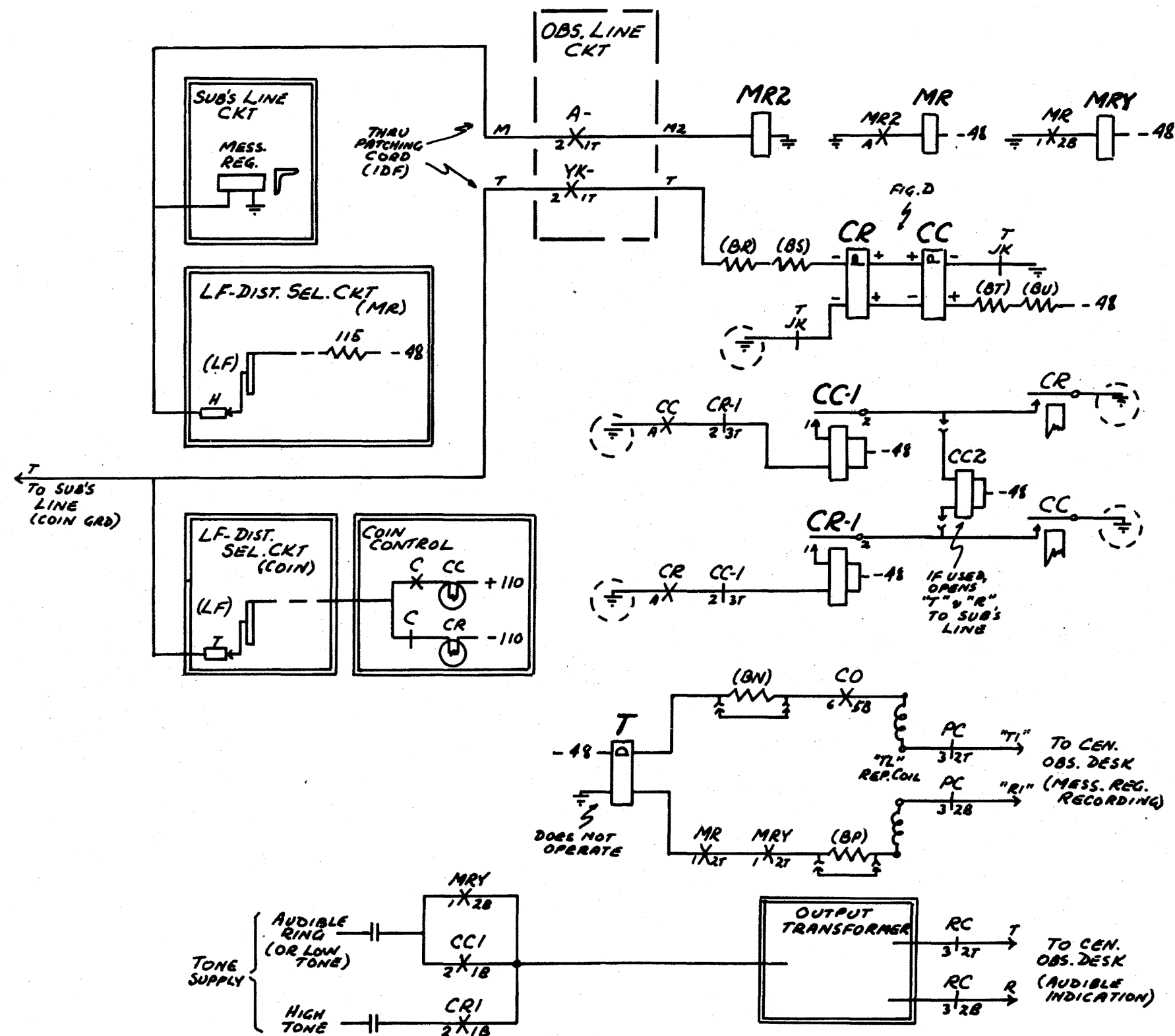
SD-90242-01 ISS. 18-D SERV. OBSERVING CRT
(LOCAL ORIGINATING SERVICE)
SD-21425-01 ISS. S-D OBSERVING LINE CKT

REG.
RECORDING DIAL PULSES
MONITORING

PANEL GCO

OS-194.1

SEQUENCE CHART

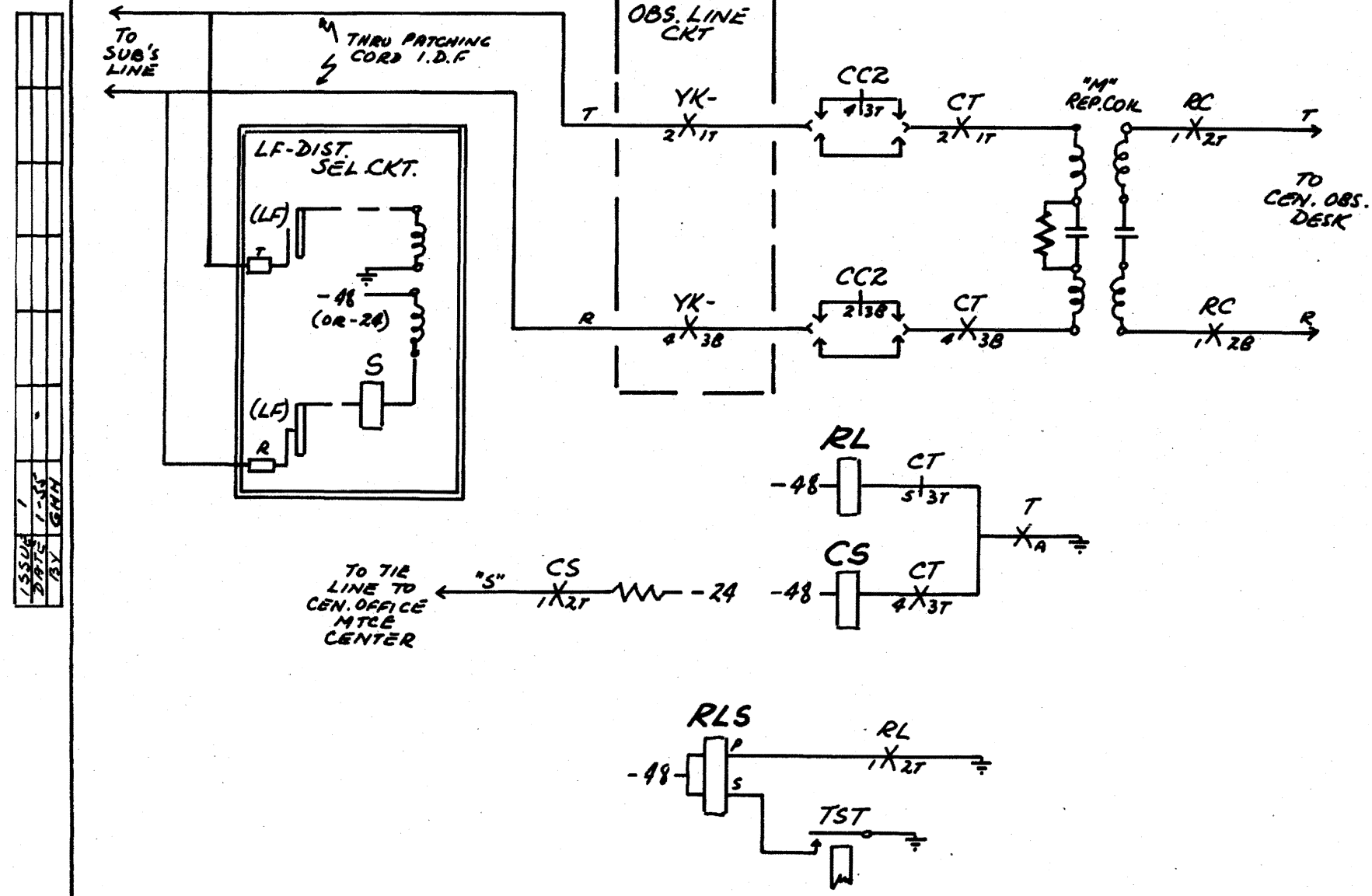
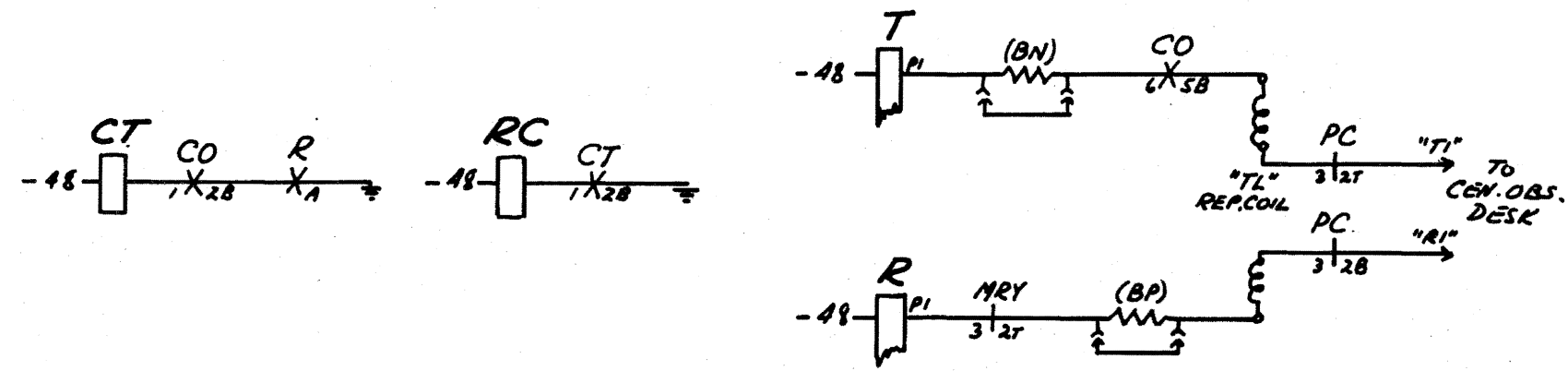


SD-90242-01 1ss. 18-D SERV. OBS. CKT
(LOCAL ORIG. SERVICE)
SD-21425-01 1ss. 5-D OBSERVING LINE CKT

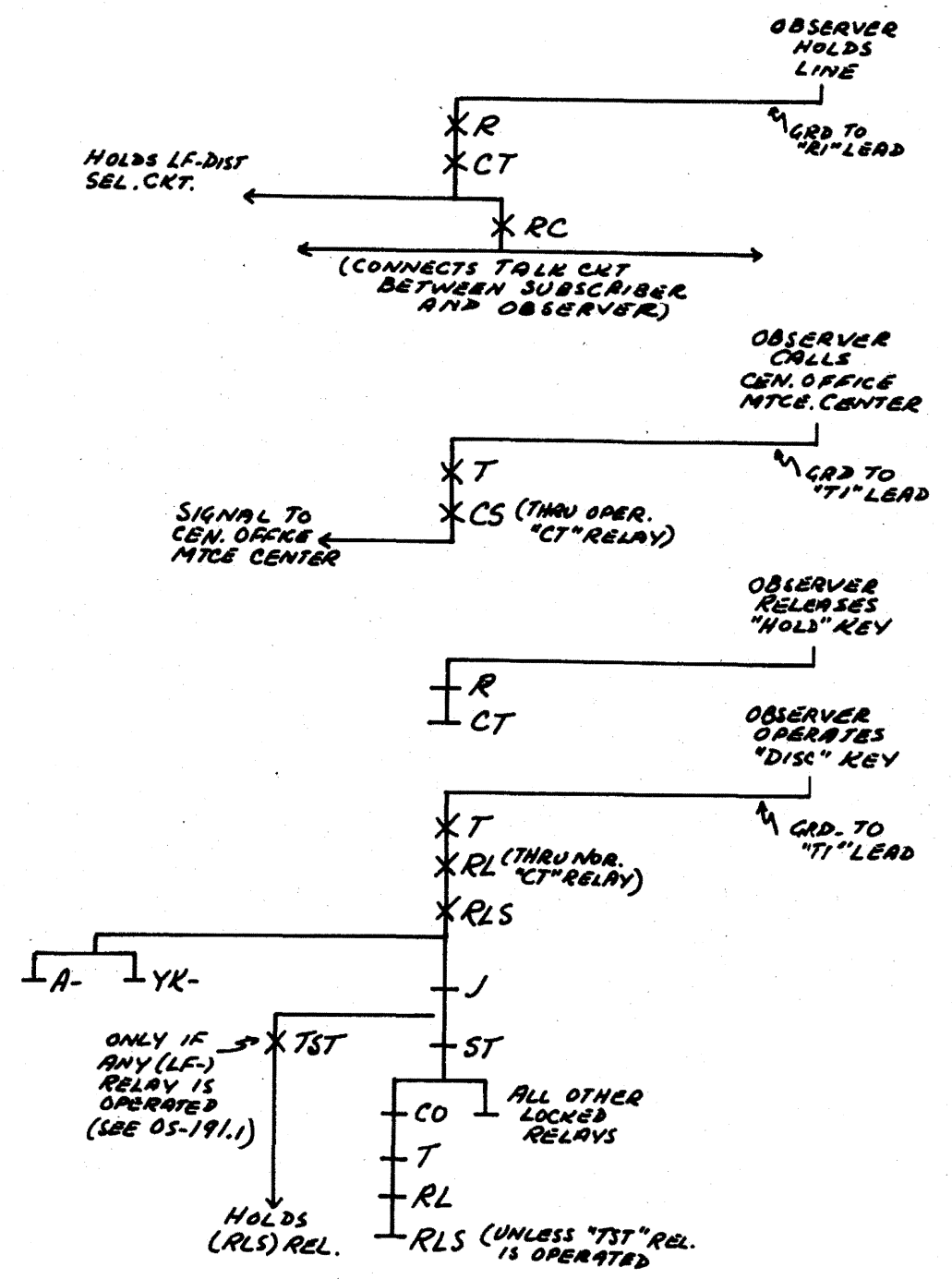
SUBSCRIBER DISCONNECT REG.
MESSAGE REGISTRATION OR
COIN DISPOSAL INDICATION

PANEL GCO

OS-1951



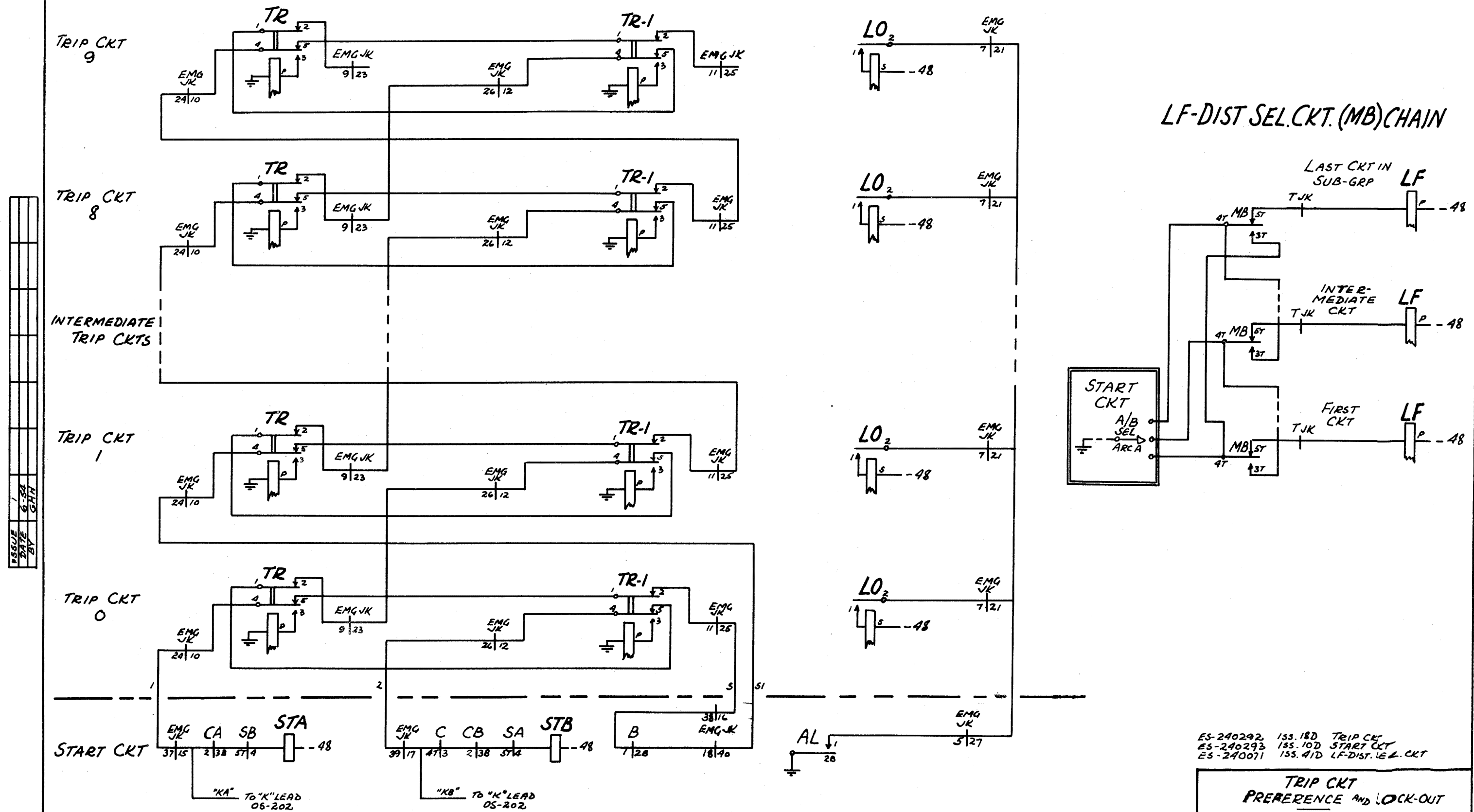
SEQUENCE CHART



SD-90242-01 ISS. 18-D SERV. OBS. CKT (LOCAL ORIL. SERVICE)
SD-21425-01 ISS. 5D OBSERVING LINE CKT

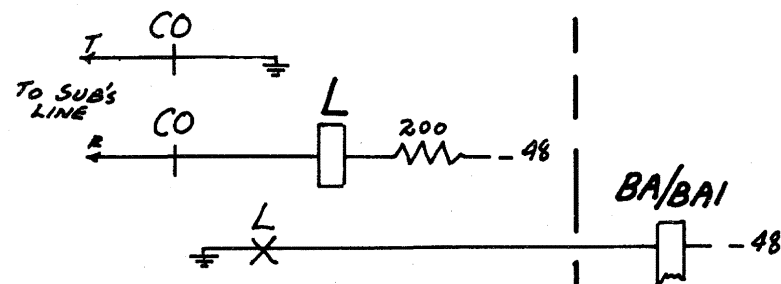
HOLDING FEATURE AND OBSERVER DISCONNECT
REG.
PANEL GCO
OS-196.1

TRIP CKT PREFERENCE AND LOCK-OUT



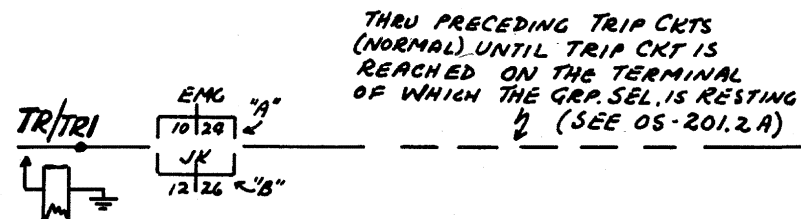
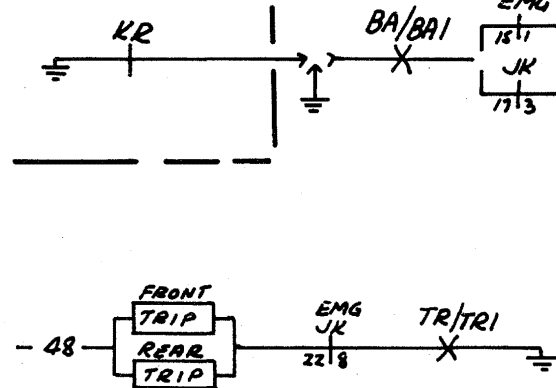
ISSUE	1
DATE	8-54
BY	CH/NS

LINE CKT

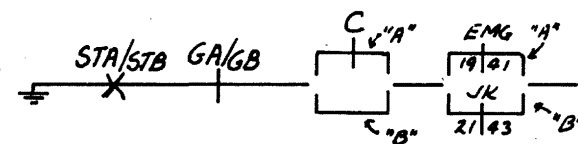
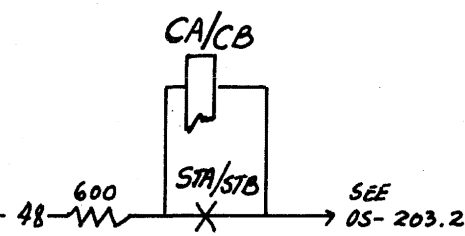
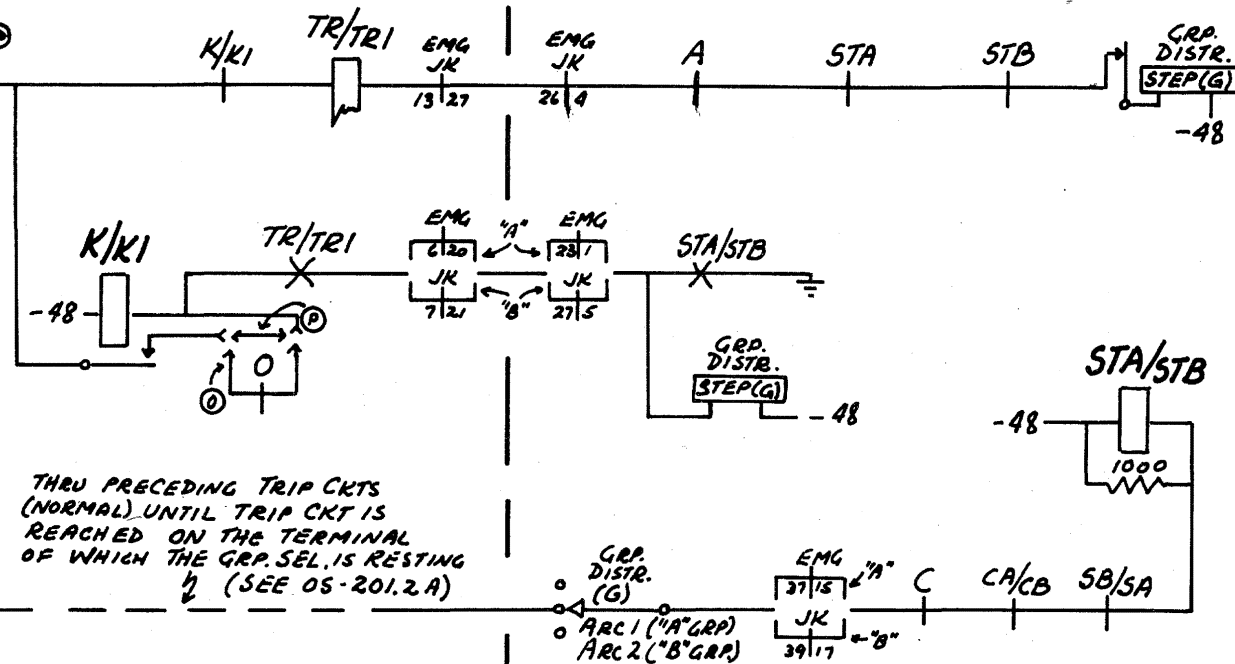


TRIP CKT

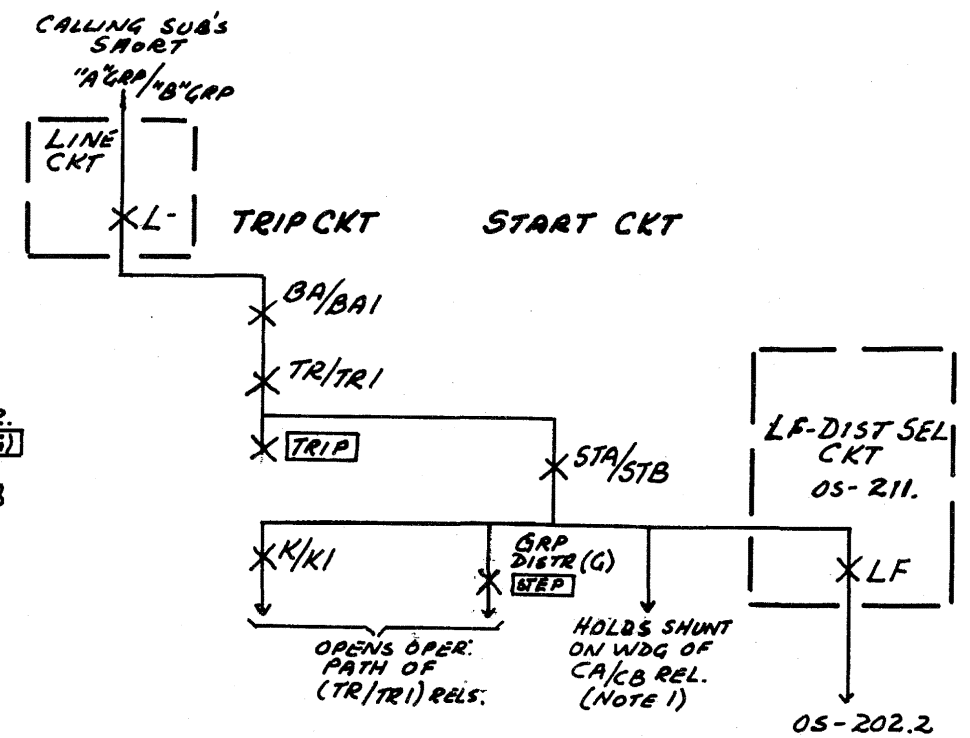
TIME ALARM CKT



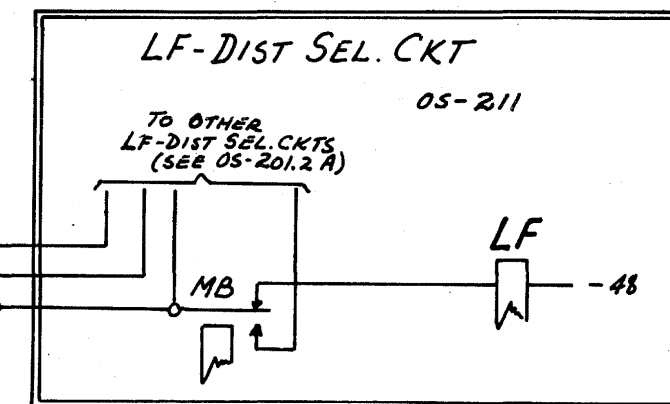
START CKT



SEQUENCE CHART



NOTE 1: TO PREVENT TRANSFER FEATURE FROM FUNCTIONING IN THE EVENT THIS CALL USES THE LAST IDLE SEL. CKT IN THE SUB-GRP. (SEE OS-203.2 FOR FUNCTION OF TRANSFER FEATURE)



T-501003 1ss. 81 LINE, TRIP, START CKTS
300 PT.

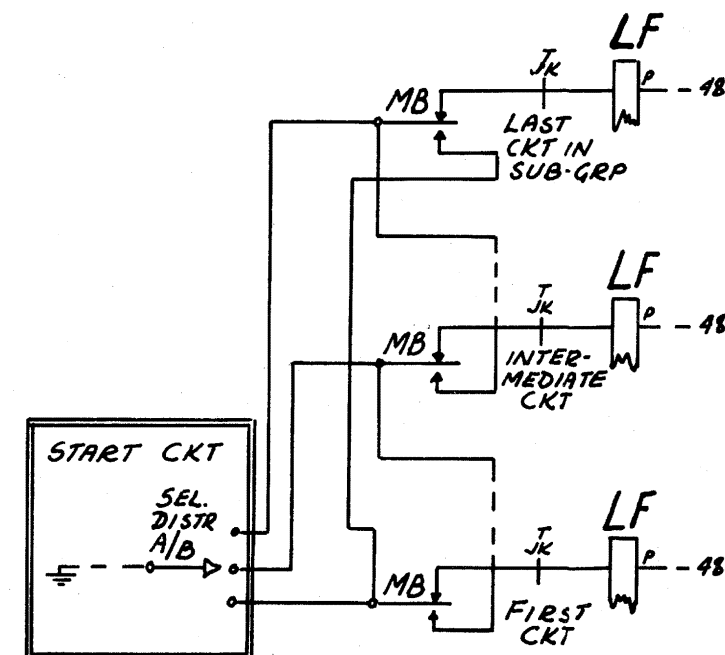
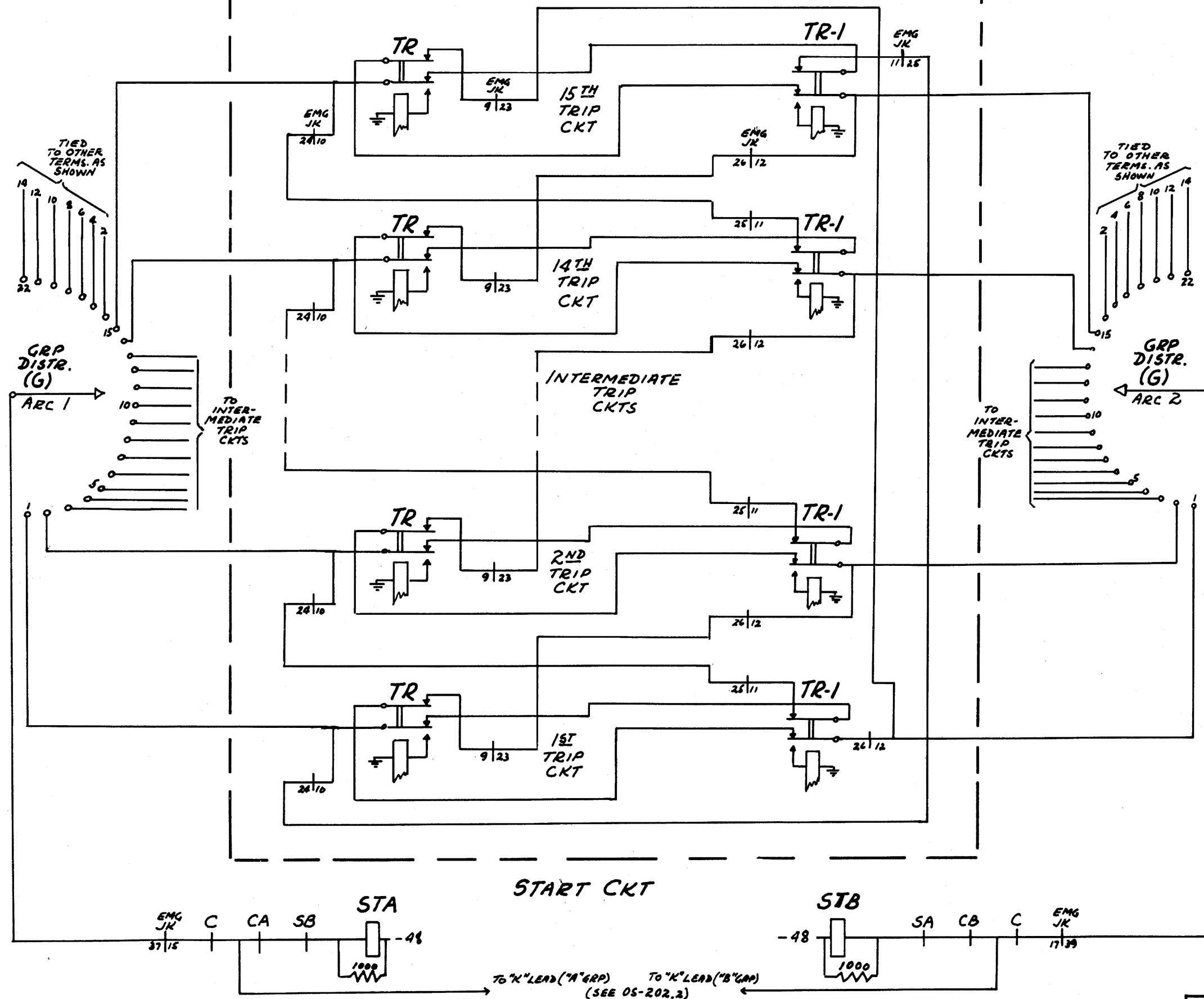
START OF CALL

PANEL GCO SDR. SEL. TYPE OS-201.2

TRIP CKT PREFERENCE

LF-DIST SEL. CKT. (MB) CHAIN

ISSUE	1
DATE	8-54
BY	CHINS

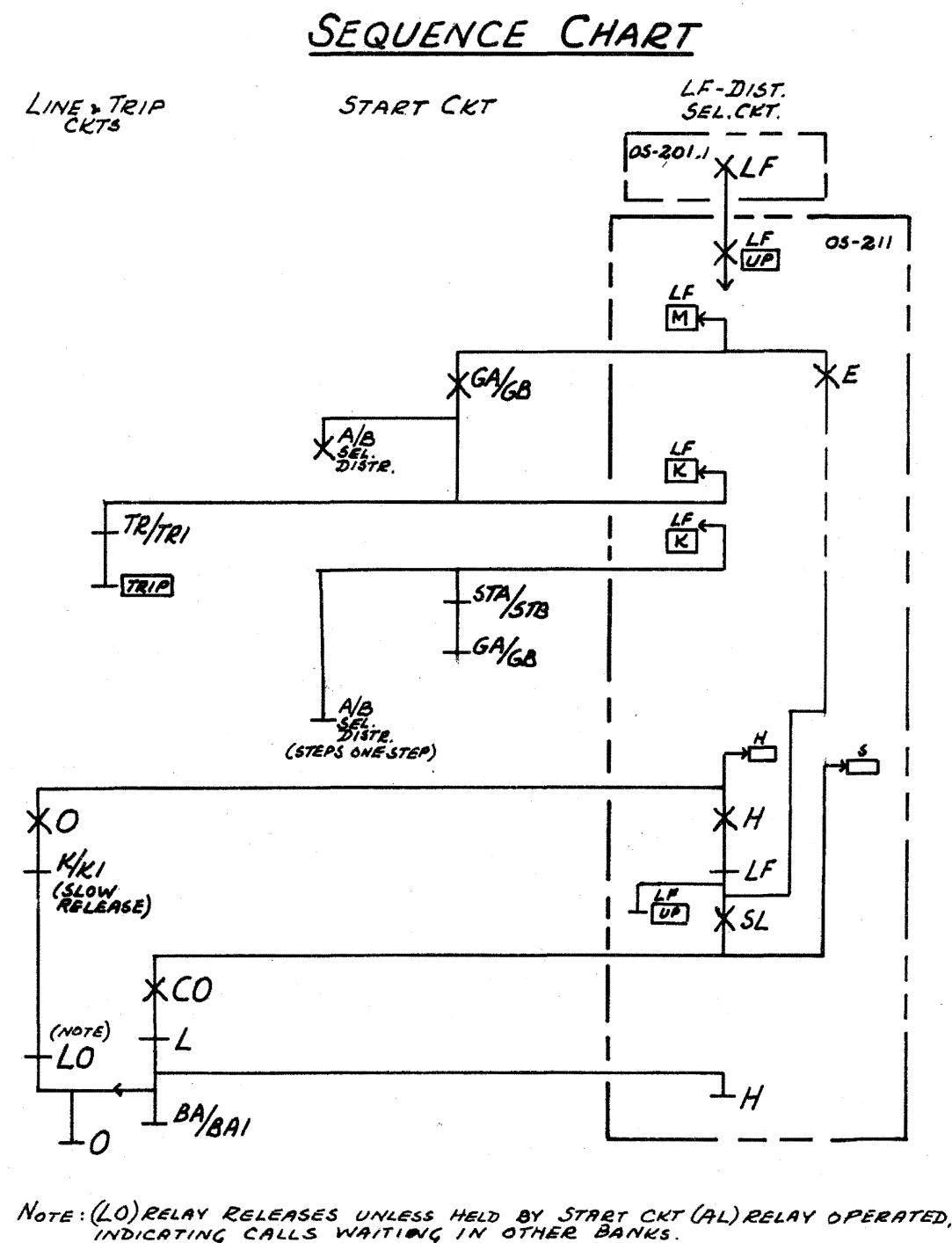
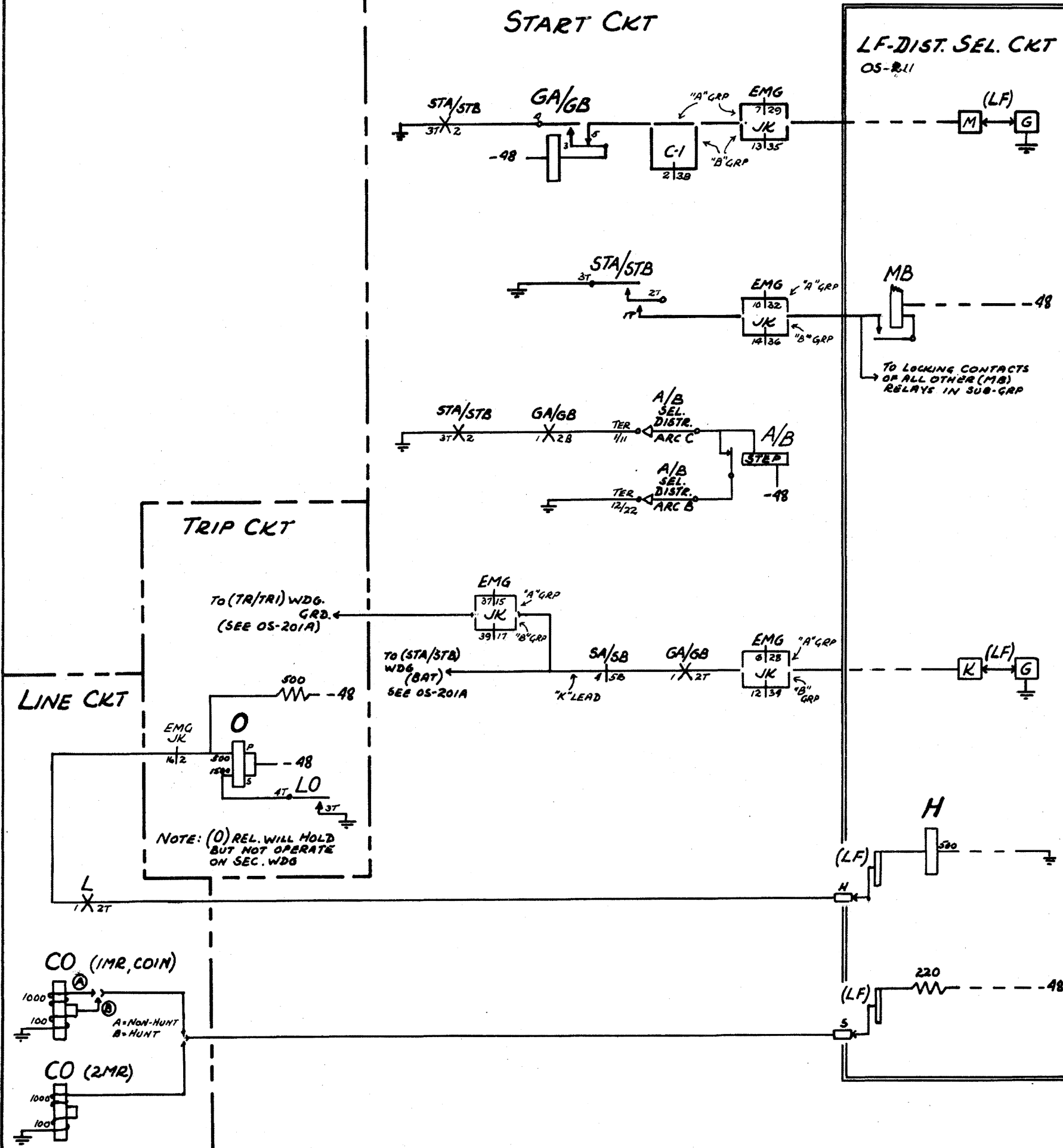


T-501003 Iss. 81 TRIP & START CKT
LF-DIST SEL CKT

TRIP CKT PREFERENCE
LF-DIST SEL. CKT (MB) CHAIN

PANEL GCO SDR. SEL. TYPE 05-201.2A

ISSUE	1					
DATE	6-30					
BY	GHH					

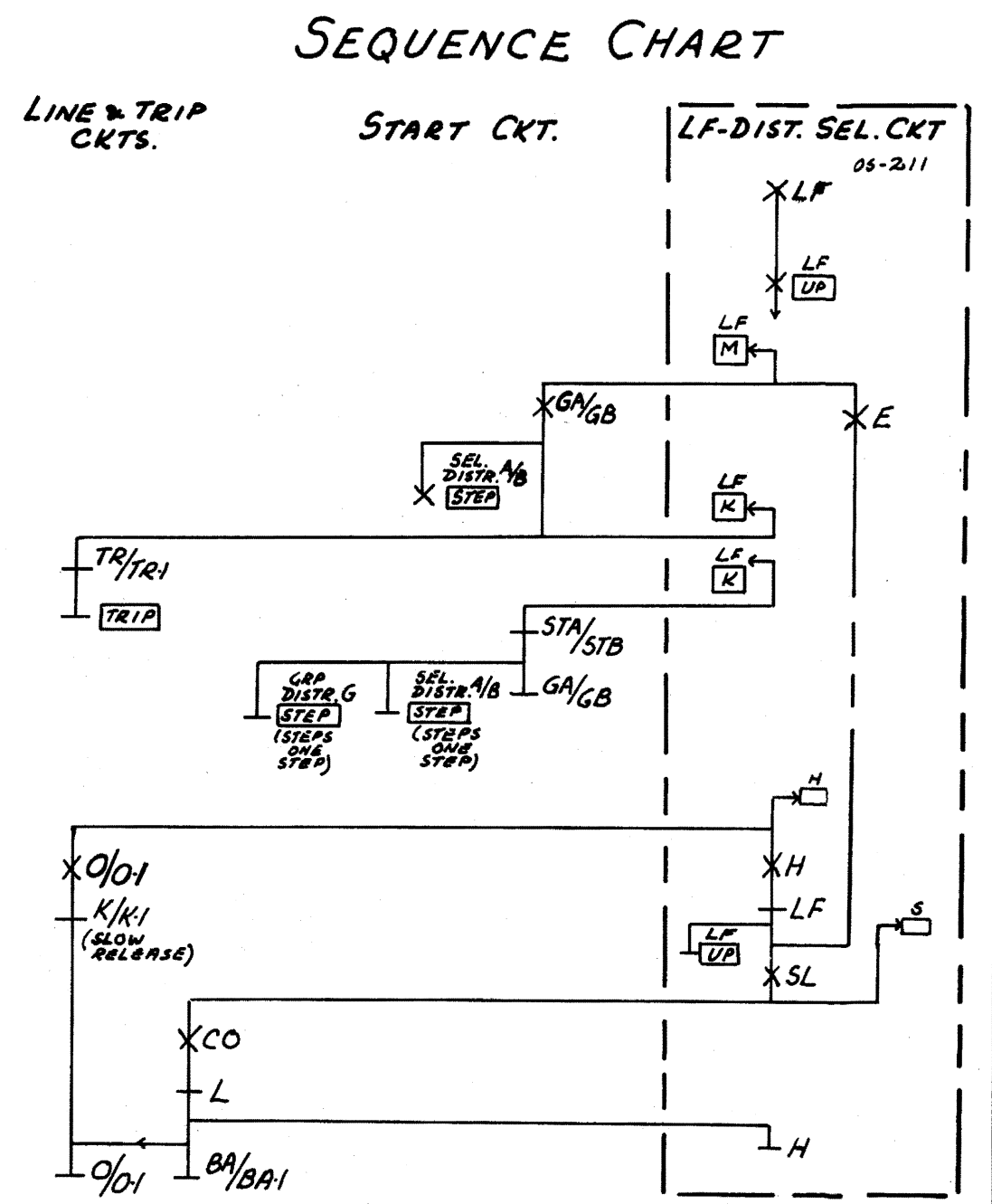
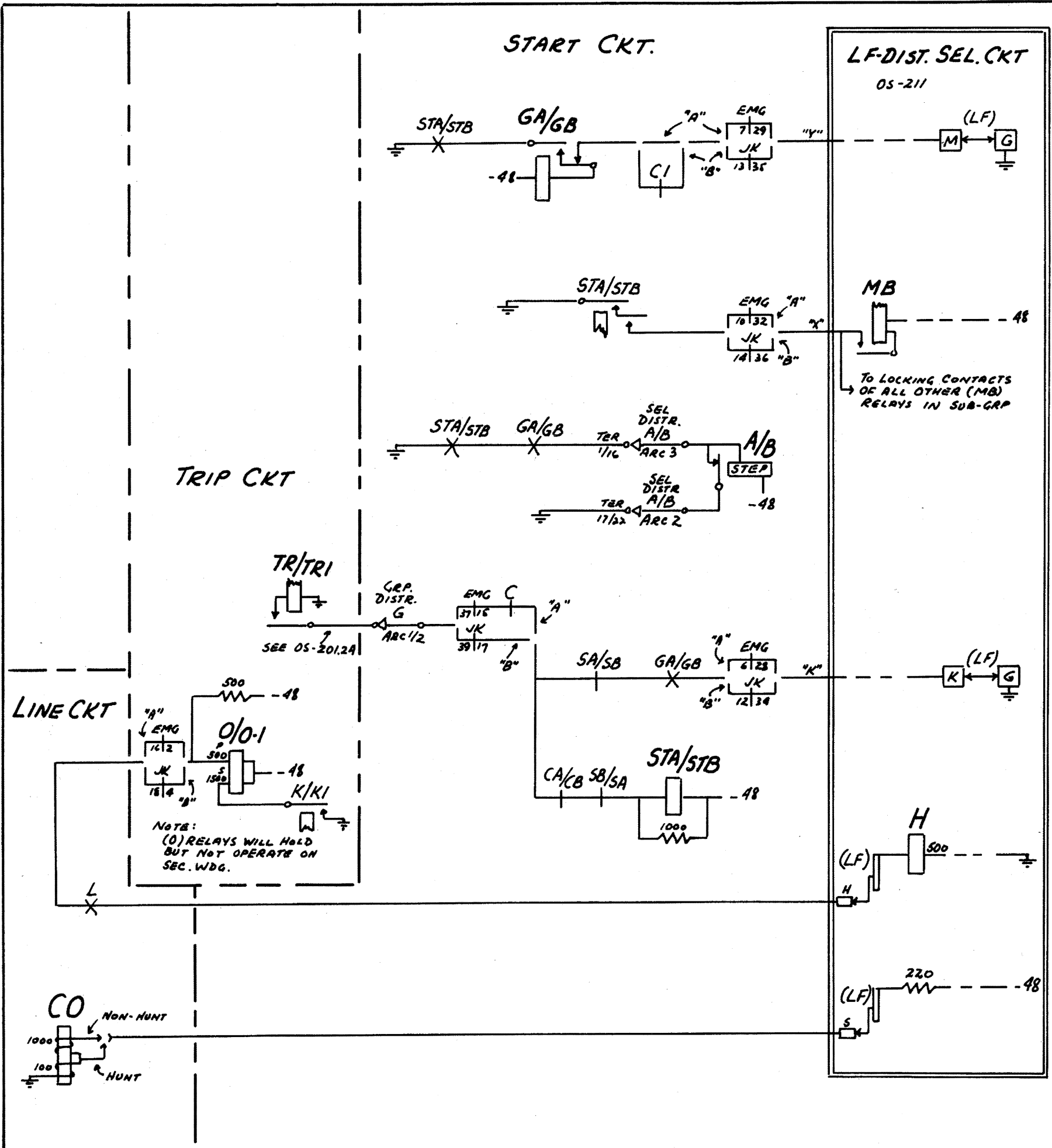


ES-240292 1SS. 18-D LINE & TRIP CKT
ES-240293 1SS. 10-D START CKT

TRIP AND START CKT RELEASE

PANEL GCO	SDR.SEL.TYPE	OS-202.1
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ISSUE	1
DATE	8-54
BY	GH/NS



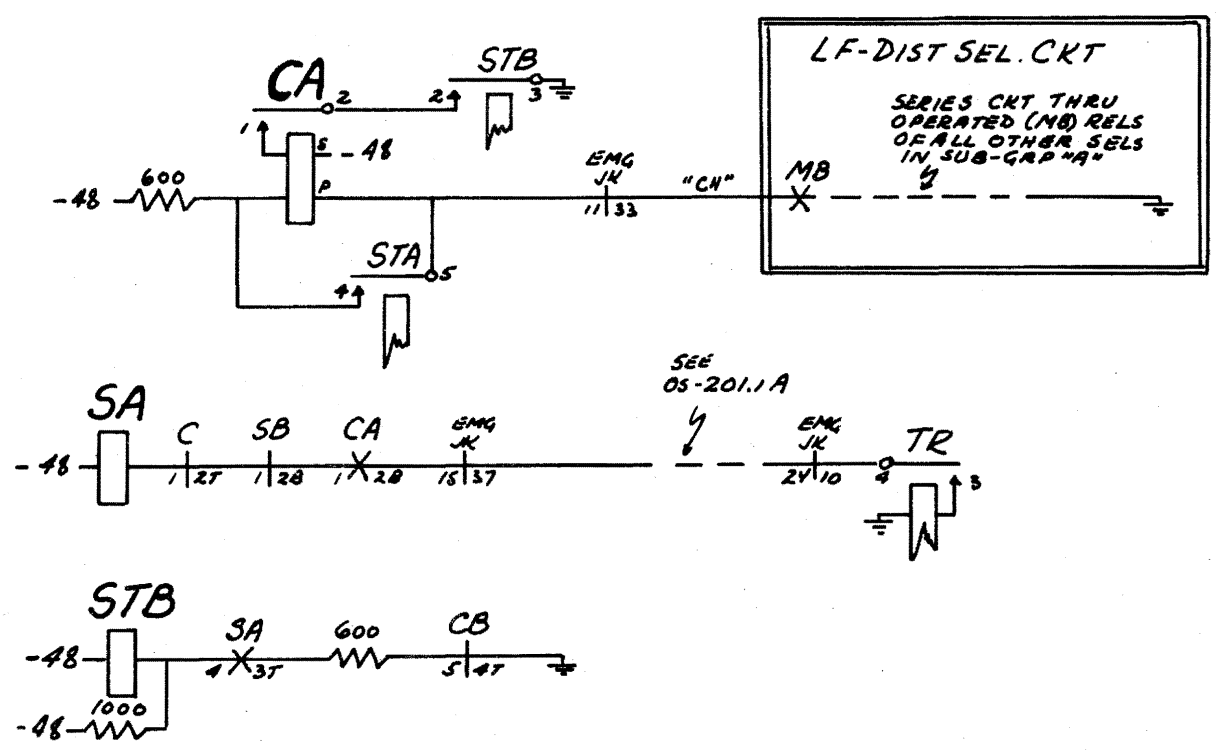
T-501003 1ss.81 LINE, TRIP, START CKT
300 PT

TRIP AND START CKT RELEASE

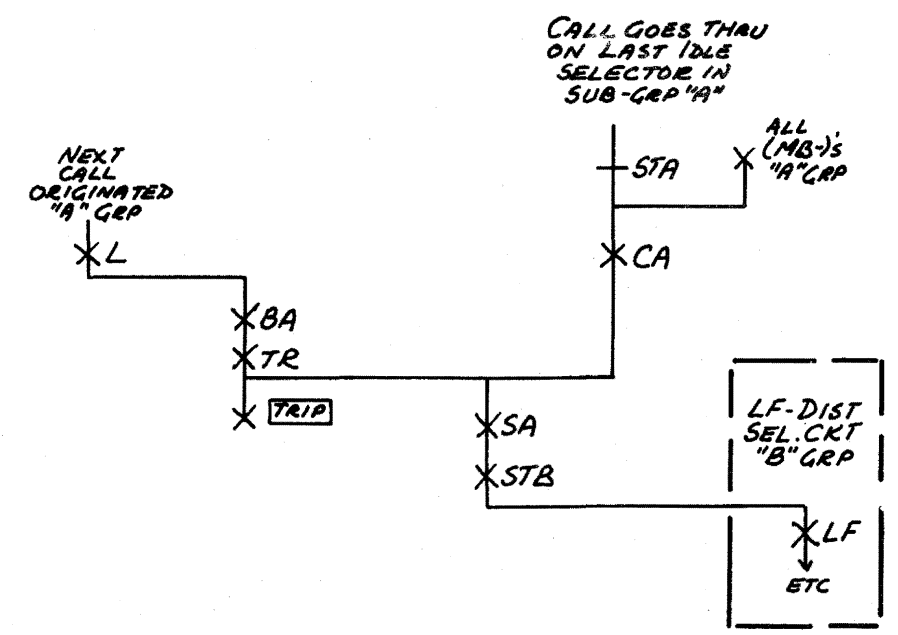
PANEL GCO SDR. SEL. TYPE OS-202.2

SEQUENCE CHART

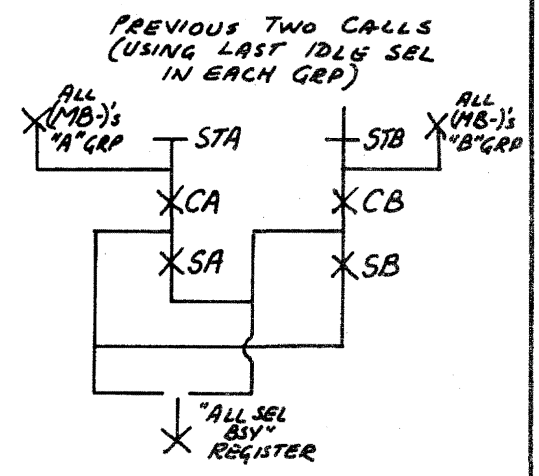
(A) ALL SELECTORS BUSY "A" GRP.



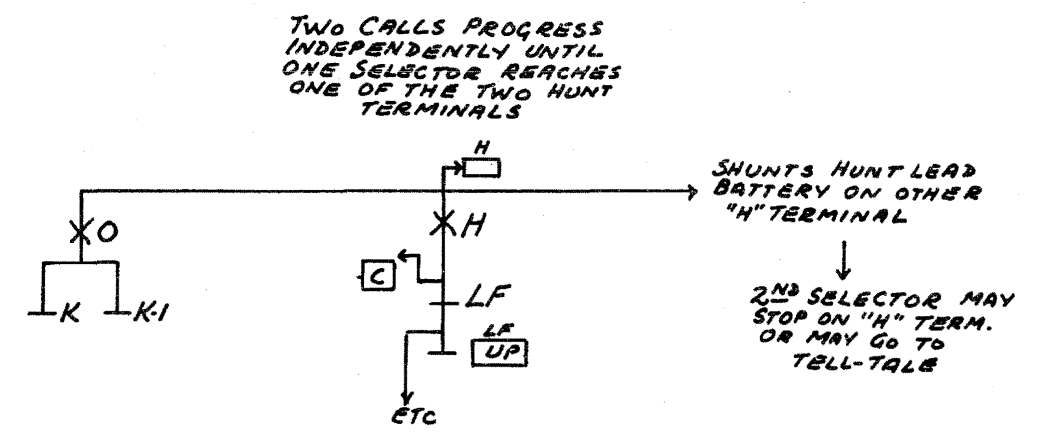
(A) ALL SELECTORS BUSY SUB-GRP "A"



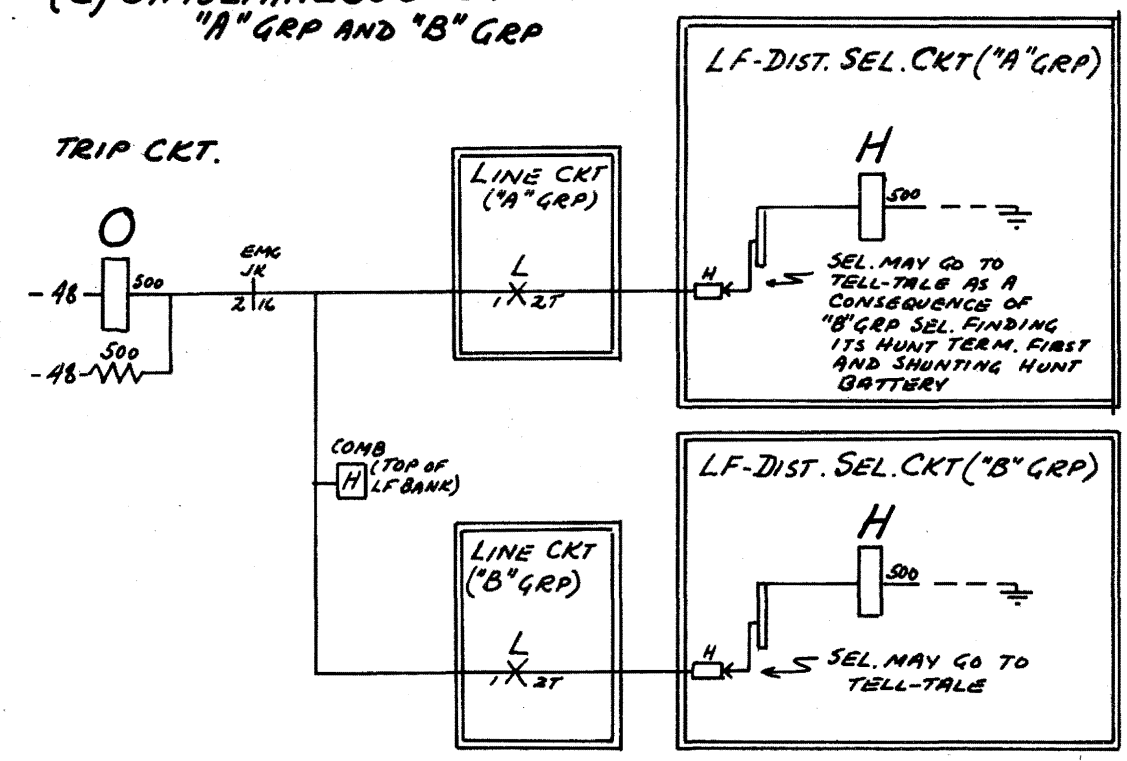
(B) ALL SELECTORS BUSY BOTH SUB-GRPS



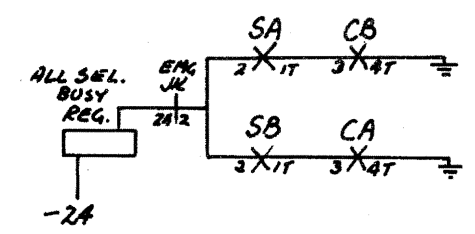
(C) SIMULTANEOUS CALLS "A" AND "B" GRPS (SAME BANK)



(C) SIMULTANEOUS CALLS "A" GRP AND "B" GRP



(B) ALL SELECTORS BUSY "A" GRP AND "B" GRP



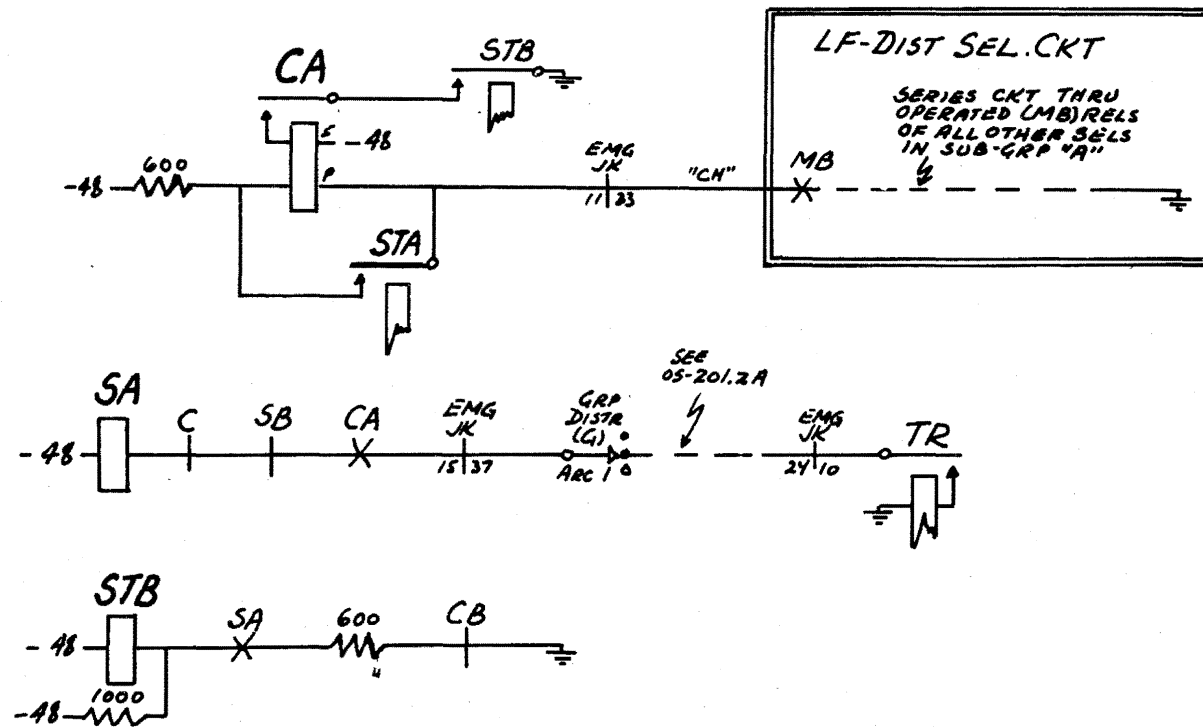
ES-240292 155.18D LINE & TRIP CKT
ES-240293 " 10D START CKT

MISC. FEATURES:
(A) ALL SELS. BUSY "A" GRP
(B) ALL SELS. BUSY BOTH GRPS
(C) SIMULTANEOUS CALLS "A" AND "B" GRPS

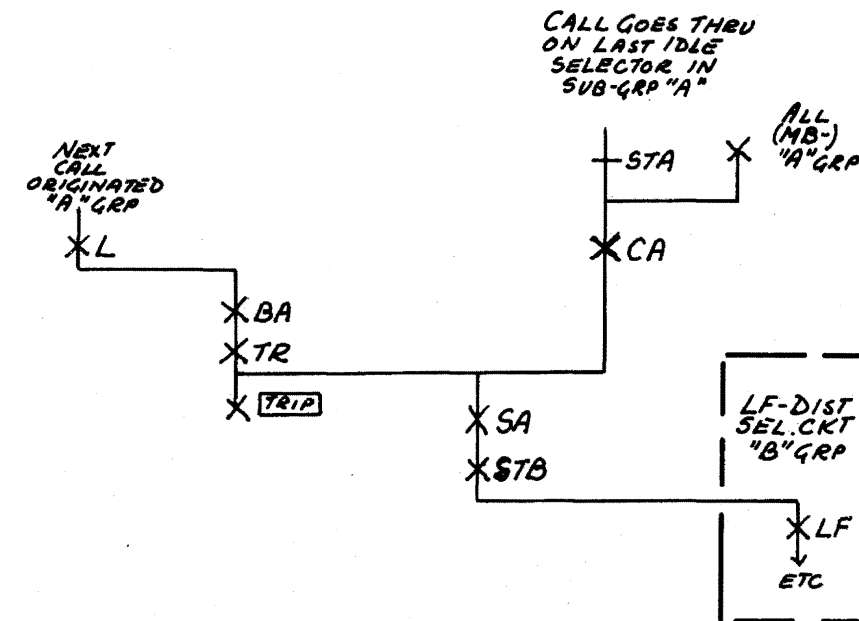
PANEL GCO SDR. SEL. TYPE OS-203.1

SEQUENCE CHART

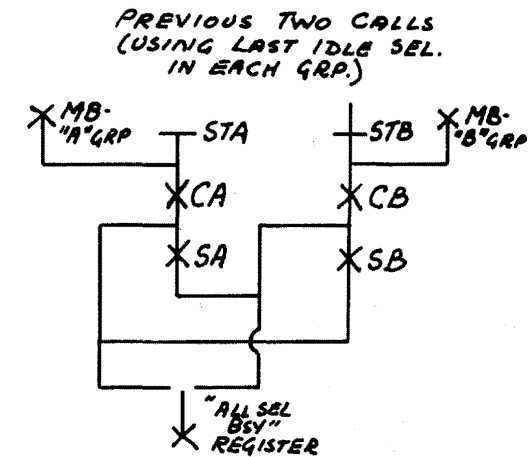
(A) ALL SELECTORS BUSY "A" GRP.



(A) ALL SELECTORS BUSY SUB-GRP "A"

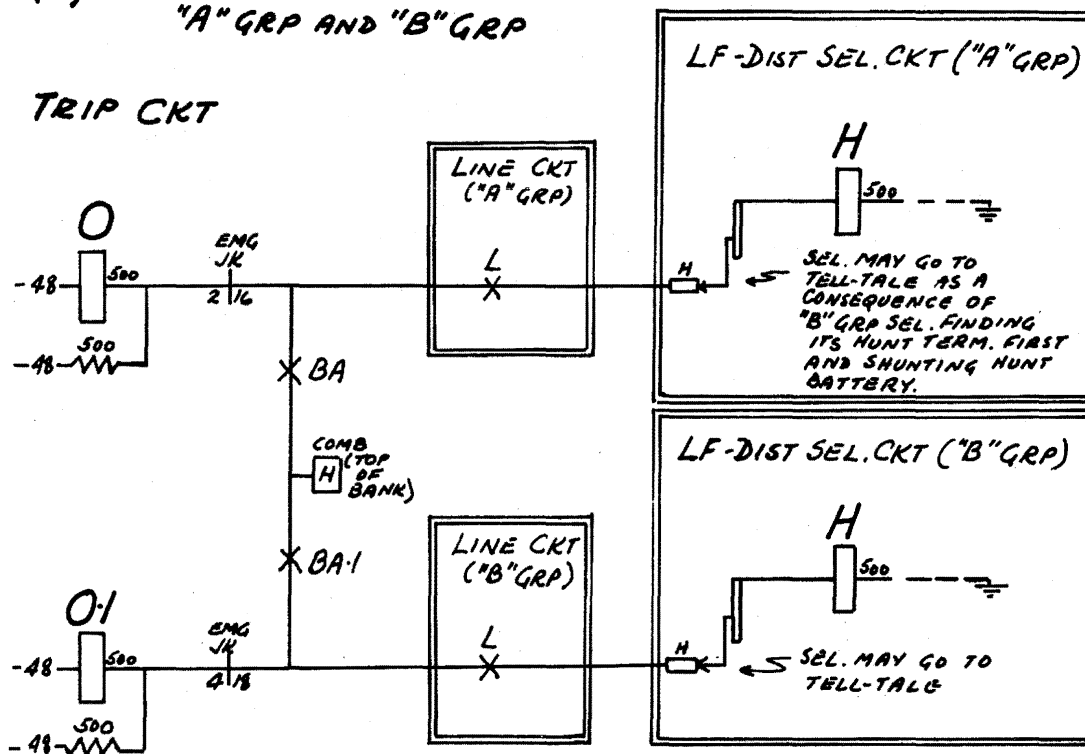


(B) ALL SELECTORS BUSY BOTH SUB-GRPS

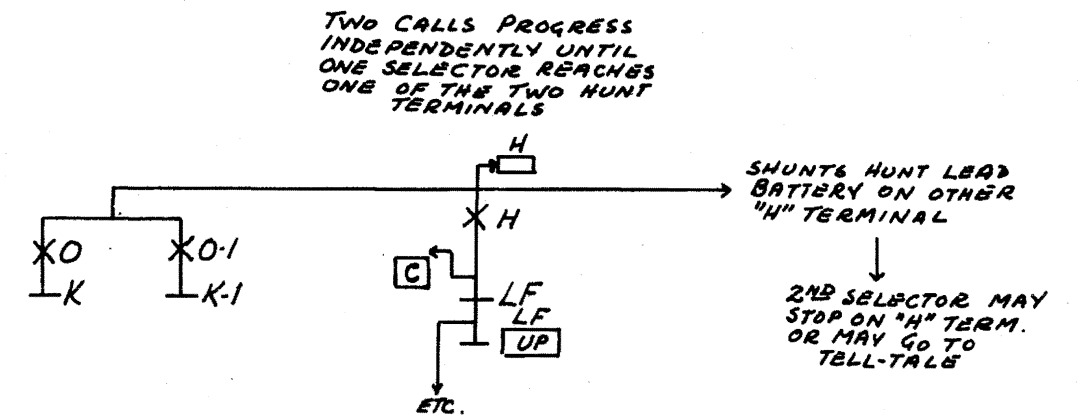
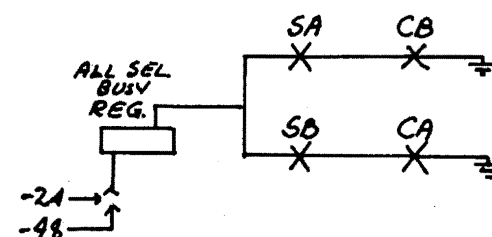


(C) SIMULTANEOUS CALLS "A" AND "B" GRPS. (SAME BANK)

(C) SIMULTANEOUS CALLS "A" GRP AND "B" GRP



(B) ALL SELECTORS BUSY "A" GRP AND "B" GRP



T-501003 1ss.81 LINE, TRIP, START CKT 300 PT.

MISC. FEATURES:
(A) ALL SELS. BUSY "A" GRP
(B) ALL SELS. BUSY BOTH GRPS
(C) SIMULTANEOUS CALLS "A" AND "B" GRPS

PANEL GCO SDR. SEL. TYPE 05-203.2

LF-DIST. SEL. CKT

STRAPPING OF
COMMUTATOR BRUSHES
(LF) (D)

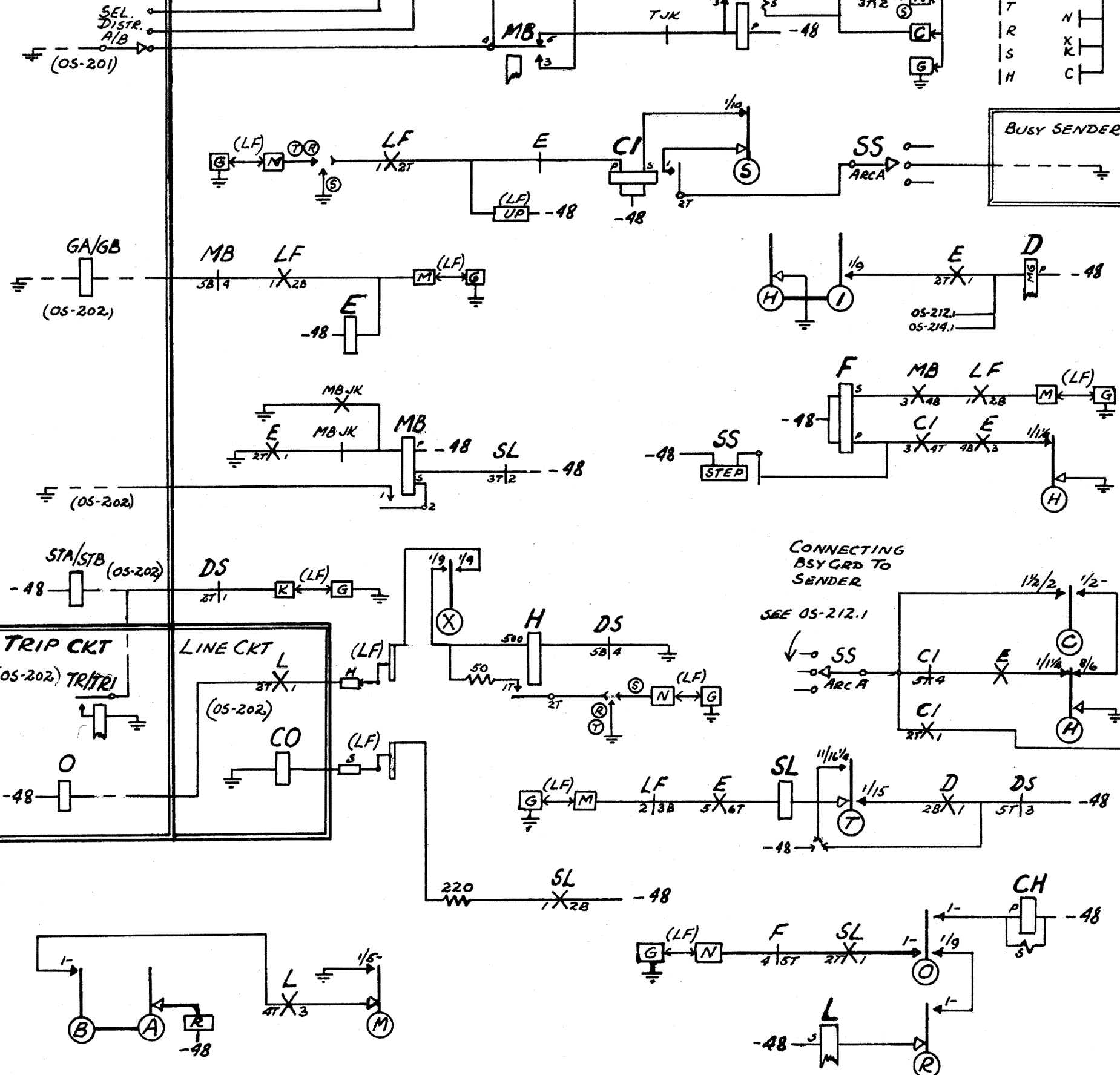
SEQUENCE CHART

START CKT

To OTHER LF-DIST. CKTS
(SEE OS-201A)

START CKT (OS-201)

LF-DIST SEL. CKT



TRIP CKT (OS-202)

LINE CKT (OS-202)

DIST. SEQ. SWITCH

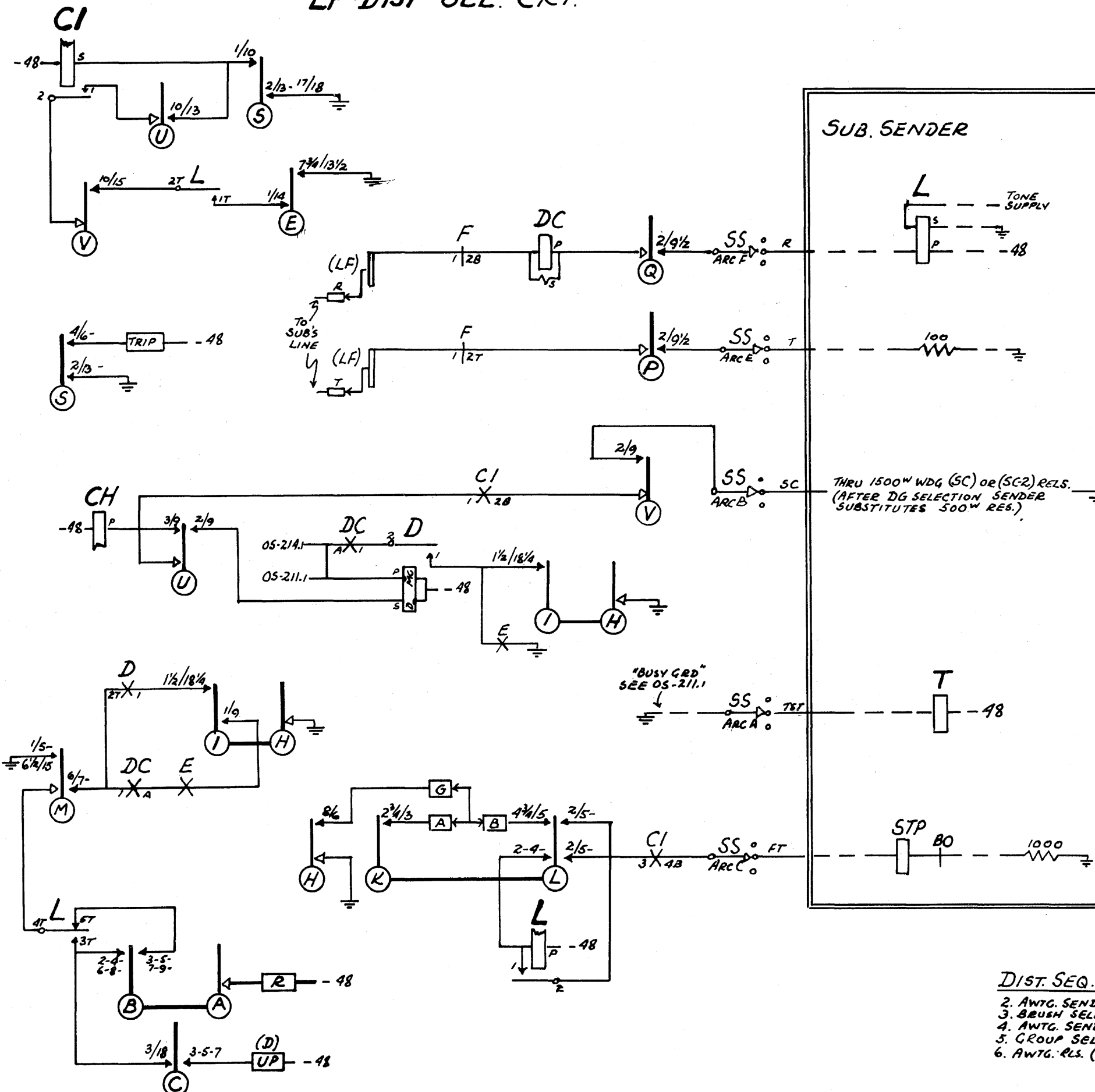
1. NORMAL (LF HUNTING)
2. AWTG. SENDER

ES-240071 1SS, A1-D LF-DIST SEL. CKT (MR)

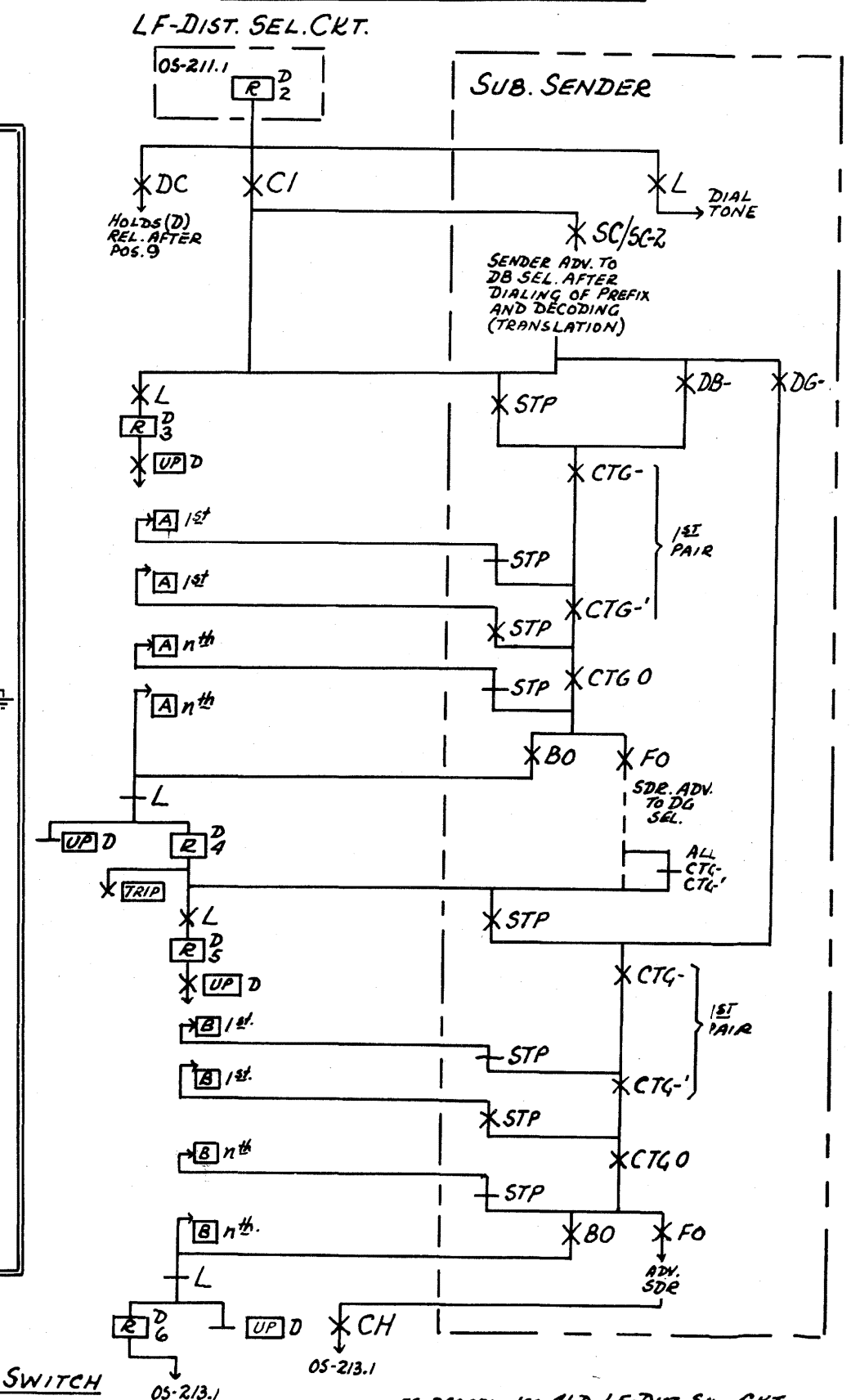
FIND CALLING LINE
HUNT IDLE SENDER
RELEASE TRIP & START CKTS

PANEL GCO SDR SEL. TYPE OS 211.1

SEQUENCE CHART



SEQUENCE CHART



DIST. SEQ. SWITCH

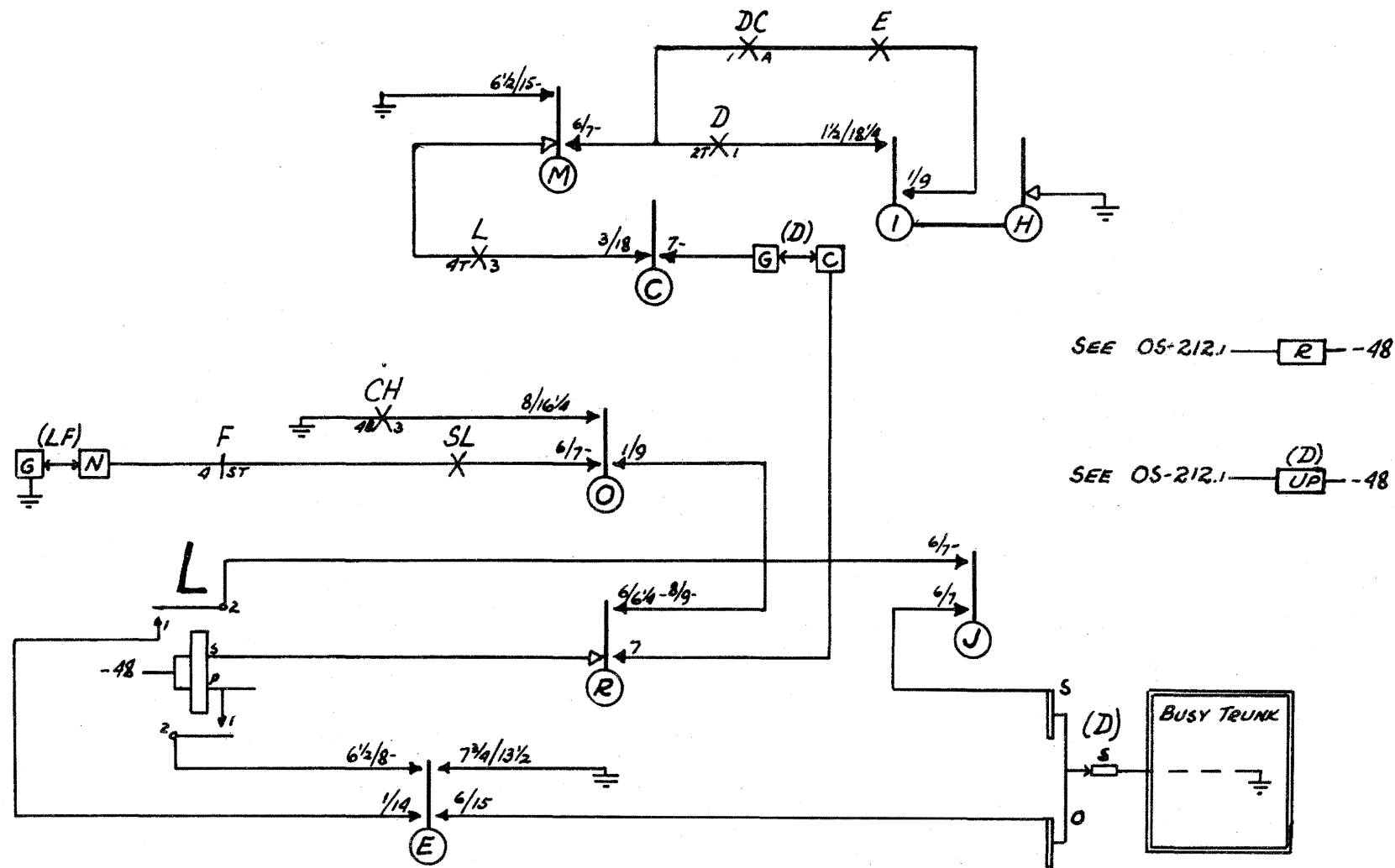
2. AWTG. SENDER
3. BRUSH SELECTION
4. AWTG. SENDER (TRIP)
5. GROUP SELECTION
6. AWTG. RLS. (RETURN ON W.O.)

ES-240071 1ss. 41-D LF-DIST SEL. CKT

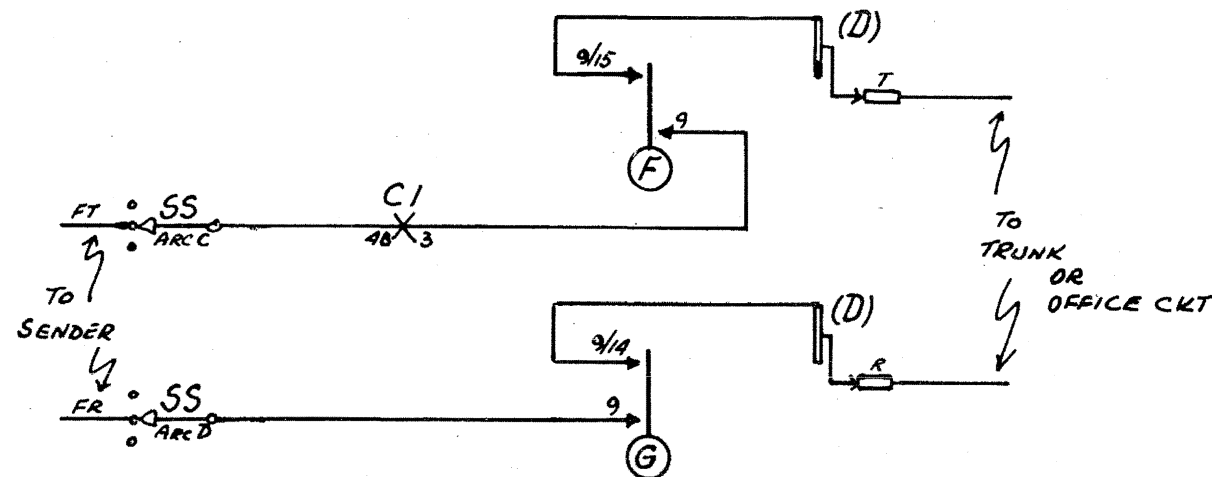
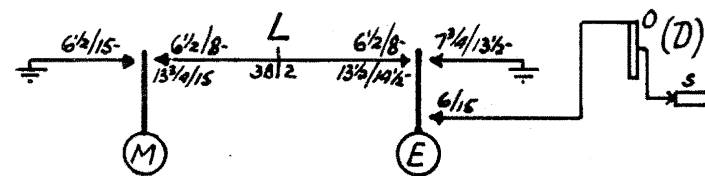
DIAL TONE TO CALLING SUB.
DISTRICT BRUSH & GROUP SEL.

PANEL GCO	SDR. SEL. TYPE	OS-2/2.1
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LF-DIST. SEL. CKT.

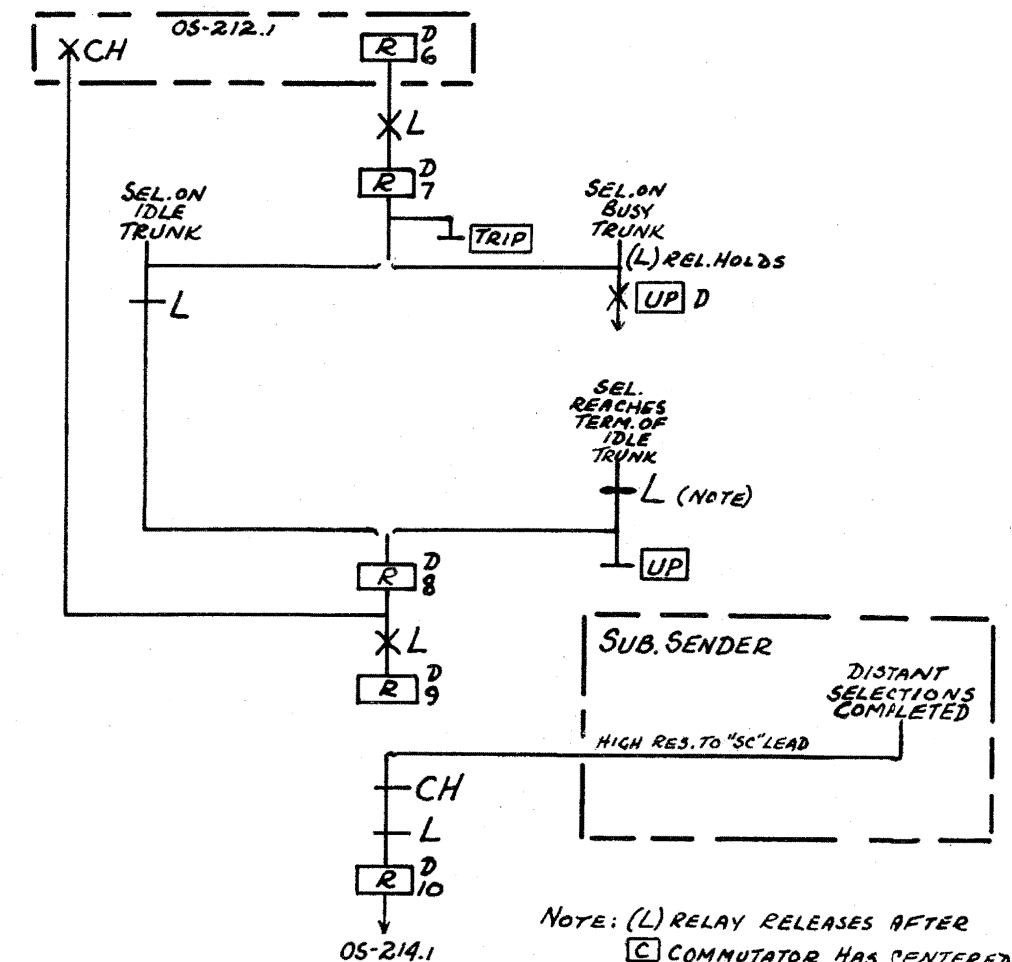


CONNECTING BUSY GRD TO TRUNK:



SEQUENCE CHART

LF-DIST. SEL. CKT



DIST. SEQ. SWITCH

6. AWG. RLS. (RETURN ON W.O.)
7. TRUNK HUNTING
8. AWG. SENDER
9. SELECTION BEYOND
10. AWG. SENDER

ES-240071 ISS. 41-D LF-DIST. SEL. CKT.

TRUNK HUNT IMR
SELECTION BEYOND
DISTRICT ADVANCE

PANEL GCO SDR SEL. TYPE OS-213.1

LF-DIST. SEL. CKT

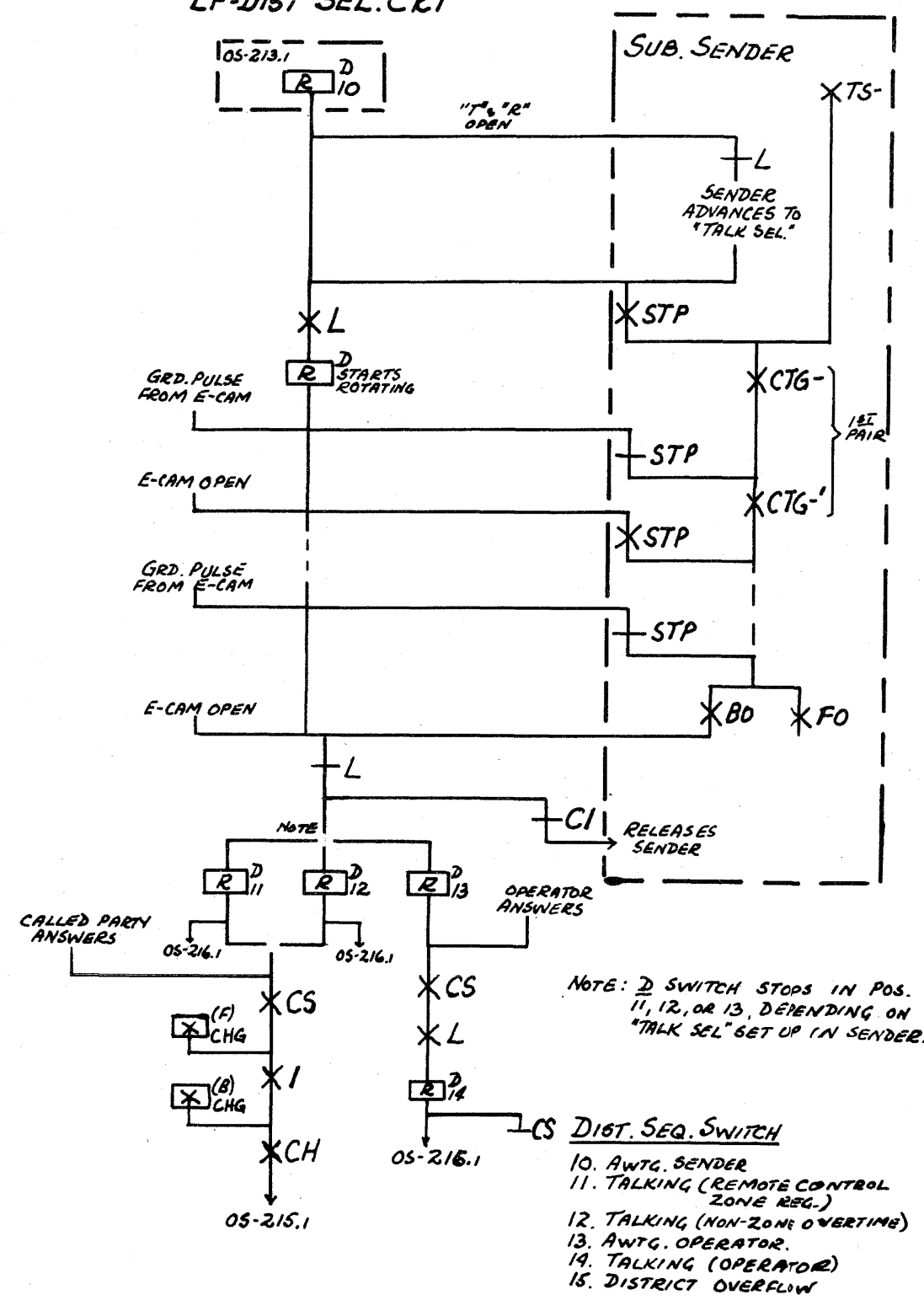
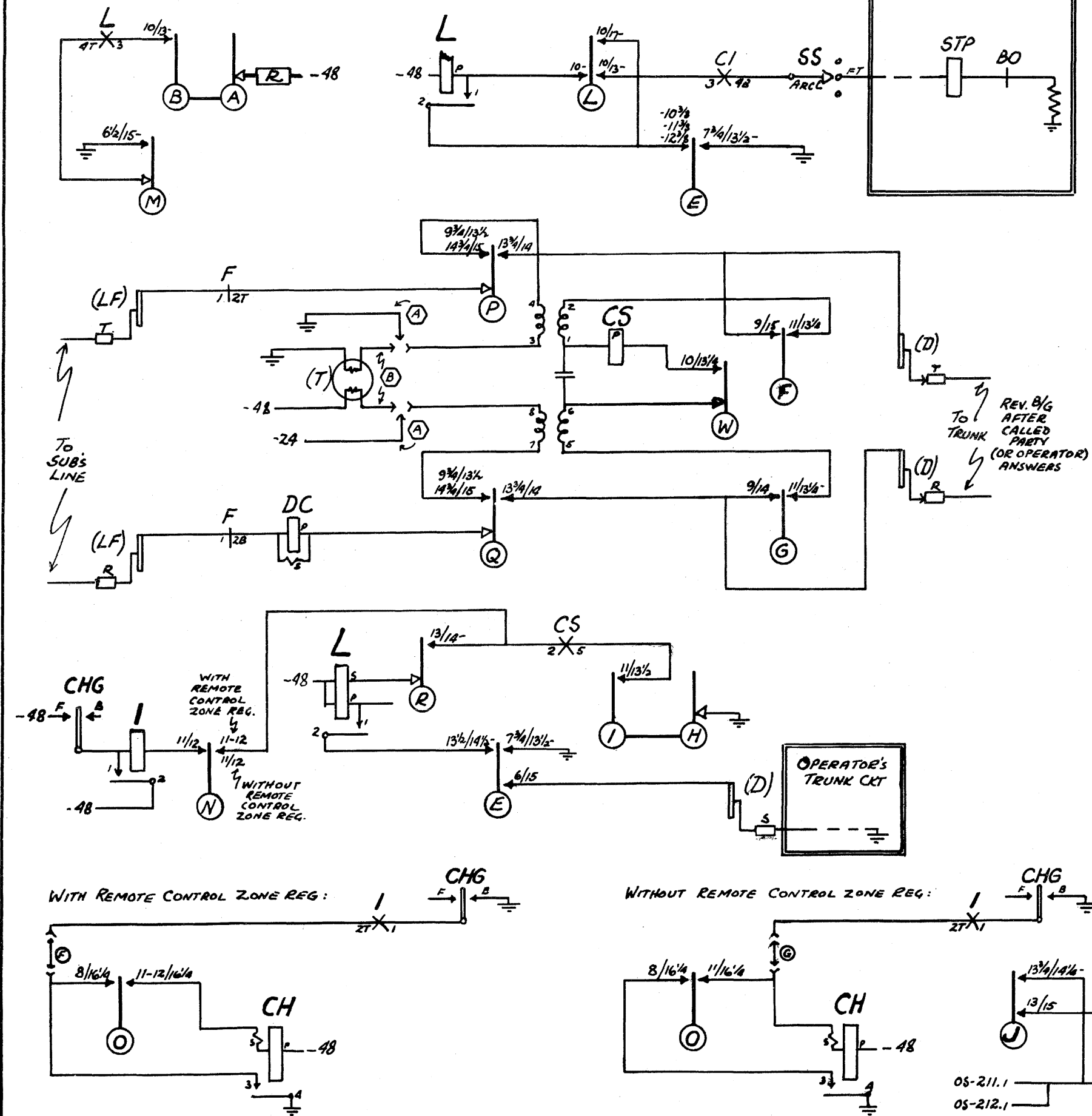
SUB. SENDER

SEQUENCE CHART

LF-DIST. SEL. CKT

SUB. SENDER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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ES-240071 155.41-D LF-DIST SEL. CKT

TALK SELECTION	TALKING	IMR
PANEL GCO	SDR. SEL. TYPE	OS-2141

[illegible]

HH5	NO
6-54	DATE
1	ISSUE

HH5	NO
6-54	DATE
1	ISSUE



HH5	NO
6-54	DATE
1	ISSUE



HH5	NO
6-54	DATE
1	ISSUE



HH5	NO
6-54	DATE
1	ISSUE

- | | |
|------|-------|
| HH5 | NO |
| 6-54 | DATE |
| 1 | ISSUE |

HH5	NO
6-54	DATE
1	ISSUE

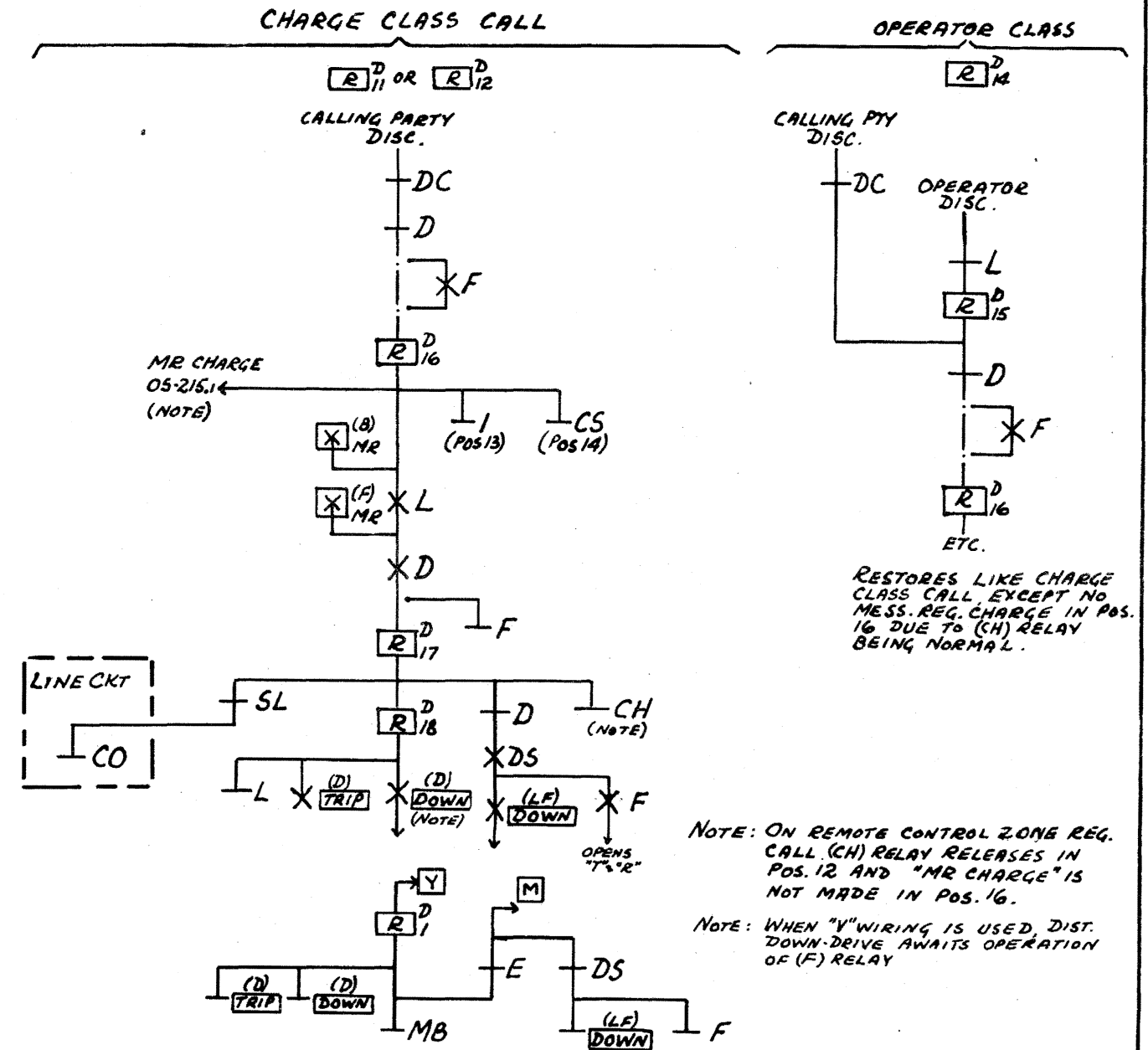
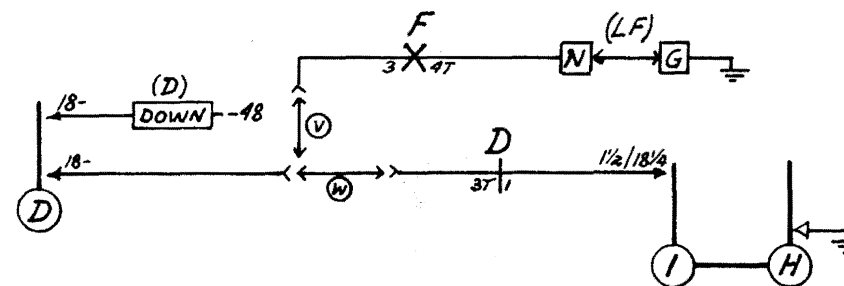
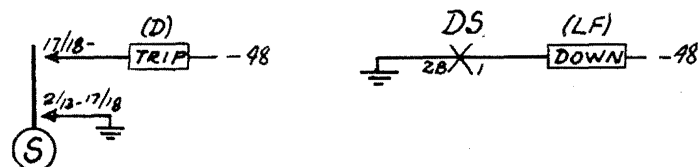
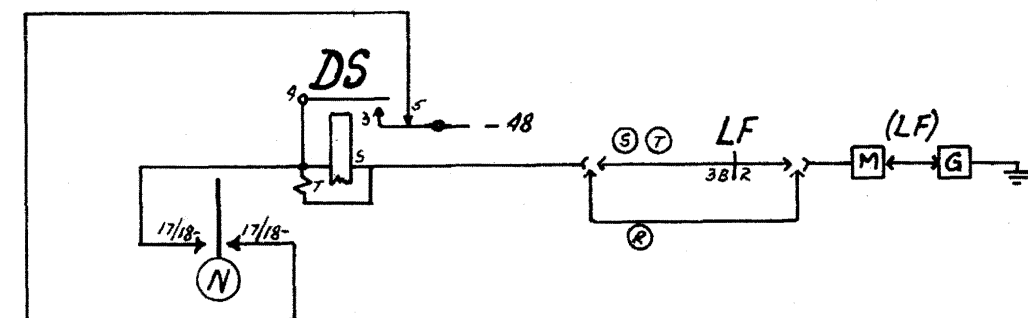
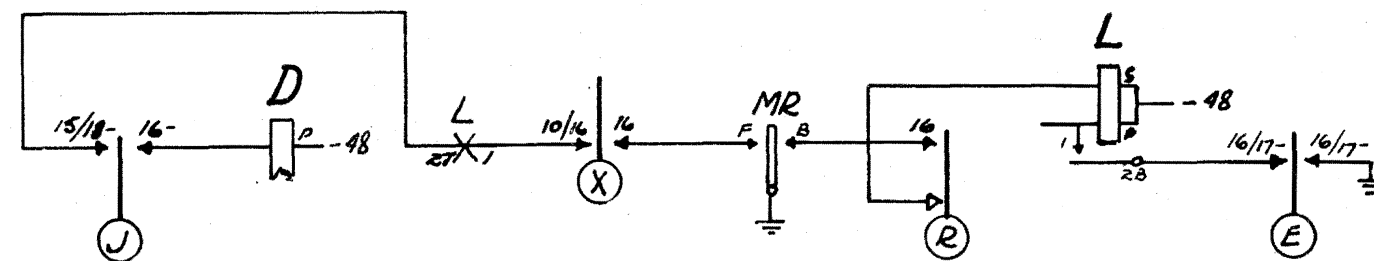
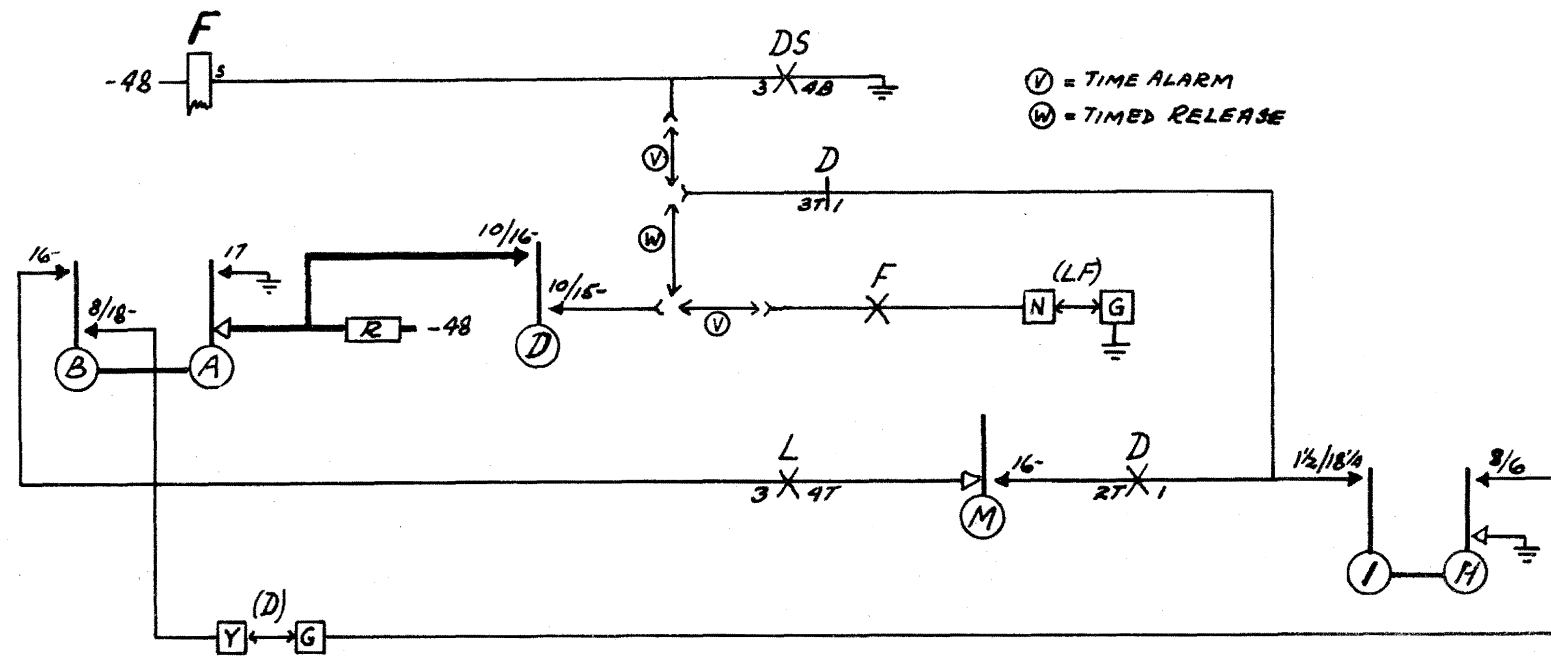
HH5	NO
6-54	DATE
1	ISSUE

HH5	NO
6-54	DATE
1	ISSUE

HH5	NO
6-54	DATE
1	ISSUE

LF-DIST. SEL. CKT.

SEQUENCE CHART



NOTE: ON REMOTE CONTROL ZONE REG. CALL (CH) RELAY RELEASES IN POS. 12 AND "MR CHARGE" IS NOT MADE IN POS. 16.

NOTE: WHEN "Y" WIRING IS USED, DIST. DOWN-DRIVE AWAITS OPERATION OF (F) RELAY

DIST. SEQ. SWITCH

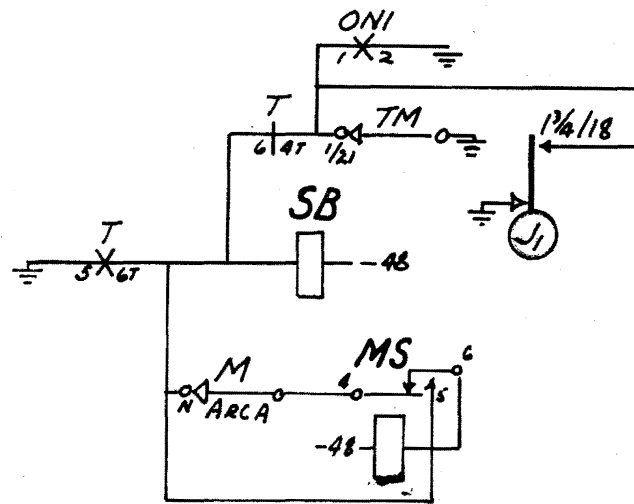
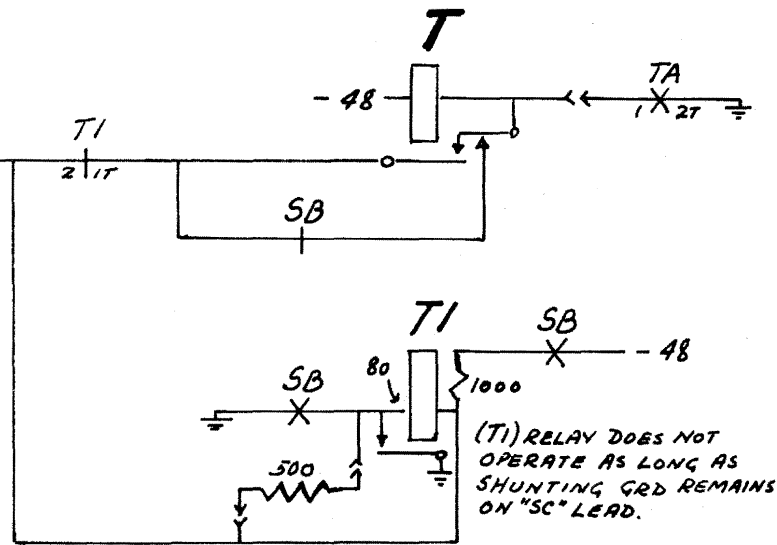
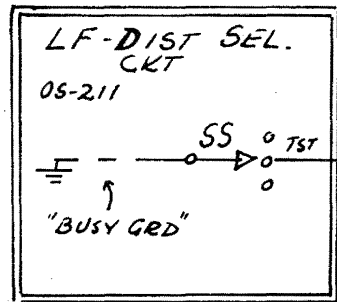
11. TALKING
12. "
13. AWG. OPERATOR
14. TALKING (OPERATOR)
15. DISTRICT OVERFLOW
16. MESSAGE REGISTER
17. PASS-BY
18. RETURN
1. NORMAL

ES-240071 1ss. 41-D LF-DIST. SEL. CKT

CALLING SUB. DISCONNECTS
LF-DISTRICT RESTORE

PANEL GCO SDR SEL TYPE OS-2161

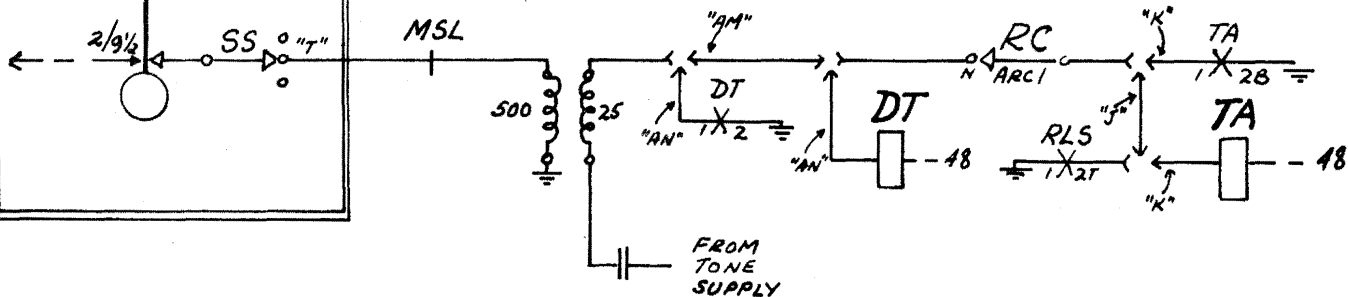
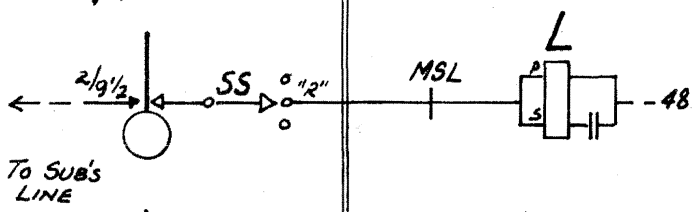
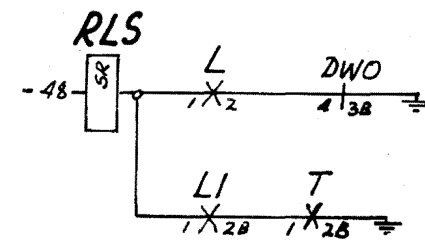
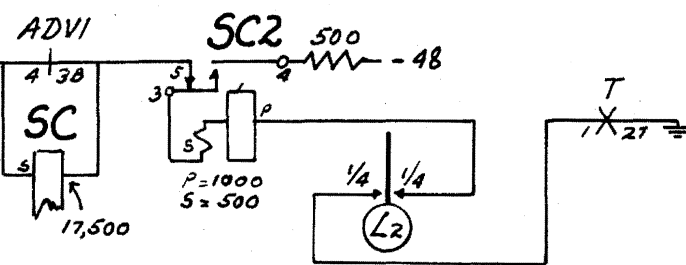
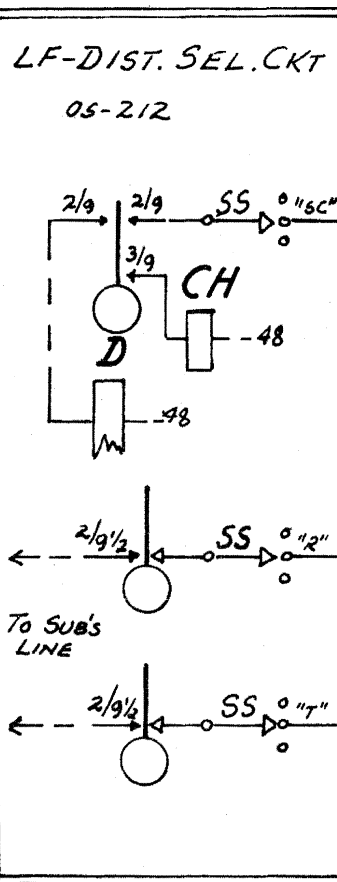
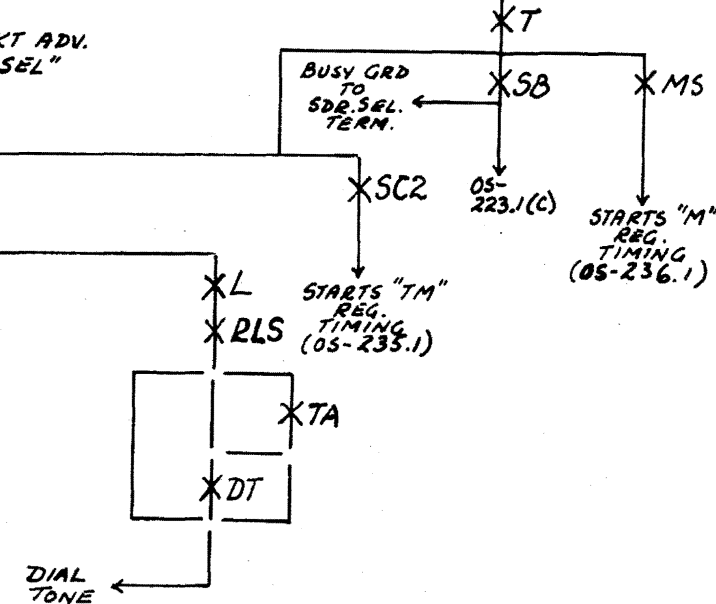
1	12-54	GHH
ISSUE	DATE	BY



SEQUENCE CHART

SDR SEIZED BY
DIST. SEL.
(GRD ON "TST" LEAD)

DIST. SEL. CKT ADV.
TO "BRUSH SEL"
(POS 2)



ES-2400S3 1SS.51D SUBSCRIBER'S SENDER
NON-COIN
NON-ZONE

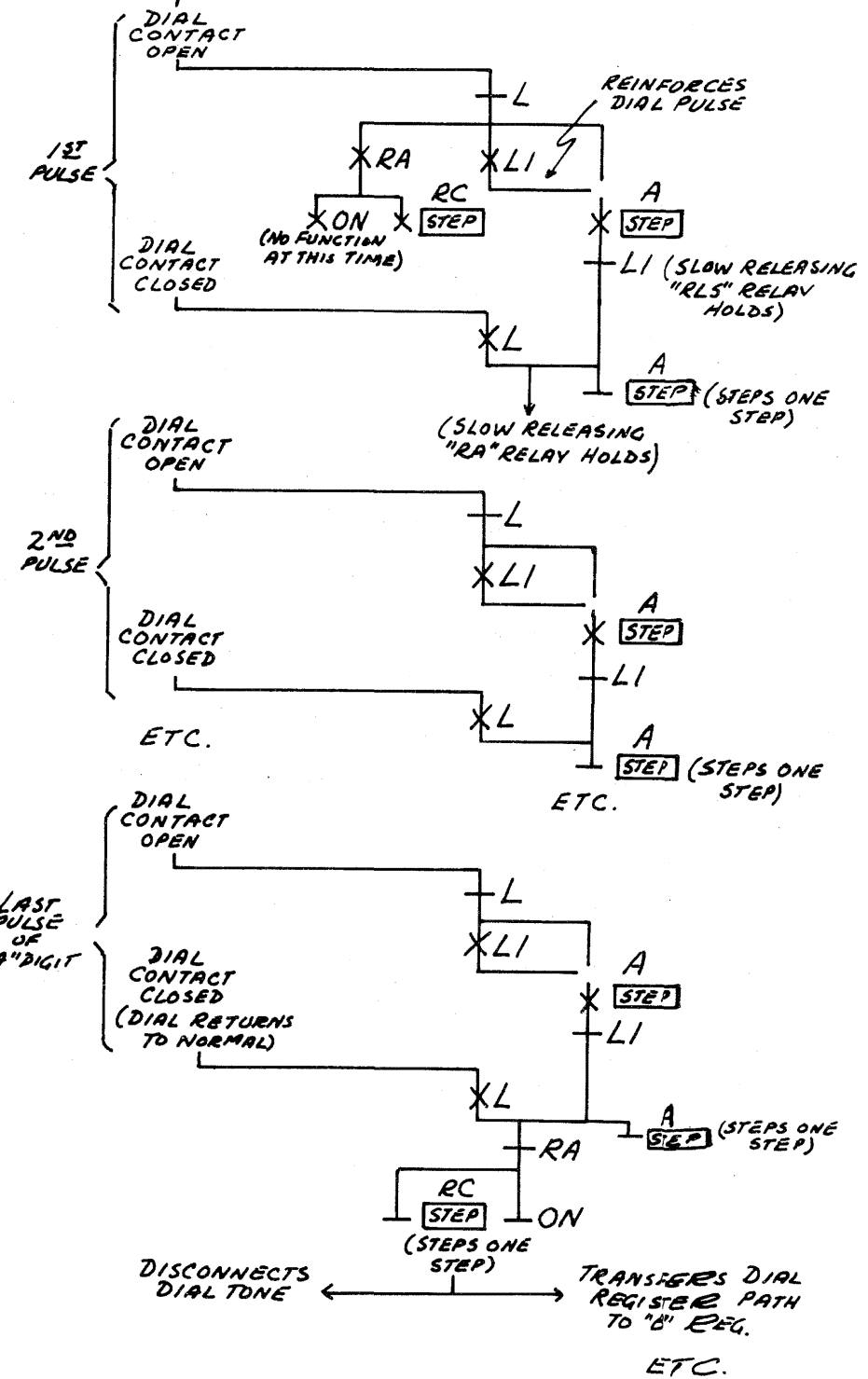
SENDER SEIZED
DIAL TONE

R2-1
R1-1

PANEL GCO

SEL. TYPE
SDR SEL. STRONG
05-221.1

CALLING SUB. STARTS
DIALING



DIALING

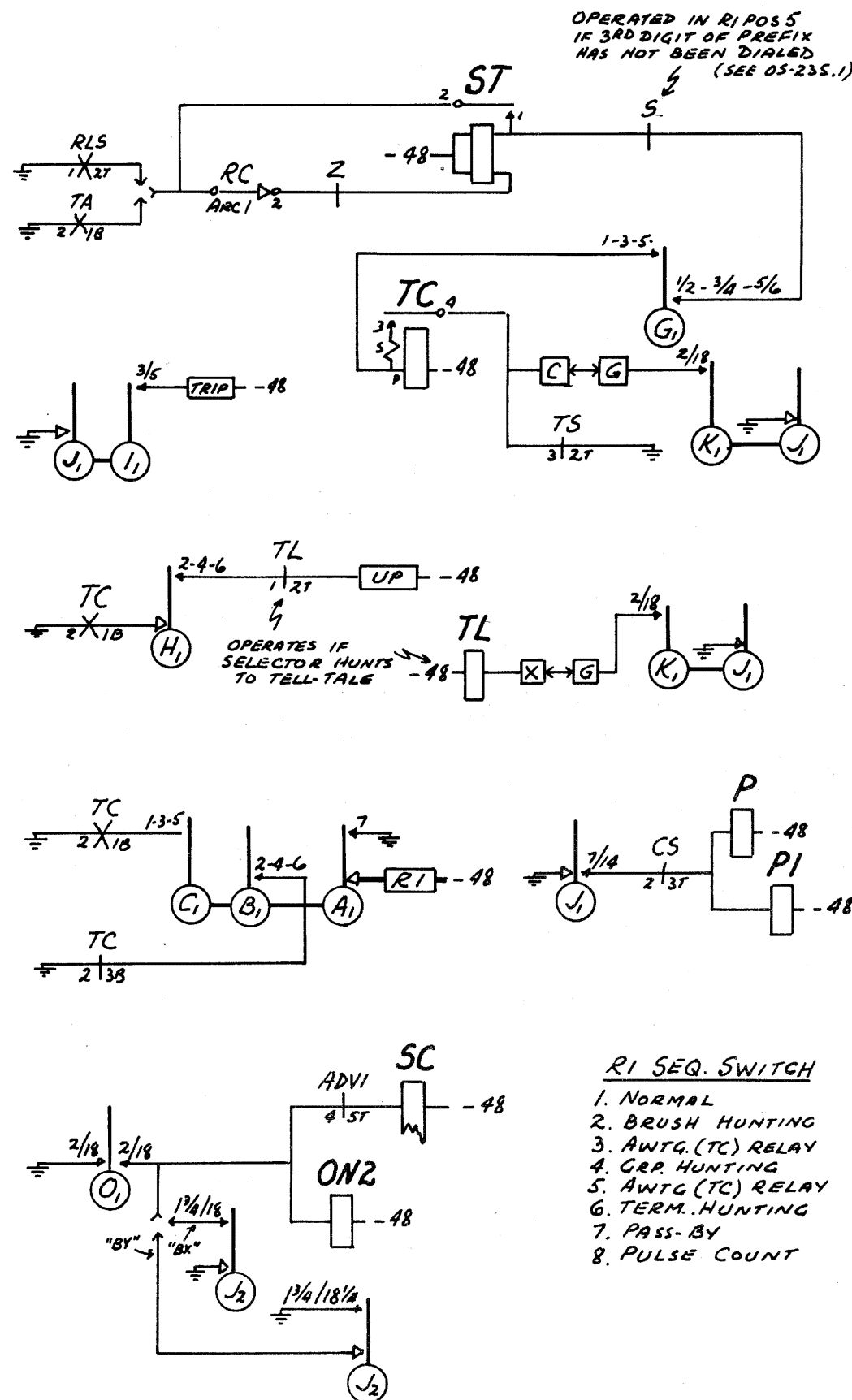
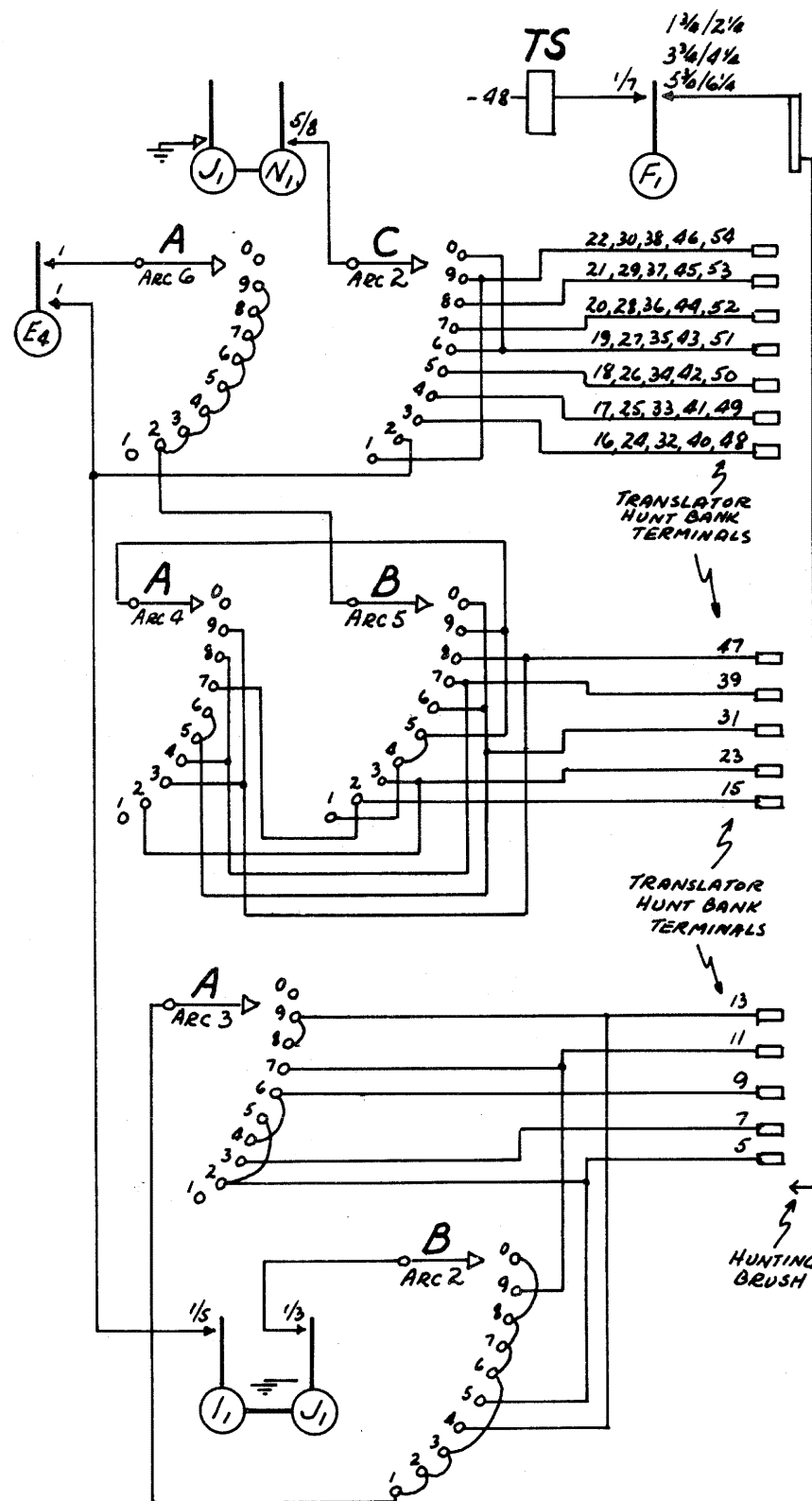
$$\begin{matrix} R_2-1 \\ R_1-1 \end{matrix}$$

PANEL GCO

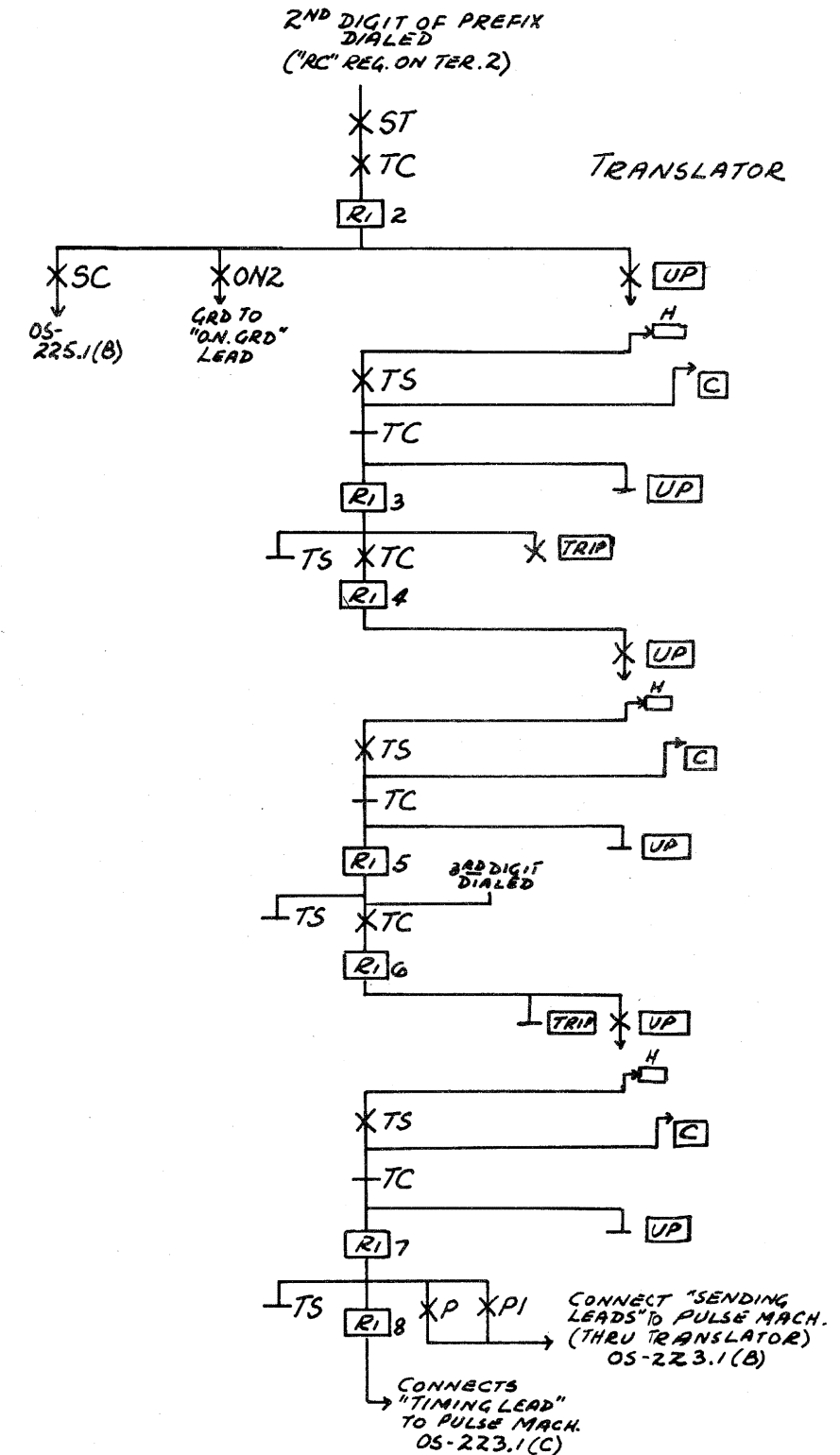
SEL. TYPE WITH

OS-222.1

TYPICAL WIRING TO TRANSLATOR HUNT BANK



SEQUENCE CHART



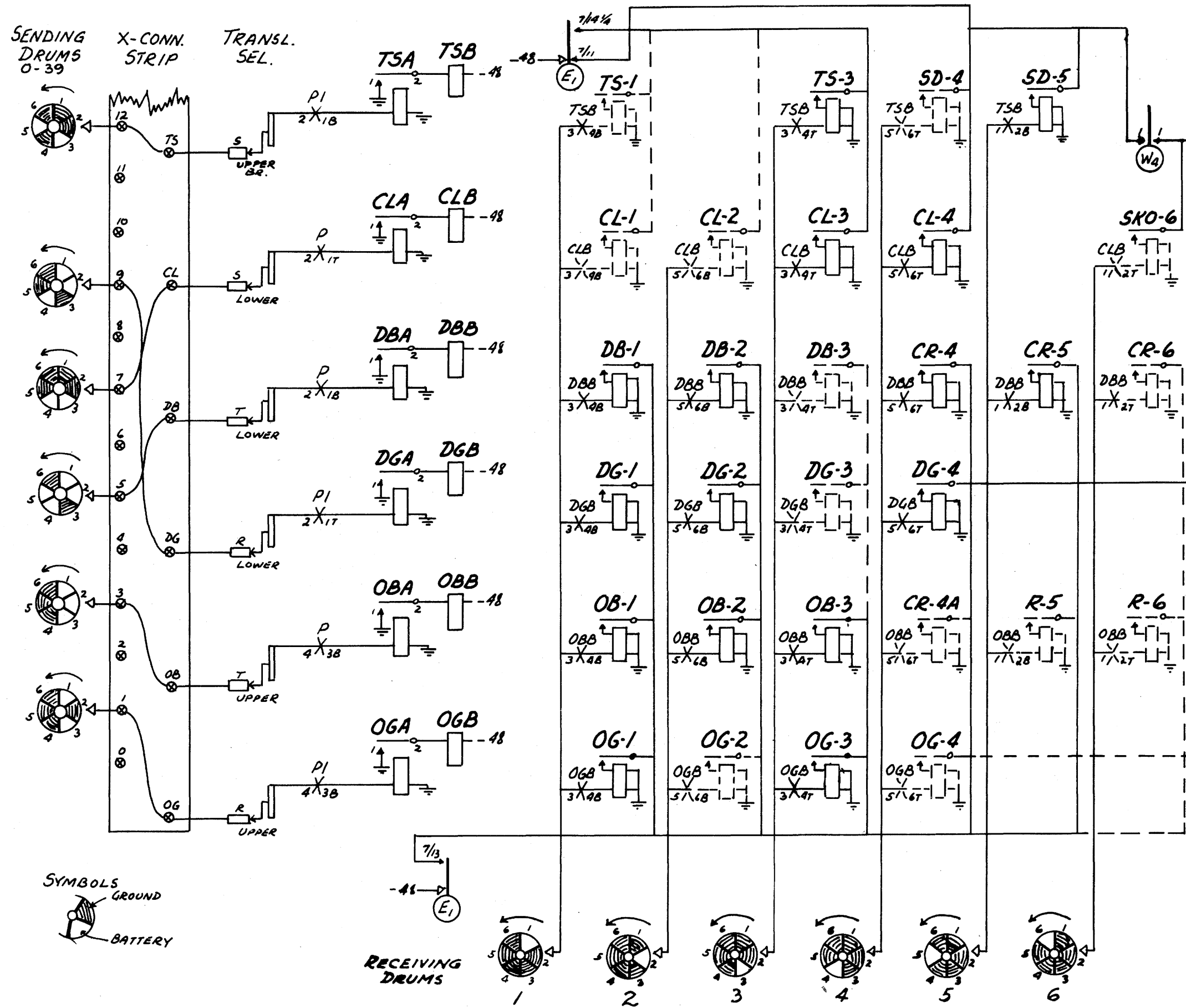
ES-240053 135.51D SUBCIRCUIT'S SDR

TRANSLATOR
BRUSH, GROUP, TERMINAL
HUNTING

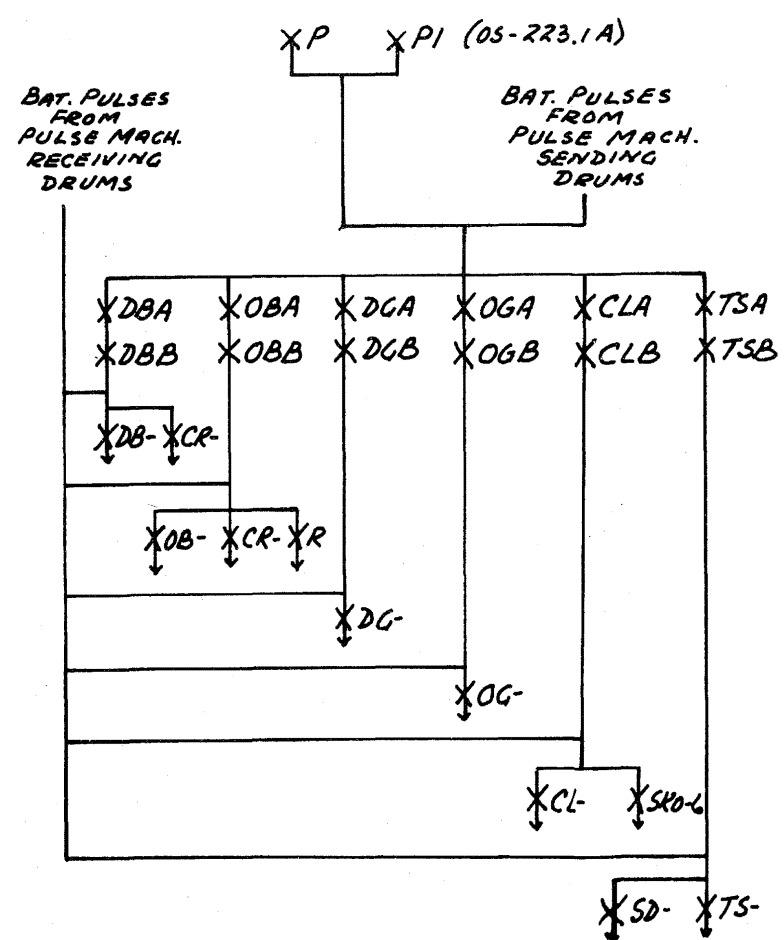
SEL. TYPE WITH
SDR. SEL. TRANS.

OS-223.1(A)

ISSUE	1
DATE	12-58
BY	GHH



SEQUENCE CHART



RELAYS SET UP INFORMATION IN SENDER FOR USE IN MAKING VARIOUS SELECTIONS, ETC.

NOTE 1: (DB-A), (DB-B), (OBA) ETC. MAY OPERATE FROM ONE TO SIX TIMES DEPENDING ON THE NUMBER OF BATTERY SEGMENTS ON THE PARTICULAR PULSE MACHINE SENDING DRUM WHICH IS USED (SEE SHEET "C" FOR TIMING OF ONE COMPLETE REVOLUTION OF PULSE MACHINE)

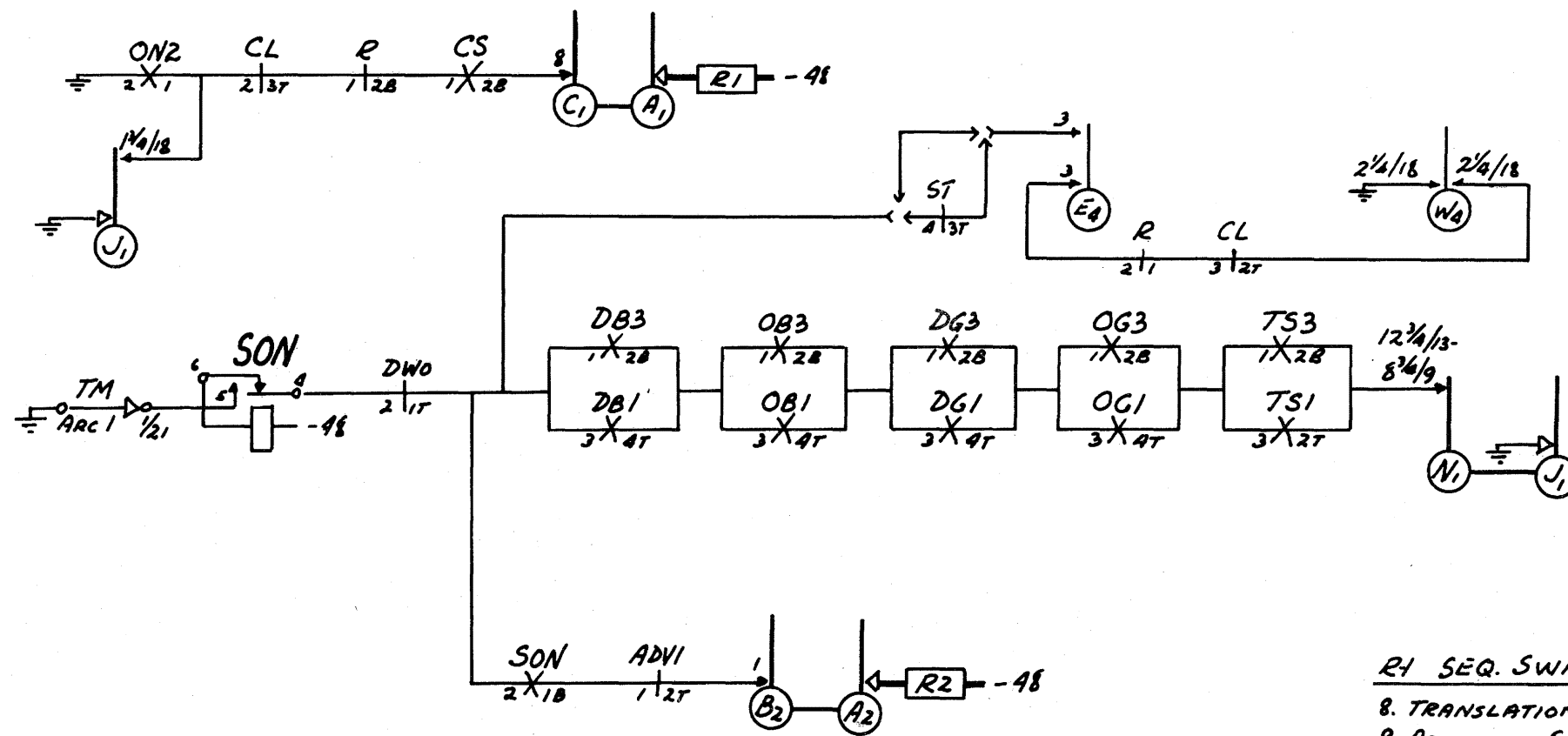
NOTE 2: SOLID LINES ON SKETCH INDICATE RELAYS AND LEADS INVOLVED WHEN USING PULSE MACHINE SENDING DRUMS AS ILLUSTRATED. DOTTED LINES SHOW RELAYS AND LEADS WHICH WOULD BE INVOLVED WHEN USING DRUMS HAVING OTHER POSSIBLE COMBINATIONS OF BATTERY SEGMENTS

ES-240053 1SS.SID SUBSRIEYBER'S SDR. NON-ZONE NON-COIN

TRANSLATION R2-1 R1-8

PANEL GCO SEL. TYPE WITH SDR SEL. TRANS. OS-223.1(B)

SEQUENCE CHART

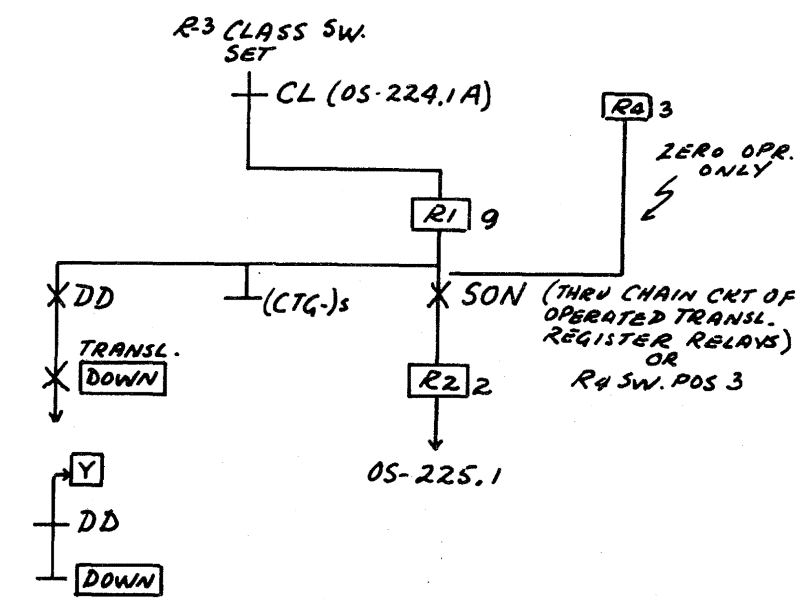


R1 SEQ. SWITCH

- 8. TRANSLATION
- 9. ADVANCE SENDER

R2 SEQ. SWITCH

- 1. NORMAL
- 2. DIST. BRUSH SELECTION

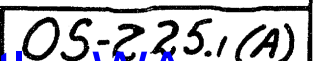
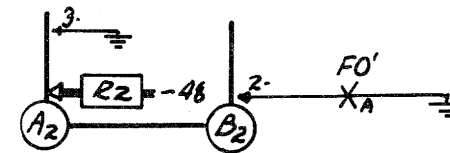


ES-240053 1st. SID SUBSCRIBER'S SENDER

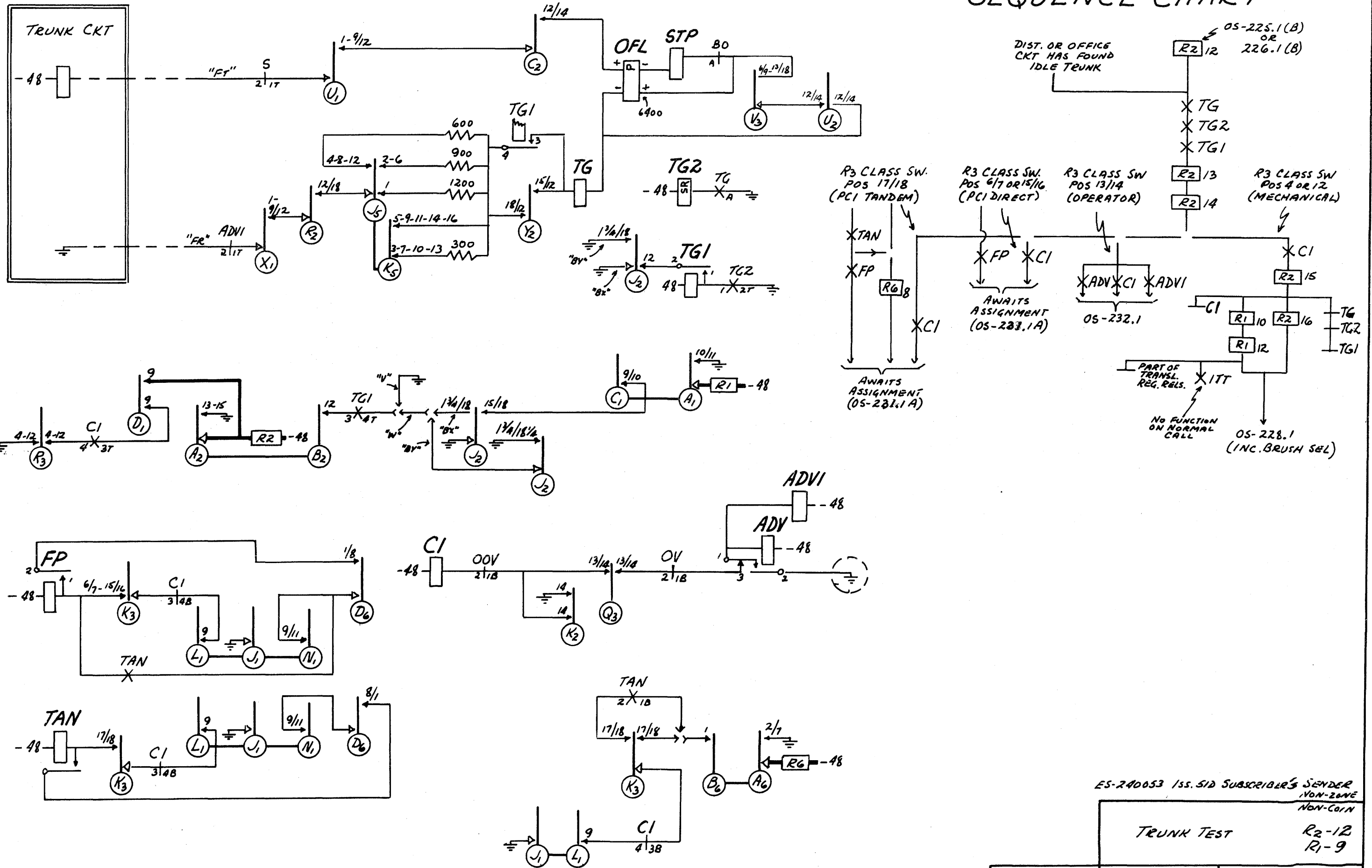
CHECK TRANSLATION REGISTER RELAYS R2-1
RESTORE TRANSLATOR R1-9

PANEL GCO SEL. TYPE WITH SDR. SEL. & TRANSL. OS-224.1(D)

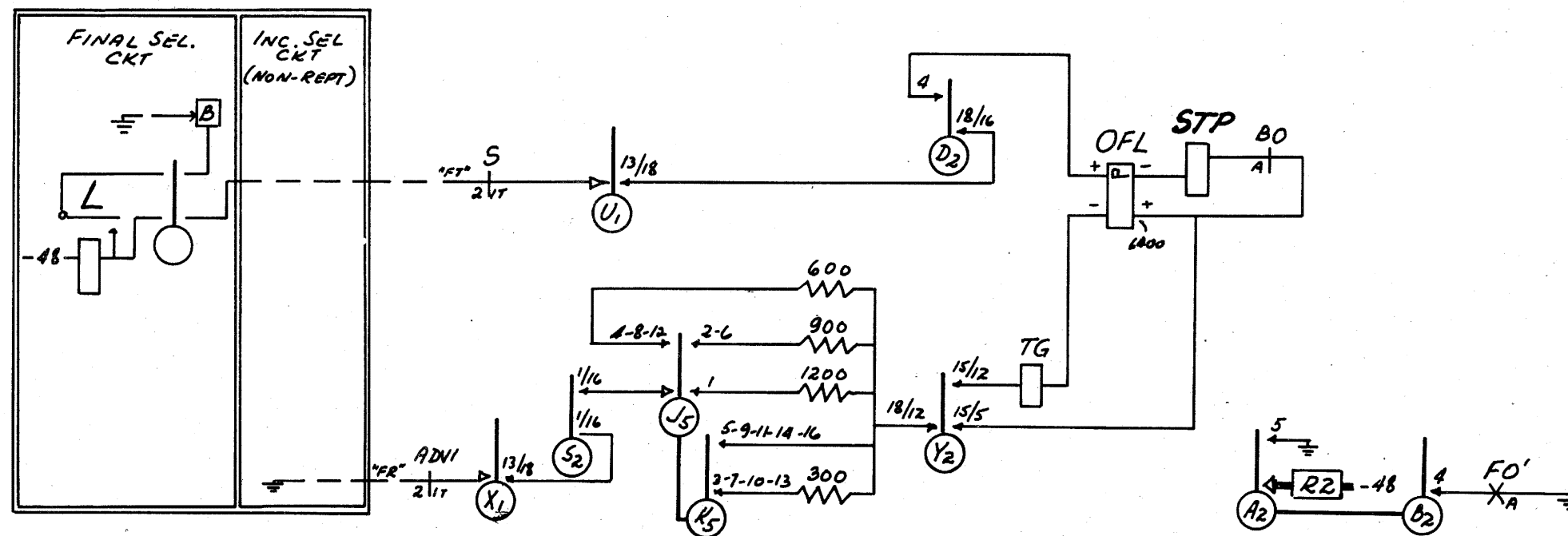
ILL. BELL TEL. CO - PLANT SCHOOL



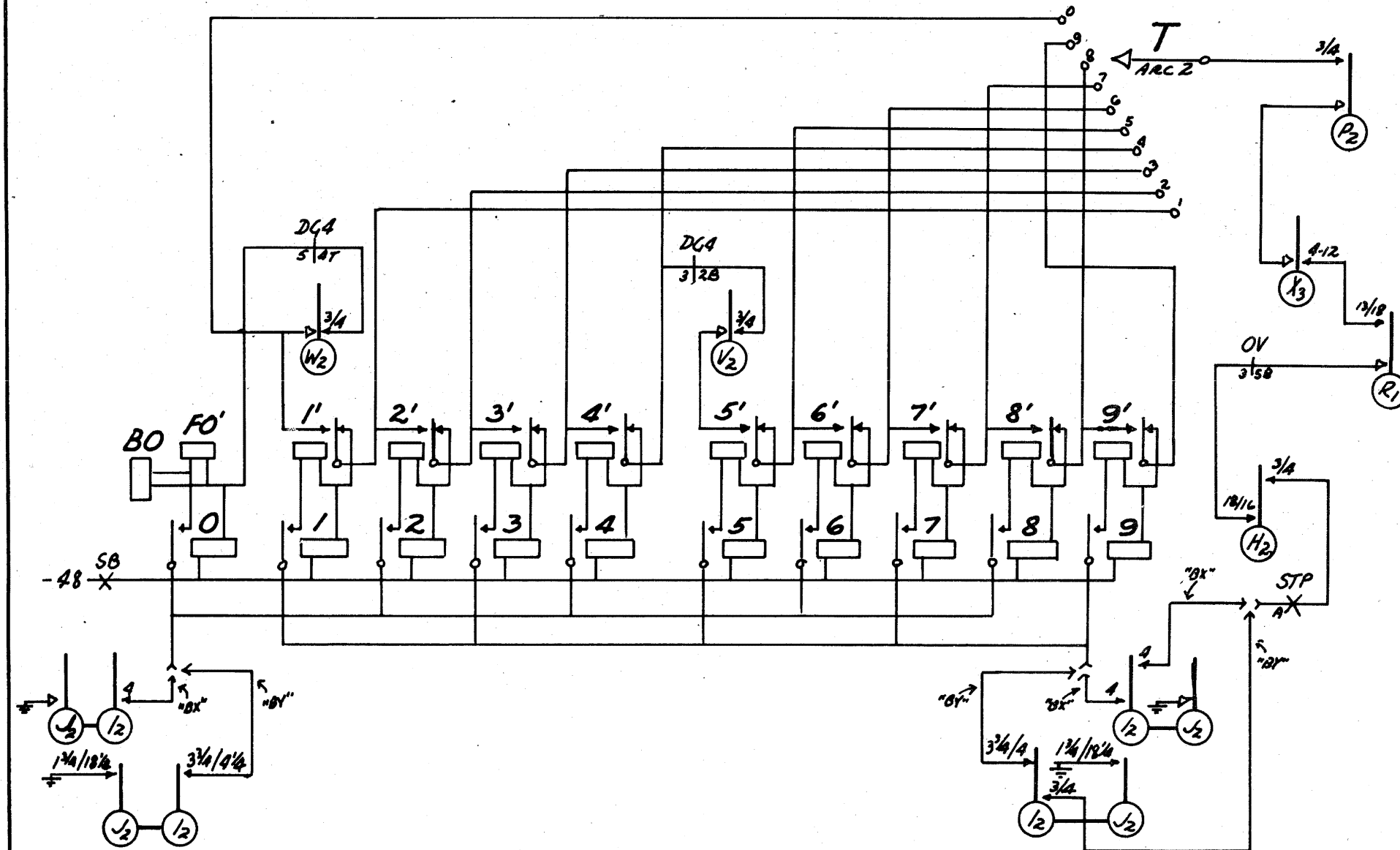
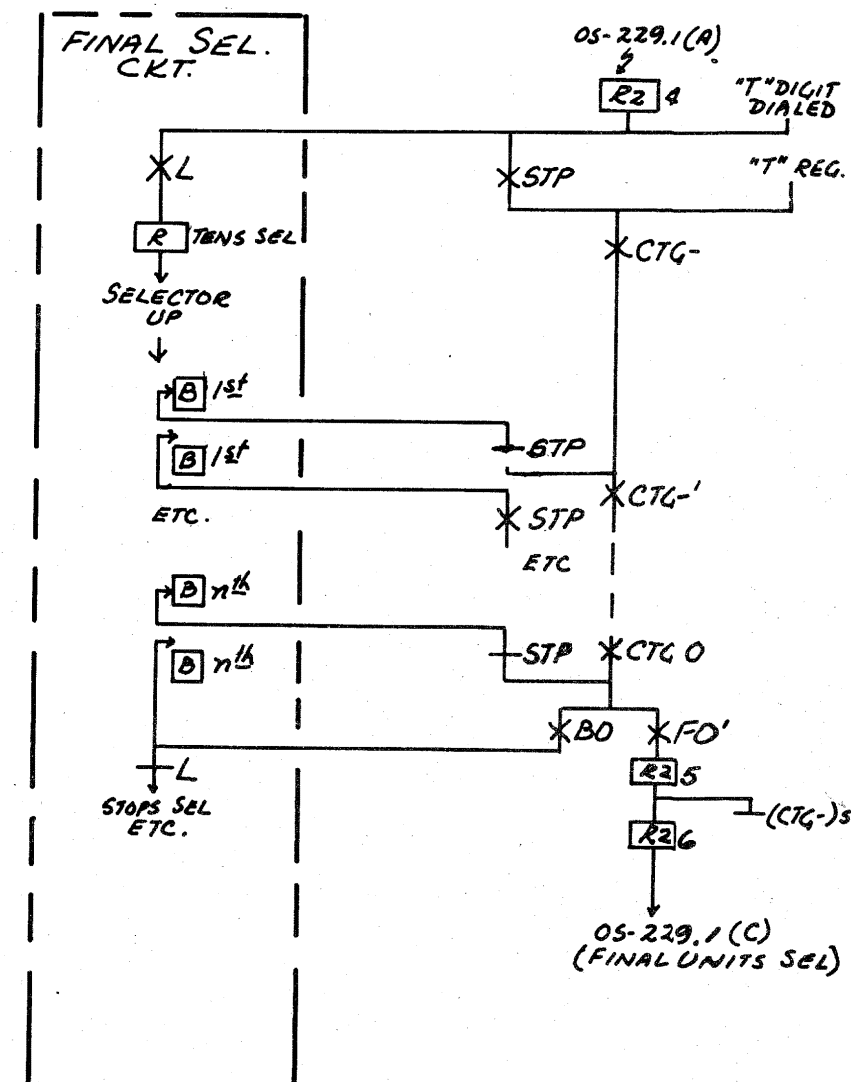
SEQUENCE CHART



ISSUE	1
DATE	12-54
BY	GH



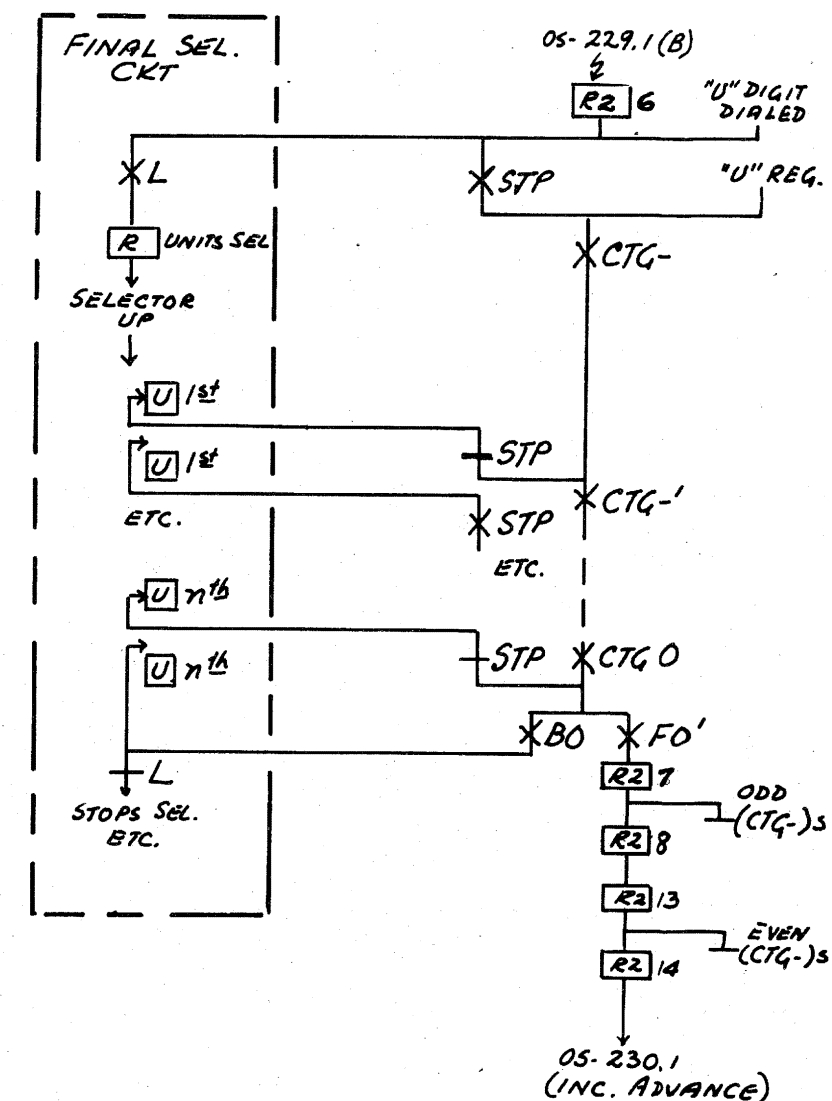
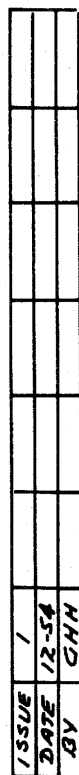
SEQUENCE CHART



ES-240053 ISS. SID SUBSCRIBER'S SENDER

NON-ZONE
NON-COIN
FINAL TENS SELECTION R2-4
R1-13
R3-4

PANEL GCO SEL. TYPE WITH SDR. SEL. TRANS. OS-229.1(B)



NON-ZONE
NON-COIN

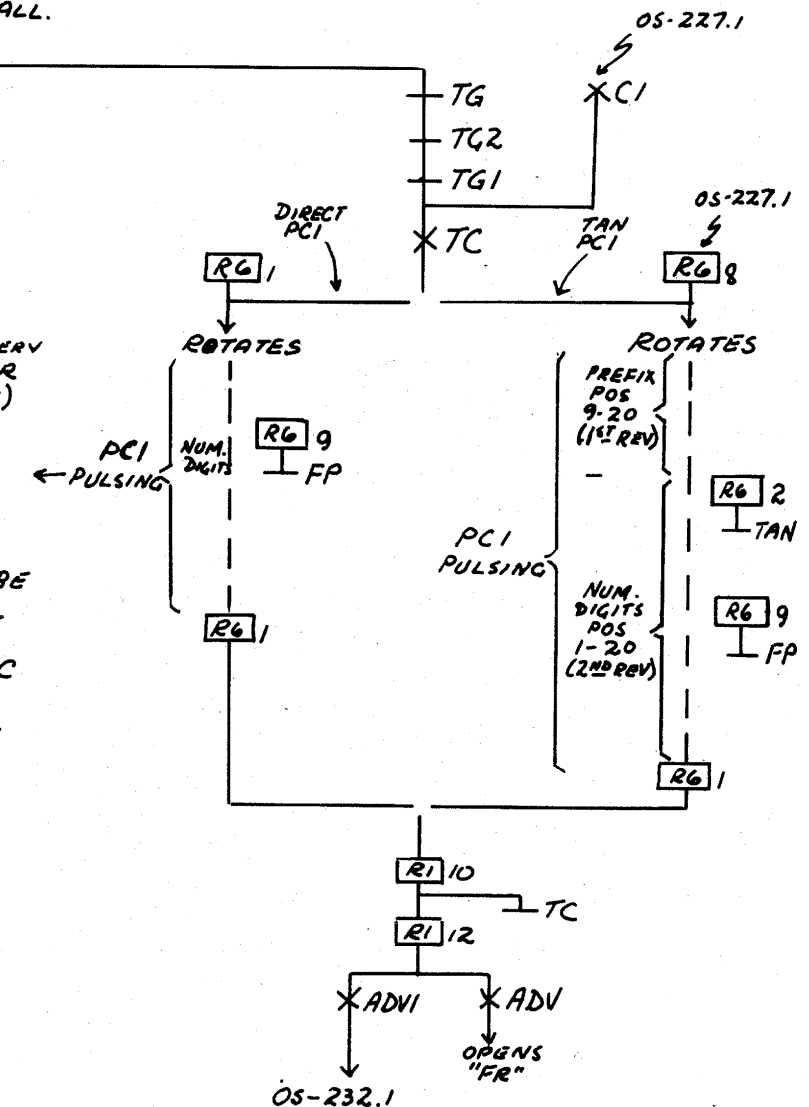
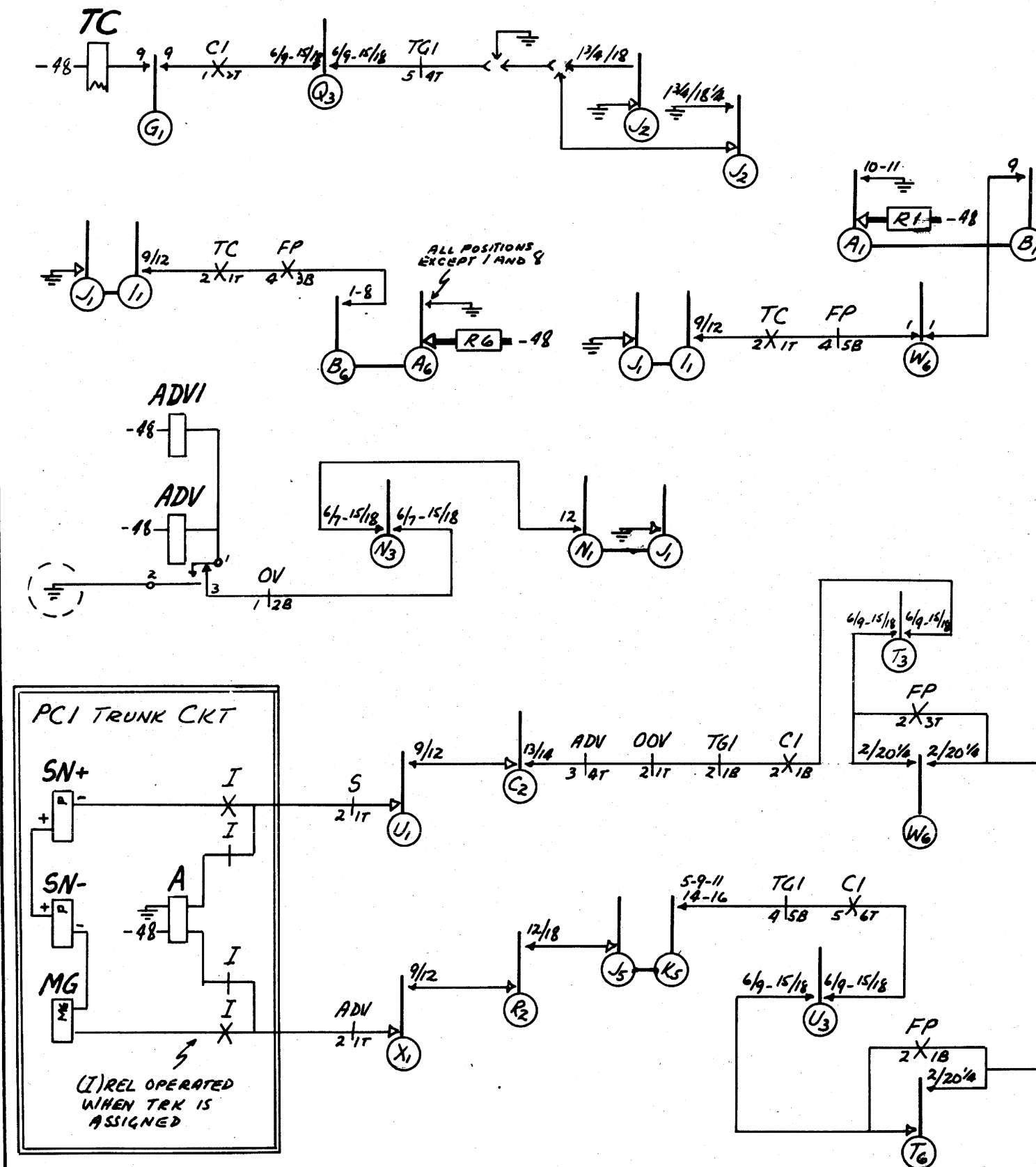
FINAL UNITS R₂ - 6
SELECTION R₁ - 13
(SKIPPING A.B.X. SEL.) R₃ - 4

PANEL GCO

SEL. TYPE WITH SDR. SEL. & TRANS.	05-229.1(C)
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SEQUENCE CHART

TRUNK RELAY OPERATED
IN SERIES WITH (TG) RELAY
DURING TRUNK TEST
CAUSES TRUNK TO BE
"ASSIGNED" (TIP AND RING
MOMENTARILY OPENED),
MANUALLY OR AUTOMATICALLY,
WHEN "B" OPERATOR IS
READY TO HANDLE CALL.



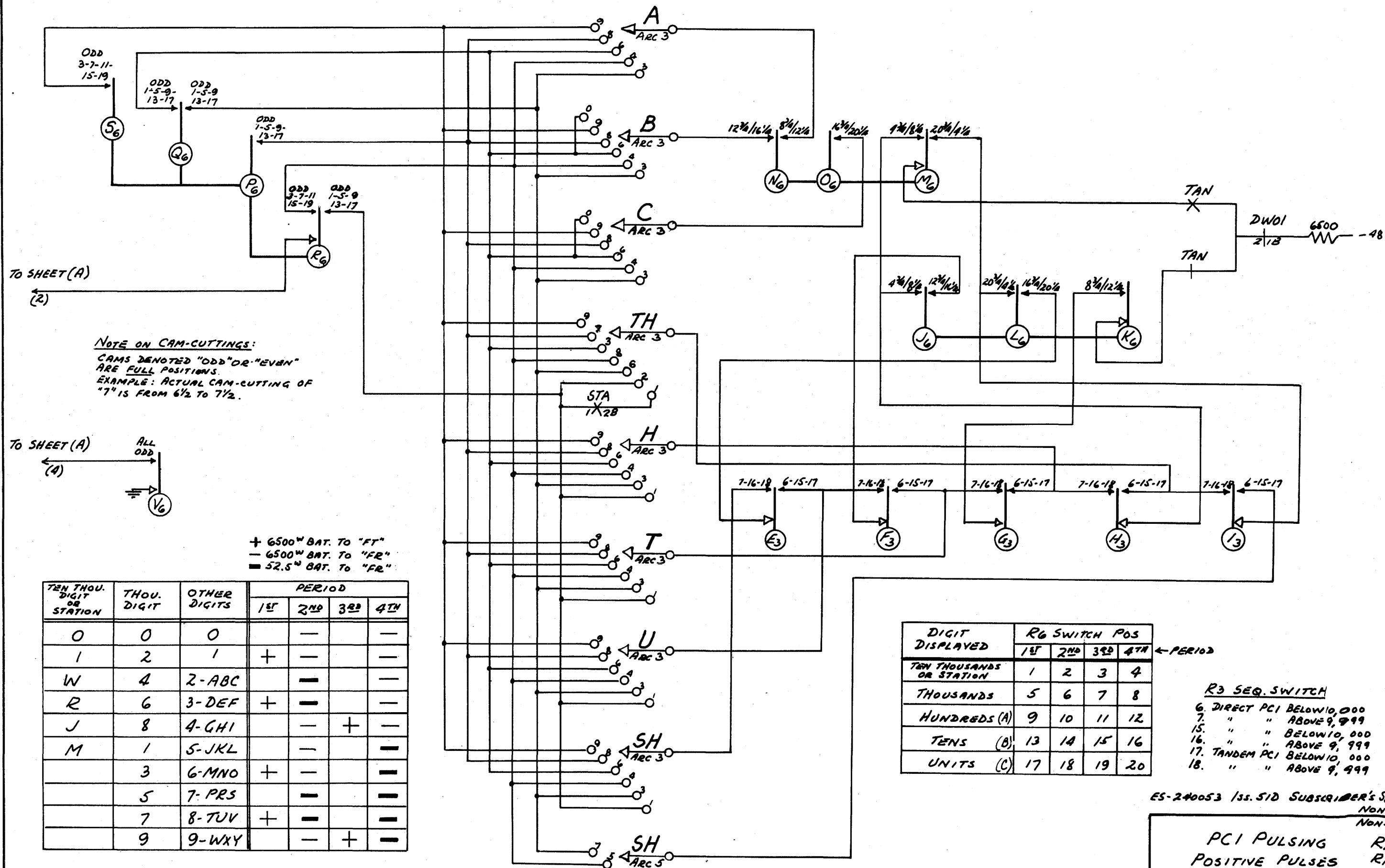
"LIGHT" OR "HEAVY" BATTERY PULSES ARE SENT OVER "FT" ("POSITIVE" PULSES) OR "FR" ("NEGATIVE" PULSES) TO OPERATE POLARIZED AND MARGINAL RELAYS AT PCI "B" BOARD WHICH WILL CAUSE CALLED NUMBER TO BE DISPLAYED ON "CALL INDICATOR".
(SEE SHEETS B AND C FOR PULSE CHART AND OPERATIONAL SKETCHES.)

ES-240053 1ss.51D SUBSCRIBER'S SENDER
NON-ZONE
NON-COIN

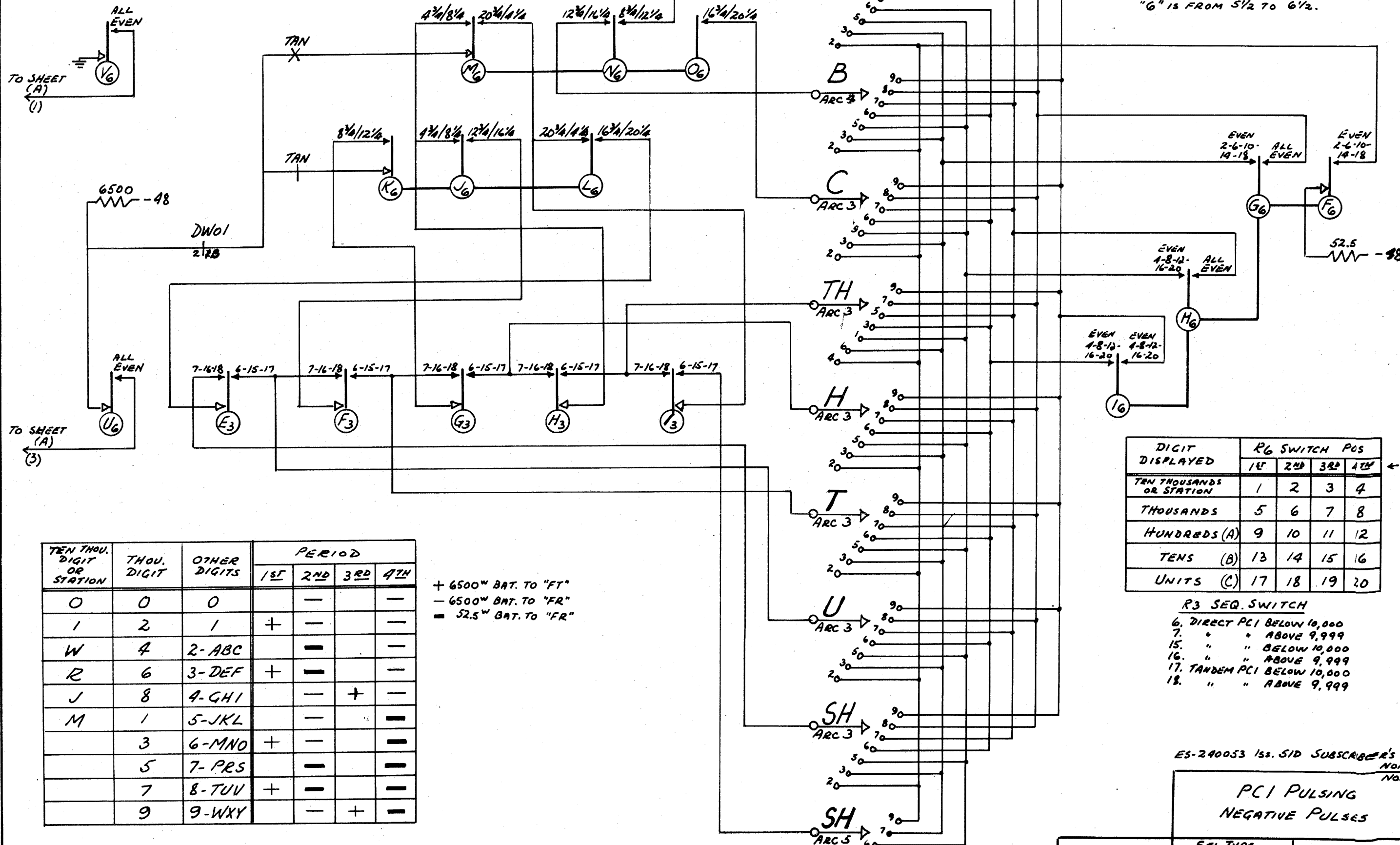
PC1 PULSING
FUNDAMENTAL CIRCUIT

PANEL GCO	SEL. TYPE WITH SDR. SEL. TRANSL.	OS-23/1(A)
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ISSUE	1	12-50	GMH.
DATE			
BV			



NOTE ON CAM-CUTTINGS:
CAMS DENOTED "ODD" OR "EVEN"
ARE FULL POSITIONS
EXAMPLE: ACTUAL CAM-CUTTING OF
"6" IS FROM 5 1/2 TO 6 1/2.



DIGIT DISPLAYED	R6 SWITCH POS				← PERIOD
	1ST	2ND	3RD	4TH	
TEN THOUSANDS OR STATION	1	2	3	4	
THOUSANDS	5	6	7	8	
HUNDREDS (A)	9	10	11	12	
TENS (B)	13	14	15	16	
UNITS (C)	17	18	19	20	

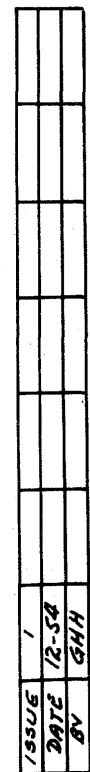
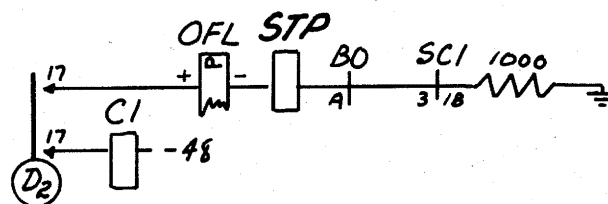
R3 SEQ. SWITCH
6. DIRECT PCI BELOW 10,000
7. " " ABOVE 9,999
15. " " BELOW 10,000
16. " " ABOVE 9,999
17. TANDEM PCI BELOW 10,000
18. " " ABOVE 9,999

ES-240053 ISS. SID SUBSCRIBER'S SENDER
NON-COIN
PCI PULSING R2-14
NEGATIVE PULSES R1-9

PANEL CCO SEL. TYPE WITH SDR SEL. TRANS. OS-23/1(C)

TEN THOU. DIGIT OR STATION	THOU. DIGIT	OTHER DIGITS	PERIOD			
			1ST	2ND	3RD	4TH
0	0	0		—		—
1	2	1	+	—		—
W	4	2-ABC		—		—
R	6	3-DEF	+	—		—
J	8	4-GHI		—	+	—
M	1	5-JKL		—		—
	3	6-MNO	+	—		—
	5	7-PRS		—		—
	7	8-TUV	+	—		—
	9	9-WXY		—	+	—

+ 6500V BAT. TO "FT"
- 6500V BAT. TO "FR"
= 52.5V BAT. TO "FR"



LF-DIST SEL CKT

OS-213

CH

R10

HIGH RES. TO "BC" LEAD (SEE OS-225.1B)

OS-227.1 (OPERATOR)

OS-230.1 (DIRECT MECH)

OS-231.1 (PCI)

ADVI

DIRECT MECH. ONLY

OS-230.1

R217

(CTG-)s

XCI XSTP (SOAK)

R218

CI STP

OTHER CLASSES OF CALLS

OS-227.1

R214

CLOSING "FT" FOR TALK SEL

OS-214

XL

SEQ. SWITCH ROTATES

E-CAM GRD (POS 10V8)

STP

E-CAM OPEN ETC.

XSTP

E-CAM GRD

STP

E-CAM OPEN

L

SEQ. SW. STOPS AFTER HAVING MOVED 1, 2, OR 3 POSITIONS

X(TS-)s or (Z)

XCTG-

XCTG-1

XCTG0

XBD XFO1

OS-233.1

CLASS OF CALL	R2 SW. POS.	R1 SW POS
ZERO OPR.	14	1
3-DIGIT OPR.	14	9
PCI	14	12
DIRECT MECH.	18	14

ES-240053 1st. SID SUBSCRIBER'S SENDER
NON-ZONE
NON-COIN

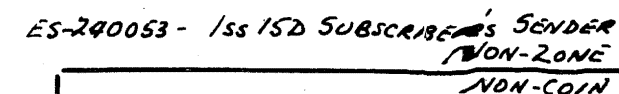
TALK SELECTION

PANEL GCO

SEL.TYPE WITH
SDP.SEL + TRANS

OS. 2.32.1

downloaded from: TCI Library - <http://www.telephonecollectors.info> - Source: Connections Museum, Seattle, WA



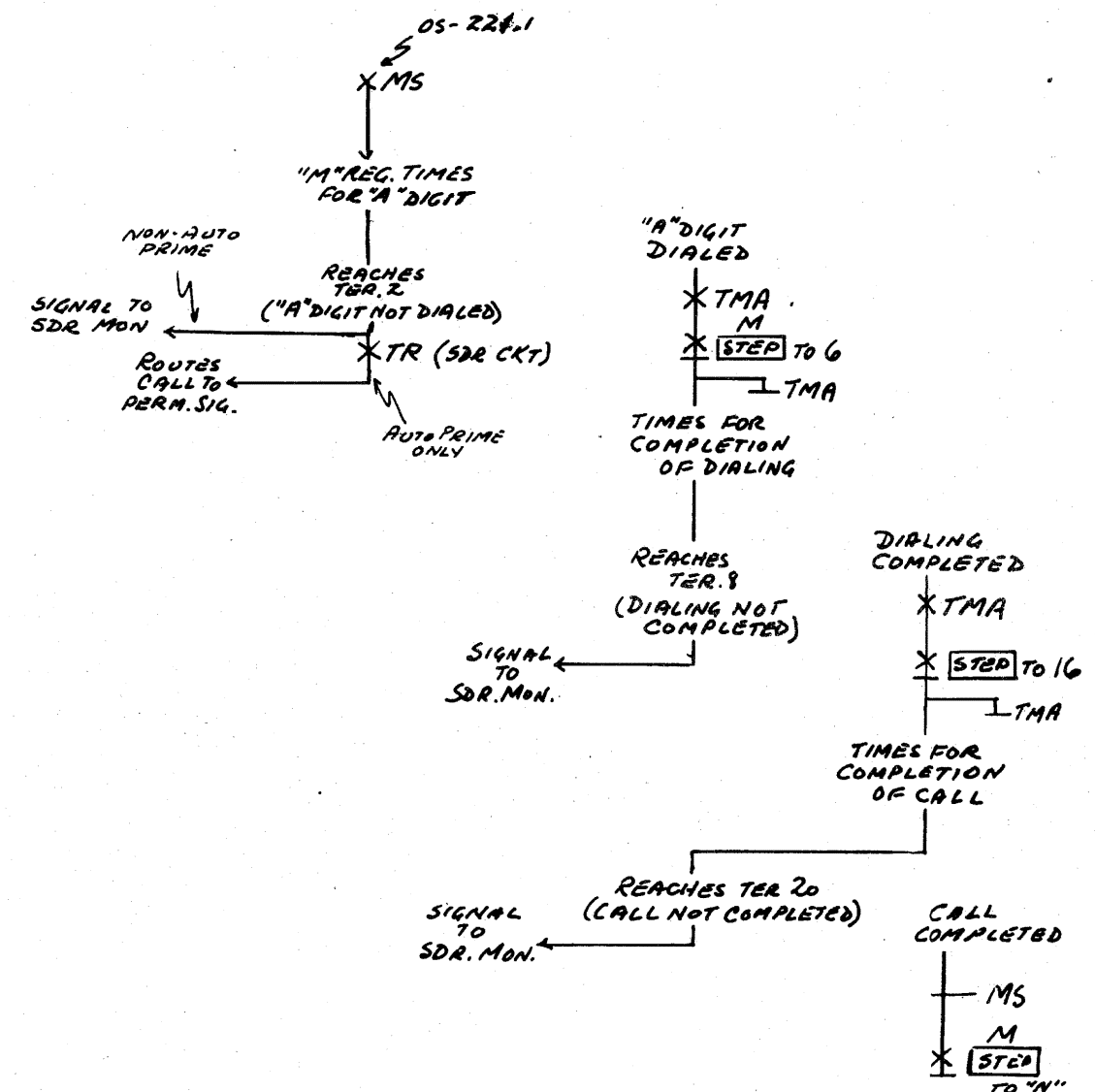
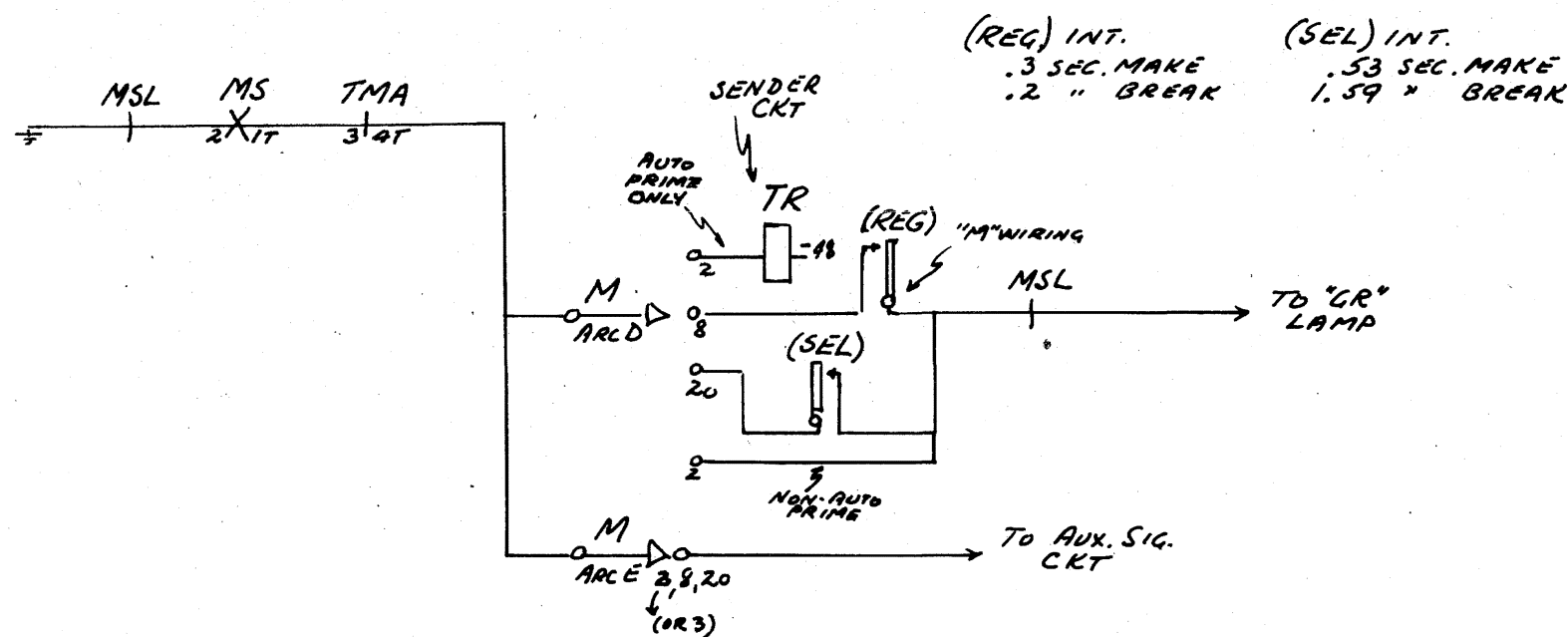
SENDER RELEASE

PANEL GCO

SEL.TYPE WITH
SDR.SEL. TRANSF.

OS. 233.

1550E	/			
247E	12-54			
BY	GMH			



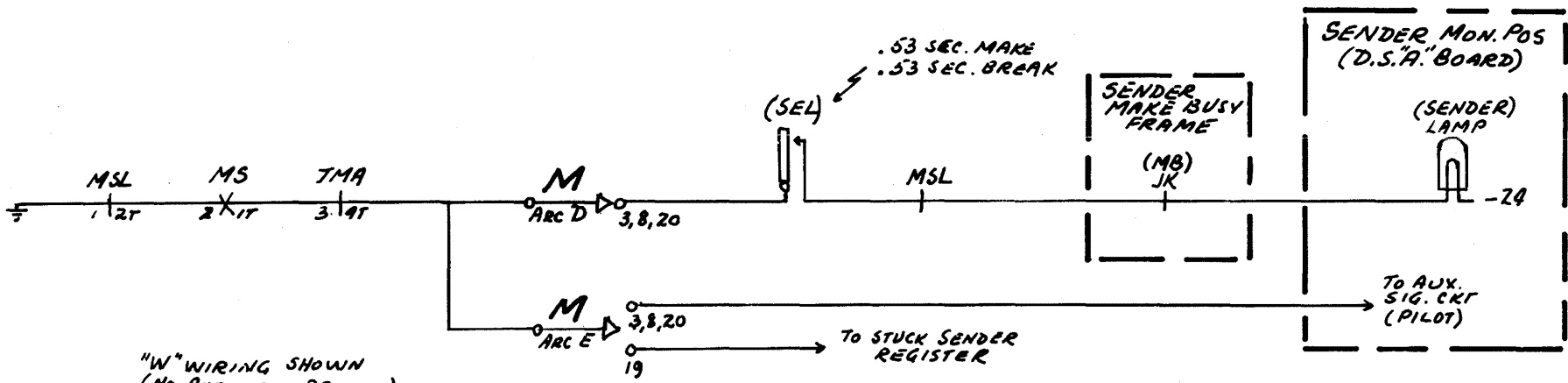
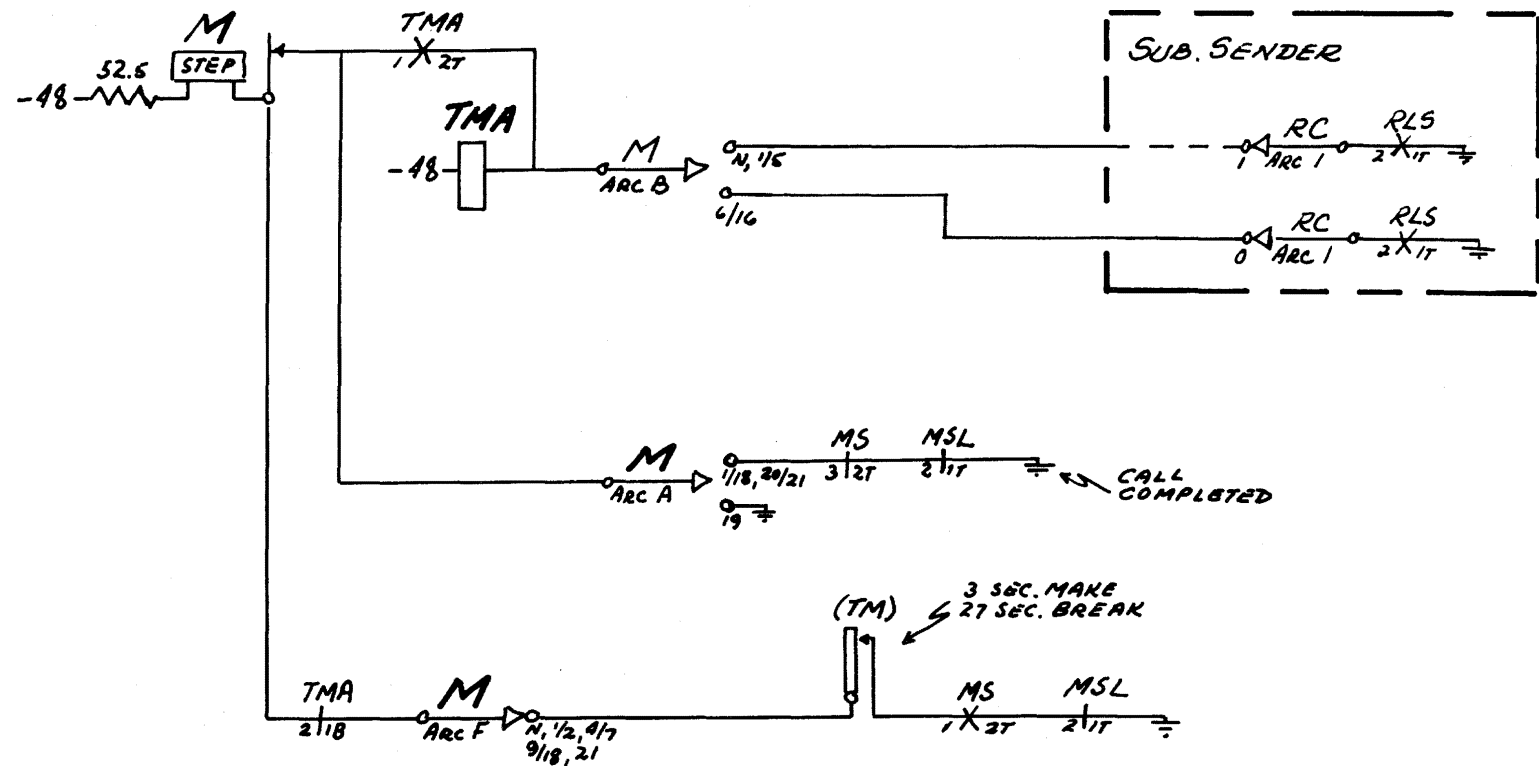
NON-COIN

"M" REGISTER FUNCTION

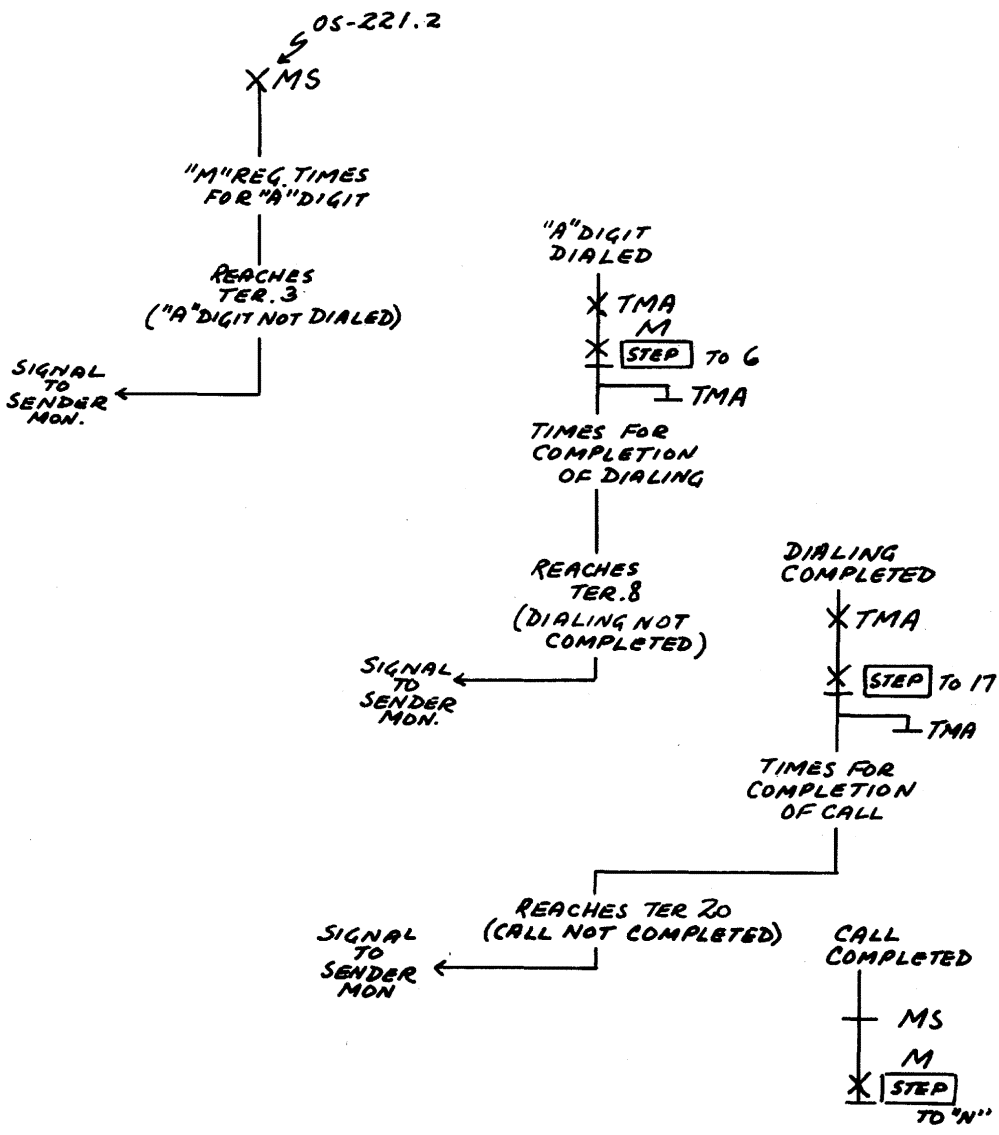
SEL.TYPE SDR
SDR.SEL - TRANSU

05-2361

SEQUENCE CHART



"W" WIRING SHOWN
(NO AUTOMATIC PRIMING)



SD-21826-011 ISS. 150 SUBSCRIBER'S SENDER
ES-20929-01 ISS. 290 SUB. SENDER TIME
MEASURE CIRCUIT

NON-COIN

"M" REGISTER FUNCTION

PANEL GCO SEL. TYPE SDR WITH OS-2362