

TRAINING MANUAL
THE PANEL DIAL SYSTEM
(BATTERY CUT-OFF--ZONE REGISTRATION)

THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY
OPERATING AND ENGINEERING DEPARTMENT
PLANT OPERATION DIVISION

PANEL SYSTEM

(BATTERY CUT-OFF -ZONE REGISTRATION)

TRAINING MANUAL

SEQUENCE CHARTS AND OPERATIONAL SKETCHES

THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY

OPERATION AND ENGINEERING DEPARTMENT

PLANT OPERATION DIVISION

For Training Purposes Only

August, 1953

PREFACE

This provisional training material covers the Panel System, Battery Cut-Off type.

This manual contains a series of typical circuit diagrams. These are drawn in the simplified style which is used in teaching the complex 'Comon Control' switching systems now in current use. This method makes use of sequence charts and operational sketches. This volume contains a chart and sketch for each of the typical circuits.

Since the drawings are intended to be used in the study of the Panel System, Battery Cut-Off type, in general, and do not necessarily conform to any particular office, it may be necessary to consider the regular Schematic Drawings (SD's) and Circuit Descriptions (CD's) when preparing learners to work in a specific office.

Students should be cautioned that the particular circuits contained in this manual are intended to be used as training aids, and are not necessarily applicable for maintenance.

INDEX OF OPERATIONAL SKETCHES

TITLE	SKETCH NO.	TITLE	SKETCH NO.
LEGEND FOR OPERATIONAL SKETCHES	0	DISTRICT TELL TALE-INCOMING TELL TALE	29
STARTING LINE FINDER	1A	FINAL TELL TALE	30
TRIP & LINK CIRCUIT ALLOTING	1B	LATE RELEASE-FULL MECH. & OPERATOR CALLS	31
FINDING LINE	2	P. C. I. IMPULSES	32
SEIZING A SENDER	3	P. C. I. LINE PULSE DRAWING	32A
SUBSCRIBER SENDER-PULSE COUNTING	4A	DISTRICT TIMING CIRCUIT	33
SUBSCRIBER SENDER - REGISTRATION	4B	PULSE CHECKING	34
SEIZING A DECODER	5	CONN DISTRICT CALLED PARTY ANSWER - COIN CONTROL	35
DECODER - REGISTRATION RELAYS & TEST OF RECEIVING LEADS	6A	COIN DISTRICT LINE TEST - TALKING TO OPERATOR	36
" - GROUNDING A CODE POINT	6B	COIN DISTRICT RETURN TO NORMAL	37
" - CLASS OF SERVICE RELAYS	6C	2-PARTY DISTRICT- T RELAY TEST-PARTY TEST-CALLED PTY ANSWER	38
" - OPERATION OF ROUTE & ZONE RELAYS	6D	2-PARTY DISTRICT SEIZURE M. R. CONN. REGISTRATION & TMG.	38A
" - TRANSMITTING CLASS INFORMATION	6E	2-PARTY DISTRICT SEIZURE M. R. CONN. & CHECK OF LEADS	39
" - " COMPENSATING RESISTANCE INFORMATION	6F	2-PARTY DISTRICT REGISTRATION & TIMING	40
" - " DISTRICT BRUSH INFORMATION	6G	2-PARTY DISTRICT M. R. CONN. TIME ALARM	41
" - " DISTRICT GROUP INFORMATION	6H	2-PARTY DISTRICT - RETURN TO NORMAL	42
" - " OFFICE BRUSH	6I	2-PARTY DISTRICT - DISCONNECTION - NO CHARGE CALLS	42A
" - " OFFICE GROUP	6J	CALL DISTRIBUTING "B" BOARD - FINDING TRUNK	43
" - " ZONE CHARGE & TALK SELECTION INFOR.	6K	" " " - "B" POS. HUNT & ORDER TONE	44
" - CHECK OF TRANSMITTING LEADS & RELEASE	6L	" " " - SENDER SELECTION	45
" - HA - HB, TA - TB RELAY OPERATION	6M	" " " - REGISTRATION OF DIGITS	46
DISTRICT BRUSH & GROUP SELECTION	7	" " " - SELECTIONS	47
OFFICE SELECTIONS AND OFFICE TEST	8	" " " - RINGING, TRIPPING SUPERVISION, OVERFLOW AND DISCONNECT	47A
DISTRICT - TRUNK SELECTION TRUNK TEST	9	" " " - RELEASE OF SDR. & LINK	48
INCOMING BRUSH AND GROUP SELECTION	10	" " " - LINK TIME OUT	49
" TRUNK HUNTING CABLE DISCHARGE	11	" " " - "B" LINK START & TRIP - TIMING	50
FINAL BRUSH SELECTION	12	KEY PULSE "A" BOARD - DIST. SEIZURE & SENDER SELECTION	51
" TENS & UNITS SELECTION	13	" " " - CONNECTION OF KEY SET TO SENDER	52
INCOMING ADVANCE	14	" " " - REGISTRATION OF DIGITS & KEY SET RELEASE	53
DISTRICT ADVANCE - CABLE CHARGE	15	SEQUENCE CHART FOR OS 53	53A
TALK SELECTION & TRUNK CLOSURE	16	K. P. SENDER - CONNECTION TO DECODER CONN. & RELEASE BY DECODER	54
RELEASE OF SENDER	17	K. P. " - COUNTING RELAY & R I SWITCH ADVANCE CIRCUIT	55A
ADVANCE LINK, PRESELECT DISTRICT	17A	K. P. " - DISTRICT SELECTION & TRUNK TEST	55B
LINE TESTING	18	K. P. " - FUNDAMENTAL CCT., OFF TEST OFF SEL. TRUNK TEST INCOMING & FINAL	
RINGING & TRIPPING	19	SELECTIONS	56
CALLED PARTY SUPERVISION	20	K. P. SENDER - OFFICE BRUSH & GROUP SELECTIONS	57
INITIAL CHARGE & OVERTIME - ZONE 1	21	K. P. " - INC. BRUSH, INC. GR., FINAL BRUSH SELECTIONS	58
" " " - " 2	21A	K. P. "A" BOARD INC. ADVANCE, TRUNK CLOSURE, SENDER RELEASE, TALKING DISTRICT RELEASE	60
" " " - " 3	21B	K. P. "A" BOARD FINAL TENS & UNITS SELECTIONS	59
" " " - " 4	21C	K. P. "A" BOARD FULL SELECTOR TANDEM CONN. TO PREPARATION OF SENDER	61
" " " - " 5	21D	K. P. SENDER - P. C. I. PULSING	62
RELEASE OF DISTRICT - CHARGE CALL	22	K. P. "A" BOARD - SENDER TIMING, TELL TALE, OVERFLOW, ABANDONED CALLS &	
RELEASE OF INCOMING & FINAL	23	OPERATOR ERRORS	63
SENDER TIME MEASURE SWITCH	24	SEQUENCE CHART FOR OS 63	63A
DIAL ZERO CALL	25	" " " " "	63B
EARLY RELEASE - DIST POS 2/16 SDR POS 1/3	26		
DISTRICT OVERFLOW ON FULL MECHANICAL OR P. C. I. CALL	27		
LINE FINDER OVERFLOW & TELL TALE - INCOMING OVERFLOW	28		
LINE TRIP START & LINK CIRCUITS	28A	LEGEND FOR SEQUENCE CHARTS	SC-0
SUB. GROUP A & B KEY TRANS. AT LK. FR. LINK M. B., DIST. MB.	28B	RECEIVER OFF HOOK TO SENDER SEIZURE	SC-1
START CIRCUIT FAILURE ALL LINKS BUSY & OVFL.	28C	DECODER FUNCTIONS	SC-2
STUCK SENDER SECOND TRIAL	28D		
DECODER & CONNECTOR TIME OUT	28E		

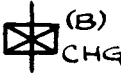
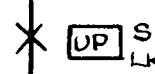
INDEX OF OPERATIONAL SKETCHES
BATTERY CUT-OFF

CIRCUIT	DRAWING	ISSUE	CIRCUIT	DRAWING	ISSUE
LINE - TRIP - START & LINK CIRCUIT	SD-21460-011	14D	CALL DISTRIBUTING "B" SWITCHBOARD POSITION AND TONE CIRCUIT	SD-21104-011	33D
LINE FINDER & DISTRICT CIRCUIT	SD-21405-011	15D	" " "	-012	"
" " " "	SD-21405-012	12D	" " "	-013	"
DECODER CONNECTOR CIRCUIT	SD-21187-011	15D	" " "	-014	"
" " "	-012	"	" " "	-015	"
" " "	-013	"	" " "	-016	"
" " "	-014	"			
DECODER CIRCUIT	SD-21277-011	24D	CALL DISTRIBUTING "B" SWITCHBOARD SENDER CIRCUIT	SD-21106-011	14D
" "	-012	"	INCOMING SELECTOR CIRCUIT FROM MANUAL OFFICE	SD-21115-02	15AR
" "	-013	"	LINE FINDER-DISTRICT SELECTOR CIRCUIT 2-PARTY	SD-21406-021	12AR
" "	-014	"	" " " " " "	-022	"
" "	-015	"	" " " " " "	-023	"
" "	-016	"	LINE FINDER-DISTRICT & COIN CONTROL CIRCUIT	SD-21350-011	16D
" "	-017	"	" " " " " "	-012	"
" "	-018	"	" " " " " "	-013	"
" "	-019	"	MESSAGE REGISTER CONNECTOR CIRCUIT	SD-21417-011	11D
INCOMING SELECTOR CIRCUIT FROM PANEL-LOCAL OR TANDEM	SD-21115-011	18B	" " " "	-012	"
" " " " " " " "	-012	"	" " " "	-013	"
" " " " " " " "	-013	"			
3-WIRE OFFICE SELECTOR CIRCUIT	ES-240252	9D	CALL DISTRIBUTING "B" SWITCHBOARD TRIP, START & LINK CIRCUITS	SD-21105-011	19D
PULSE CHECK CIRCUIT	SD-21536-01	2D	" " "	-012	"
FINAL SELECTOR CIRCUIT	SD-21200-01	10D	" " "	-013	"
A-SWITCHBOARD SPECIAL SERVICE CORD CIRCUIT	SD-21172-011	9D	SUBSCRIBERS SENDER CIRCUIT	SD-21193-011	25B
" " " " " " "	-012	"	" " "	-012	"
A-SWITCHBOARD KEY SET CIRCUIT	SD-90460-01	13D	" " "	-013	"
OPERATORS TELEPHONE CIRCUIT	SD-90456-011	10A	" " "	-014	"
" " "	-012	"	" " "	-015	"
SUPERVISORS TELEPHONE CIRCUIT	SD-20323-011	11D	" " "	-016	"
" " "	-012	"	" " "	-017	"
" " "	-013	"	" " "	-018	"
A-SWITCHBOARD KEY PULSING SENDER CIRCUIT	SD-21382-011	19D	" " "	-019	"
" " " " " "	-012	"			
" " " " " "	-013	"			
" " " " " "	-014	"			
" " " " " "	-015	"			
A-SWITCHBOARD OUTGOING TRUNK CIRCUIT	SD-21179-01	7D			
A-SWITCHBOARD DISTRICT SELECTOR CIRCUIT	SD-21181-01	6D			
TRUNK CIRCUIT TO SPECIAL OPERATOR	SD-21600-011	10D			
OPERATORS TELEPHONE CIRCUIT	SD-21104-017	33D			

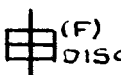
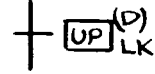
LISTING OF S. D.
 DRAWINGS
 & ISSUES
 BATTERY CUT OFF

1. RELAY OR OTHER APPARATUS OPERATIONS AND RELEASES ONLY ARE SHOWN.
2. VERTICAL PROGRESSION DOWNWARD SHOWS THE TIME PHASE OF RELAY MOVEMENTS (OPERATIONS OR RELEASES)

3. OPERATE SYMBOLS:

- (A)  A INDICATES A RELAY COMES TO FULLY OPERATED CONDITION AT THIS POINT. FOR POLARIZED RELAYS, THE ARMATURE HAS MOVED TO FRONT OR LEFT CONTACT.
- (B)  (B) CHG INDICATES INTERRUPTER CHG HAS CLOSED ITS BACK CONTACT.
- (C)  ² LK INDICATES LINK SEQUENCE SWITCH HAS ADVANCED TO POSITION 2.
- (D)  ^S LK INDICATES LINK SENDER SELECTOR UP-DRIVE MAGNET IS OPERATED.

4. RELEASE SYMBOLS:

- (A)  B INDICATES B RELAY COMES TO FULLY RELEASED CONDITION AT THIS POINT. FOR POLARIZED RELAYS, THE ARMATURE HAS MOVED TO BACK OR RIGHT CONTACT.
- (B)  (F) DISC INDICATES INTERRUPTER DISC HAS OPENED ITS FRONT CONTACT.
- (C)  (D) LK INDICATES LINK CIRCUIT DISTRICT SELECTOR UP-DRIVE MAGNET IS RELEASED.

5. SYMBOL NOTATION:

- (A)  SS- INDICATES ONE OR MORE OF THE RELAYS DESIGNATED SSATO SSK HAVE OPERATED.
- (B)  AI-5 INDICATES ALL OF THE RELAYS DESIGNATED A1 TO A5 HAVE OPERATED.
- (C)  GA,SW INDICATES BOTH GA AND SW RELAYS HAVE OPERATED FROM THE SAME CAUSE.
- (D)  A/B INDICATES THAT EITHER ONE OF THE RELAYS HAS OPERATED.

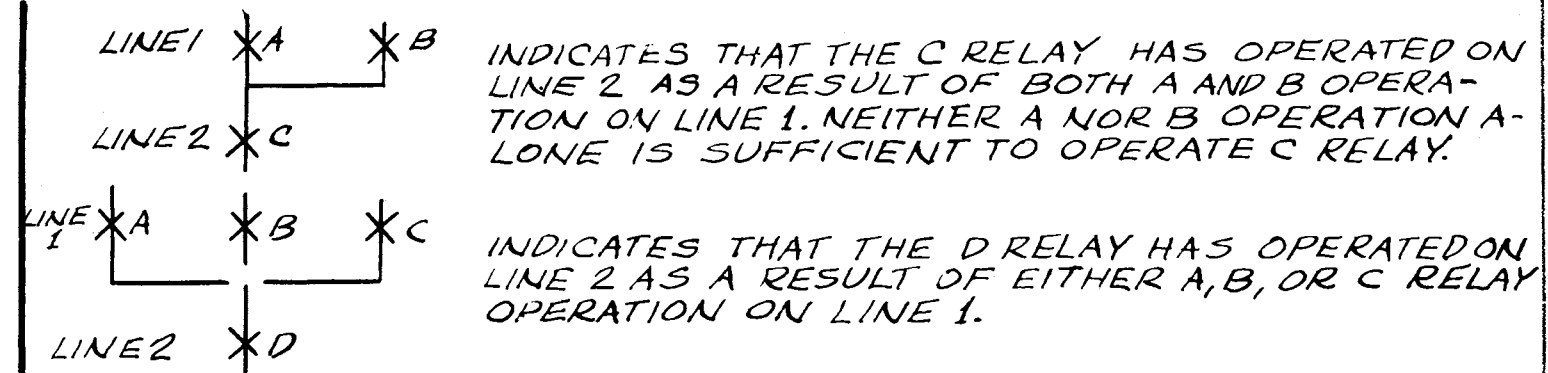
6. CONNECTING LINES:

- (A) VERTICAL LINES ARE USED TO LINK CAUSES WITH EFFECTS ON SUCCEEDING LINES AS:

LINE 1  L INDICATES THAT THE L RELAY ON LINE 2 HAS OPERATED AS A RESULT OF L RELAY OPERATING ON LINE 1.

LINE 2  LI

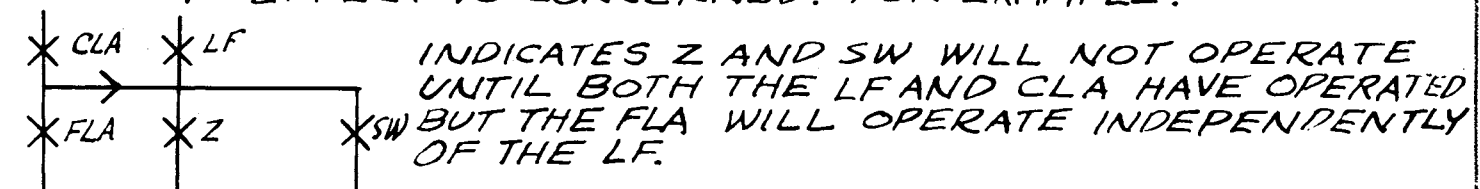
- (B) HORIZONTAL OR OBLIQUE LINES ARE USED TO CONNECT MULTIPLE CAUSES SO AS TO INDICATE THEIR COMMON EFFECT OR TO CONNECT MULTIPLE EFFECTS TO INDICATE THEIR COMMON CAUSE AS:



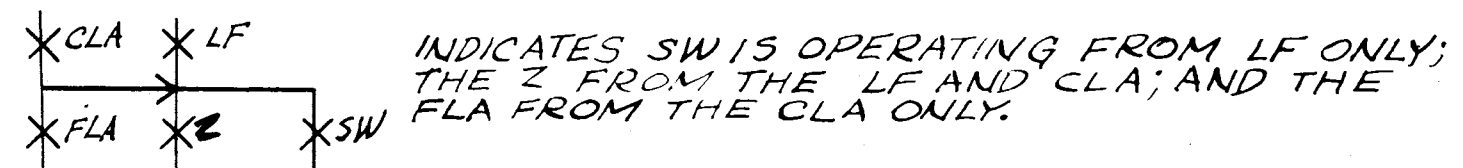
7. ARROWHEADS:

ARROWHEADS ARE USED TO SHOW THE PRECISE MEANING TO BE ATTACHED TO THE CONNECTING LINE.

(A) IF ARROWHEAD IS ON A HORIZONTAL LINE AND IS LOCATED BETWEEN TWO VERTICAL LINES, IT GIVES THE HORIZONTAL LINE DIRECTION INsofar AS CAUSE TO EFFECT IS CONCERNED. FOR EXAMPLE:



(B) IF ARROWHEAD IS ON A HORIZONTAL ADJOINING A VERTICAL LINE THE EFFECT OF THE ARROWHEAD IS LIMITED TO THE OPERATION SHOWN DIRECTLY BELOW: FOR EXAMPLE:



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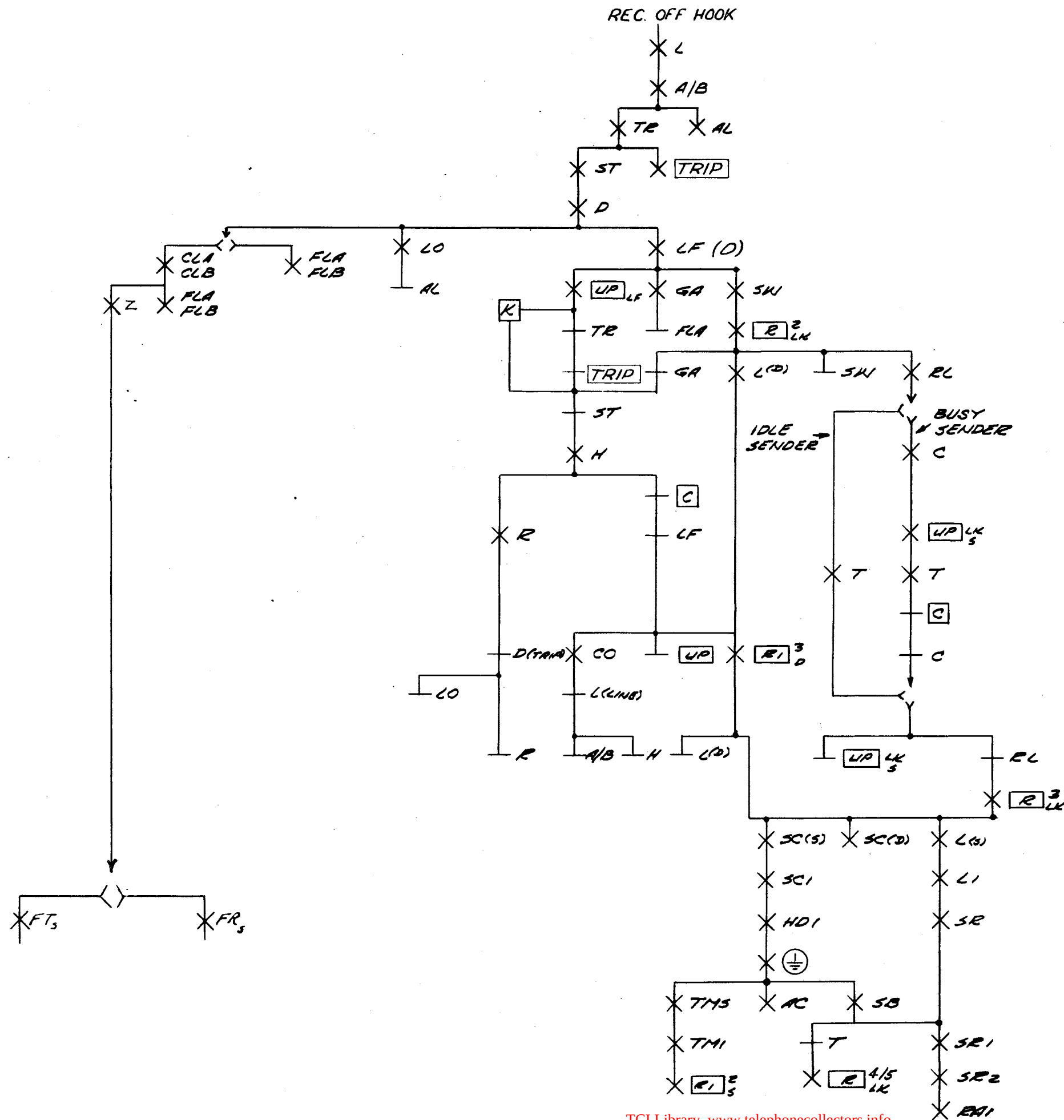
LEGEND FOR
SEQUENCE CHARTS

PANEL SYSTEM
BATTERY CUT-OFF

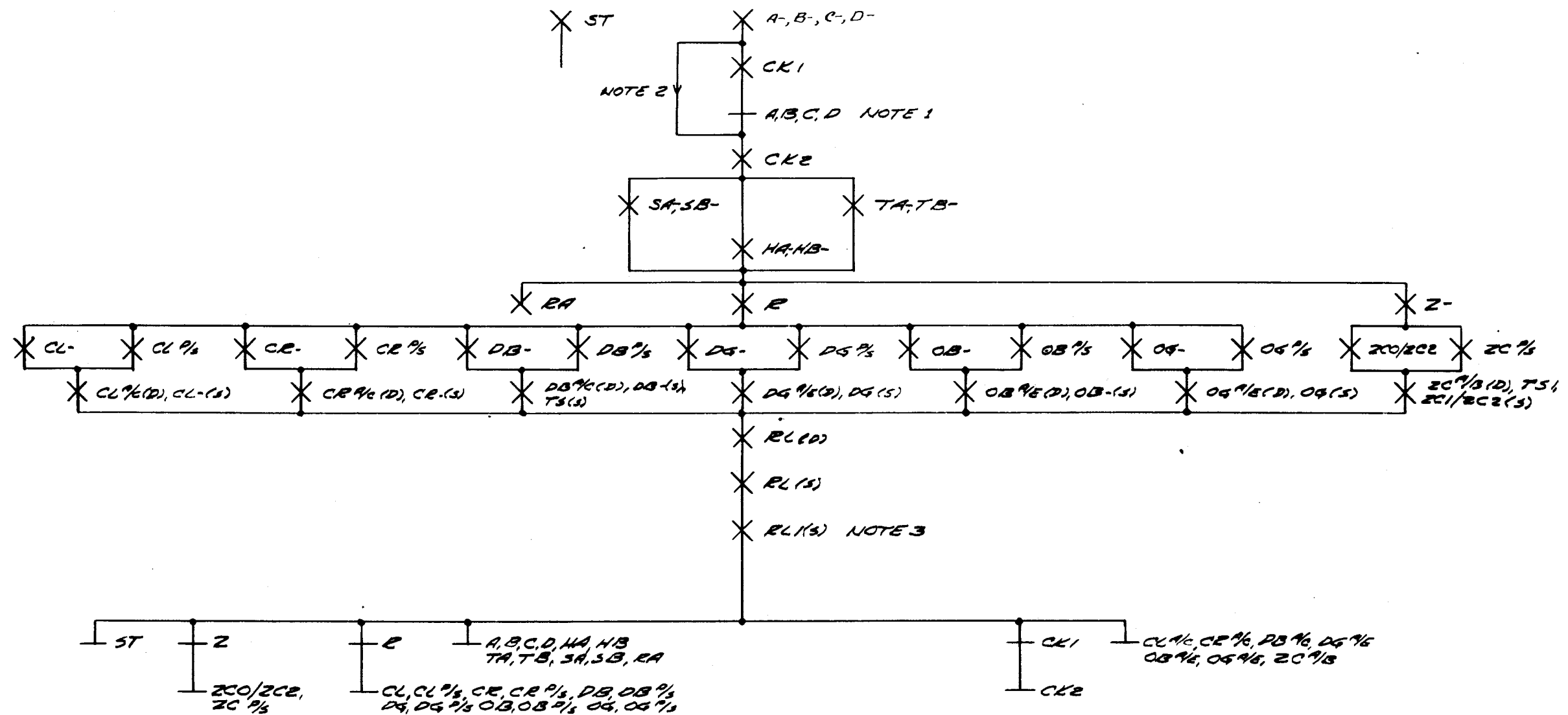
J. LAWLESS
DRAWN-T. WESSEL

SC-0

130445/1
G-1-1-93



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RECIEVER OFF THE HOOK
TO SENDER SEIZURE



NOTES

1. WHEN "CK1" OPERATES, "A", "B", "C", "D" RELAYS RELEASE EXCEPT THOSE HELD BY SENDER RELAYS.
2. "A", "B", "C" RELAYS HELD OPERATED AFTER "CK2" OPERATES, OPERATE "HA", "HB", "TA", "TB". "D" RELAYS OPERATE "SA", "SB".
3. WHEN "RL1(S)" OPERATES ALL CONNECTOR RELAYS RELEASE OPENING ALL LEADS TO DECODER.

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DECODER
FUNCTIONS

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN-R. WERDER

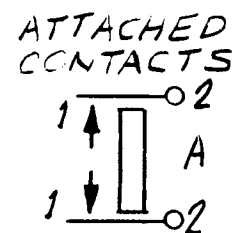
SC-2

THE SYMBOLS AND CONVENTIONS FOR THE OPERATIONAL SKETCHES ARE THE SAME AS THOSE USED ON SCHEMATIC DRAWINGS (SD-1) WITH THE FOLLOWING EXCEPTIONS.

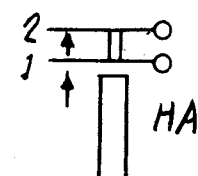
1. DETACHED CONTACT SYMBOLS ARE USED WHENEVER THEIR EMPLOYMENT AIDS IN SIMPLIFYING THE SKETCHES. THEY ARE SHOWN THUS:

(A) MAKE CONTACTS:

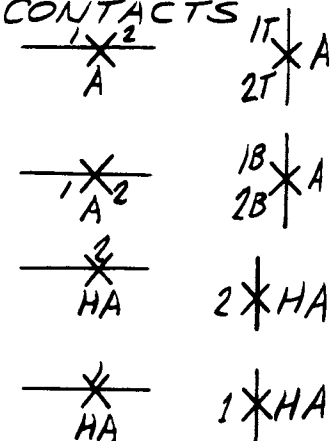
ALL RELAYS HAVING TOP AND BOTTOM SPRINGS.



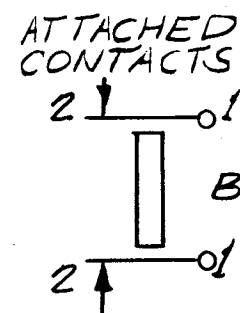
ALL RELAYS NOT HAVING TOP AND BOTTOM SPRINGS. (MULTI-CONTACT)



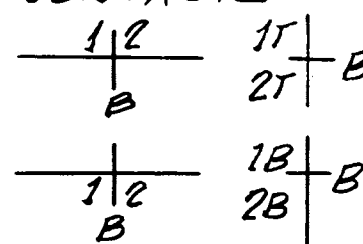
EQUIVALENT DETACHED CONTACTS



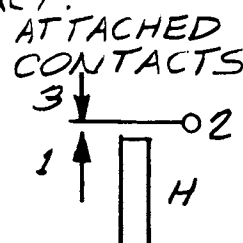
(B) BREAK CONTACTS:



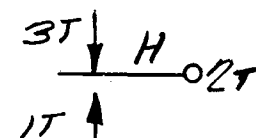
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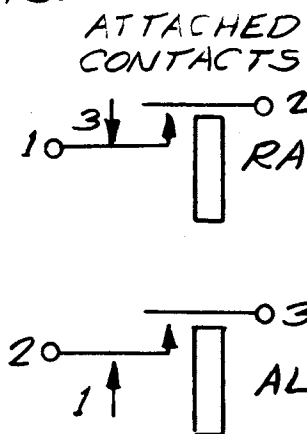
(C) TRANSFER CONTACT:



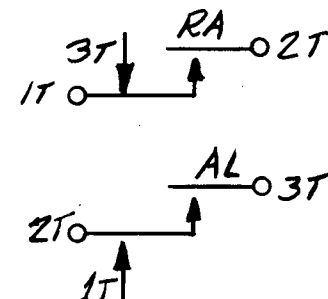
EQUIVALENT DETACHED CONTACTS



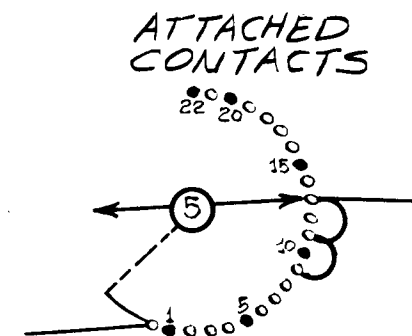
(D) OTHER CONTACTS:



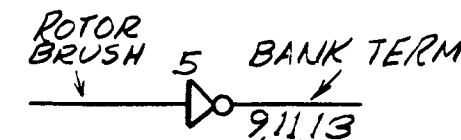
EQUIVALENT DETACHED CONTACTS



(E) 206 AND SIMILAR TYPE SELECTORS.

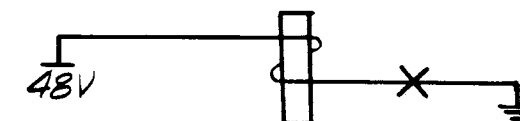


EQUIVALENT DETACHED CONTACTS



2. INNER ENDS OF WINDINGS ARE OMITTED.

3. BATTERY SYMBOL WITH THE NOMINAL VOLTAGE IS SHOWN THIS:



4. CONTACT PROTECTIONS IN GENERAL ARE OMITTED.

5. SEQUENCE CHARTS ARE IN GENERAL PROVIDED ON EACH SKETCH. THE DESIGNATIONS FOR ALL RELAYS OF WHICH THE OPERATING PATHS ARE SHOWN ON THE SKETCH ARE IN HEAVY CHARACTERS. ALL OTHERS ARE IN LIGHT CHARACTERS.

6. IN GENERAL STRAPPING OR MULTIPLE CONVENTIONS ARE OMITTED.

7. $\frac{TBO-TB9}{X}$ INDICATES THAT THE MAKE CONTACTS (ONE EACH) ON RELAYS TBO TO TB9 ARE WIRED IN PARALLEL.

8. $\frac{X}{CB-}$ INDICATES A MAKE CONTACT ON ONE OF A SERIES OF CB RELAYS.

9. GA/GB INDICATES THAT EITHER GA OR GB DESIGNATION APPLIES.

10. $\frac{TR}{JACK}$ INDICATES A BREAK CONTACT ON THE T JACK.

11. $\frac{X}{MB JACK}$ INDICATES A MAKE CONTACT ON THE MB JACK.

12. $\frac{\text{Ground Symbol}}{\text{Ground Symbol}}$ INDICATES OFF-NORMAL GROUND

$\frac{\text{Battery Symbol}}{\text{Battery Symbol}}$ INDICATES OFF-NORMAL BATTERY

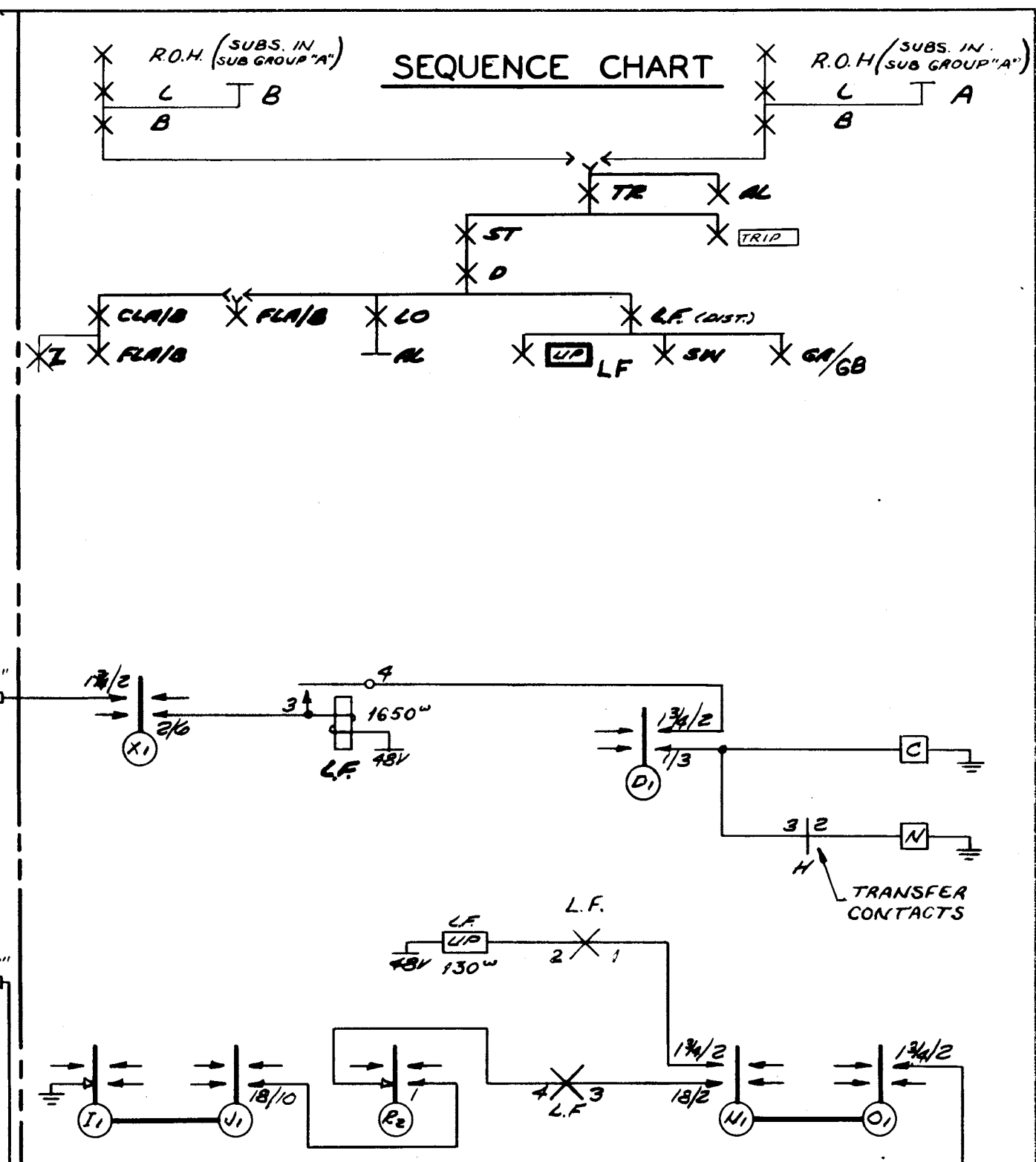
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LEGEND FOR
OPERATIONAL SKETCHES

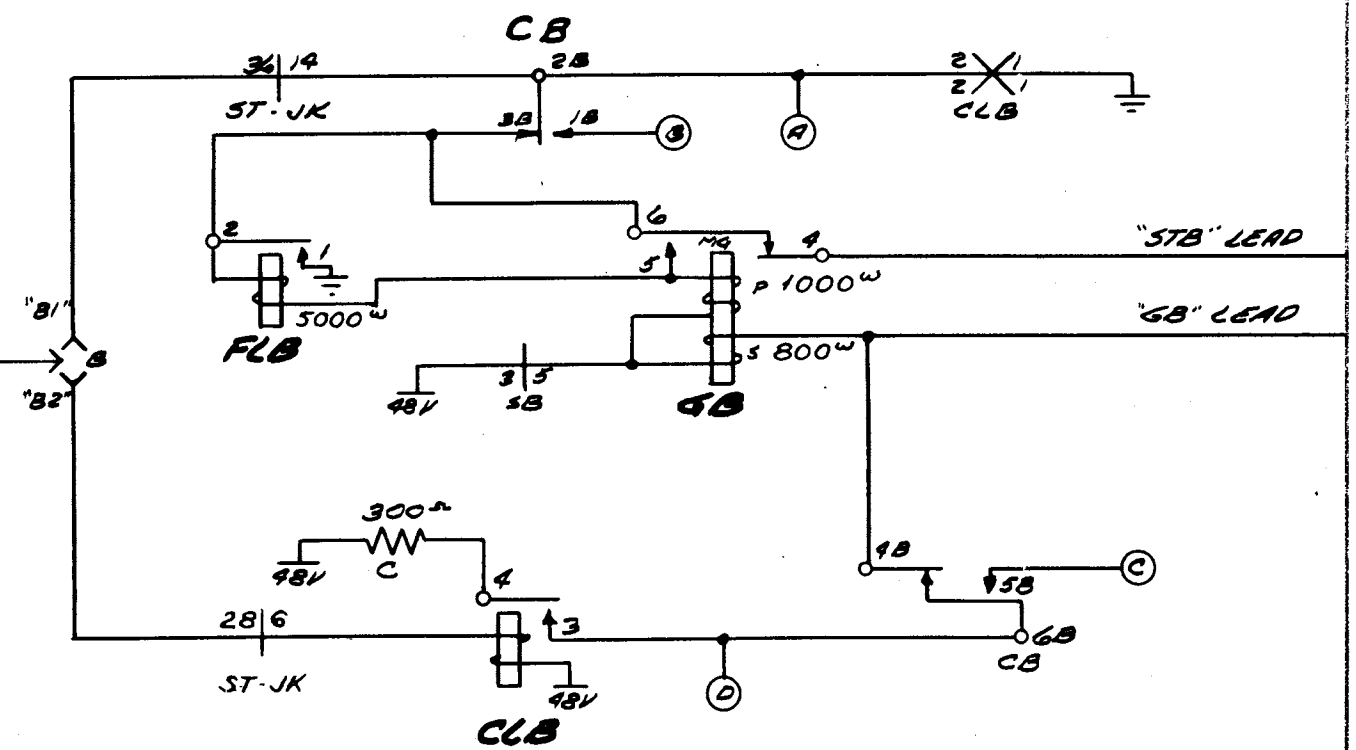
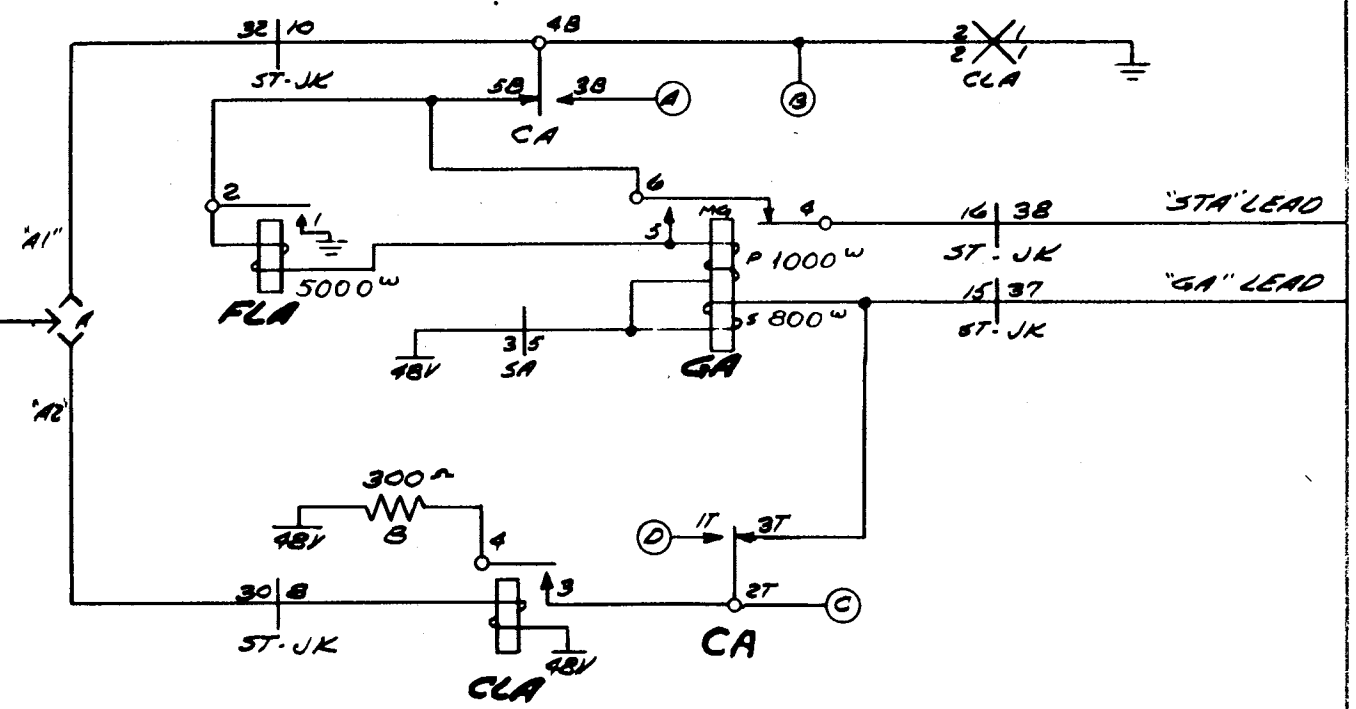
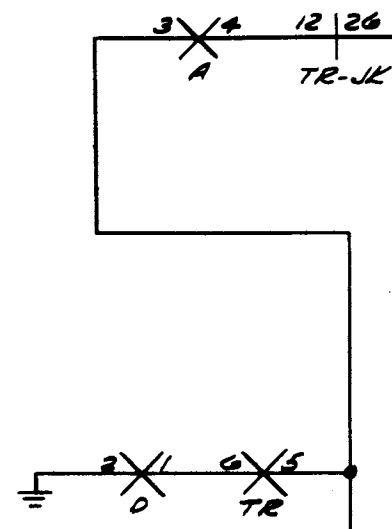
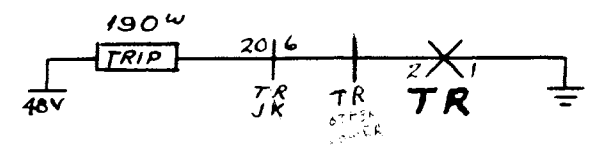
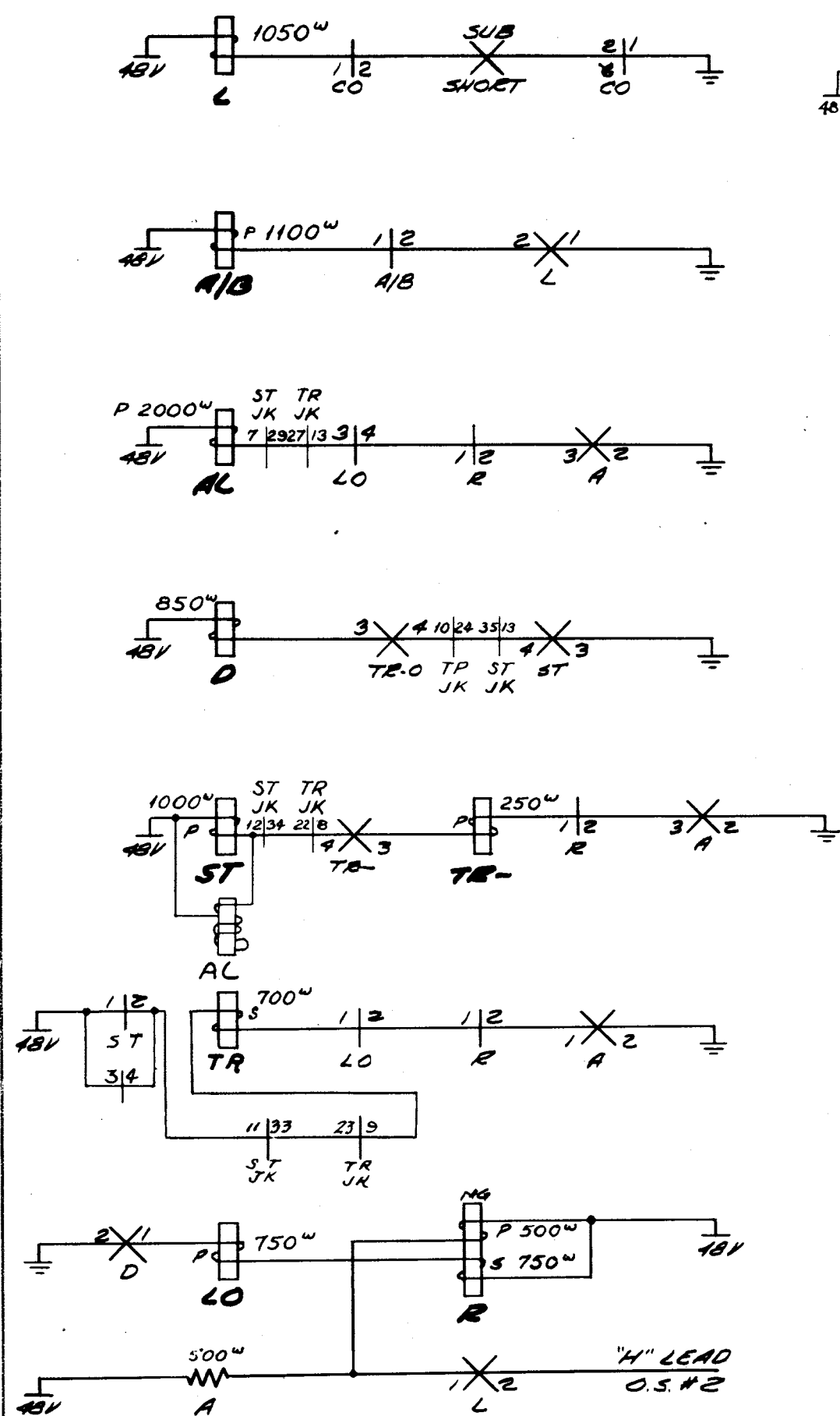
PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN-T.E. WESSEL

OS-0



OS-1A
SHEET 1



LINE START & TRIP

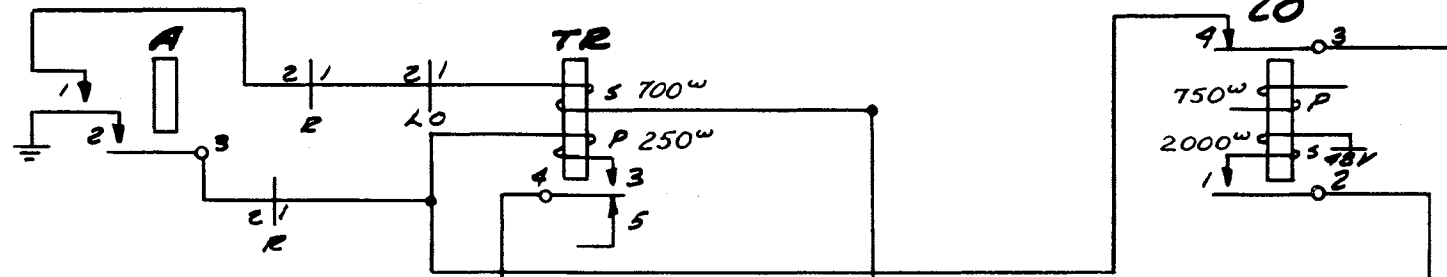
O.S. #1A SHEET #2

LINE GROUP ALLOTING CKTS.

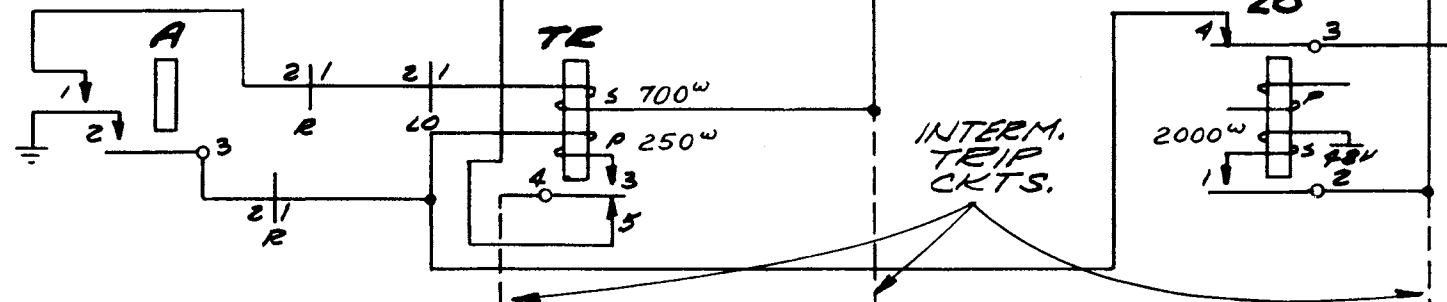
LINE & LINK ALLOTING CKTS.

PAR 615 PAGE 14

TRIP 9

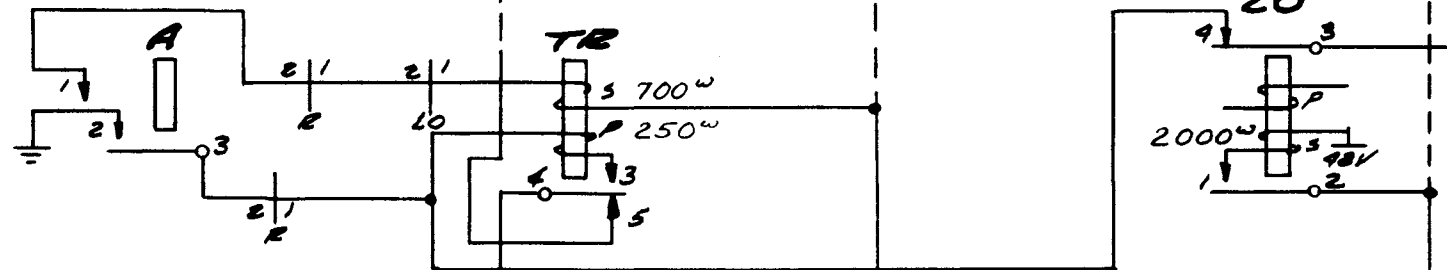


TRIP 8

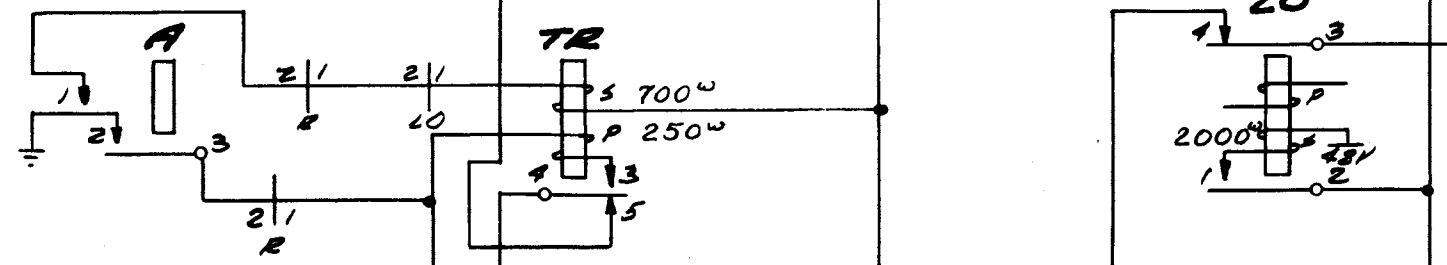


INTERM.
TRIP
CKTS.

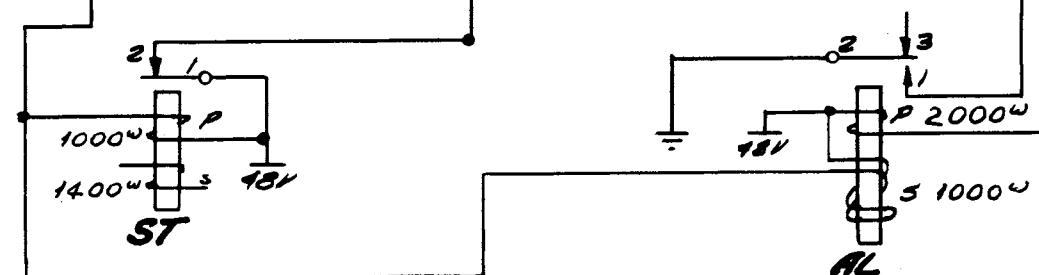
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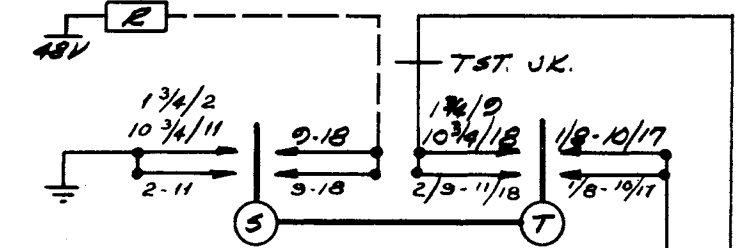
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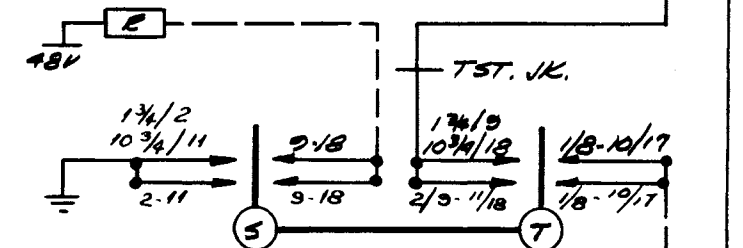
START



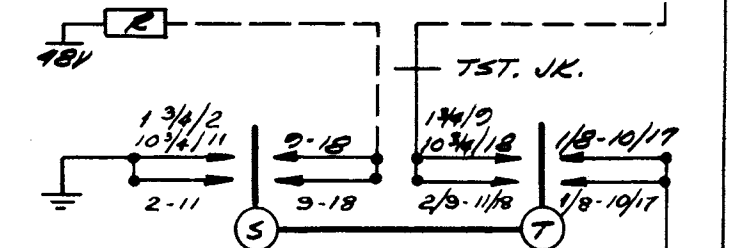
LAST LINK



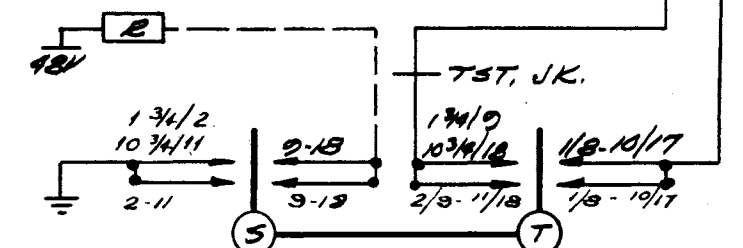
INTERMEDIATE LINKS



SECOND LINK



FIRST LINK



LINK SWITCH

1-10 AWAIT. CALL
2-11 AWAIT. SNIDE.
9-18 AWAIT. ALLOTMENT

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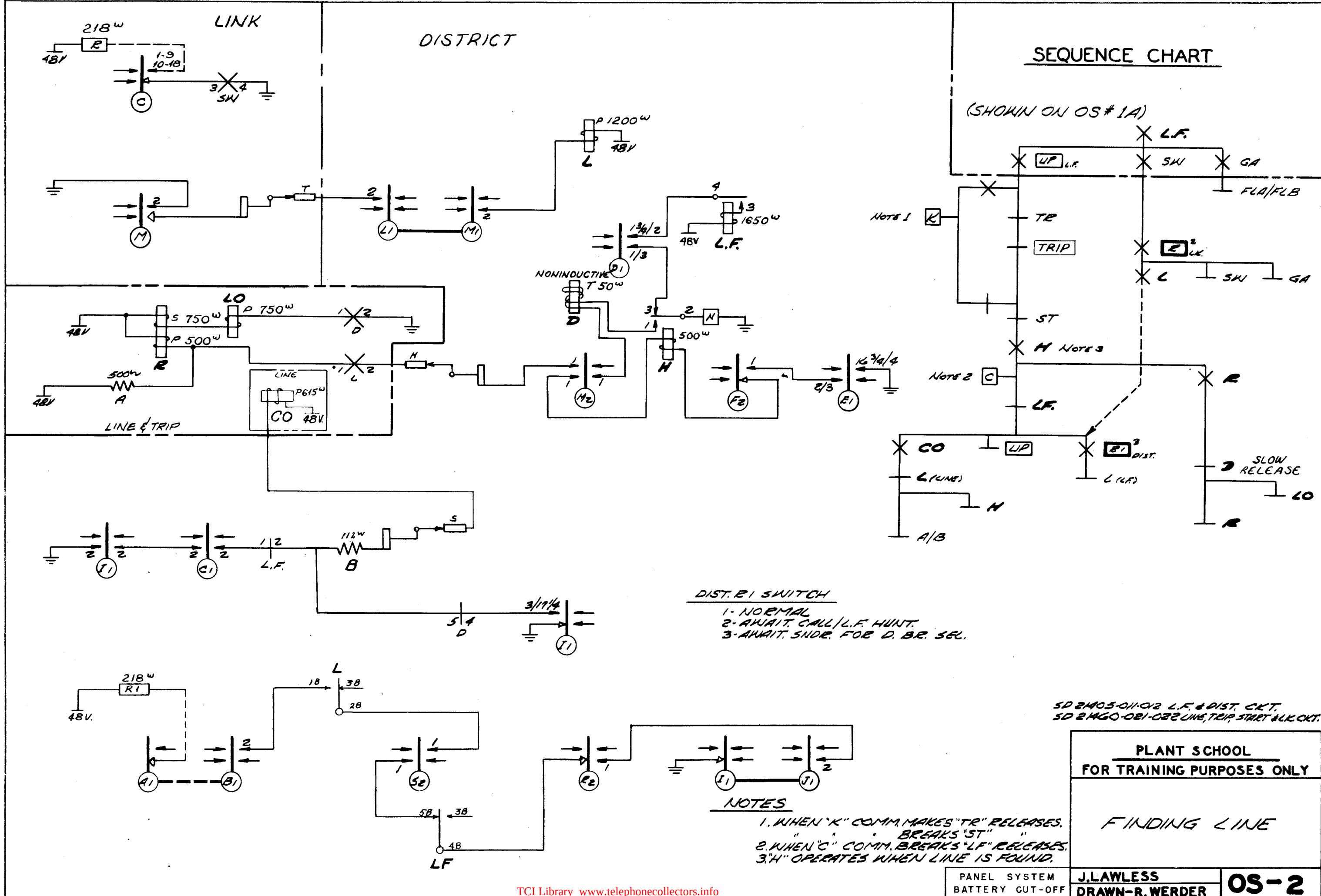
TRIP & LINK CIRCUIT
ALLOTING

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN-R. WERDER

OS-1B

15508 1 0-7-79



DIST. E1 SWITCH
 1- NORMAL
 2- AWAIT. CALL/L.F. HUNT.
 3- AWAIT. SNDR. FOR D. BR. SEL.

NOTES
 1. WHEN "K" COMM. MAKES "TR" RELEASES. BREAKS "ST"
 2. WHEN "C" COMM. BREAKS "LF" RELEASES.
 3. "H" OPERATES WHEN LINE IS FOUND.

SD 2405-011-012 L.F. & DIST. CKT.
 SD 2460-081-022 LINE, TRIP, START & LK. CKT.

PLANT SCHOOL
 FOR TRAINING PURPOSES ONLY

FINDING LINE

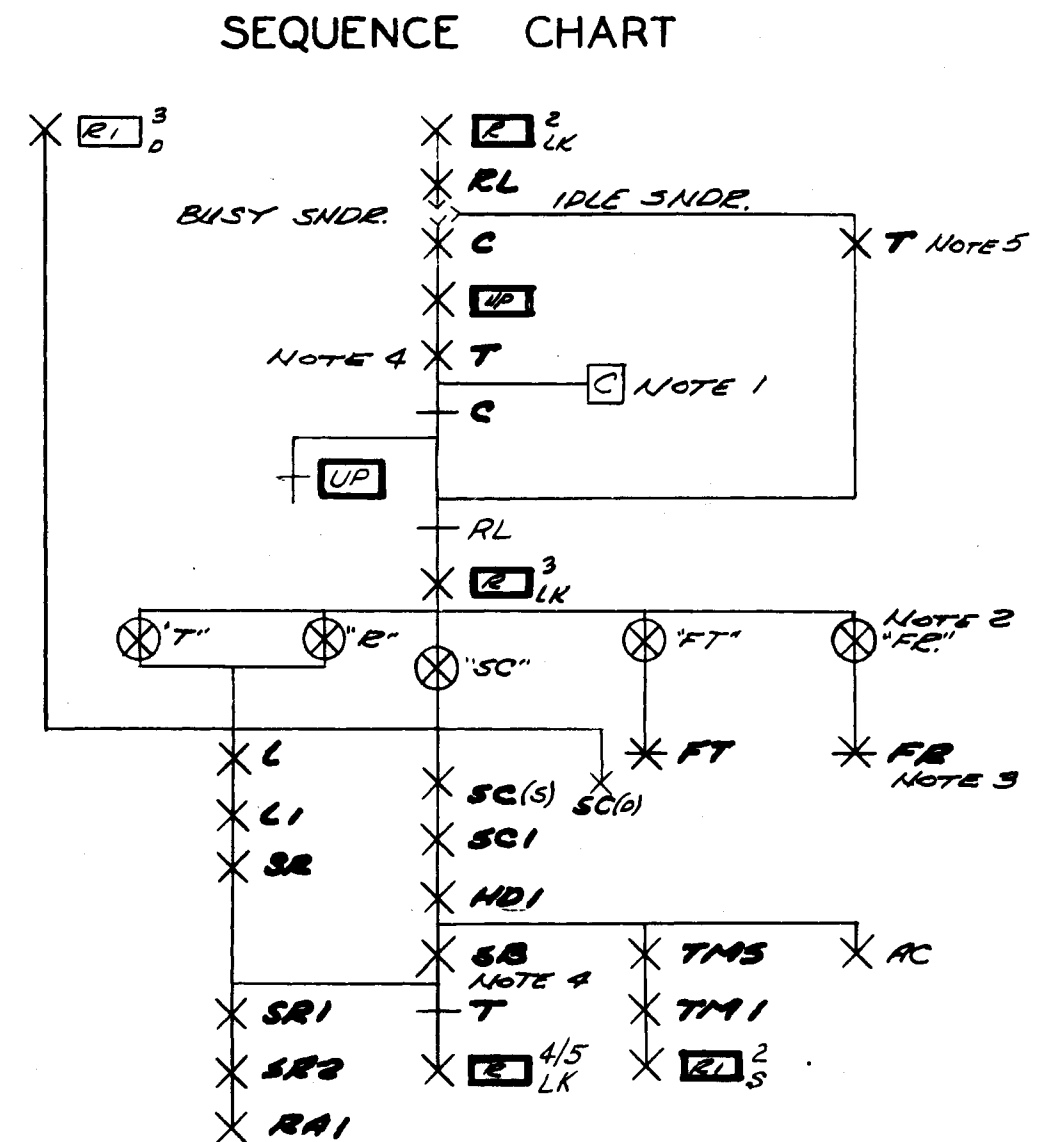
J. LAWLESS
 DRAWN-R. WERDER

OS-2

PANEL SYSTEM
 BATTERY CUT-OFF

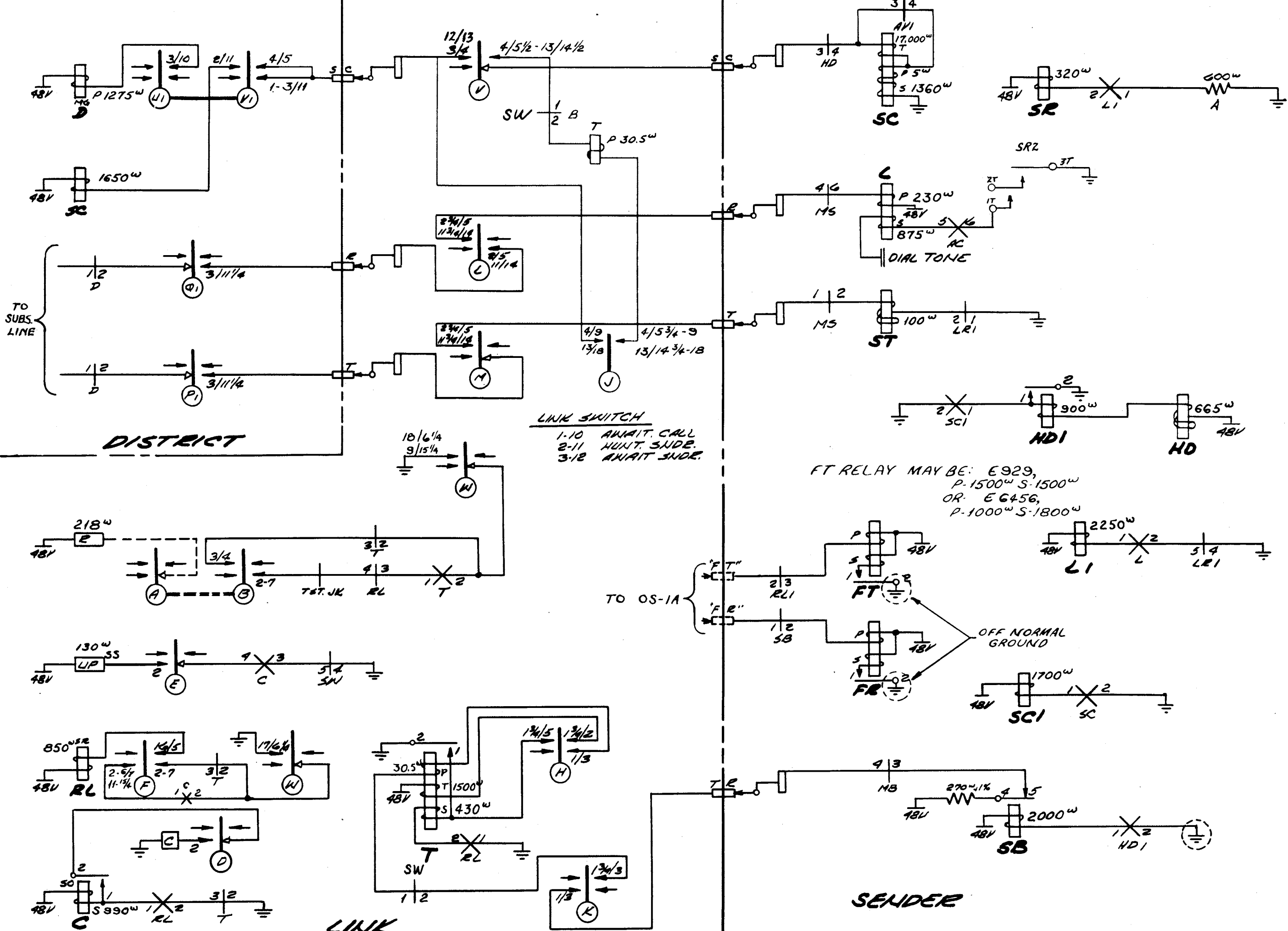


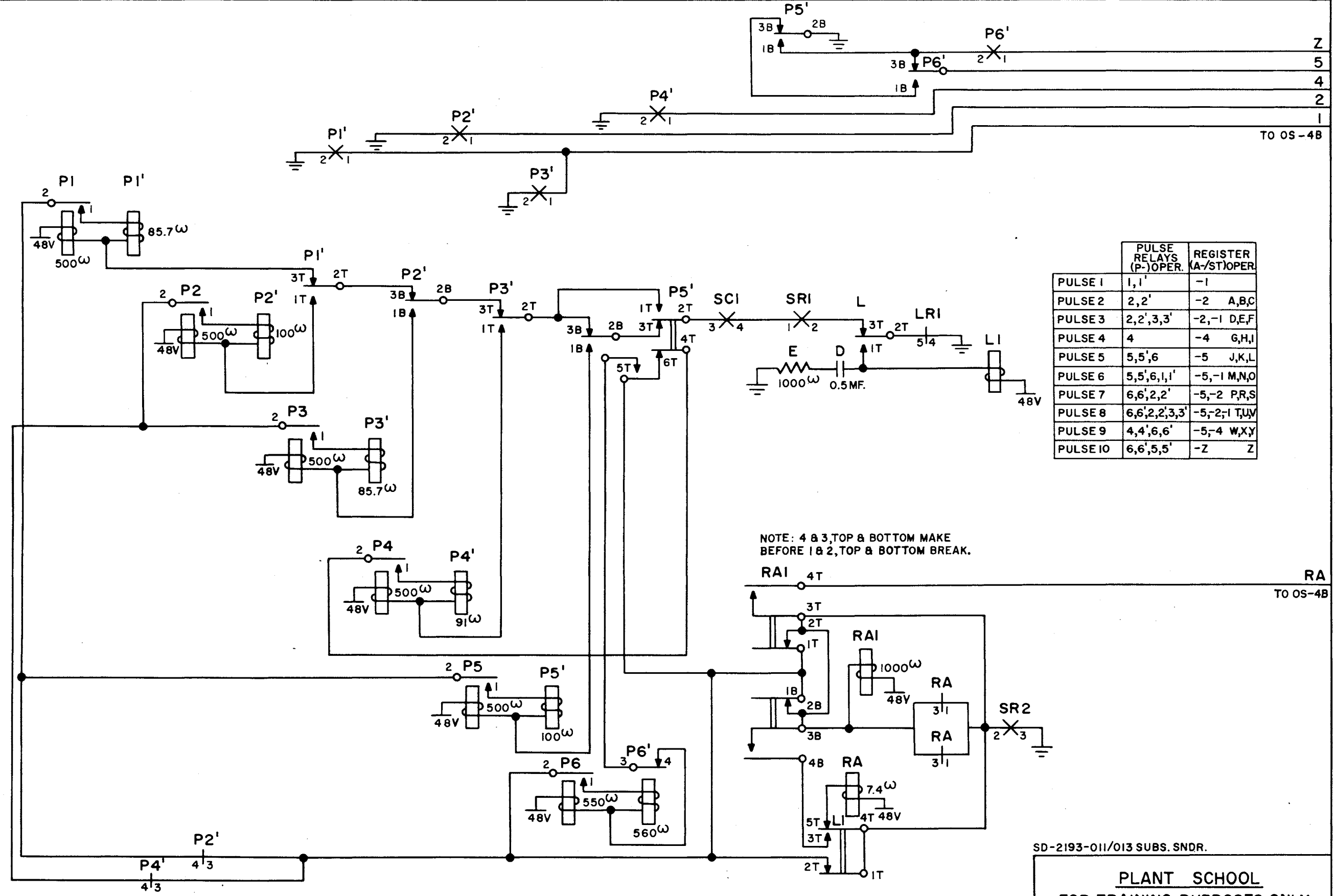
NOTES IF ALL SENDERS ARE BUSY THE SELECTOR WILL CONTINUE TO RIDE UP UNTIL THE BRUSHES REACH THE TOP OF THE COMM. WHERE THE "X" SEGMENT WITH GROUND ON IT WILL OPERATE THE "SK" RELAY TO STOP THE UP-DRIVE & ENERGIZE THE DOWN-DRIVE MAGNET. WHEN THE SELECTOR HAS REACHED THE BOTTOM THE "Y" SEGMENT WITH GROUND WILL SHUNT DOWN THE "SK" RELAY AND ENERGIZE THE UP-DRIVE MAGNET AGAIN.



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

SEIZING A SENDER





	PULSE RELAYS (P-)OPER.	REGISTER (A-ST)OPER.
PULSE 1	1, 1'	-1
PULSE 2	2, 2'	-2 A,B,C
PULSE 3	2, 2', 3, 3'	-2, -1 D,E,F
PULSE 4	4	-4 G,H,I
PULSE 5	5, 5', 6	-5 J,K,L
PULSE 6	5, 5', 6, 1, 1'	-5, -1 M,N,O
PULSE 7	6, 6', 2, 2'	-5, -2 P,R,S
PULSE 8	6, 6', 2, 2', 3, 3'	-5, -2; 1 T,U,V
PULSE 9	4, 4', 6, 6'	-5, -4 W,X,Y
PULSE 10	6, 6', 5, 5'	-Z Z

NOTE: 4 & 3, TOP & BOTTOM MAKE
BEFORE 1 & 2, TOP & BOTTOM BREAK.

SD-2193-011/013 SUBS. SNDR.

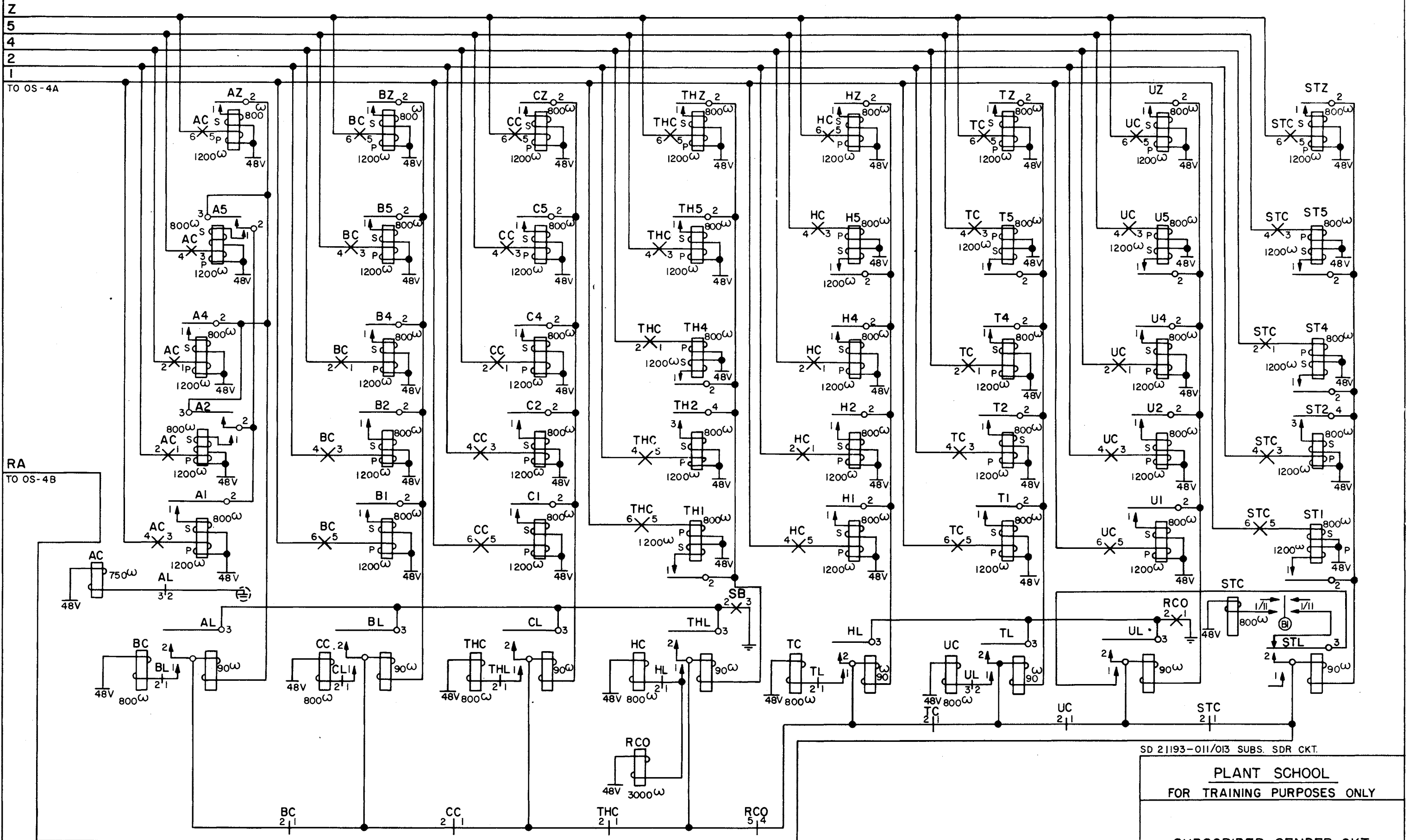
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

SUBSCRIBER SENDER CIRCUIT PULSE COUNTING

**PANEL SYSTEM
BATTERY CUT-OFF**

J. LAWLESS
DRAWN - D.S. CO. INC.

OS-4A



SD 21193-011/013 SUBS. SDR CKT.

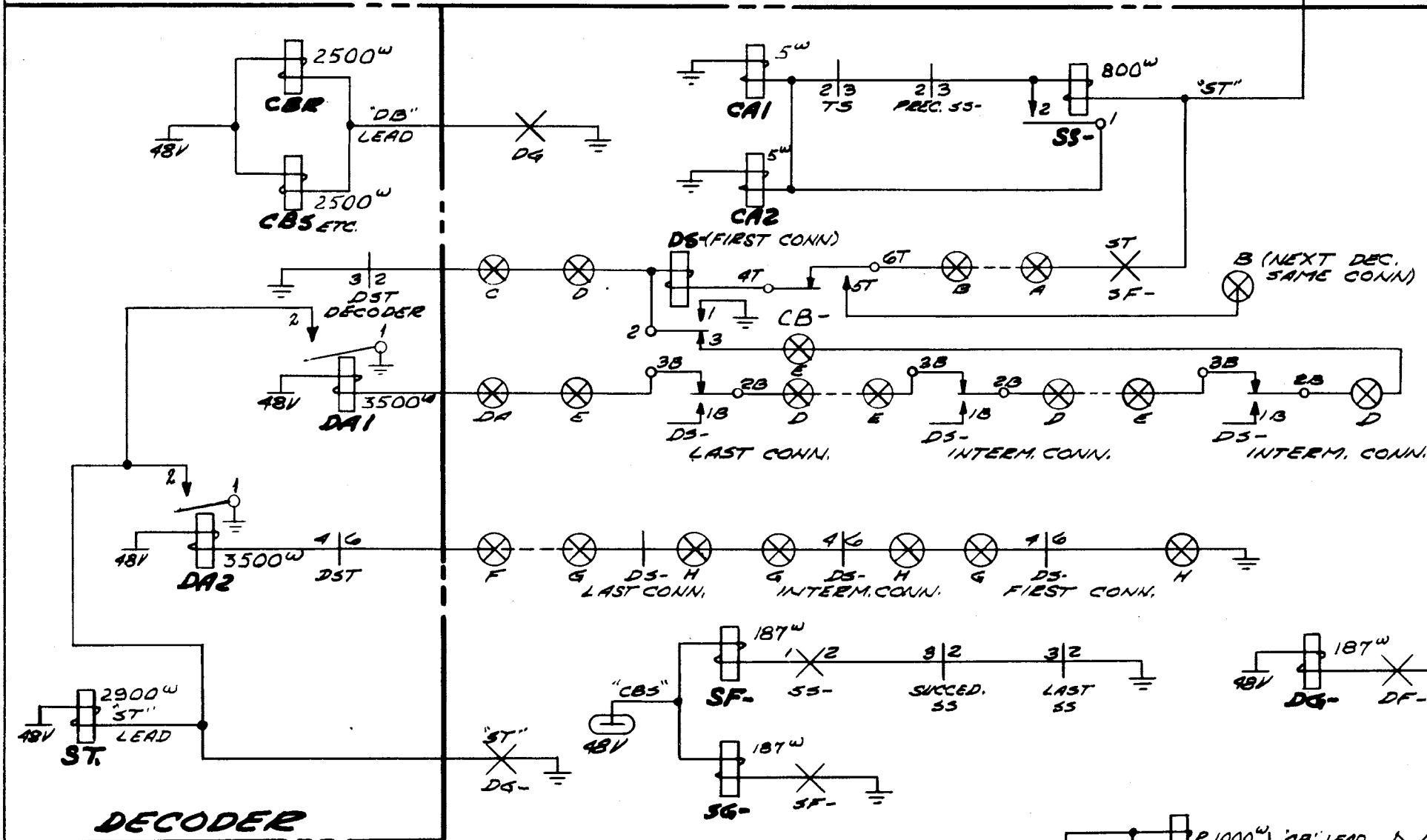
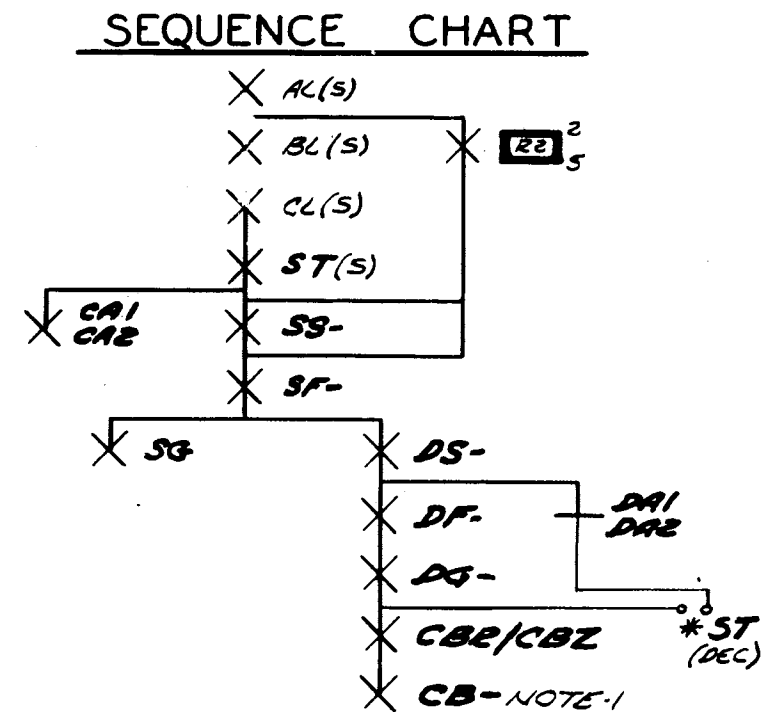
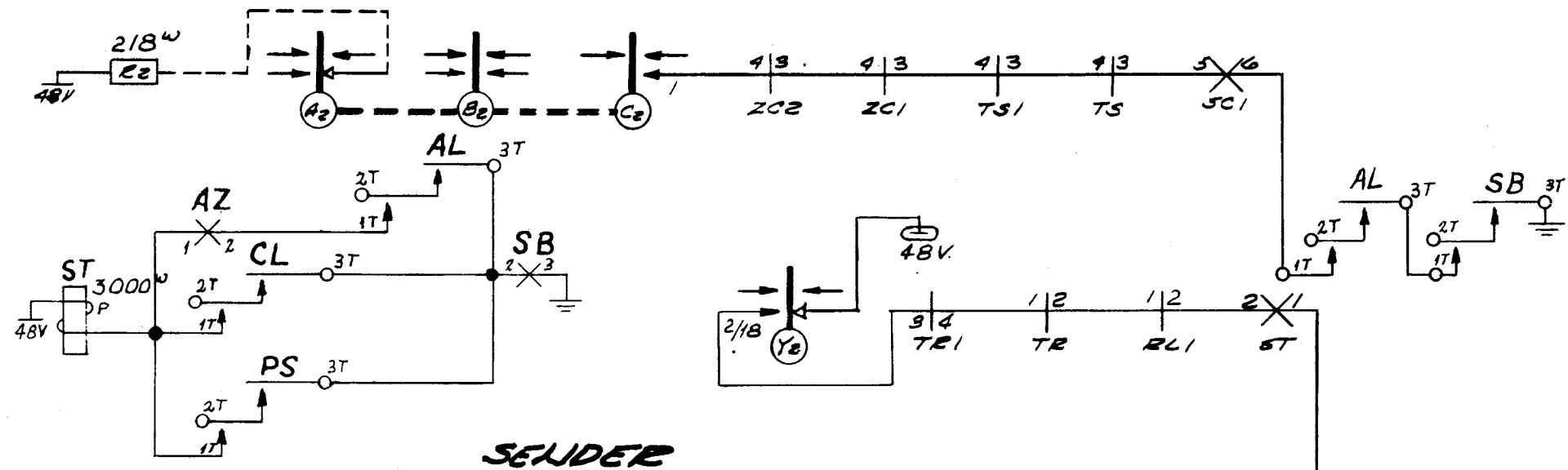
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

SUBSCRIBER SENDER CKT.
REGISTRATION

PANEL SYSTEM
BATTERY CUT-OFF

J. B. MAY
DRAWN- D.S. CO. INC

OS-4B



NOTE 1 - THE "CB" RELAY DOES NOT OPERATE IN THE DECODER CONNECTOR IN USE ON THIS CALL. THE "CB" RELAYS ASSOCIATED WITH THE DECODER IN USE ARE OPERATED IN ALL OTHER CONNECTORS.

SD 21193-011-012-013 SUBS. SNDR. CKT.
* SD 21187-011-012 DECODER CONN. CKT.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

SEIZING A DECODER

J. LAWLESS
DRAWN-R. WERDER
OS-5

PANEL SYSTEM
BATTERY CUT-OFF

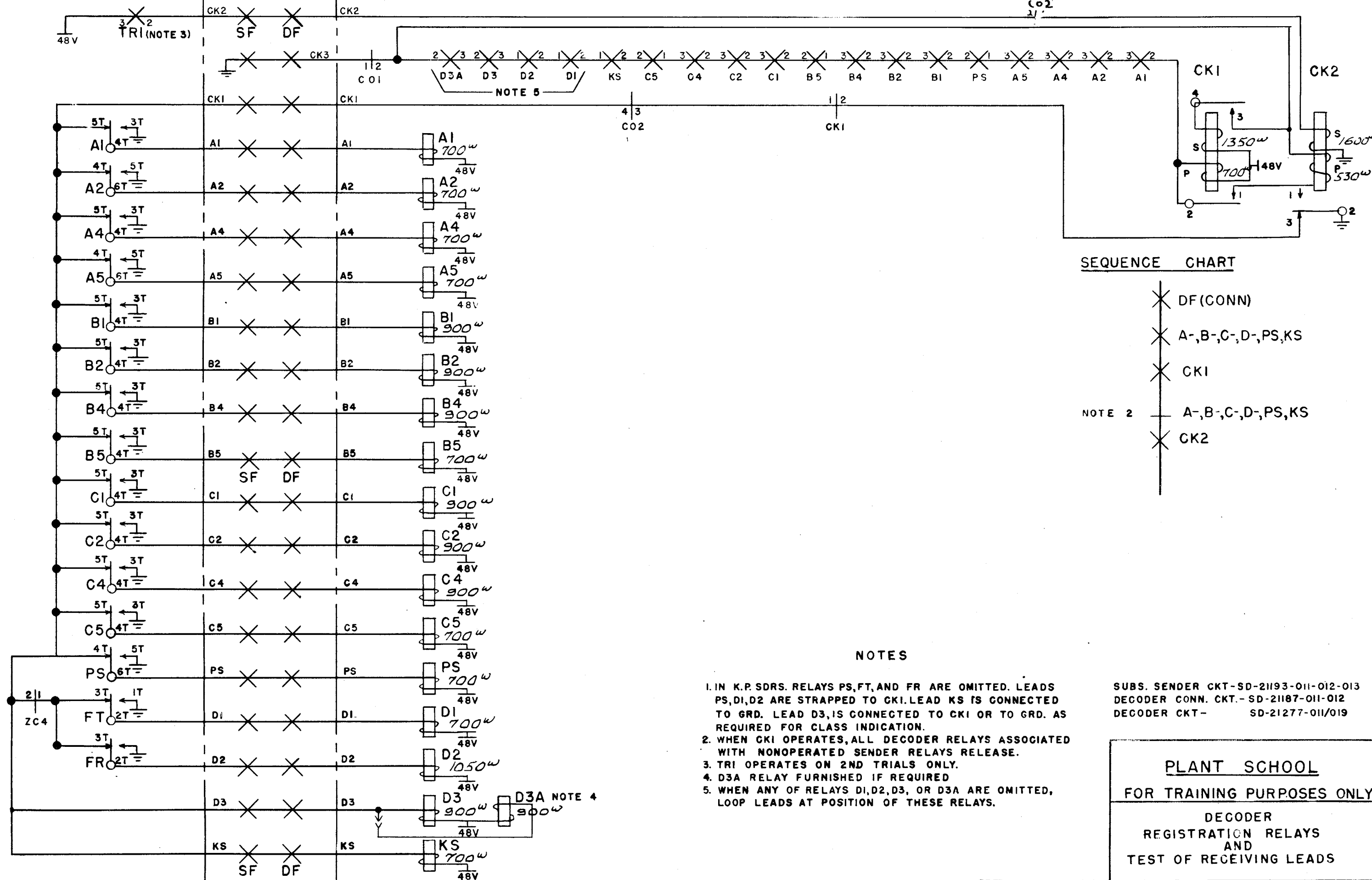
ISSUE 11-3-50

SUBS. SENDER (NOTE 1)

DEC. CONNECTOR

DECODER

CO2
21



NOTES

1. IN K.P. SDRS. RELAYS PS, FT, AND FR ARE OMITTED. LEADS PS, DI, D2 ARE STRAPPED TO CK1. LEAD KS IS CONNECTED TO GRD. LEAD D3, IS CONNECTED TO CK1 OR TO GRD. AS REQUIRED FOR CLASS INDICATION.
2. WHEN CK1 OPERATES, ALL DECODER RELAYS ASSOCIATED WITH NONOPERATED SENDER RELAYS RELEASE.
3. TRI OPERATES ON 2ND TRIALS ONLY.
4. D3A RELAY FURNISHED IF REQUIRED
5. WHEN ANY OF RELAYS DI, D2, D3, OR D3A ARE OMITTED, LOOP LEADS AT POSITION OF THESE RELAYS.

SUBS. SENDER CKT-SD-21193-011-012-013
DECODER CONN. CKT.-SD-21187-011-012
DECODER CKT-SD-21277-011/019

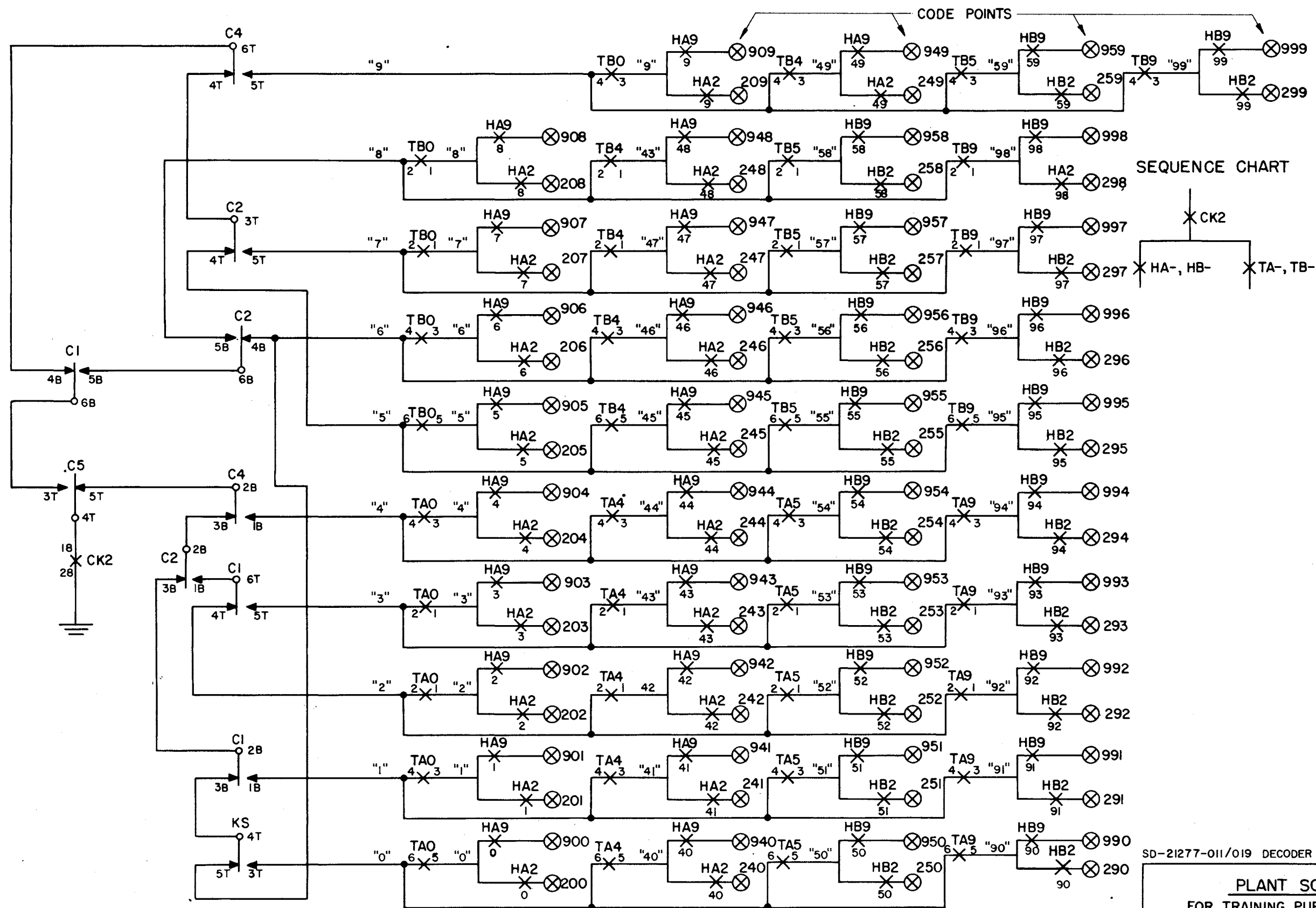
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

DECODER
REGISTRATION RELAYS
AND
TEST OF RECEIVING LEADS

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS

OS-6A



SD-21277-011/019 DECODER CIRCUIT

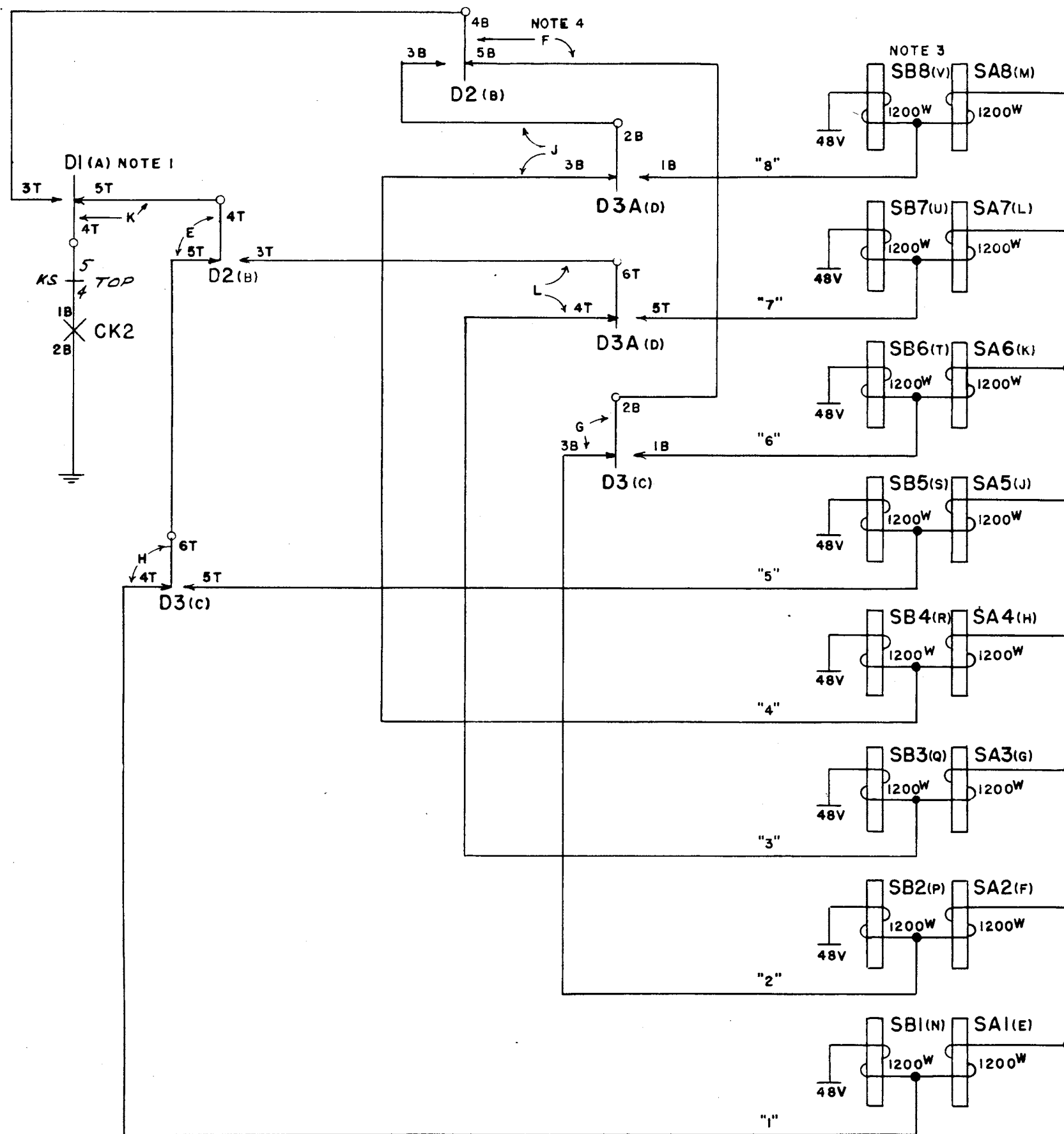
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

DECODER
GROUNDING A CODE
POINT

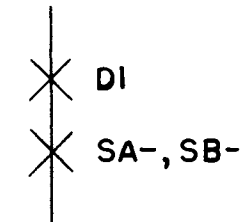
PANEL SYSTEM
BATTERY CUT-OFF

J.LAWLESS
DRAWN-D.S.CO.INC.

OS-6B

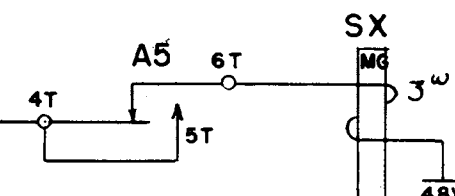


SEQUENCE CHART



- LETTERS IN PARENTHESIS DENOTE OPTIONAL APPARATUS
- APPARATUS (A), (B), (C), (D), (E), (F), (G), (H), (J), (K), (L), AND (M) ARE FURNISHED AS REQUIRED TO DISTINGUISH THE VARIOUS CLASSES OF SERVICE SERVED BY THE OFFICE.
TYPICAL USAGE OF RELAYS D1, D2 & D3 (FOR 5 CLASSES)
- WHEN ZONING REQUIRES MORE THAN SIX CONTACTS OF APPARATUS (E) TO (M) ASSOCIATED APPARATUS (N) TO (V) IS FURNISHED.
- WHEN ANY OF APPARATUS (A), (B), (C), OR (D) IS NOT FURNISHED, LOOP LEADS AT THE POSITIONS OF THE RELAYS NOT FURNISHED AS FOLLOWS

APPARATUS OMITTED	A	B	C	D
LOOP LEADS DESIGNATED	K	E, & F	G, & H	J, & L



DECODER CKT.-SD-21177-011/019

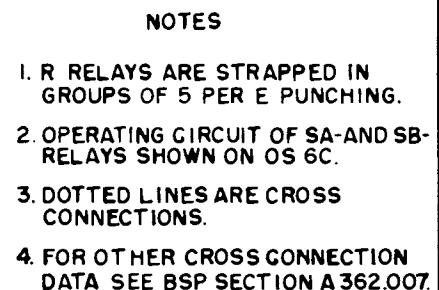
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

DECODER
CLASS
OF
SERVICE RELAYS

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS

OS-6C



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

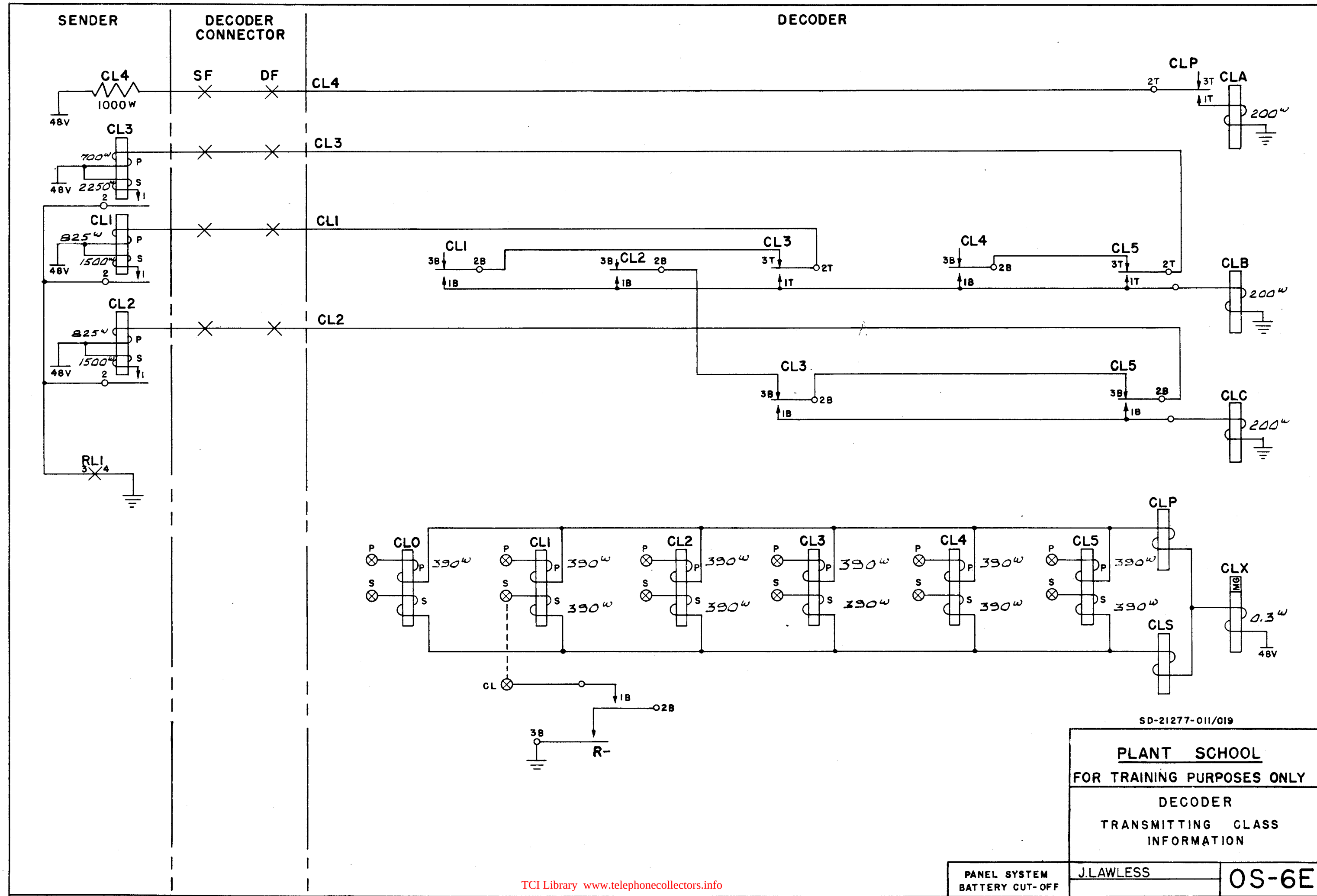
OPERATION OF ROUTE AND ZONE RELAYS

J. B. MAY
DRAWN- D.S.CO. INC.

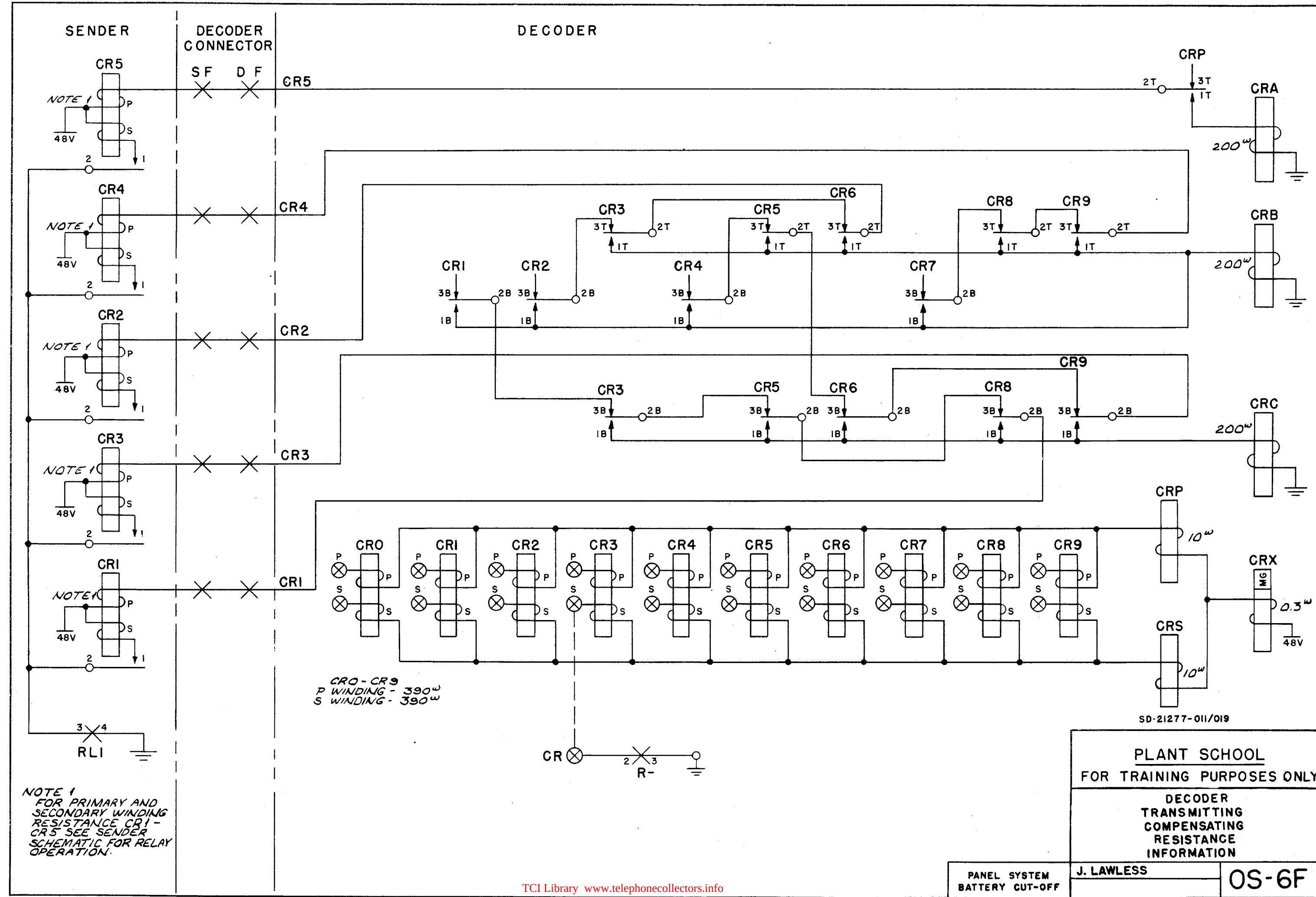
OS-6D

ISSUE
H-3-50

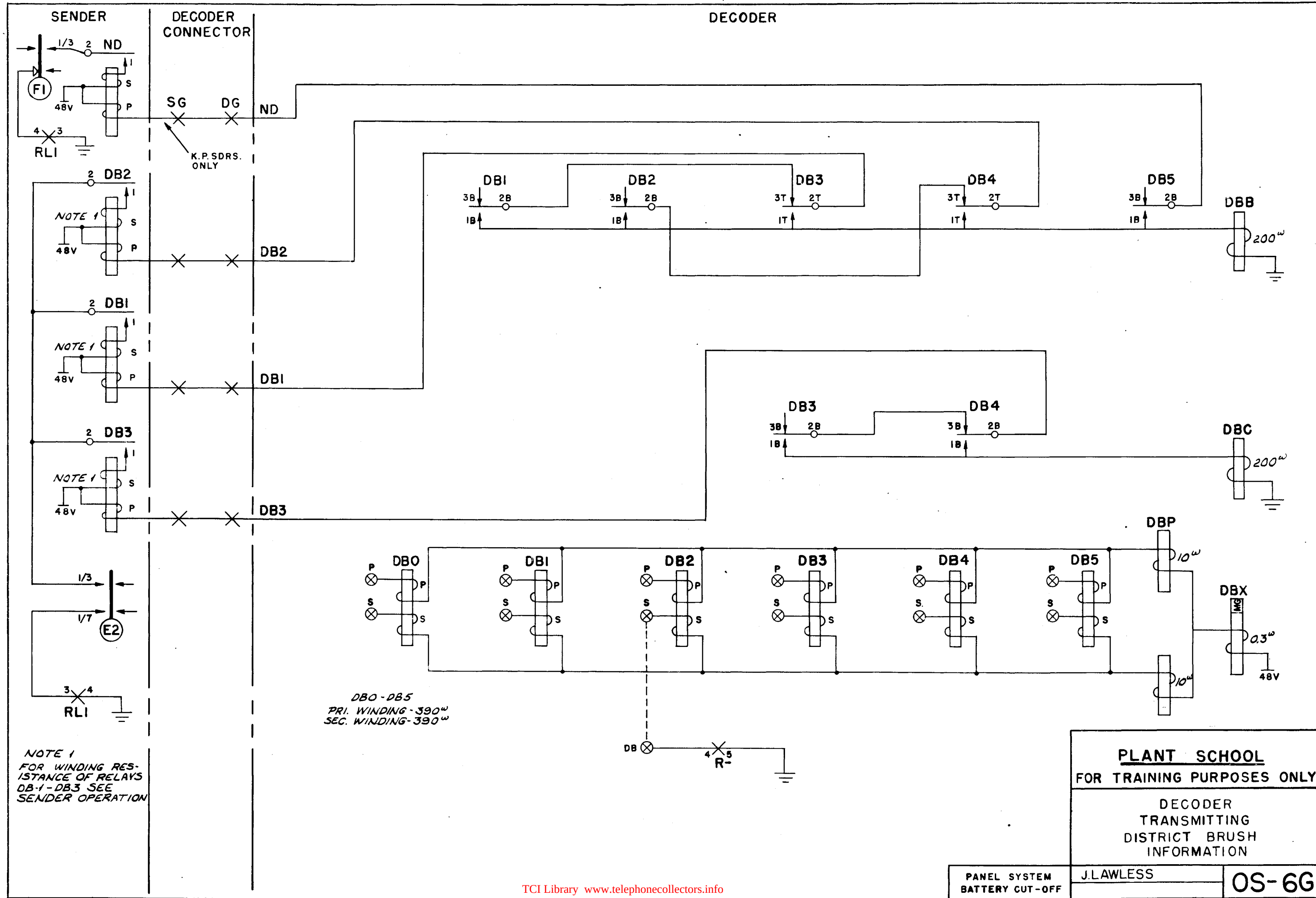
17"x11"



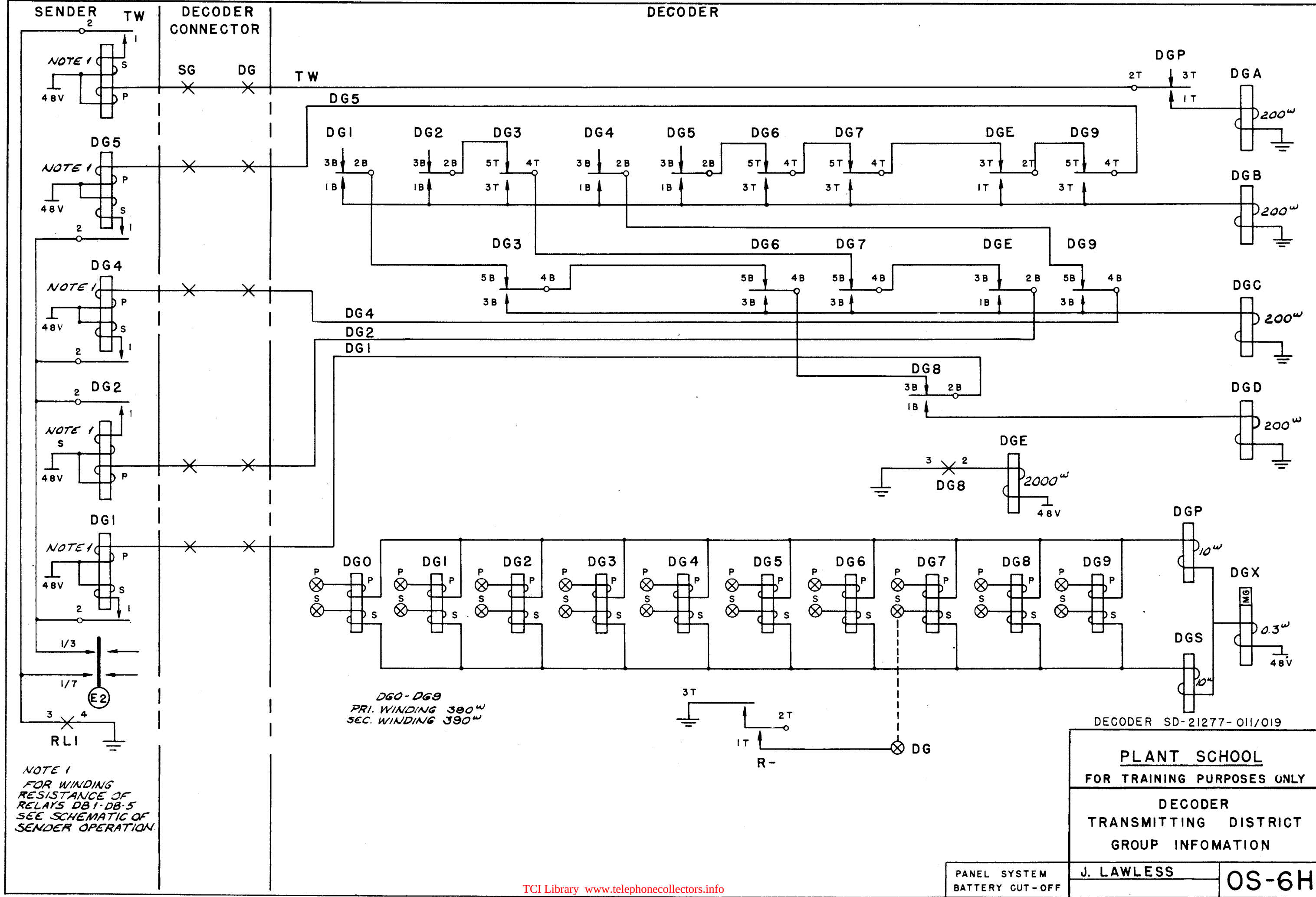
ISSUE 11-6-50

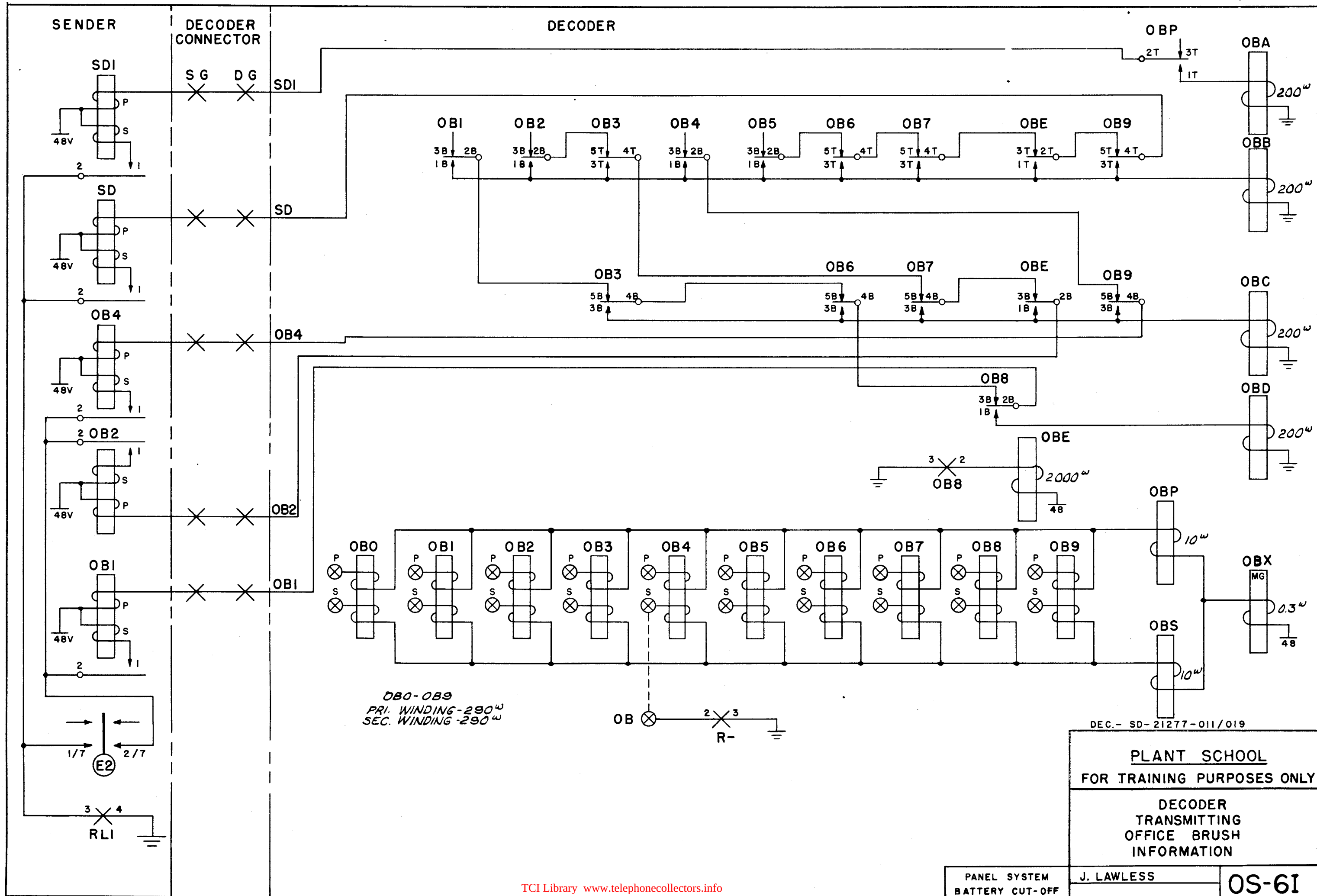


ISSUE 11-3-50

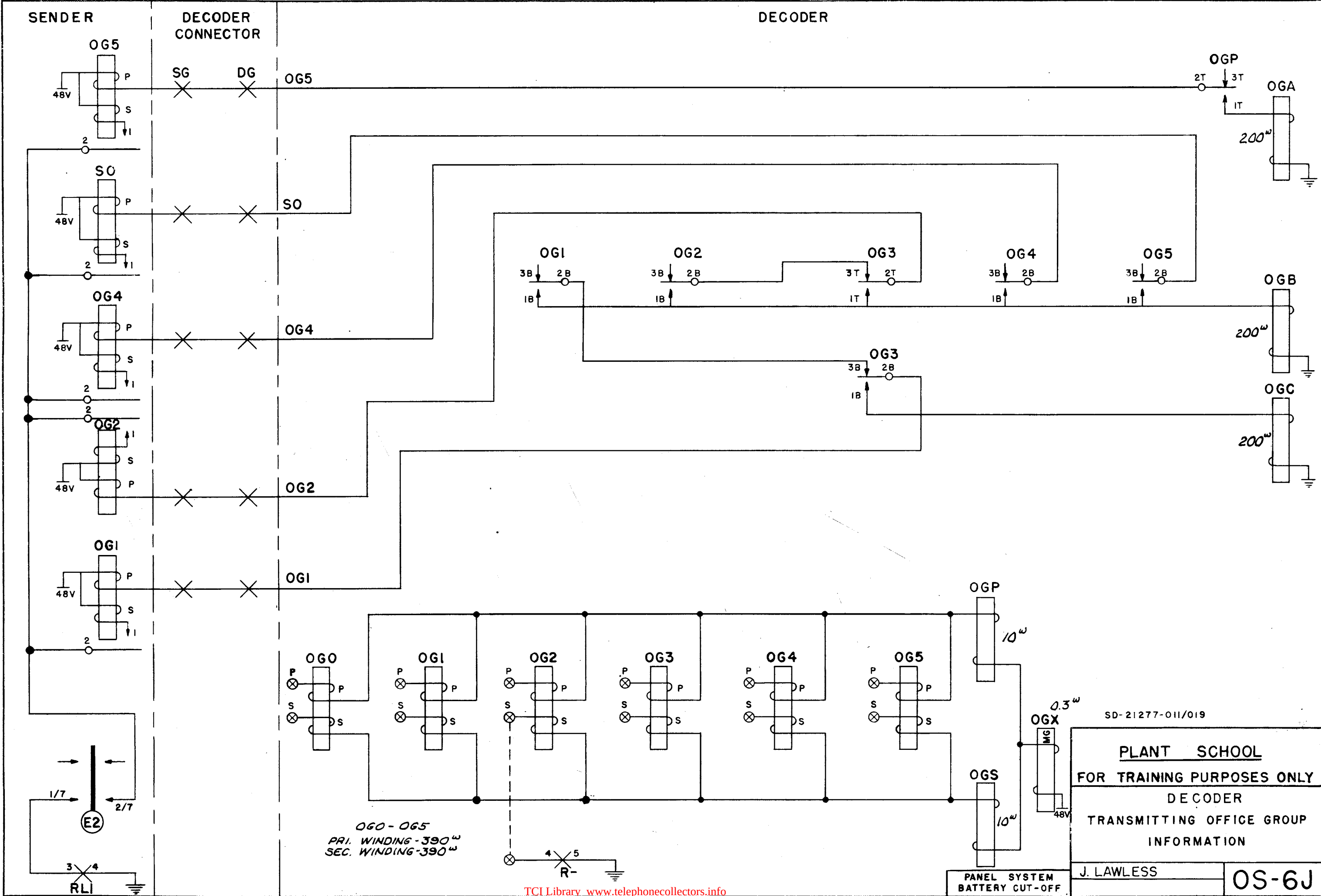


ISSUE
11-7-50





ISSUED
11-3-50



SD-21277-011/019

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY
DECODER
TRANSMITTING OFFICE GROUP
INFORMATION

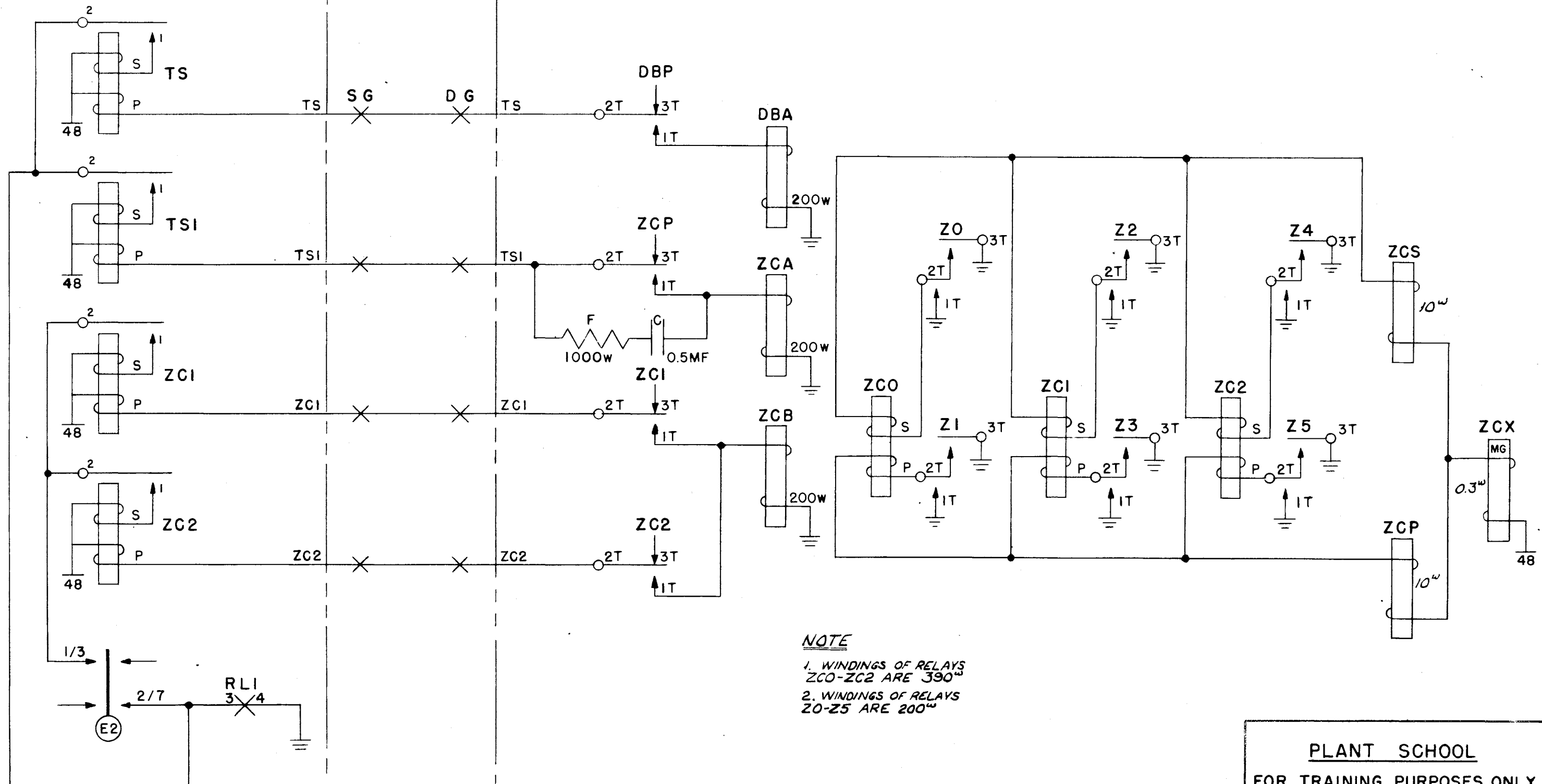
J. LAWLESS
OS-6J

ISSUED
11-3-50

SUB'S SENDER

DECODER CONNECTOR

DECODER

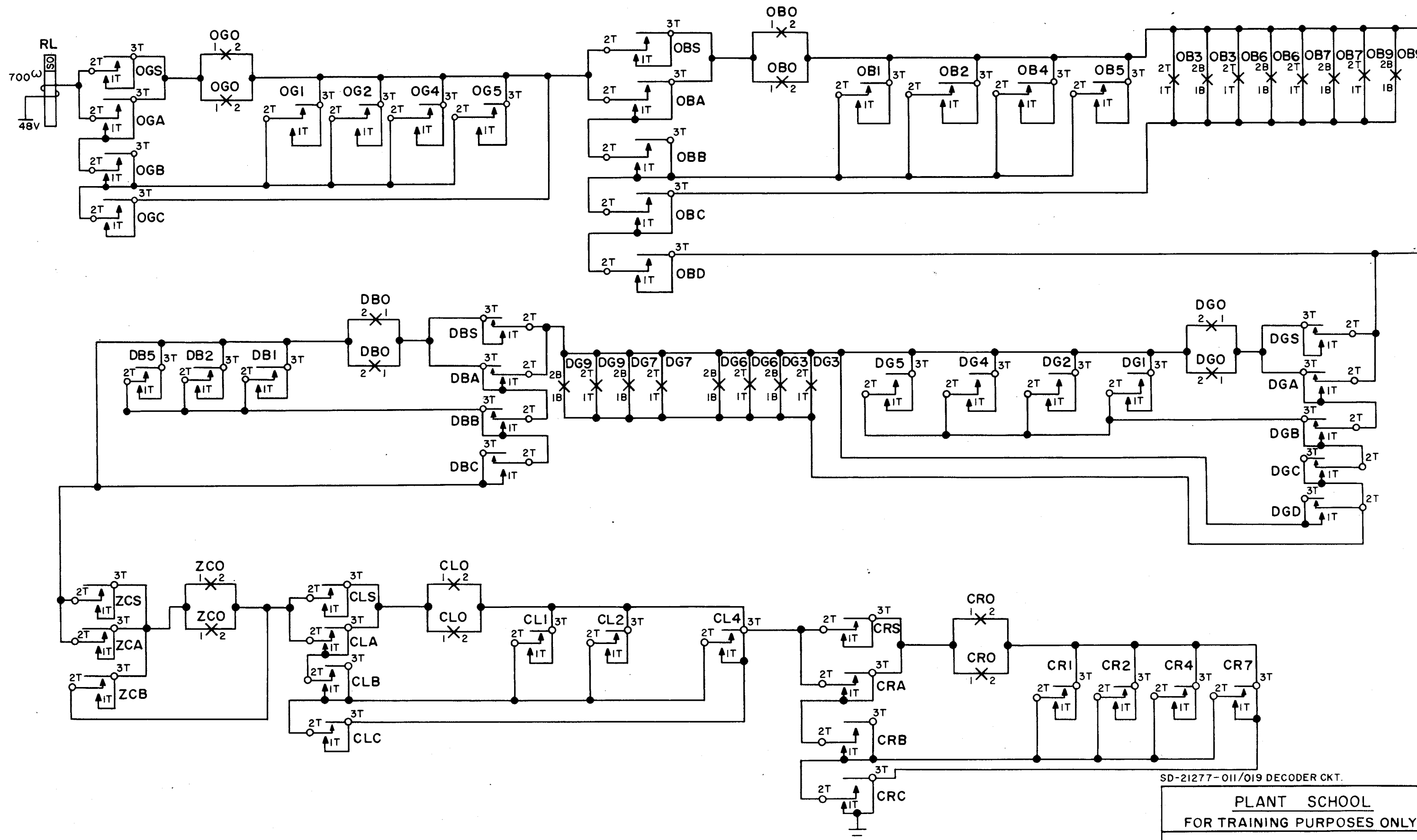


PLANT SCHOOL
FOR TRAINING PURPOSES ONLY
DECODER
TRANSMITTING ZONE CHARGE
AND
TALK SELECTION INFORMATION

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS

OS-6K



SD-21277-011/019 DECODER CKT.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

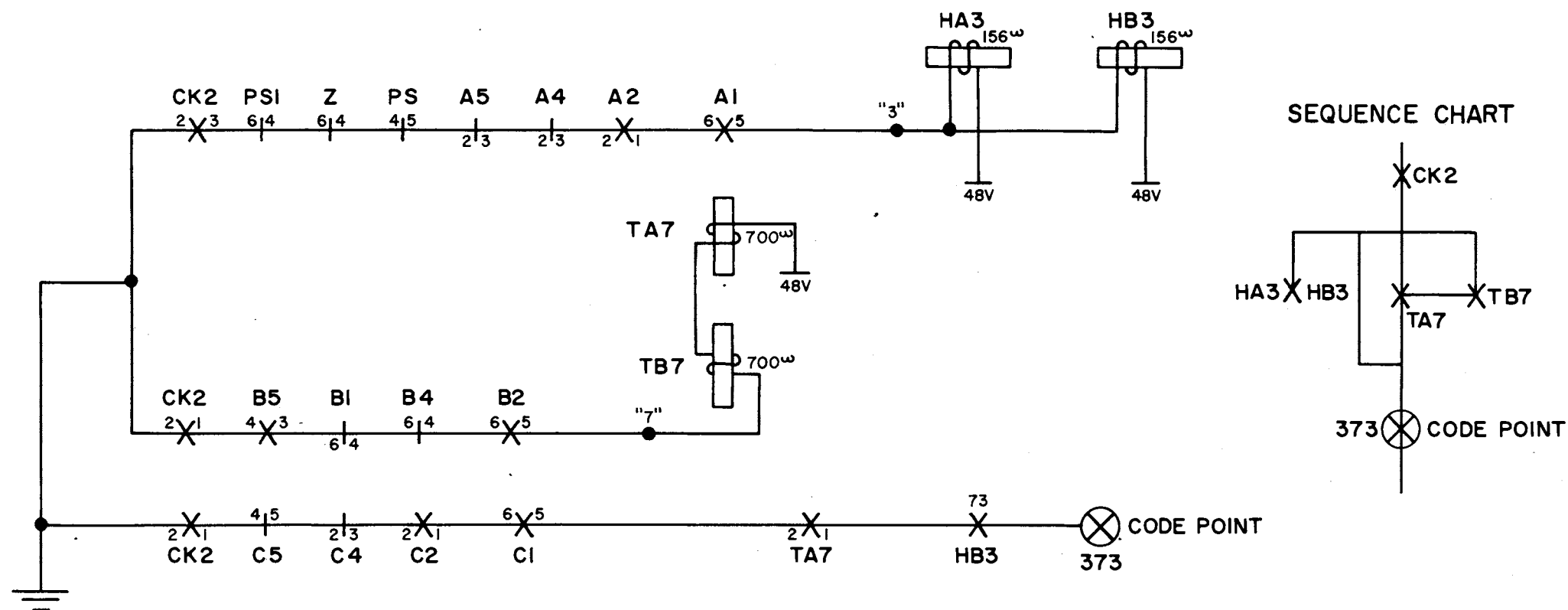
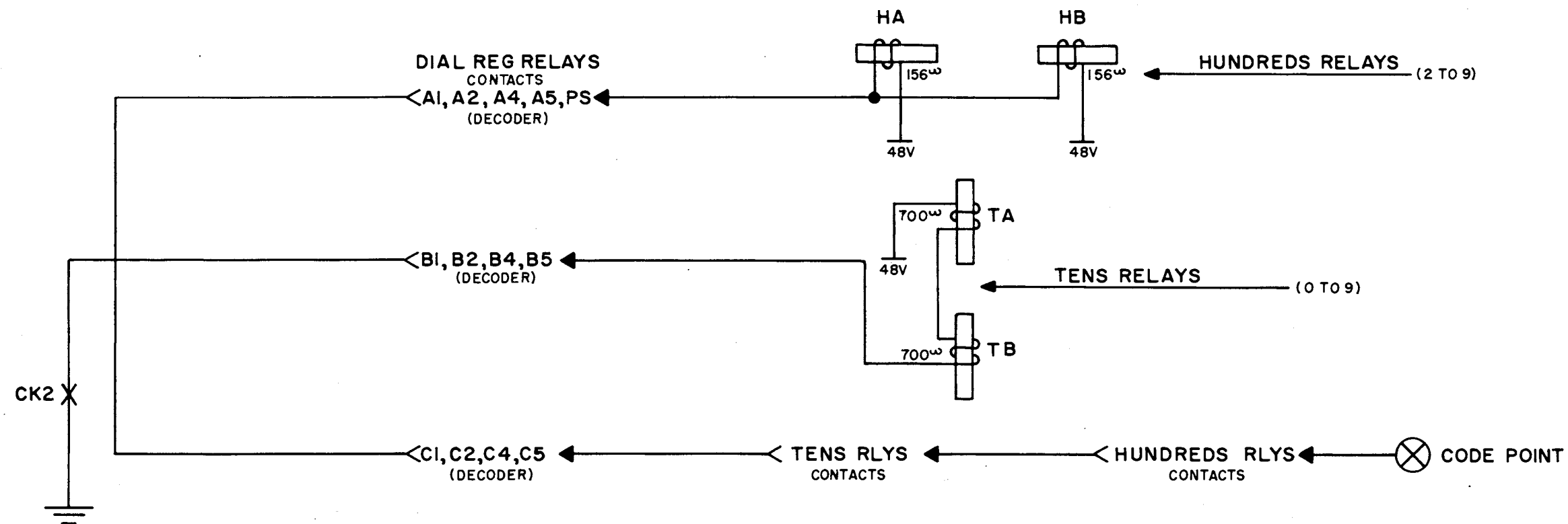
DECODER
CHECK OF TRANSMITTING
LEADS AND RELEASE

PANEL SYSTEM
BATTERY CUT - OFF

J.B. MAY
DRAWN - D.S.CO. INC.

OS-6L

ISSUE 1
JAN 1950



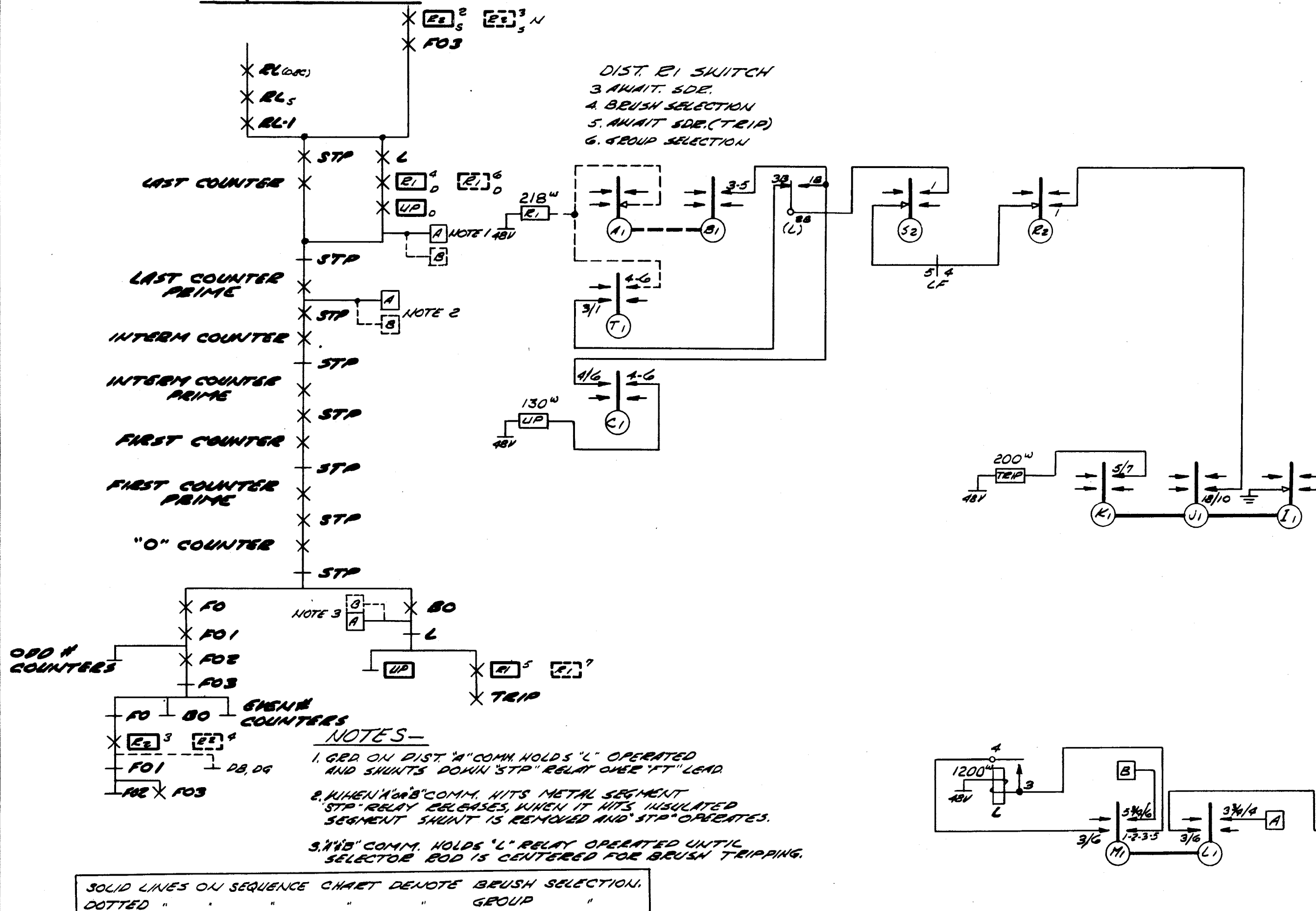
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

DECODER
HA-HB, TA-TB RELAY
OPERATION
FOR GROUNDING CODE PT.

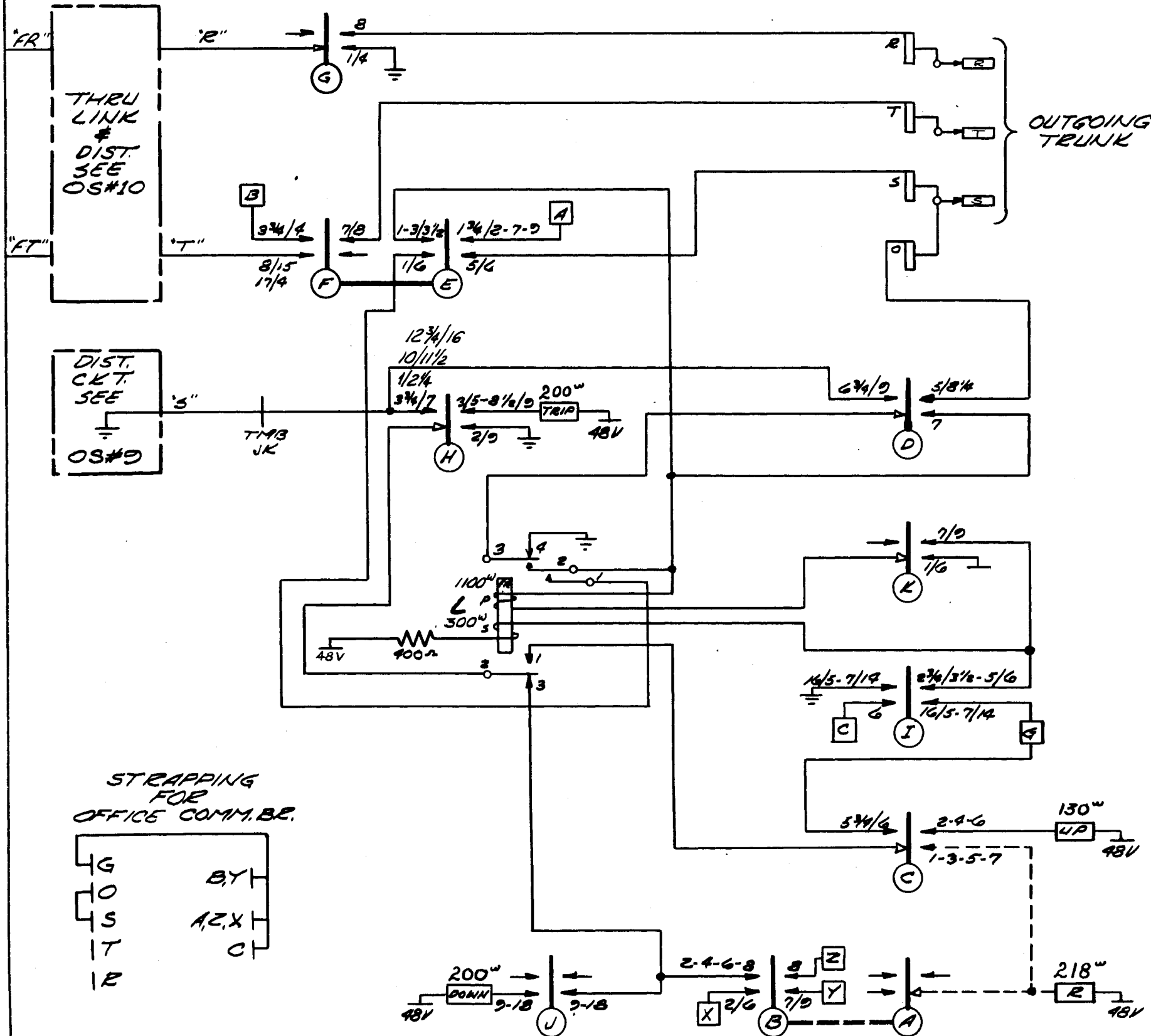
J.B. MAY
DRAWN-D.S.CO.INC.

OS-6M

SEQUENCE CHART



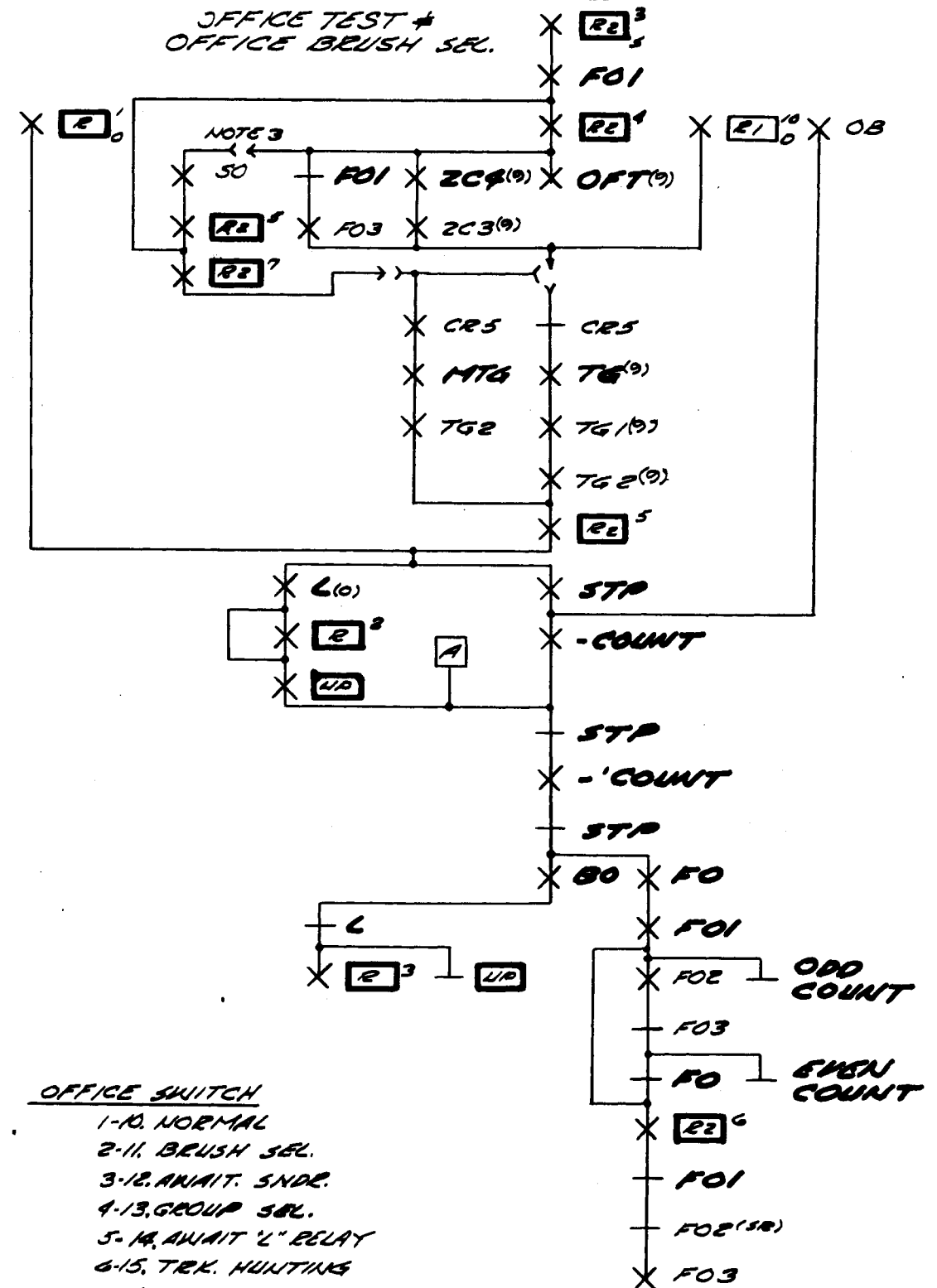
OFFICE (3 WIRE)



NOTES-

1. ON PCI AFTER STATION DELAY "R1" SWITCH ADVANCES TO POS. #12 & RELEASES "FOI."
2. ON F.M. AFTER THOUSANDS DIGIT IS RECORDED "TNT" OPERATES & RELEASES "FOI."
3. ON SKIP OFFICE CALL "SC" HOLDS "FOI" LOCKED UP & MOVES "R2" SWITCH TO #7 FOR TRUNK TEST.

SEQUENCE CHART



OFFICE SWITCH

- 1-10. NORMAL
2-11. BRUSH SEL.
3-12. AWAIT. SNDR.
4-13. GROUP SEL.
5-14. AWAIT "L" RELAY
6-15. TRK. HUNTING
7-16. AWAIT. "L" RELAY
8-17. TALKING
9-18. OVERFLOW & RETURN

SENDER "R2" SWITCH

3. DIST. GROUP
4. OFFICE TEST
5. OFFICE BRUSH
6. OFFICE GROUP
7 TRUNK TEST

SD 21193-011-012-013 SUBS. SDP. CKT.
 SS 240252 3M126 OFF. SEL. CKT.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

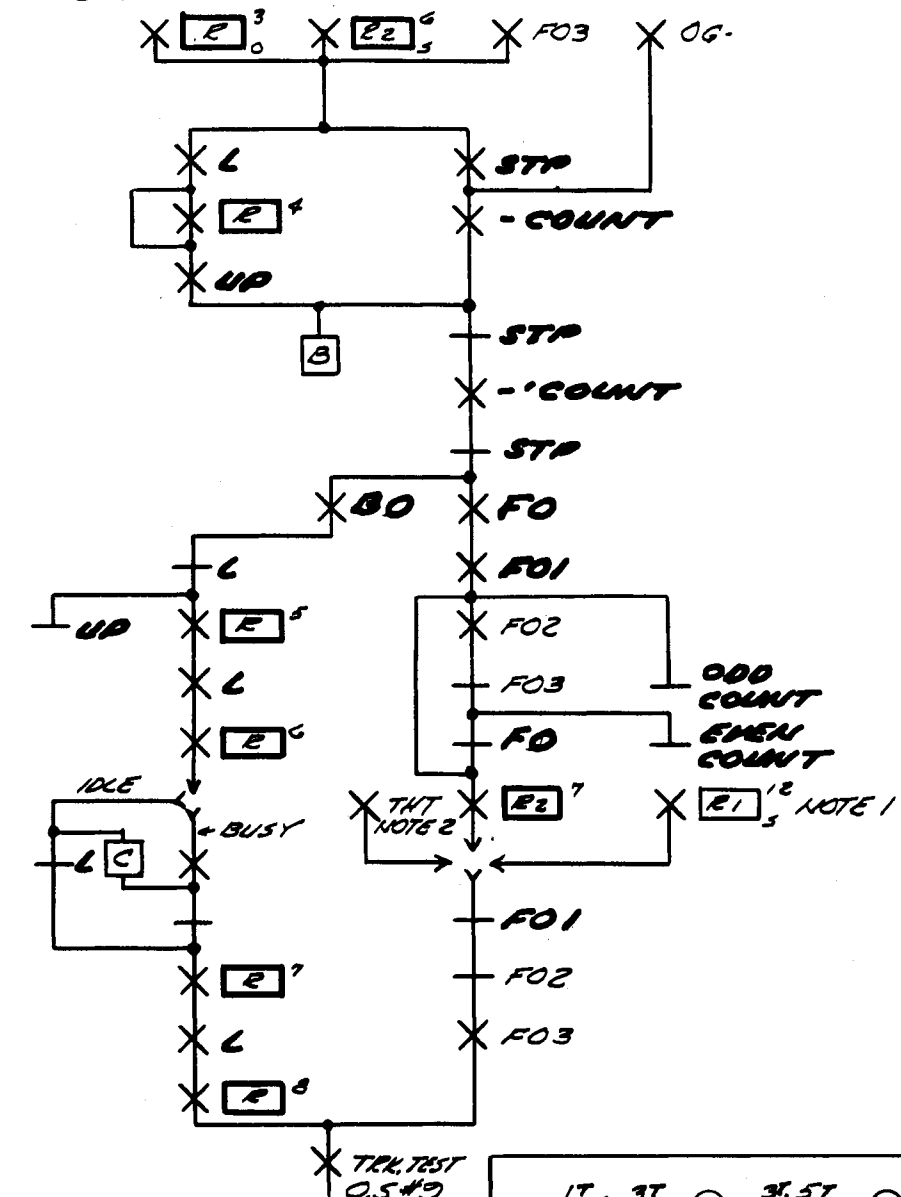
OFFICE SELECTIONS
*
OFFICE TEST

J. LAWLESS
DRAWN-R WFOBFO

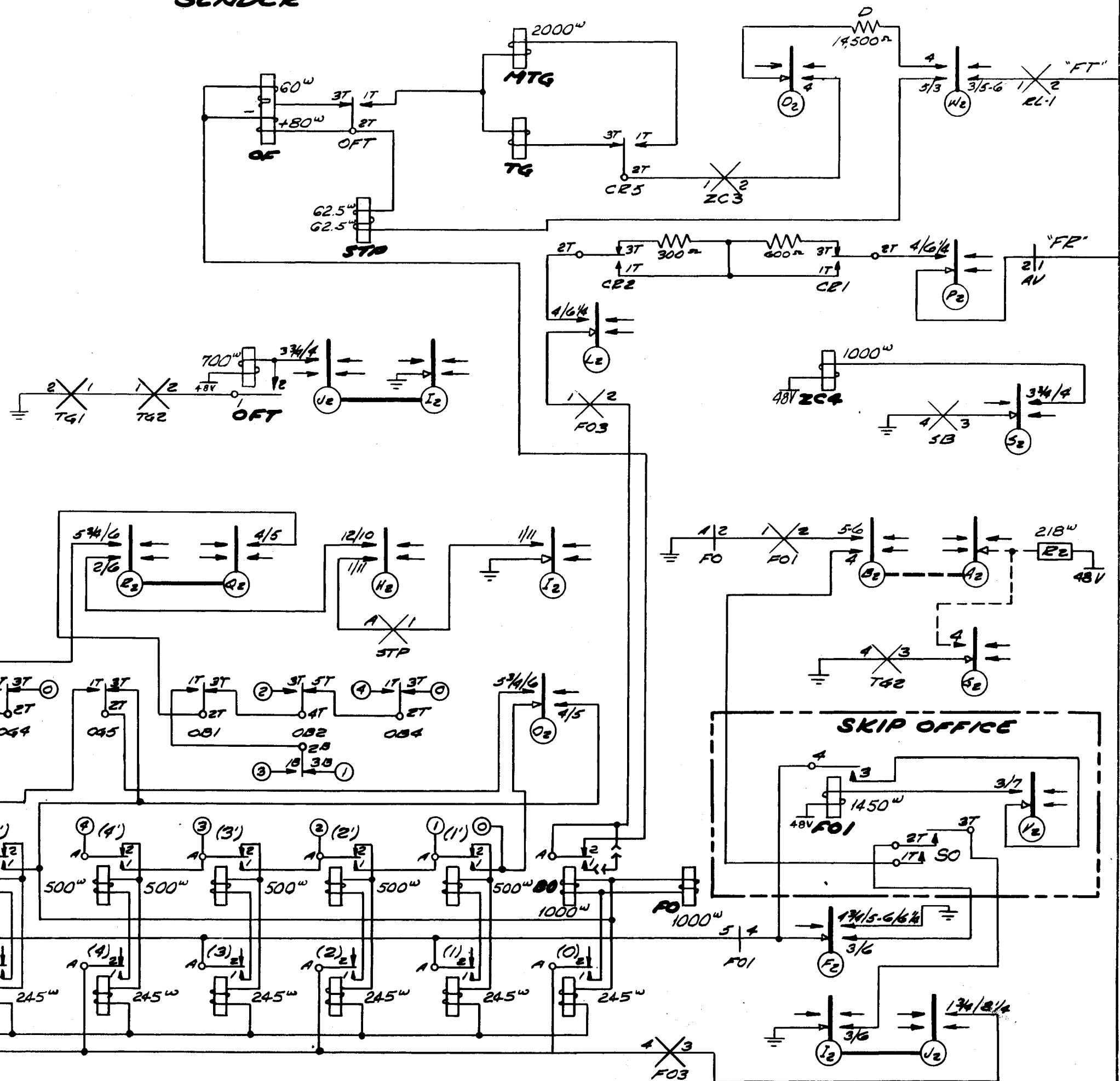
OS-8

SEQUENCE CHART

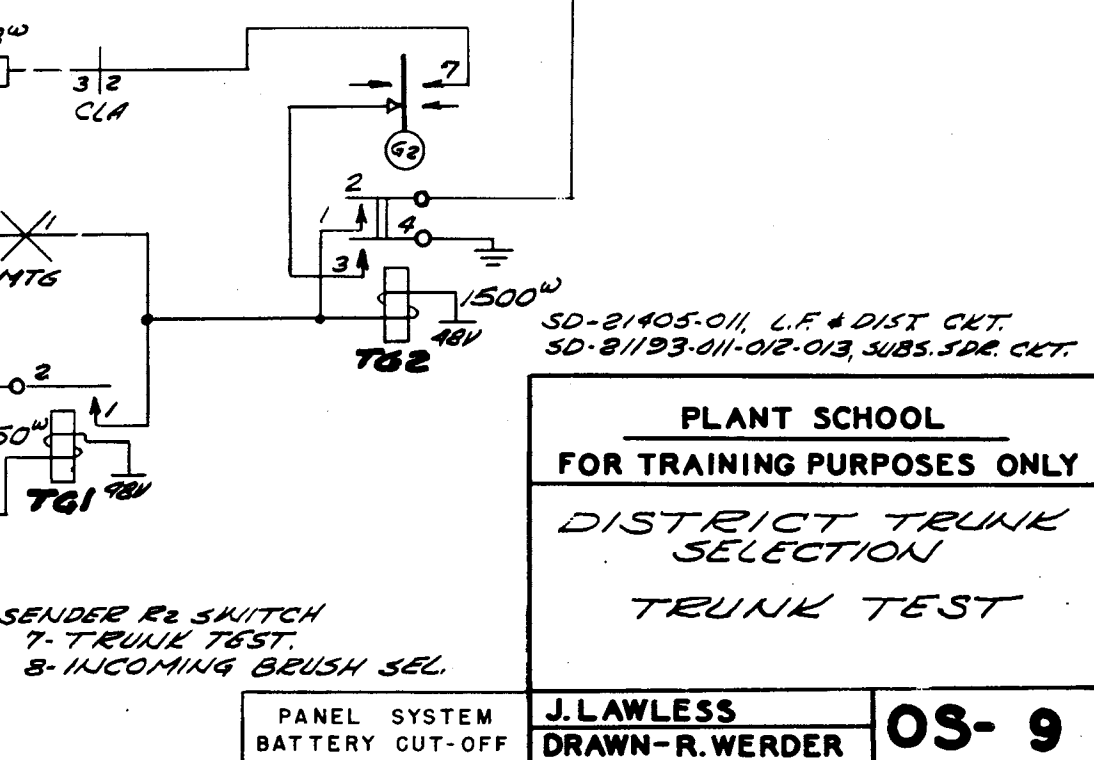
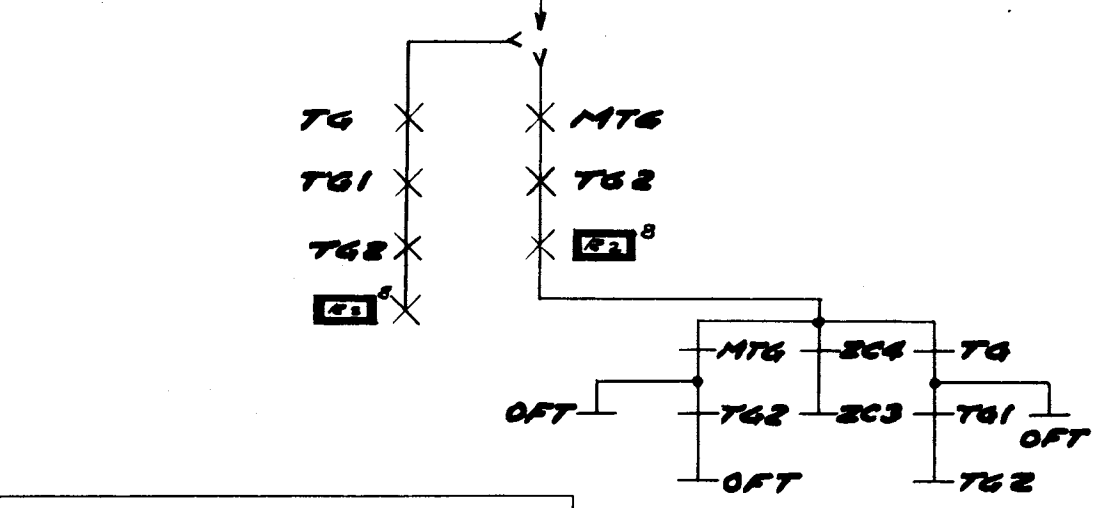
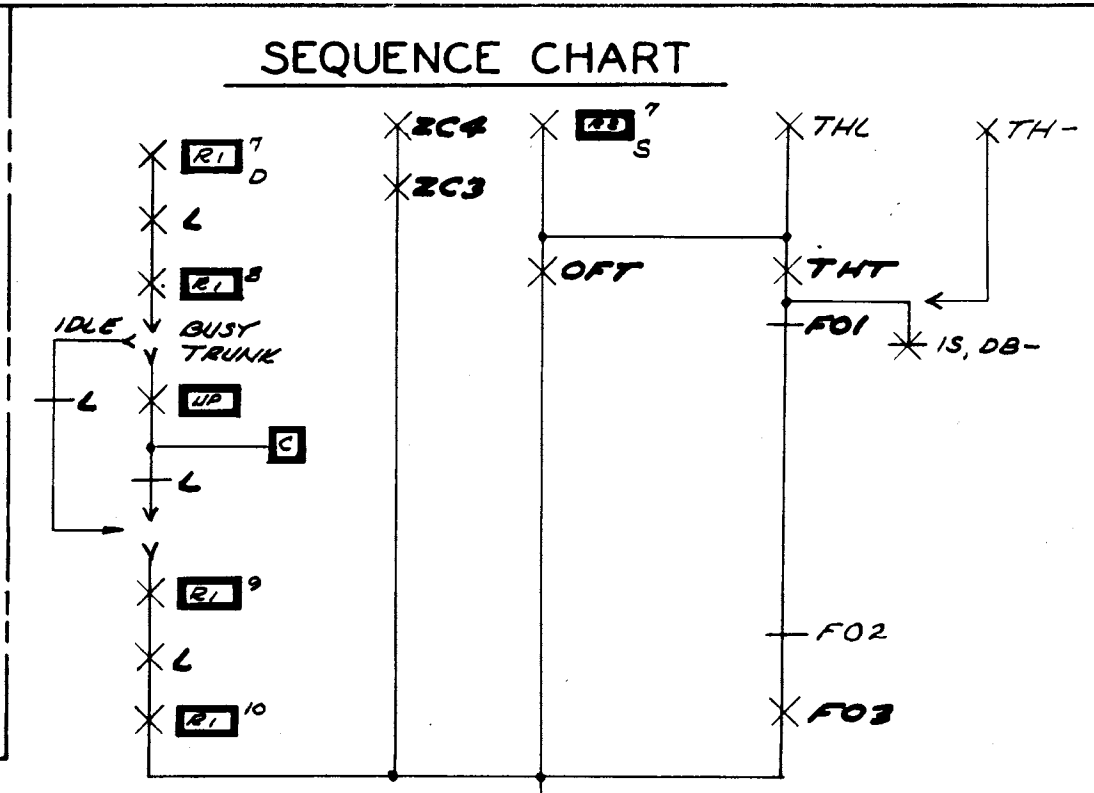
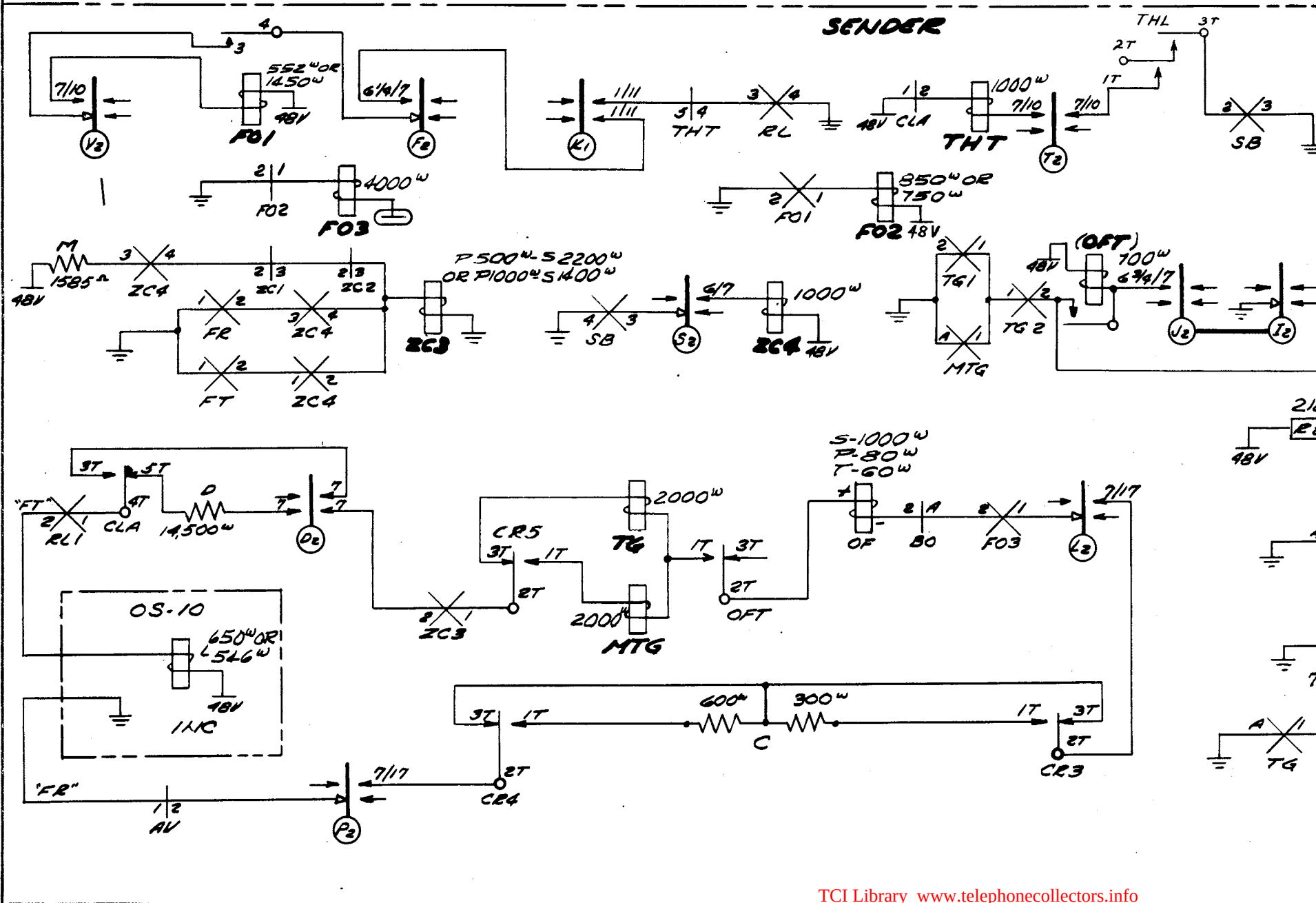
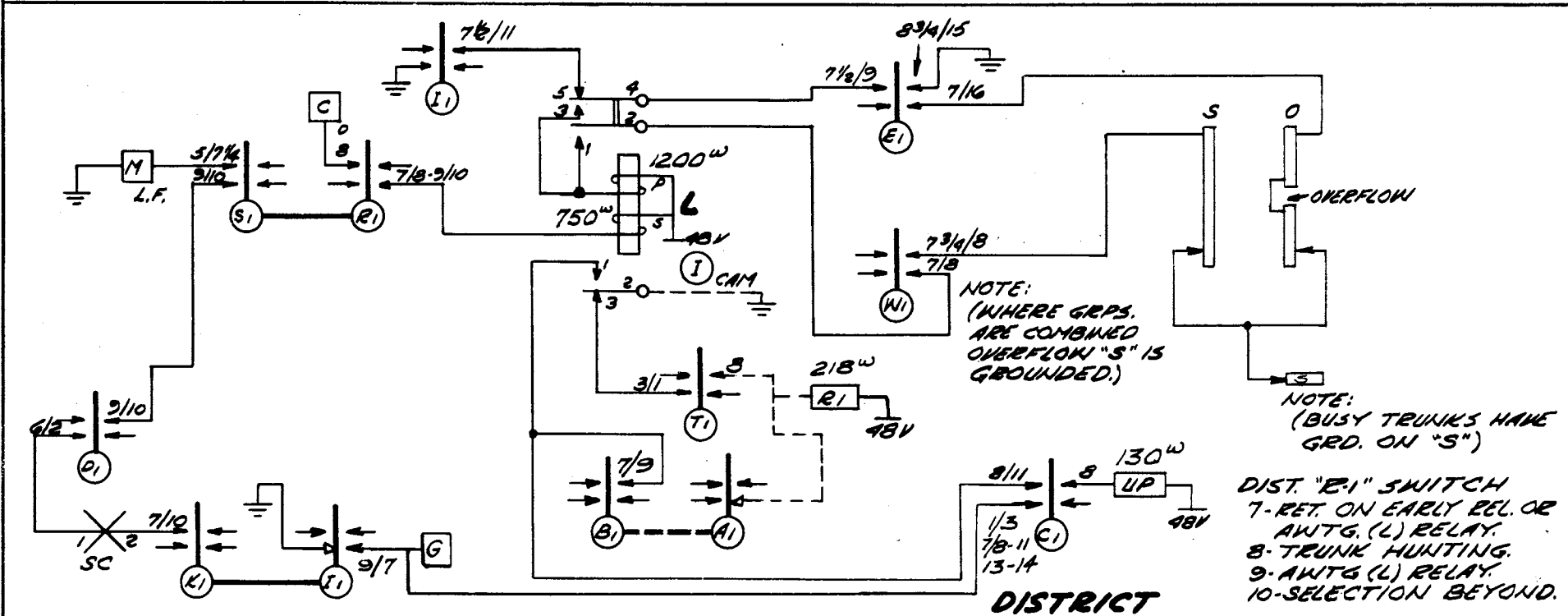
OFFICE GROUP & TRUNK SEL.



SENDER

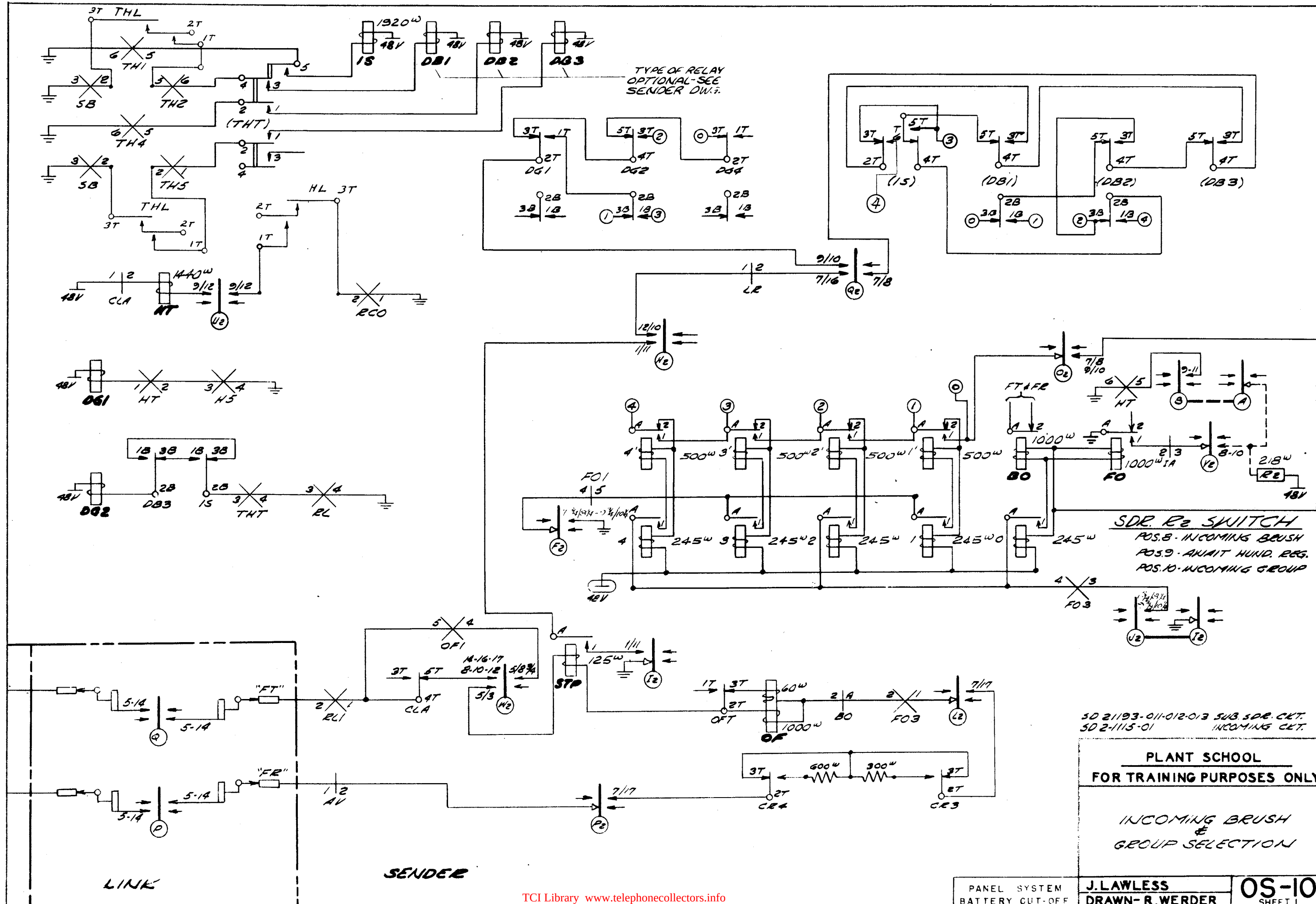


OS#8 SHT.#2

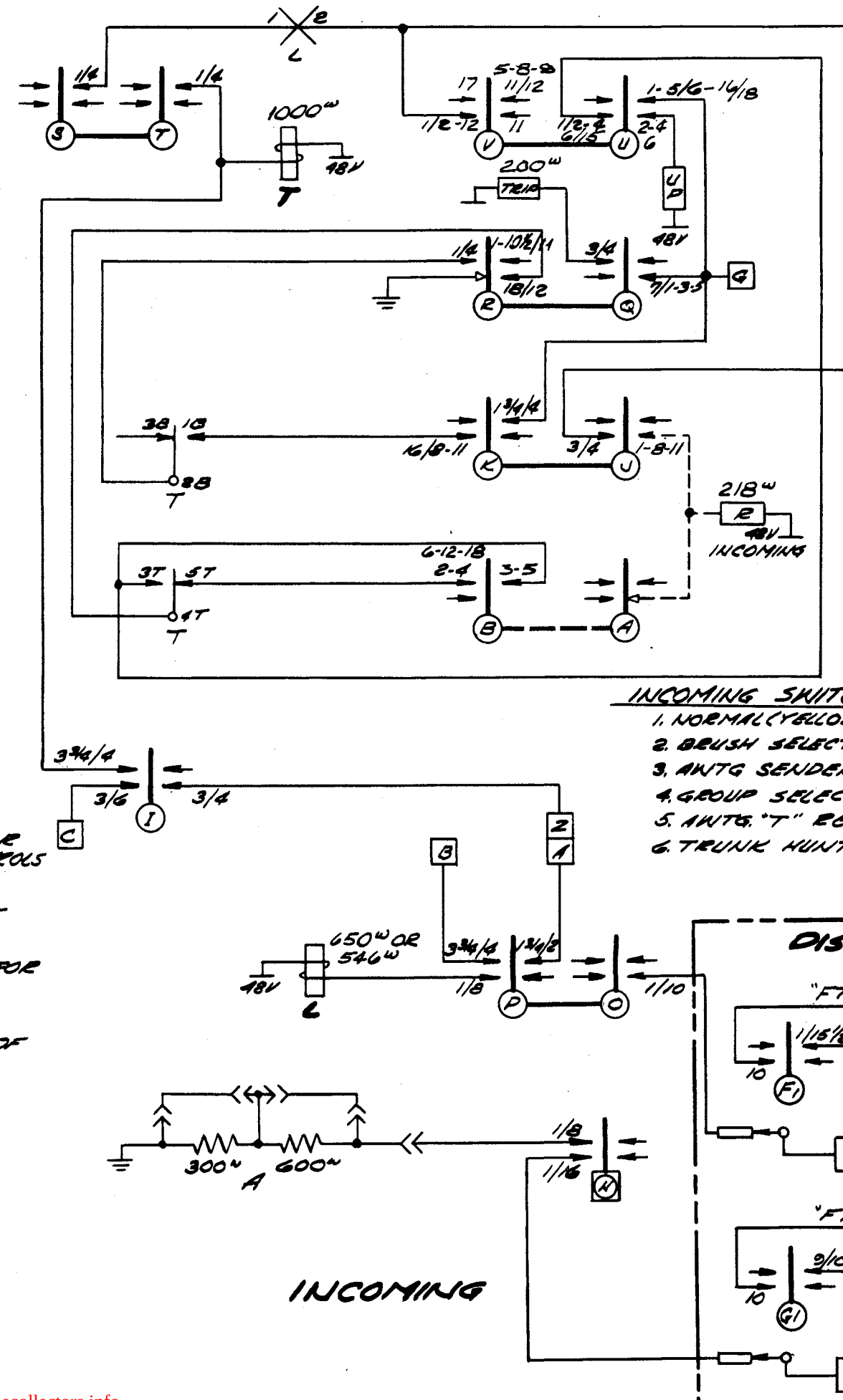
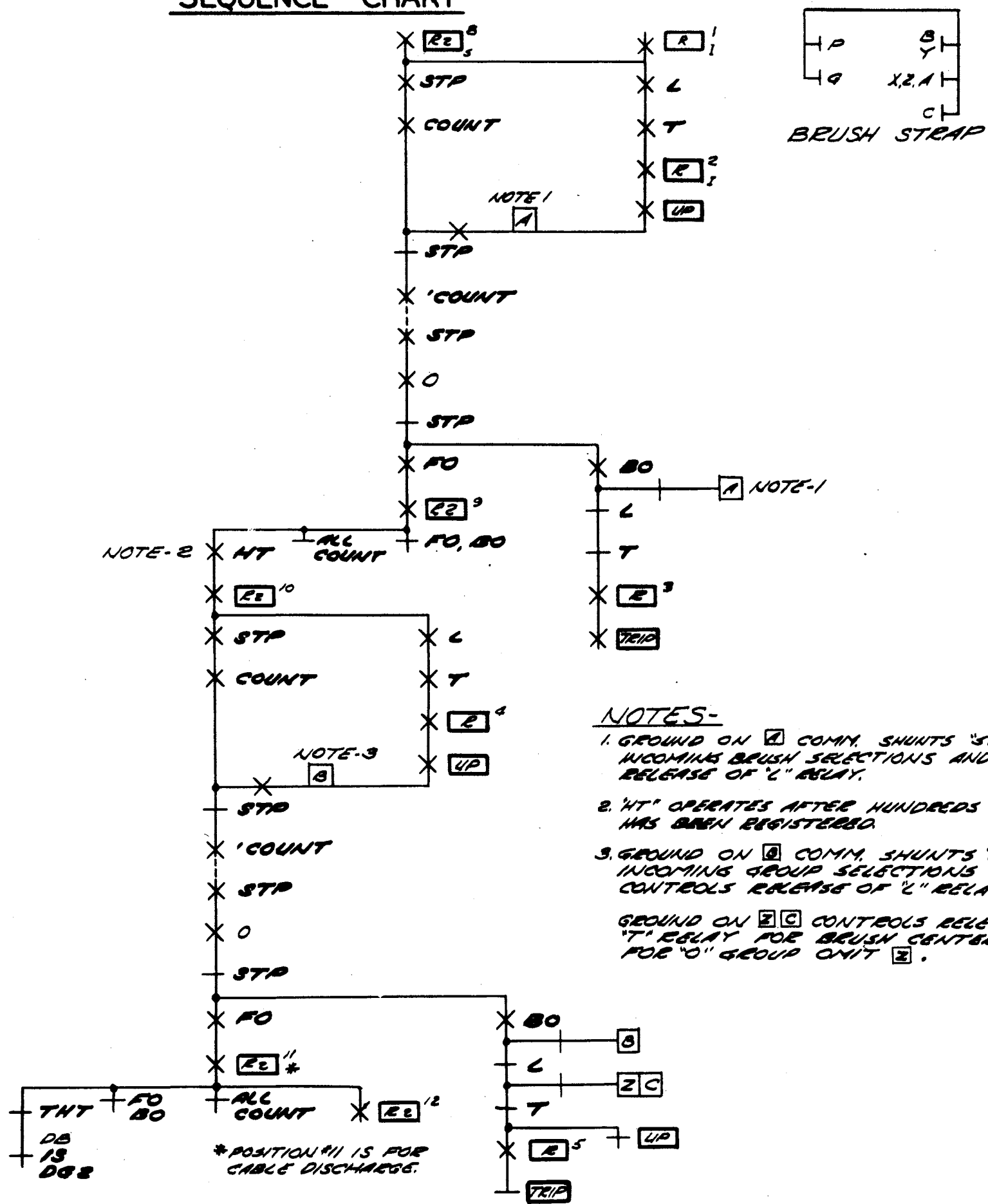


SD-21405-011, L.F. & DIST. CKT.
 SD-21193-011-012-013, SUBS. SDR. CKT.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY
DISTRICT TRUNK
SELECTION
TRUNK TEST

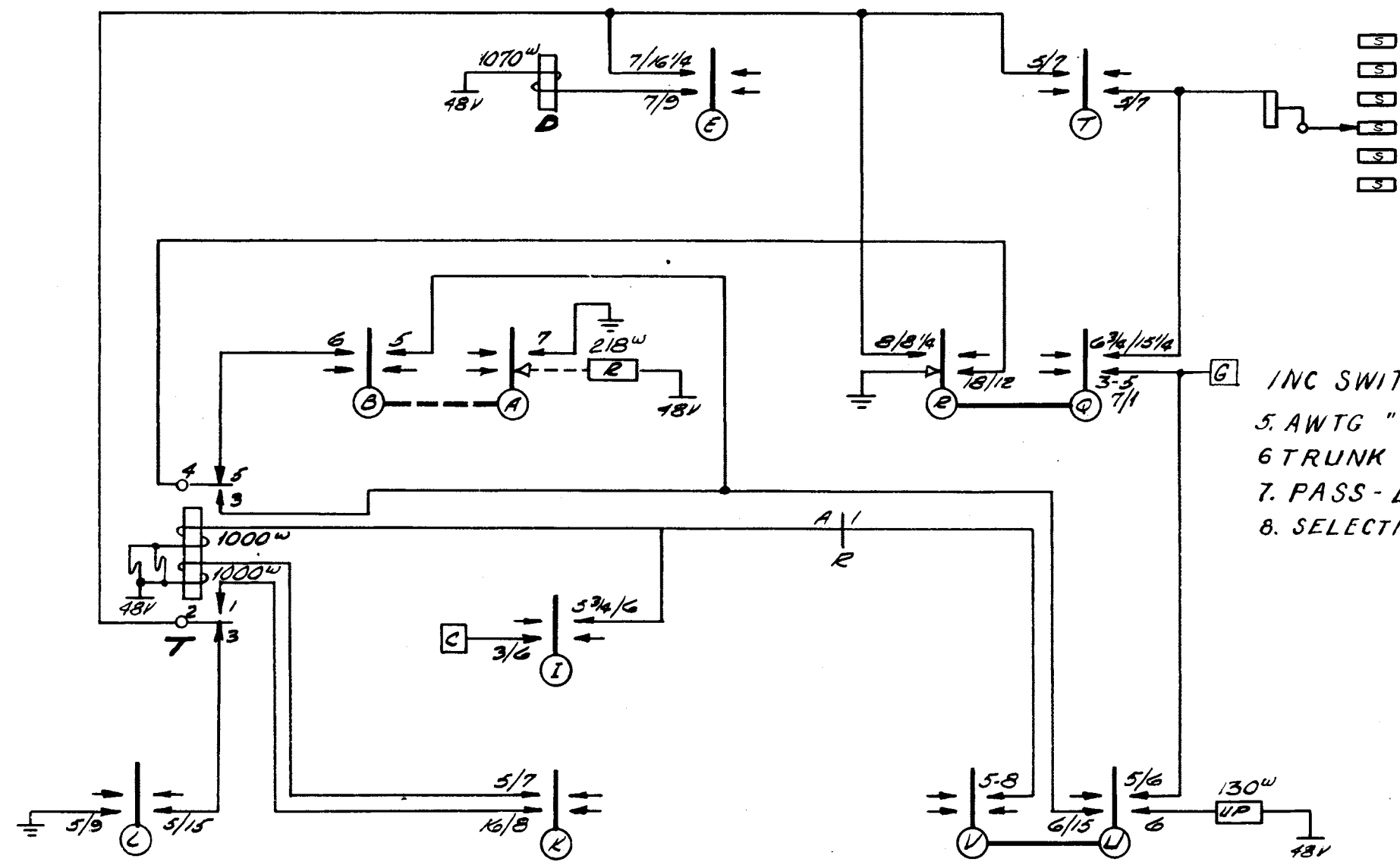


SEQUENCE CHART



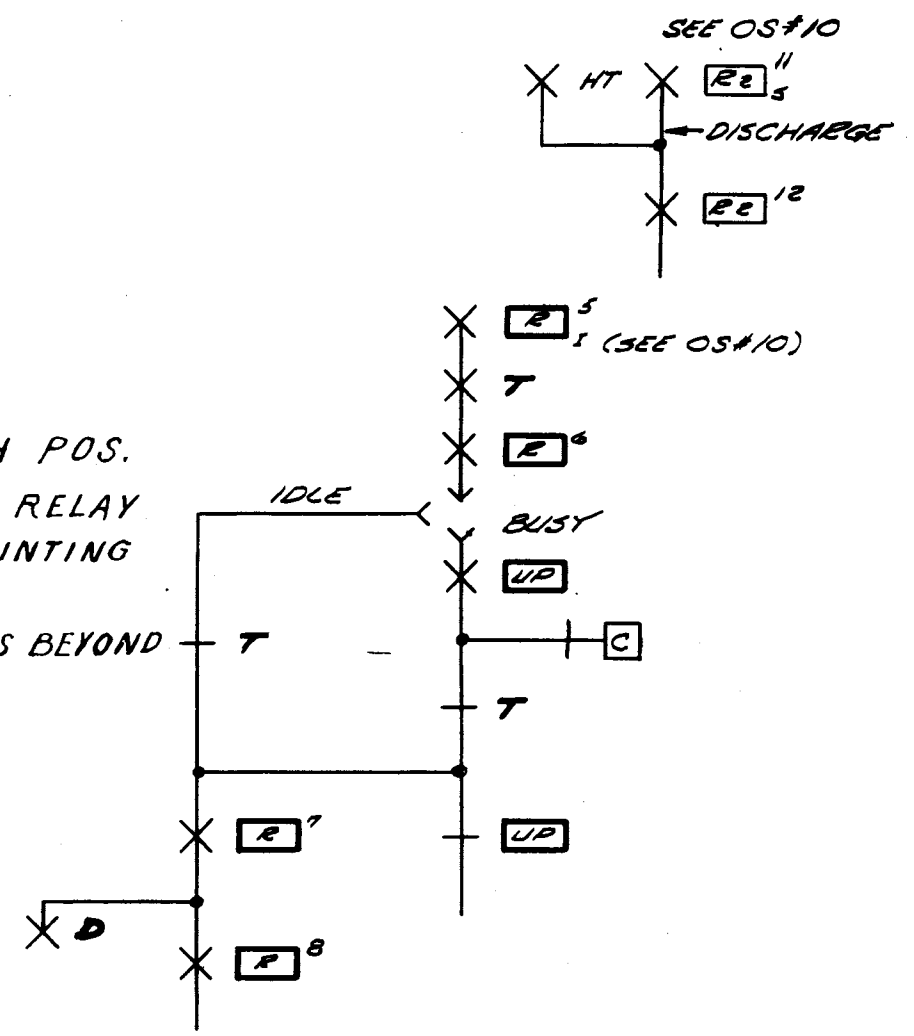
21.37.25 05.50

135057
3-7-18-78

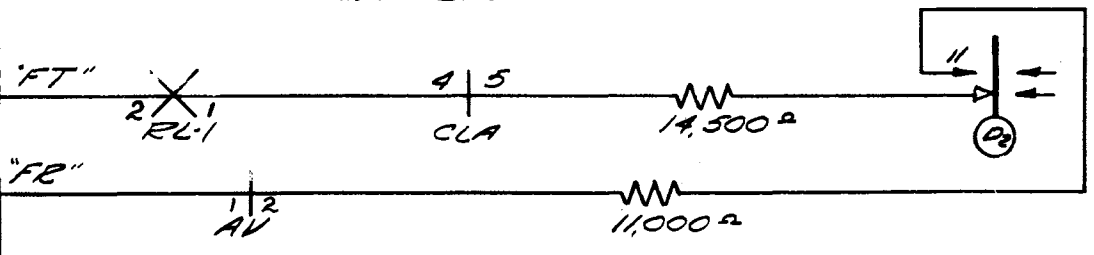


INC SWITCH POS.
5. AWTG "T" RELAY
6 TRUNK HUNTING
7. PASS-BY
8. SELECTIONS BEYOND

SEQUENCE CHART



THRU LINK & DIST.
TO INC.
SEE OS #10

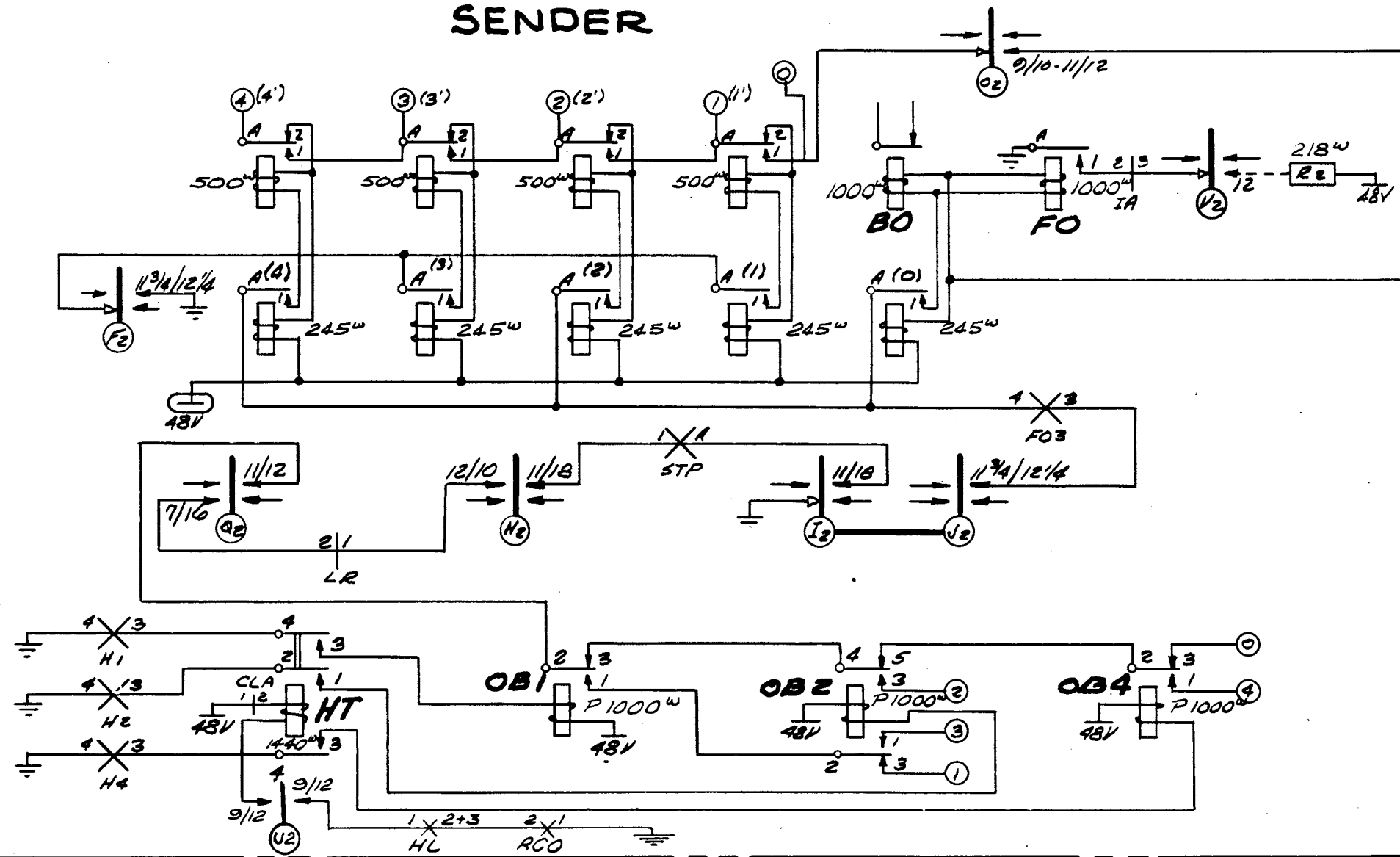


SD21115-01 INC. SEL. CKT.
SD21193-011-012-013 SUBS. SDR. CKT.

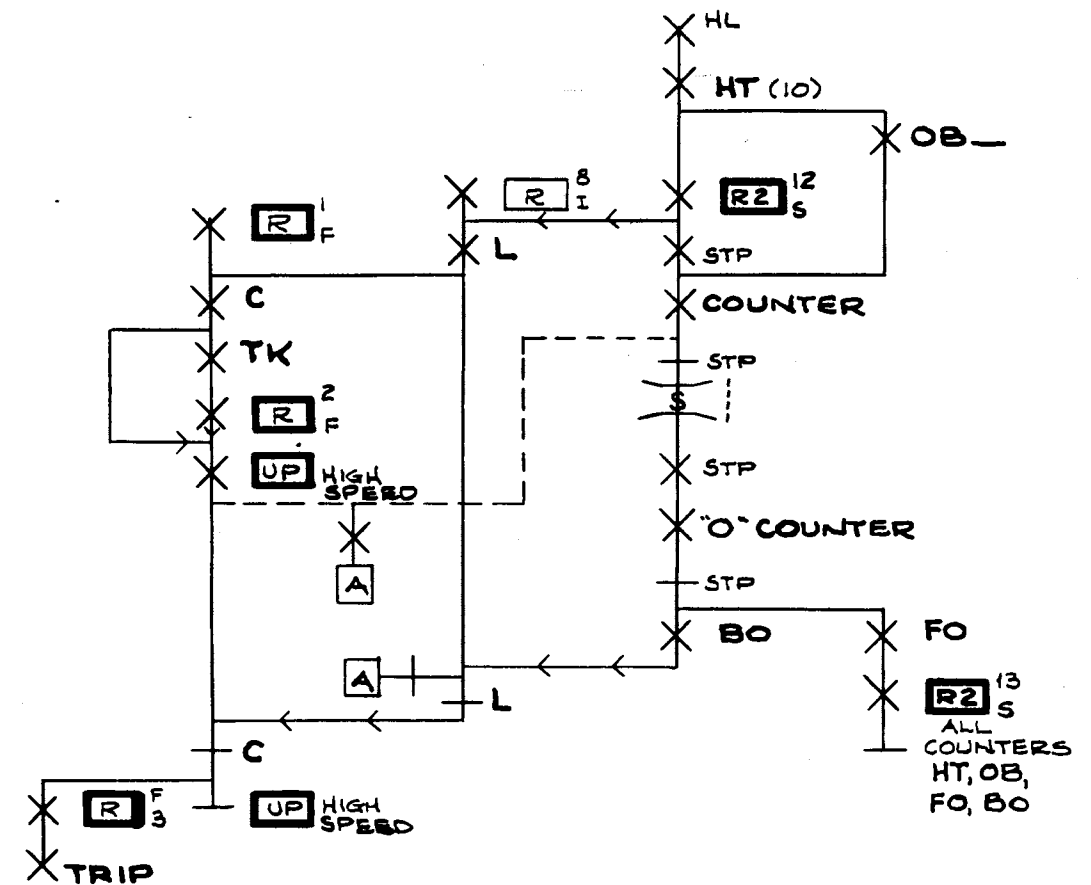
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

INCOMING
TRUNK HUNTING
CABLE DISCHARGE

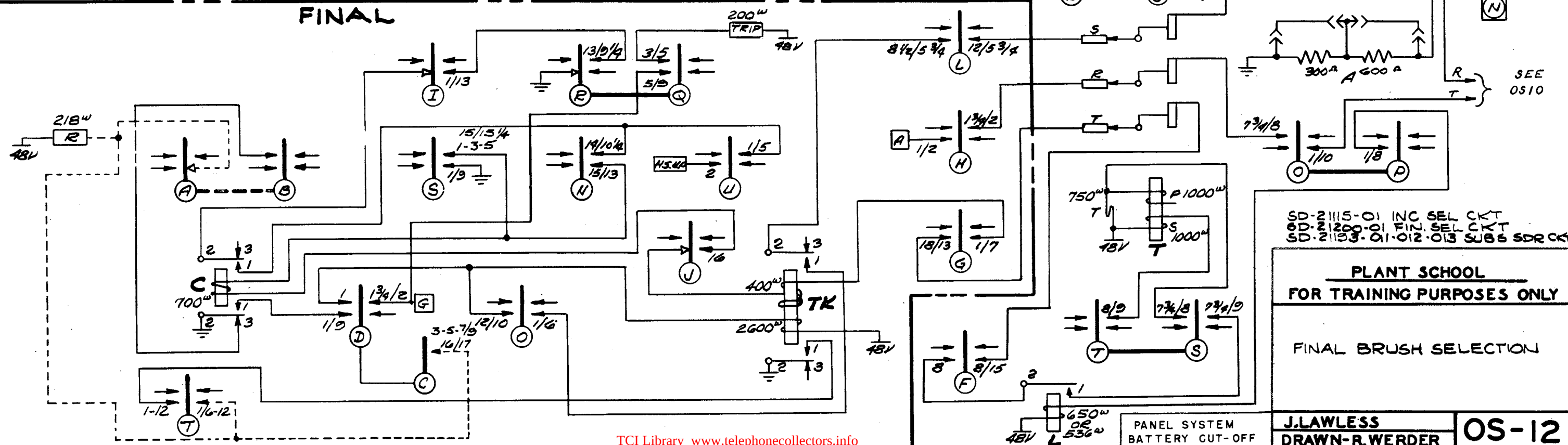
SENDER



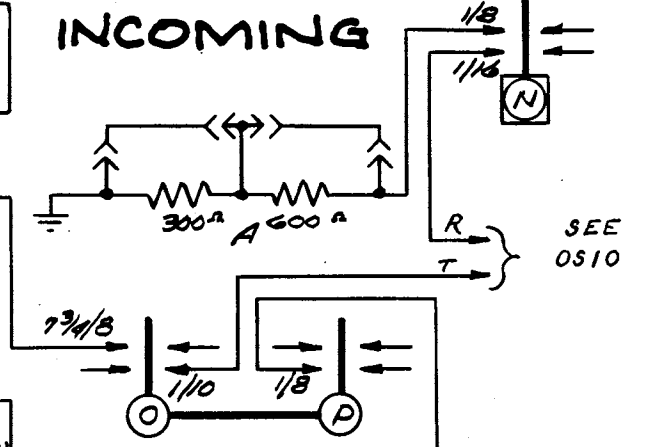
SEQUENCE CHART



FINAL



INCOMING



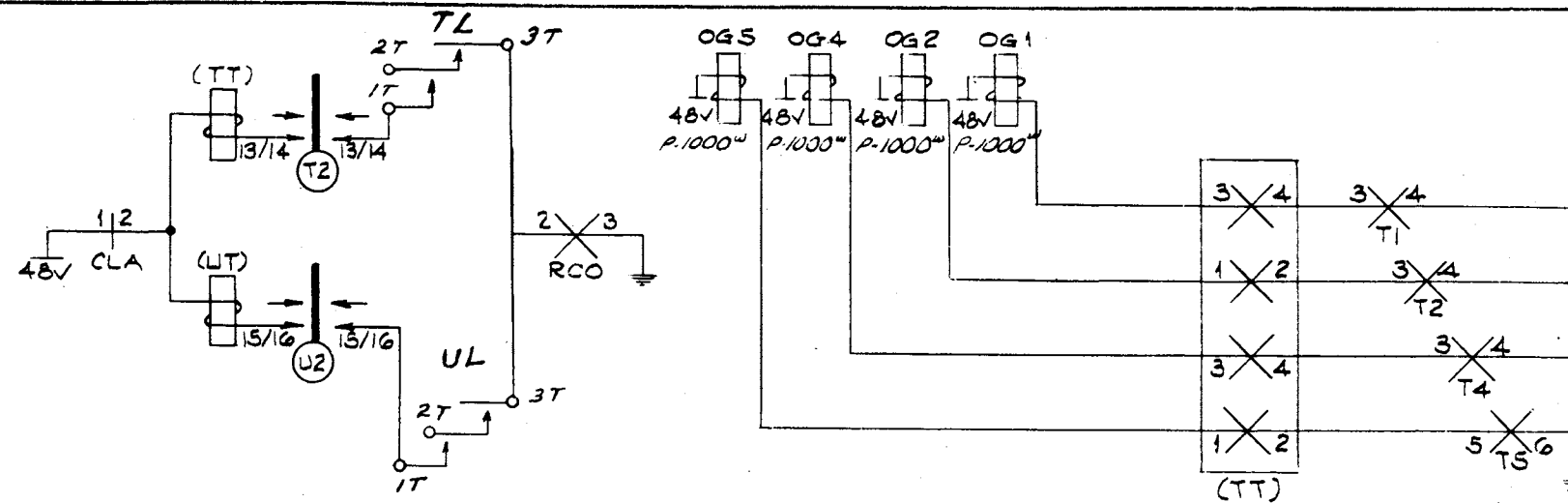
SD-21115-01 INC SEL CKT
SD-21200-01 FIN. SEL CKT
SD-21123-01-012-013 SUB S SDR CKT

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

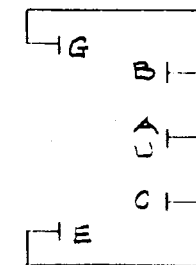
FINAL BRUSH SELECTION

J. LAWLESS
DRAWN-R. WERDER
OS-12

ISSUE 1
6-27-49

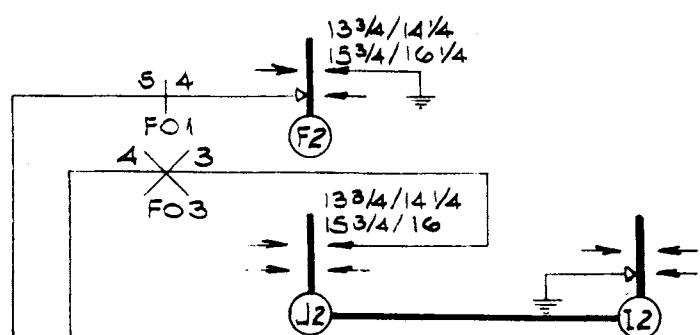
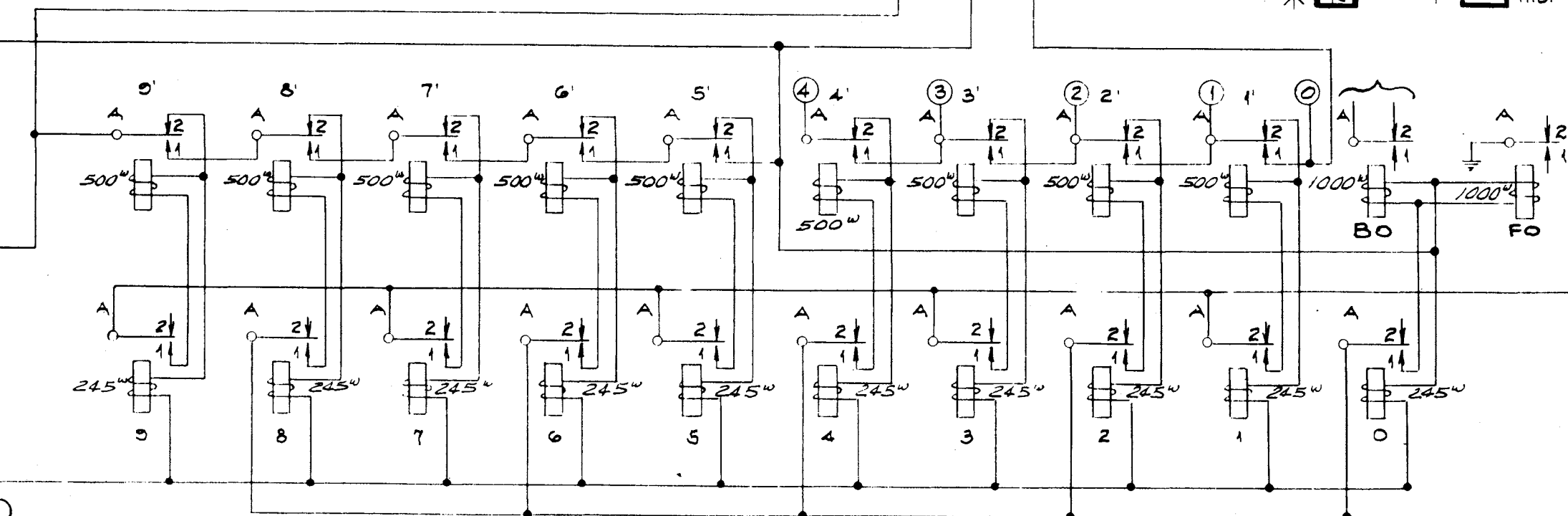
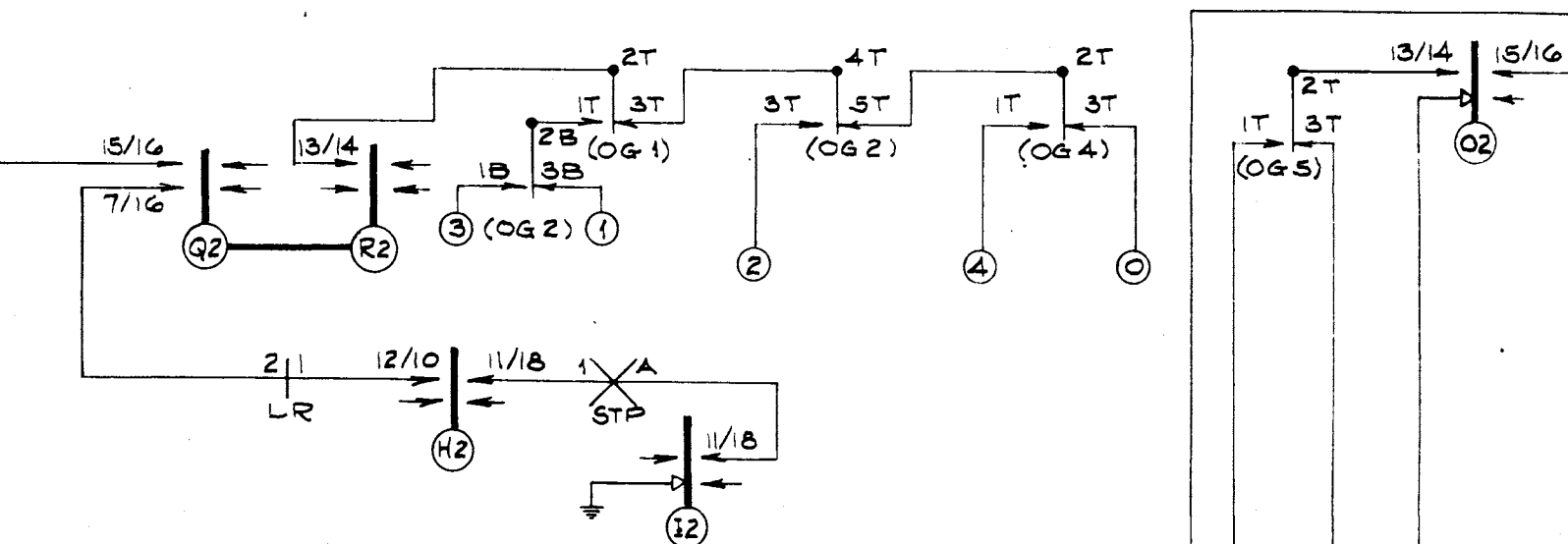
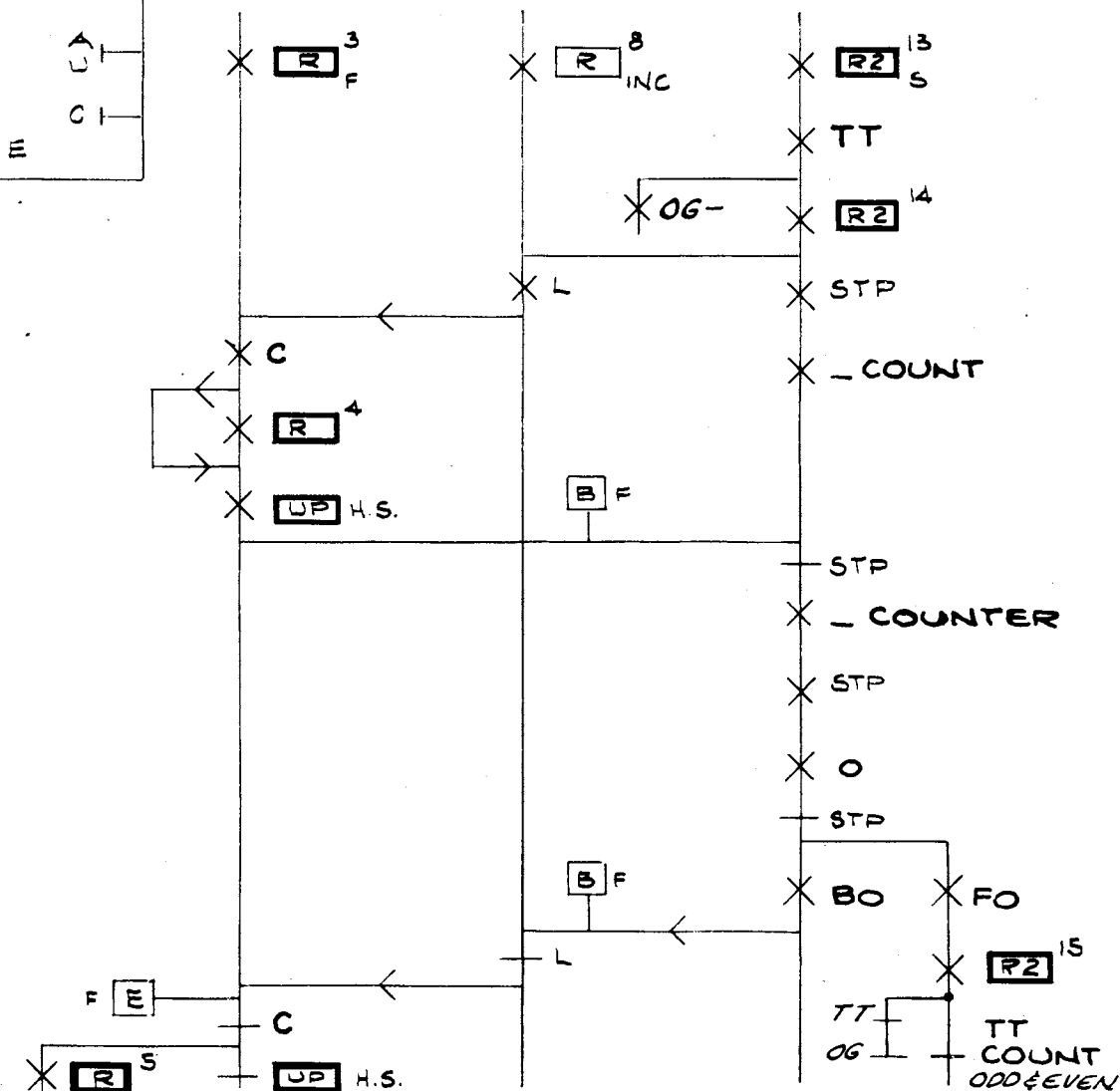


STRAPPING



SEQUENCE CHART

FINAL TENS



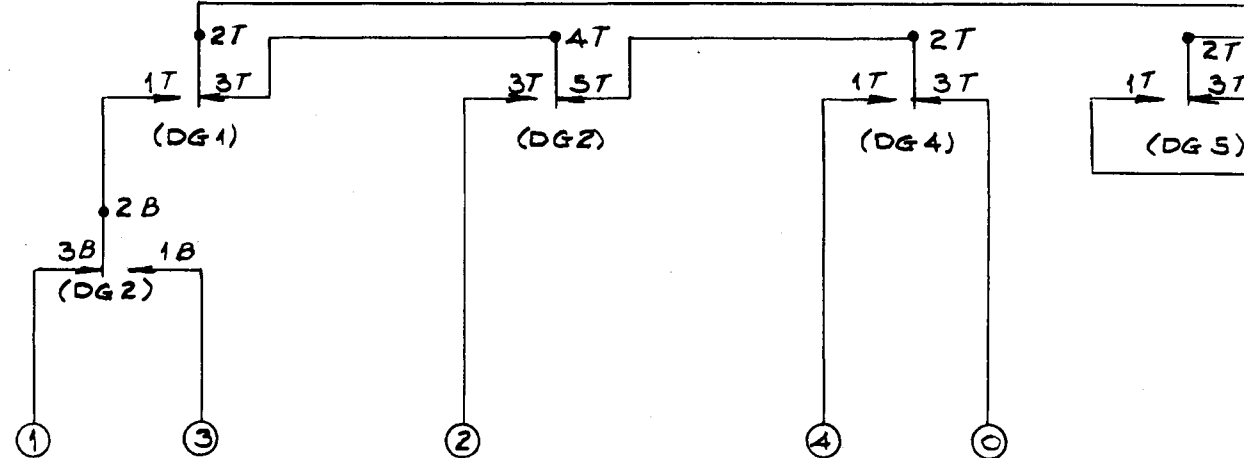
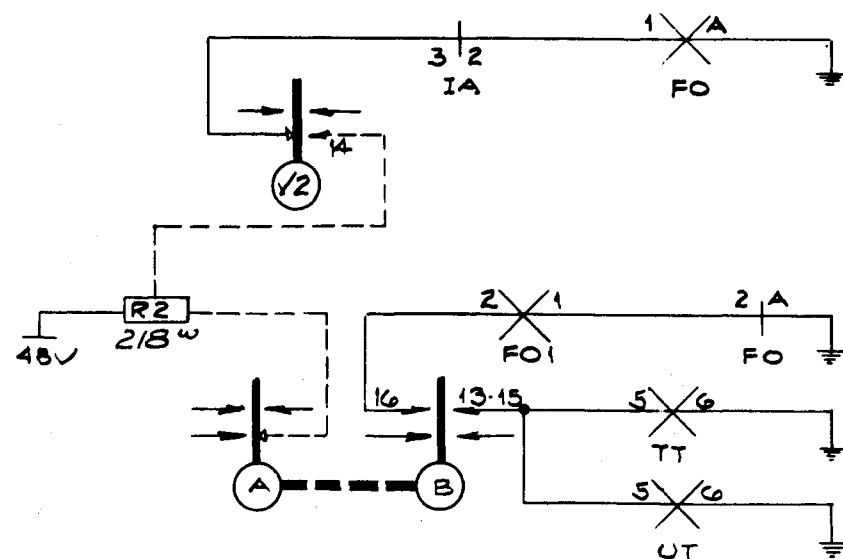
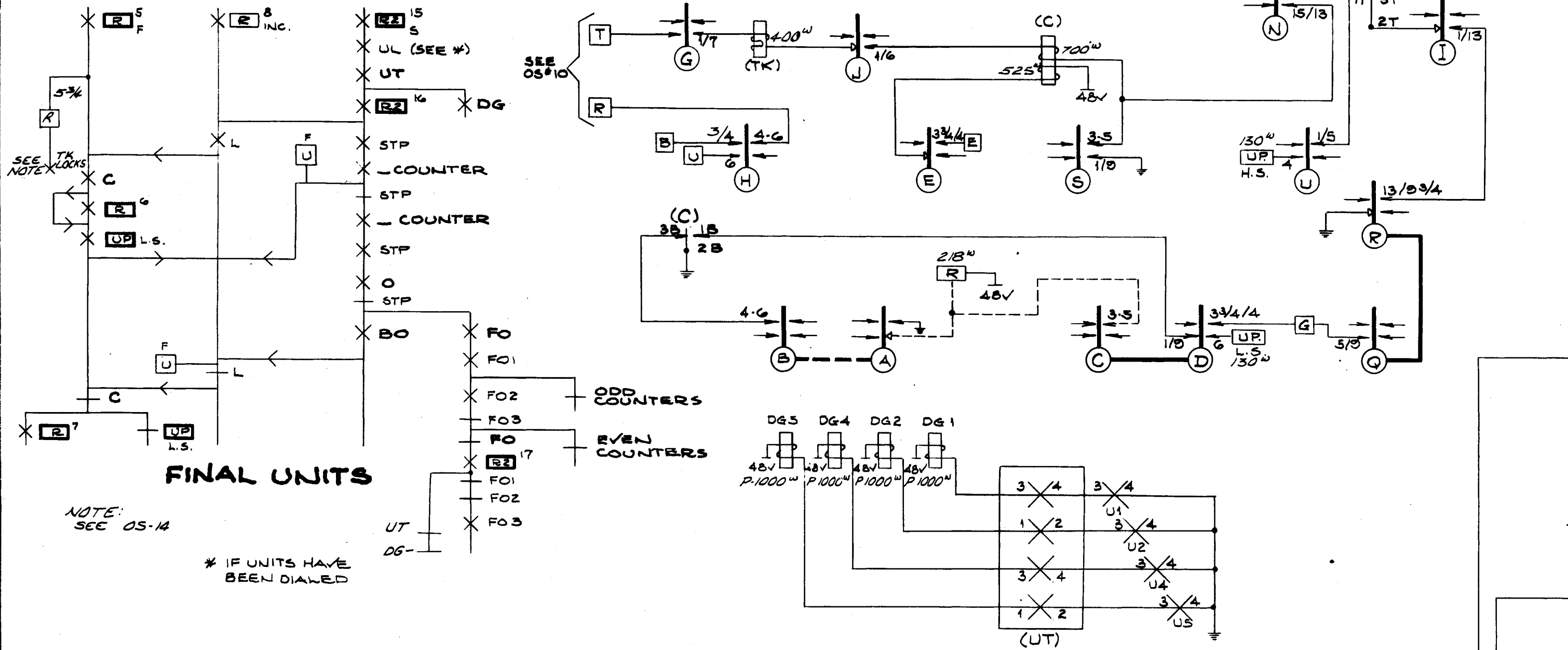
OFF NORMAL

SD 21193-01 SUBS. SDR.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

FINAL
TENS & UNITS
SELECTION

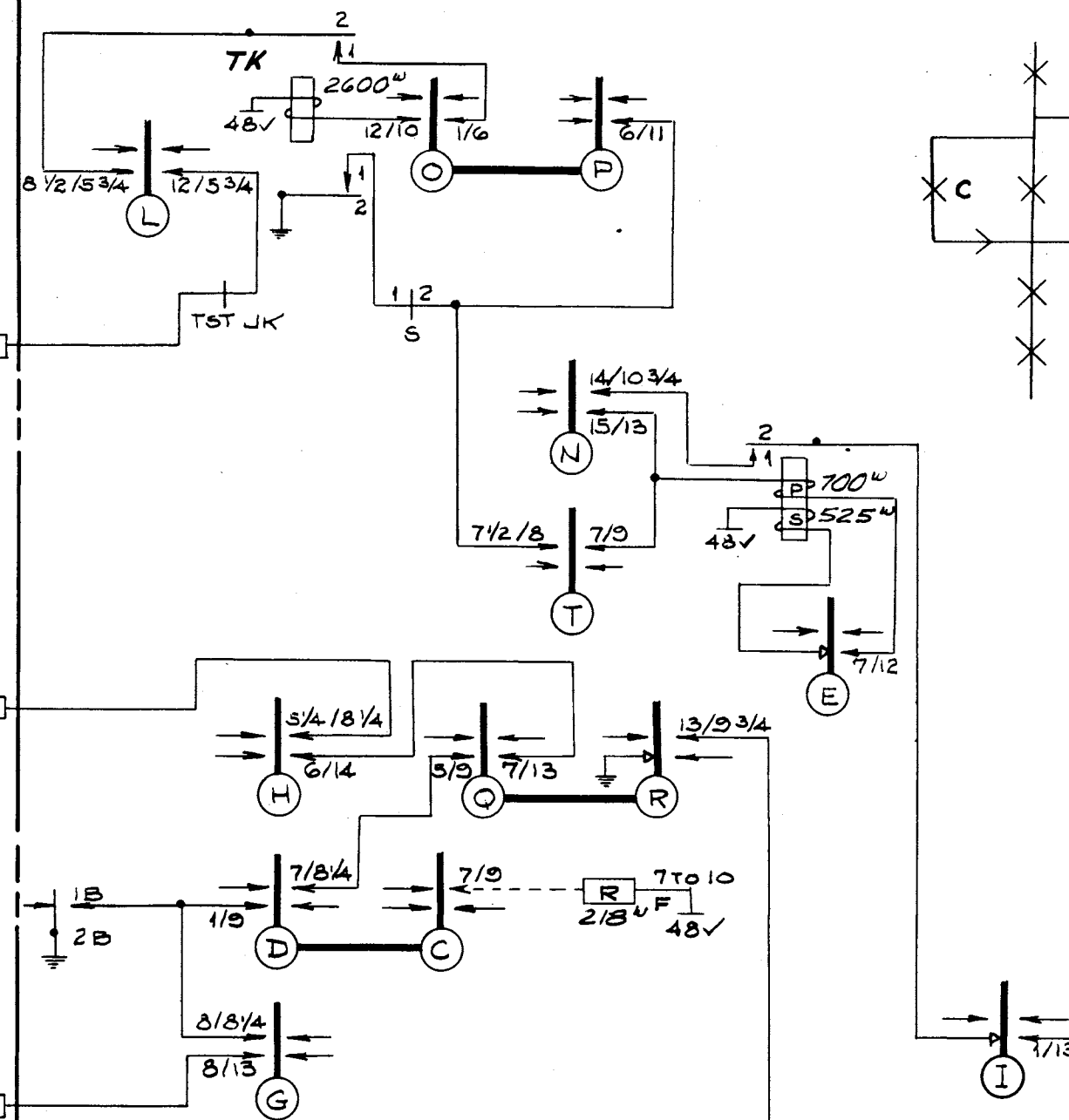
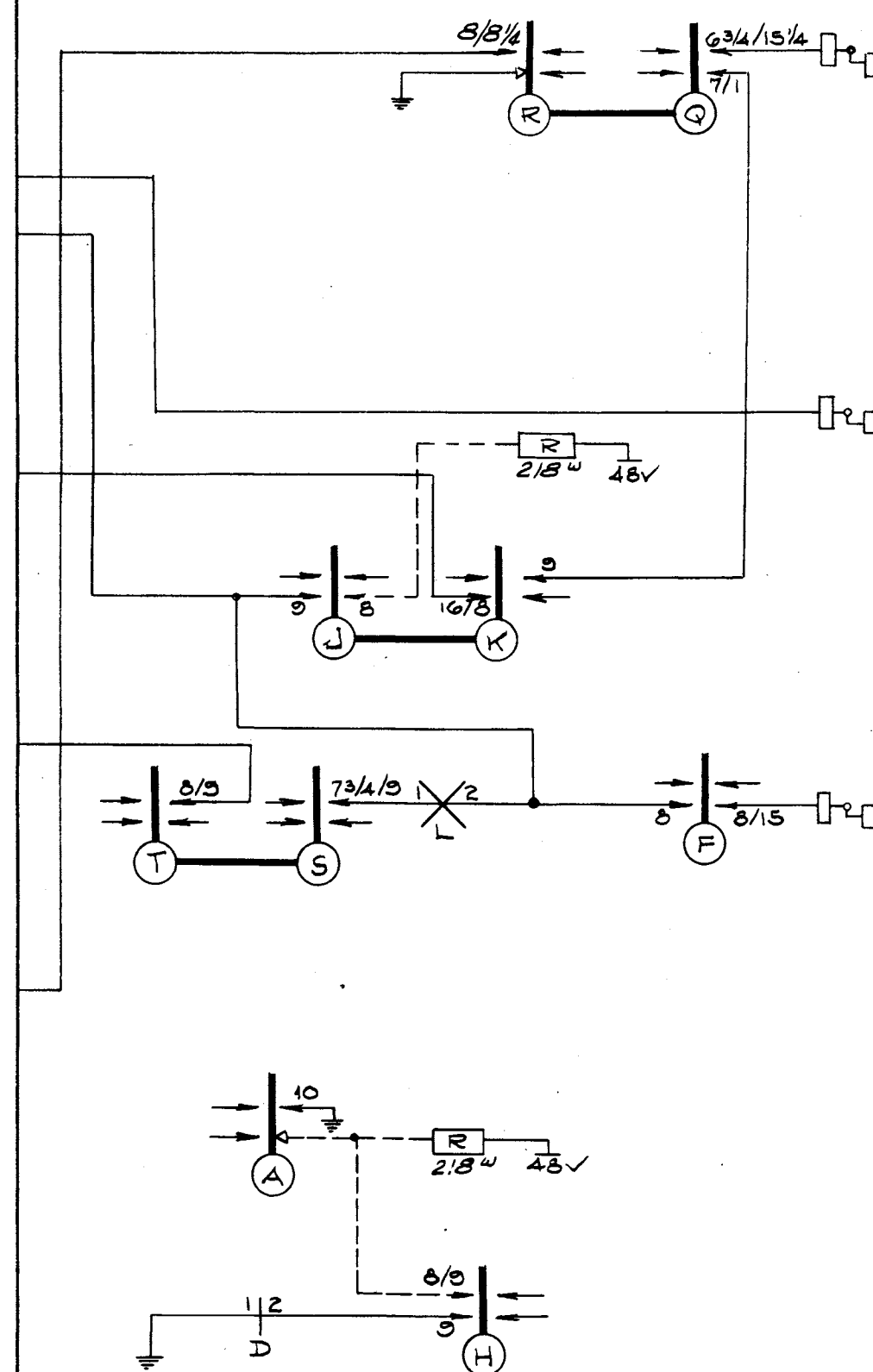
SEQUENCE CHART



INCOMING

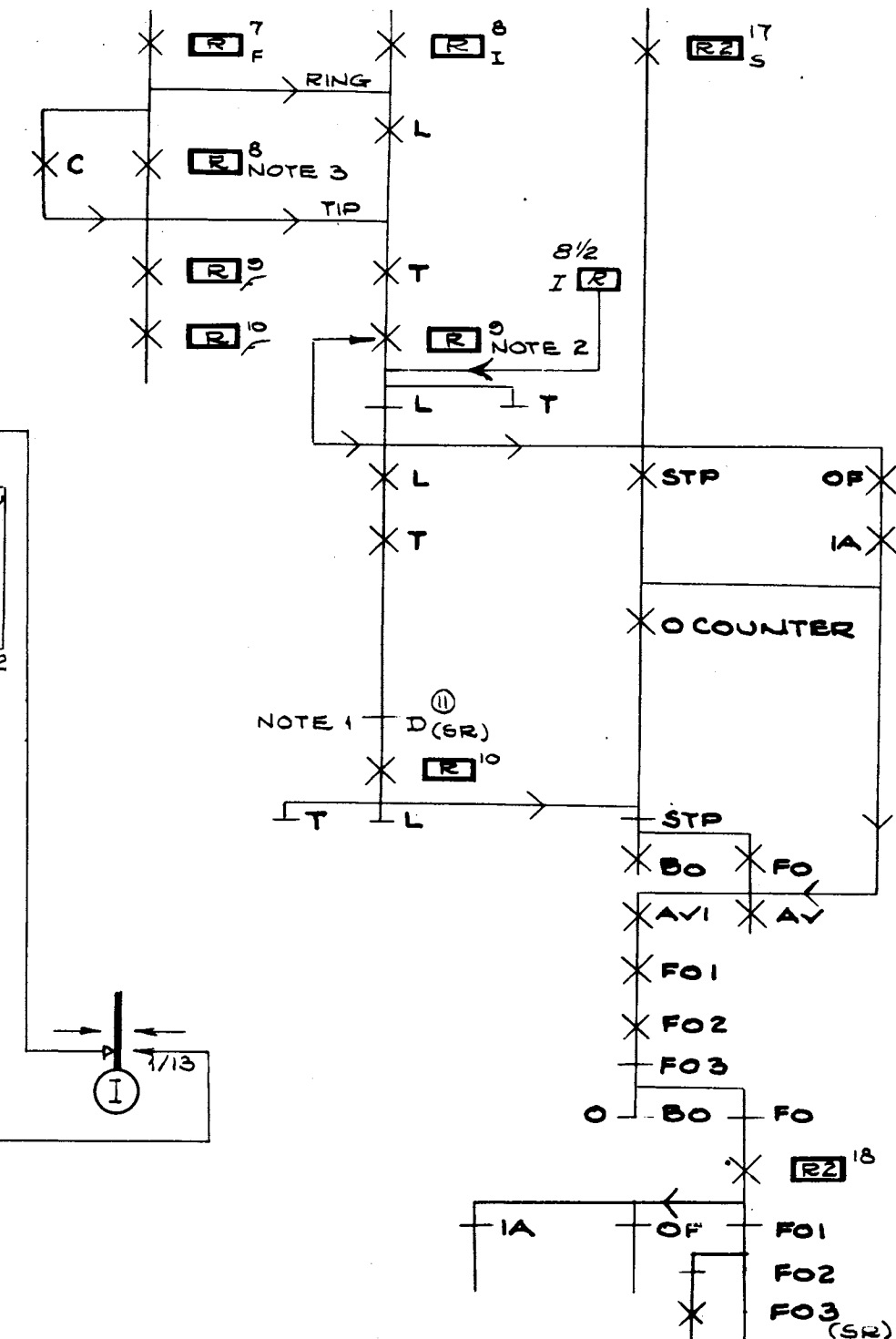
FINAL

SEQUENCE CHART



NOTES:

1. "D" RELAY IS SLOW RELEASE TO GIVE TIME FOR SENDER RELAYS TIME TO OPERATE BEFORE IT OPENS FUND. CIRCUIT.
2. IN POS. 9 INC. WE HAVE REVERSED BATT AND GRD, WILL OPERATE OF AND STP IN SERIES
3. IN POS. 8 FINAL WE HAVE GRD ON R' AND T TO INC. WHICH WILL OPERATE "L" AND "T" RELAYS IN INC.
4. "T" RELAY WILL LOCK UP IN POS. 8 AND 9 TO MAKE SURE THE SWITCH MOVES IN CASE THE "L" RELEASES.



SD-21200-011 FINAL
SD 21115-011 INC.
SD 21193-011 SUBS SEND.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

INCOMING ADVANCE

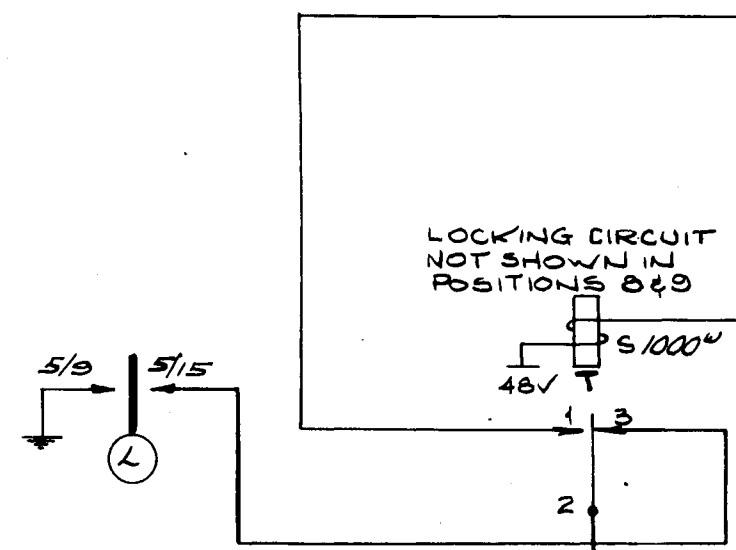
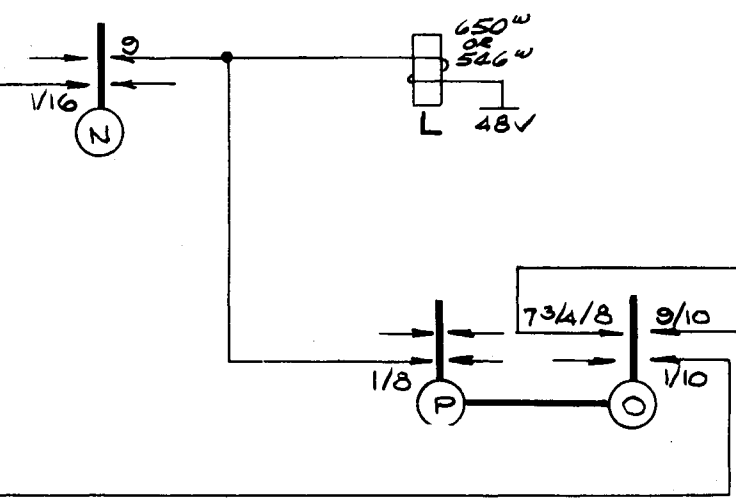
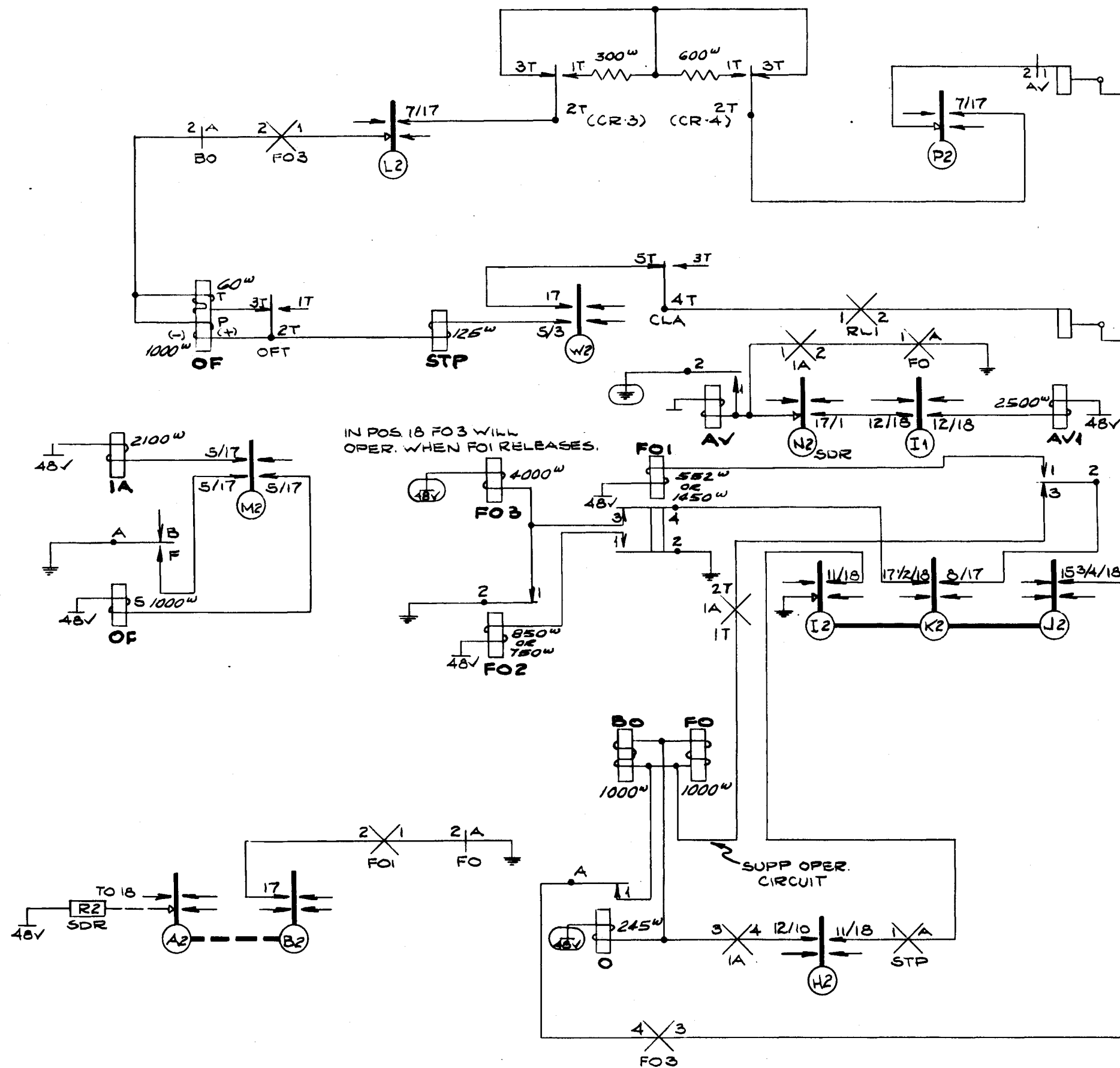
PANEL SYSTEM
BATTERY CUT-OFF.

J. LAWLESS
DRAWN-N. MILLER

OS-14
SHEET 1

SENDER

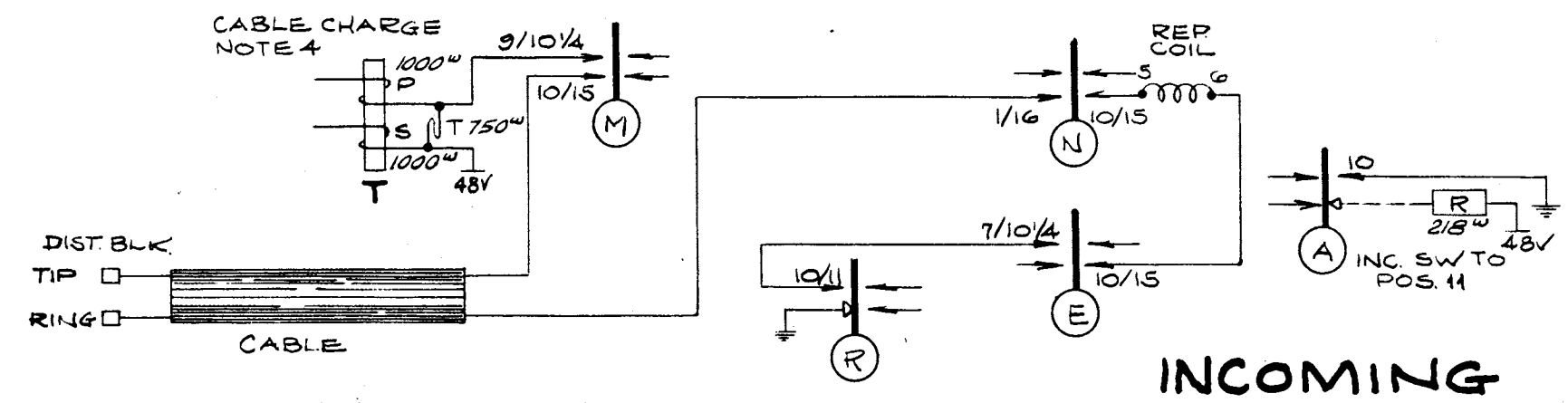
INCOMING



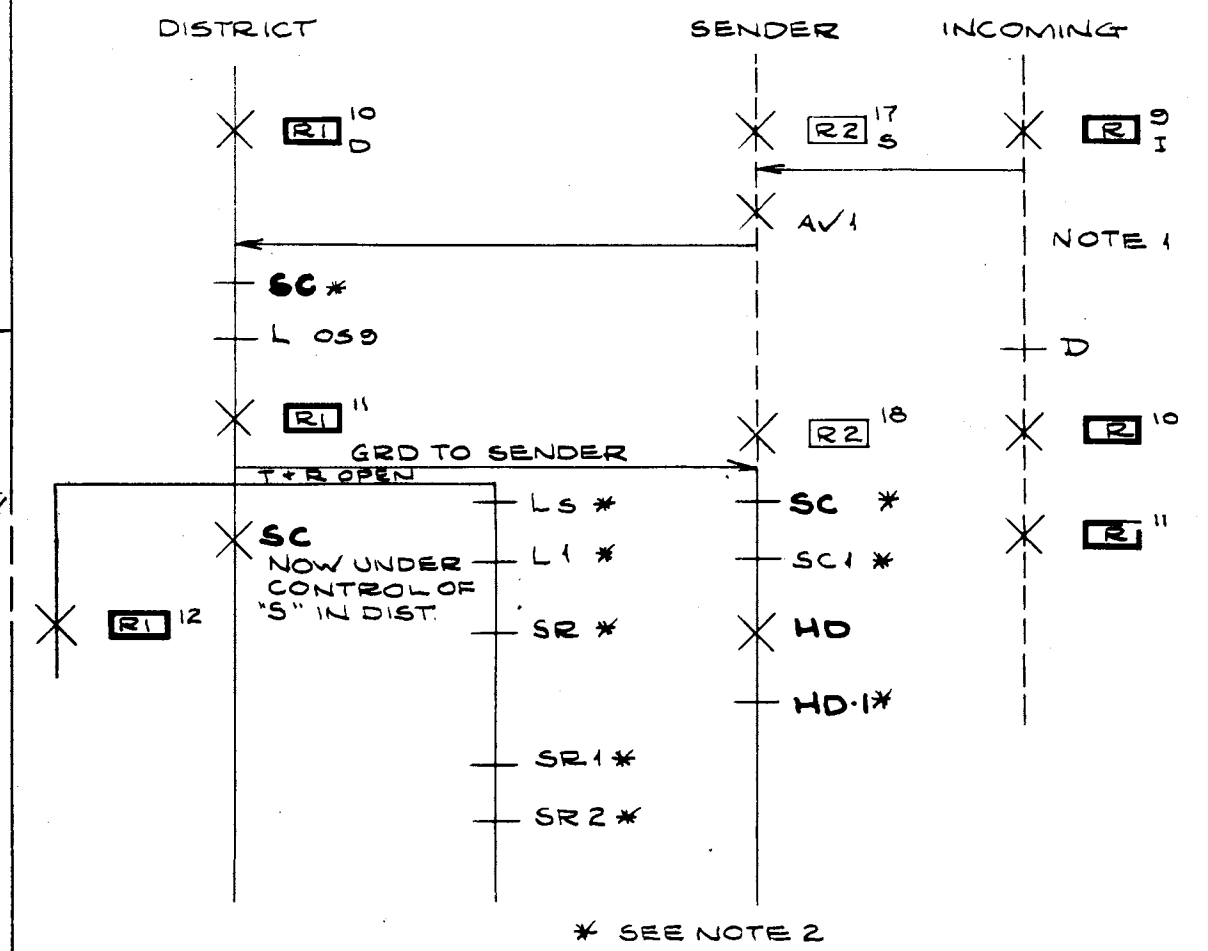
NOTE-
O STAYS OPERATED
POS. 8 TO POS. 9 OF INC.

ISSUE
9-30-49

CABLE CHARGE
NOTE 4



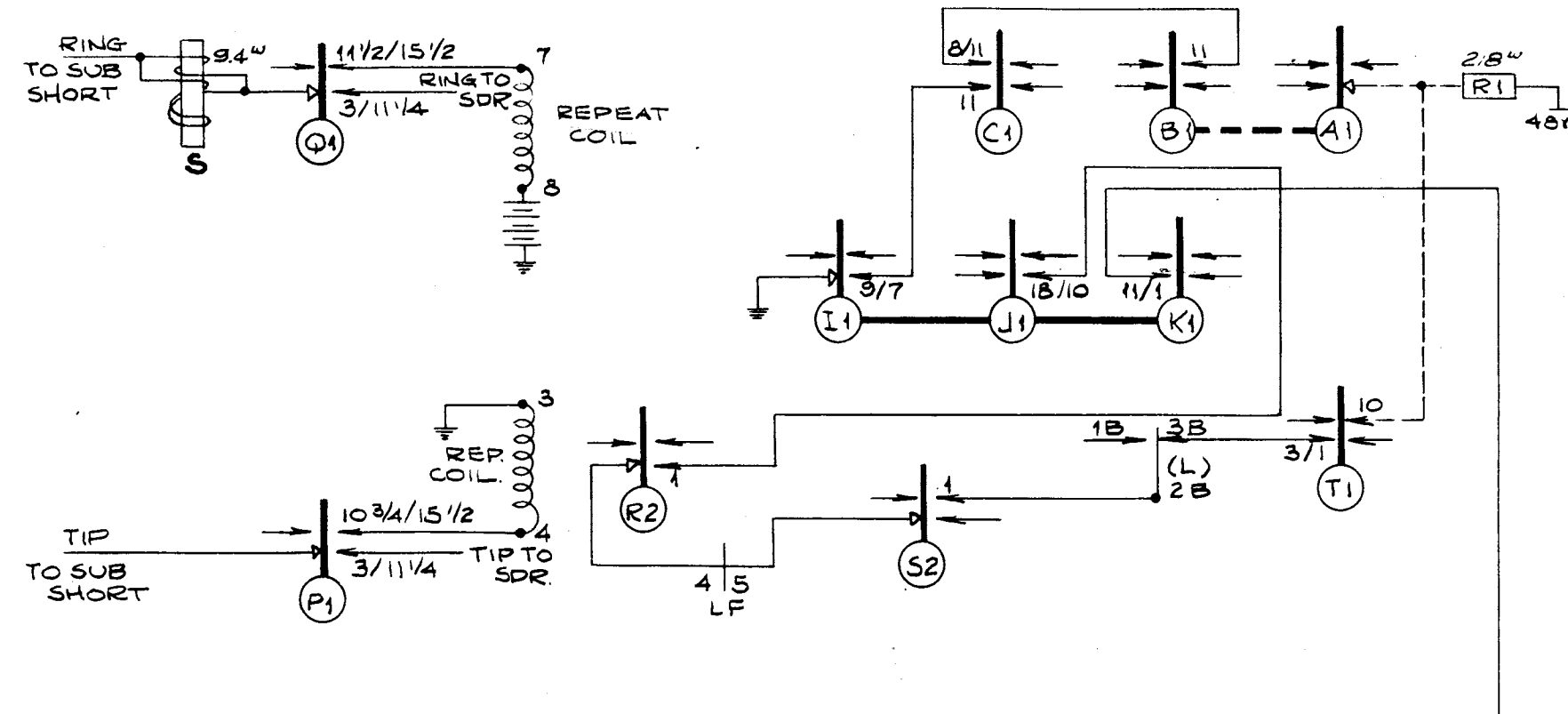
SEQUENCE CHART



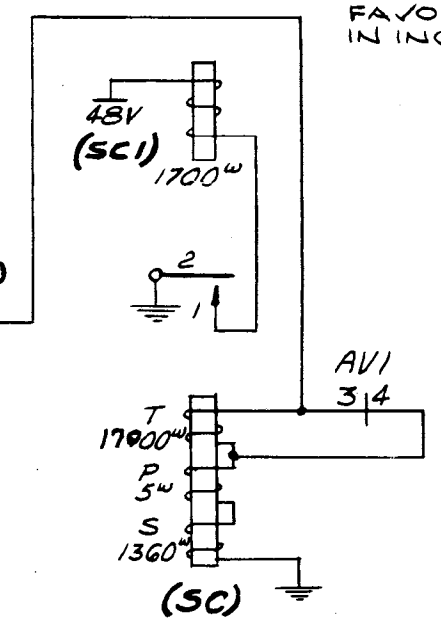
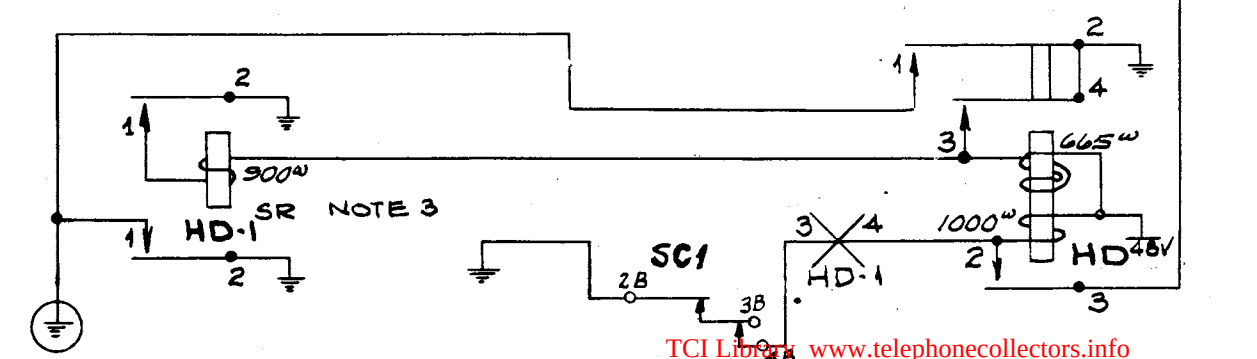
NOTES:

1. FOR OPER. ON DOTTED LINES SEE OS-14.
2. FOR OPER. CKTS. SEE OS-3.
3. HD-1 SLOW REL. TO ALLOW HD TO SUPPLY OFF NOR. GRD. WHEN HD-1 RELS.
4. CHARGE CABLE CAP. IN DIRECTION FAVORABLE TO OPER. OF "A" RELAY IN INCOMING.

DISTRICT



SENDER

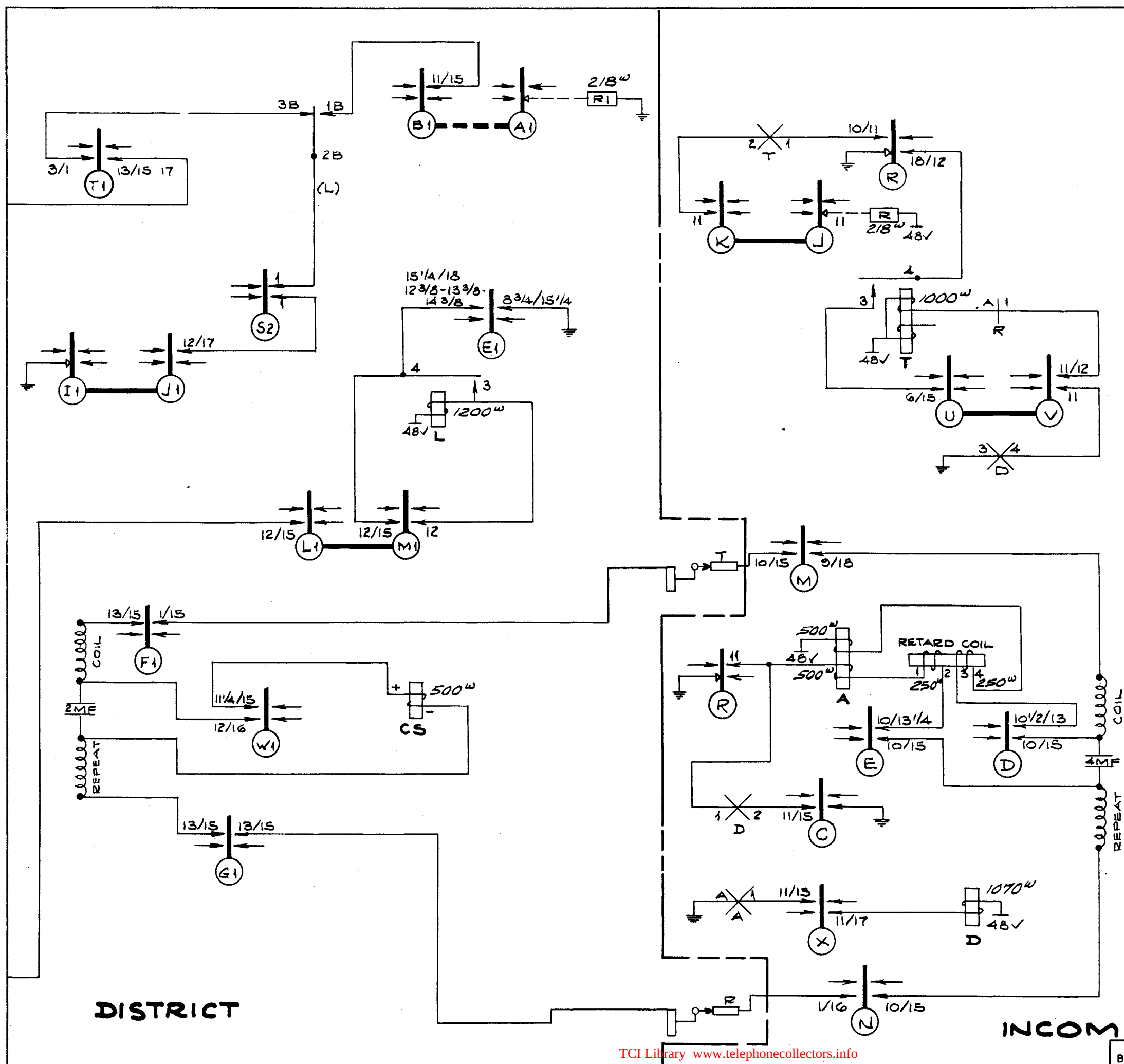


SD-21115-01 INC. SEL. CKT.
SD-21405-01-012 LFE DIST. CKT.
SD-21123-01-012-013 SUBS. GDR.

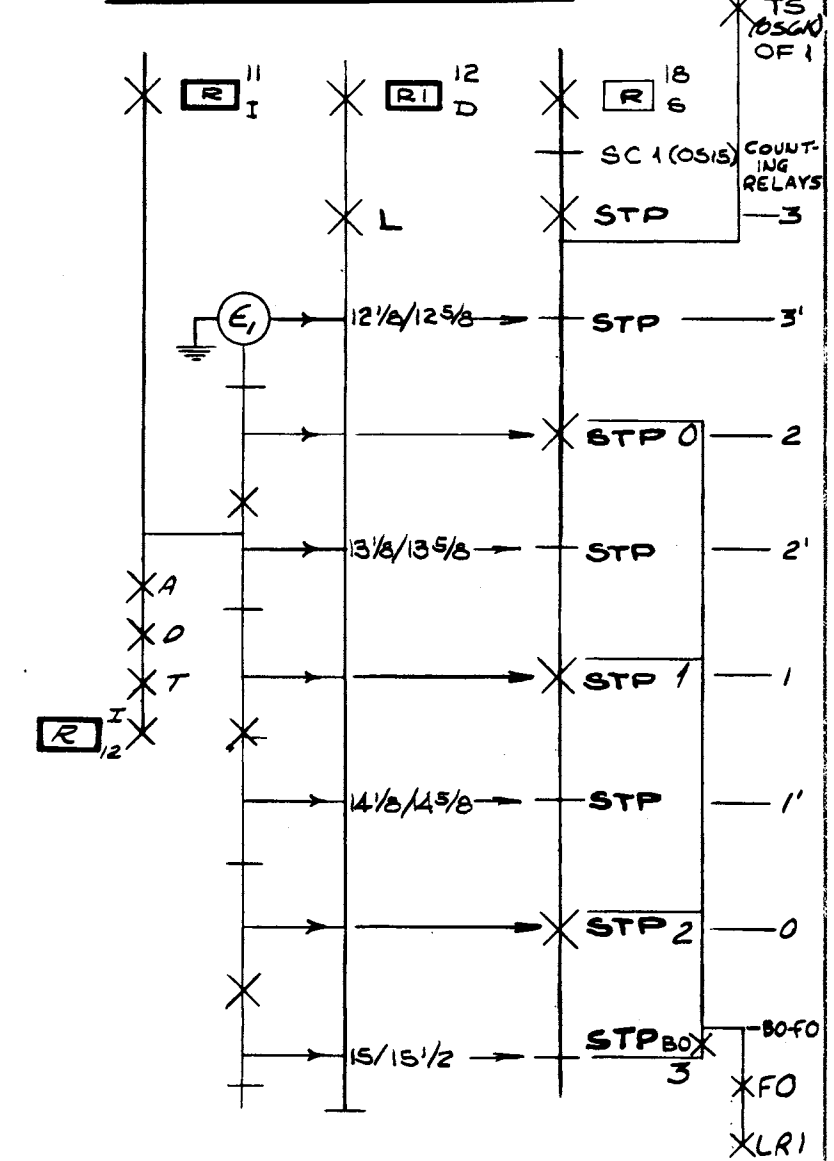
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

DISTRICT ADVANCE
CABLE CHARGE

1630E
7-11-49



SEQUENCE CHART



TALK SEL.	SW. POS.	E CAM PULSING	SEND RELAYS
0	13	12/8/12/8	TS
1	14	13/8/13/8	TS-TS1
2	15	14/8/14/8	NONE
3	16	15/8/15/8	OF 1

INC. SD 21115-011
DIST. SD 21405-011
SUBS. SEND. SD 21193-011

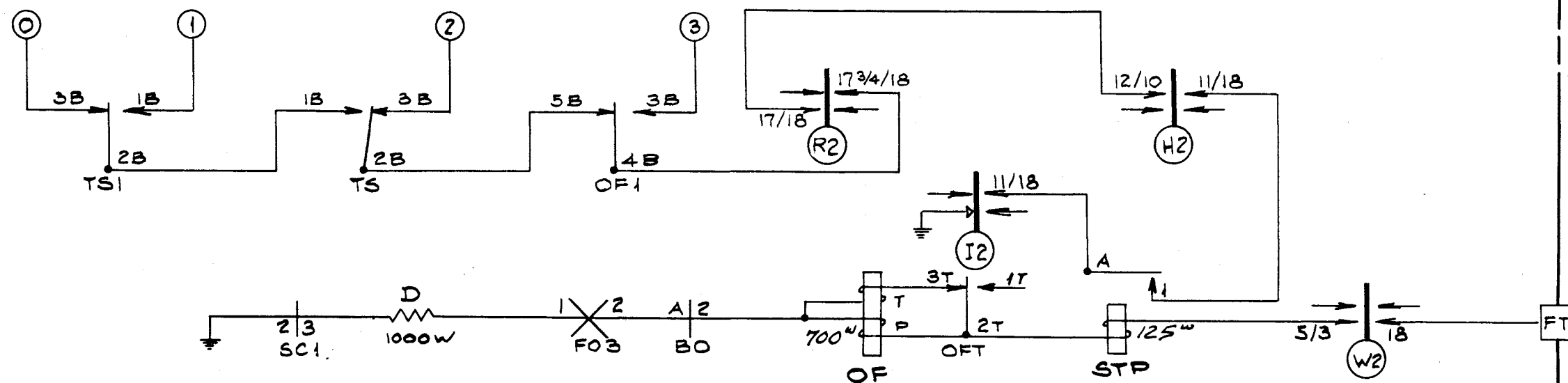
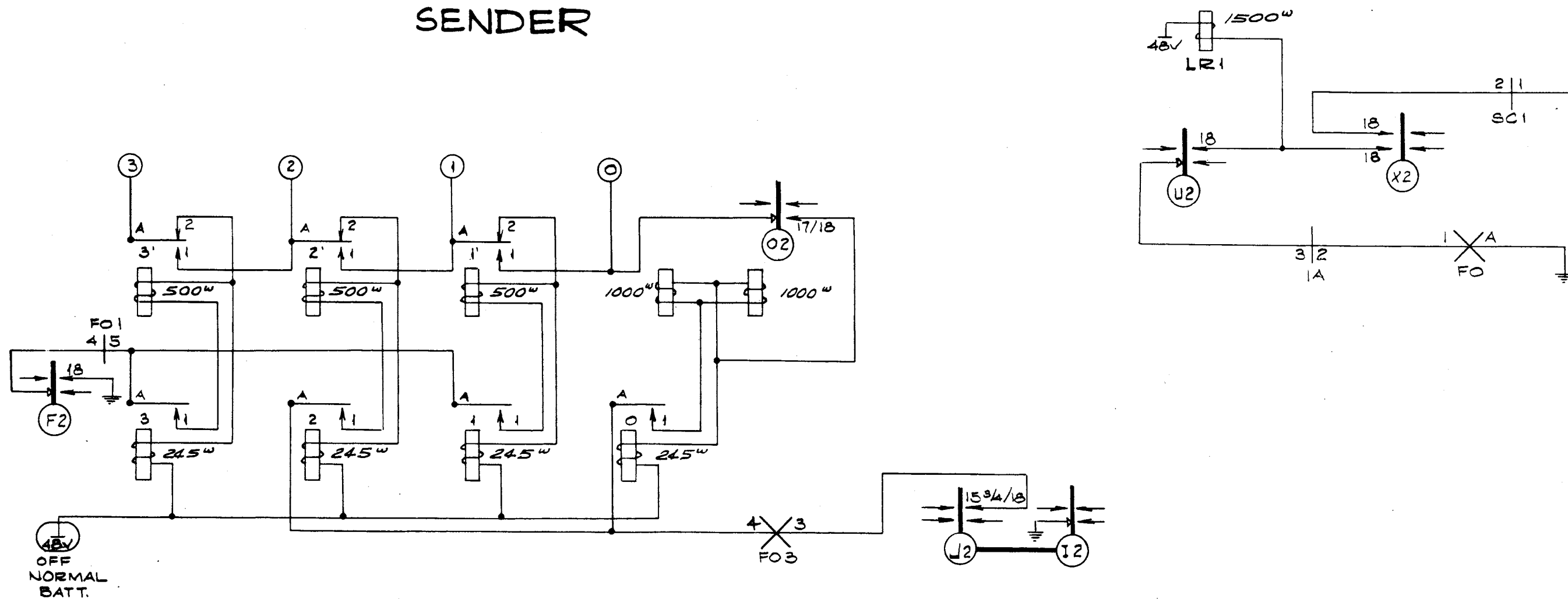
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

TALK SELECTION
AND
TRUNK CLOSURE

J. LAWLESS
DRAWN-N. MILLER

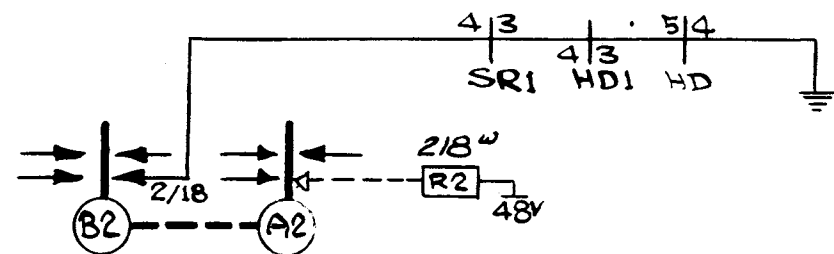
OS-16
SHEET 1

SENDER

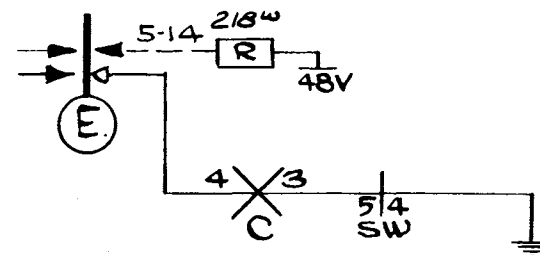


LINK

ISSUE 1
7-13-49

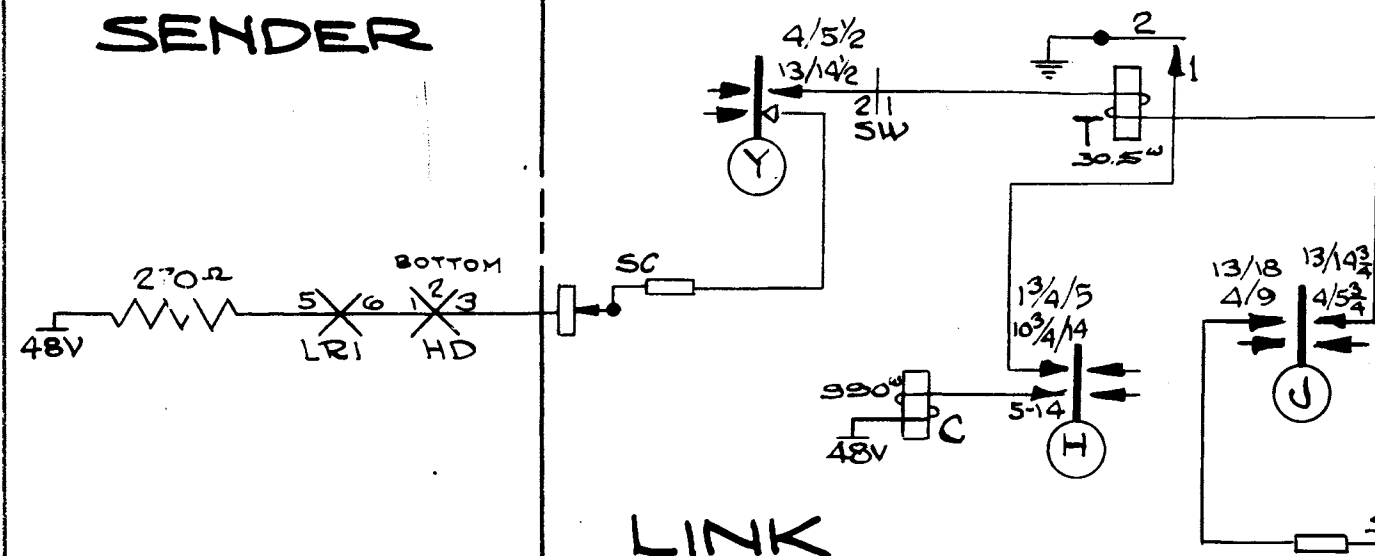


SENDER R2 TO 1



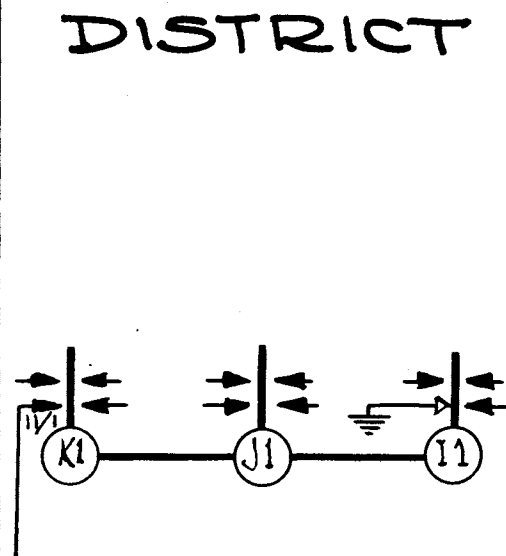
LINK R TO 6 OR 15

SENDER

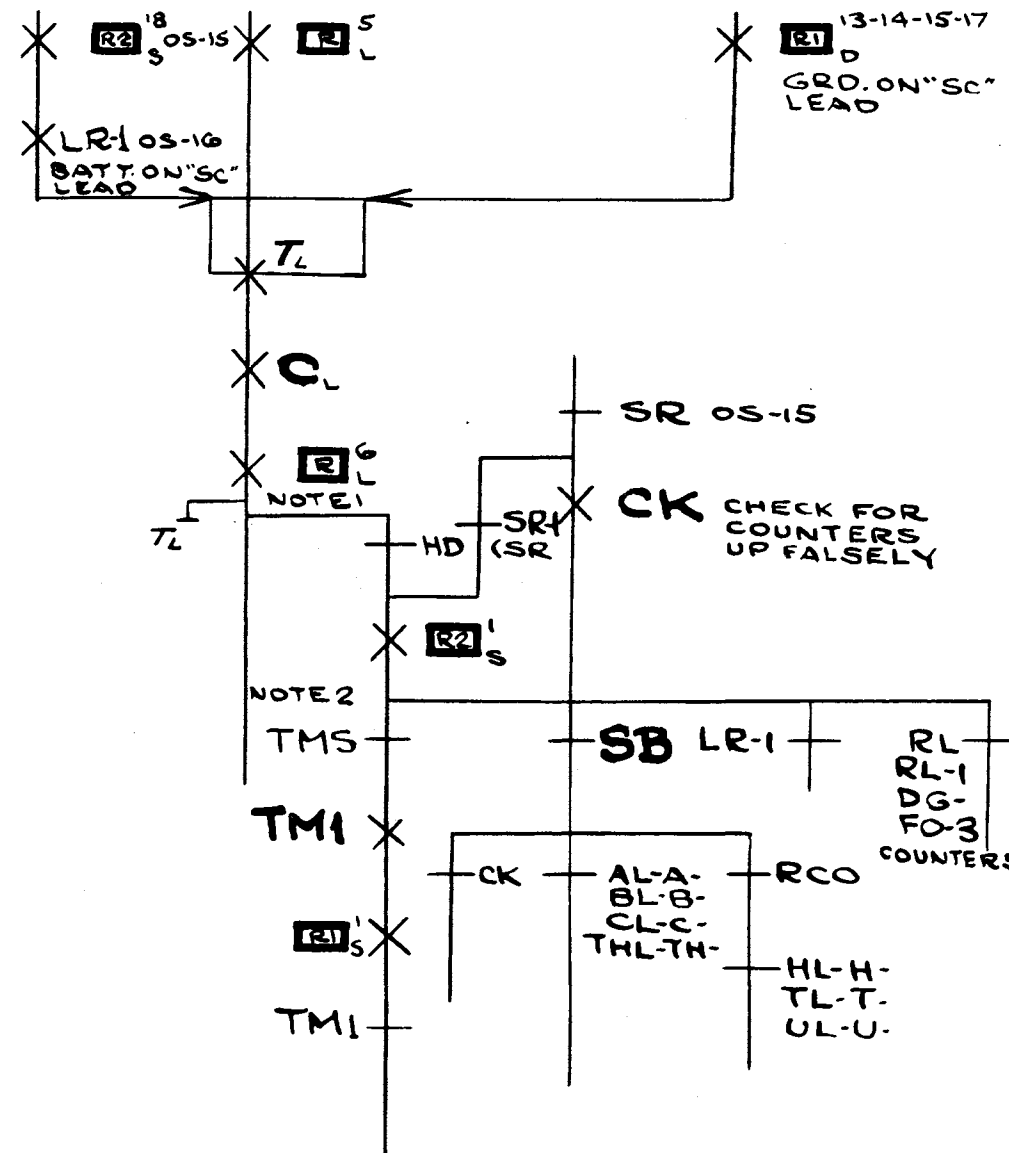


LINK

DISTRICT



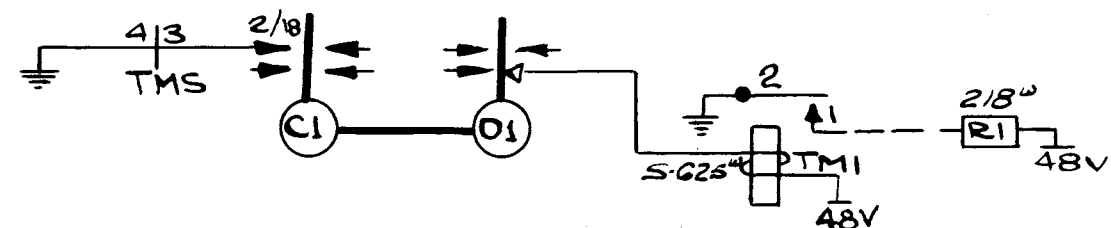
SEQUENCE CHART



NOTES:

1. ALL LEADS OPEN TO SDR. WHEN LINK LEAVES POS. 5.
2. LAST SOURCE OF OFF NOR. GRD. REMOVED.

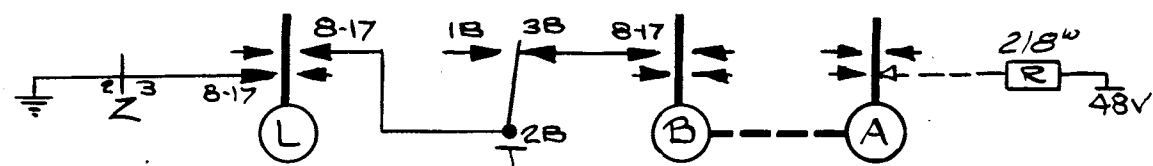
SENDER TIME SW. R1 TO 1



LINK SW. POS.

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

LINK R TO POS 9



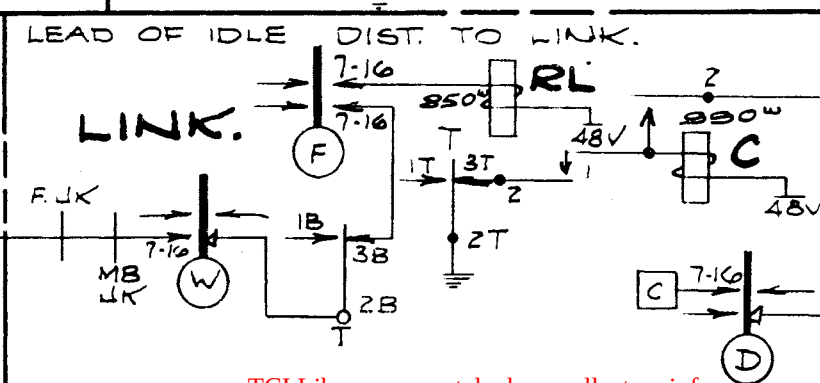
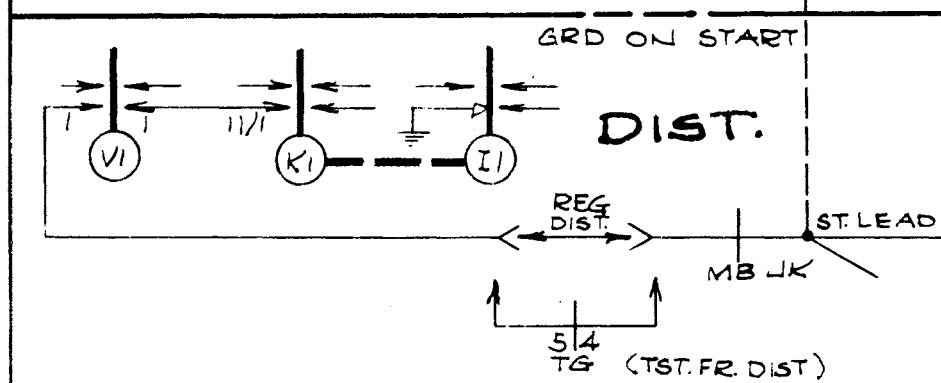
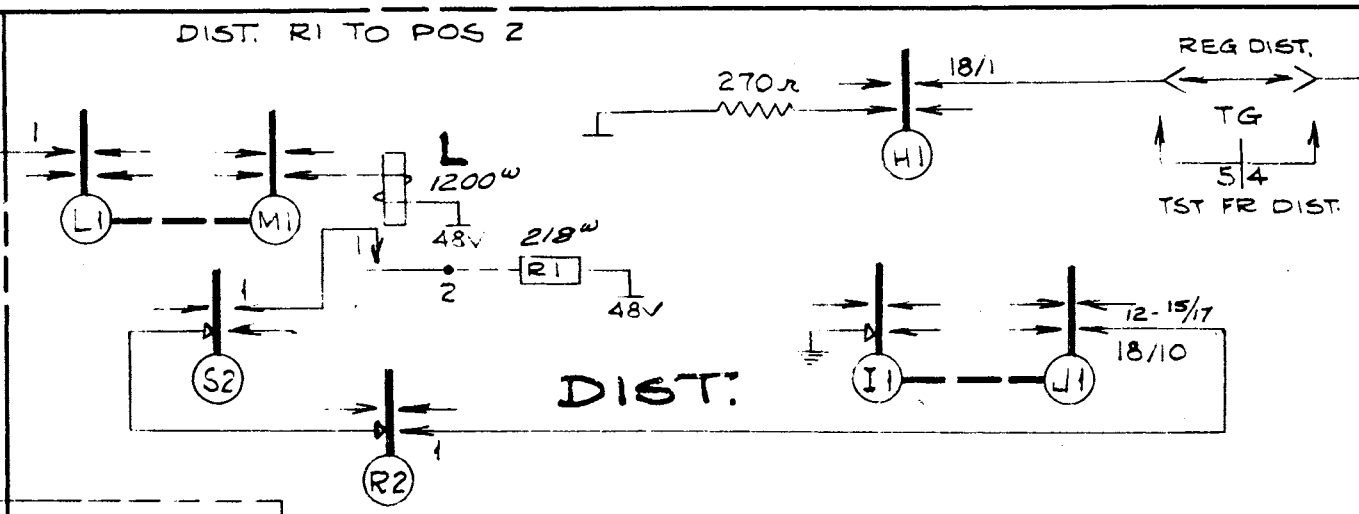
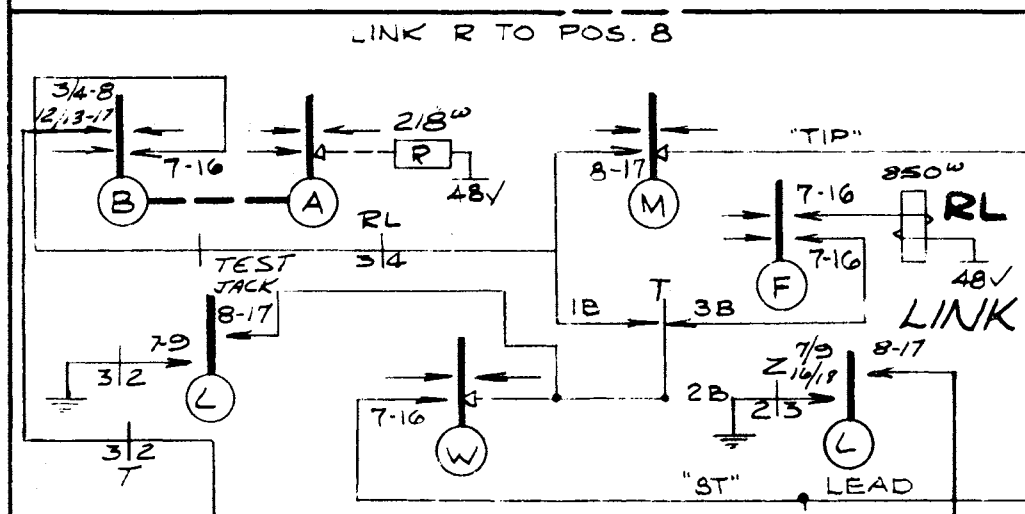
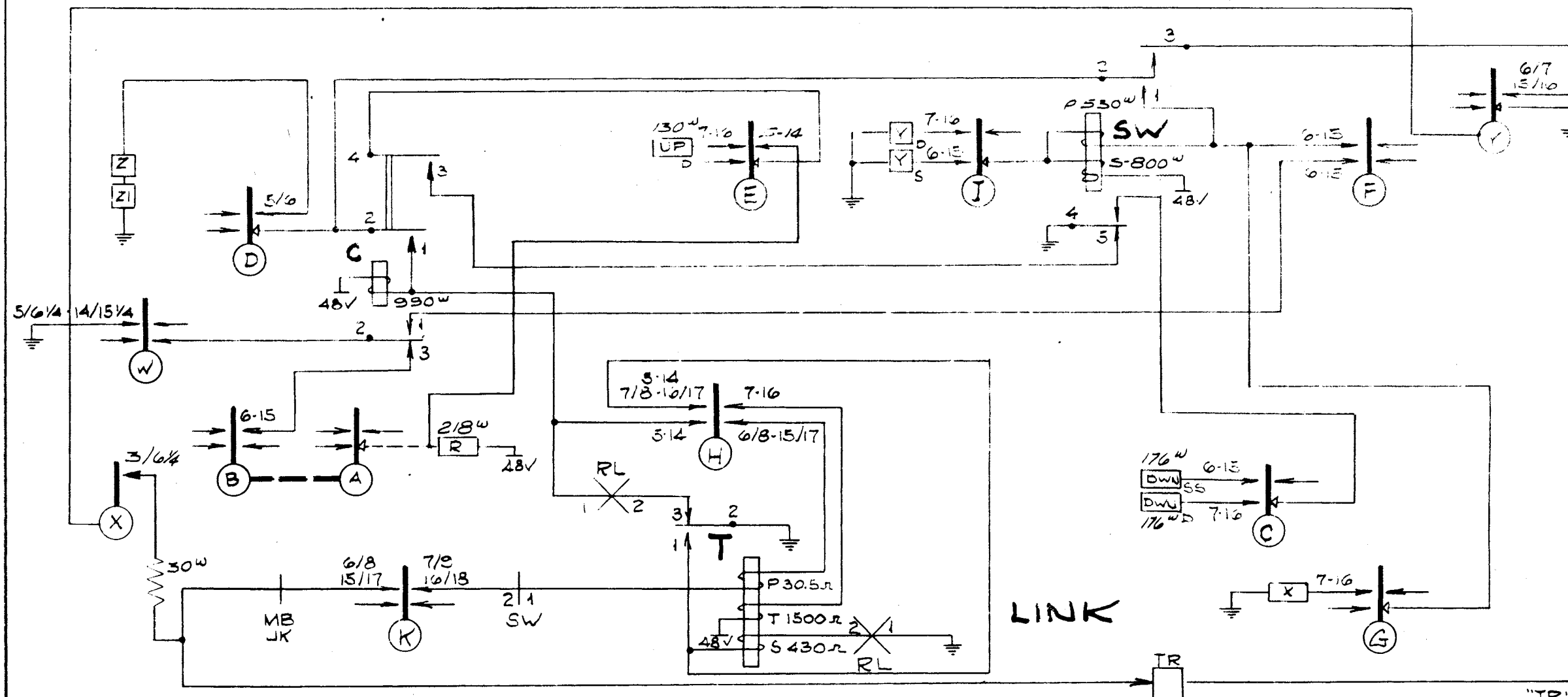
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

RELEASE OF SENDER

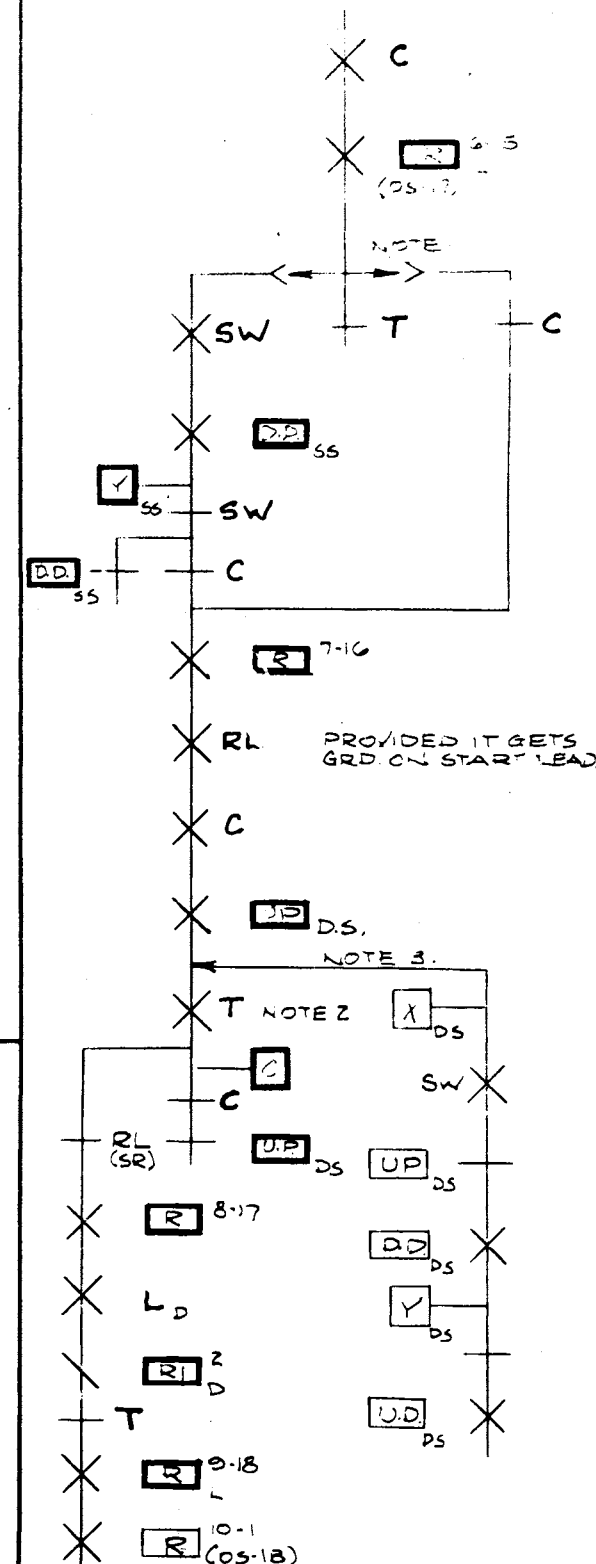
PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN-T. WESSEL
OS-17

SEQUENCE CHART



1. IF SDR SEL IS ON ONE OF TOP 20 SDR'S. "C" REMAINS LOCKED TO 2. OTHERWISE "C" RELEASES WHEN SW LEAVES 5.
2. "T" OPNS WHEN AN IDLE DISTRICT IS FOUND.
3. IF SEL WENT TO TOP AND DIST. WAS NOT YET FOUND.



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

ADVANCE LINK
PRESELECT DISTRICT

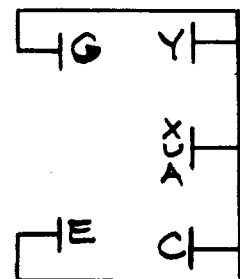
PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN N.B. MILLER

OS-17A

ISSUE 1
9-26-49

COMM STRAPPING

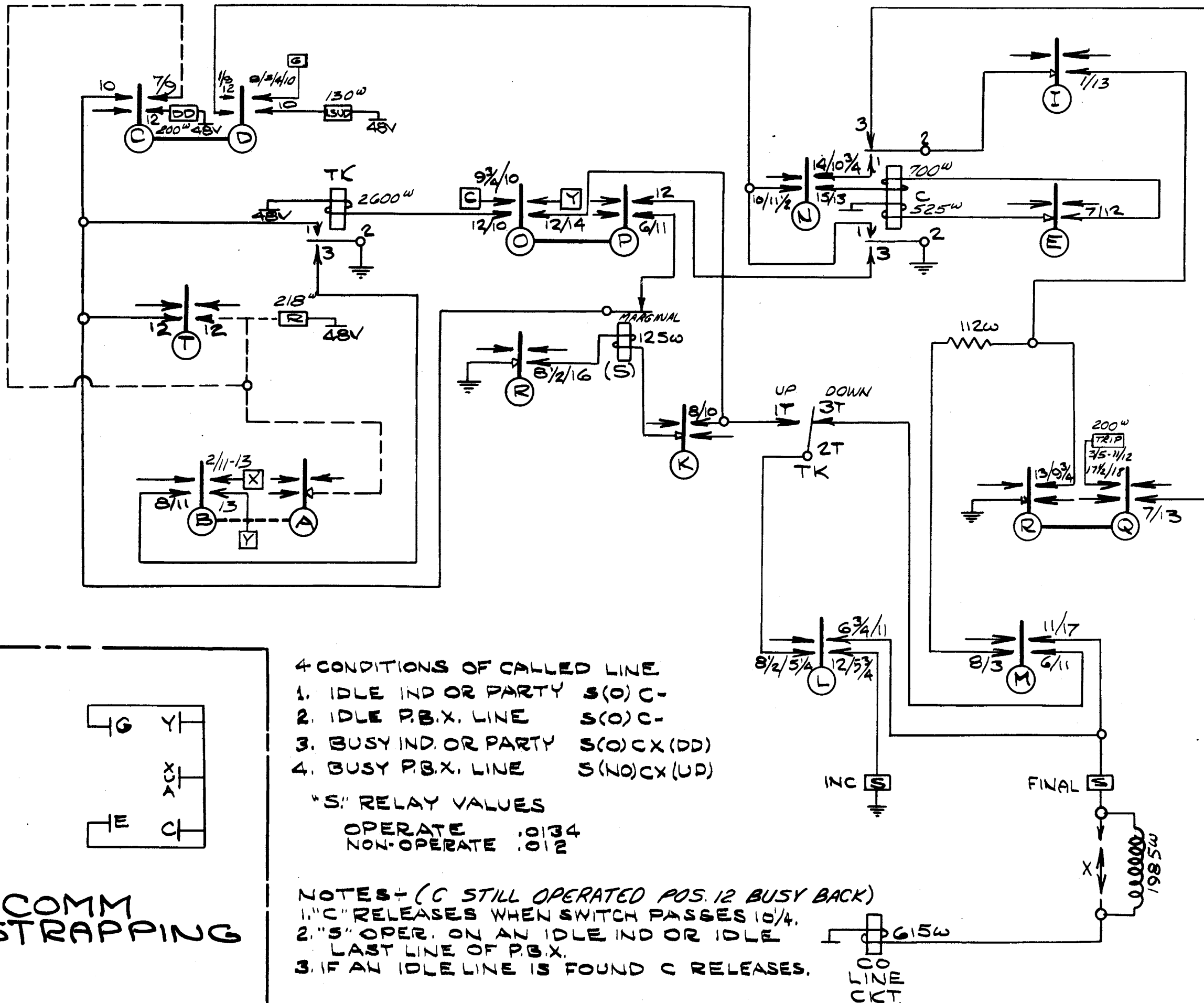


- 4 CONDITIONS OF CALLED LINE
1. IDLE IND OR PARTY S(O) C-
 2. IDLE P.B.X. LINE S(O) C-
 3. BUSY IND OR PARTY S(O) CX (DD)
 4. BUSY P.B.X. LINE S(NO) CX (UP)

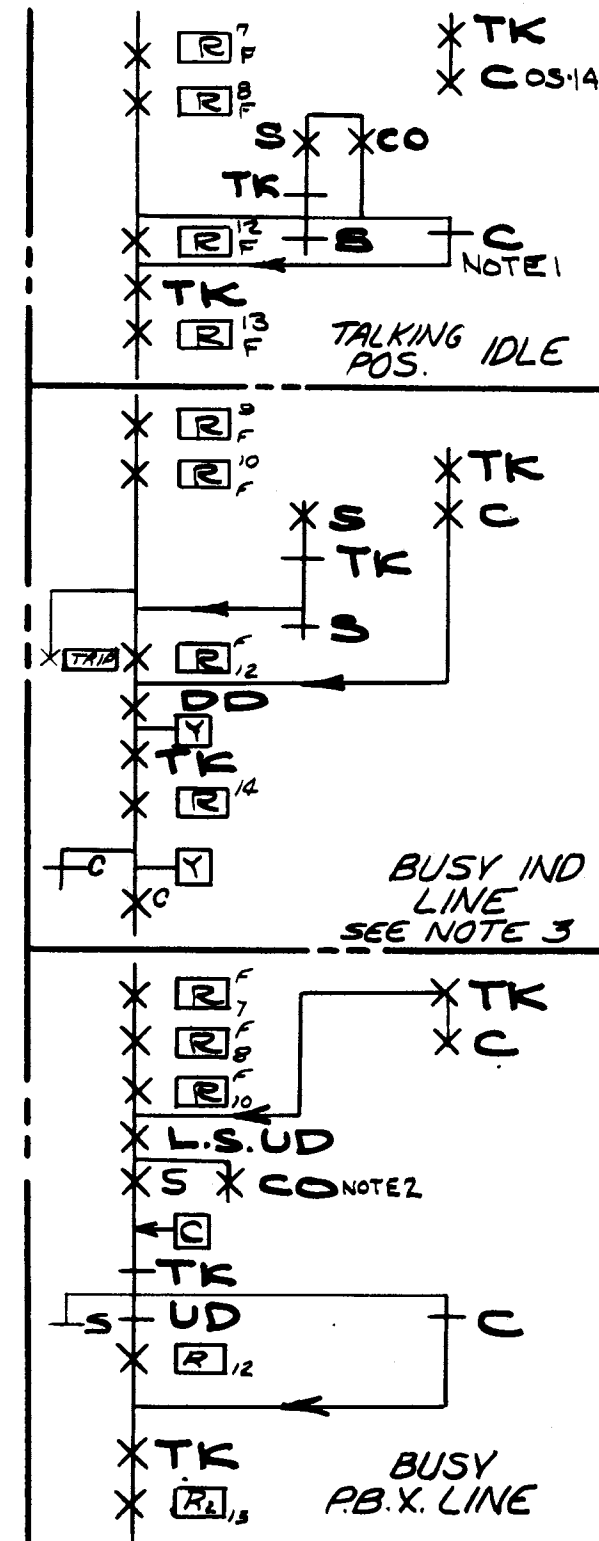
"S" RELAY VALUES
OPERATE .0134
NON-OPERATE .012

NOTES - (C STILL OPERATED POS. 12 BUSY BACK)
1. "C" RELEASES WHEN SWITCH PASSES 10/4.
2. "S" OPER. ON AN IDLE IND OR IDLE
LAST LINE OF P.B.X.
3. IF AN IDLE LINE IS FOUND C RELEASES.

615w
LINE
CKT.



SEQUENCE CHARTS



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

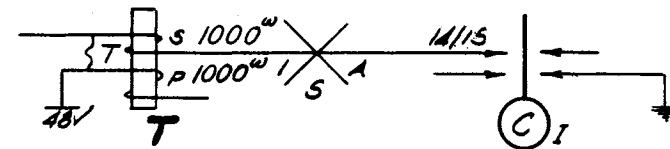
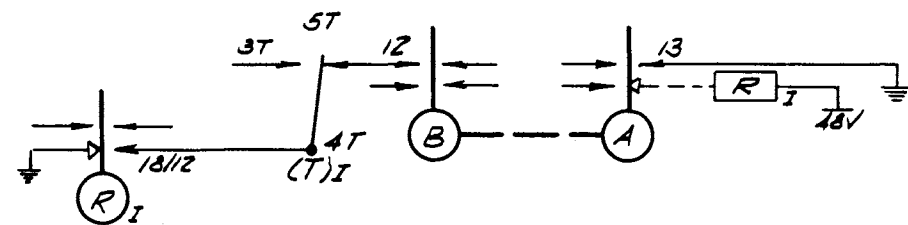
LINE
TESTING

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN-T. WESSEL

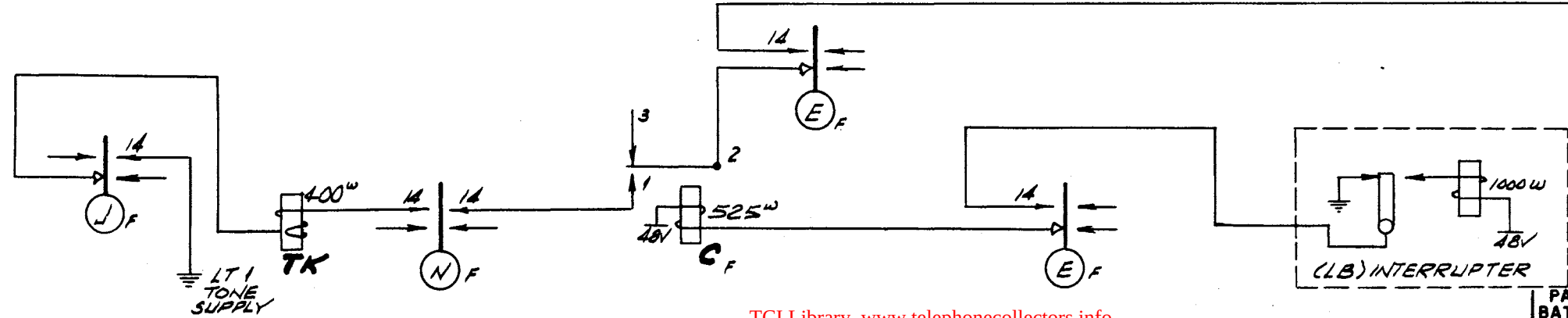
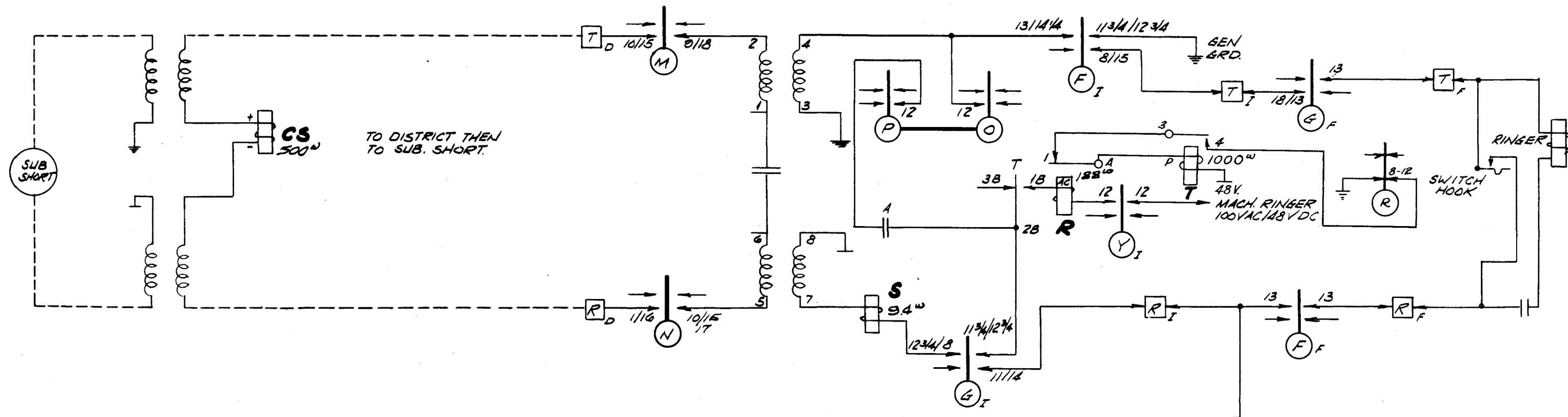
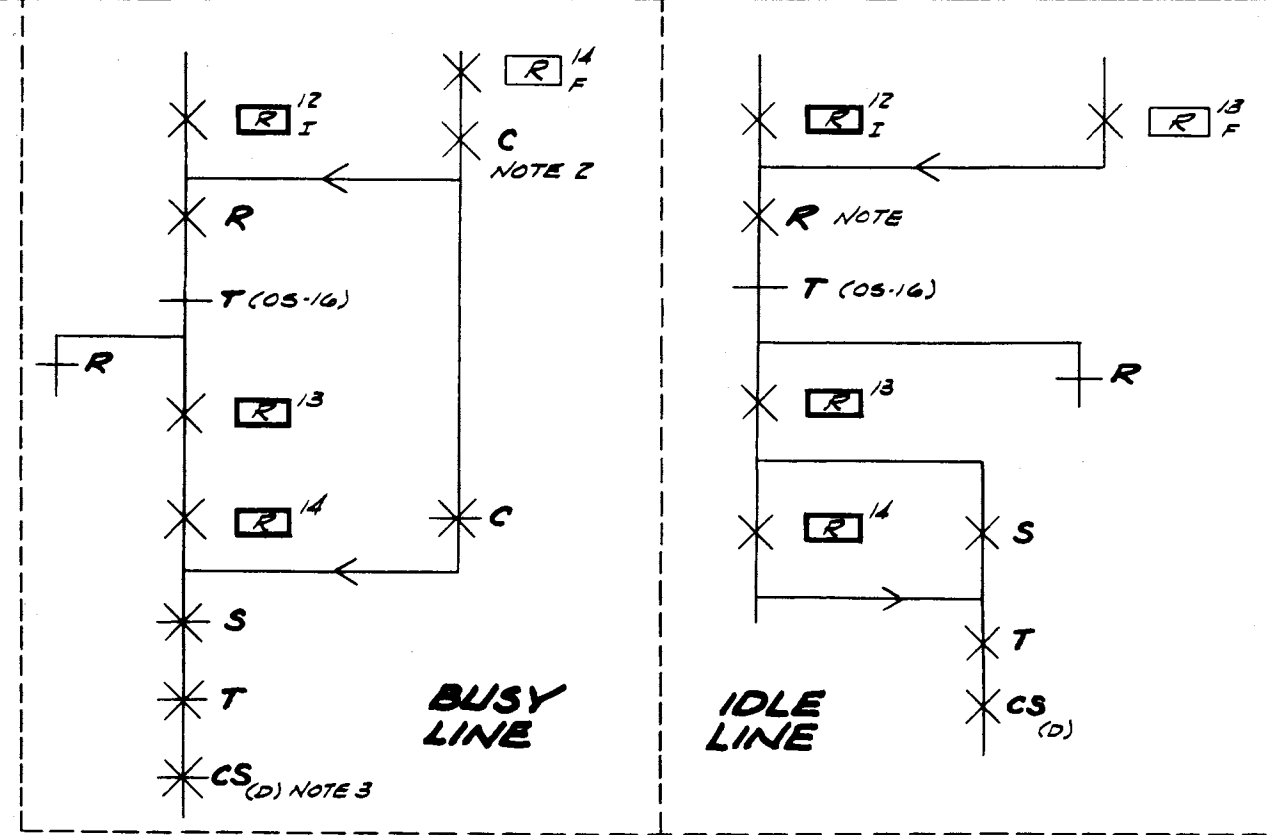
OS-18

1355/E/ 9-27-49



NOTES:

1. WHEN SUB. ANSWERS
2. "C" FLASHES ON B.B. SIGNAL
3. "CS" OPERATES ON REV. BATT. FROM TRK. CKT.

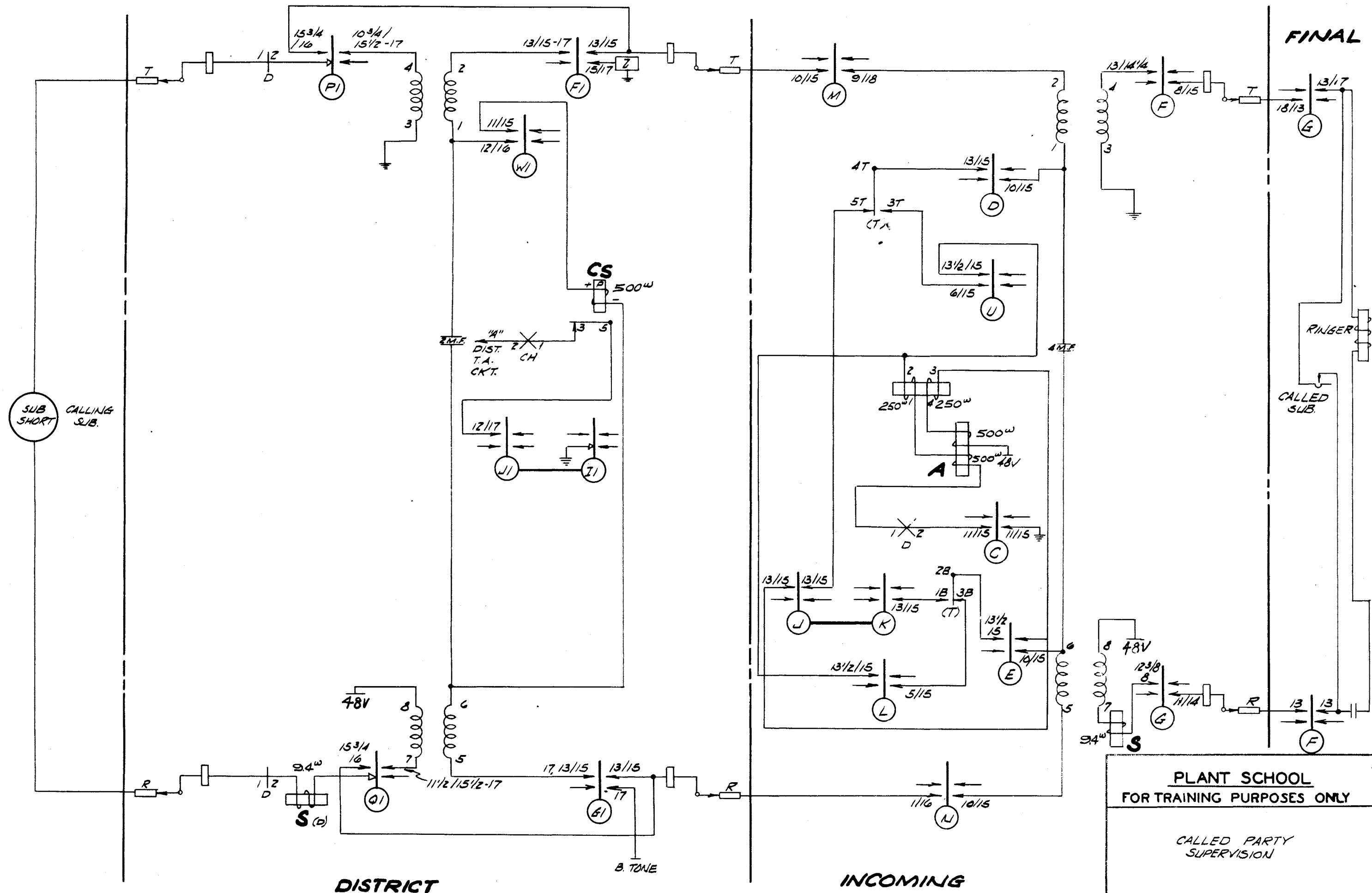


PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

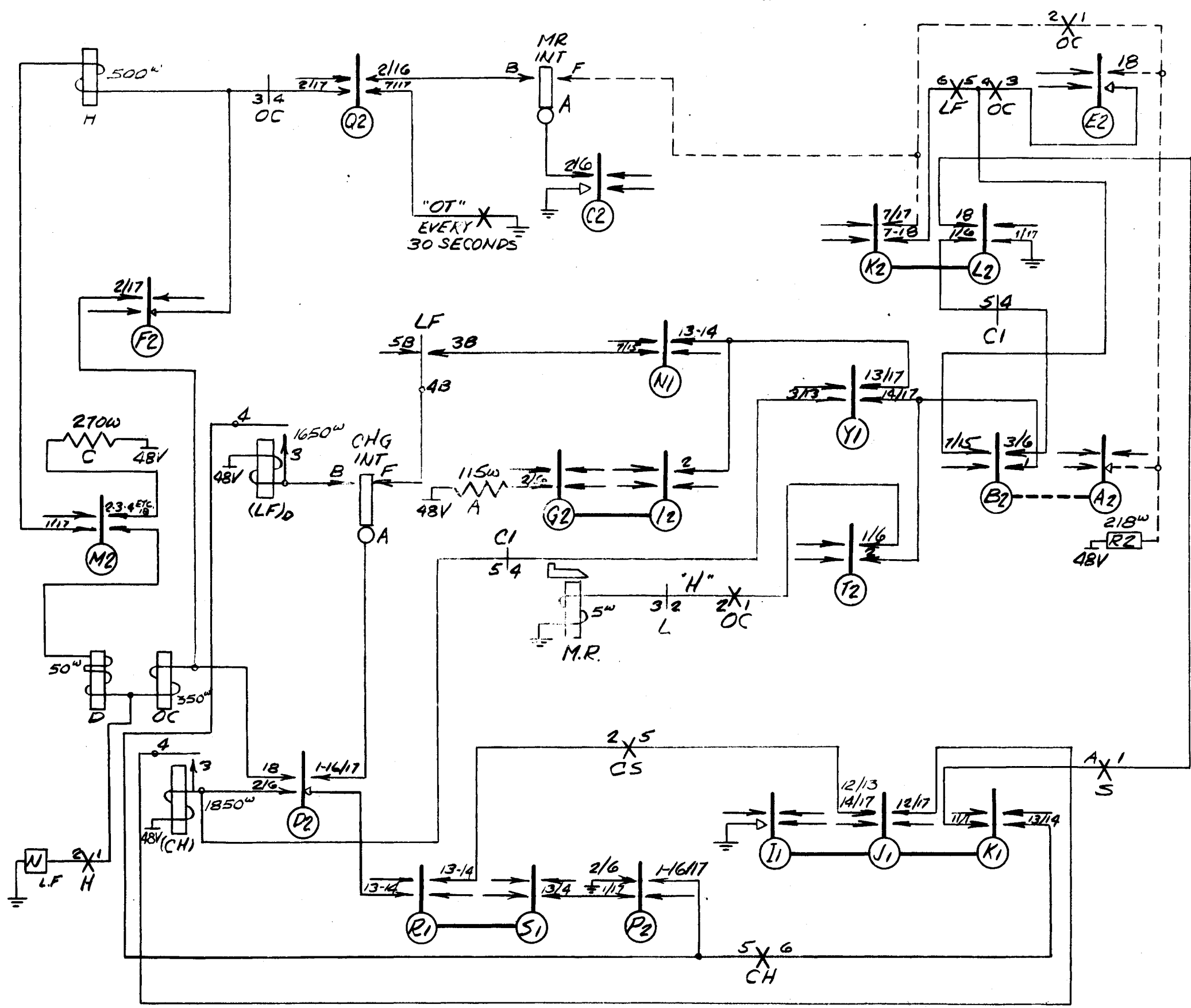
RINGING & TRIPPING

J. LAWLESS
DRAWN - N. B. MILLER

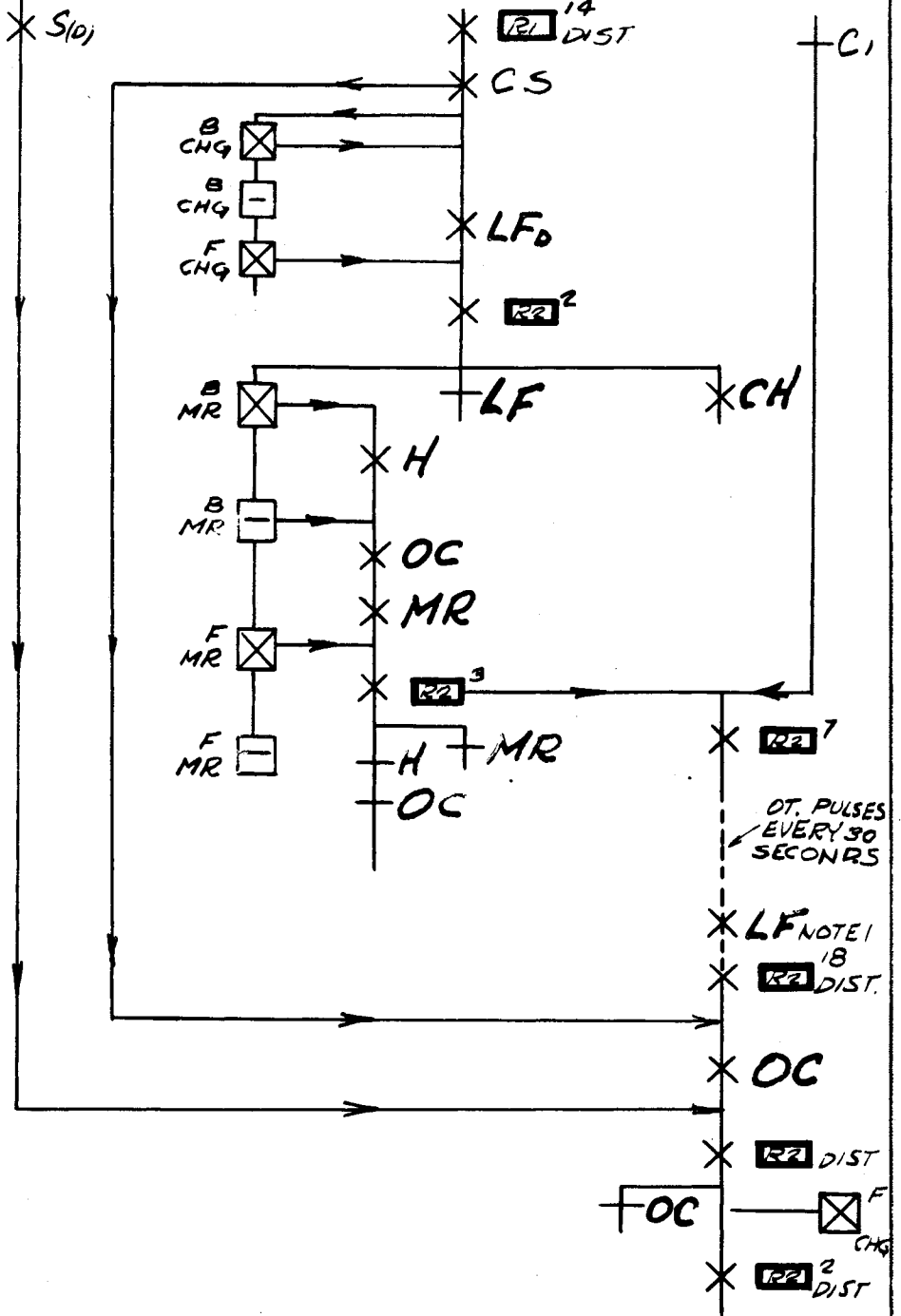
OS-19



ISSUE 1
9-28-49



SEQUENCE CHART



NOTES

1. "LF" OPERATES IN POS. 16-17 OF R2 & REMAINS UP DURING CALL.

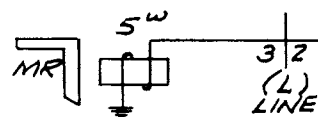
SD-21405-011-012 FIG 1 & B

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

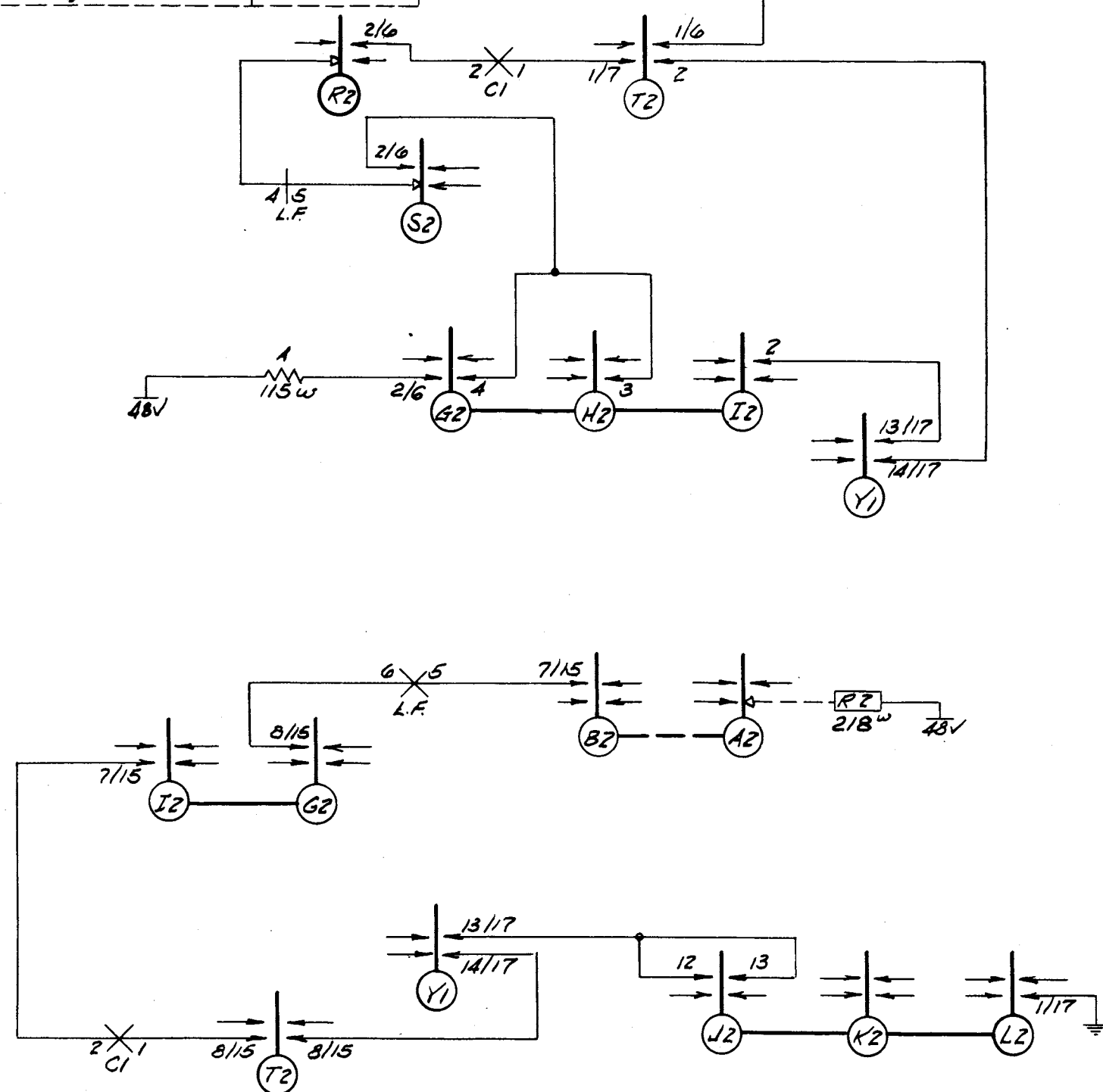
INITIAL CHARGE &
OVERTIME
ZONE 1

ISSUE 1
9-30-49

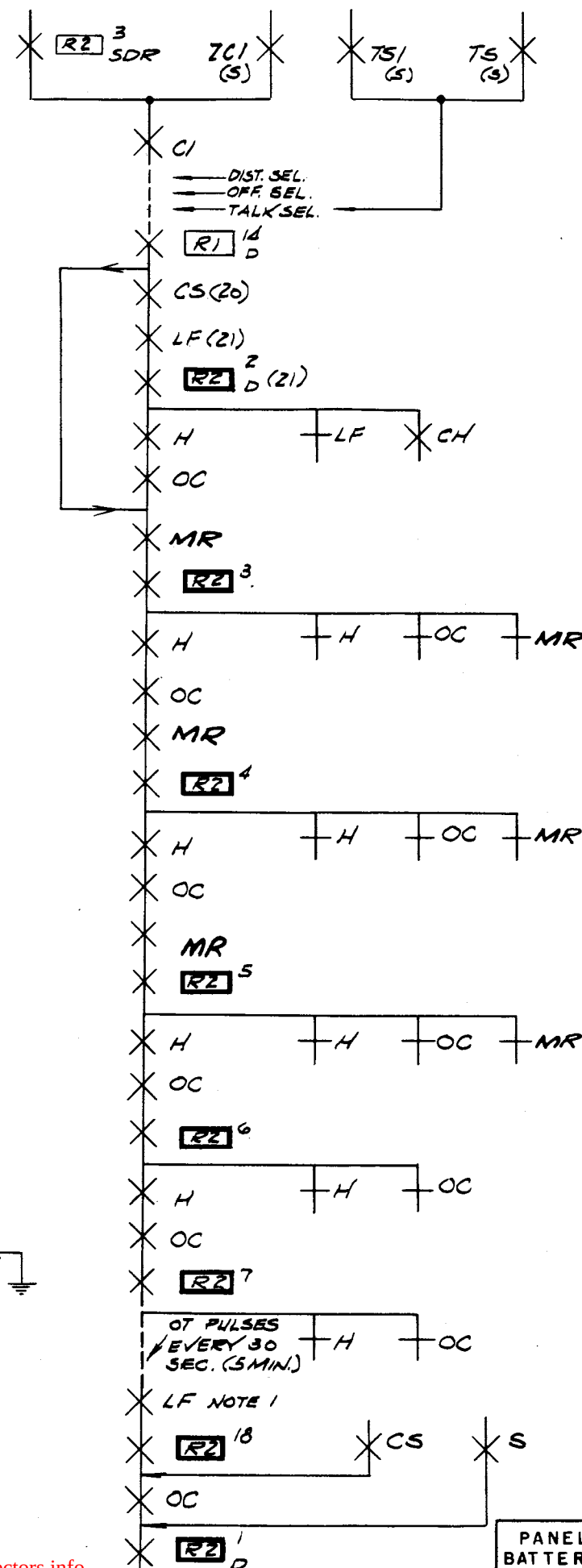
LINE CIRCUIT



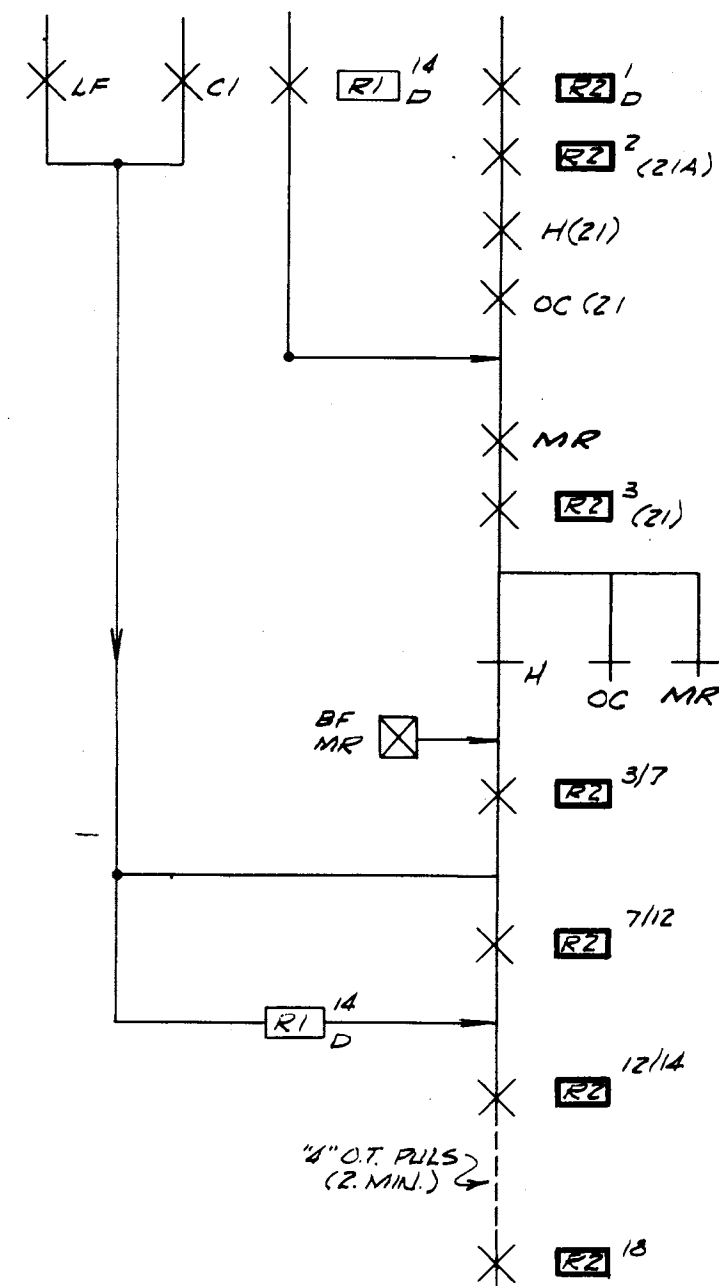
LINE FINDER



INITIAL CHARGE (3 REG 5 MIN.)



OVERTIME CHARGE (1 REG EVERY 2 MIN.)



NOTES
1. LF OPR'S IN POS 16/17 R2 AND REMAINS LOCKED UP FOR DURATION OF CALL.

SD-21405-011-012 FIG 1 & B

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

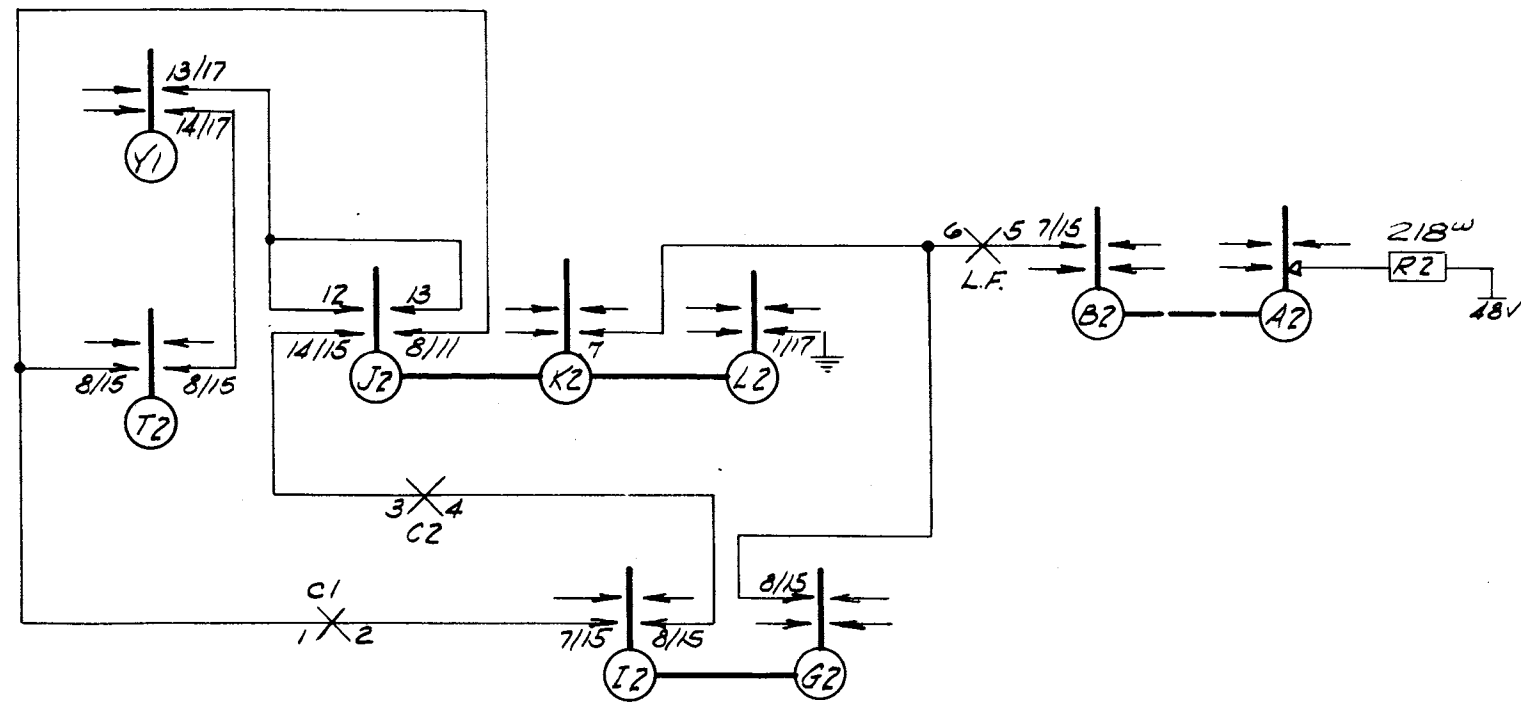
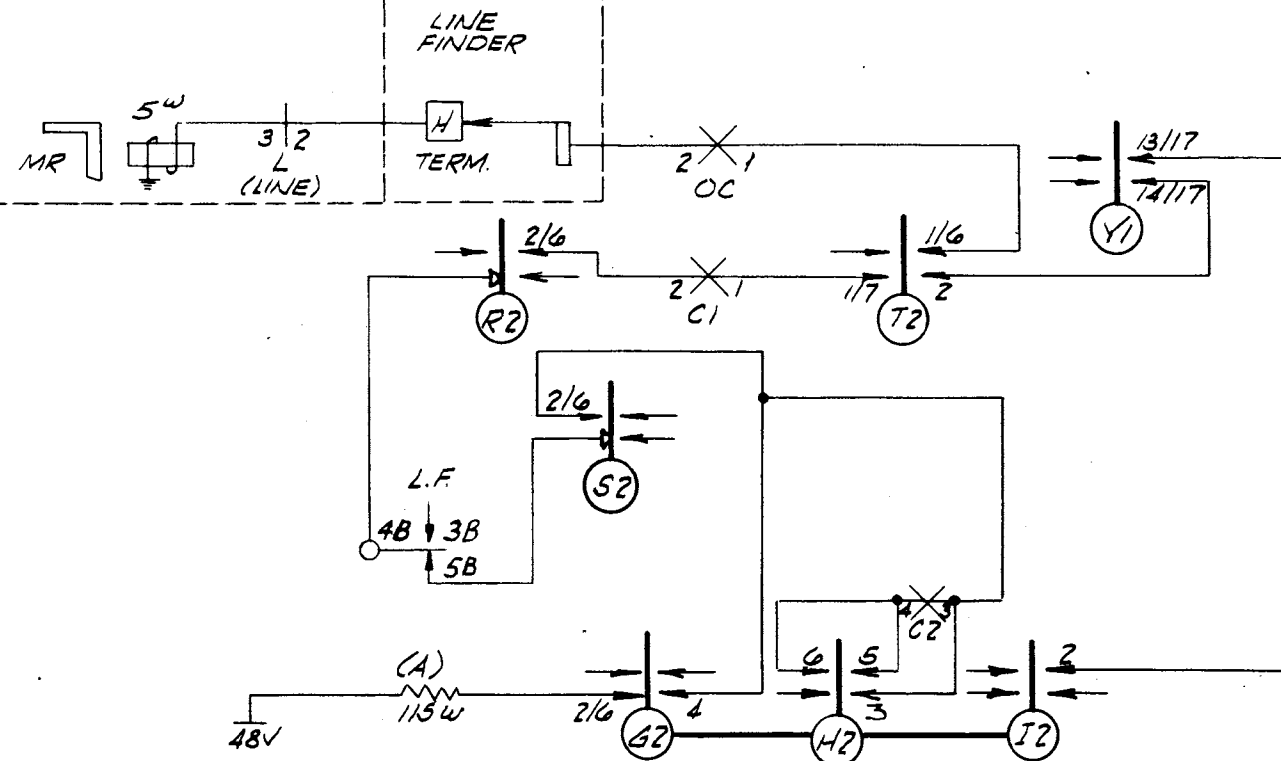
ZONE 3
INITIAL CHARGE
AND OVERTIME

PANEL SYSTEM
BATTERY CUT-OFF

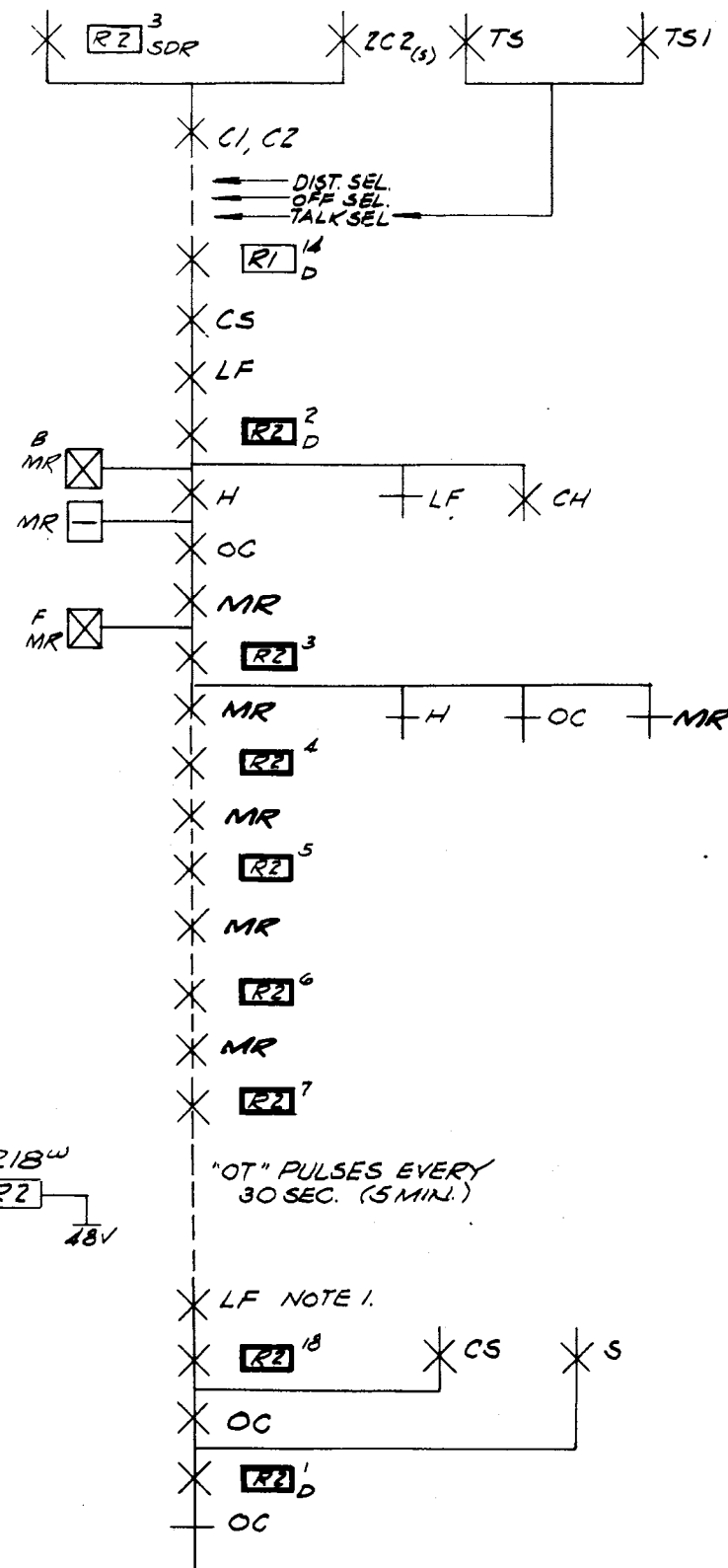
J. LAWLESS
DRAWN-N.B. MILLER

OS-21B

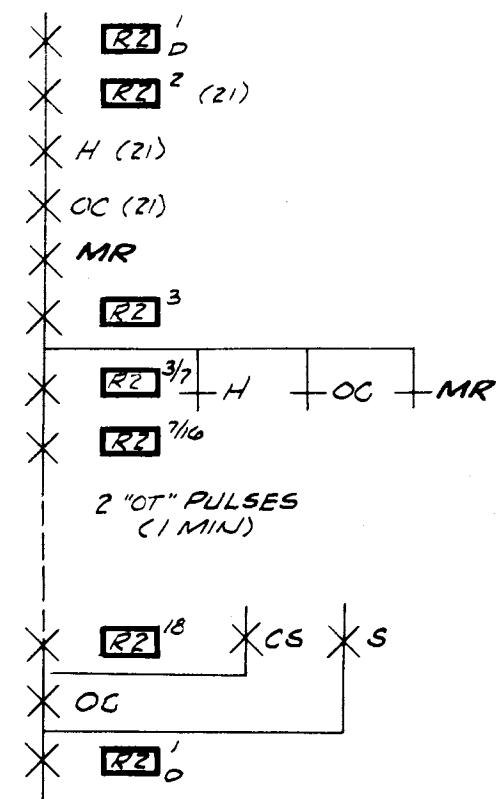
ISSUE
10-10-49



INITIAL CHARGE (5 REG — 5 MIN.)



OVERTIME CHARGE (1 REG EVERY MIN.)



NOTE:
1. LF OPERATES IN POS. 16/17 AND
REMAINS LOCKED UP FOR
DURATION OF CALL.

SD 21405-011-012 FIG 1 & B

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

ZONE 5
INITIAL CHARGE
AND OVERTIME

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
DRAWN-N.B. MILLER

OS-21D

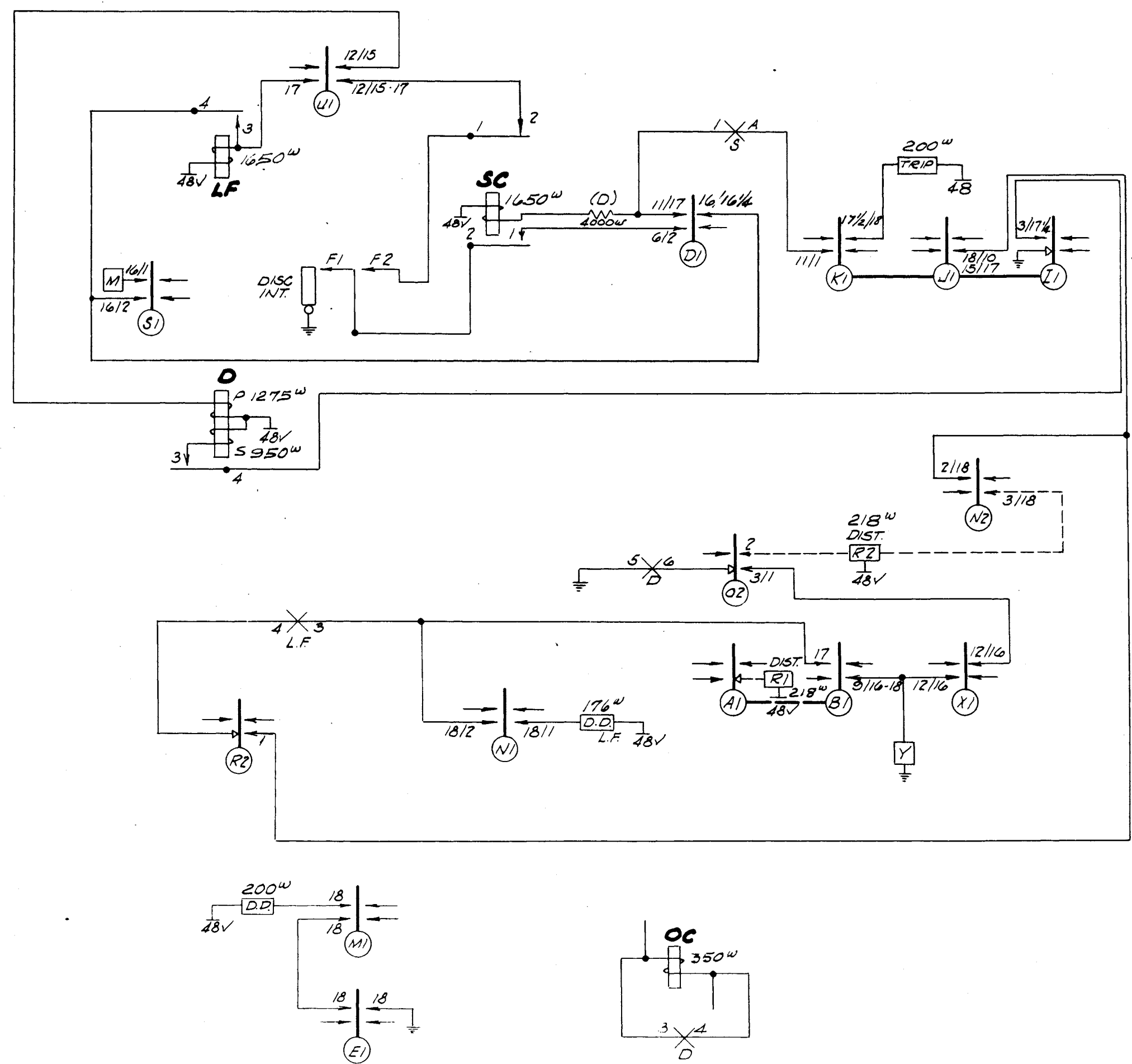
[illegible]

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

RELEASE OF DISTRICT
CHARGE CALL

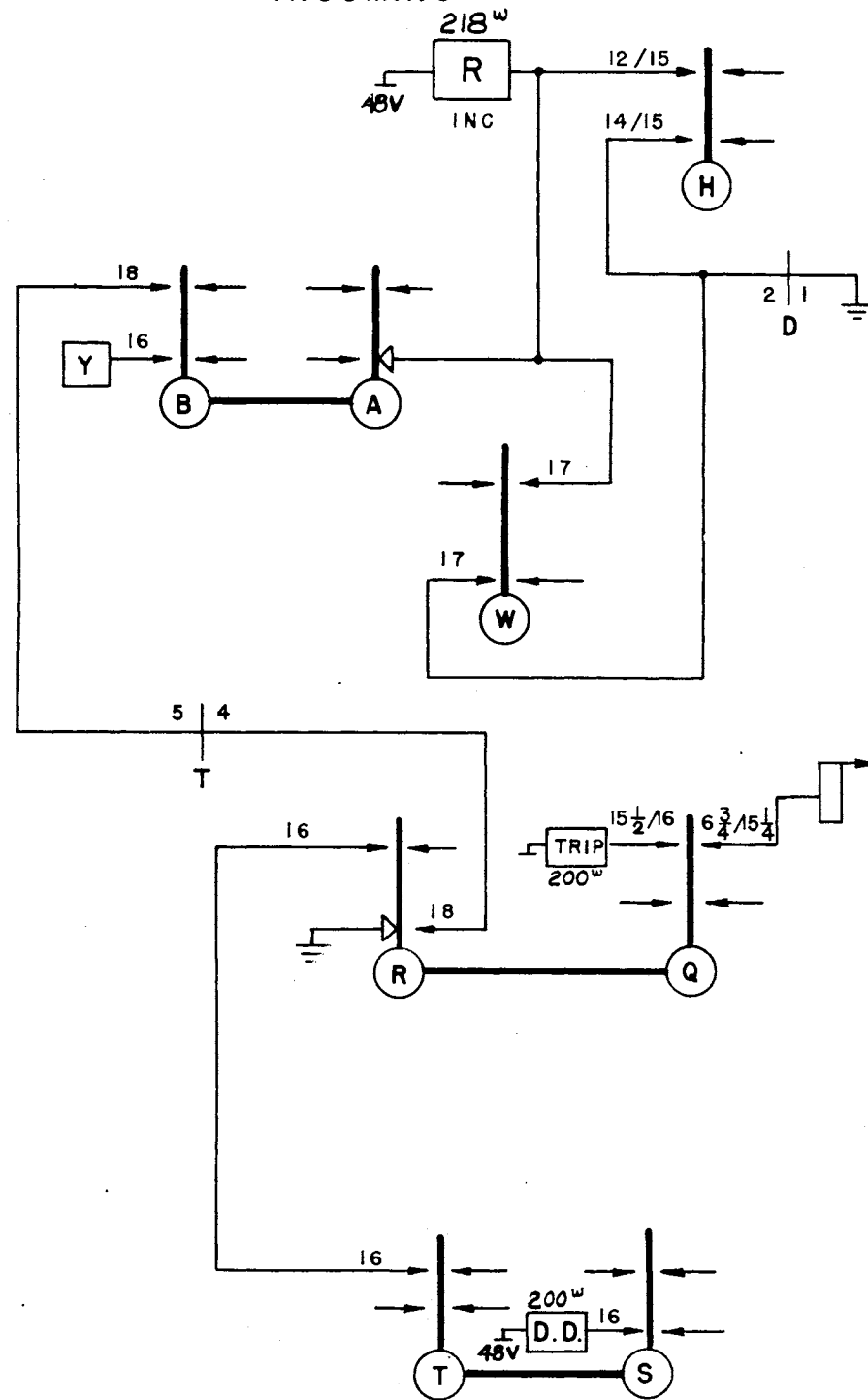
J. LAWLESS	OS-22
DRAWN - N. B. MILLER	

PANEL SYSTEM
BATTERY CUT-OFF

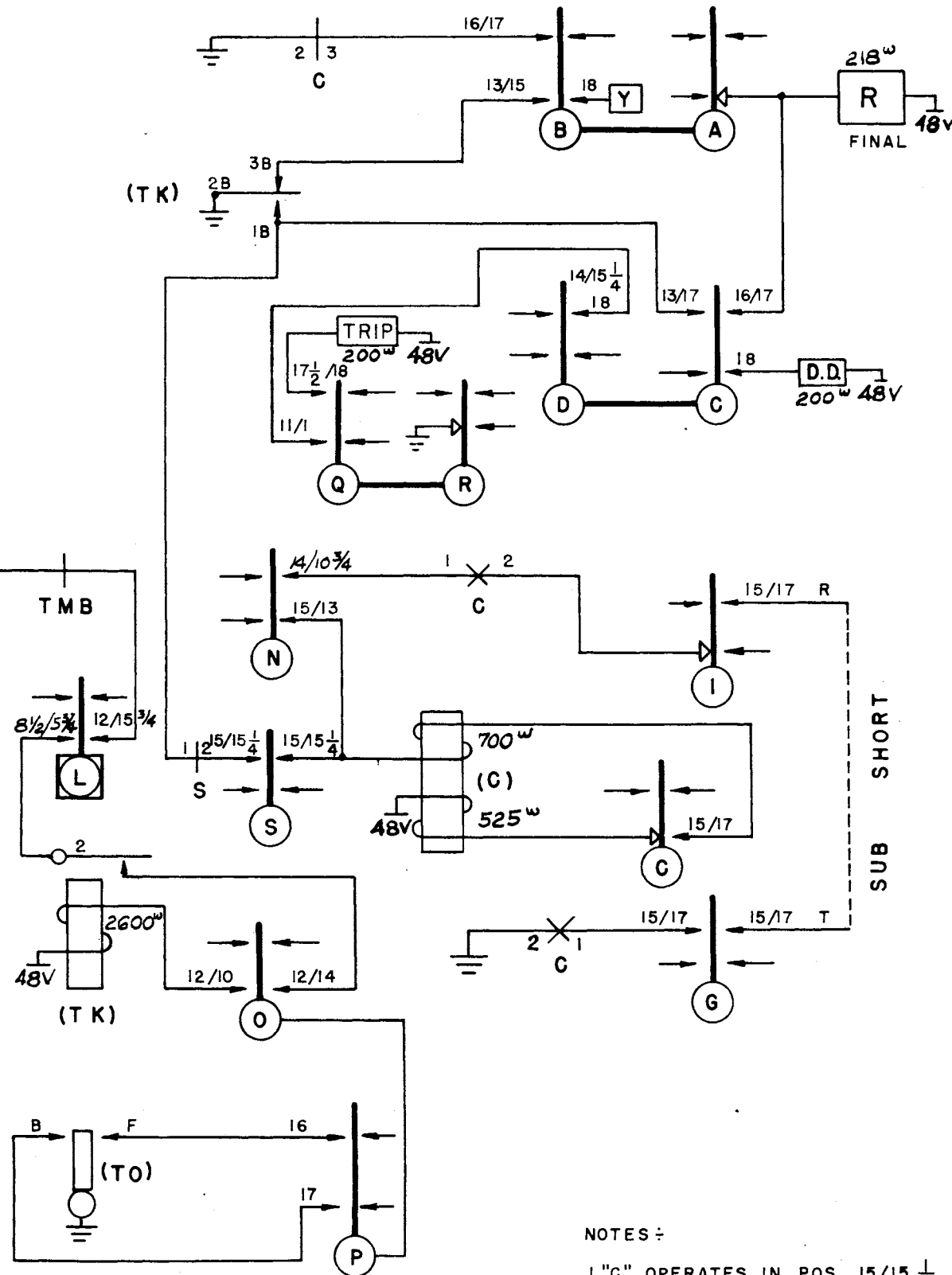


ISSUE
11-6-50

INCOMING



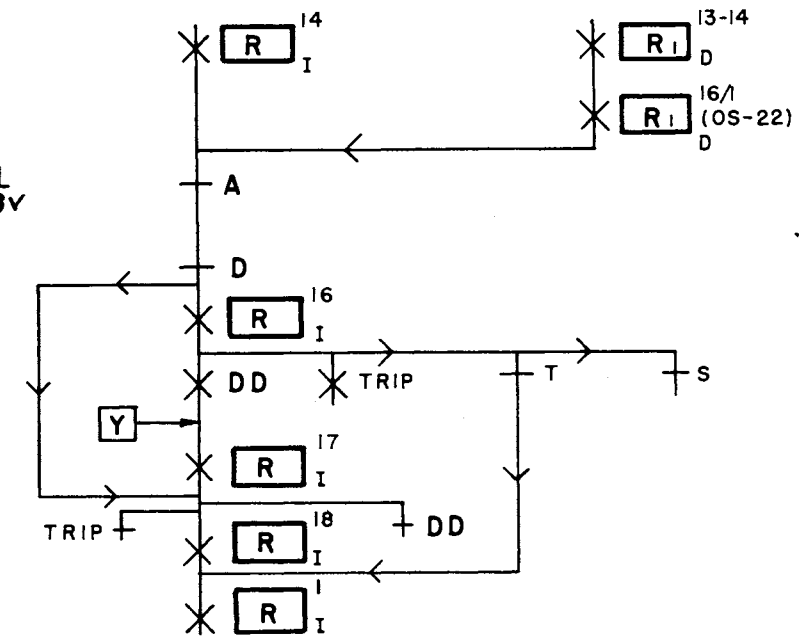
FINAL



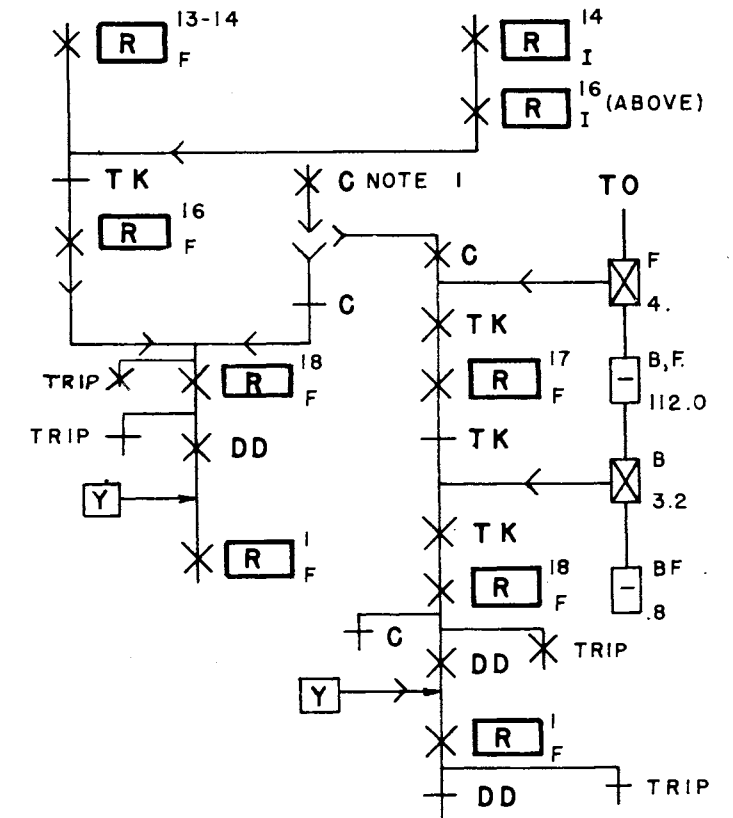
NOTES:

1."C" OPERATES IN POS. 15/15 $\frac{1}{4}$
AND LOCKS TO POS. 17 IF R.O.H.
OTHERWISE "C" RELEASES IN
POS. 16

INCOMING



FINAL



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

RELEASE OF
INCOMING & FINAL

PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS

OS-23

155UE 1
10-10-49



Diagram 1: TMS NOTE 1 (1). Components: TMA, TM1 (RI²), TM, TMI (AL), TM (RI³), TM, TMI, TM (RI⁴), TM. Timing: 3 SEC., 27 SEC., 3 SEC., 27 SEC. Outputs: TMI, AL, TM, PS, ST.

Diagram 2: Components: TMA, TM (RI⁵), TM, TMI (CL3, XUL), TM (RI⁶), TM, TMI, TM (RI⁷), TM. Timing: 3 SEC., 27 SEC., 3 SEC., 27 SEC. Outputs: TMI, TM, TMI, TM, TMI, PARTIAL DIAL LAMP OR S.S. LAMP.

Diagram 3: Components: SEL, TM (RI⁸), TM (SD), TMI (SDI), TM (RI⁹), TM, TMI, TM, TMI (RI¹⁰), TM, TMI, TM (RI¹¹), TM, TMI, TM (RI¹²), TM. Timing: 3 SEC., 27 SEC., 3 SEC., 27 SEC., 3 SEC., 27 SEC., 3 SEC., 27 SEC., 3 SEC., 27 SEC., 3 SEC., 27 SEC. Outputs: SD, SDI, TMI, TMI, TMI, TMI, TMI, TMI, TMI, TMI, TMI, TMI.

Diagram 4: Components: TMA, TM (RI¹⁵), TM, TMI (RI¹⁶), TM, TMI, TM (RI¹⁷), TM (NOTE 2, C, TW), TMI, TM (RI¹⁸), TM. Timing: 3 SEC., 27 SEC., 3 SEC., 27 SEC., 3 SEC., 27 SEC., 3 SEC., 27 SEC. Outputs: TMI, TMI, TMI, TMI, TMI, TMI, TIME TO COMPLETE, S.S. LAMP.

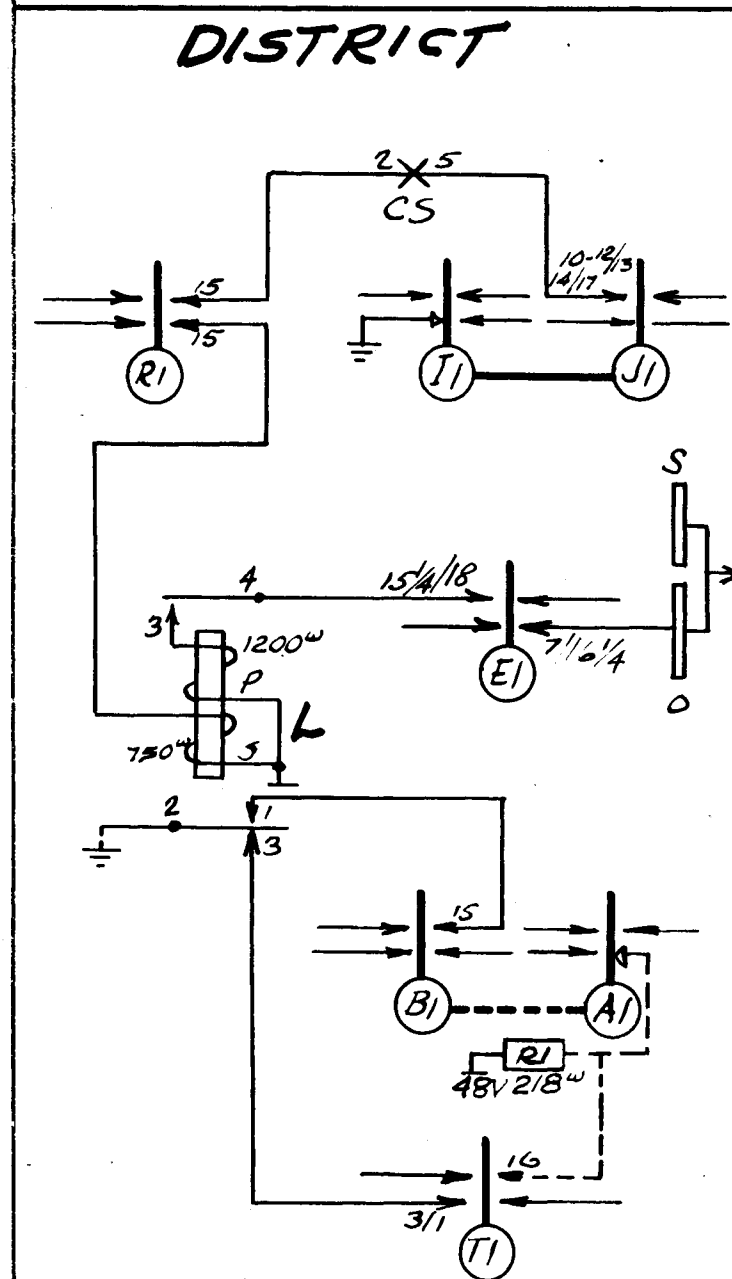
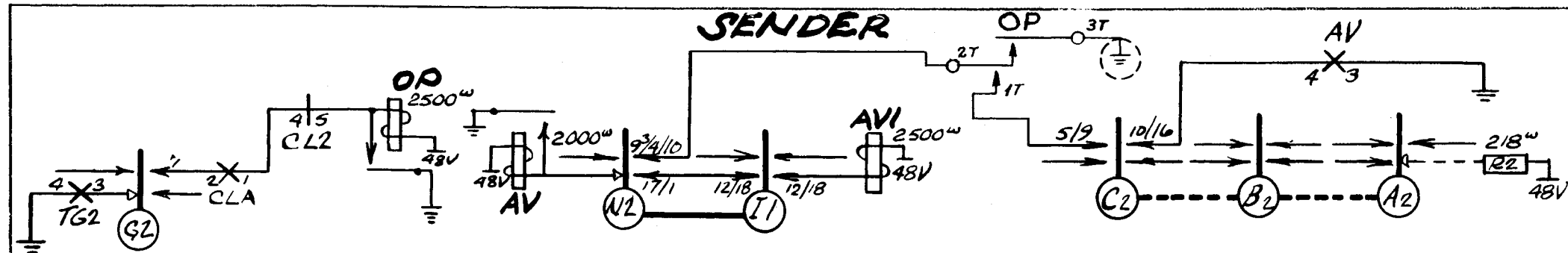
STA DELAY

PANEL SYSTEM
BATTERY CUT-OFF

J.LAWLESS
DRAWN-T.E.WESSEL

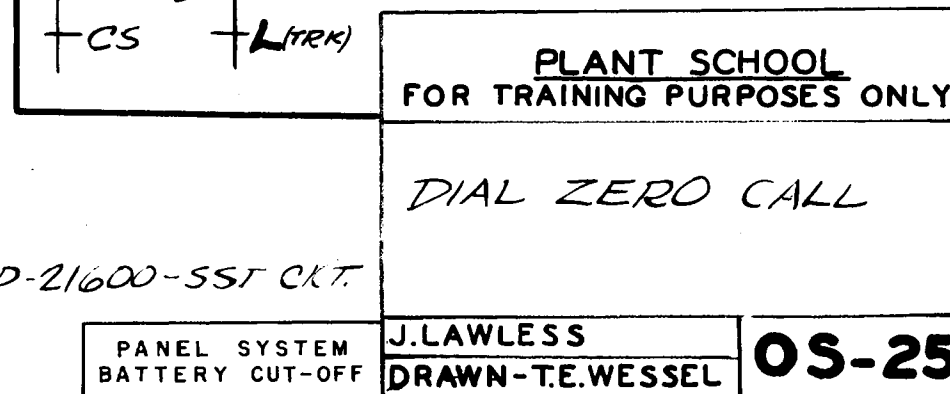
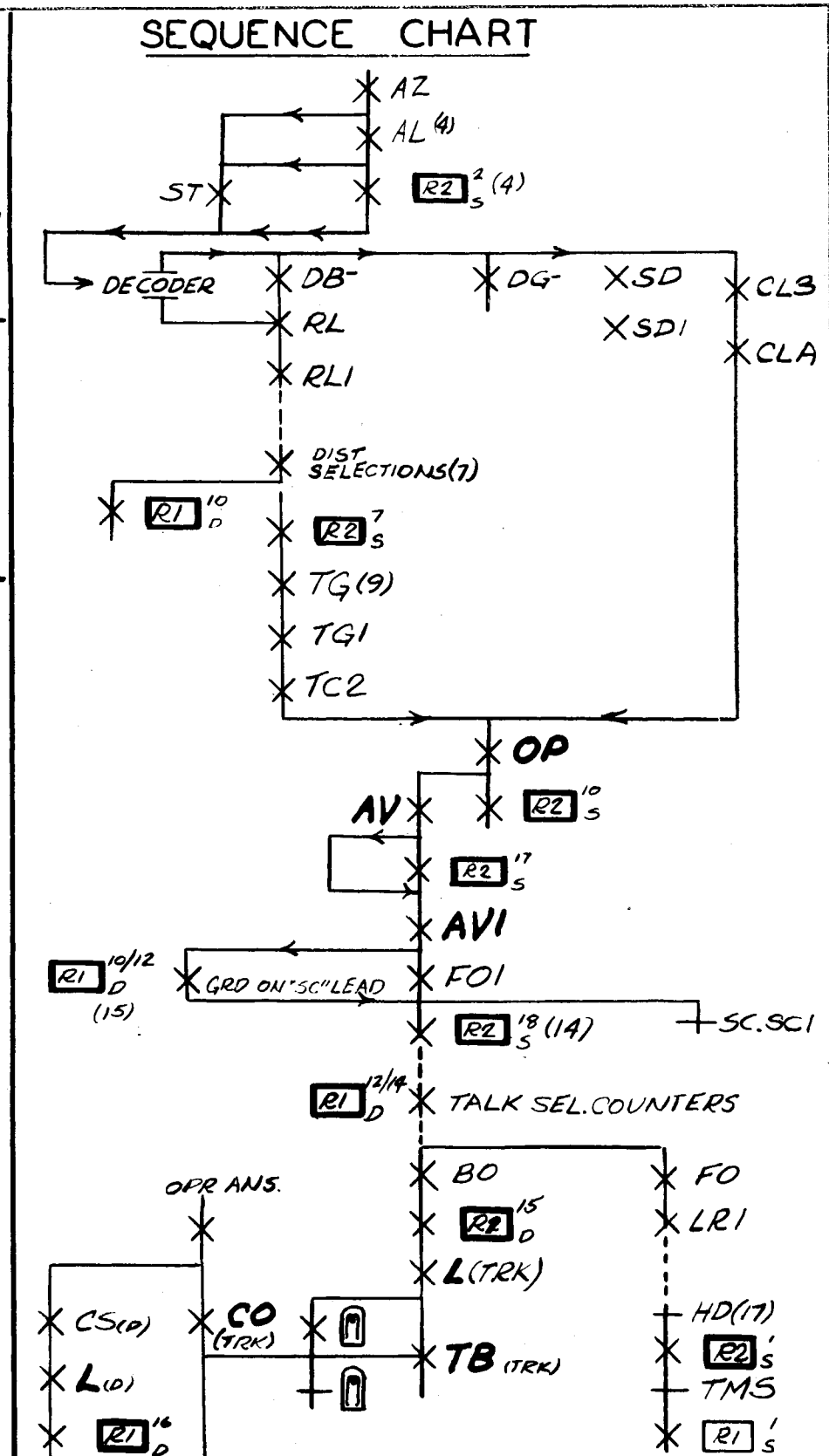
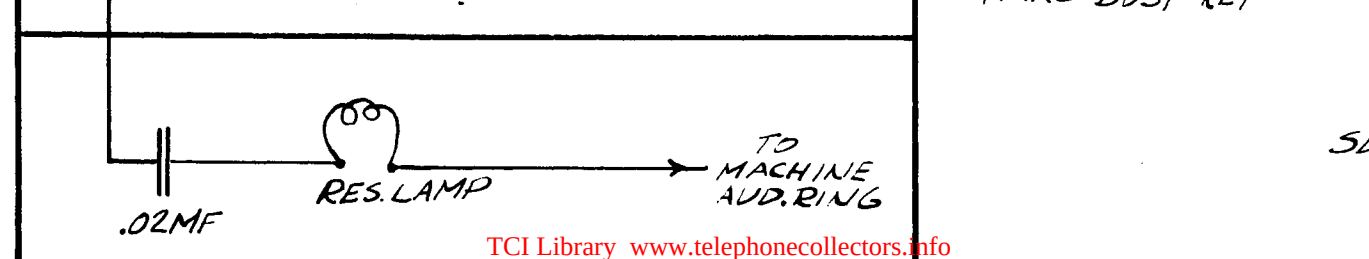
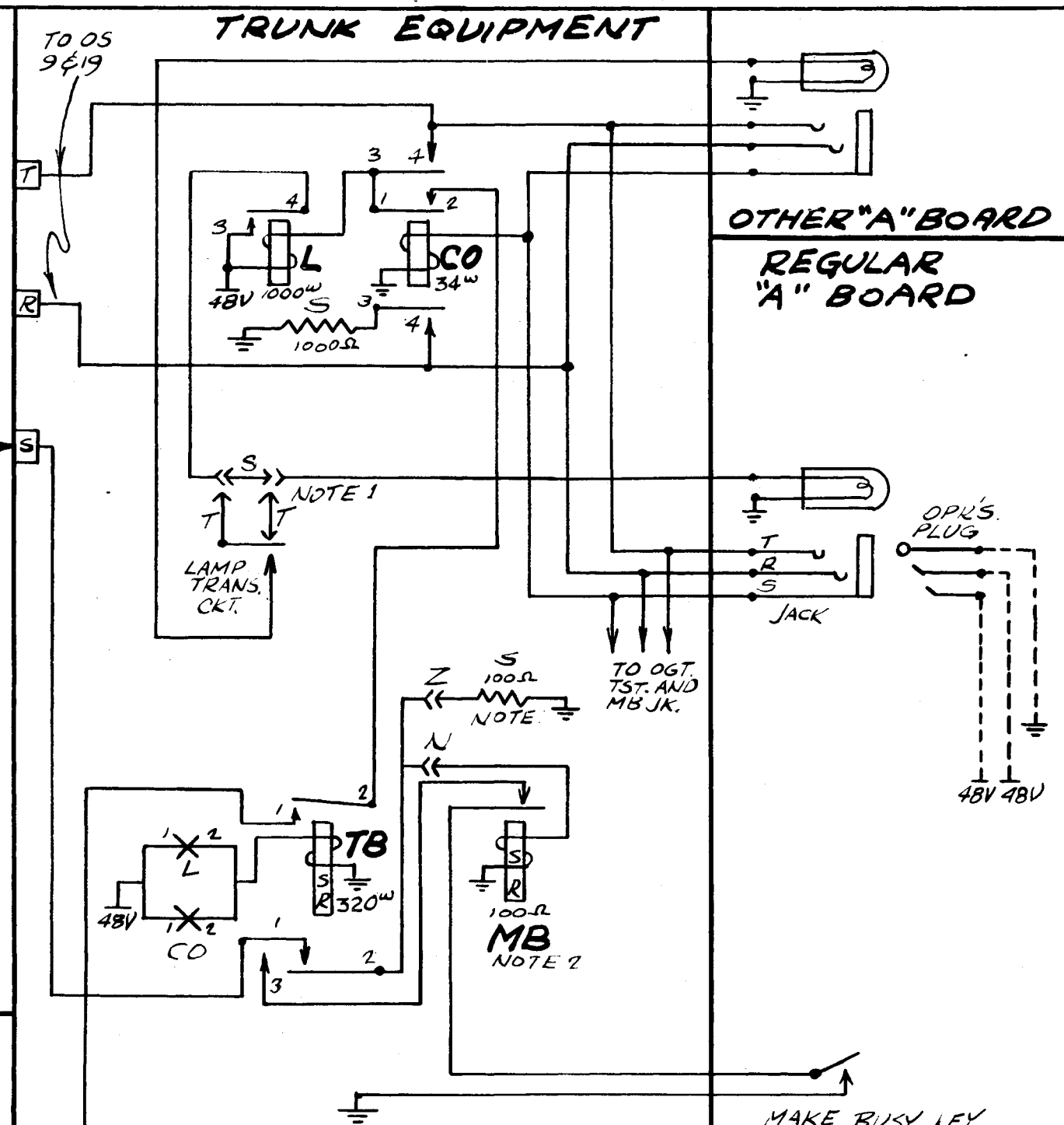
OS-24

ISSUED
10-14-49

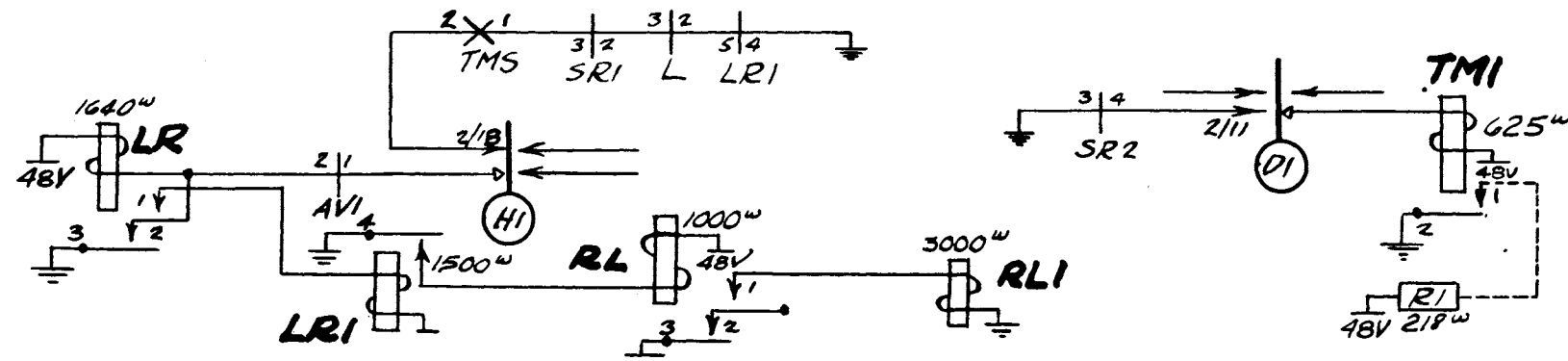


NOTES:

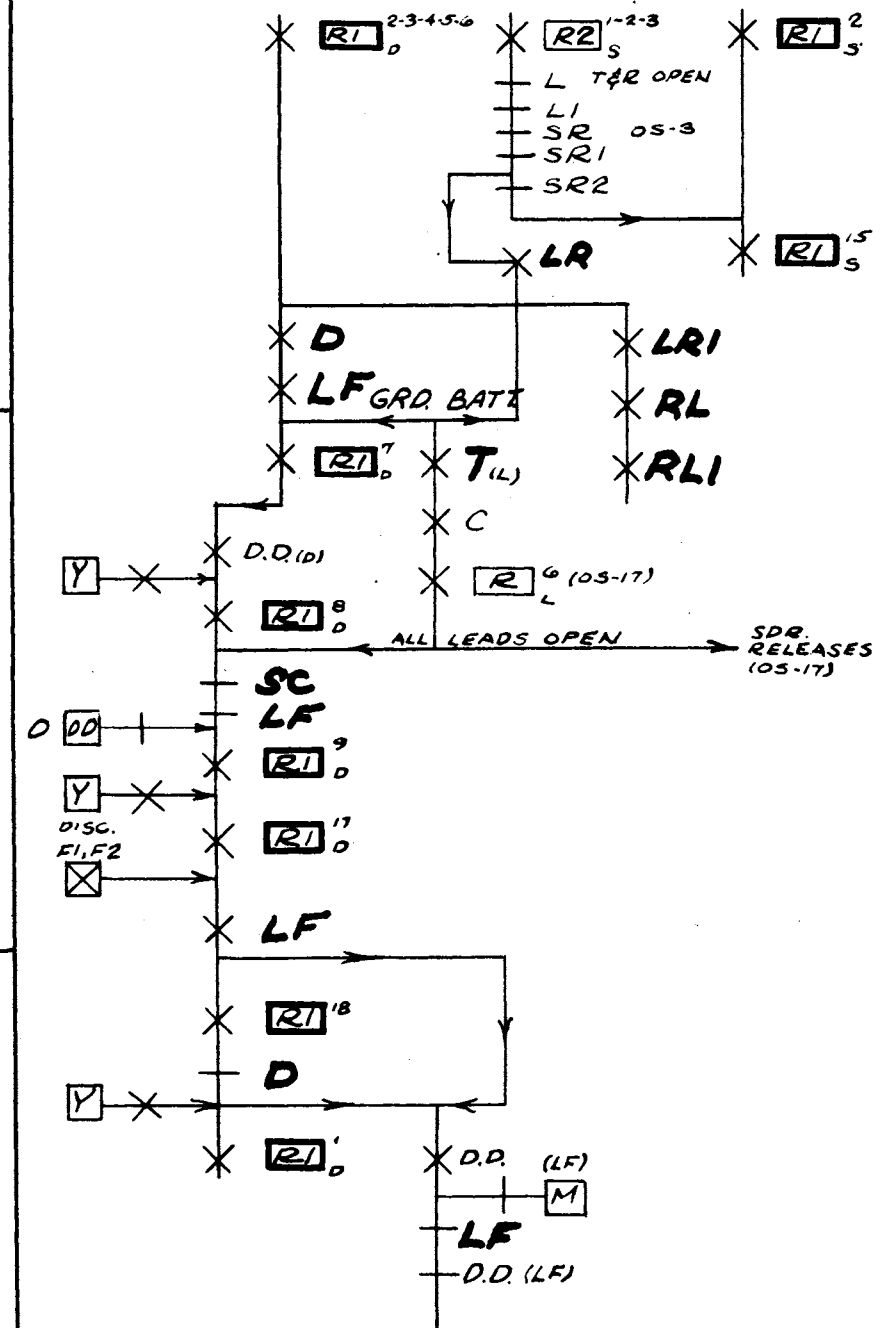
1. USE WIRING NETS IF TRUNK HAS ONLY ONE APP. USE WIRING Z & T IF TRUNK HAS TRANS. EQUIP.
2. "MB" IS SLOW TO REL TO HAVE MOMENTARY OPEN ALLOWING DIST. "L" TO REL WHEN CALL IS COMPLETE, IF KEY WAS THROWN WHEN CALL WAS GOING ON.



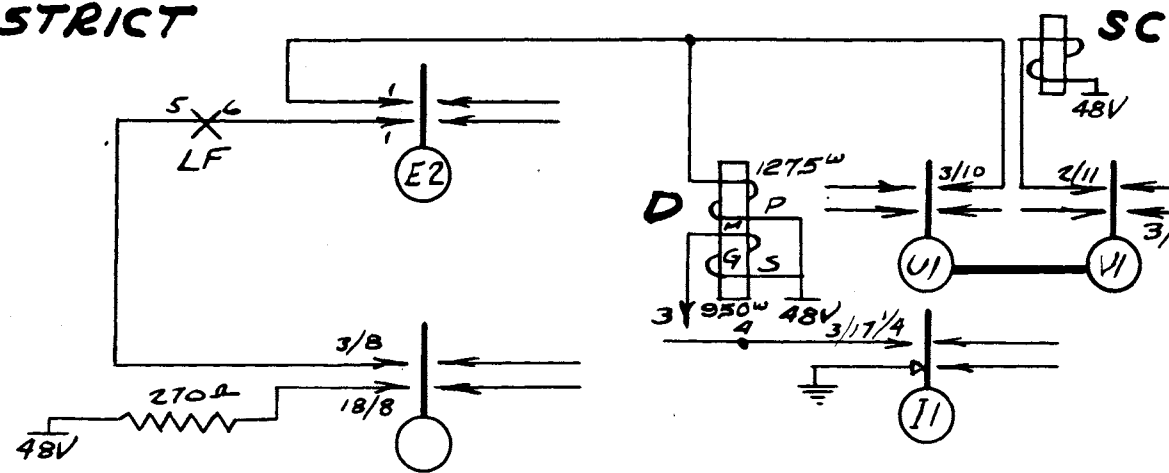
SENDER



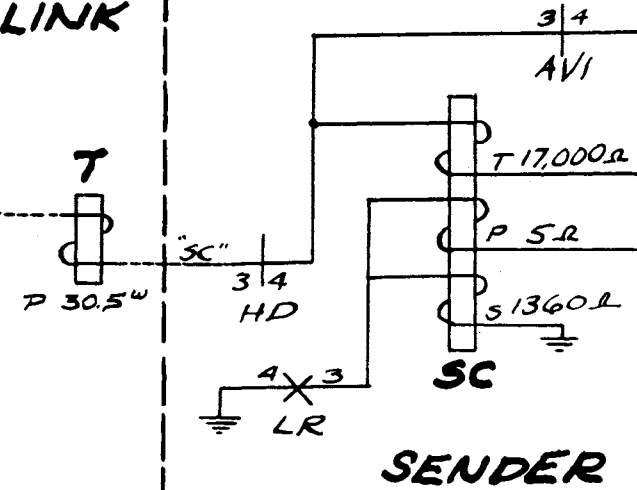
SEQUENCE CHART



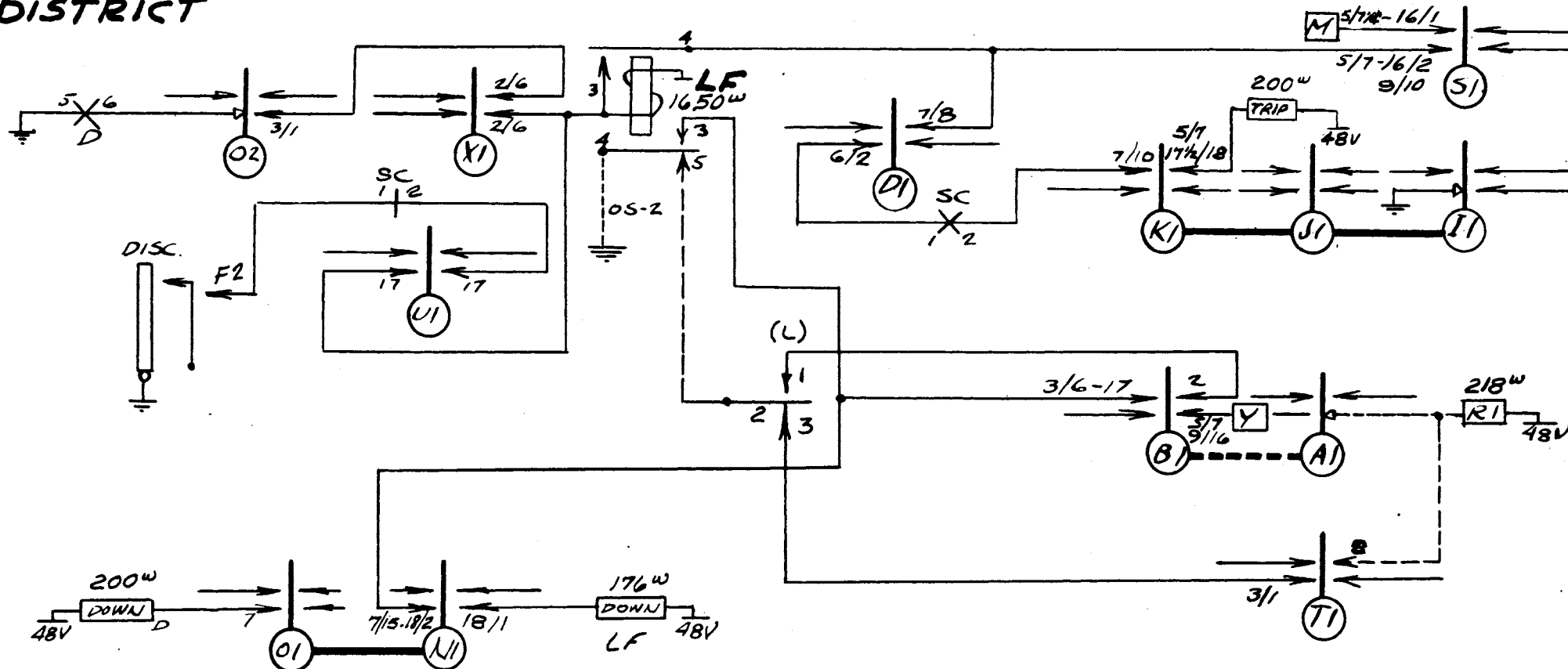
DISTRICT



LINK



DISTRICT



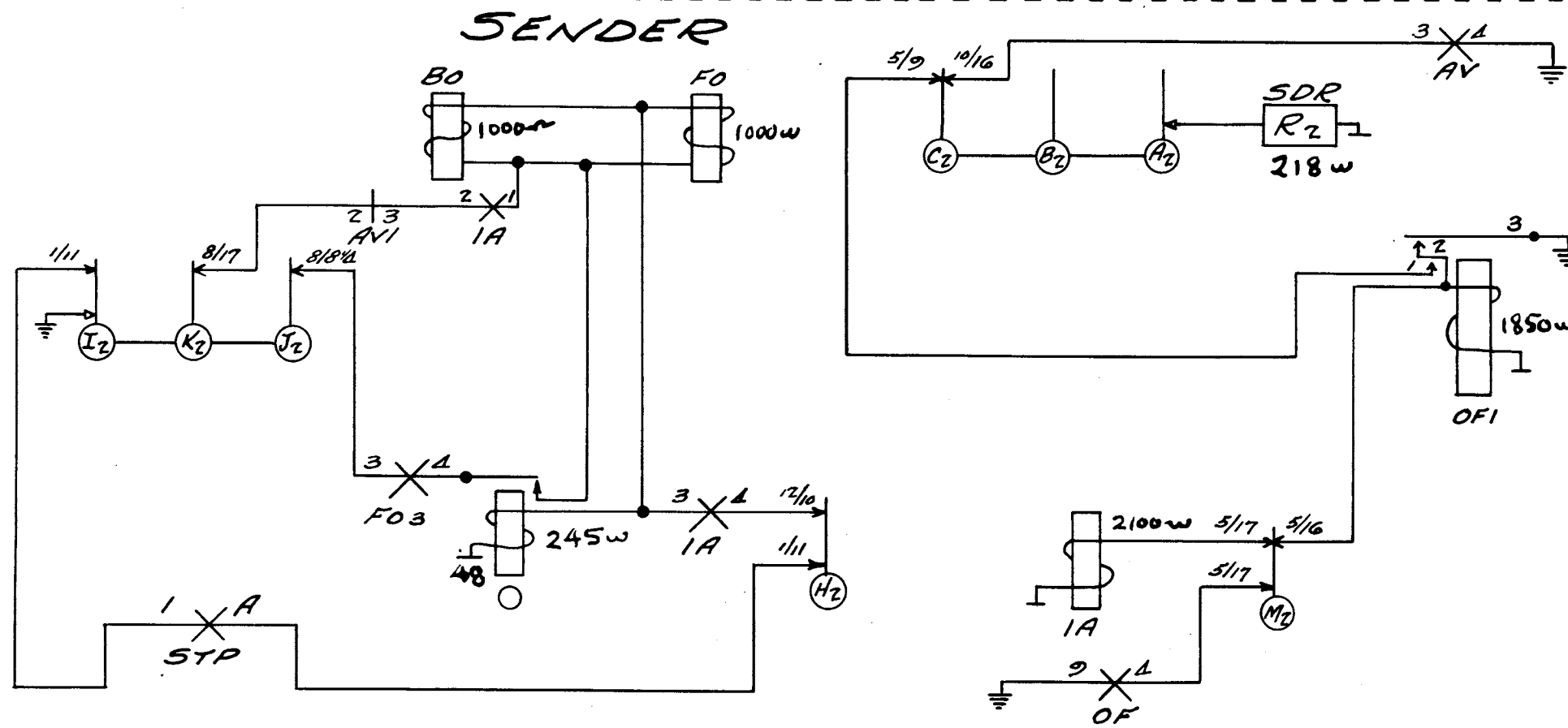
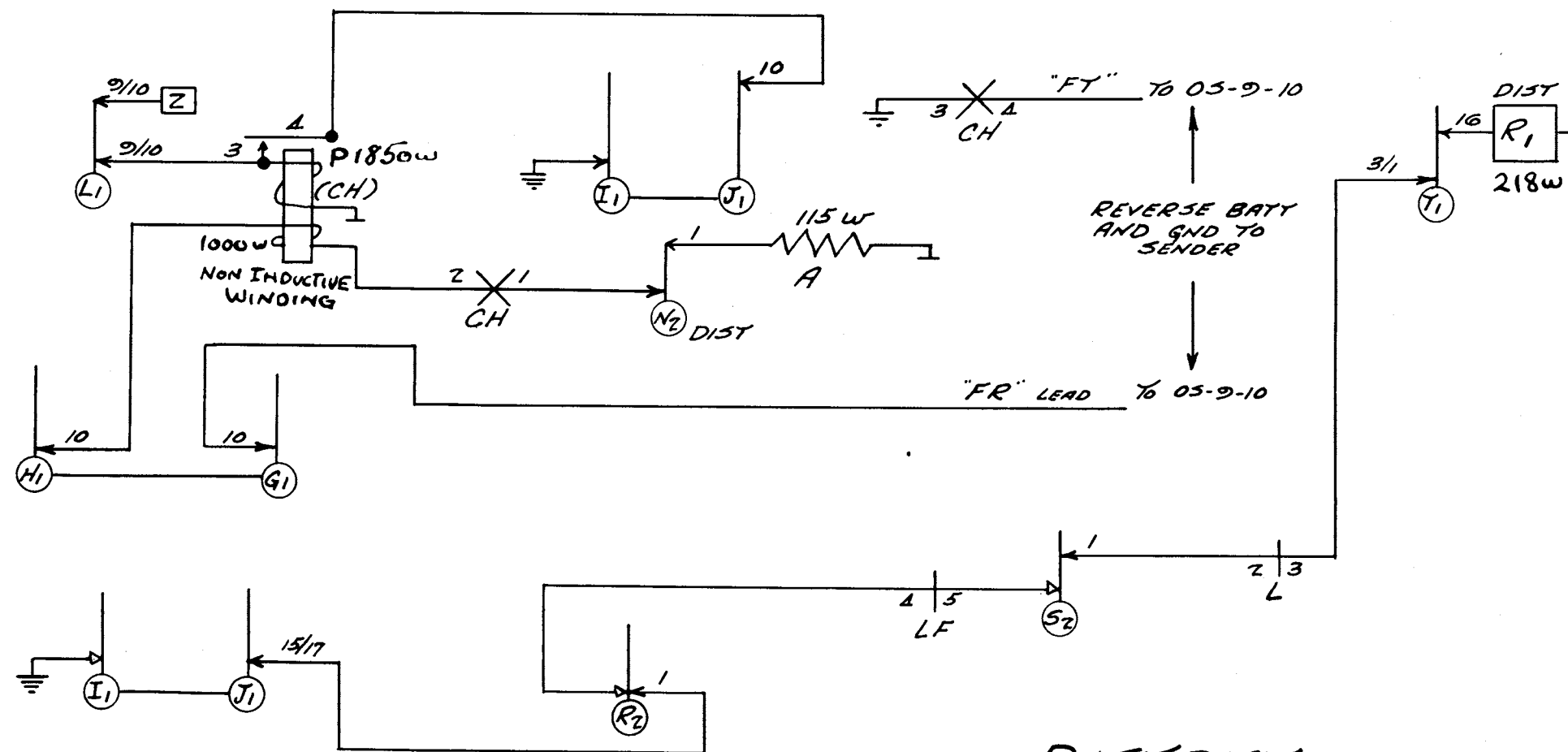
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

EARLY RELEASE
DIST. POS. 2/6 SDR. POS 1/3

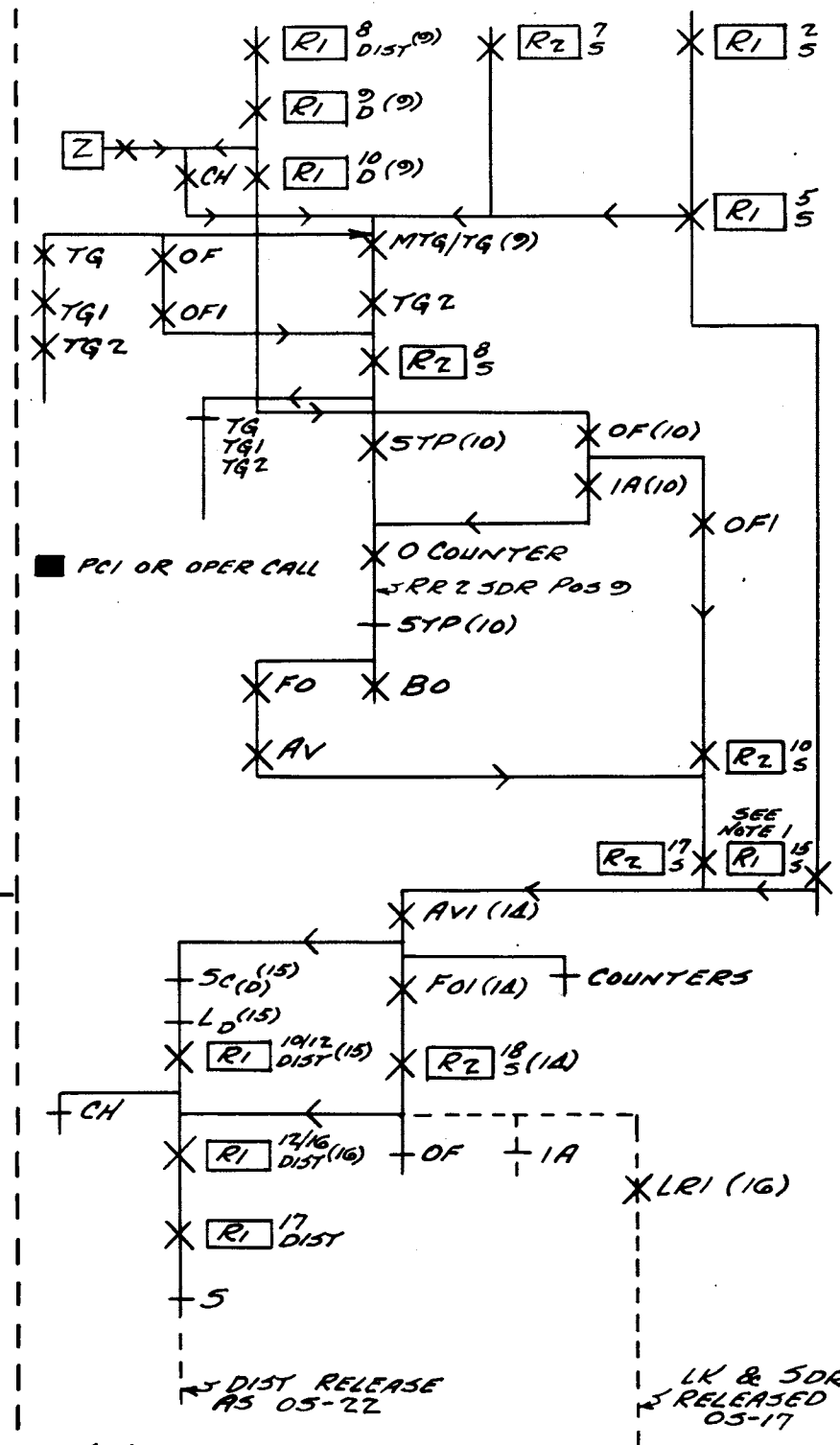
PANEL SYSTEM
BATTERY CUT-OFF

J. LAWLESS
F DRAWN T.E.WESSEL

OS-26



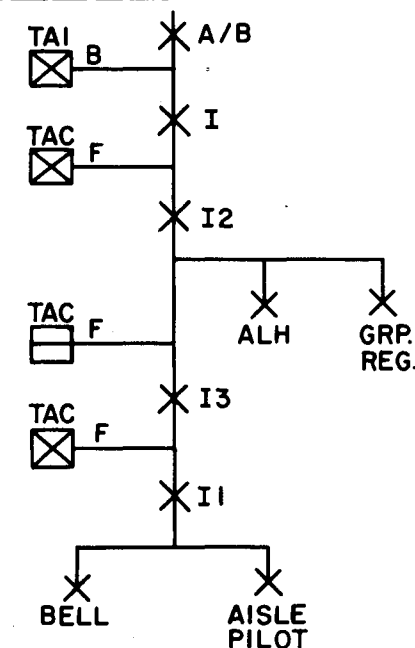
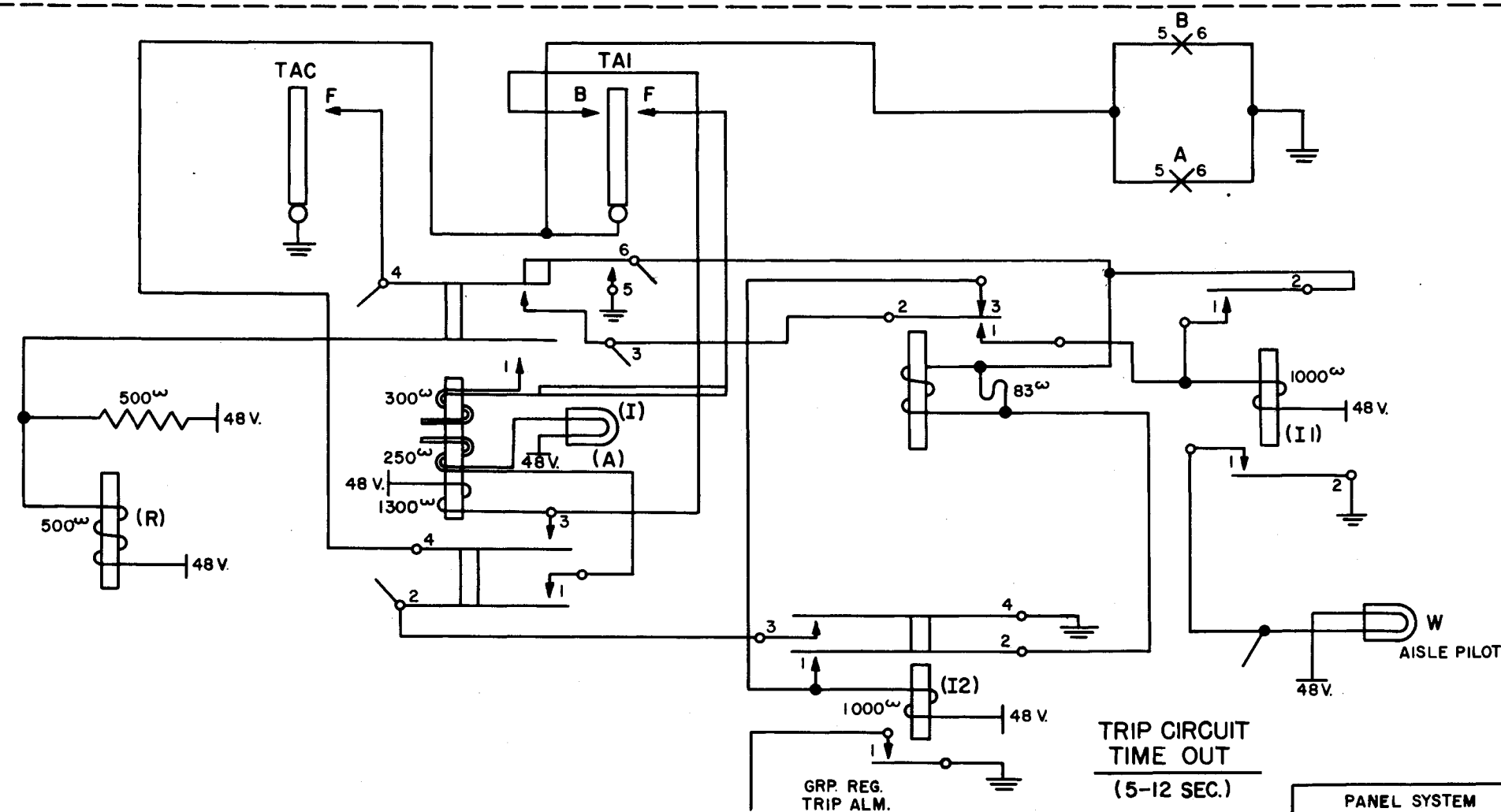
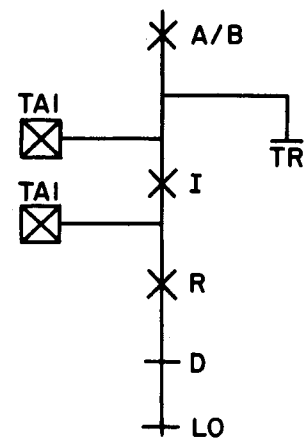
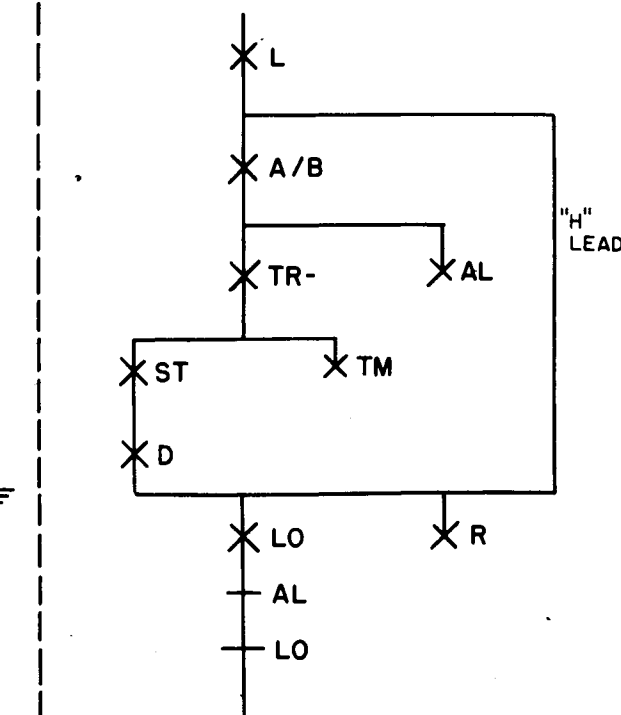
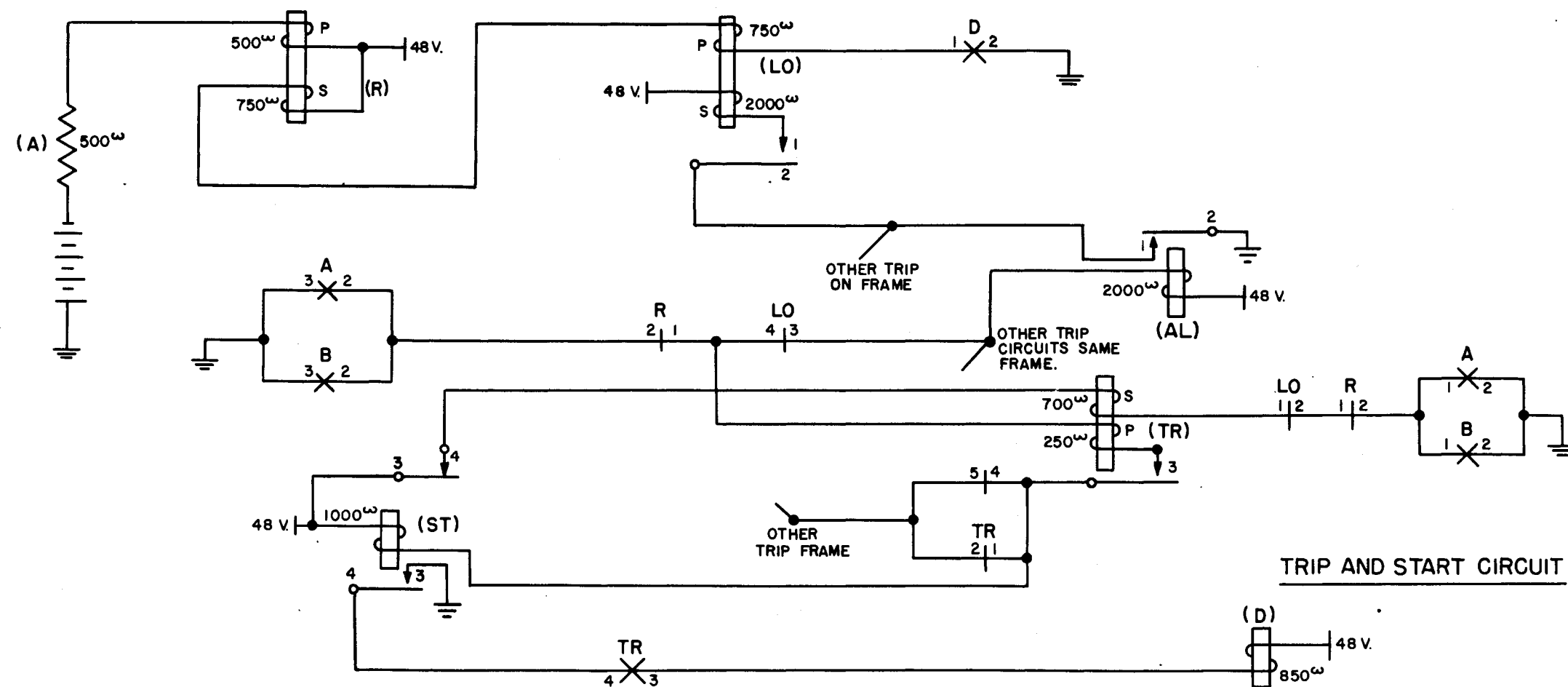
SEQUENCE CHART



NOTES:
1. WHEN DAILING IS COMP.
R1 IS ADV TO POS 15

PANEL SYSTEM	PLANT SCHOOL	
CUT OFF	DISTRICT OVERFLOW ON	
BATTERY	FULL MECHANICAL OR PCI CALL	
	J. MAY	05 # 27
	DRAWN BY E. SMITH	





PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

LINE, TRIP, START
AND LINK CIRCUITS

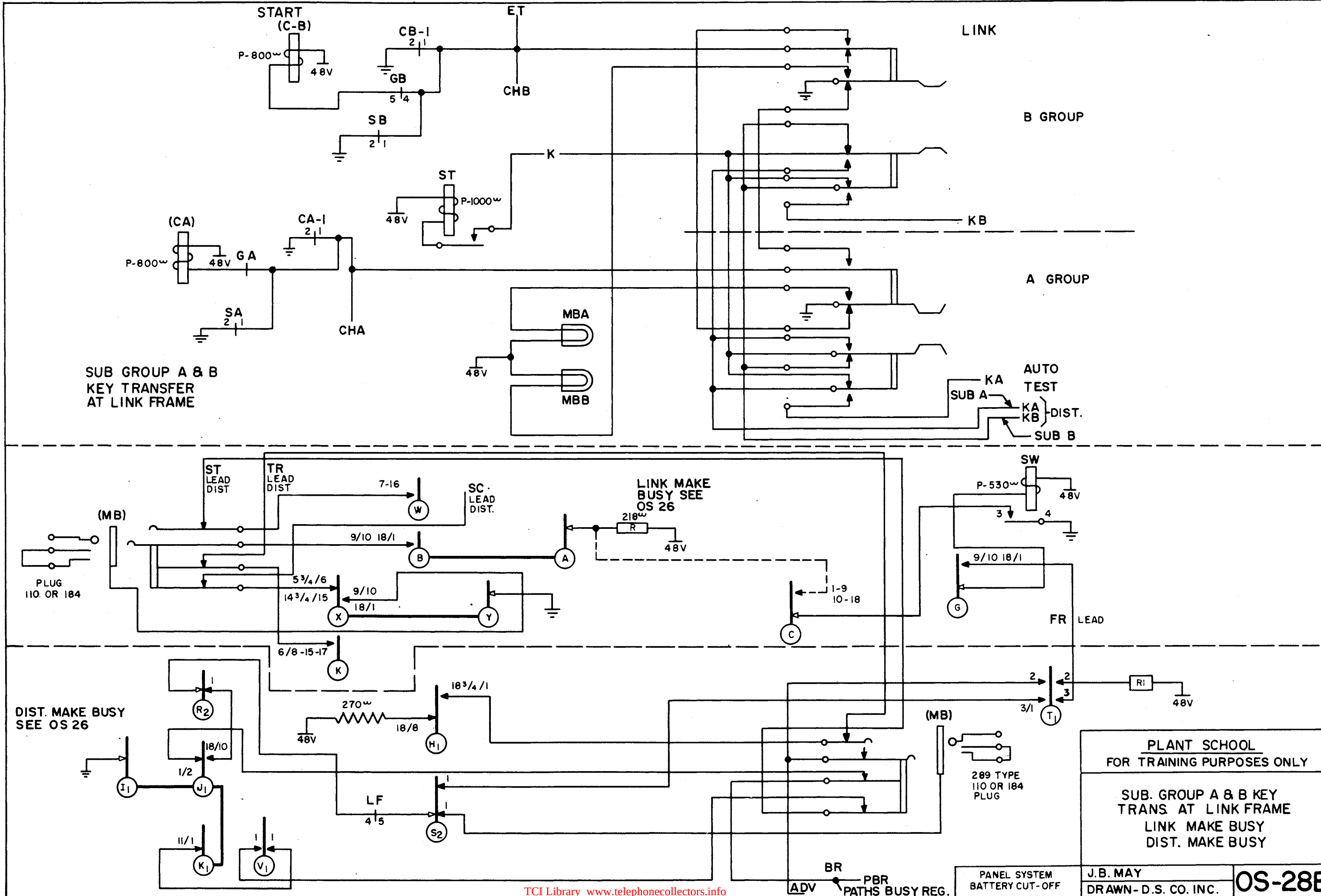
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN - D.S. CO. INC.

OS-28A

ISSUE 1
JAN. 1950

SUB GROUP A & B
KEY TRANSFER
AT LINK FRAME



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

SUB. GROUP A & B KEY
TRANS. AT LINK FRAME
LINK MAKE BUSY
DIST. MAKE BUSY

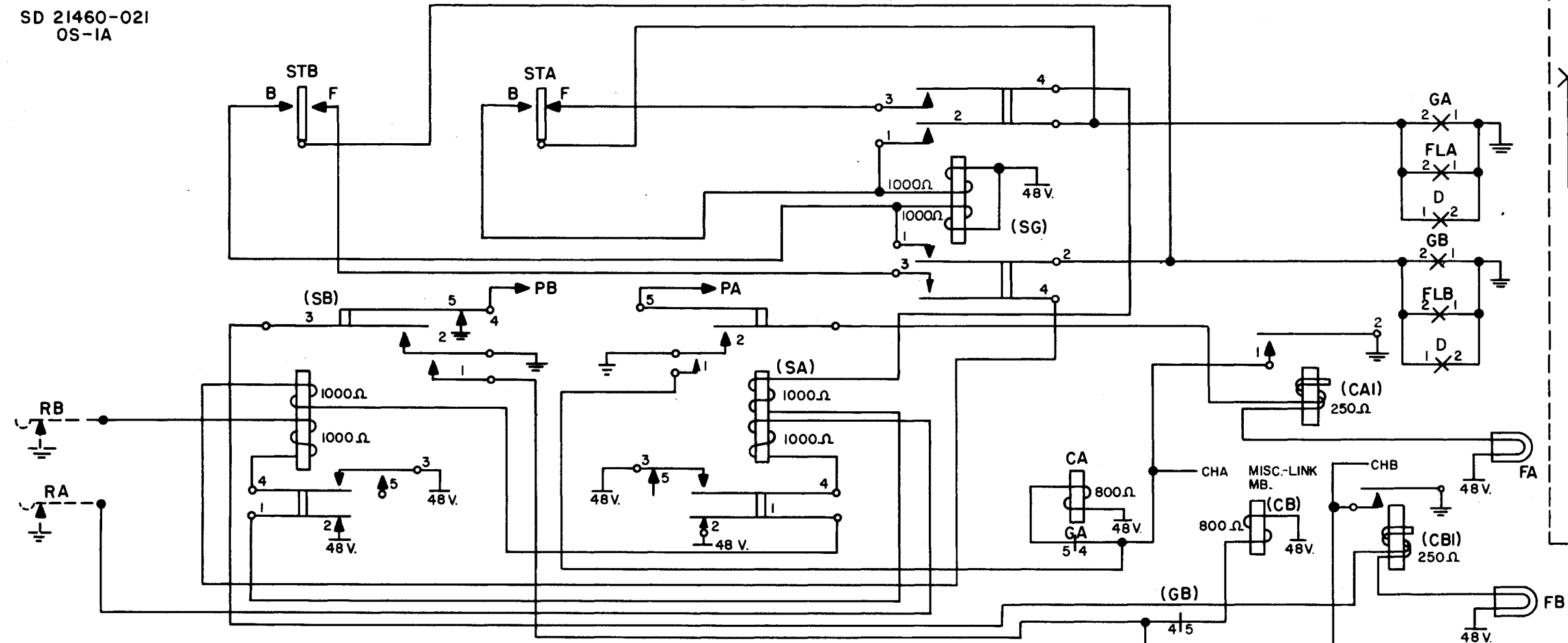
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN-D.S. CO. INC.

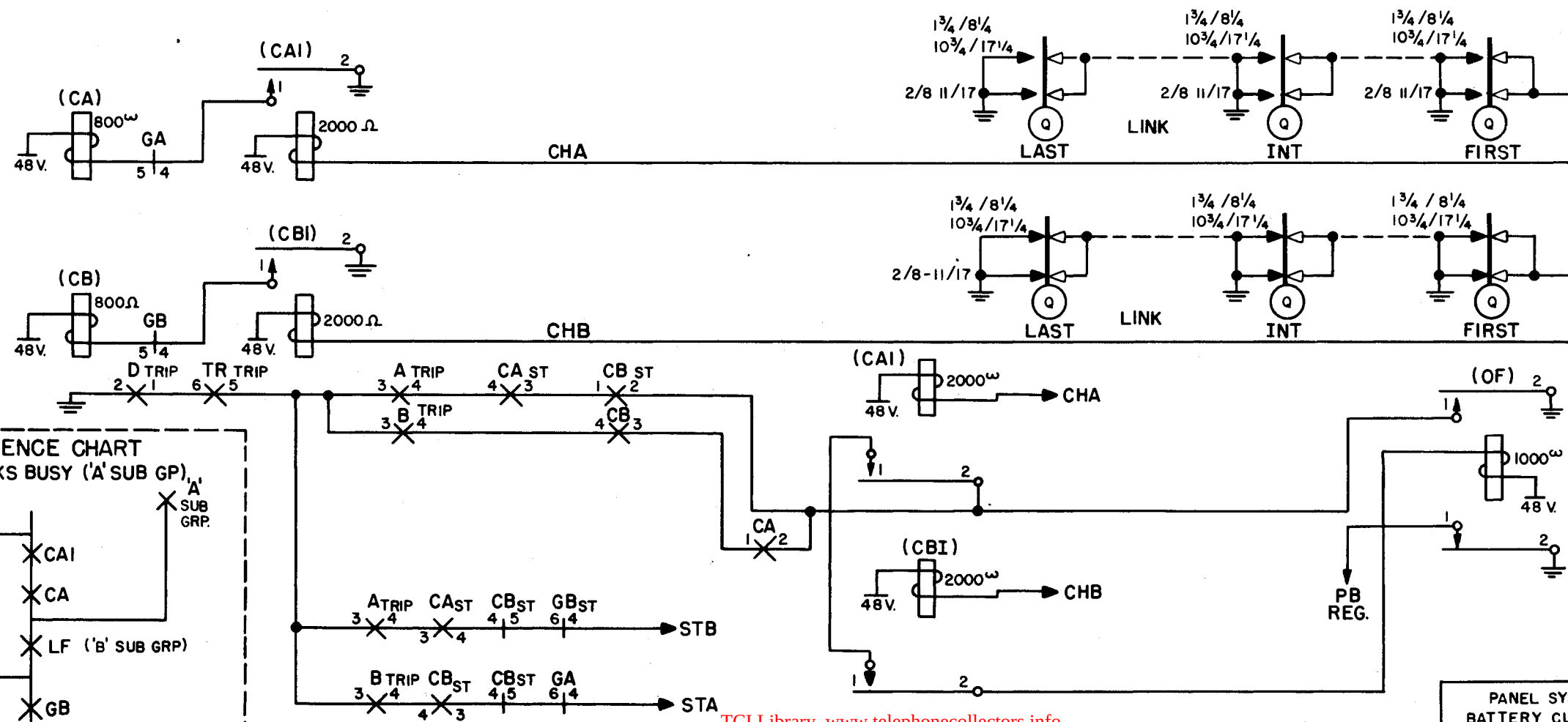
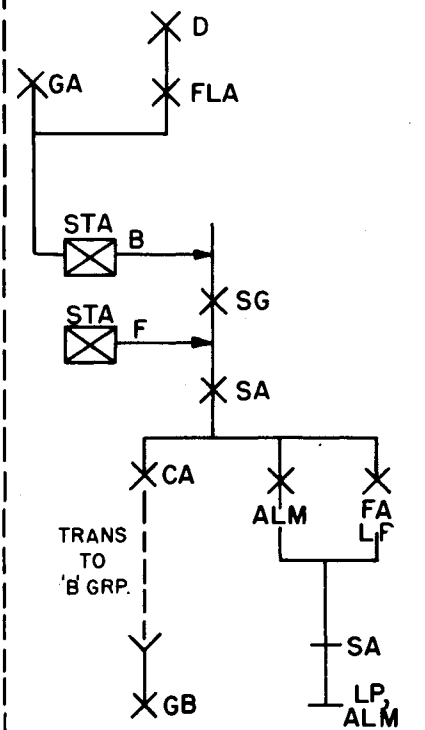
OS-28B

SD 21460-021
OS-1A

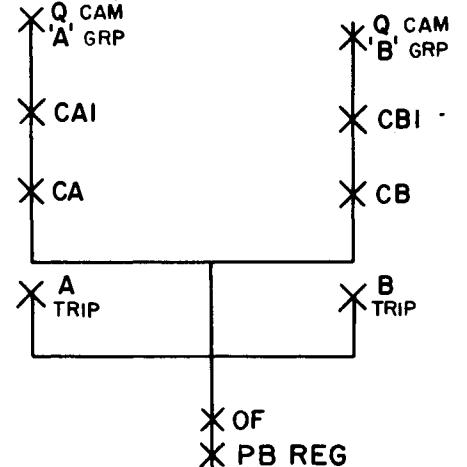
FAILURE A/B SUB GROUPS (START CKT)



SEQUENCE CHART



SEQUENCE CHART ALL LINKS BUSY - (A+B SUB GRPS)



SD 21460-011

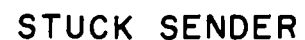
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

START CKT. FAILURE
ALL LINKS BUSY & OVFL.

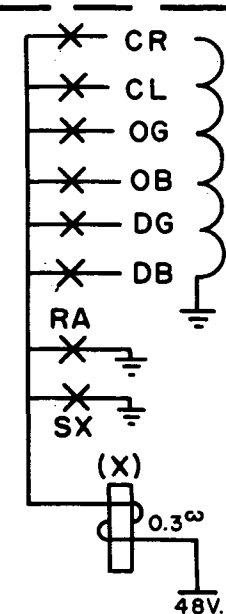
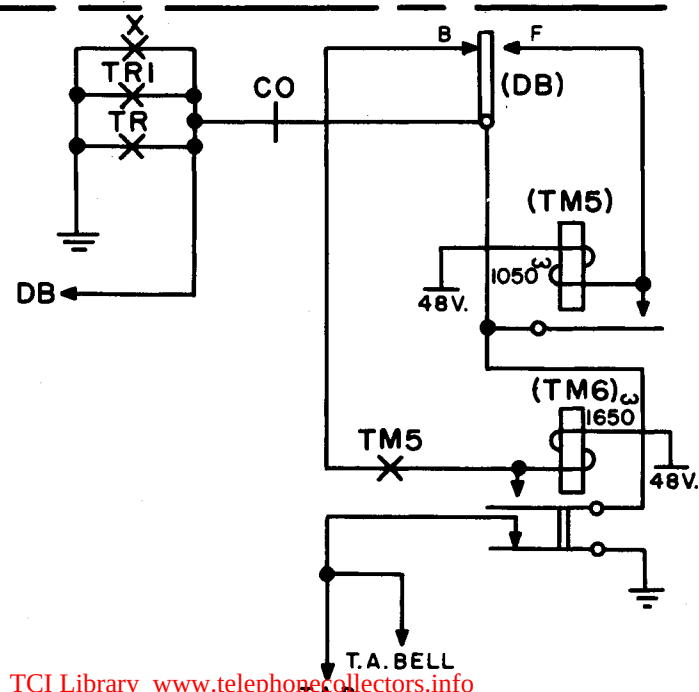
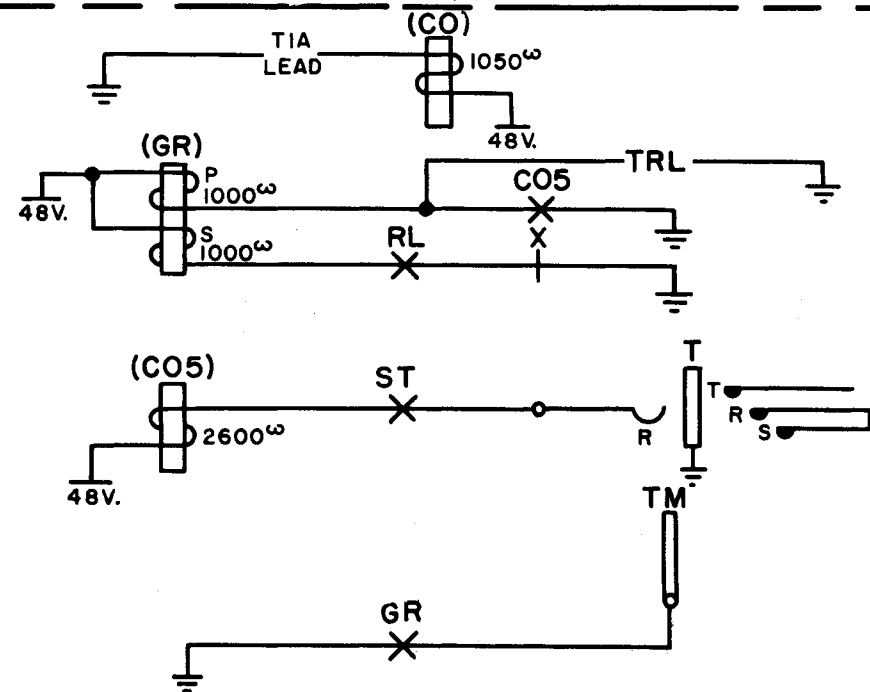
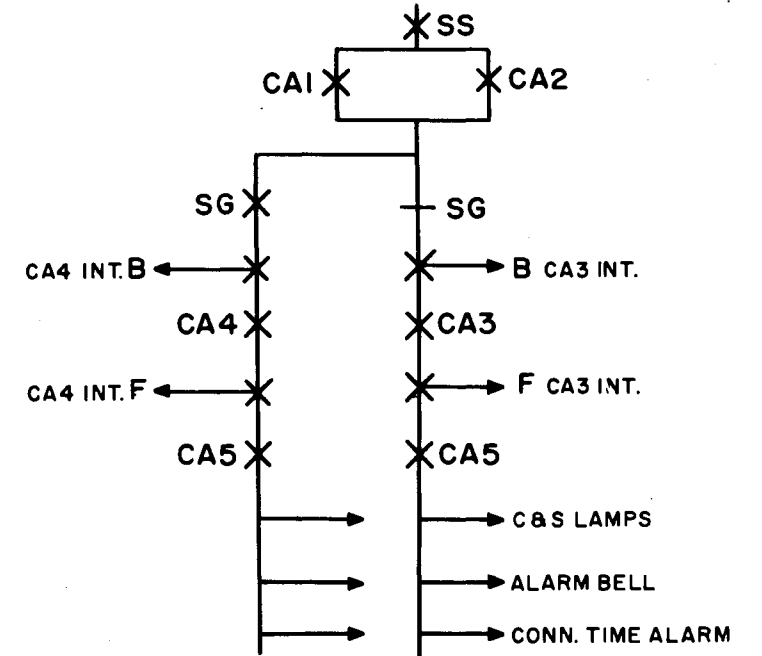
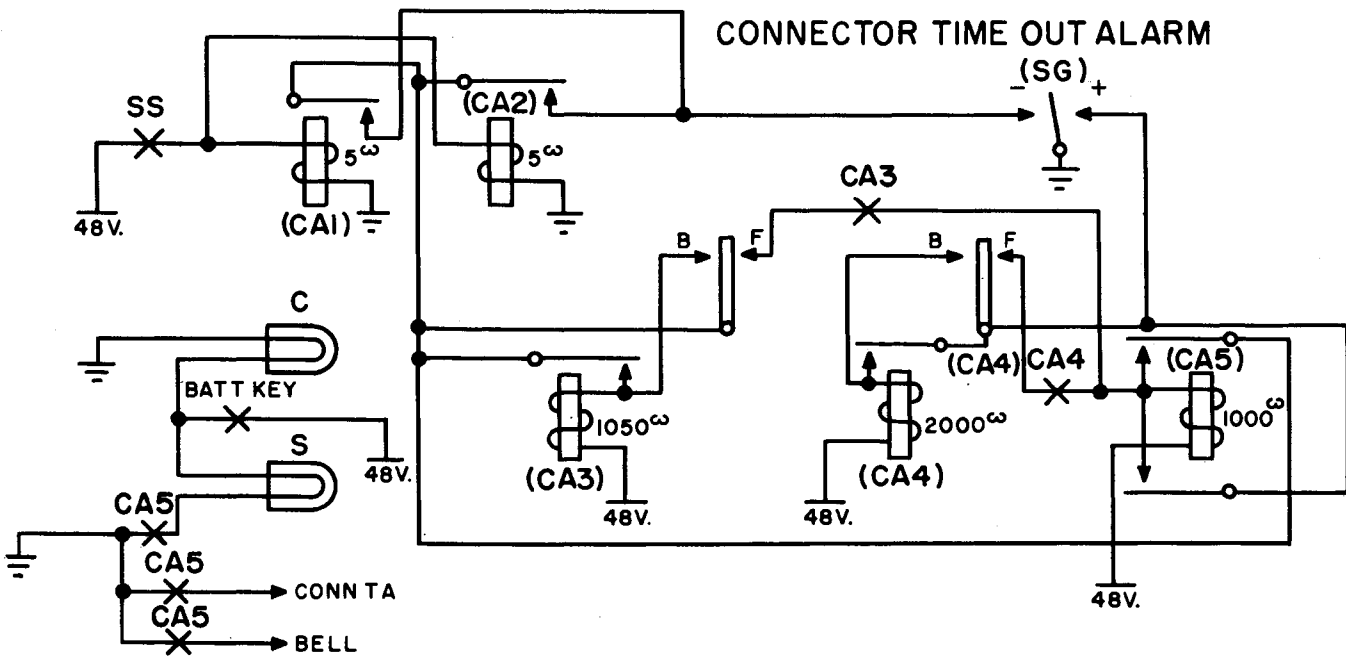
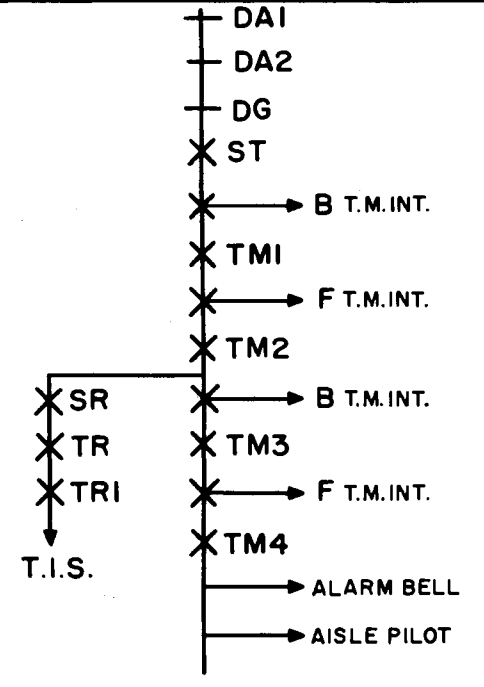
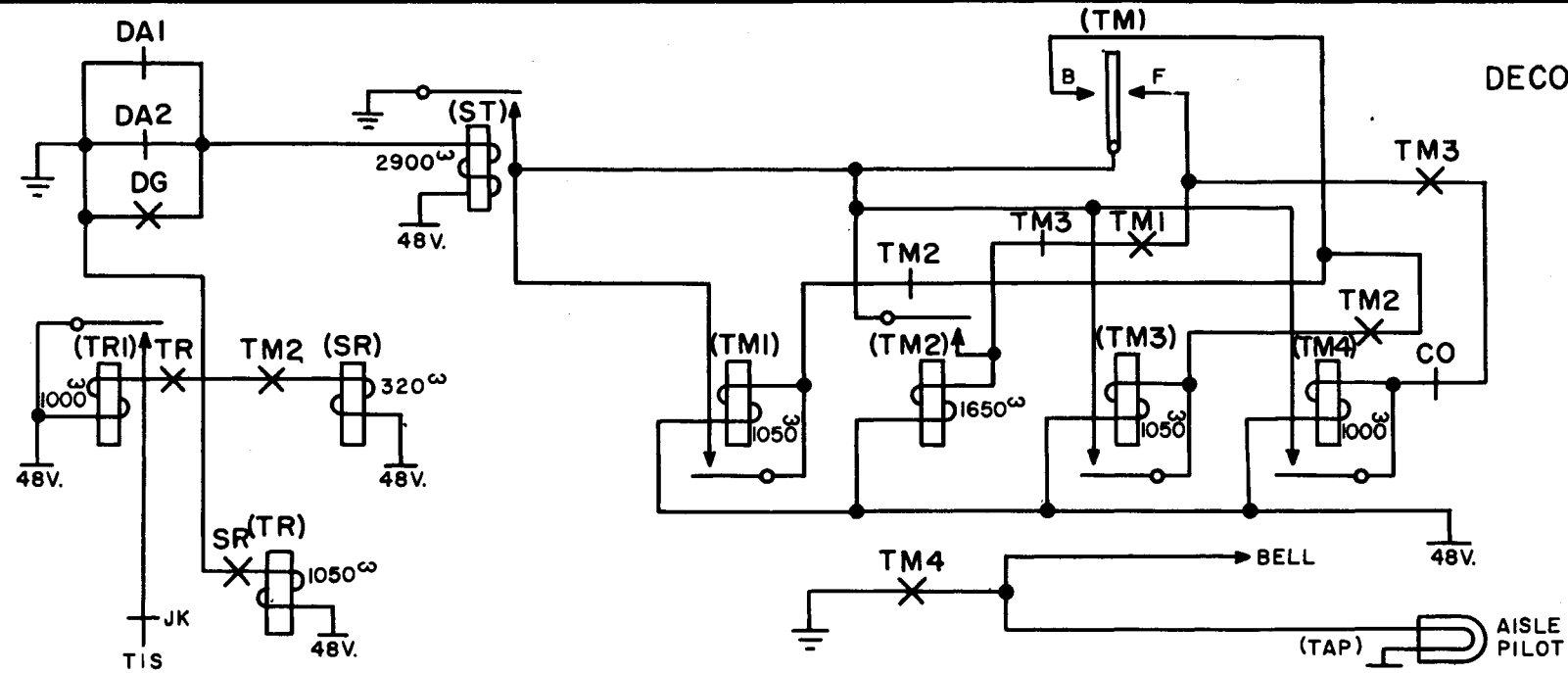
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN - D.S. CO. INC.

OS-28C



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PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

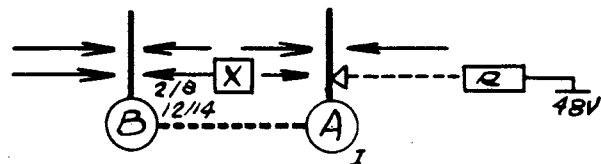
DECODER & CONNECTOR
TIME OUT

PANEL SYSTEM
BATTERY CUT-OFF

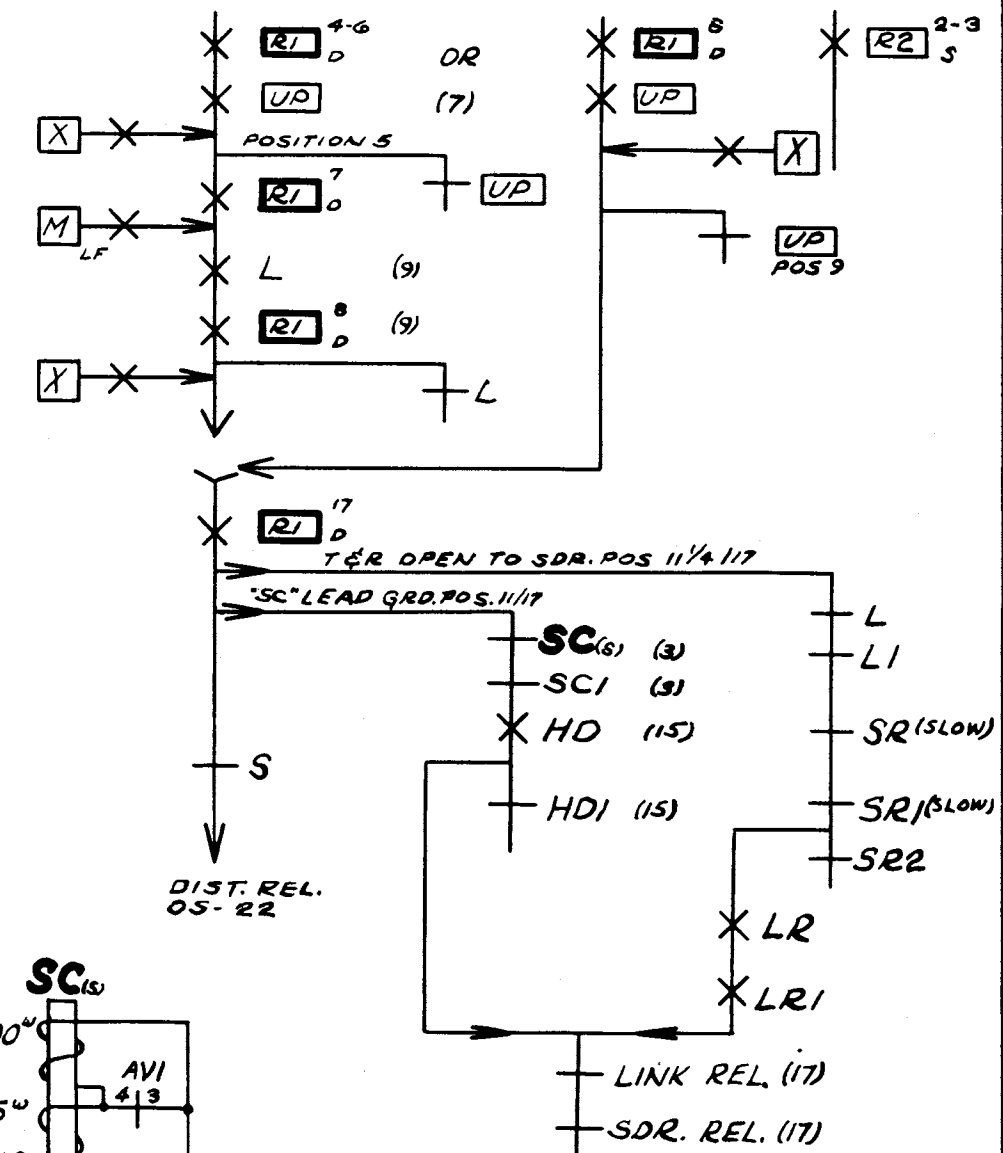
J.B.MAY
DRAWN-D.S.CO.INC.

OS-28E

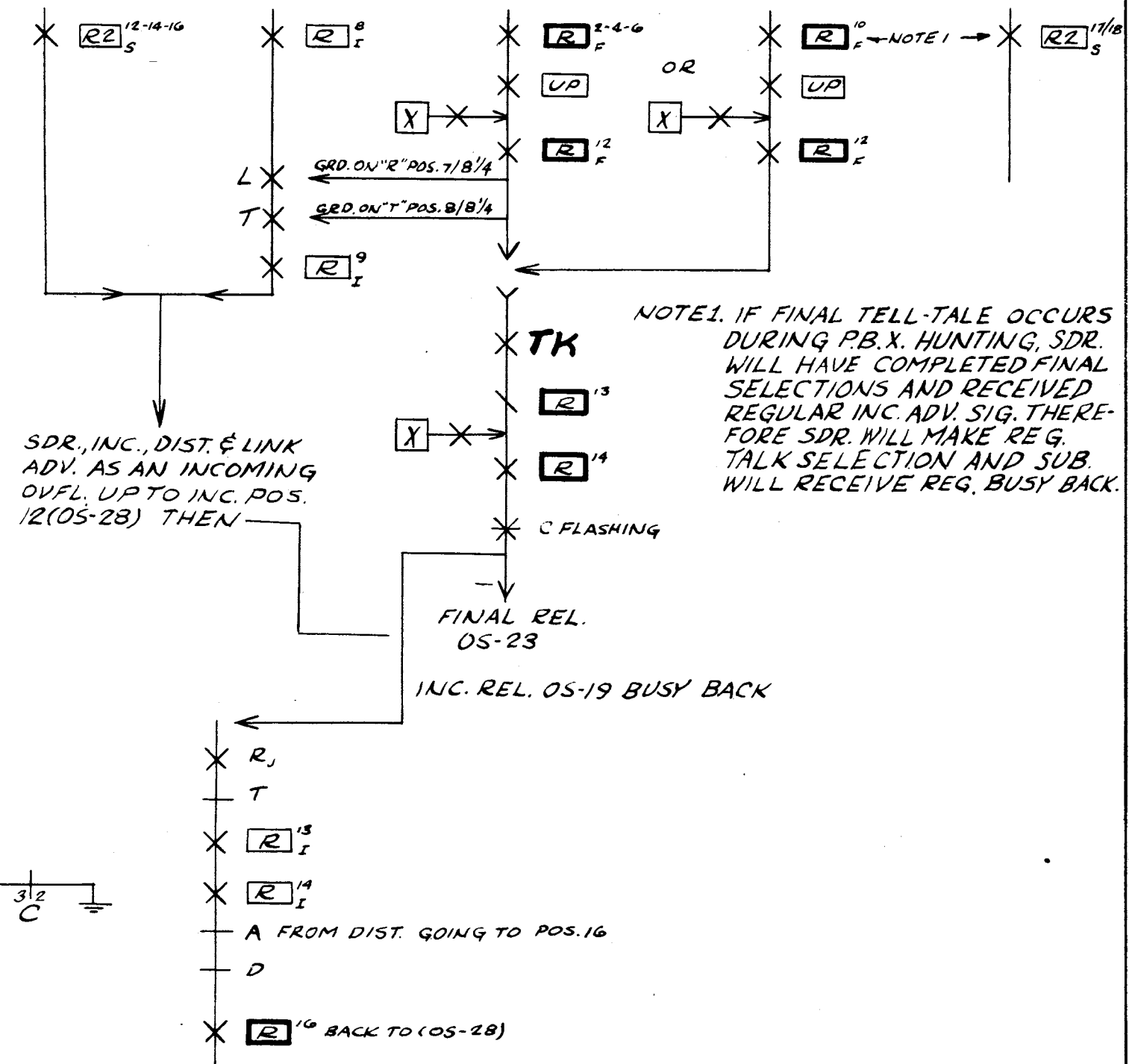
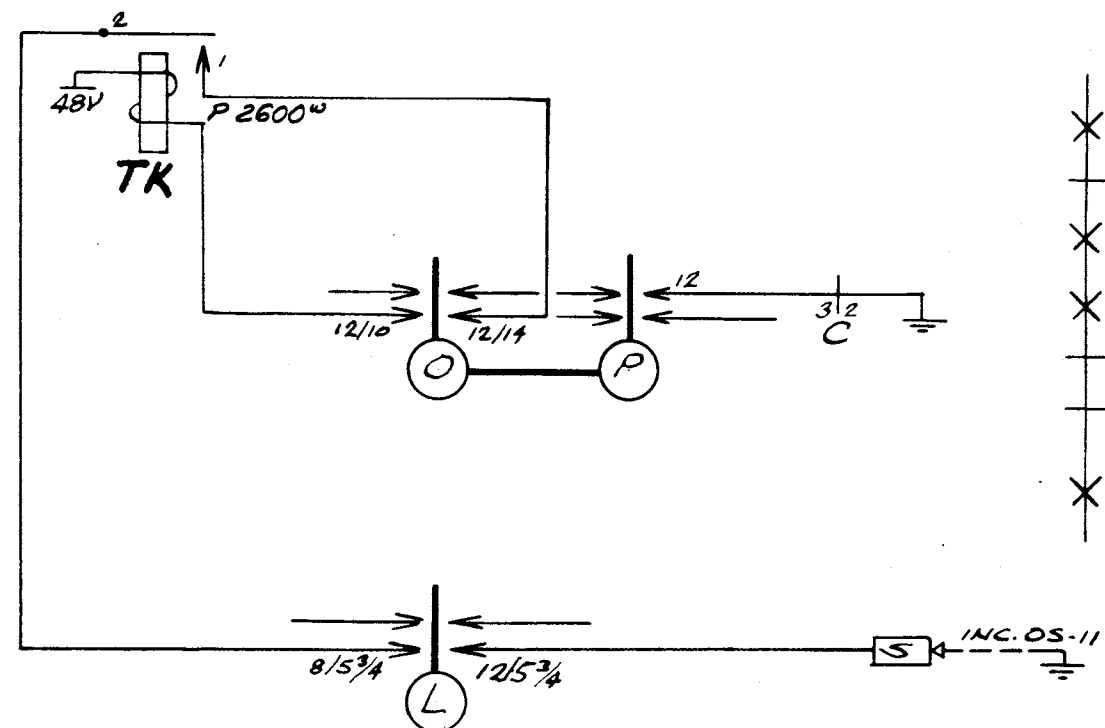
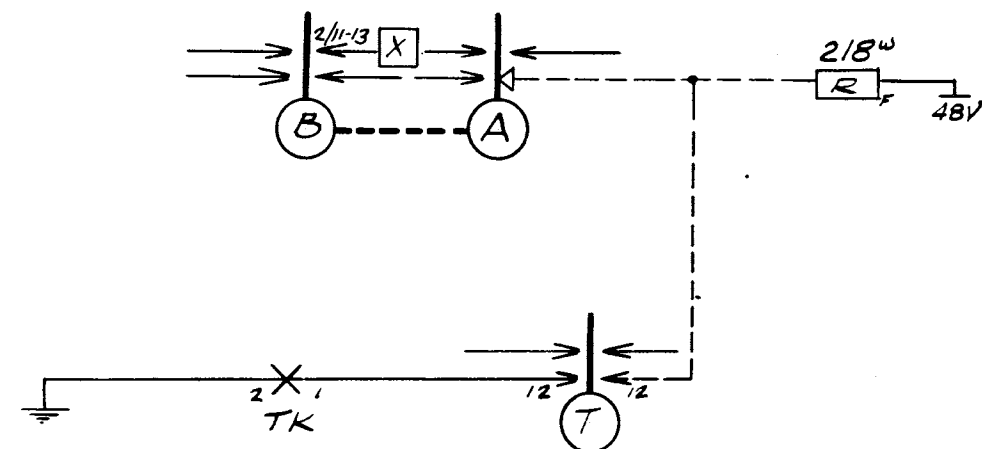
ISSUE #2
OCT. 18, 1949



1. WHEN ☒ ADVANCES INC. TO POS. 9,
OPERATIONS IN SDR., INC. & DISTRICT
ARE THE SAME AS OS-28 (INC. OVFL.)
EXCEPT ☒ ADV. SW. 12/15.



OS-29



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

FINAL TELL-TALE

OS-30

[illegible]

The diagram is a hand-drawn schematic of a control system, possibly for a typewriter or printer. It features several vertical lines representing power rails and various components connected to them.

Left Vertical Line (Power Rail): Labeled with L(3), L1, SR, SR1, and SR2. An arrow points from the bottom of this line to a component labeled R1 with a 5 and a 5.

Top Section:

- Between the first and second vertical lines: R1 5 →, L(3), L1, SR, SR1, SR2.
- Between the second and third vertical lines: R2 4/1 5 NOTE 1, OP (15), AV (25), R2 10 5, R2 11 5, AVI, SC (26), FO (114), L0 (15), R2 18 5.
- Between the third and fourth vertical lines: R1 10 0.

Central Section:

- Between the second and third vertical lines: AV (25), R2 10 5, R2 11 5, AVI, SC (26), FO (114), L0 (15), R2 18 5.
- Between the third and fourth vertical lines: R1 10 0.

Bottom Section:

- Between the second and third vertical lines: SC3, SC1, HD, HDI.
- Between the third and fourth vertical lines: R1 10/12 0, D 05-22, R1 17 0, F1, F2 DISC., LF, ETC 05-26, R1 17/1 (26), LRI.

Annotations and Connections:

- An arrow points from the bottom of the first vertical line to a component labeled R1 with a 5 and a 5.
- A note "BEFORE R2 GETS TO POS. A" is written below the first vertical line.
- A component labeled F2 DISC. is connected to the third vertical line.
- A component labeled F1, F2 DISC. is connected to the fourth vertical line.
- A component labeled LRI is connected to the fourth vertical line.
- A component labeled BATT. is connected to the bottom of the fourth vertical line.
- A component labeled GRO. is connected to the bottom of the fourth vertical line.

SENDER

48V 1500W

18/18

2/1 SC1

LINK

5/5

2/1 SC1

DISTRICT

3/1

2/3 LP

3/1

12/17

18/10

5/4 LF

1/1

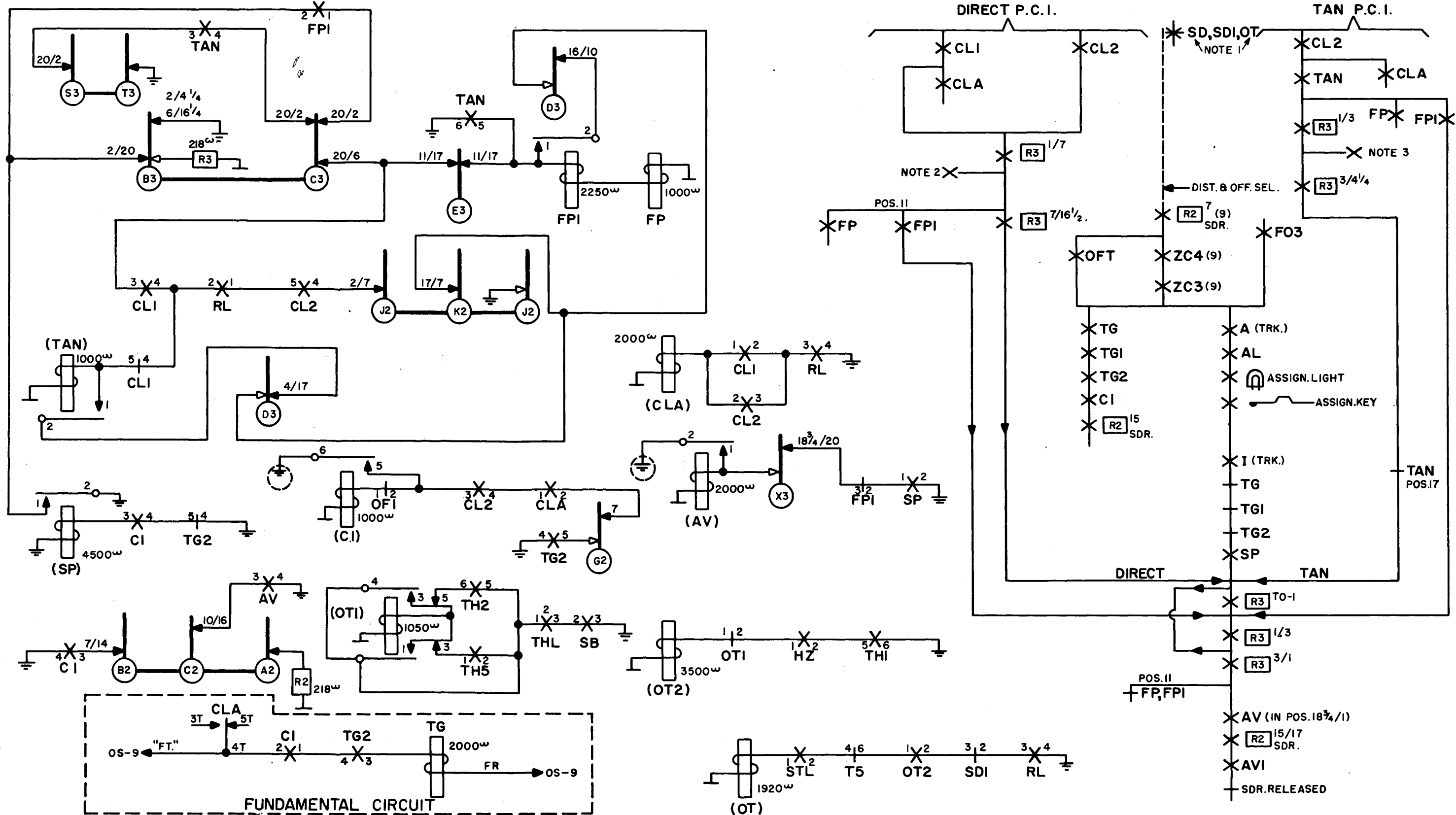
BATT.

TOLL 3

- NOTES:
1. SDR. COMPLETES WHATEVER IS LEFT OF OFFICE TEST, OFF. GP. AND TRK. TEST.
 2. INC. OR FINAL TO TELL-TALE BECAUSE "LR" OPENS COUNTING RLY. CIRCUIT.

LATE RELEASE
FULL MECH. & OPR. CALLS

OS-31



NOTES

1.	OT - POSSIBLE { STA. DELAY	A	ABOVE AND PARTYS - NONE
		B	ABOVE AND NO PARTYS - SD
	OT - IMPOSSIBLE {	C	BELOW AND NO PARTYS - SD, SDI
		D	BELOW AND PARTYS - SDI

2. B3 CAM ADVANCES SW FROM 3 TO 4 1/4 ON TAN.
3. B3 CAM ADVANCES SW FROM 6 TO 16 1/4 ON DIRECT.
4. 2 & 3 SPRINGS MAKE 1/2 BEFORE & AFTER POS. INDICATED.
5. 3 SPRING MAKE / BEFORE & AFTER POS. INDICATED.

TIP	BATT.	ODD	POS. OR BLANK
RING	GND.	EVEN	NEG.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

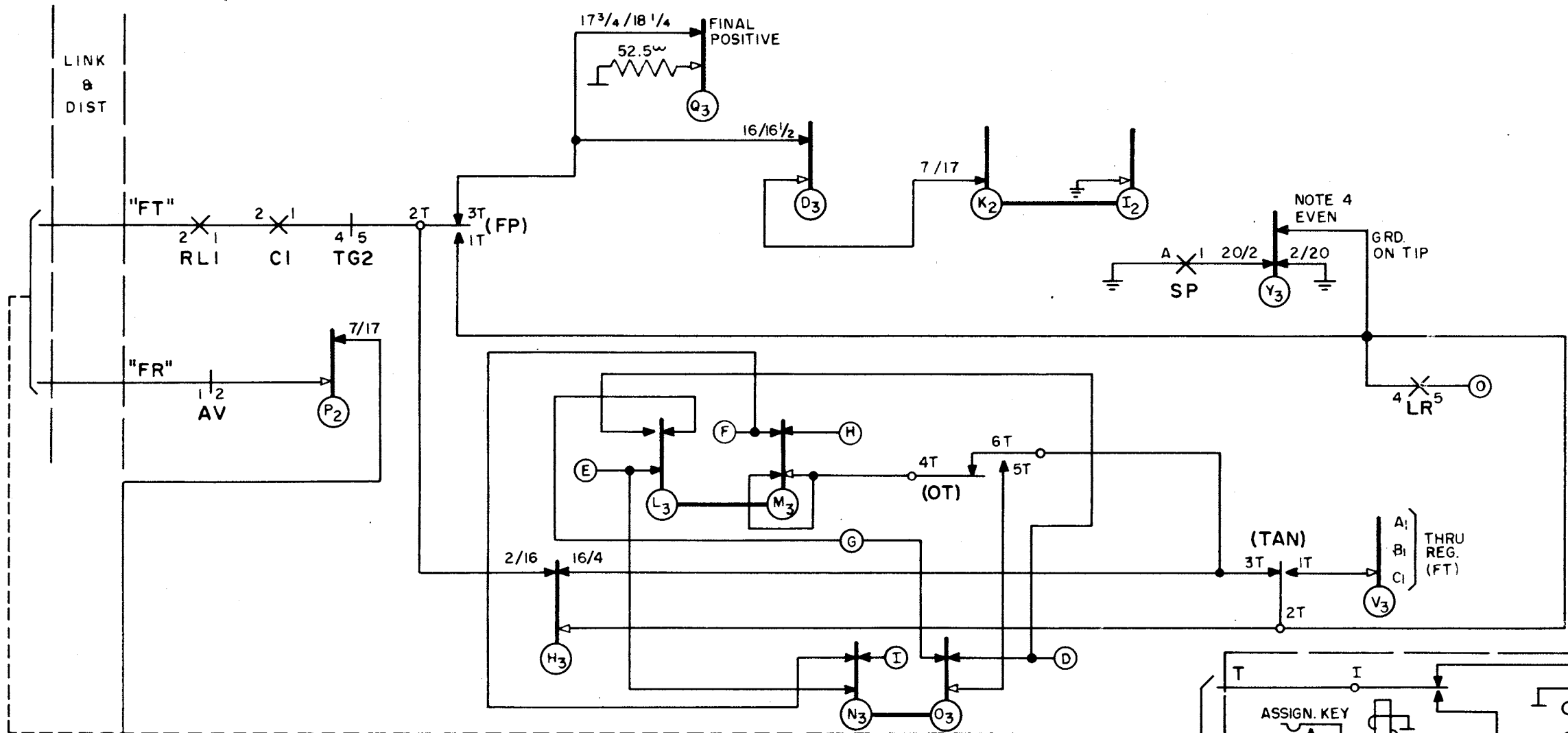
P.C.I. IMPULSES

PANEL SYSTEM
BATTERY CUT-OFF

J.B.MAY
DRAWN - D.S. CO. INC.

OS-32
SHEET 1

LINK
8
DIST



CODE

STA	THOU	HUND TENS UNITS	PULSES		
0	0	0	-	-	-
1	2	1	+	-	-
W(9)	4	2	-	-	-
R(7)	6	3	+	-	-
J(5)	8	4	-	+	-
M(6)	1	5	-	-	-
	3	6	+	-	-
	5	7	-	-	-
	7	8	+	-	-
	9	9	-	+	-

ORDER OF SENDING PULSES

TAN

SW. POS. 5 $\longleftrightarrow$ 16

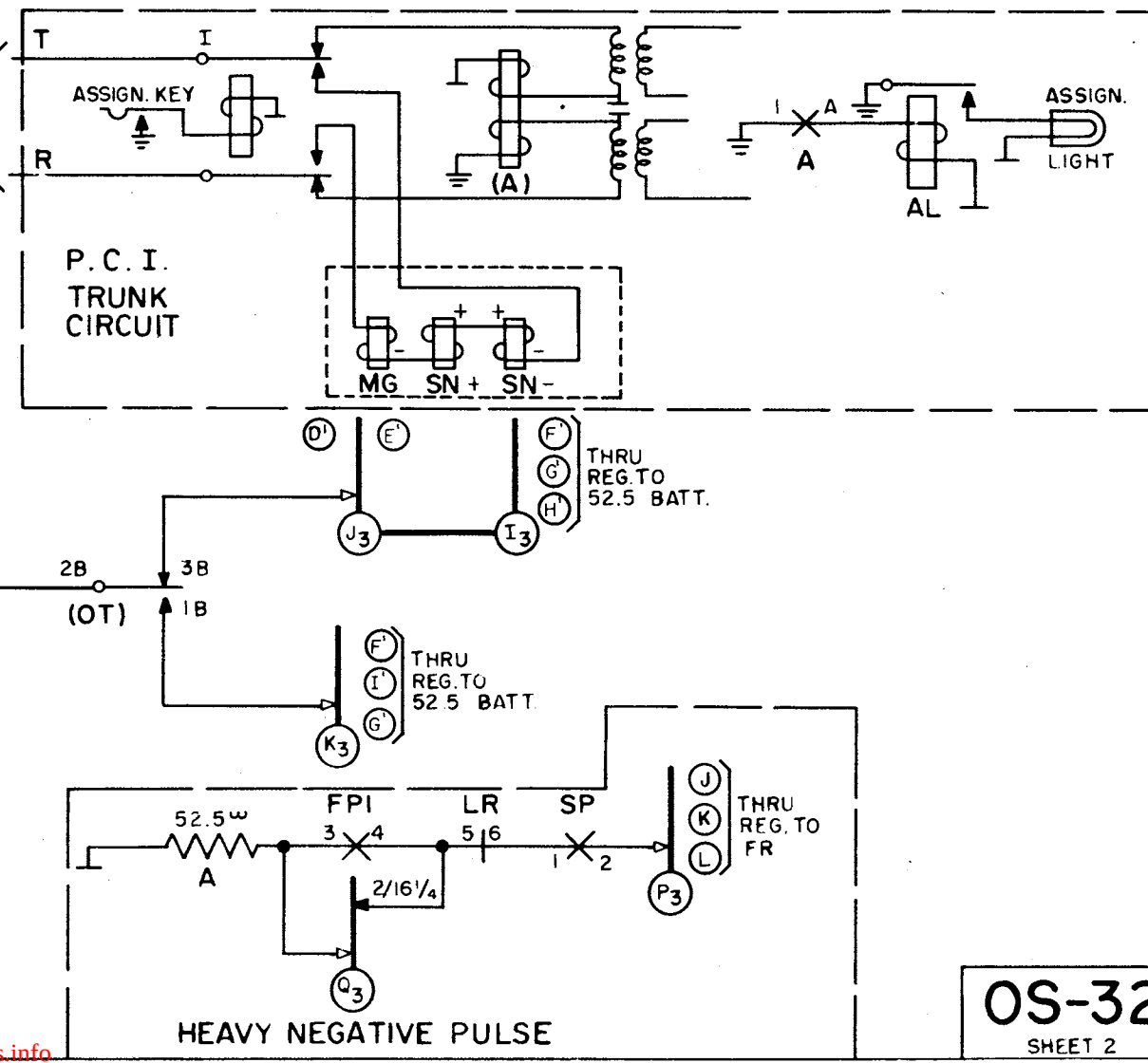
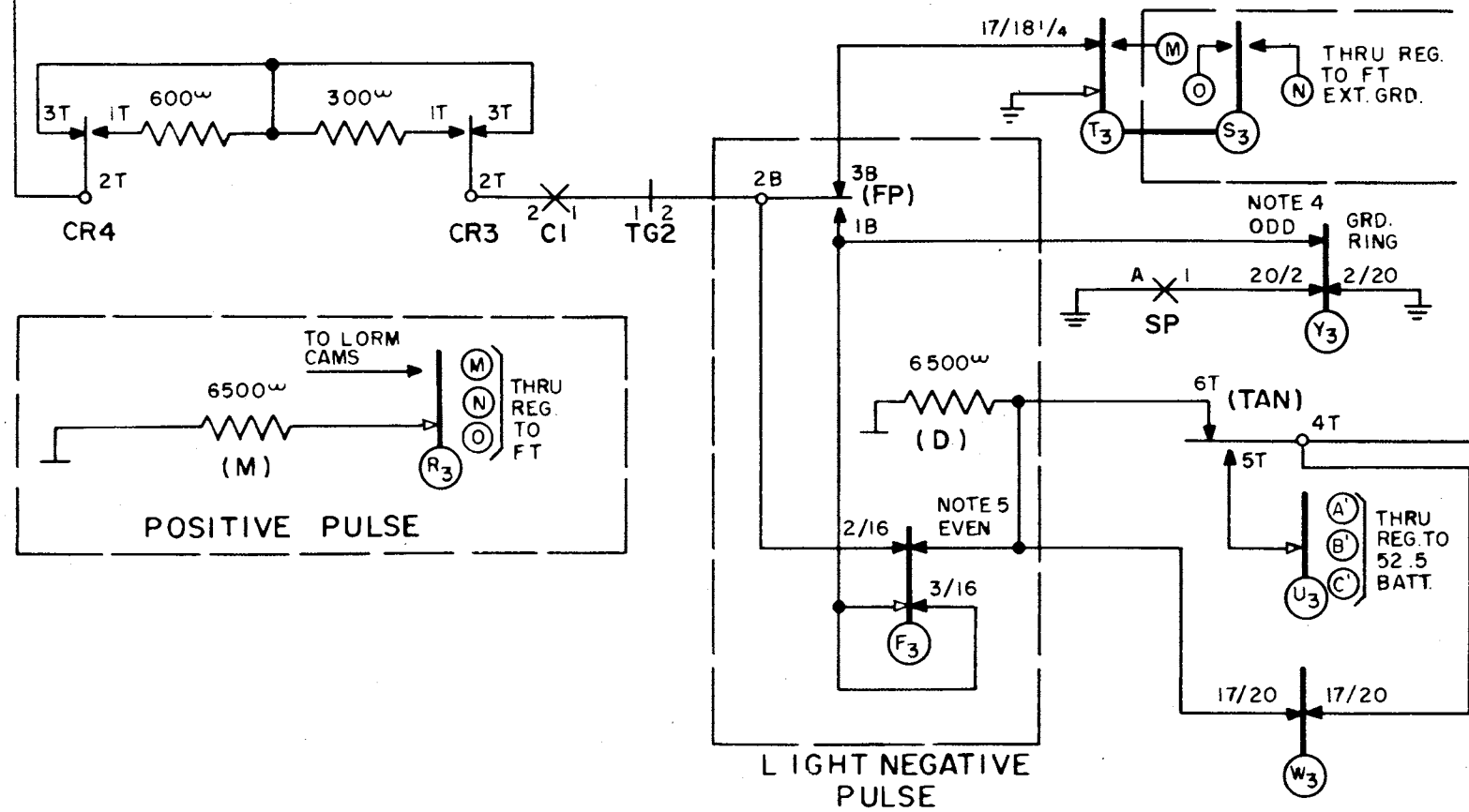
A-B-C CODE

DIR.

SW. POS. 17 $\longleftrightarrow$ 16

OT DOWN ST-TH-H-T-U RELAYS

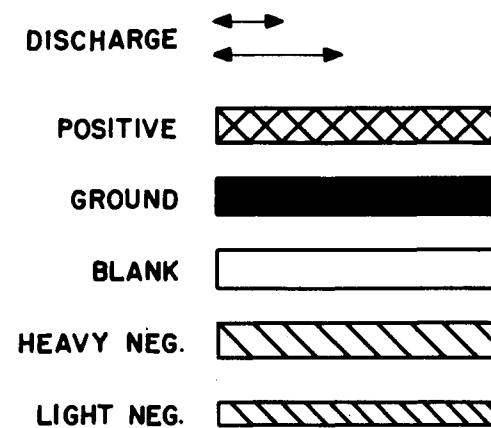
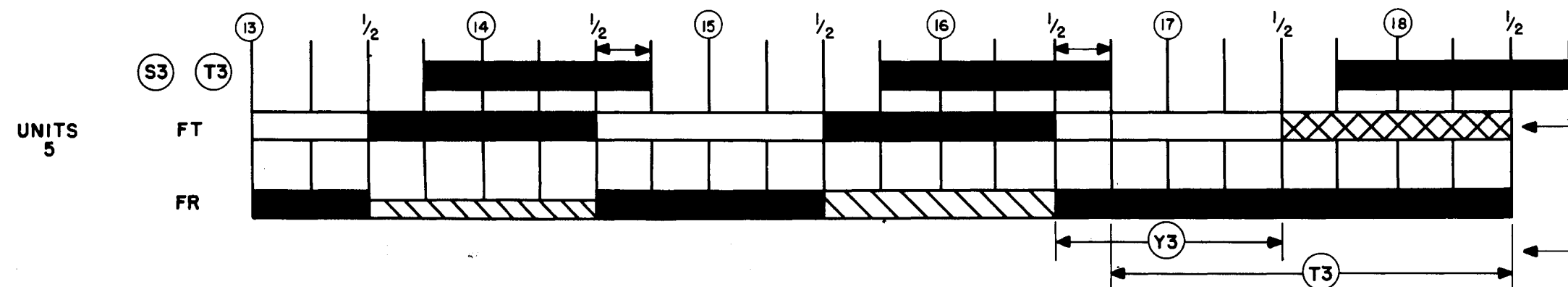
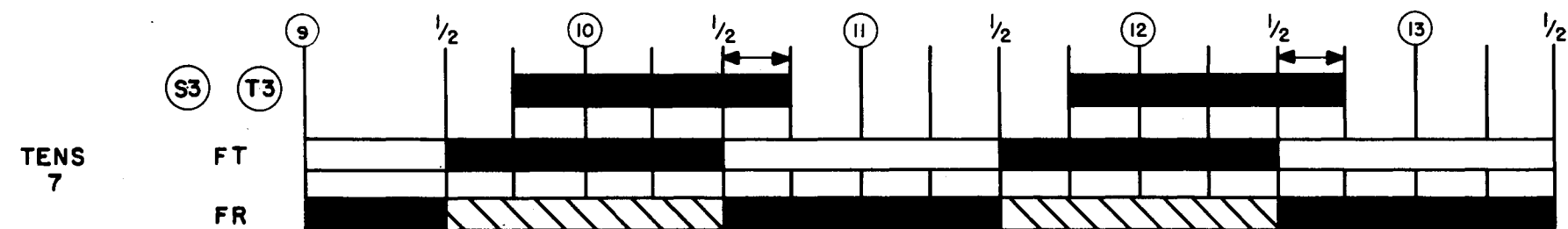
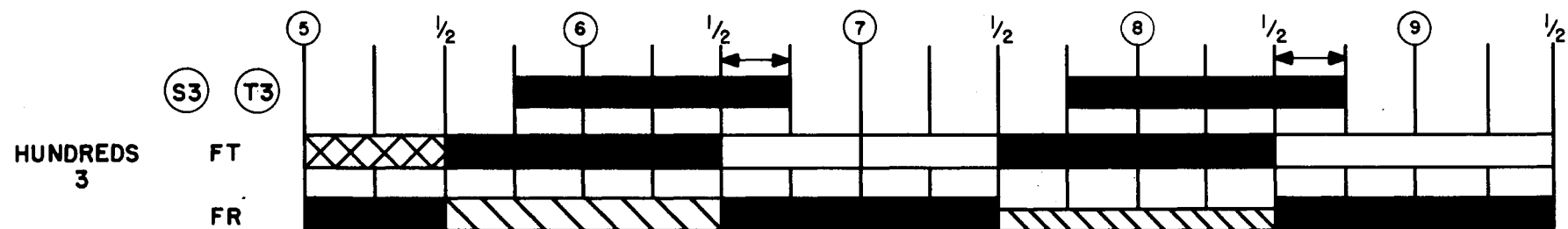
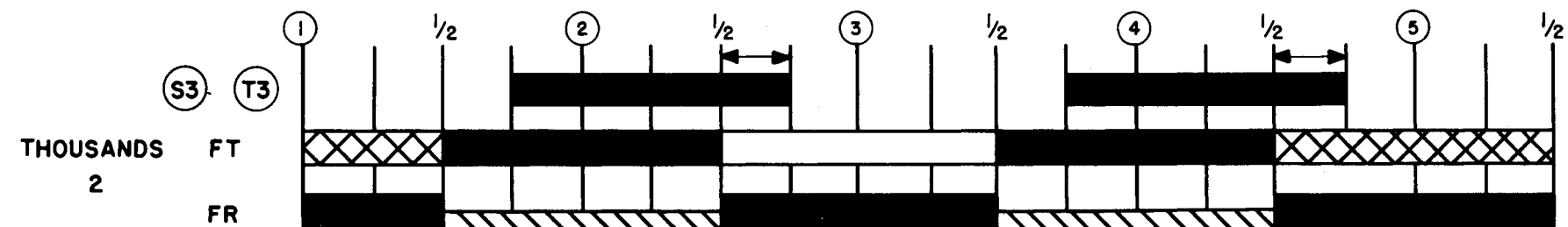
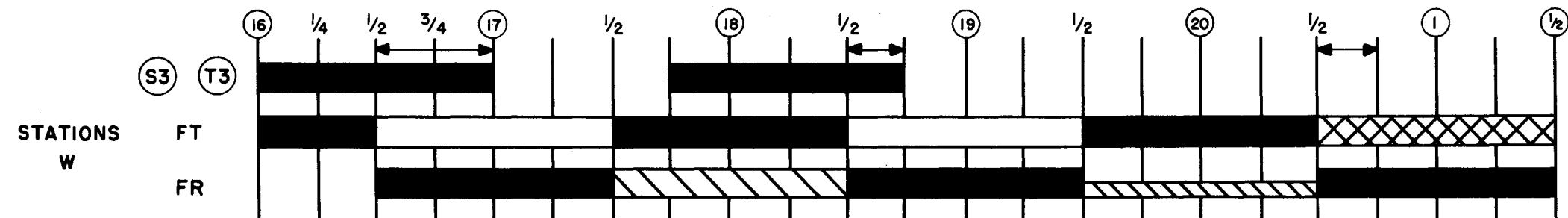
OT UP TH-H-T-U-ST RELAYS



ISSUE 1
JAN. 1950

ISSUE 1
JAN. 1960

SEE NOTE 3



- NOTE 1. HEAVY POSITIVE ON "FT" TO ADVANCE P.C.I. CONTROL.
- NOTE 2. FP NORMAL AT POS. 11 GRD. 17/18 1/4 FROM T3 ON "FR".
- NOTE 3. ALL CAMS HAVE 1/4 POS. OVERLAP, EXCEPT AT STARTING POINTS WHICH HAVE 1/2 POS. OVERLAP.

SD 21193-011-012-013 SENDER

NOTE 1

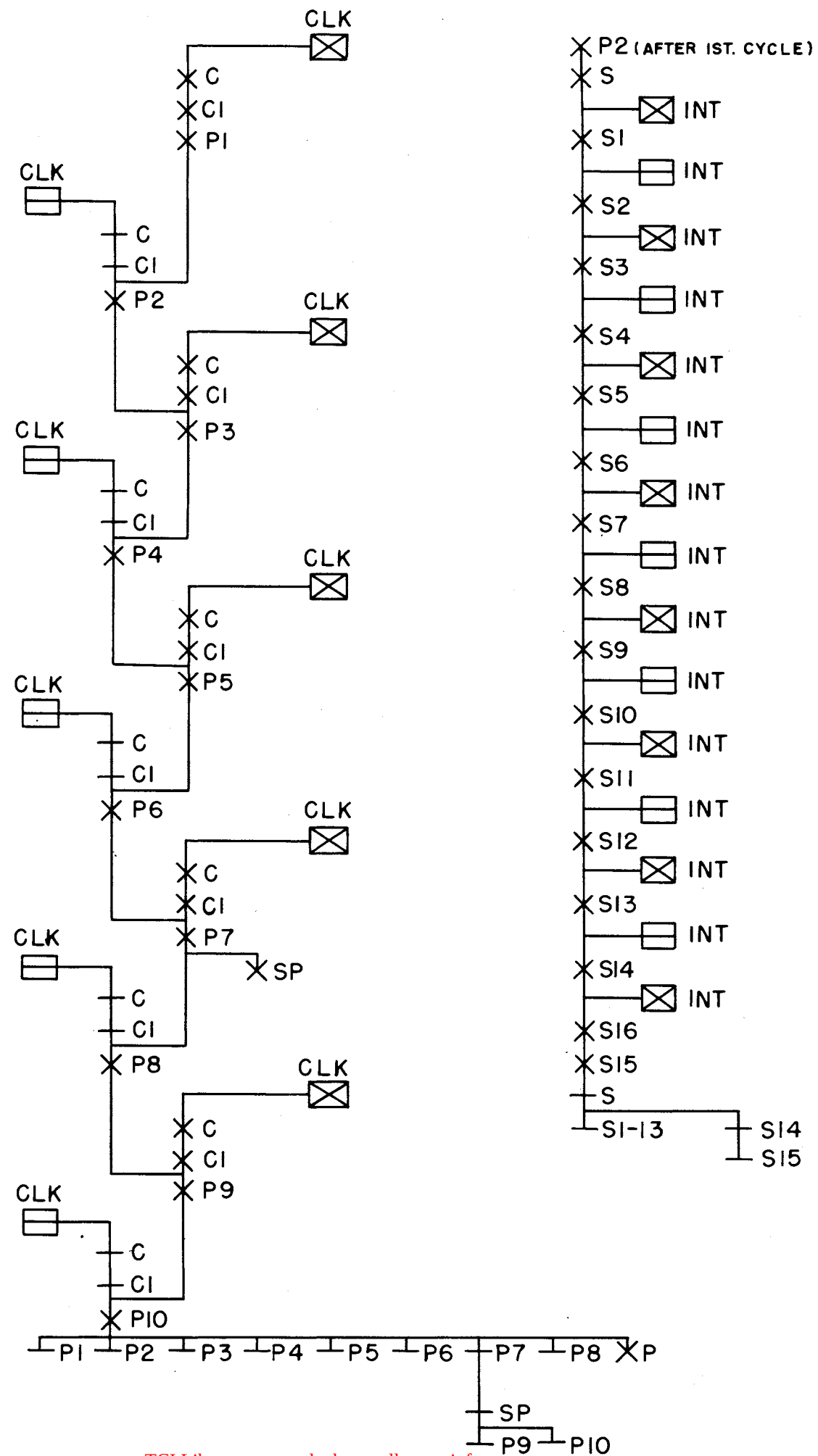
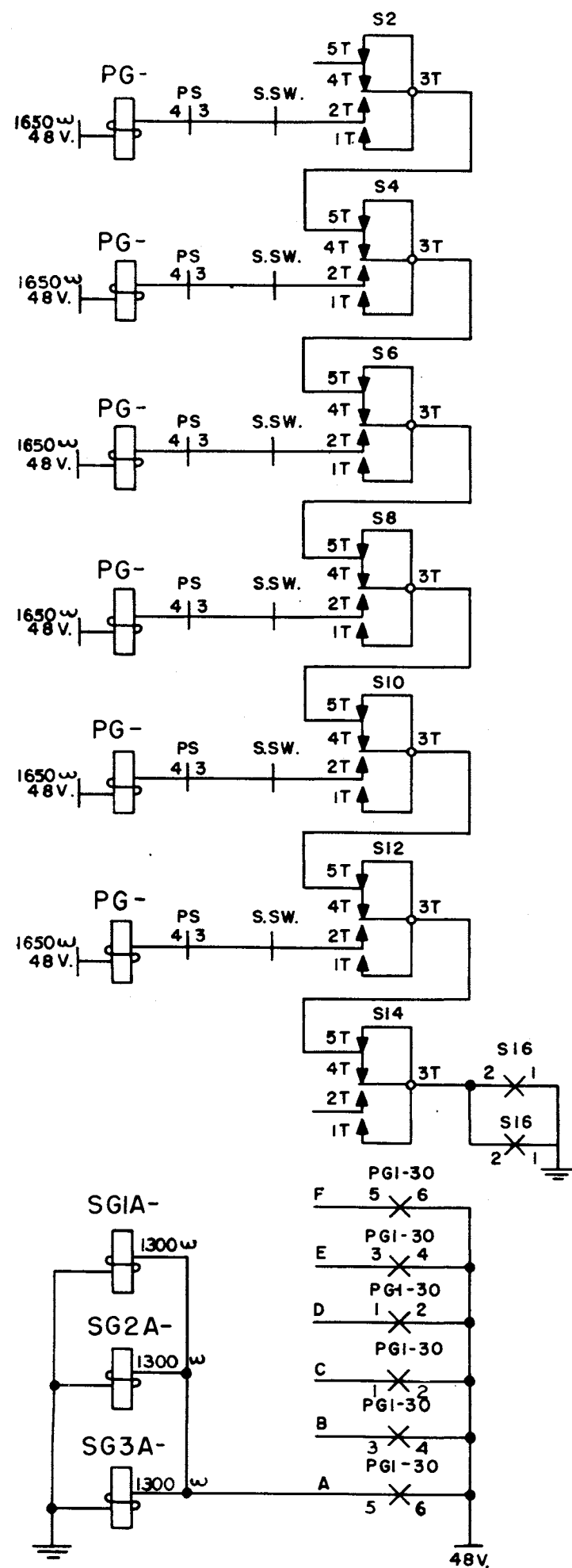
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

NOTE 2

PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN - D.S. CO. INC.

OS-32A



AFTER 1ST. CYCLE

- X S2
- X PGI/7/13/19/25
- X S4
- X PG2/8/14/20/26 — PGI/7/13/19/25
- X S6
- X PG3/9/15/21/27 — PG2/8/14/20/26
- X S8
- X PG4/10/16/22/28 — PG3/9/15/21/27
- X S10
- X PG5/11/17/23/29 — PG4/10/16/22/28
- X S12
- X PG6/12/18/24/30 — PG5/11/17/23/29
- X S14
- PG6/12/18/24/30

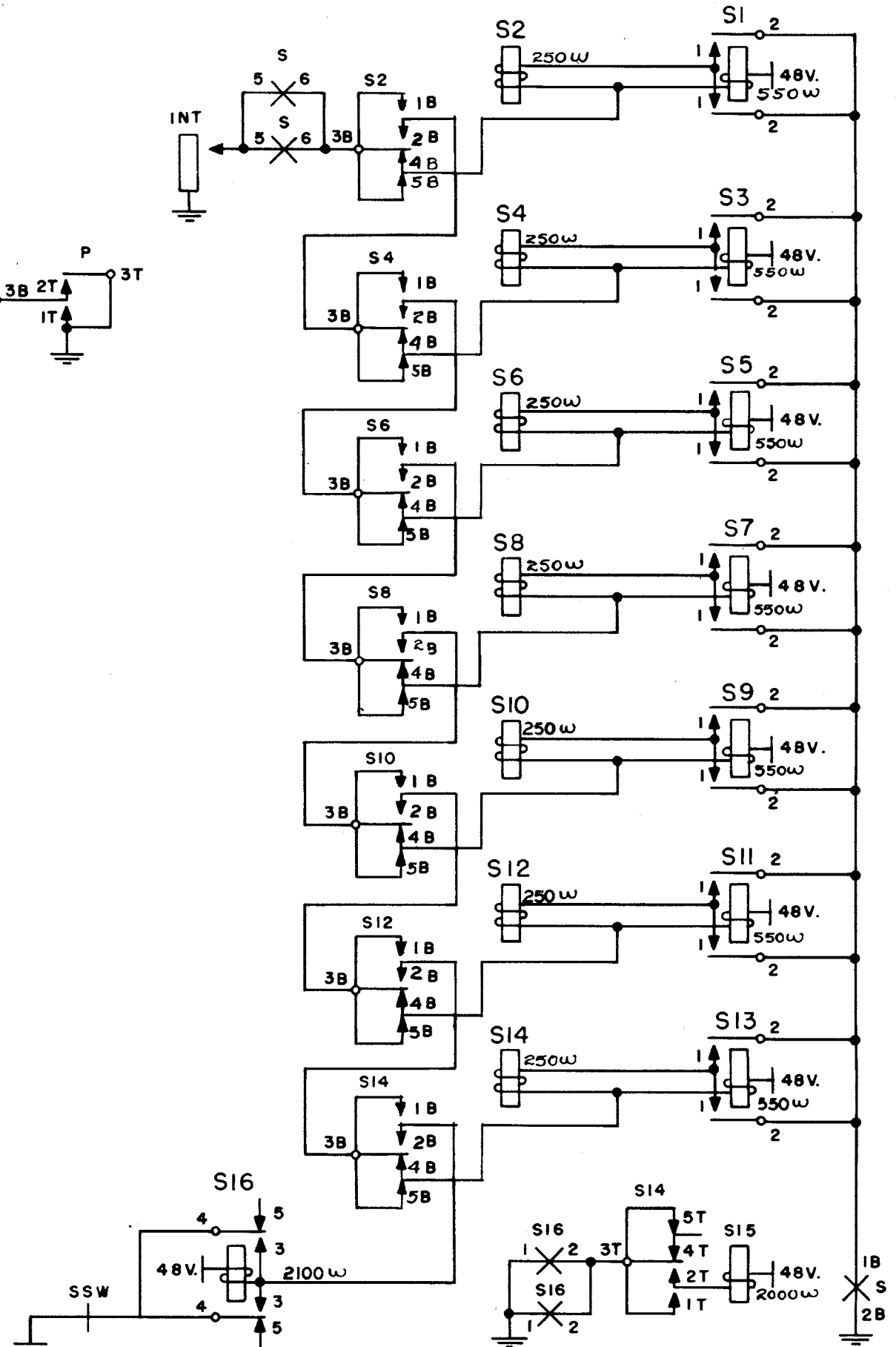
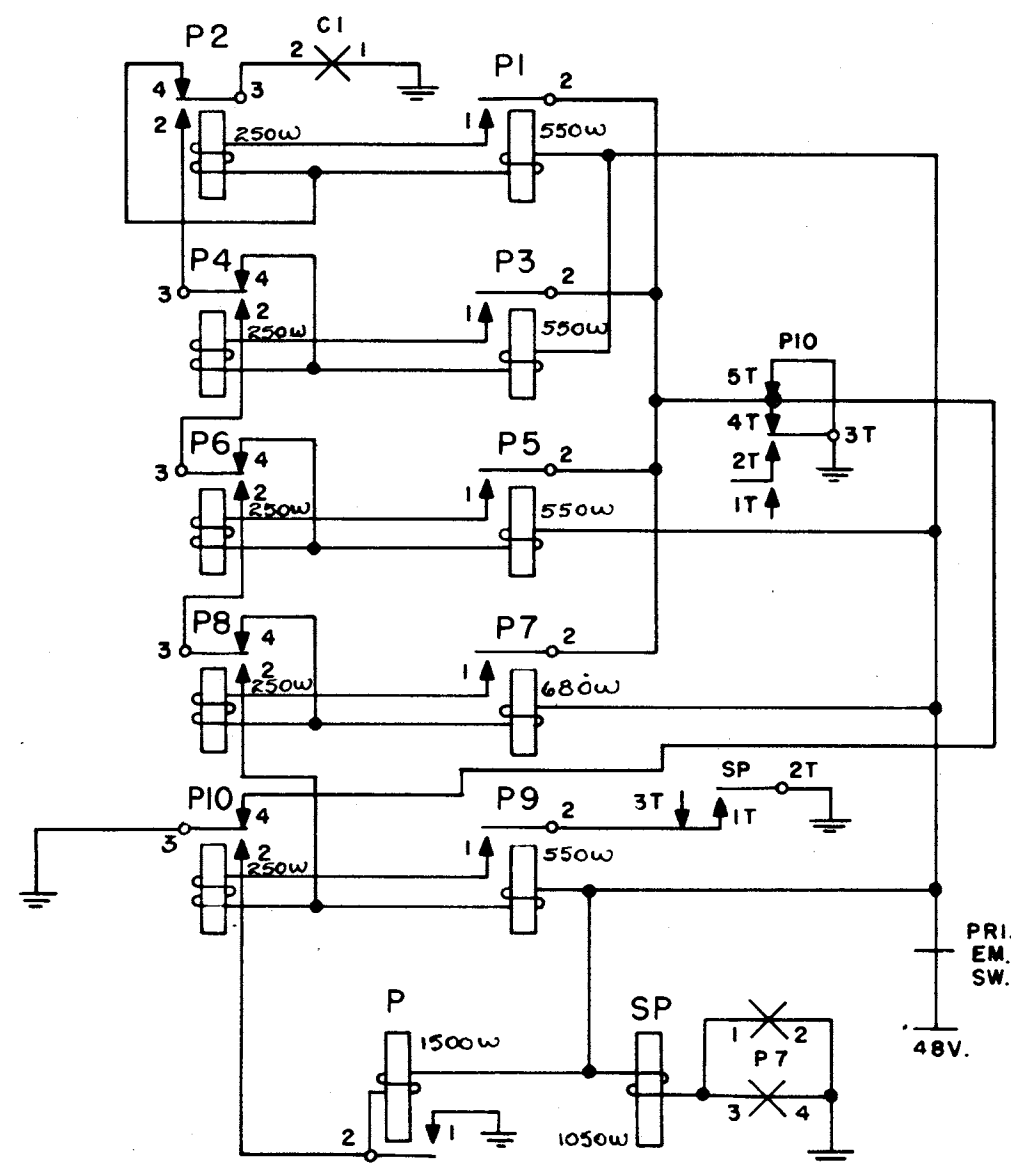
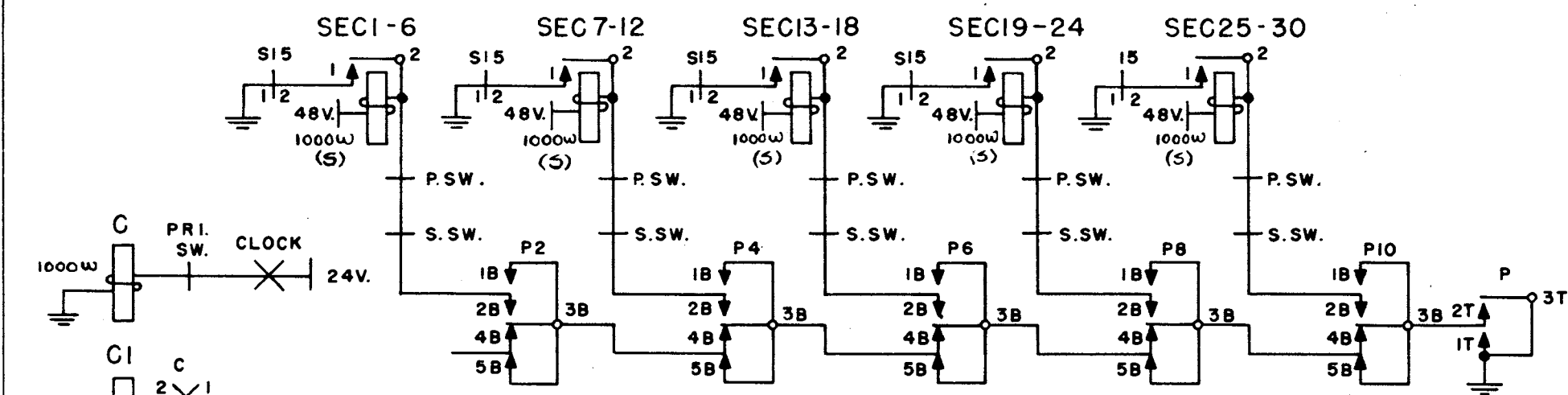
SD 21536-01 PULSE CHECKING CIRCUIT
SD-21404-01 DIST. TMG.

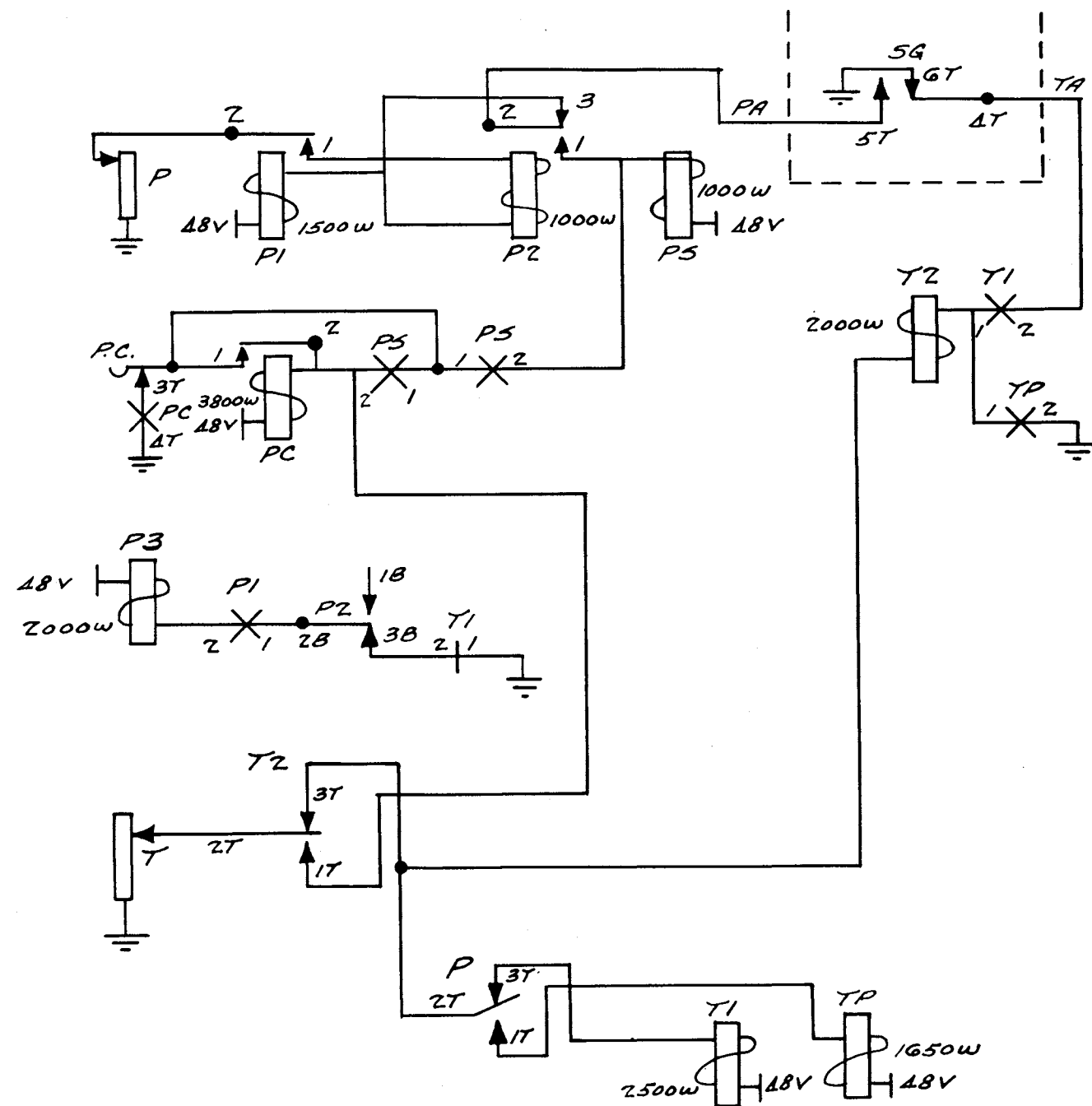
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

DISTRICT TIMING
CIRCUIT

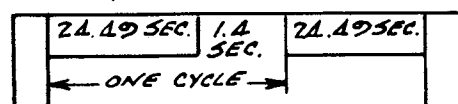
PANEL SYSTEM
BATTERY- CUT OFF

OS-33
SHEET I

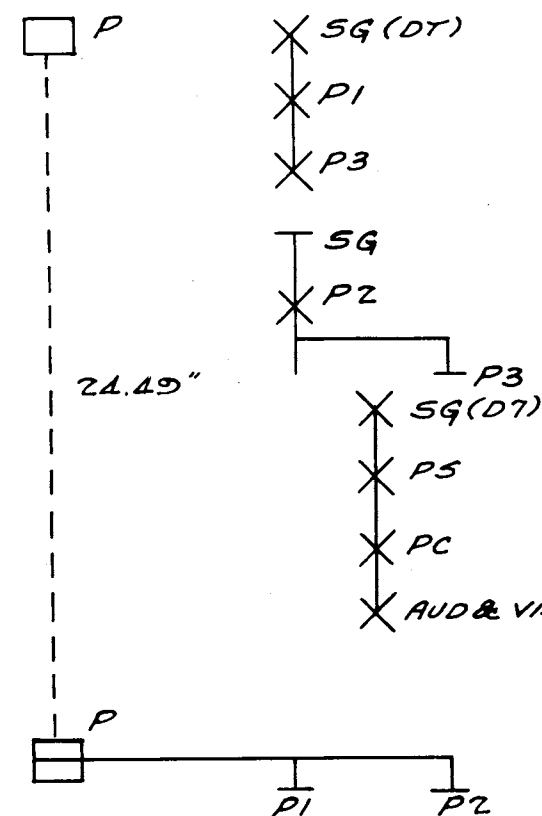
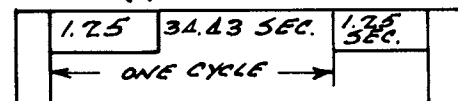




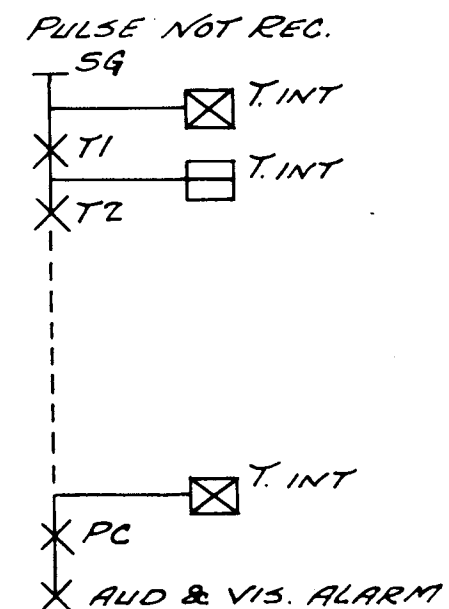
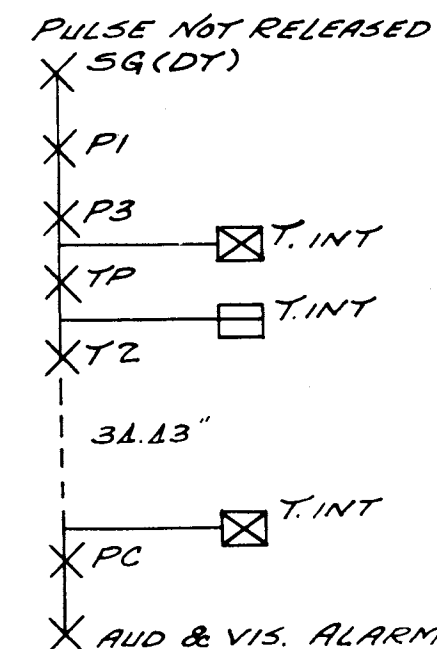
(P) INT



(T) INT



IF SG OPERATES
SECOND TIME WHILE
"P" INTERRUPTER IS
STILL CLOSED



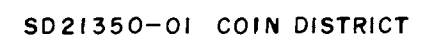
SD 21536-01 PULSE CHECKING

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

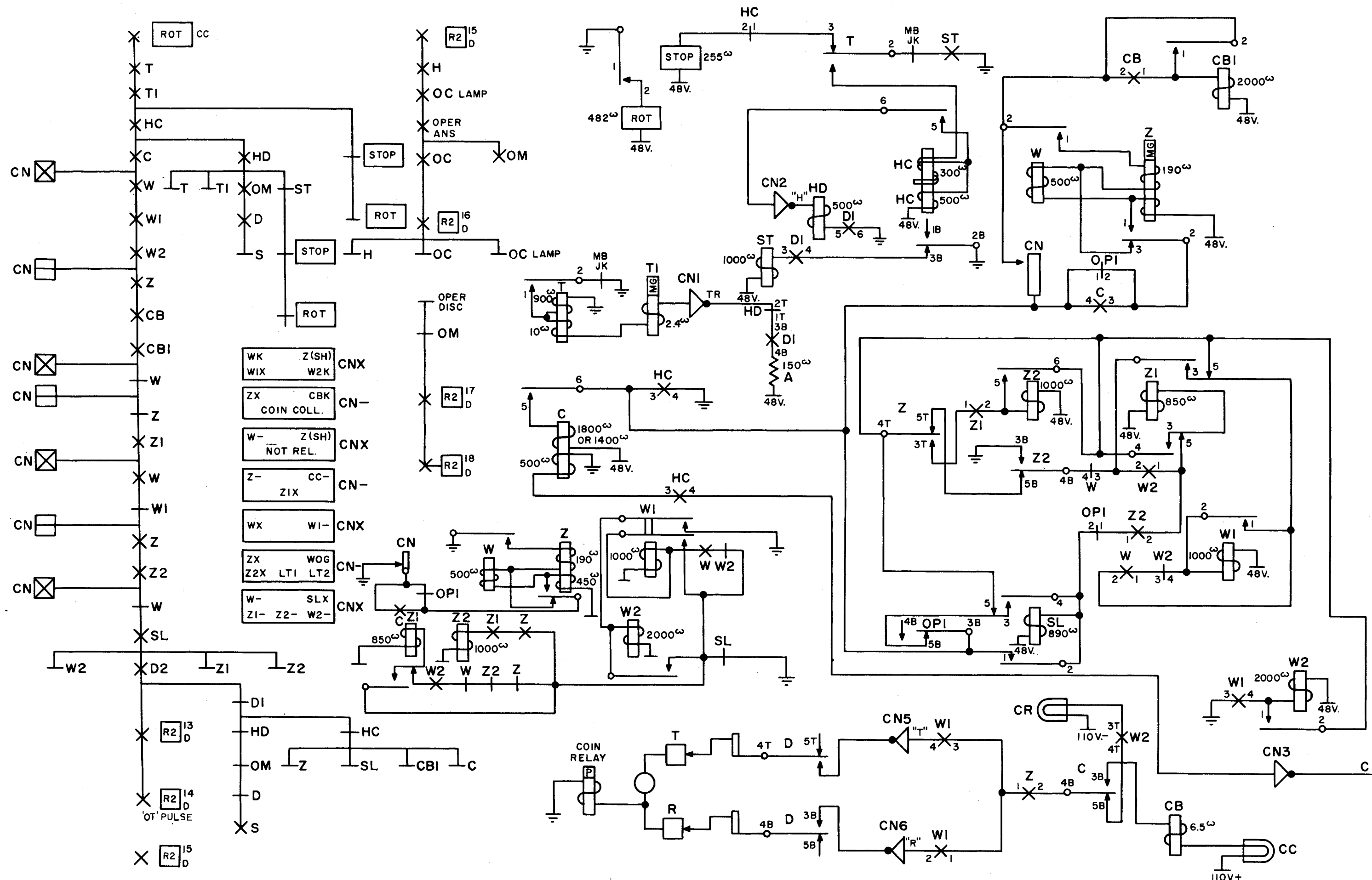
PULSE CHECKING

PANEL SYSTEM
BATTERY CUT OFF

05-34

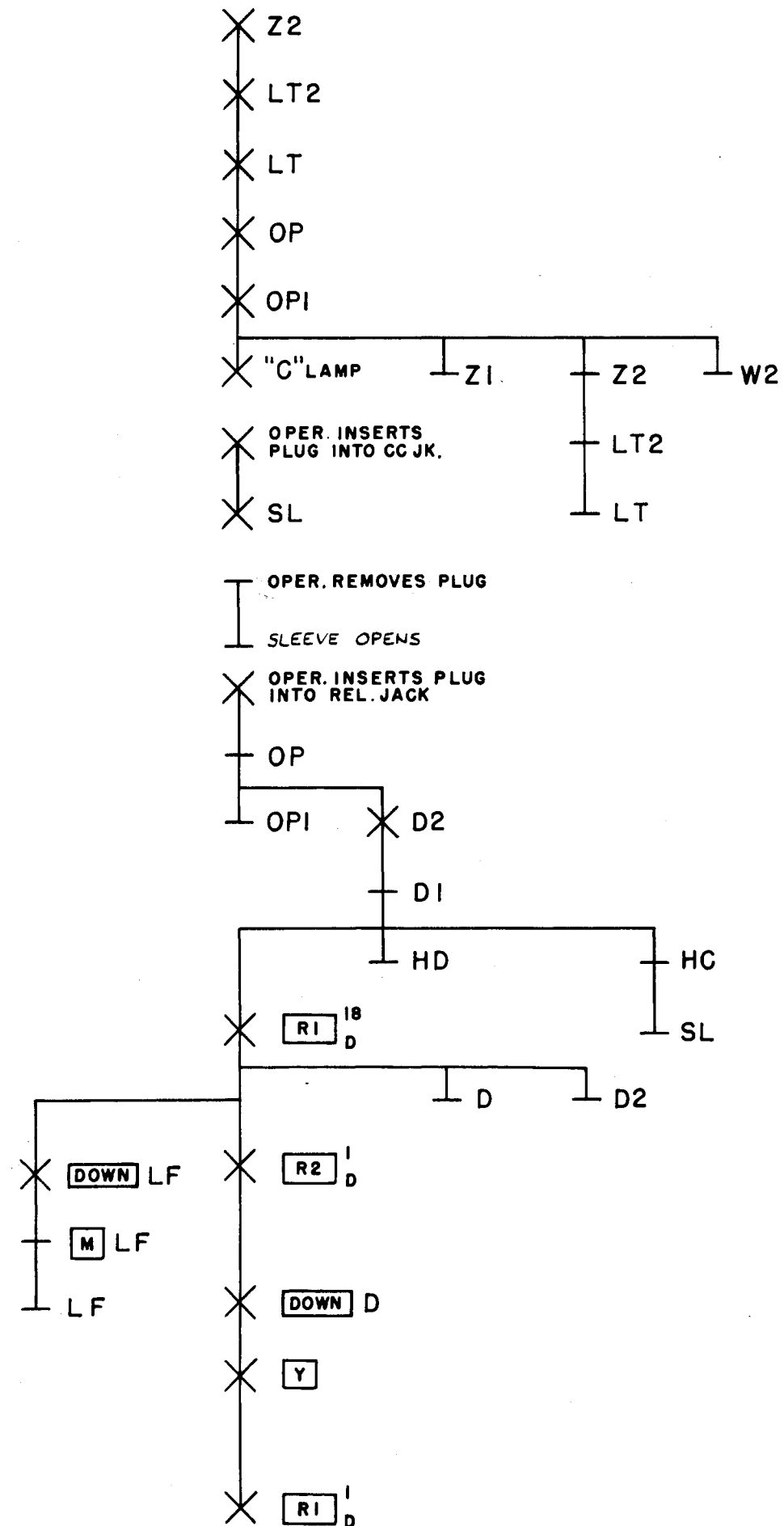


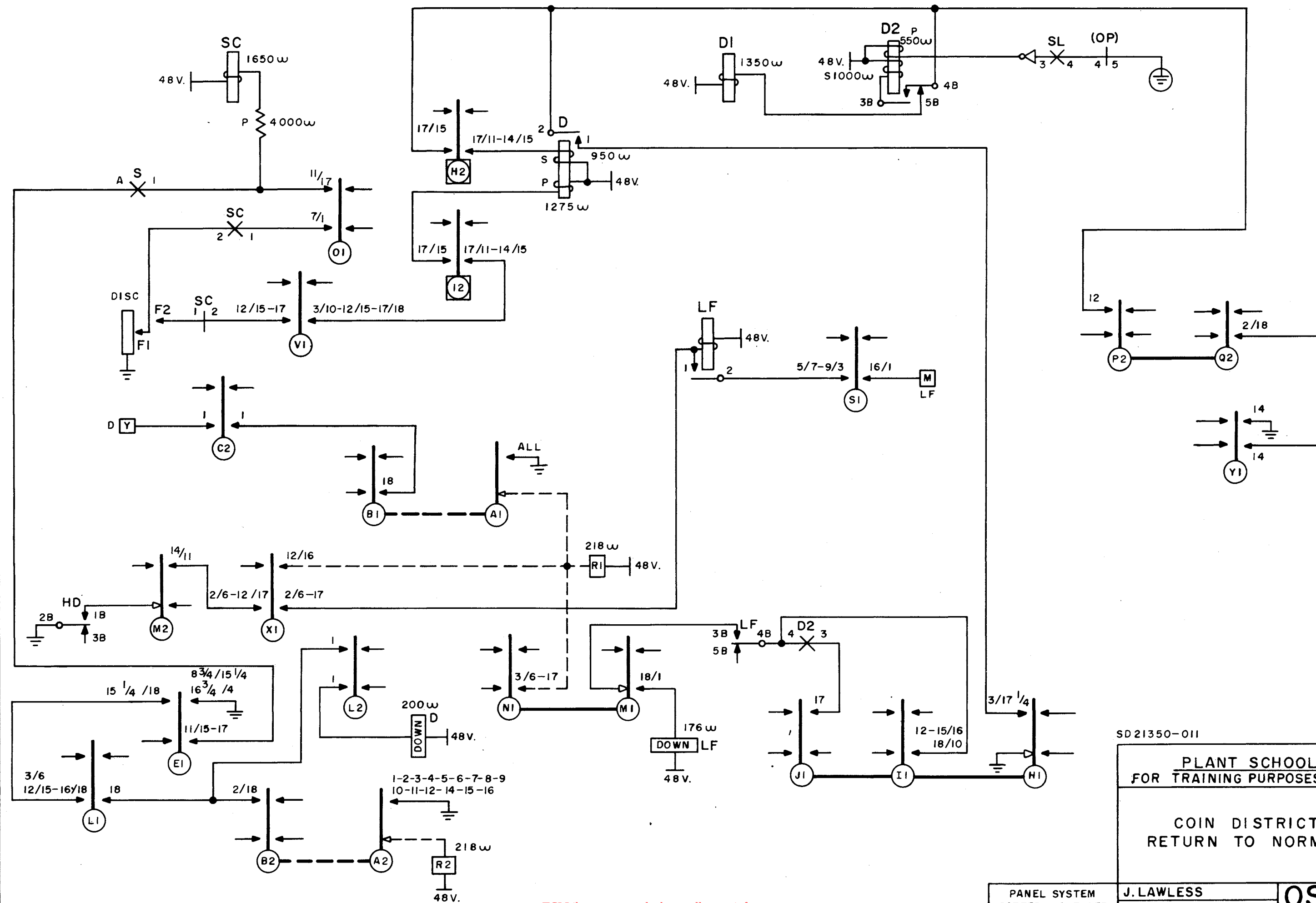
OS35
SHEET 1



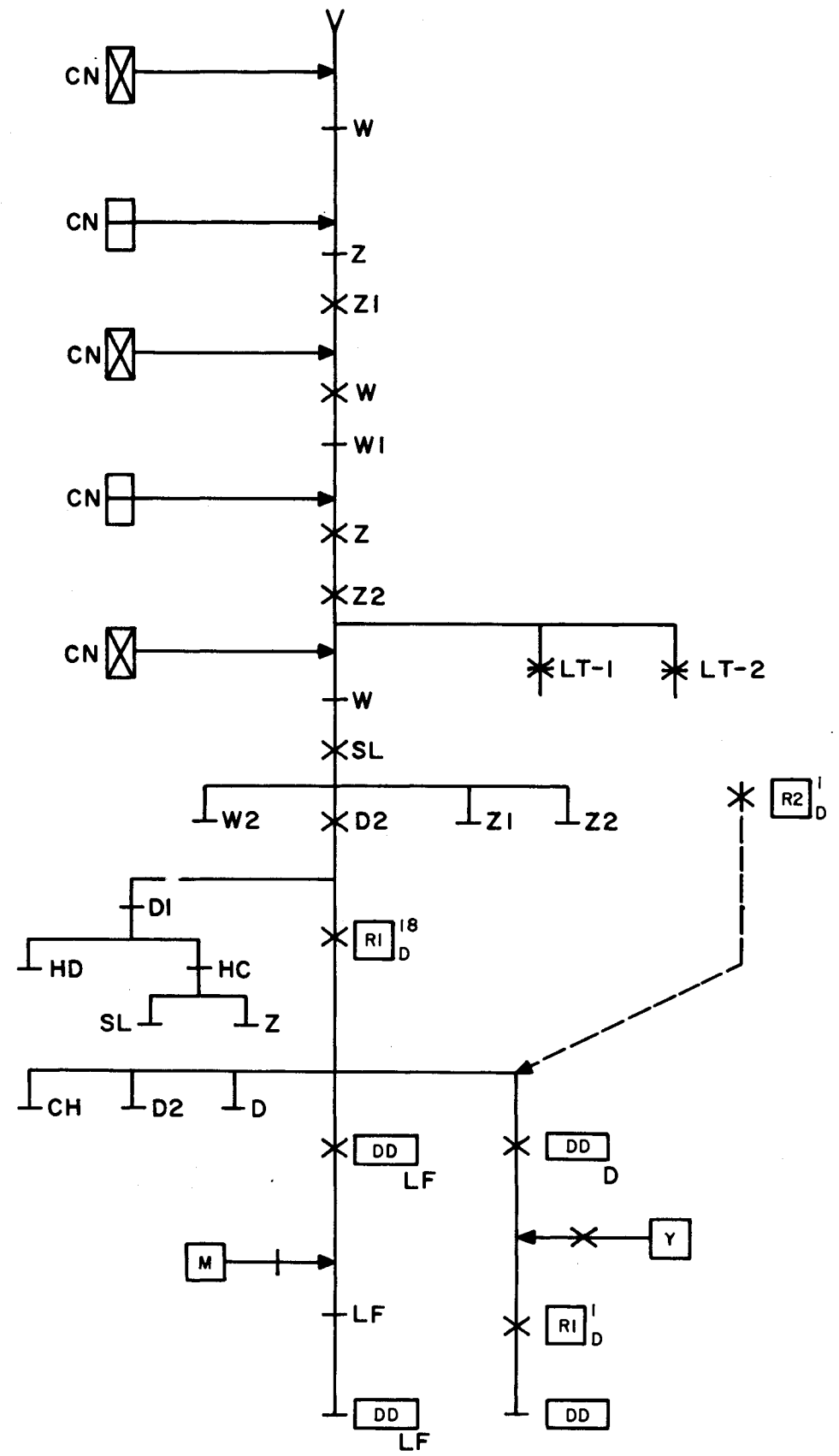
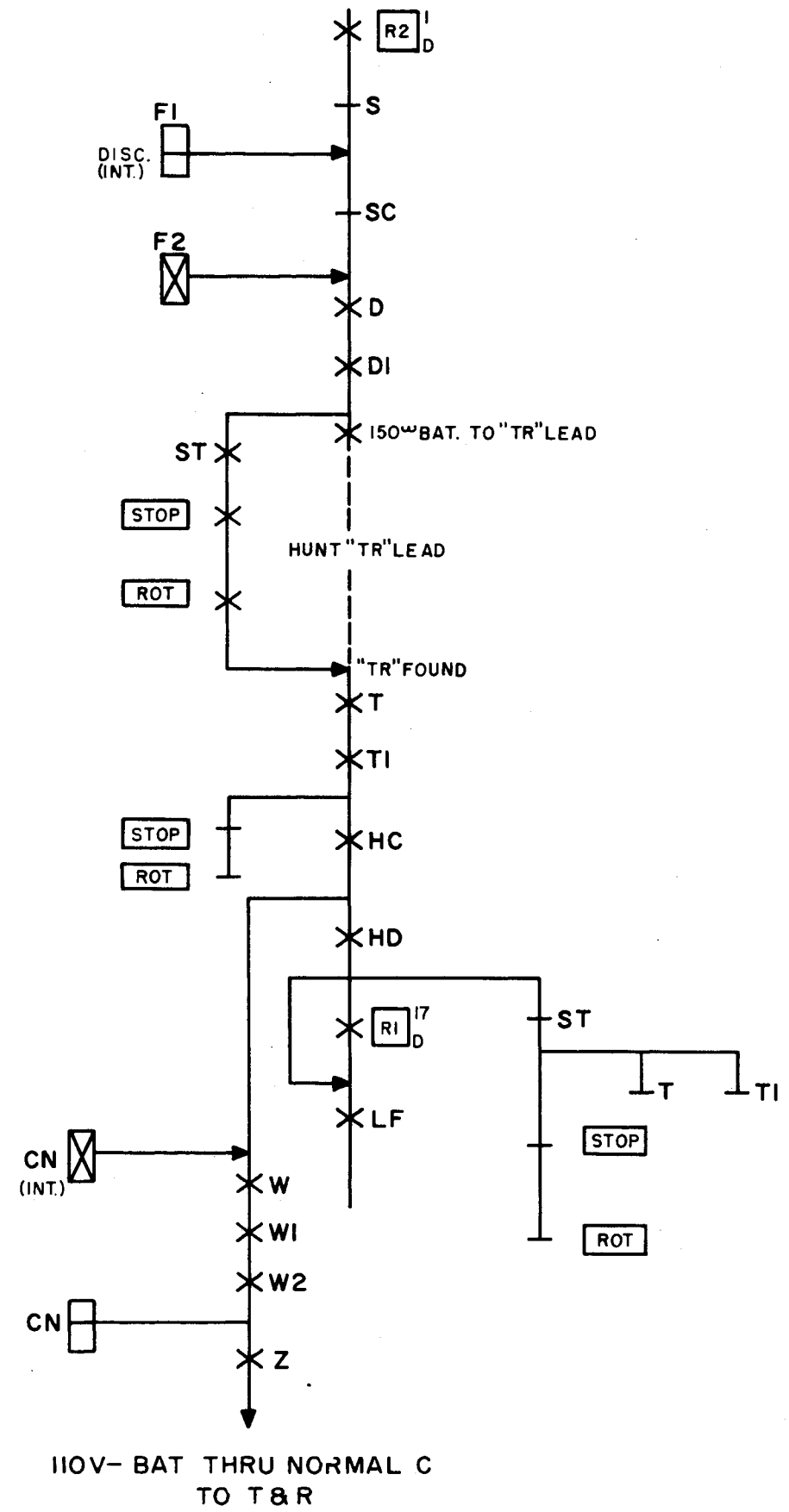
ISSUE
JAN. 1950

FAILURE TO
COLLECT OR REFUND
ON DISCONNECT

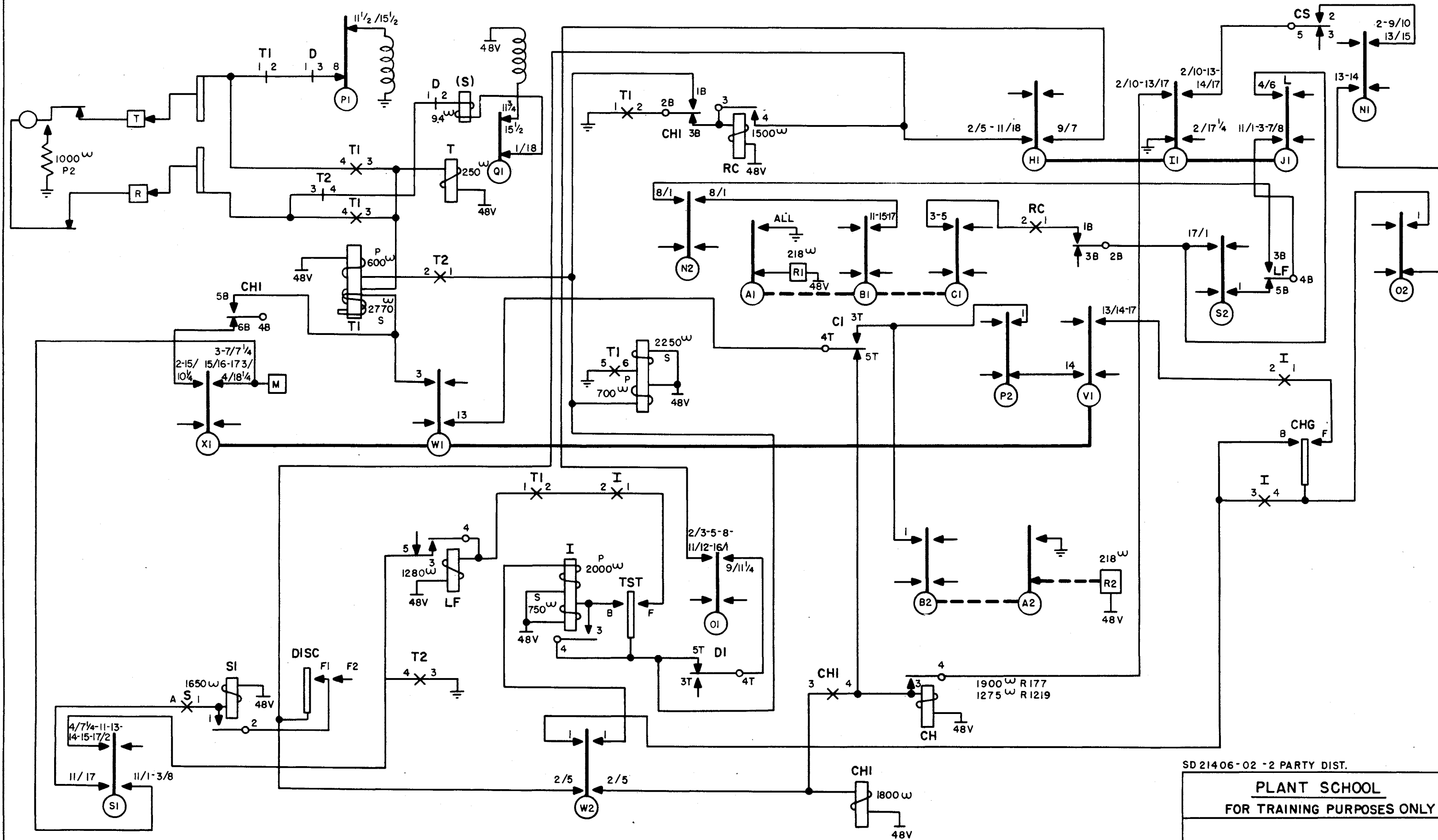




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ISSUE
JAN. 1950



SD 214 06-02 -2 PARTY DIST.

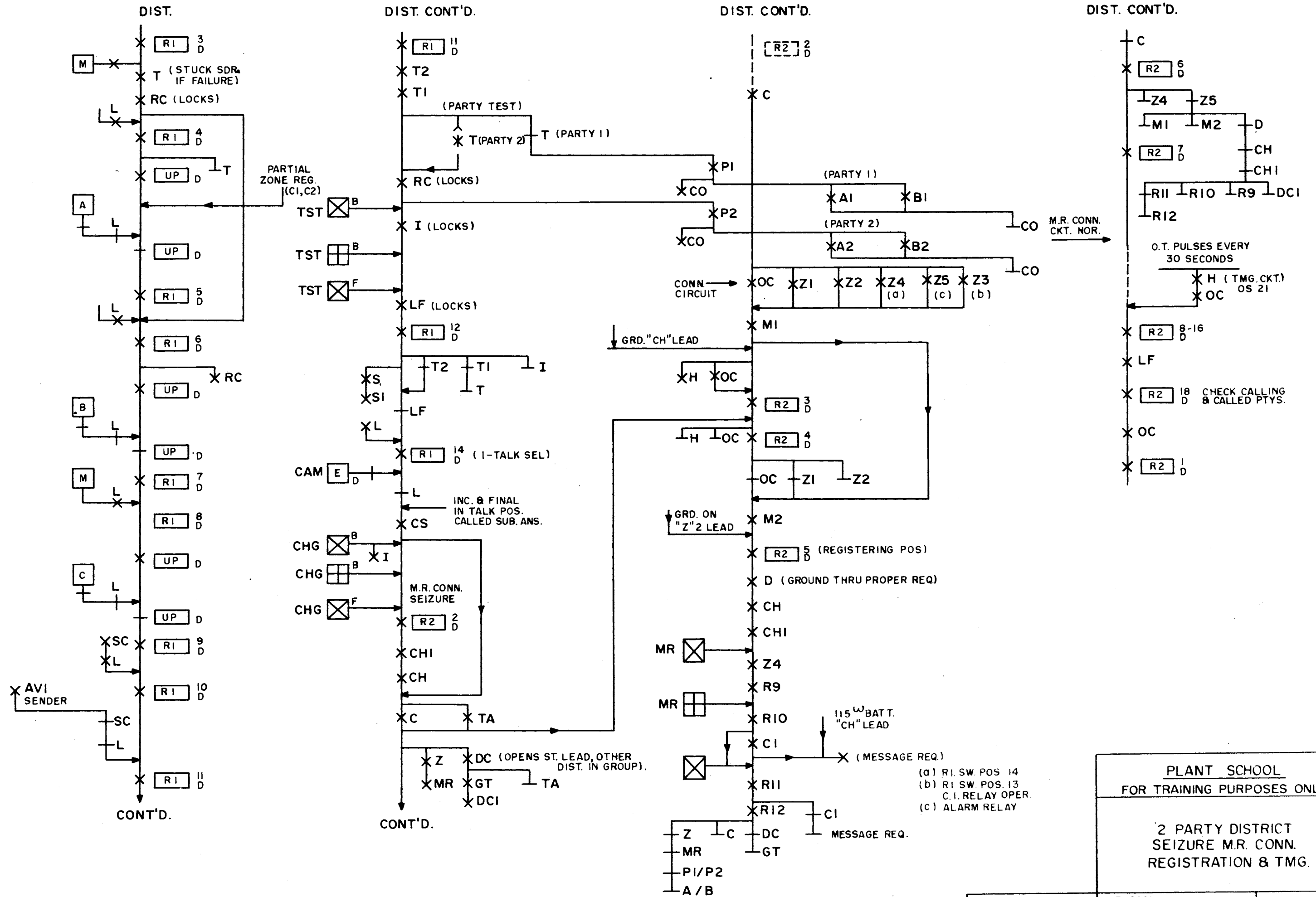
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

2 PARTY DISTRICT
T-RELAY TEST - PARTY TEST
CALLED PARTY ANSWER

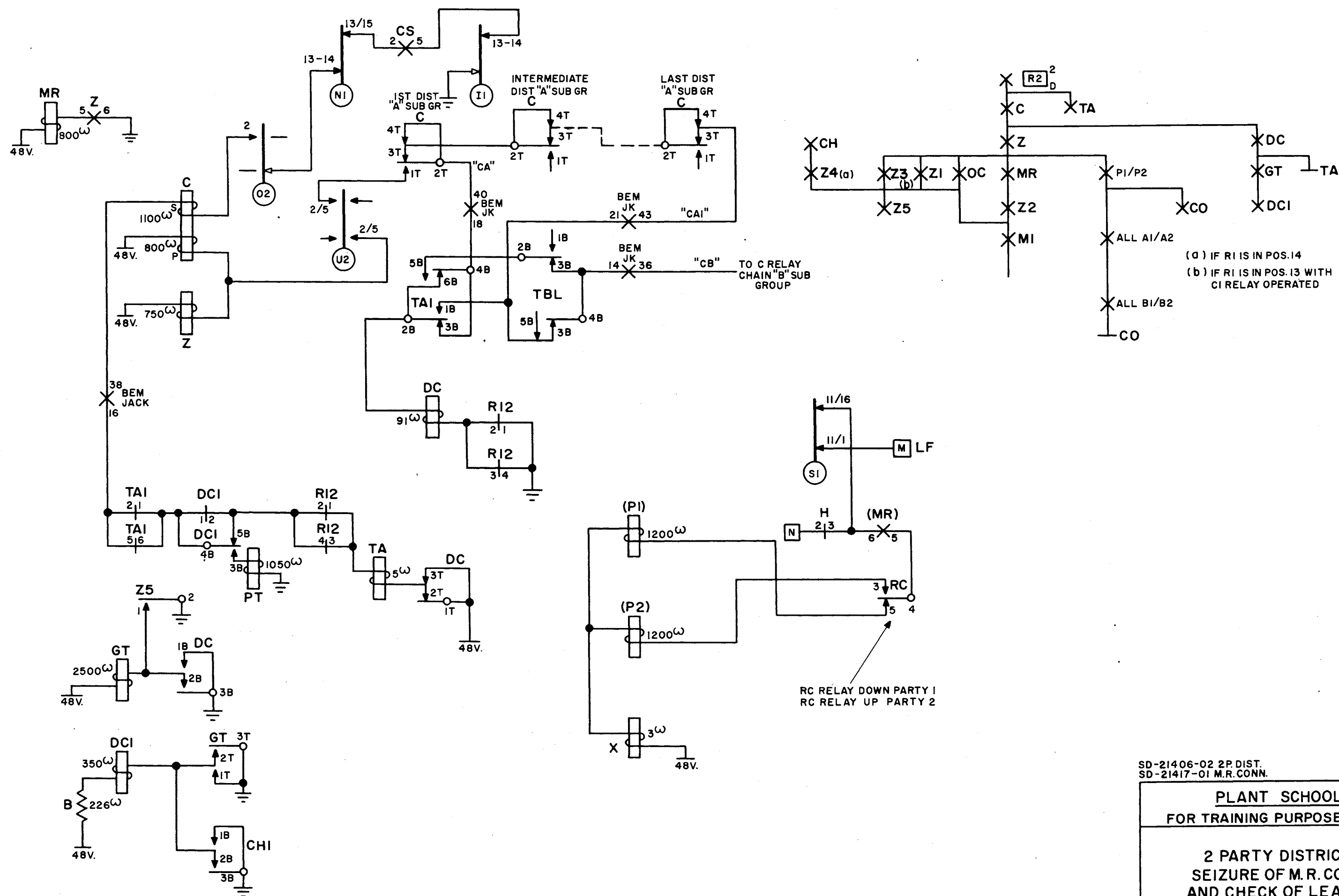
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN - D.S.CO. INC.

OS-38



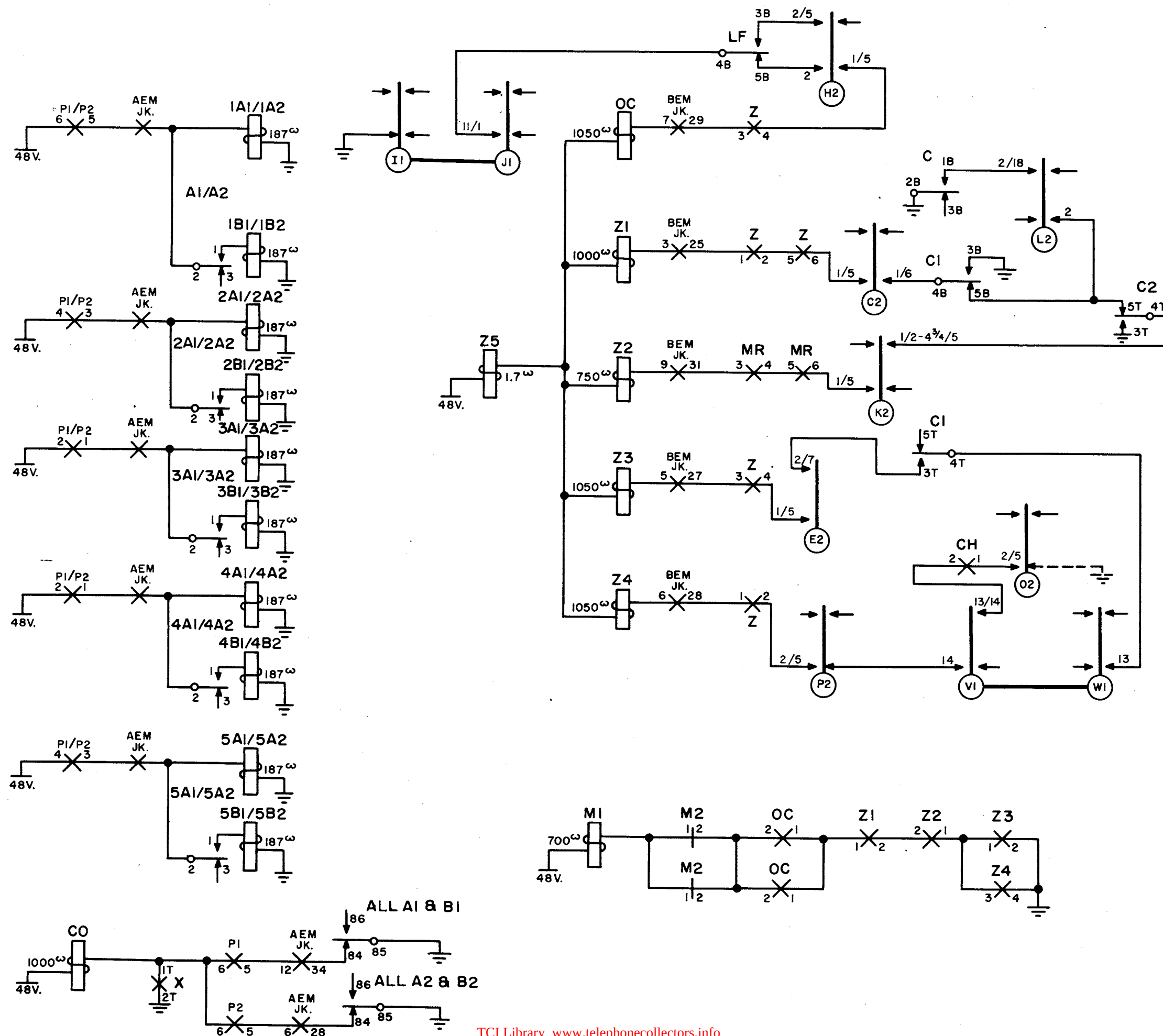
ISSUE 1
JAN. 1950

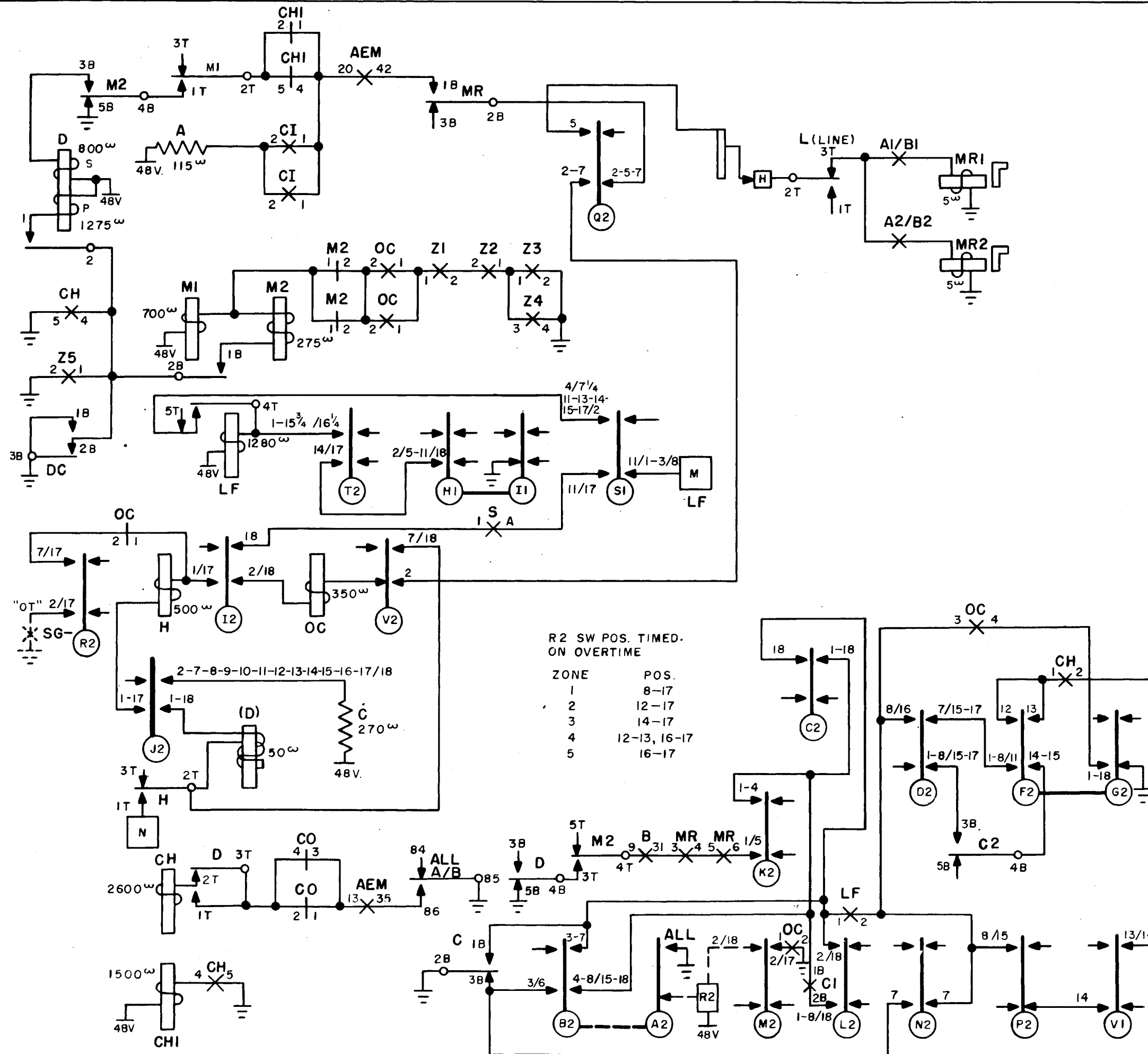


SD-21406-02 2P.DIST.
SD-21417-01 M.R.CONN.

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

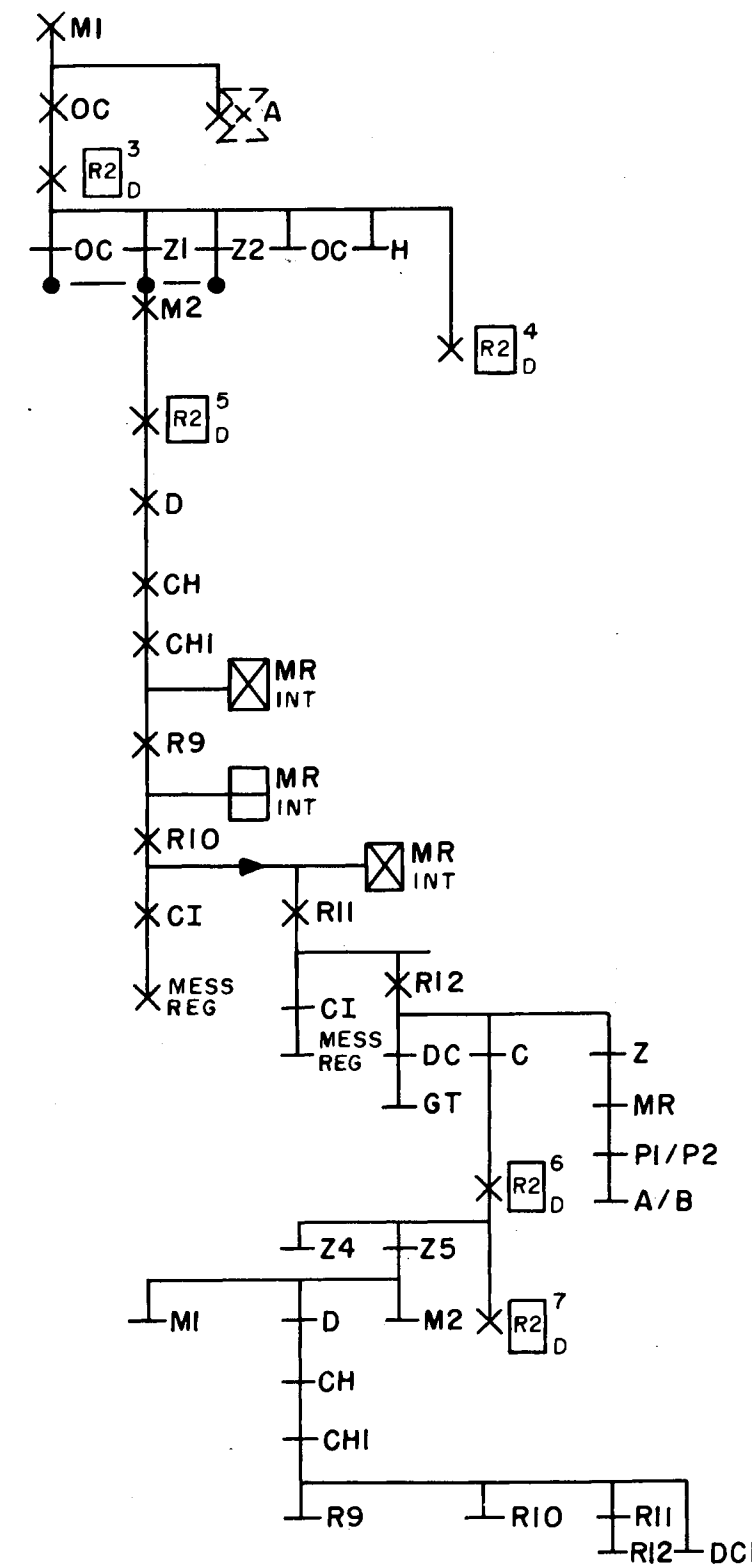
2 PARTY DISTRICT
SEIZURE OF M.R.CONN.
AND CHECK OF LEADS





R2 SW POS. TIMED.
ON OVERTIME

ZONE	POS.
1	8-17
2	12-17
3	14-17
4	12-13, 16-17
5	16-17



SD 21406-02 2 PARTY DIST.
SD 21417-01 M.R. CONN.

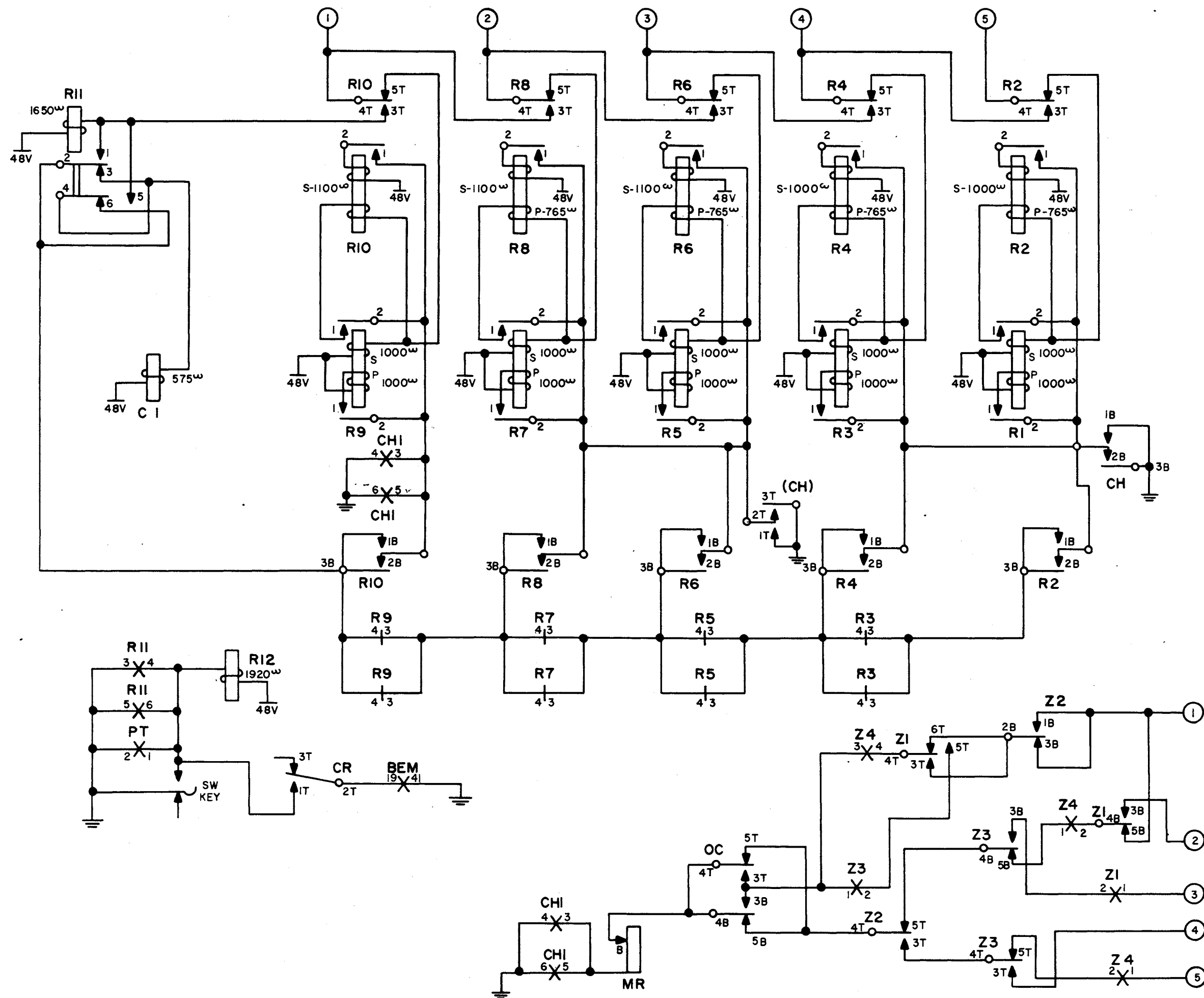
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

2 PARTY DISTRICT
REGISTRATION & TIMING

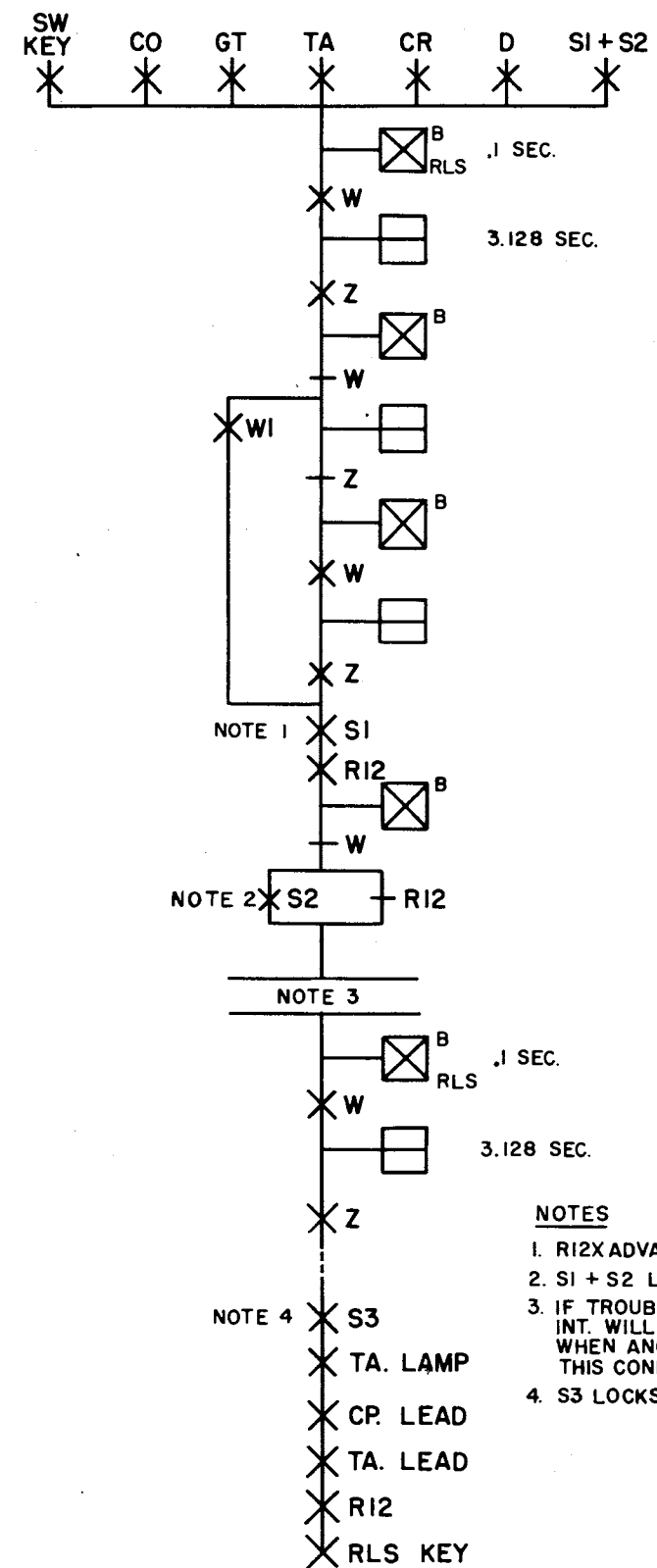
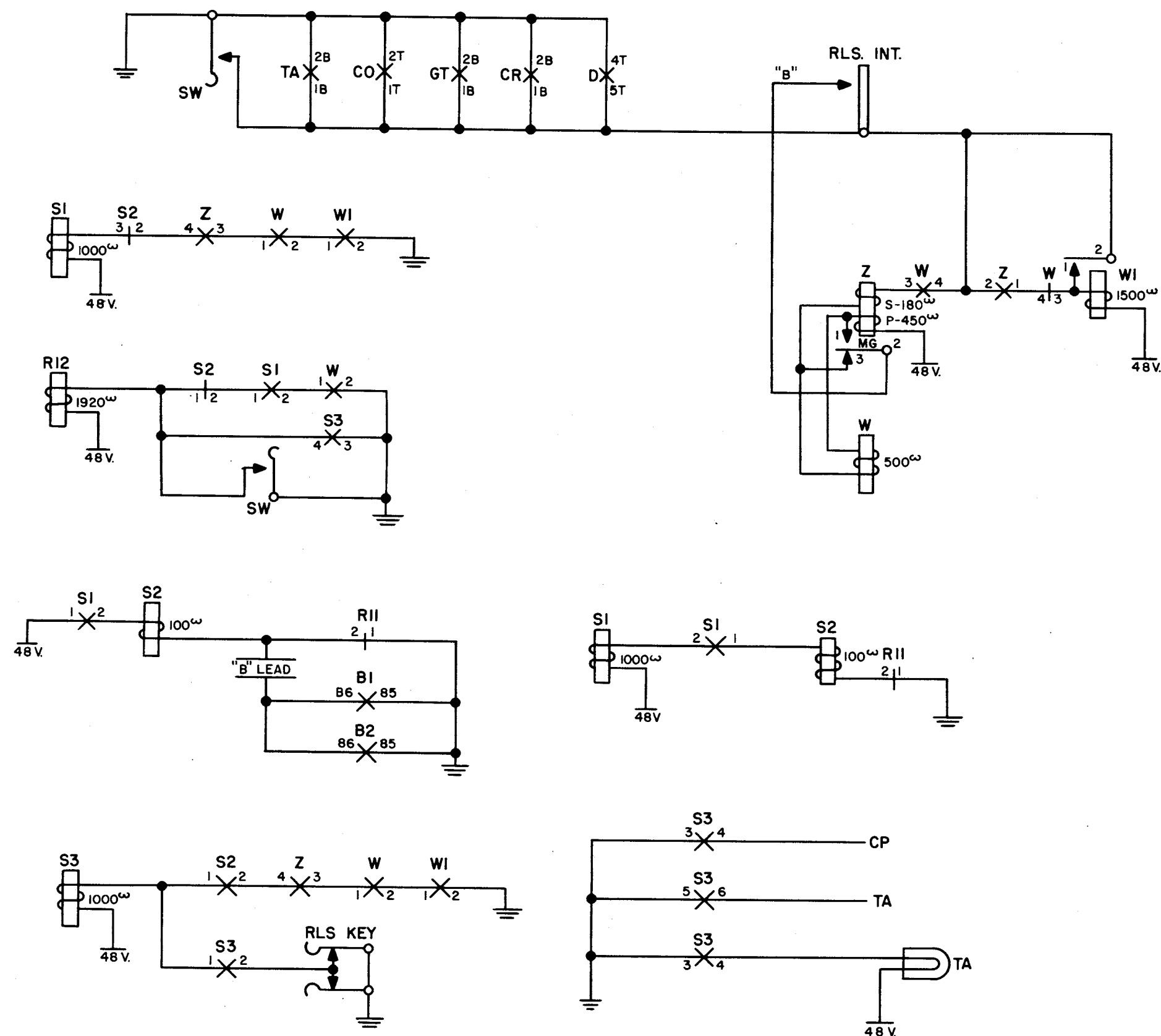
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN - D.S. CO. INC.

OS40
SHEET 1



ISSUE 1
JAN. 1950



NOTES

1. R12X ADVANCES DIST.
2. SI + S2 LOCK TO NORMAL R11.
3. IF TROUBLE REMAINS, RLS INT. WILL AGAIN FUNCTION WHEN ANOTHER DIST. SEIZES THIS CONN.
4. S3 LOCKS TO RLS. KEY NORMAL.

SD 21417-01

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

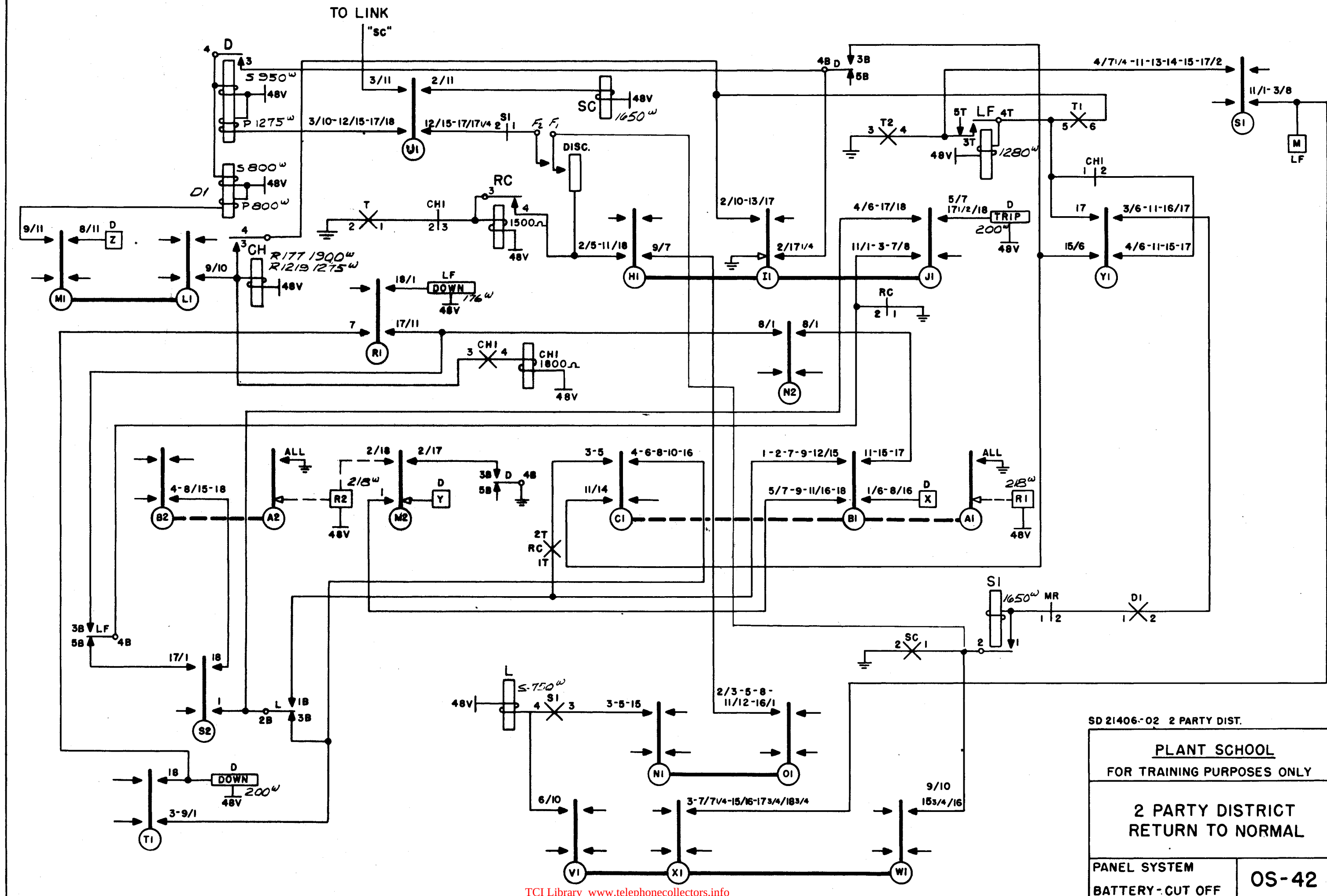
M. R. CONN.
TIME ALARM

PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN - D.S. CO. INC.

OS-41

ISSUED
JAN. 1950



SD 21406-02 2 PARTY DIST.

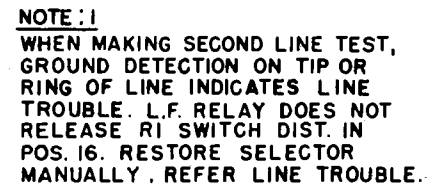
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

2 PARTY DISTRICT
RETURN TO NORMAL

PANEL SYSTEM
BATTERY - CUT OFF

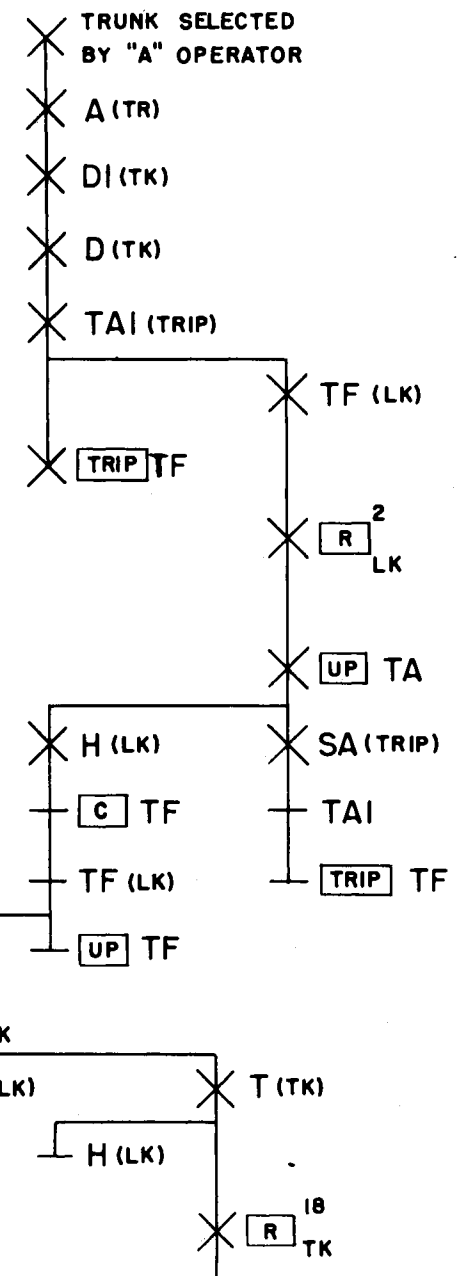
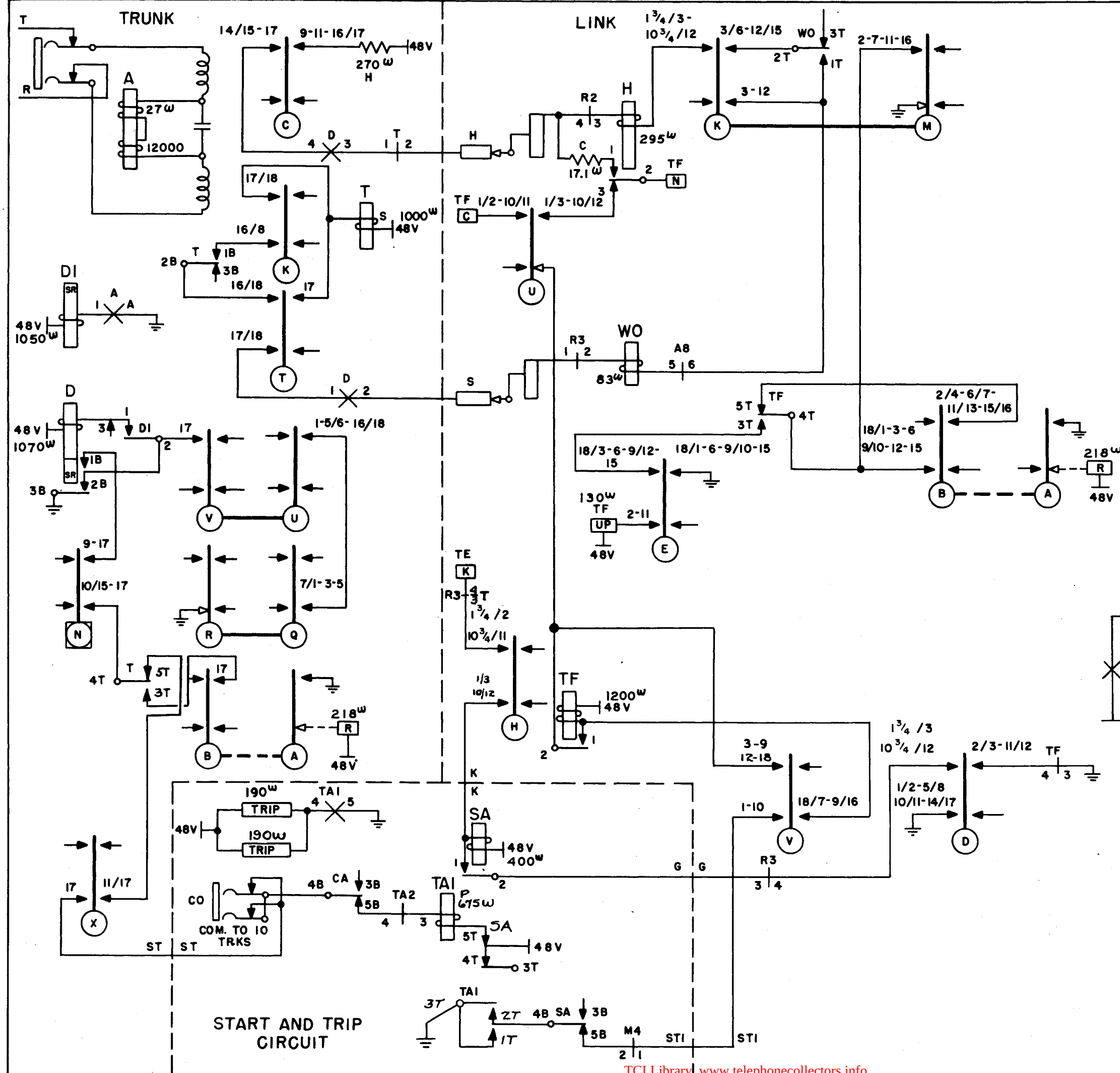
OS-42

ISSUE 1			
JAN. 1950			



TCI Library www.telephonecollectors.info

OS-42A



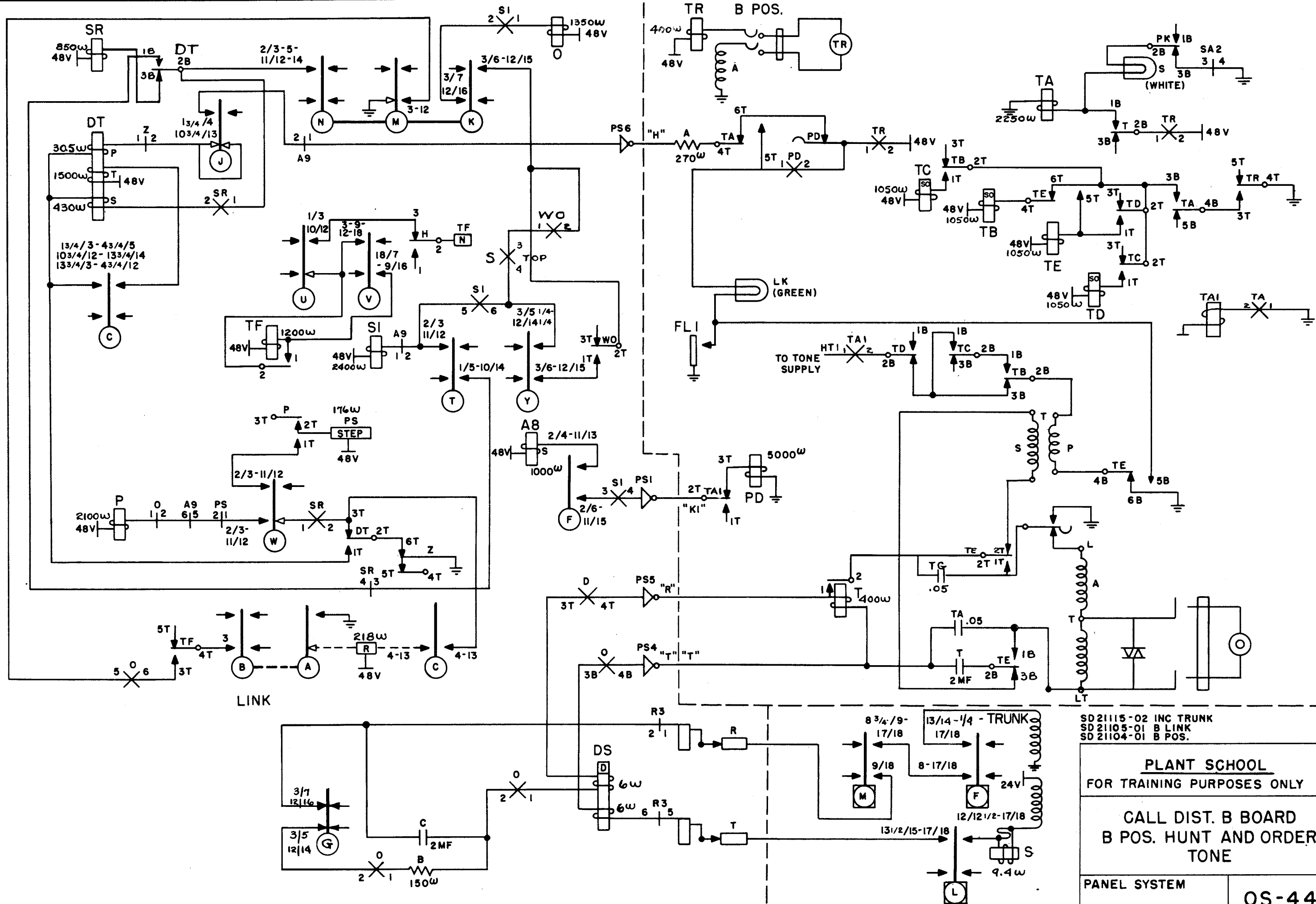
SD21115-01 INC TRUNK
SD21105-01 BLINK

PLANT SCHOOL
FOR TRAINING PURPOSE ONLY

CALL DISTRIBUTION B.B.D.
FINDING TRUNK

PANEL SYSTEM
BATTERY-CUT OFF

OS-43



SD 21115-02 INC TRUNK
SD 21105-01 B LINK
SD 21104-01 B POS.

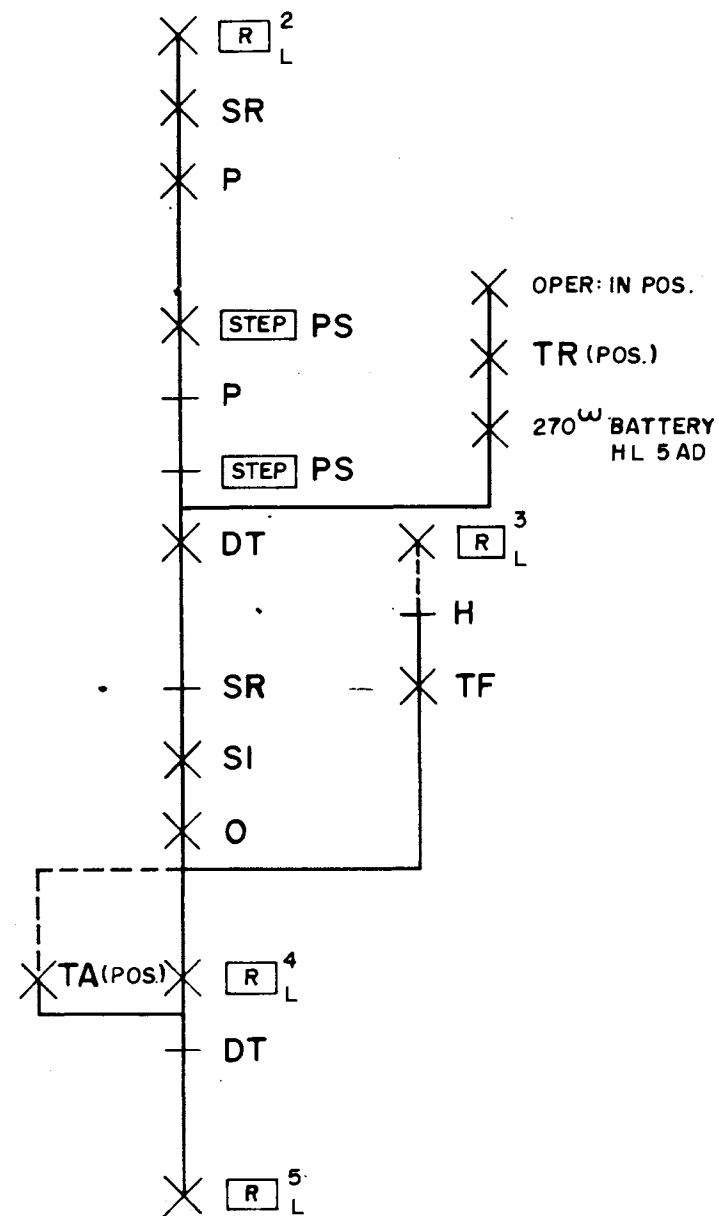
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

CALL DIST. B BOARD
B POS. HUNT AND ORDER
TONE

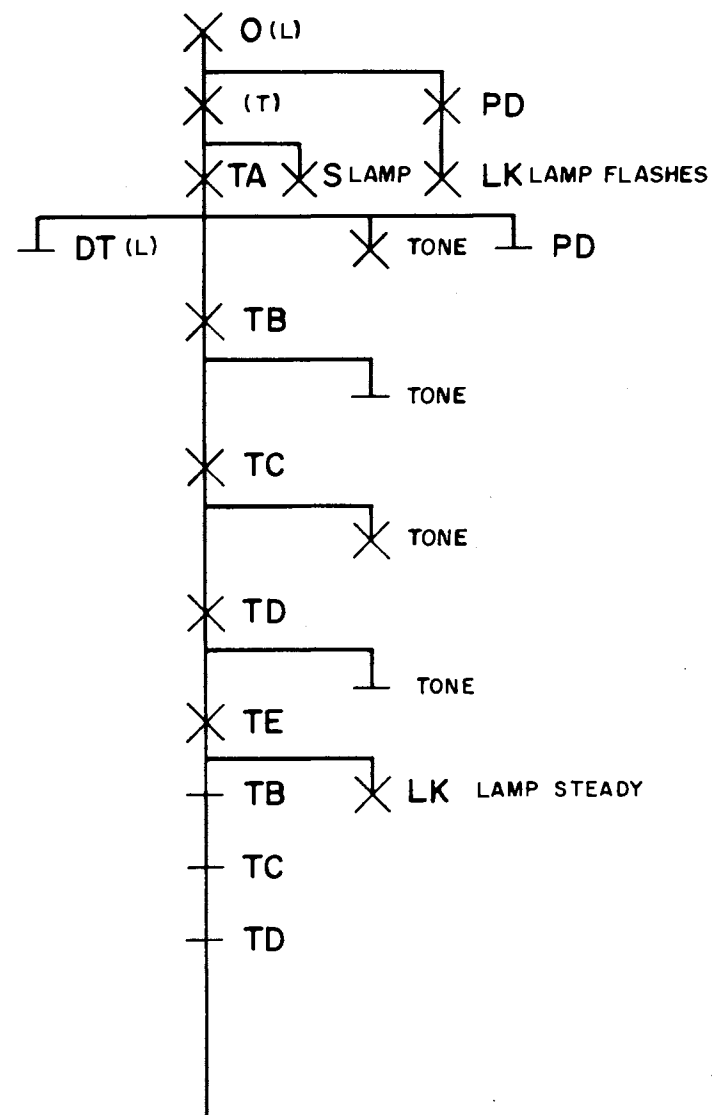
PANEL SYSTEM
BATTERY - CUT OFF

OS-44
SHEET 1

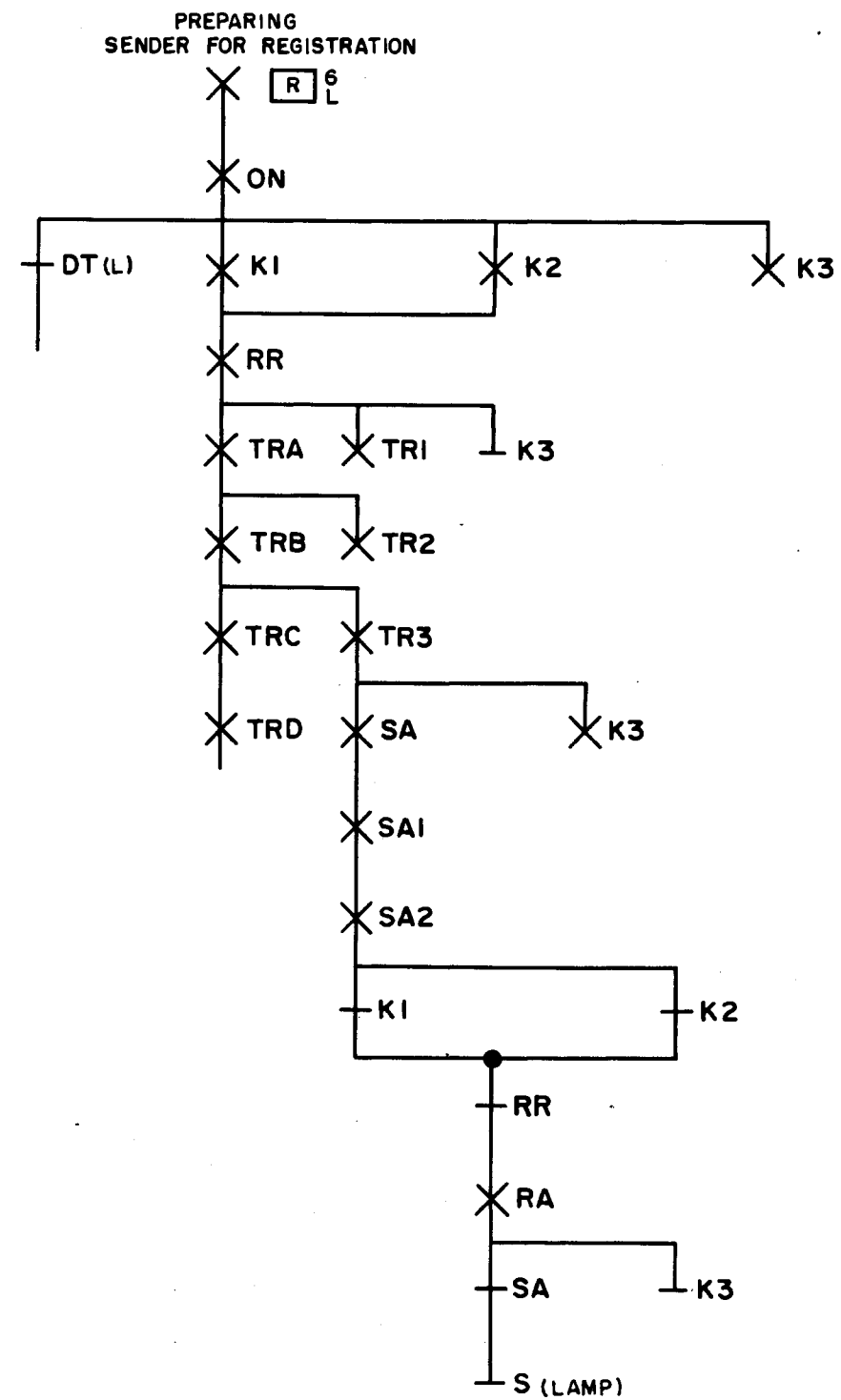
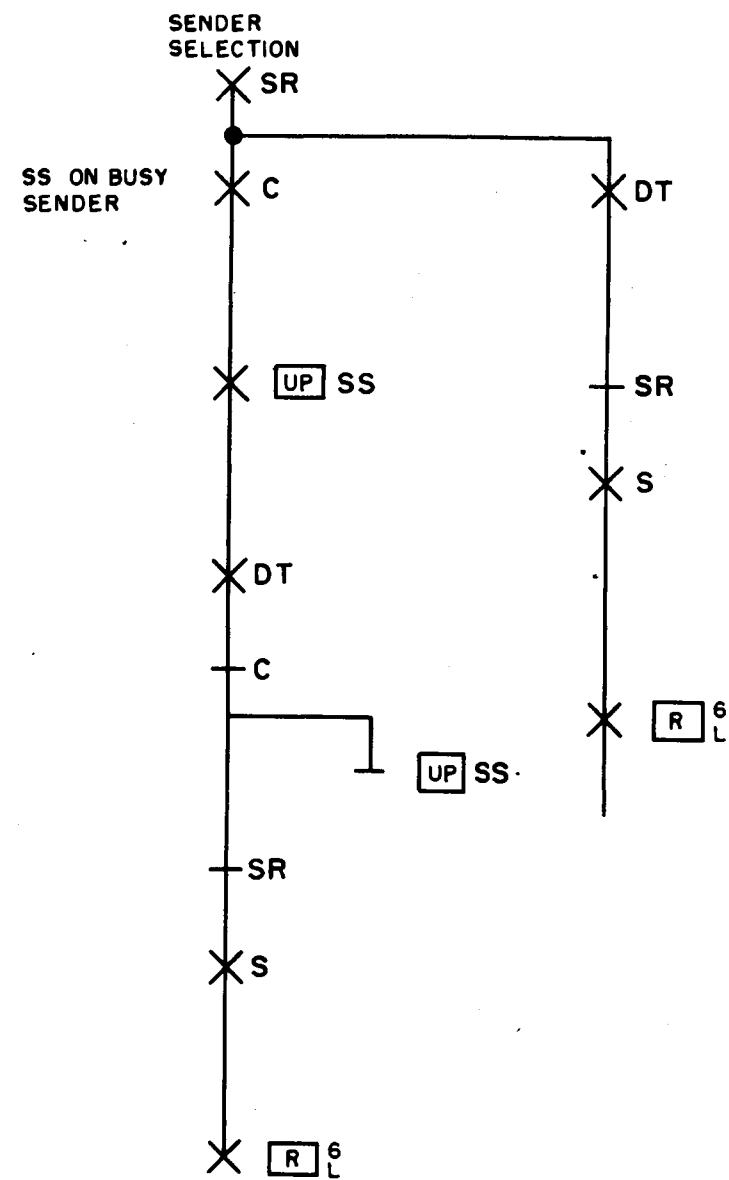
"B" POSITION SELECTION



ORDER TONE TO
"A" & "B" OPERATORS
FROM B POSITION CKT



ISSUE
JAN 1950



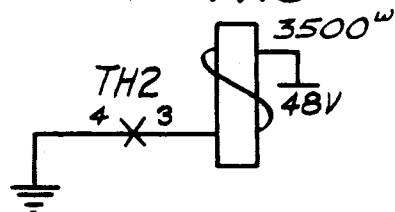
ISSUE
JAN 1950

ISSUE
DEC. 8, 49

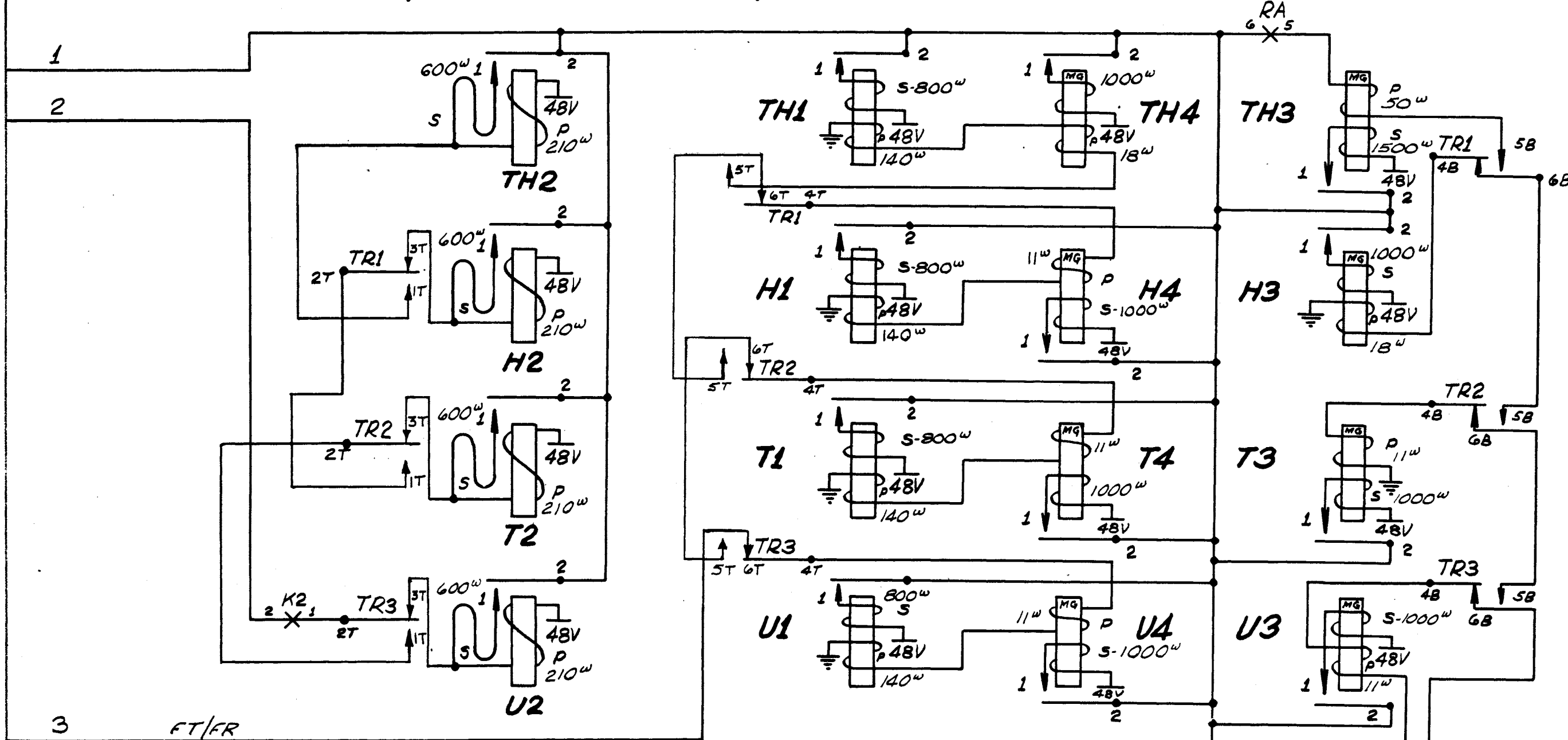
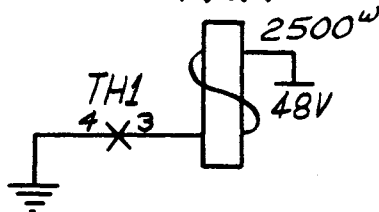
17" x 11"

SENDER

THB



THA



LEAD	KEY OPERATED									
	0	1	2	3	4	5	6	7	8	9
K1-FT		L	H				L	H		
K2-FR				L	H				L	H
K3-K	L	L	L	L	L	H	H	H	H	H
REG. RELAYS	3	134	±3	1234	123	NONE	1-4	1	1-24	1-2

L = LOW RESISTANCE BATTERY
H = HIGH RESISTANCE BATTERY

4 K LEAD

BLINK
B SENDER
B POS.

SD- 21105-01
SD- 21106-01
SD- 21104-01

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

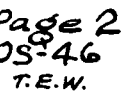
CALL DIST. "B" BOARD
REGISTRATION OF DIGITS

J. LAWLESS

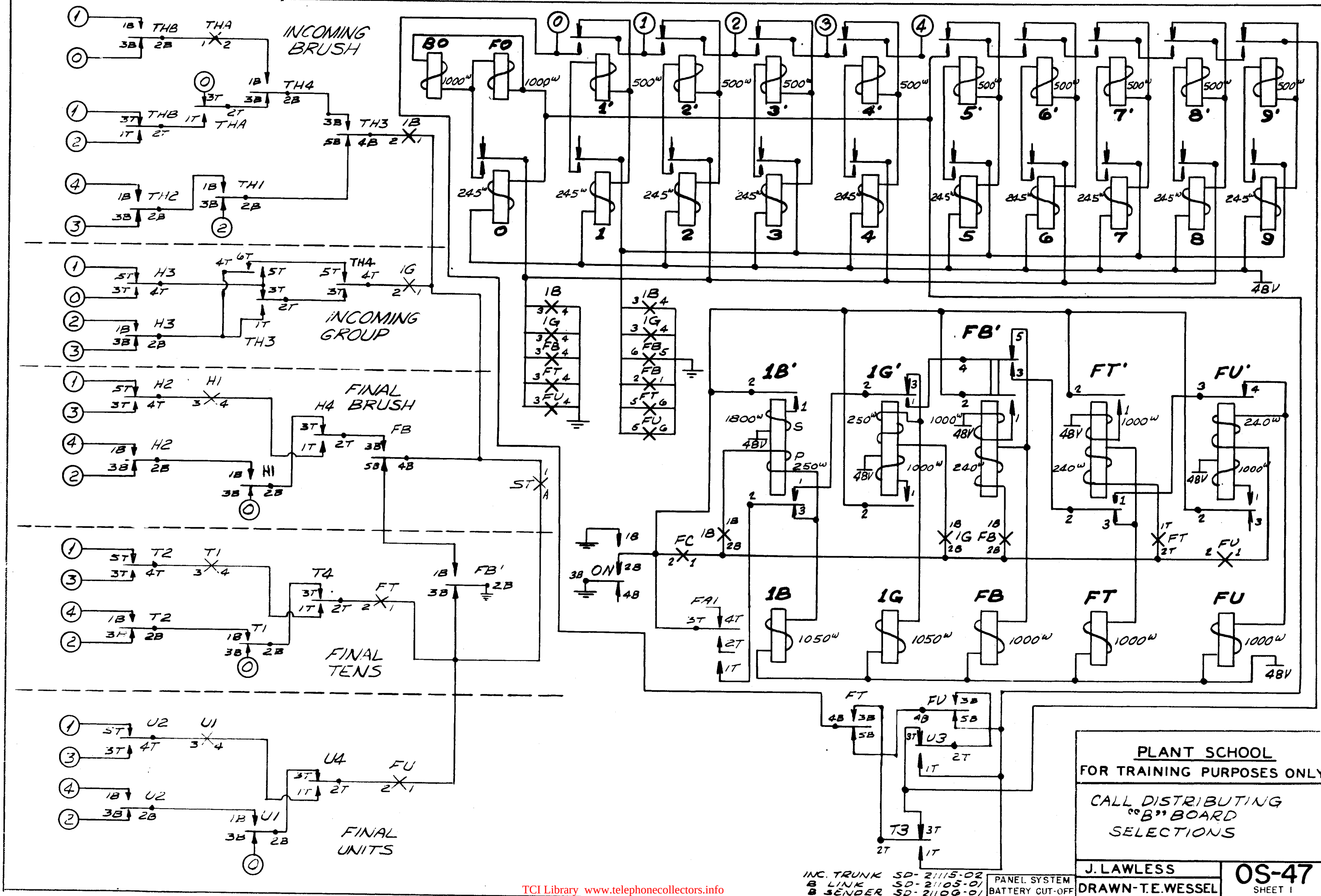
DRAWN-T.E. WESSEL

OS-46
SHEET 1

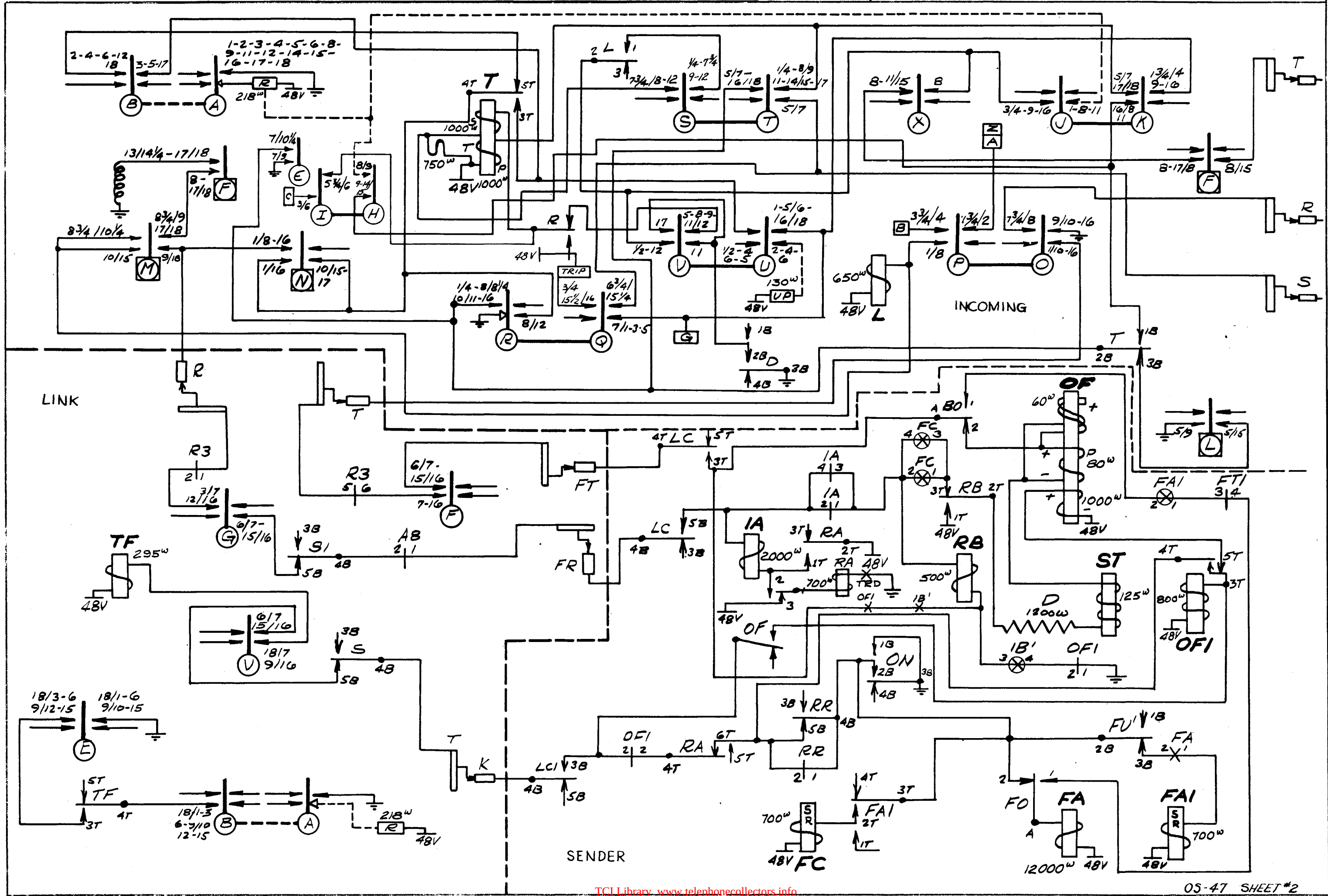
PANEL SYSTEM
BATTERY CUT-OFF



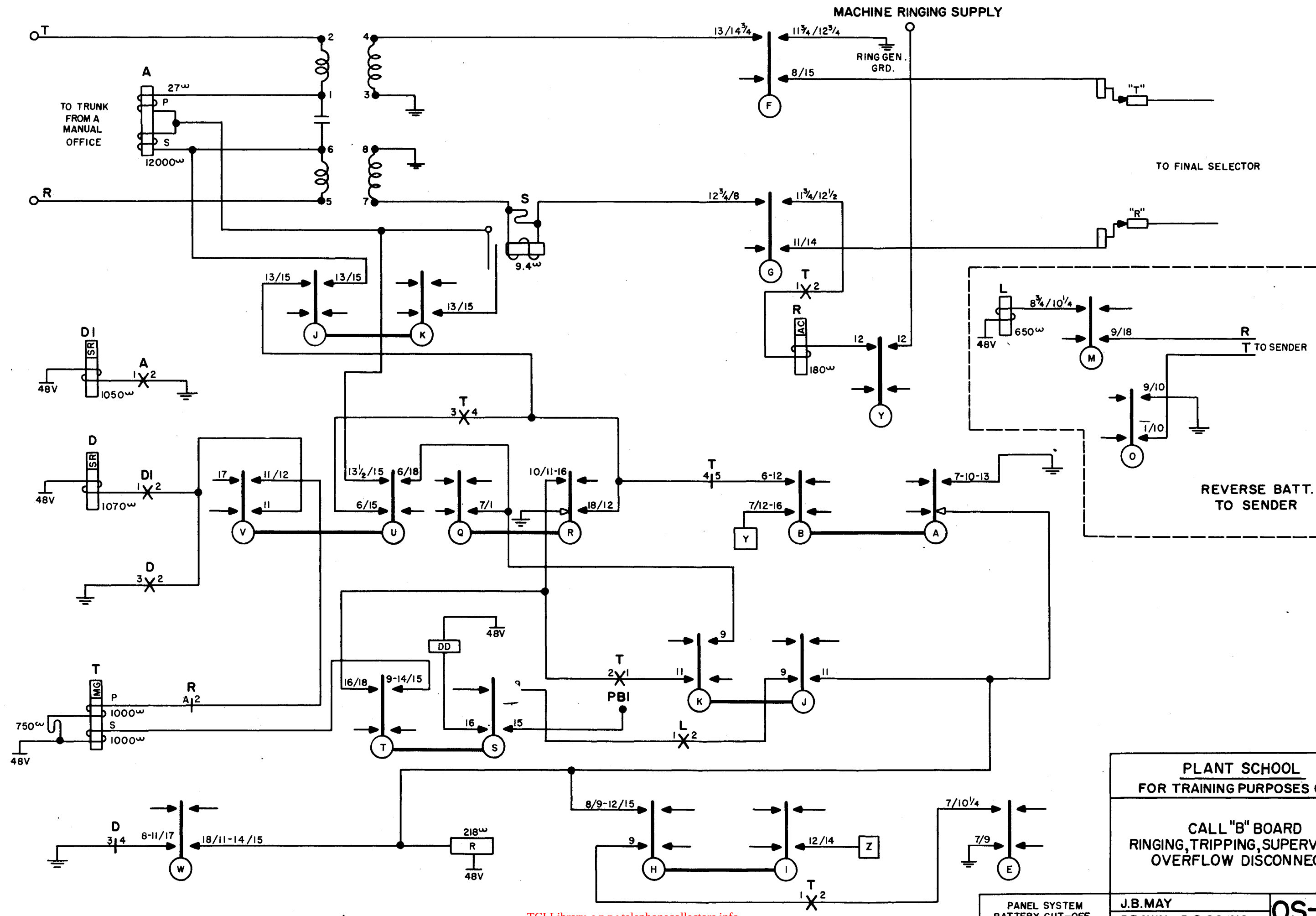
1530
DEC 2-49

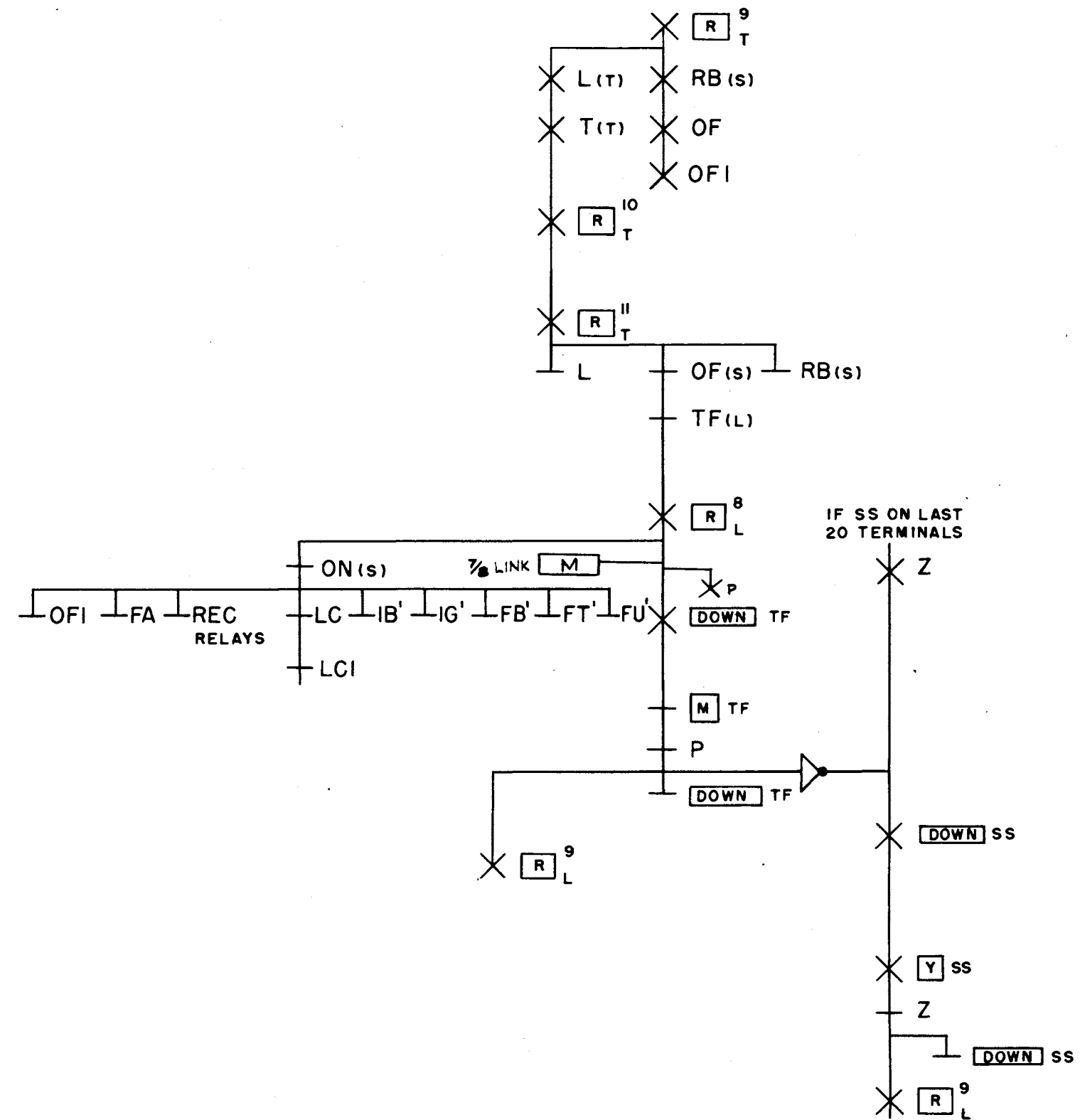
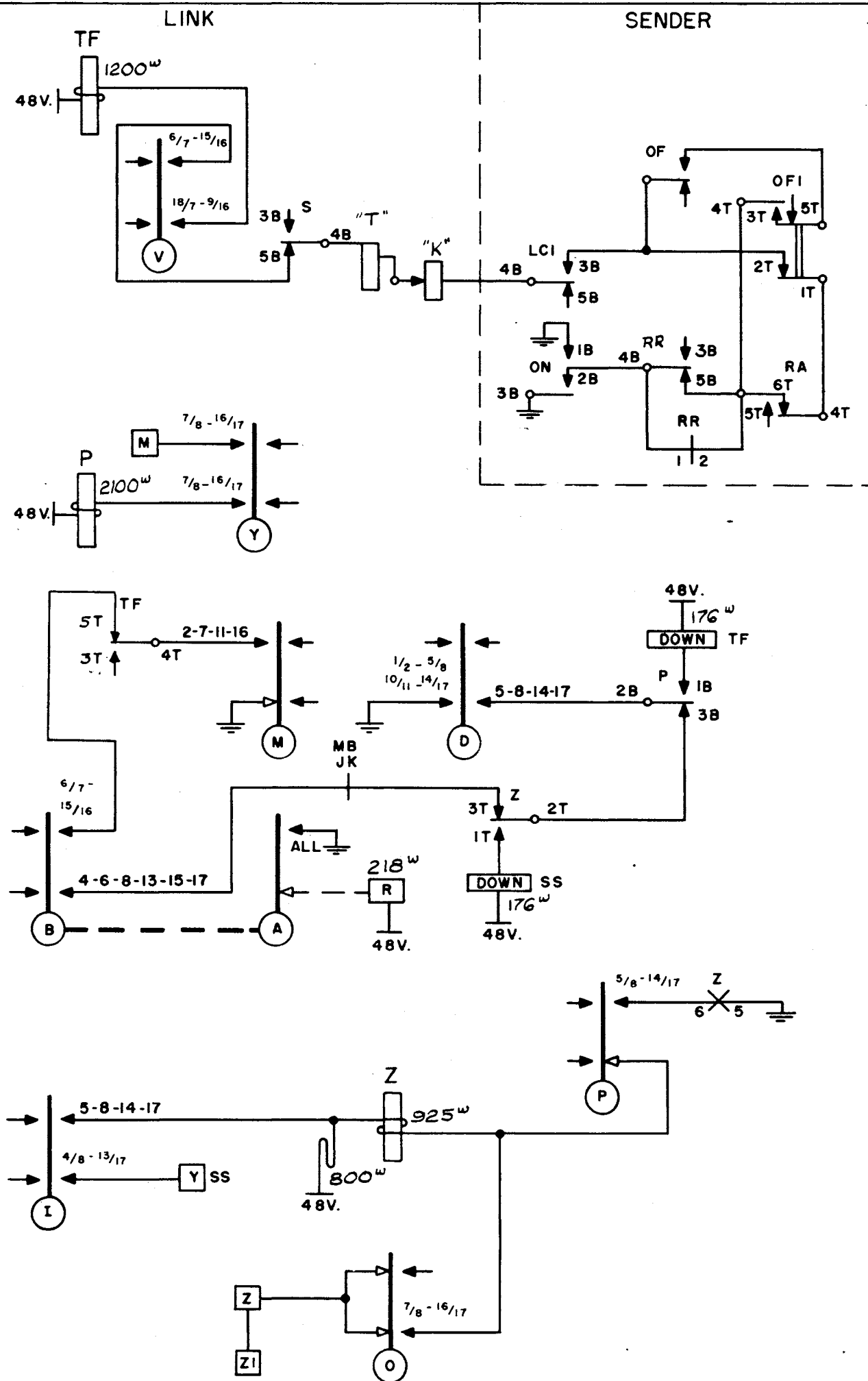


PLANT SCHOOL
FOR TRAINING PURPOSES ONLY
CALL DISTRIBUTING
"B" BOARD
SELECTIONS
J. LAWLESS
DRAWN-T.E. WESSEL
OS-47
SHEET 1



OS-47, Page 2
12-7-49 T.E.A.





SD-21105-01 B LINK
SD-21106-01 B SENDER

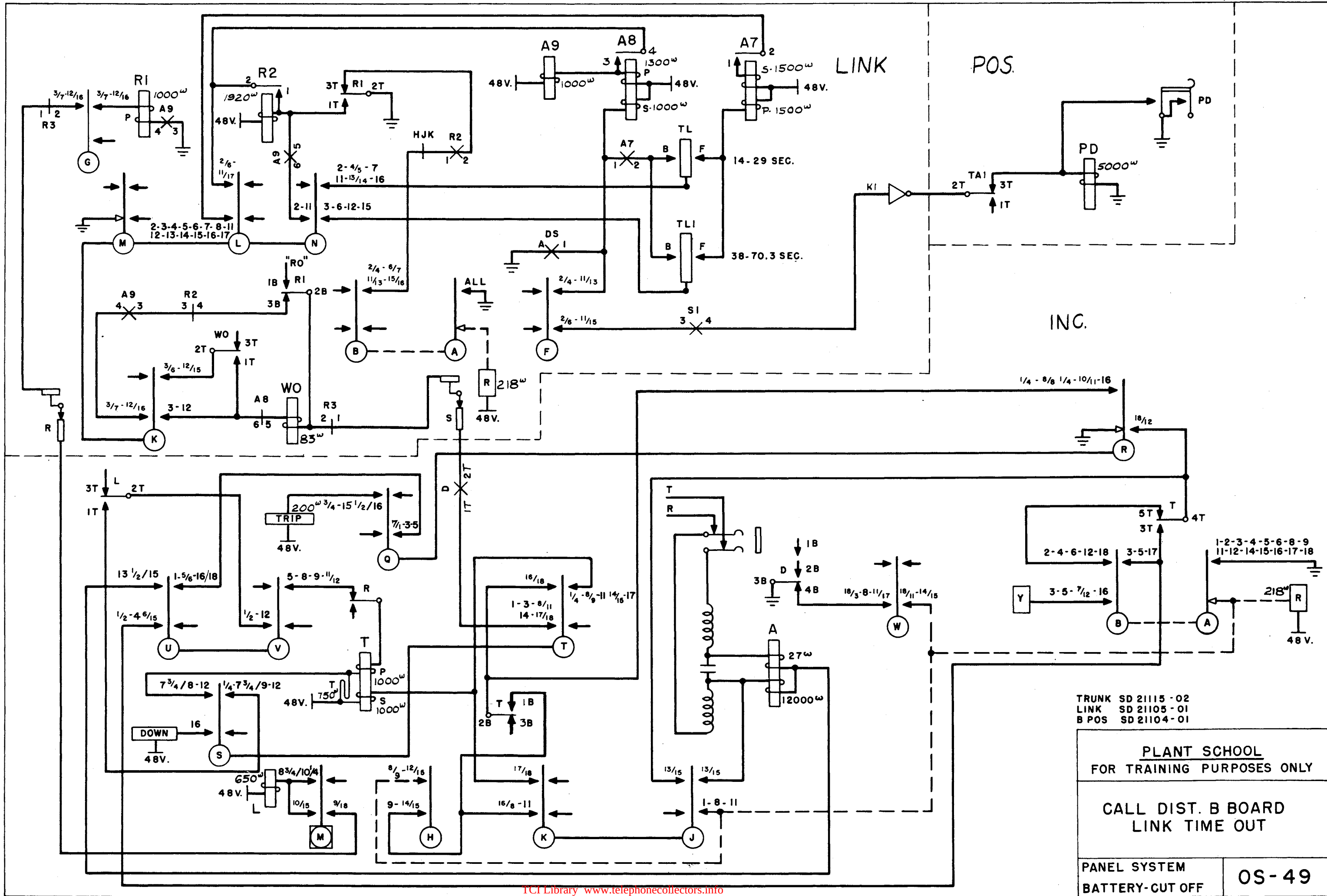
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

RELEASE OF SENDER
AND LINK

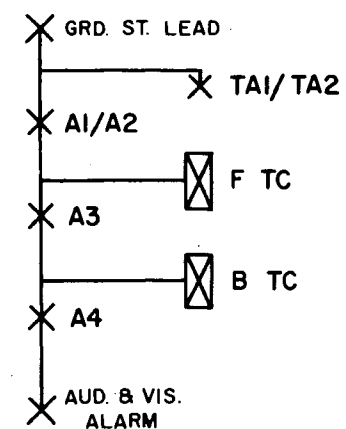
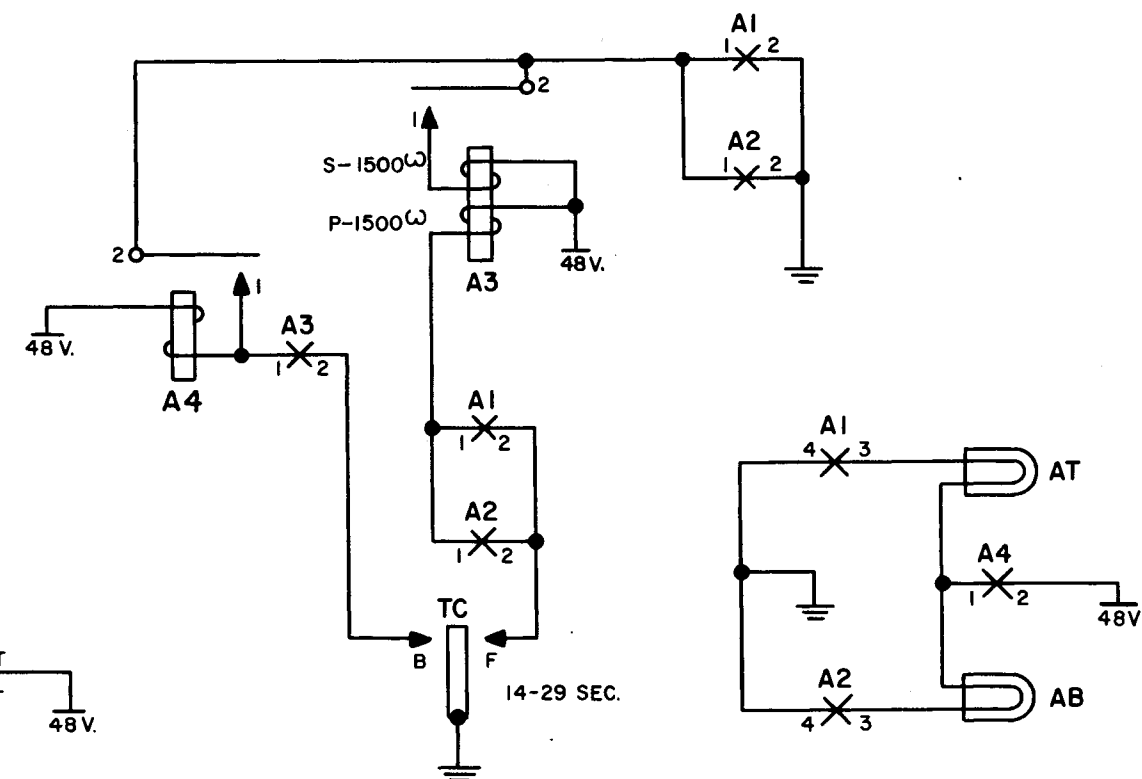
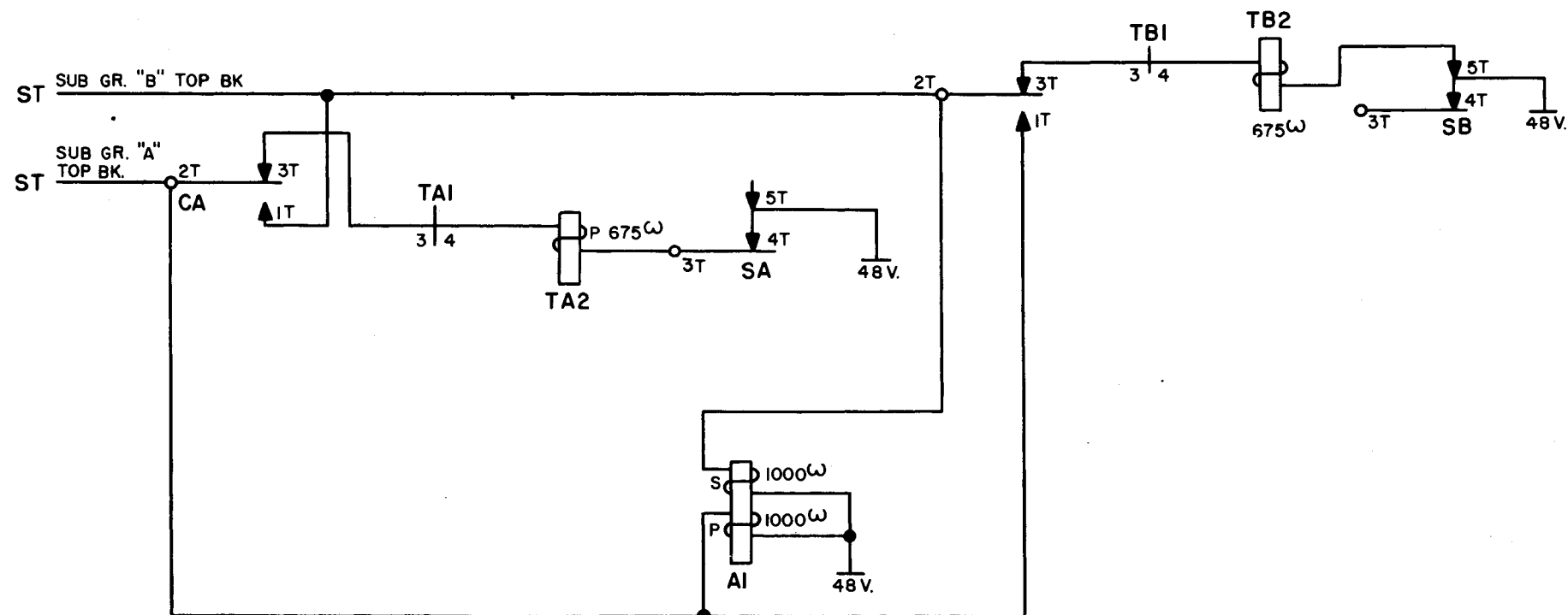
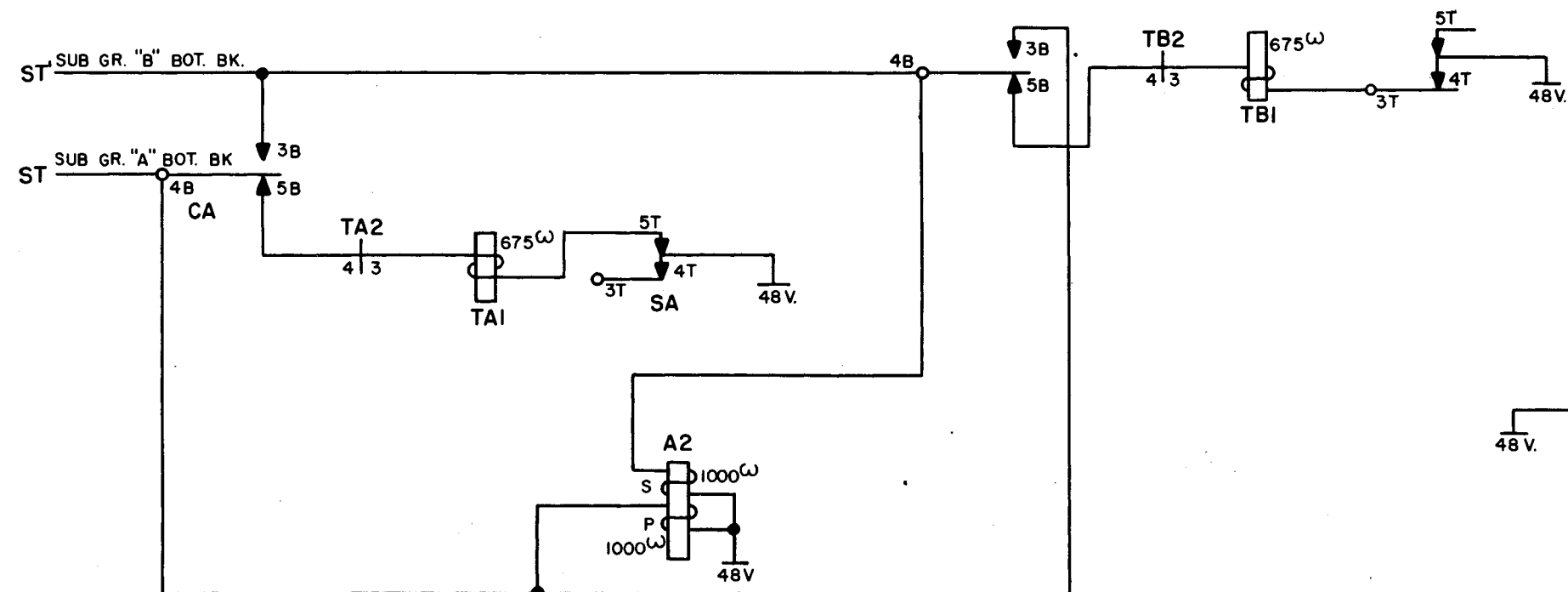
PANEL SYSTEM

BATTERY-CUT OFF

OS-48



ISSUE 1
JAN 1950



SD 1105-01 C.D. "B" LINK

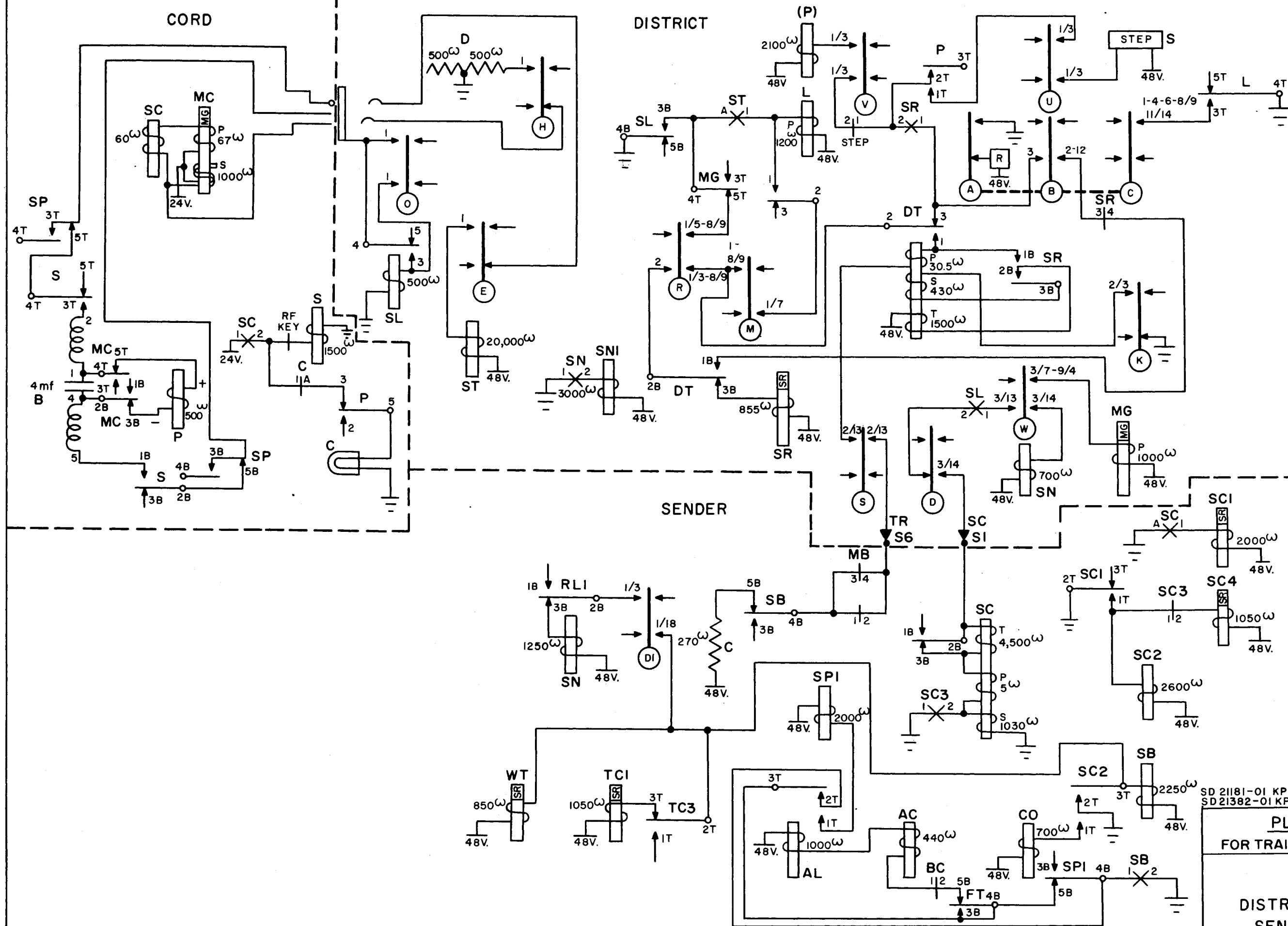
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

CALL DIST. "B" BOARD
BLINK START & TRIP
TIMING & TRANSFER

PANEL SYSTEM
BATTERY CUT-OFF

J. B. MAY
DRAWN - D.S. CO. INC.

OS-50
SHEET 1



SD 21181-01 KP DISTRICT
SD 21382-01 KP SENDER

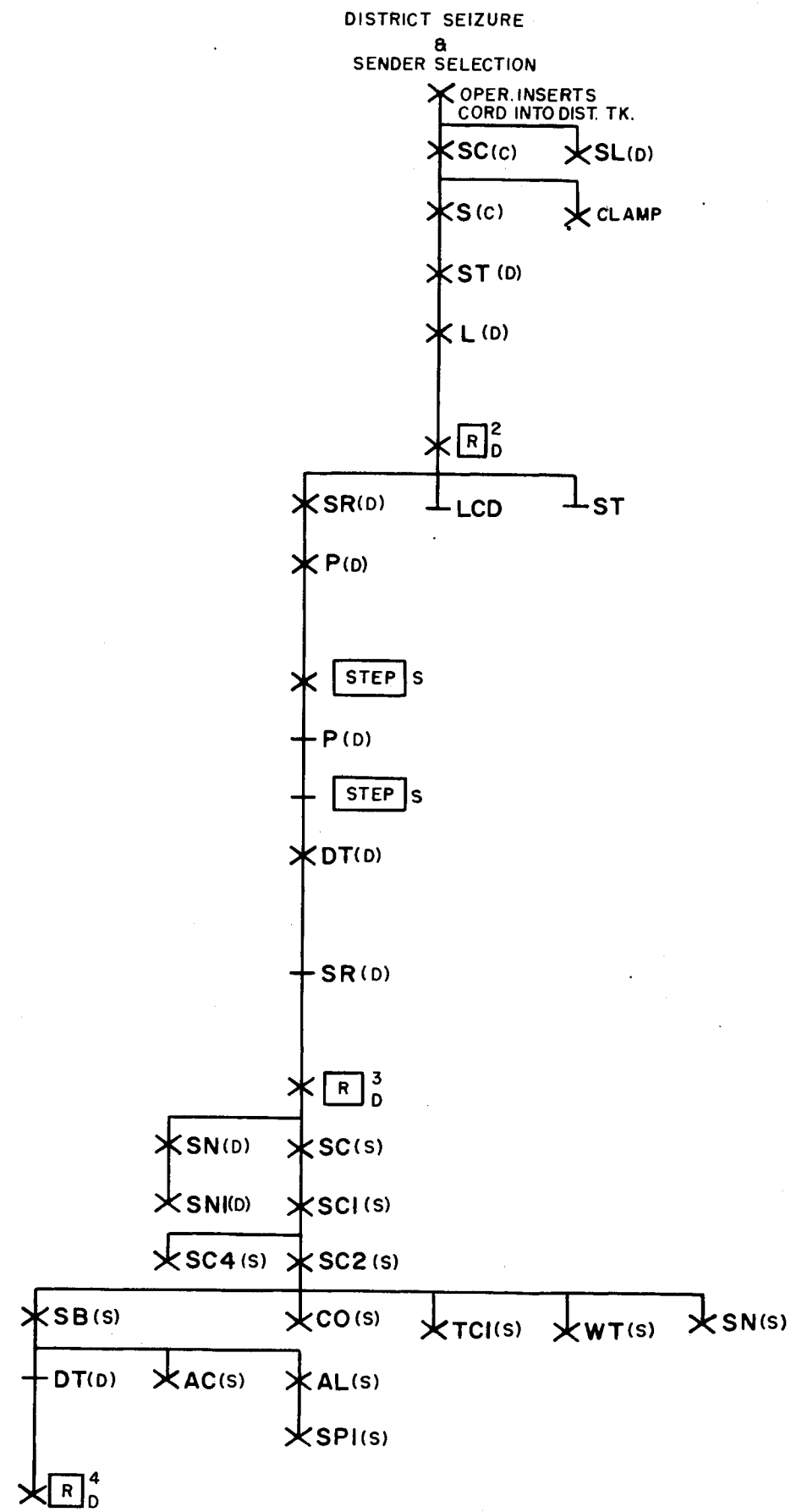
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

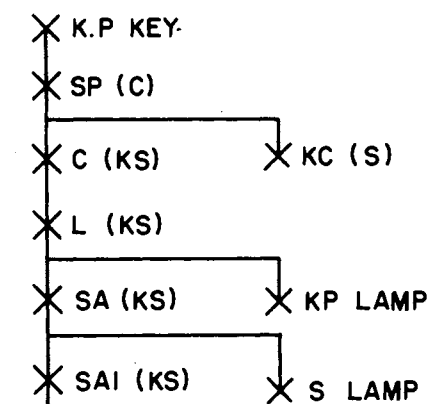
KPA BOARD
DISTRICT SEIZURE AND
SENDER SELECTION

PANEL SYSTEM
BATTERY CUT-OFF

J.B.MAY
DRAWN - D.S.CO. INC.

OS-51
SHEET 1





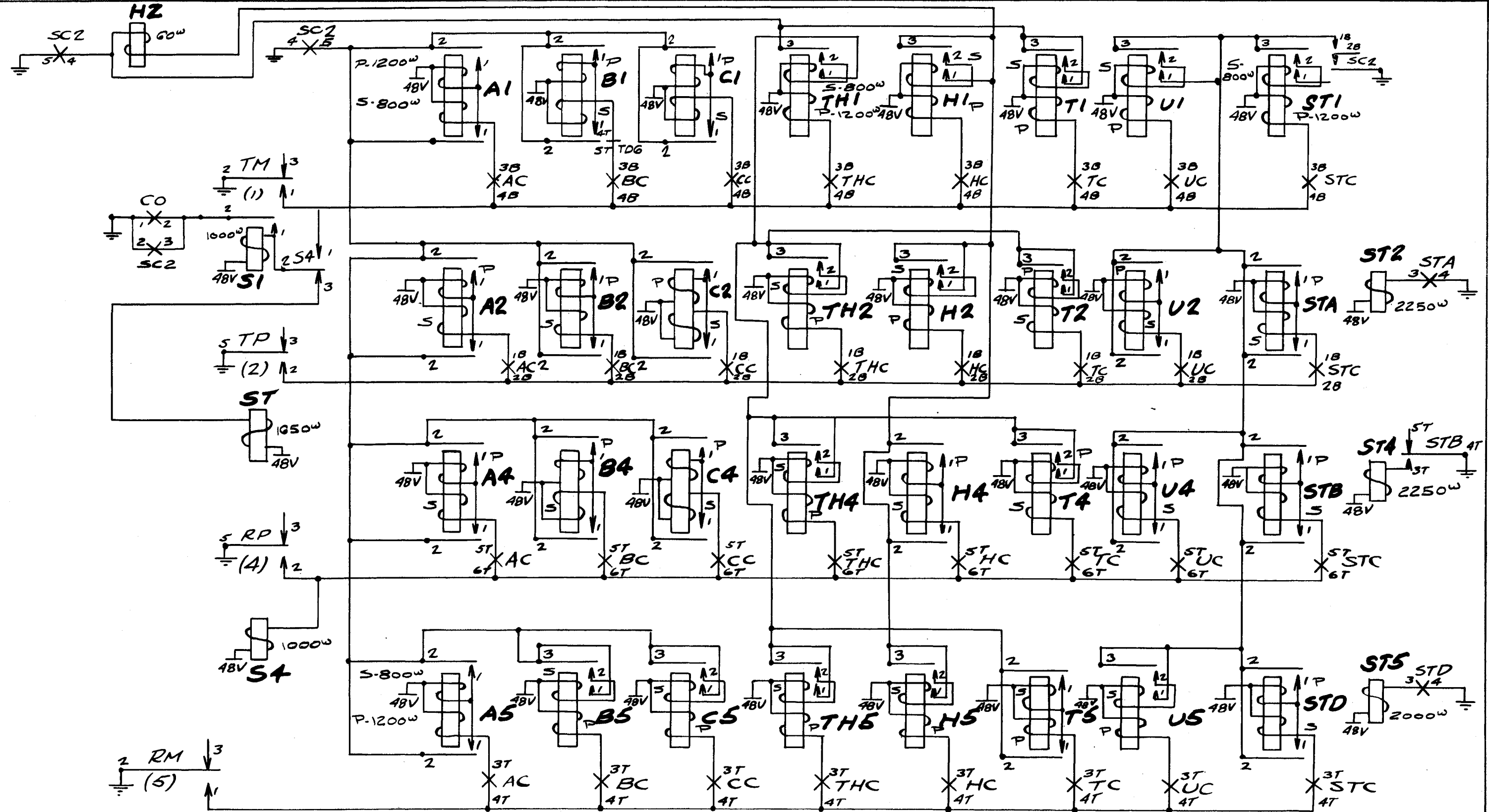
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

K.P.A. BOARD
CONNECTION OF KEY SET
TO SENDER

J. B. MAY
DRAWN - D.S.CO. INC.

OS-52

ISSUE NOV. 1949

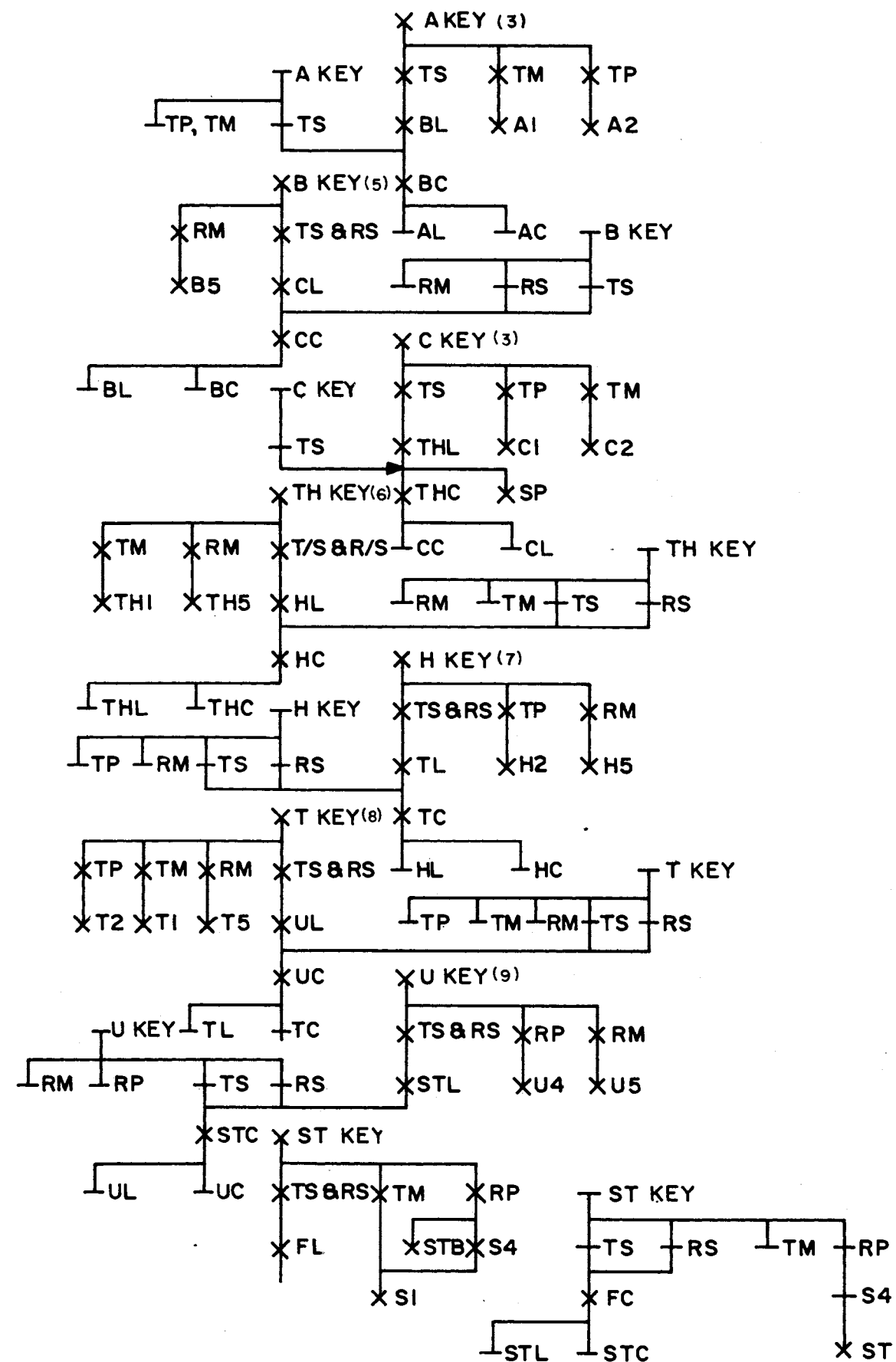


SD-21172-01 SPEC. JER. CORD
SD-21181-01 K.P. DISTRICT
SD-21383-01 K.P. SENDER
SD-90460-01 KEY SET

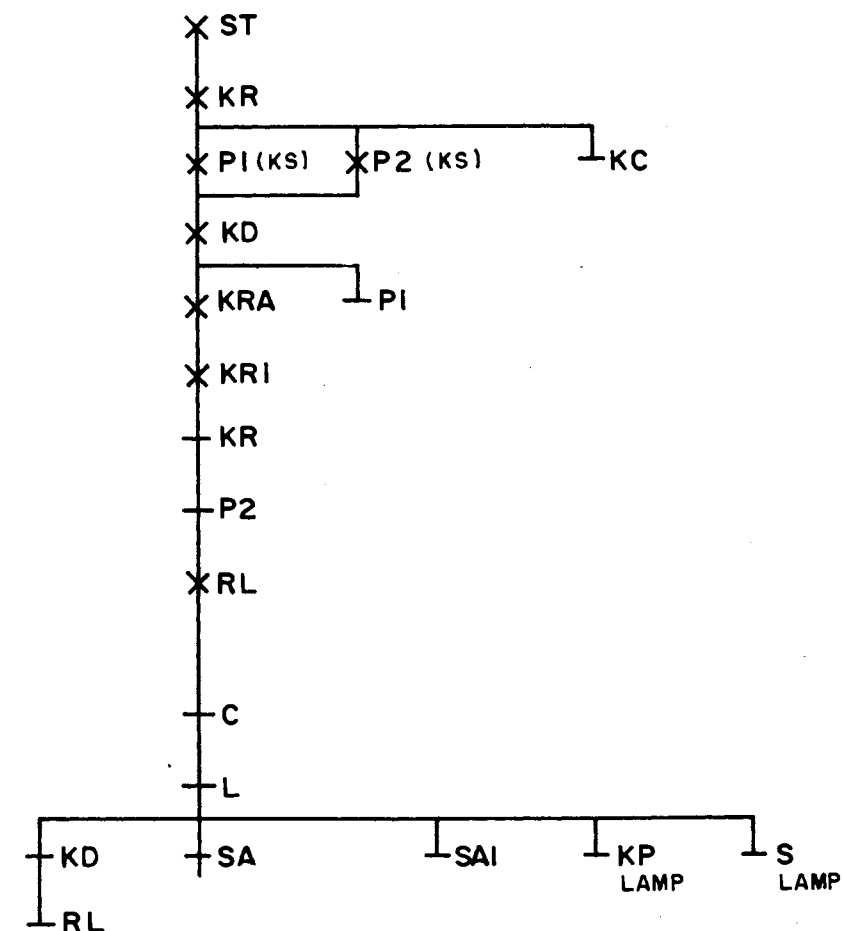
PLANT SCHOOL FOR TRAINING PURPOSES ONLY	
K.P. A BOARD REGISTRATION OF DIGITS AND KEY SET RELEASE.	
J. LAWLESS DRAWN-T.E. WESSEL	OS-53 SHEET 1

PANEL SYSTEM
 BATTERY CUT-OFF

REGISTRATION OF 353-6789



KEY SET RELEASE



SEQUENCE CHART FOR OS53

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

KPA BOARD
REGISTRATION OF DIGITS
AND KEY SET RELEASE

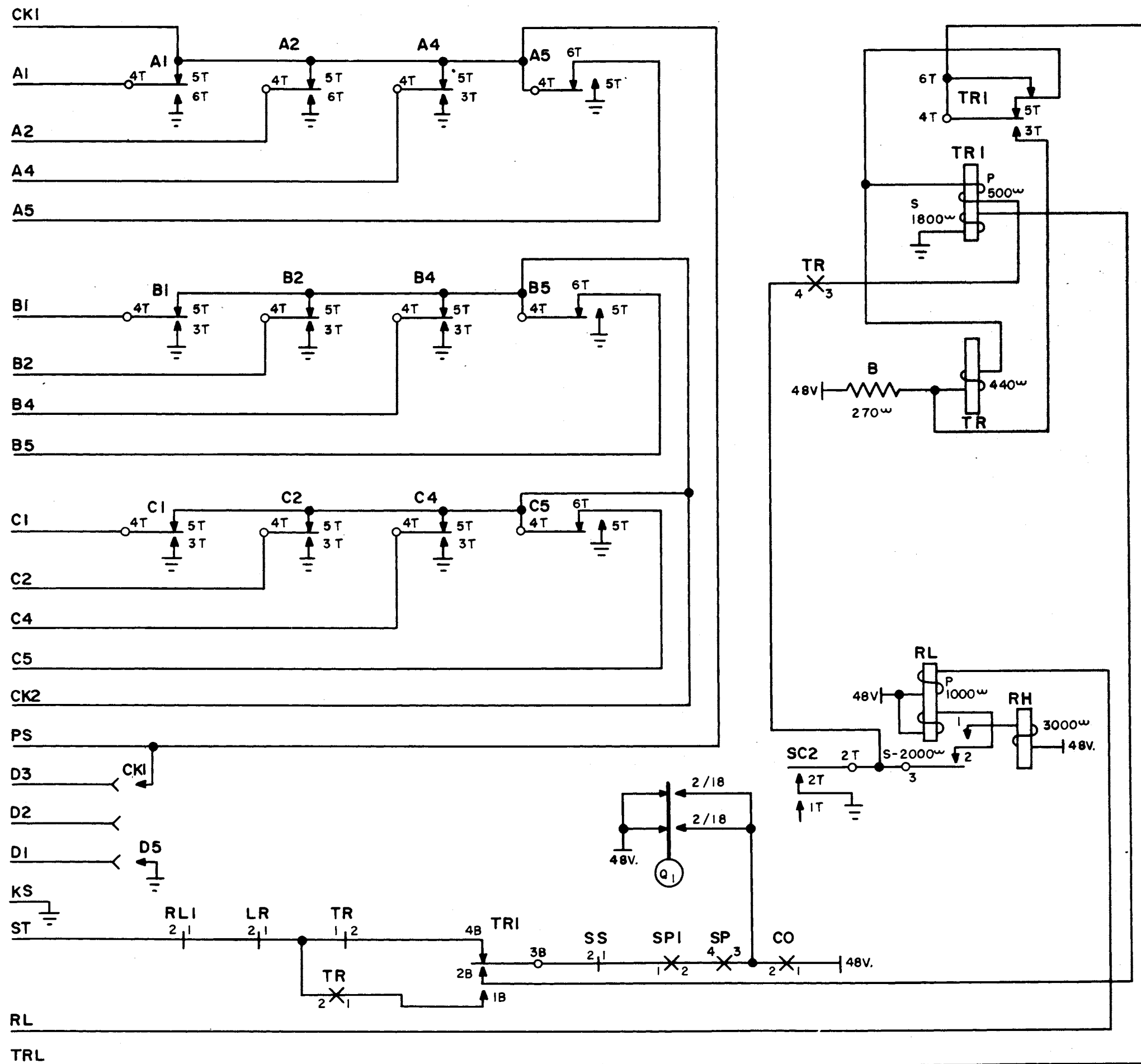
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN-D.S.CO. INC.

OS-53A

ISSUE 1
JAN. 1950

TO DEC.
CONN.



SD 21383-01 KP SENDER

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

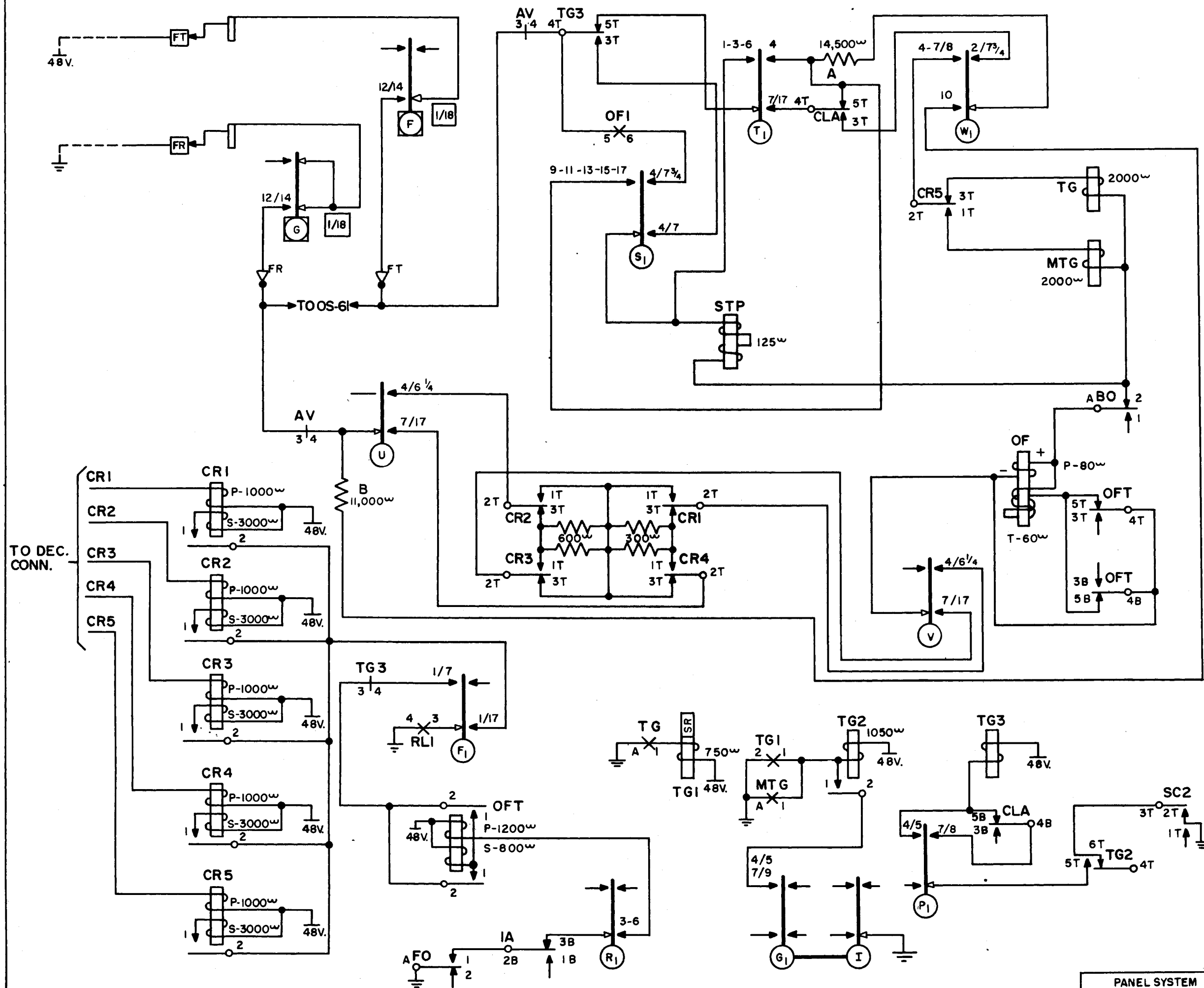
KP SENDER
CONNECTION TO DECODER
CONNECTOR & RELEASE
BY DECODER

PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN-D.S.CO. INC.

OS-54





SD 21382-01 KP SENDER
SD 21181-01 KP DISTRICT

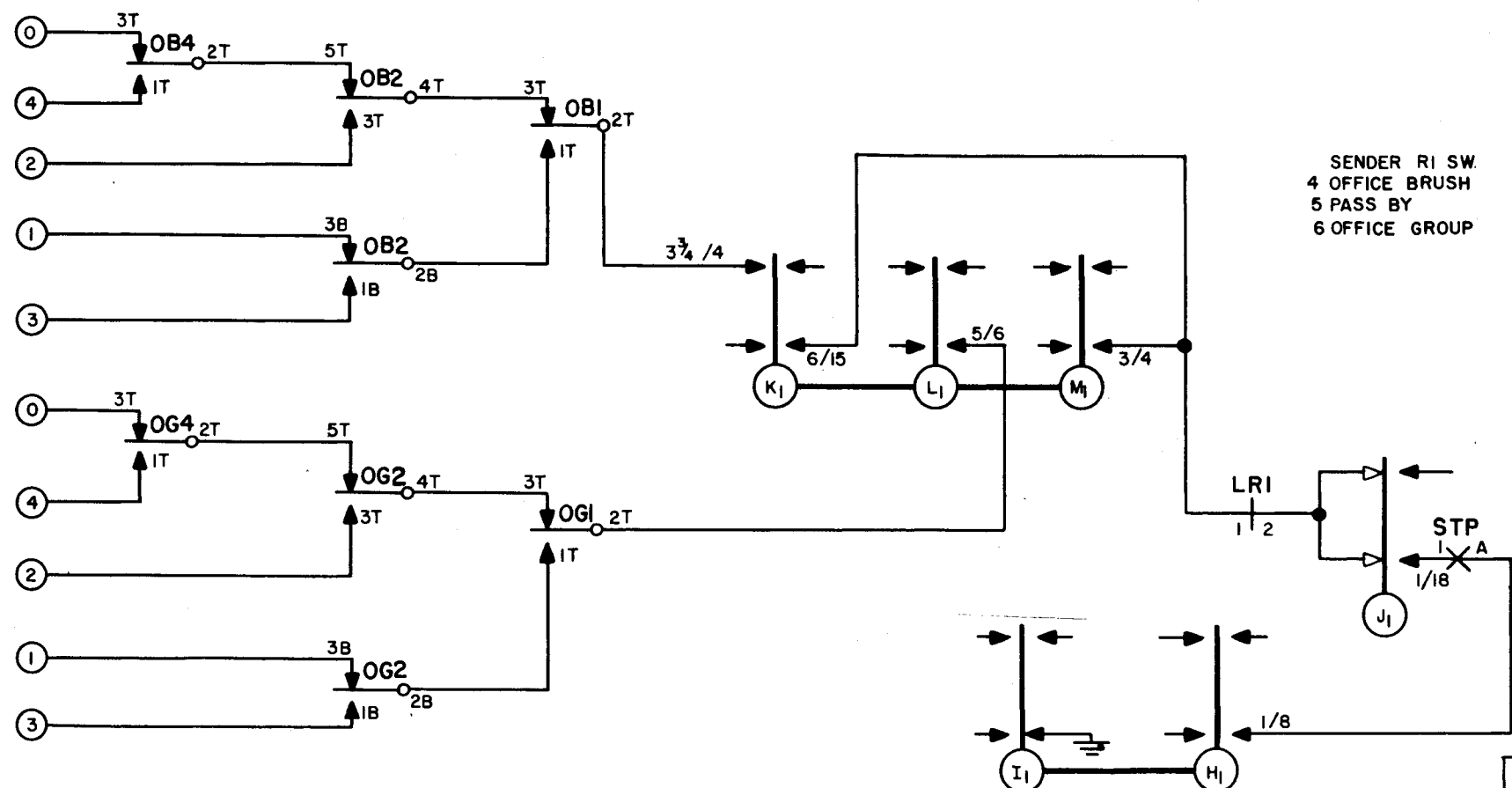
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

KP SENDER
FUNDAMENTAL CIRCUIT
OFF. TST. OFF SEL., TRUNK
TEST, INC., & FIN. SEL.

PANEL SYSTEM
BATTERY CUT-OFF

J. B. MAY
DRAWN-D.S.CO. INC.

OS-56



SENDER RI SW.
4 OFFICE BRUSH
5 PASS BY
6 OFFICE GROUP

SD 21383 -UI KP SENDER

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

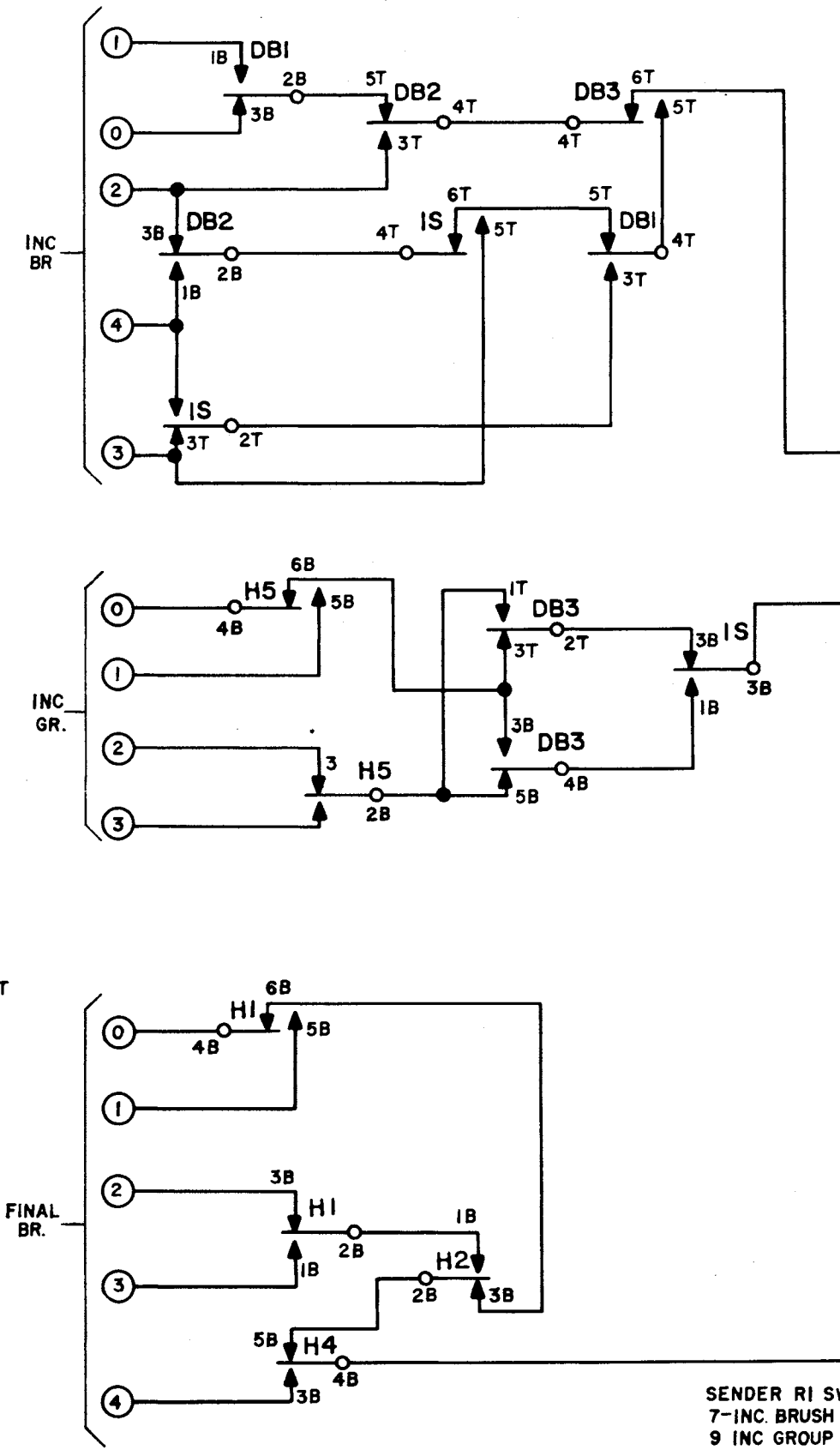
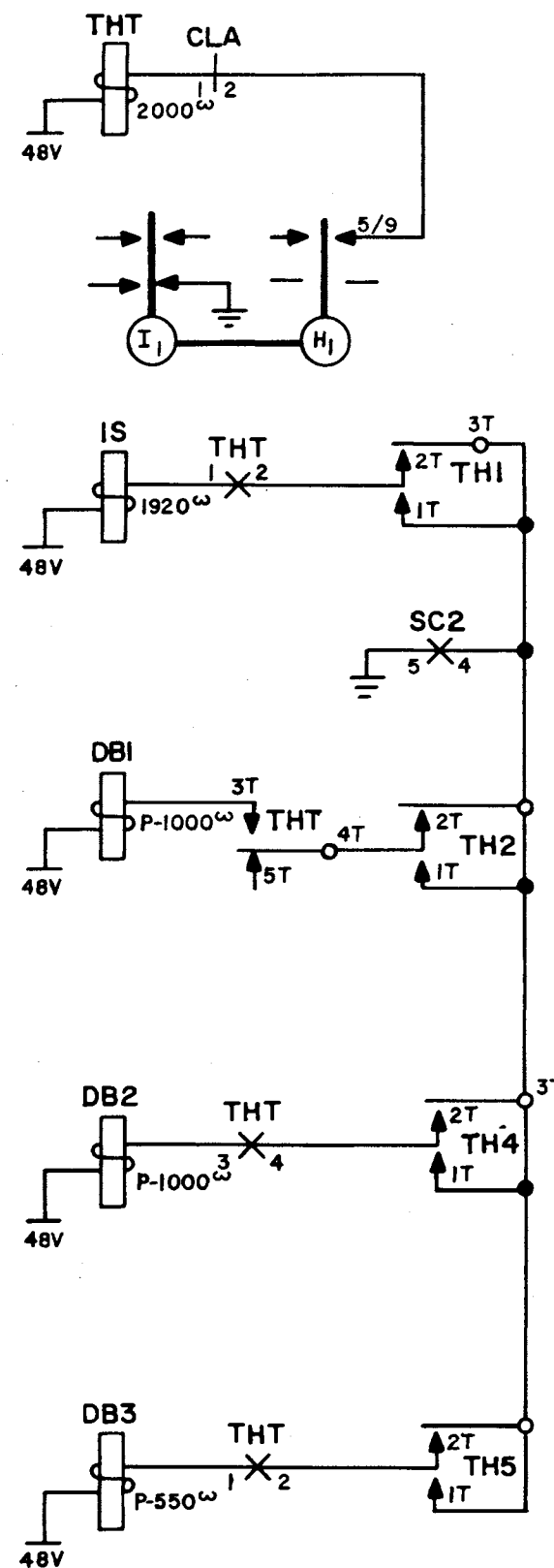
KP SENDER
OFFICE BRUSH &
OFFICE GROUP SEL.

PANEL SYSTEM
BATTERY CUT-OFF

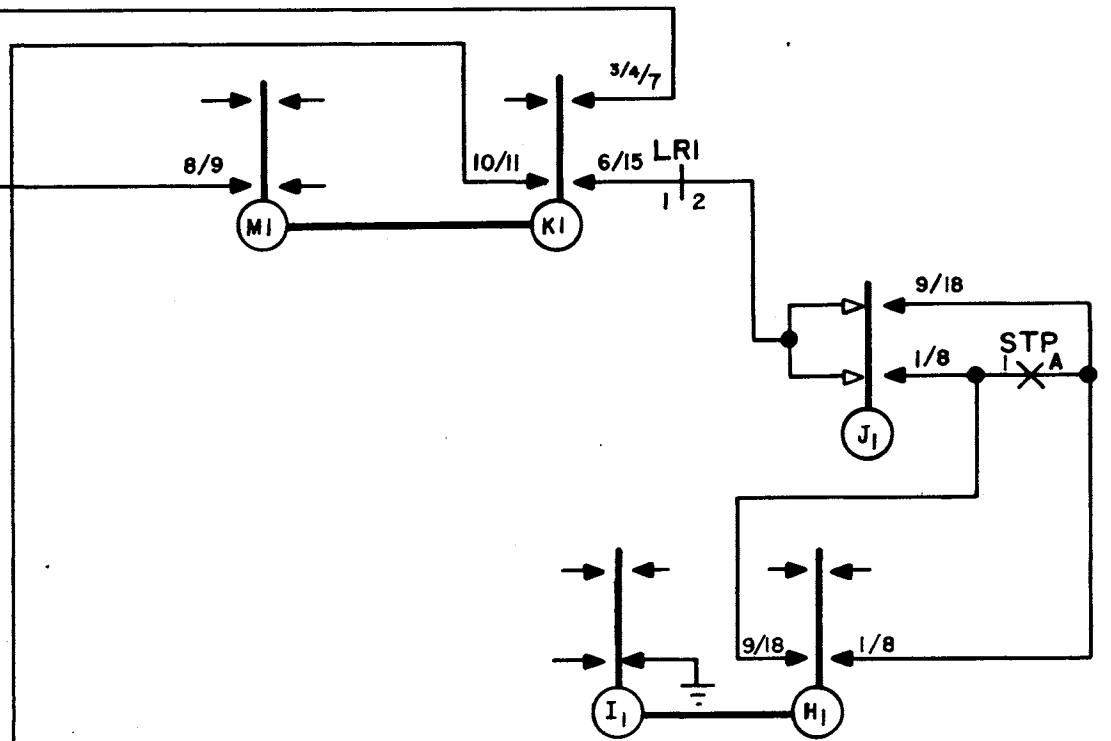
J. B. MAY
DRAWN - D.S. CO. INC.

OS-57

ISSUE 1
JAN. 1950



SENDER RI SW.
7-INC. BRUSH
9 INC GROUP
11 FINAL BRUSH



SD 21383-01 KP SENDER

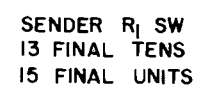
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

KP SENDER
INC. BR, INC. GR. & FINAL
BRUSH SELECTIONS

PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN D.S. CO. INC.

OS-58



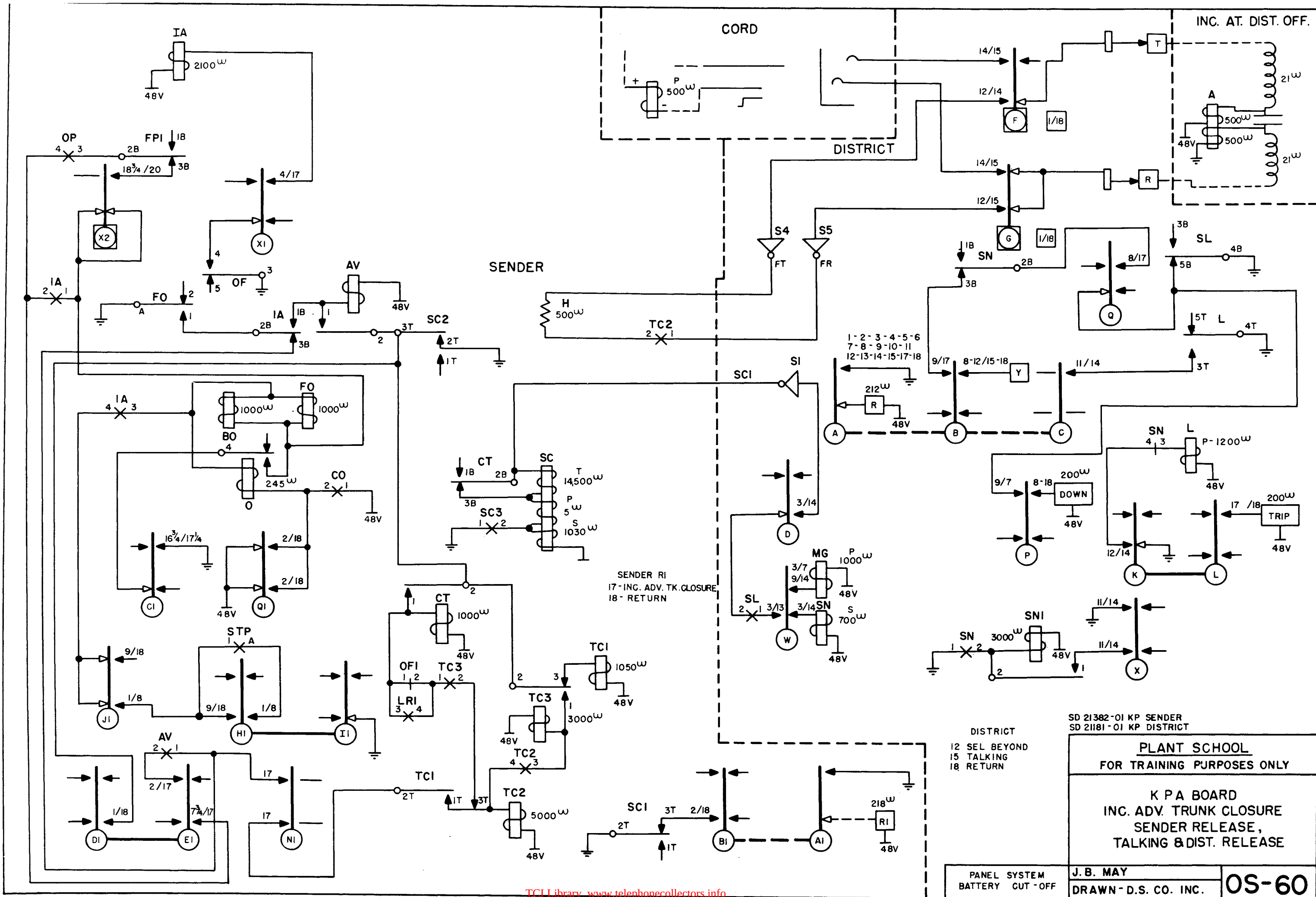
PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

KP SENDER
FINAL TENS & UNITS
SELECTIONS

PANEL SYSTEM
BATTERY CUT-OFF

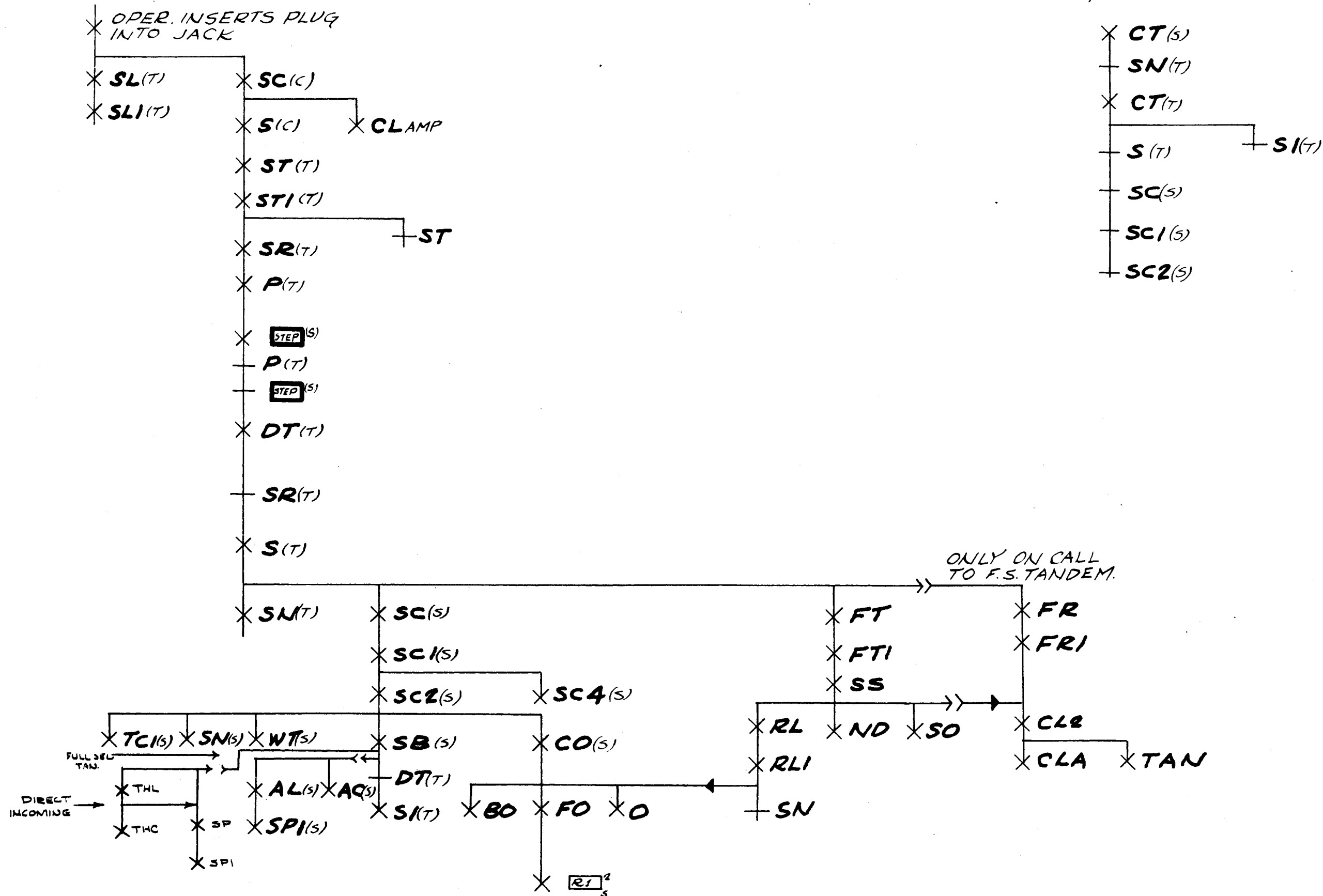
J. B. MAY
DRAWN-D.S. CO. INC.

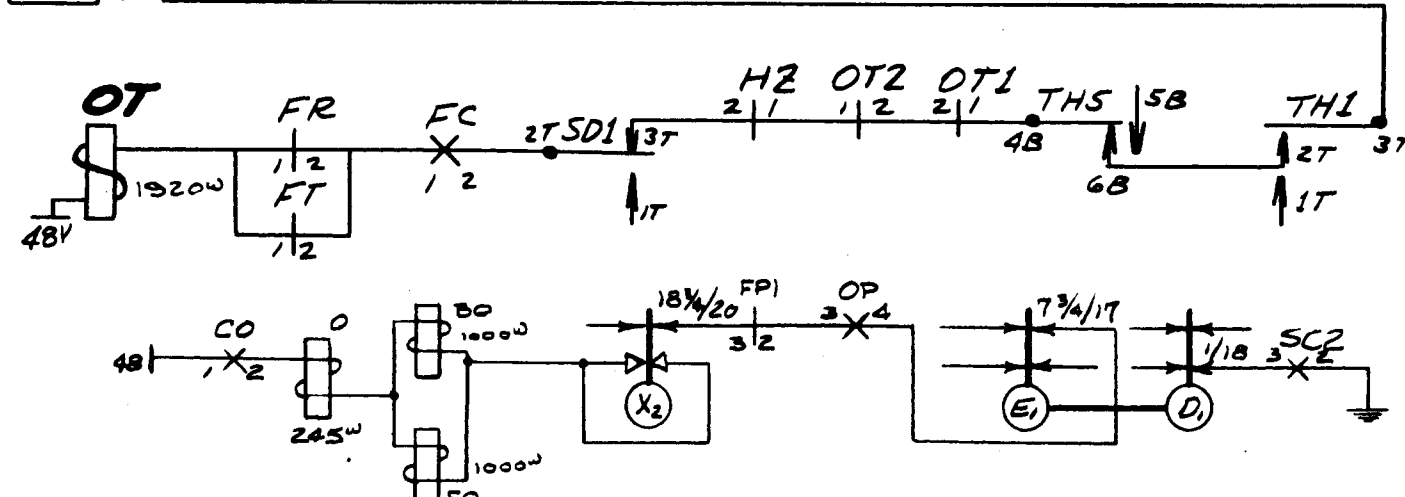
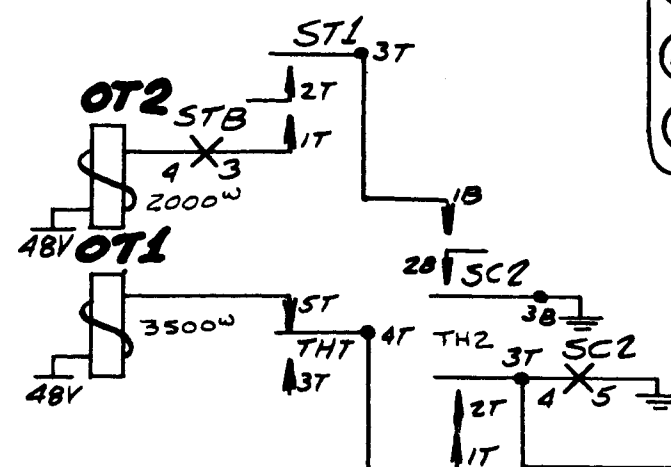
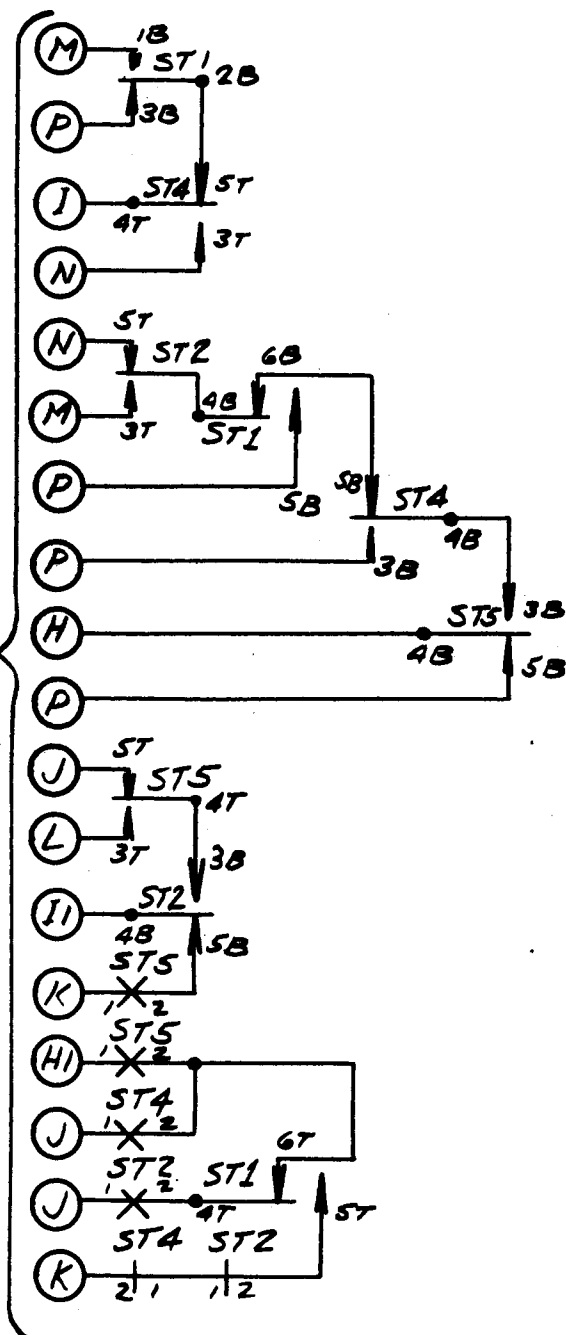
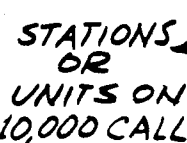
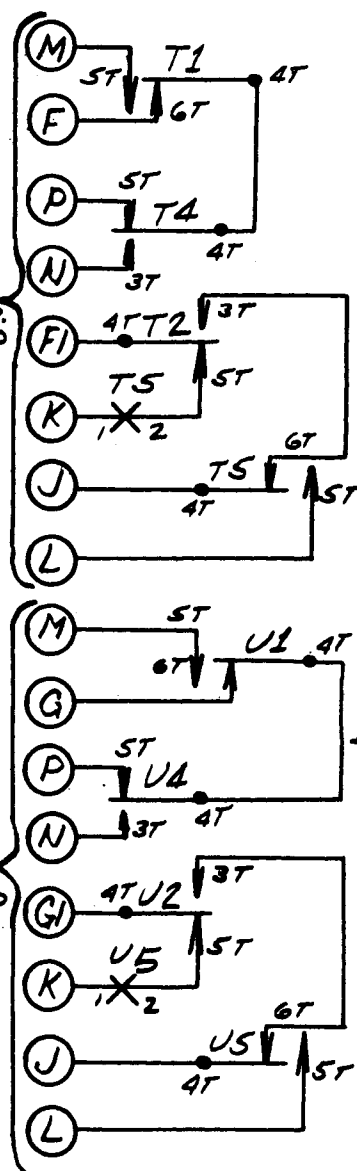
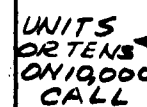
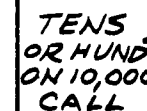
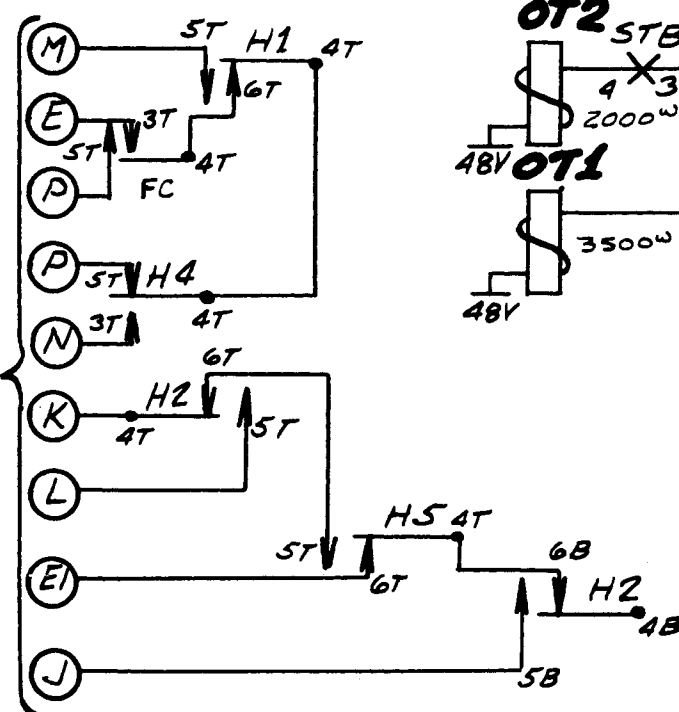
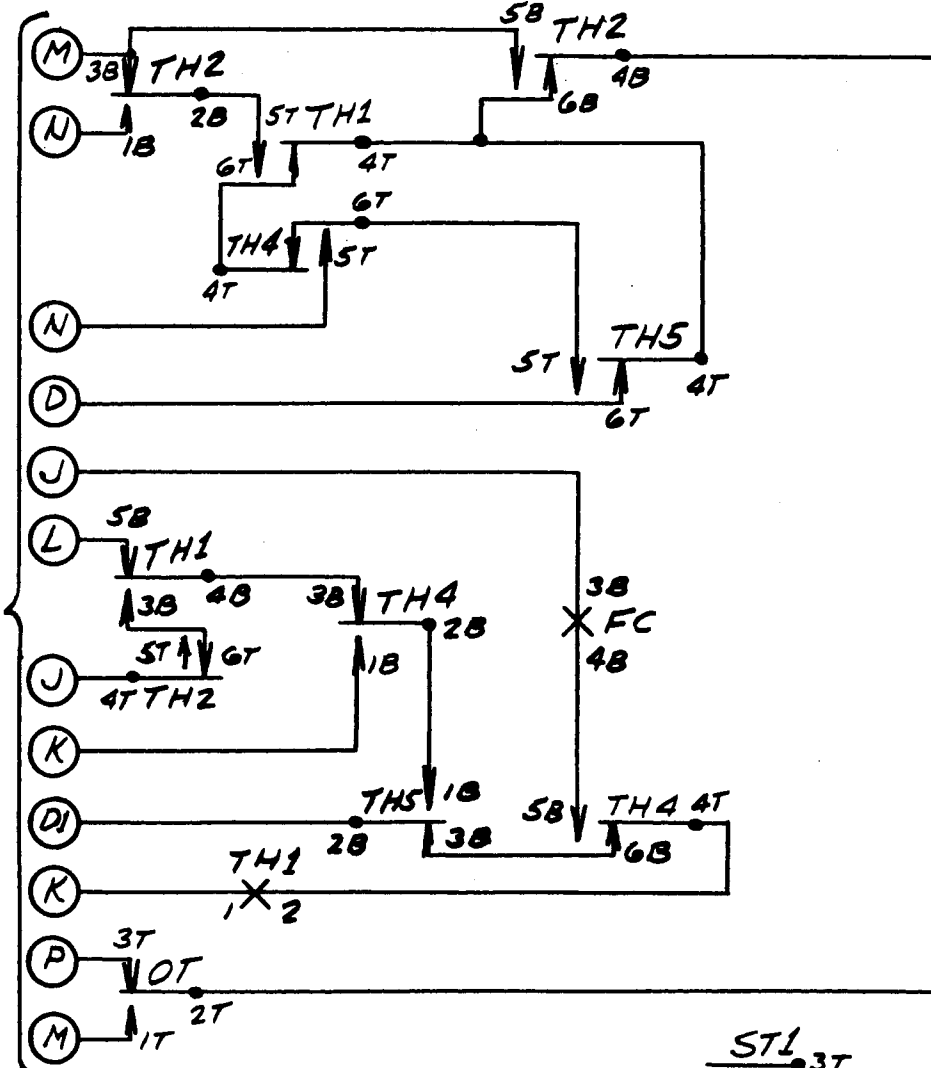
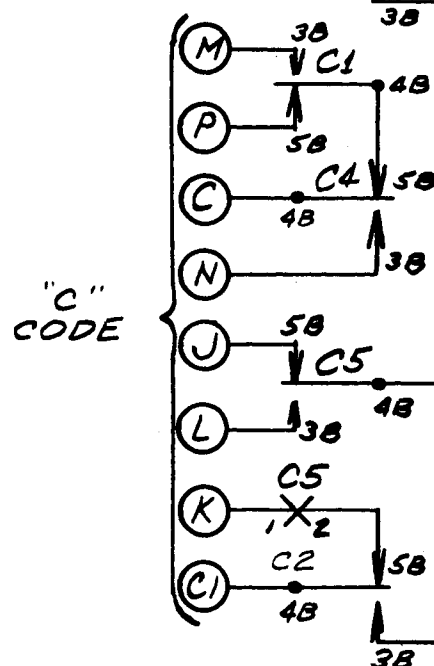
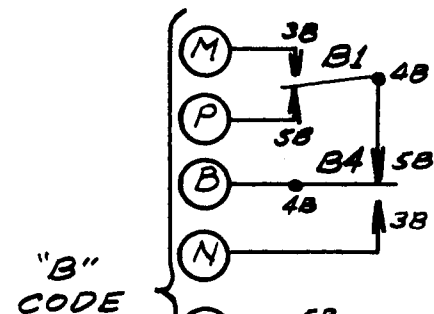
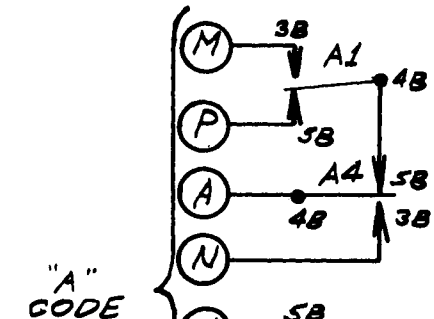
OS-59

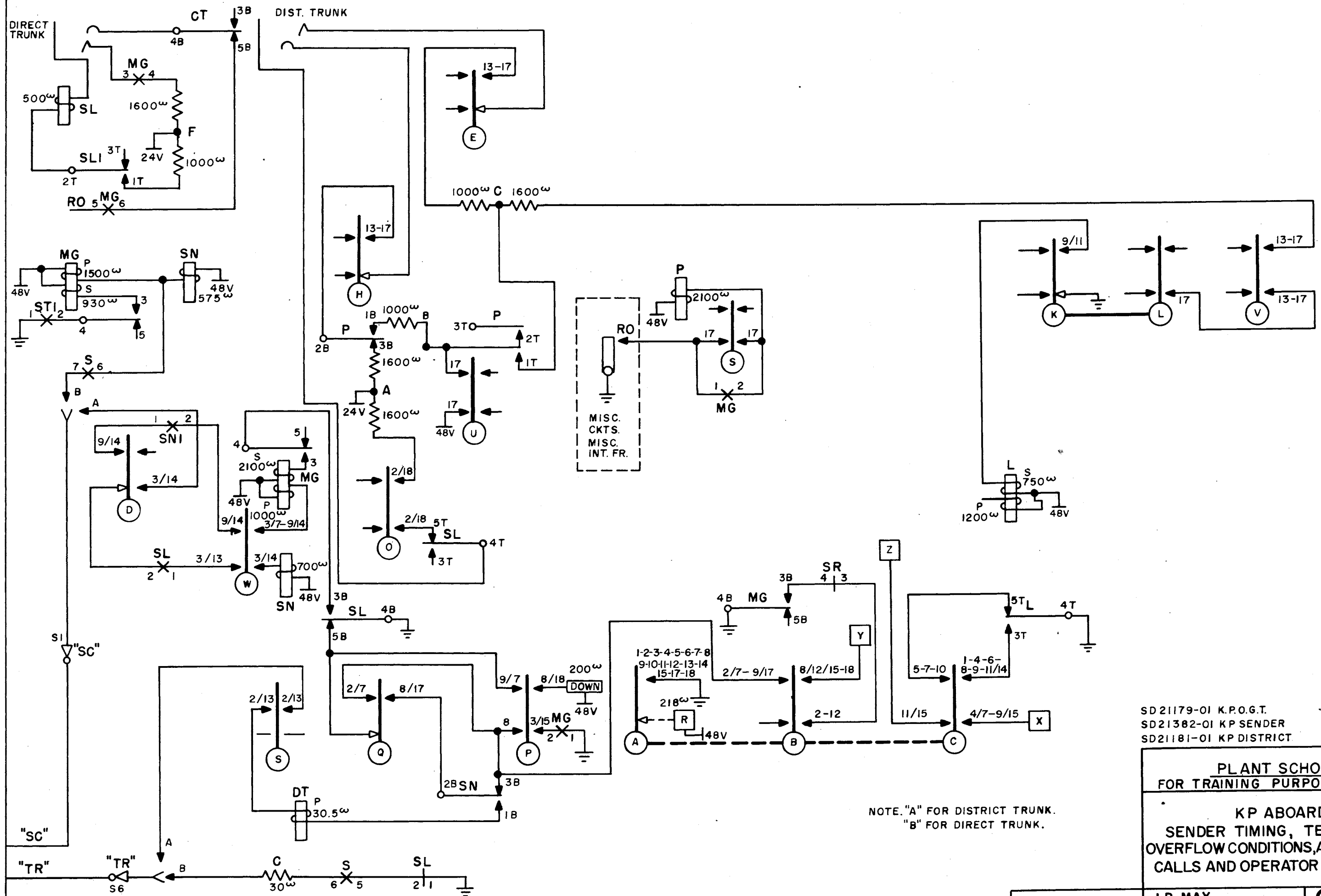


CALL TO DIRECT INCOMING OR F.S. TANDEM

TRUNK CUT THRU
REL. SENDER.







SD 21179-01 K.P.O.G.T.
SD 21382-01 KP SENDER
SD 21181-01 KP DISTRICT

PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

KP ABOARD
SENDER TIMING, TELLTALE,
OVERFLOW CONDITIONS, ABANDONED
CALLS AND OPERATOR ERRORS

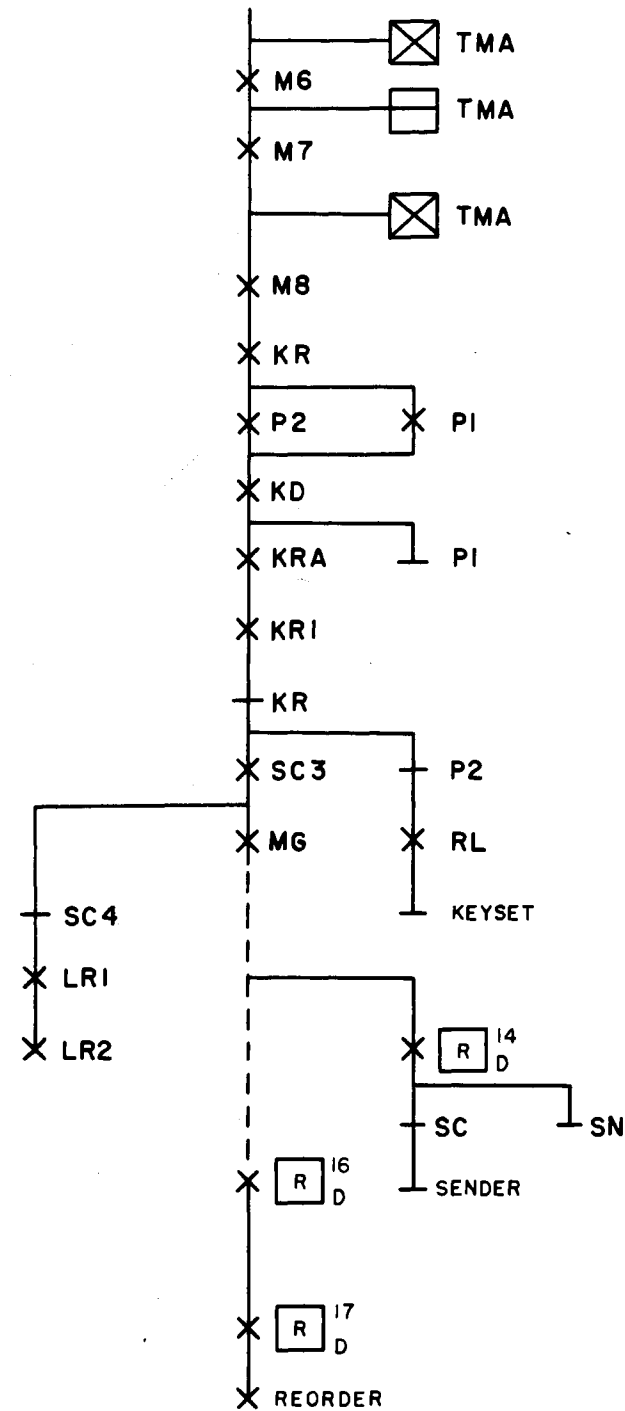
PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN-D.S.CO. INC.

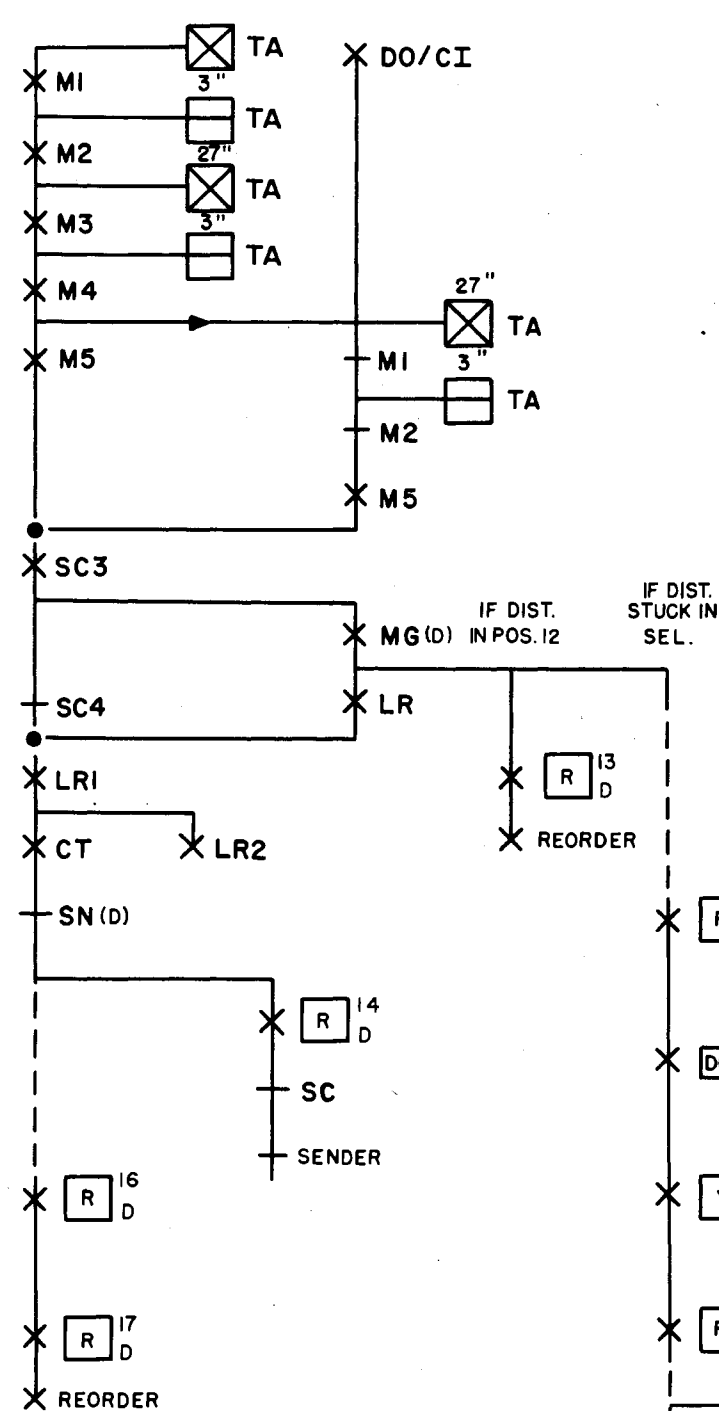
OS63
SHEET 1

SENDER TIME OUT

FAILURE TO KEY 27"-57"

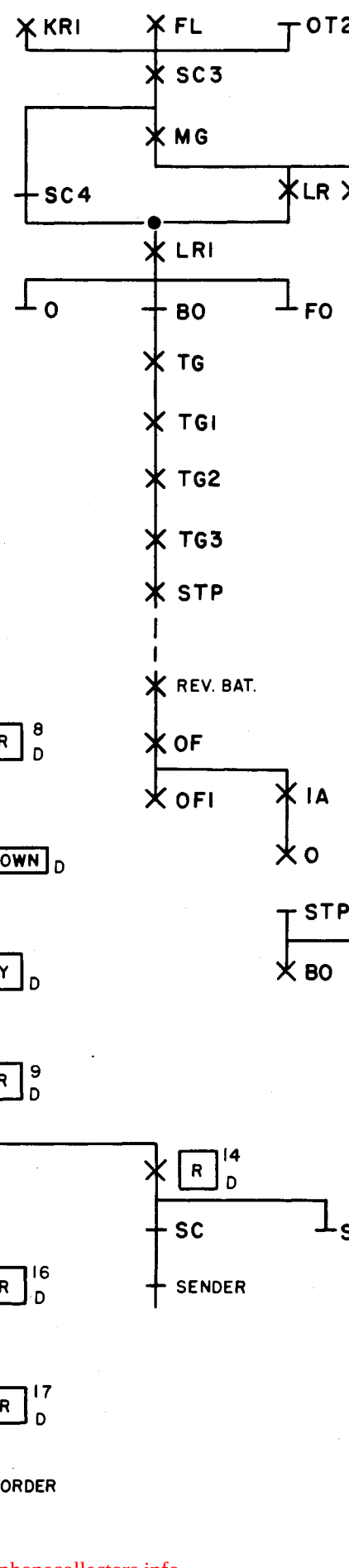


FAILURE TO COMPLETE SELECTIONS 30' - 63" OR 60"-93"

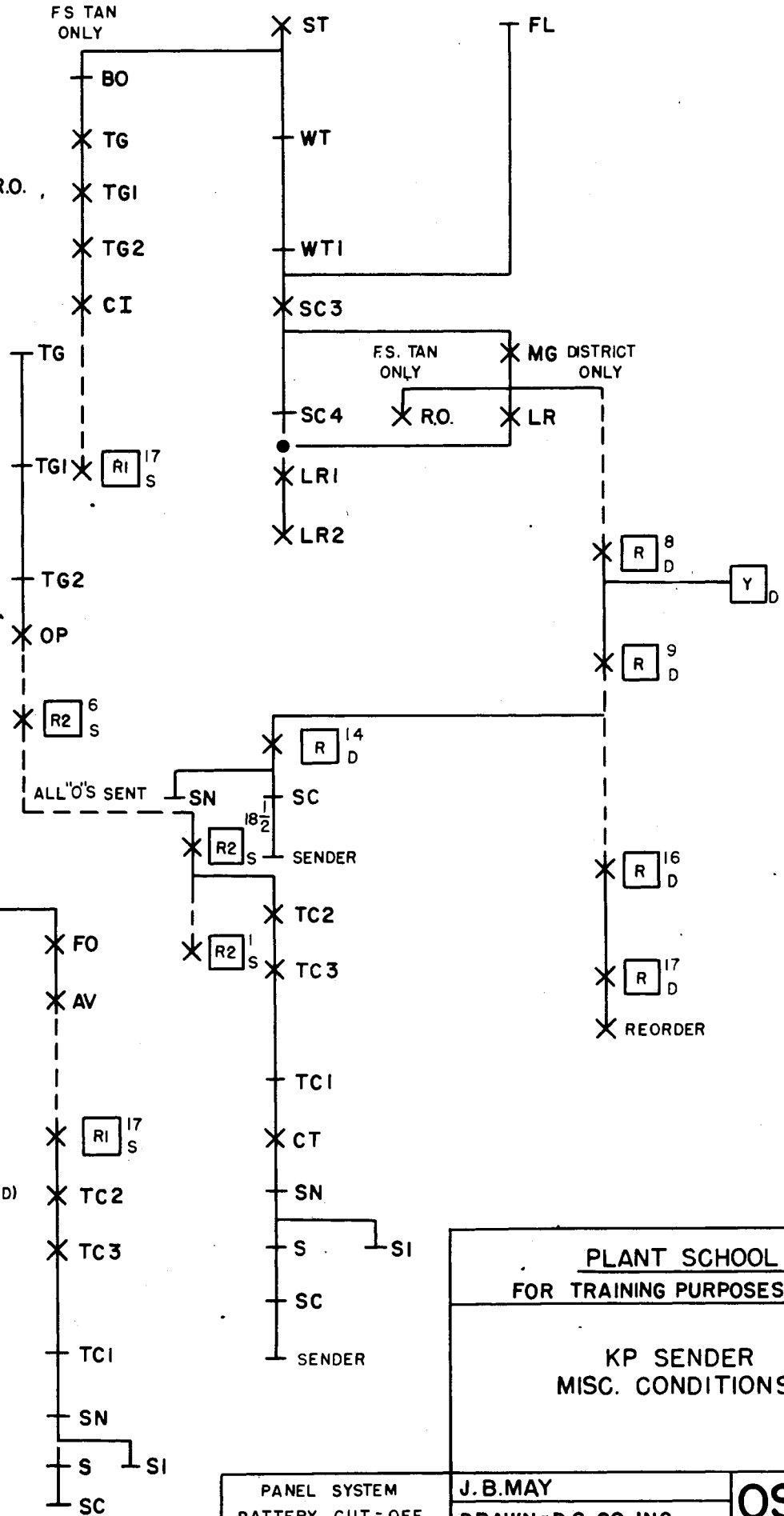


OPERATORS ERRORS

MORE THAN 4 DIGITS ON DIRECT INCOMING



LESS THAN 7 DIGITS DISTRICT OR F.S. TAN



PLANT SCHOOL FOR TRAINING PURPOSES ONLY

KP SENDER MISC. CONDITIONS

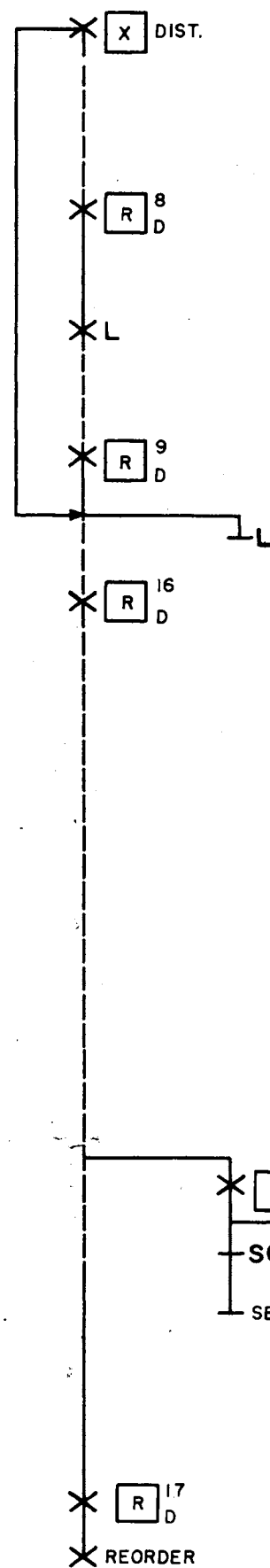
PANEL SYSTEM BATTERY CUT-OFF

J.B.MAY DRAWN - D.S. CO. INC.

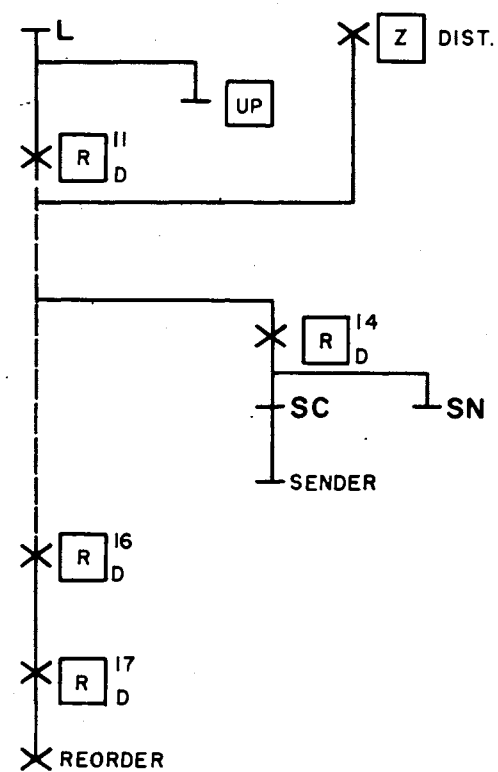
OS-63A SHEET 1

TELL TALE AND OVERFLOW CONDITIONS

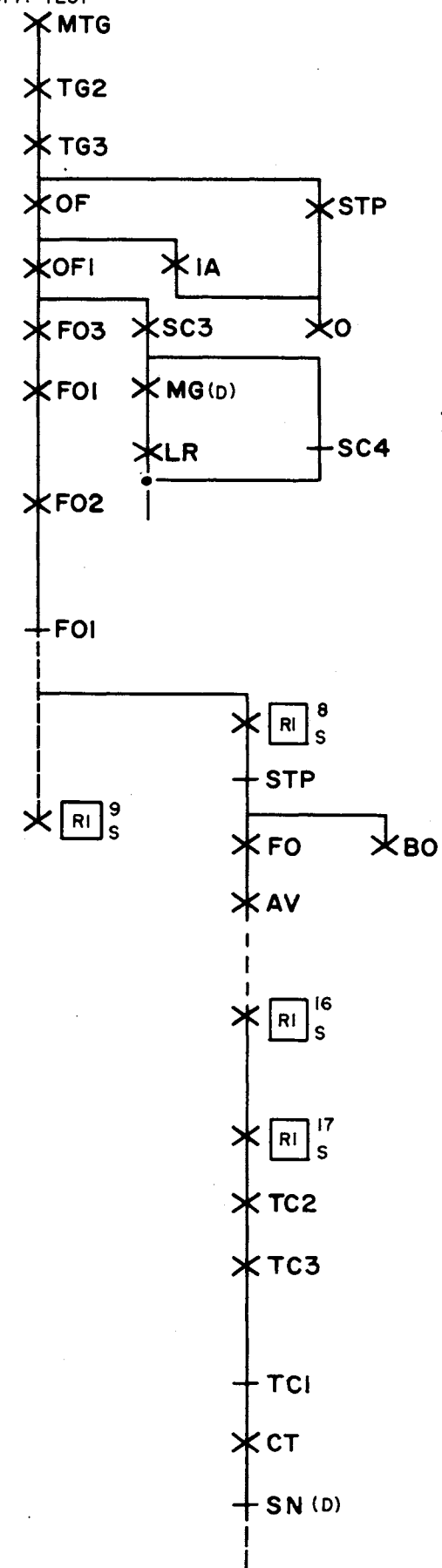
DISTRICT TELL TALE



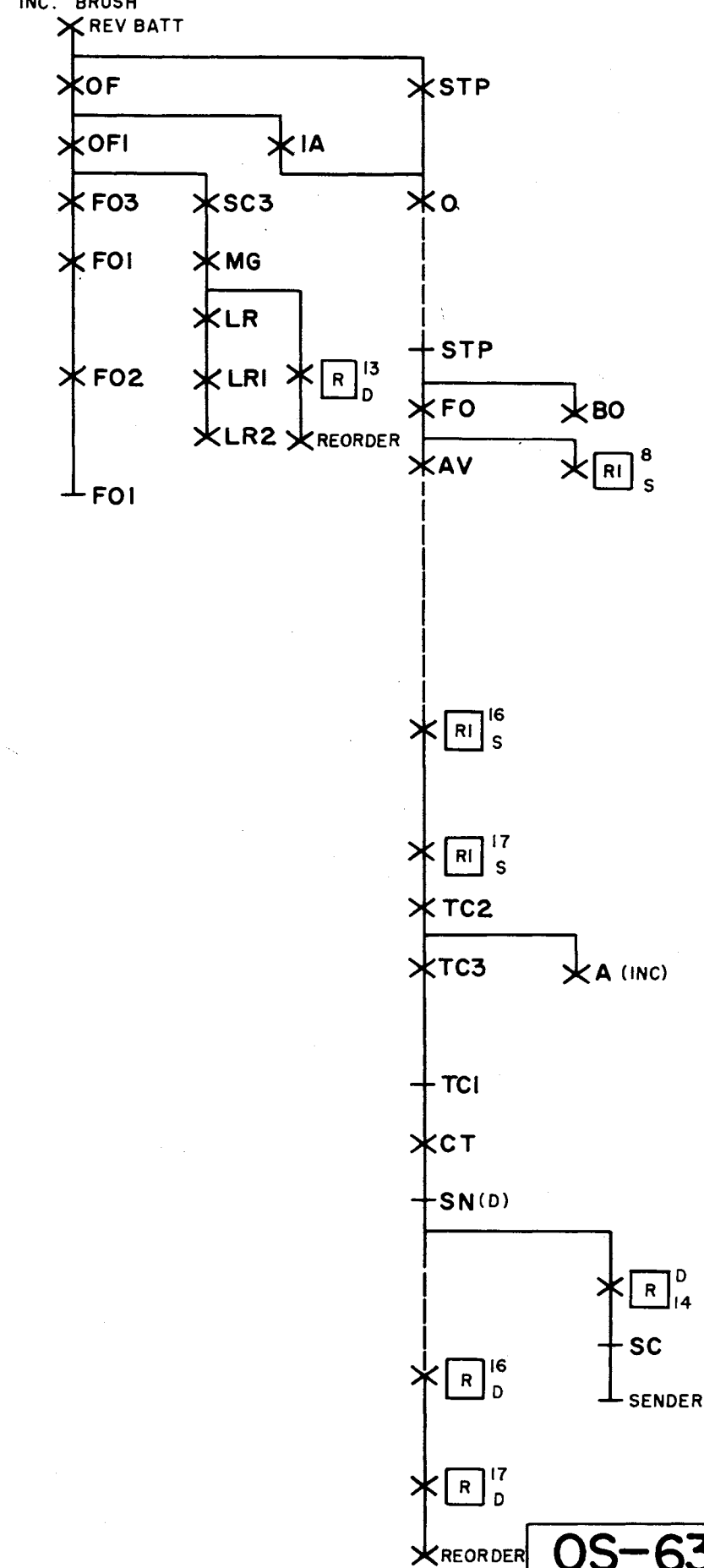
DISTRICT OVERFLOW



REV. TRUNK OFF. TEST



TELL TALE INC. BRUSH

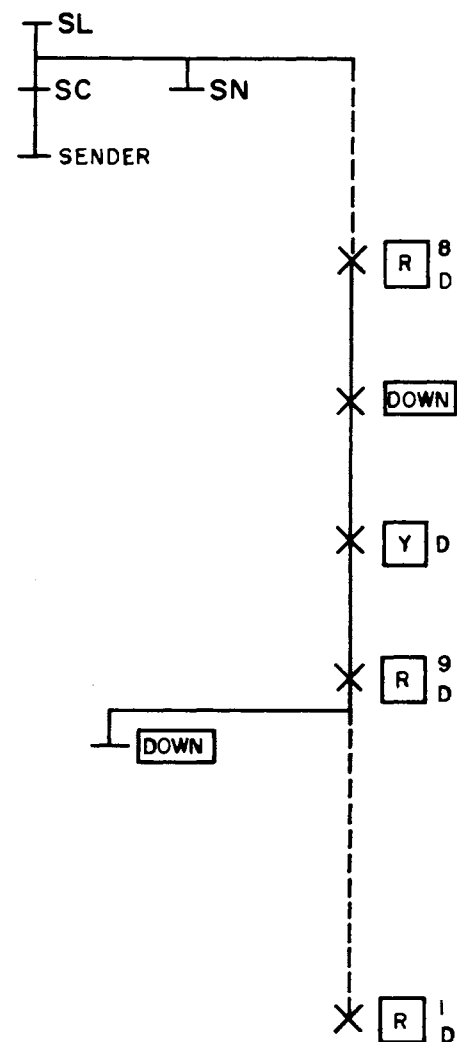


OS-63A

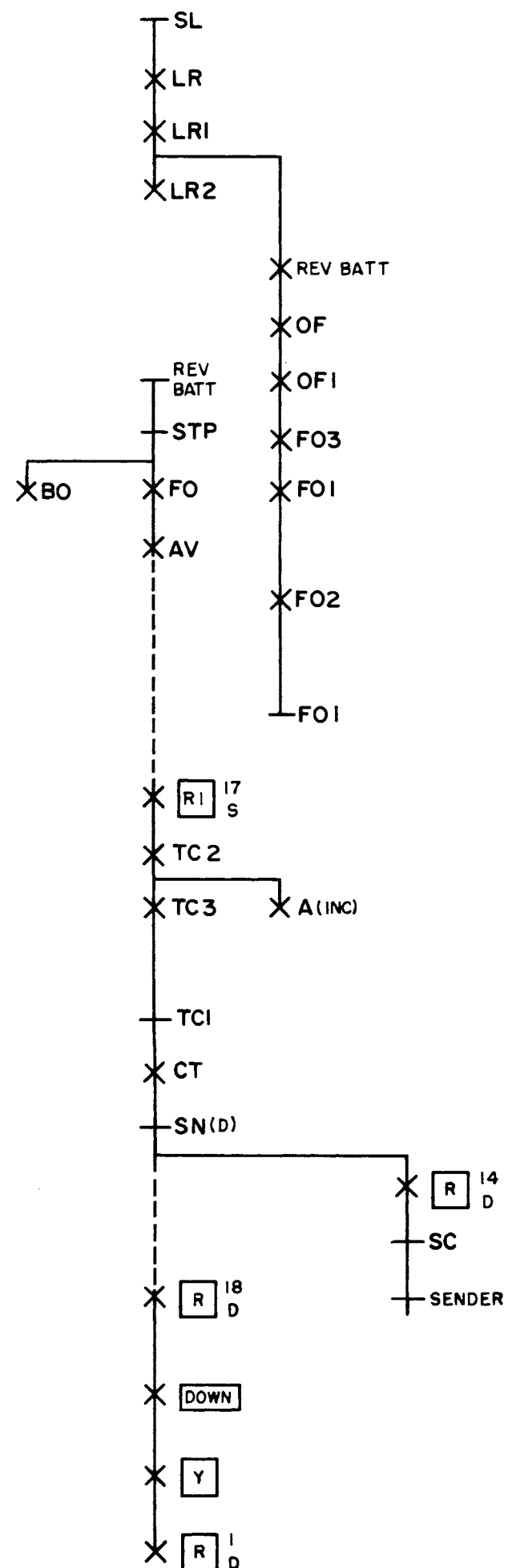
SHEET 2

ABANDONED CALLS

DIST. BRUSH



INC. GROUP



PLANT SCHOOL
FOR TRAINING PURPOSES ONLY

KP SENDER
MISC
CONDITIONS

PANEL SYSTEM
BATTERY CUT-OFF

J.B. MAY
DRAWN-D.S. CO. INC.

OS-63B