

TRAINING MANUAL

**THE
STEP – BY – STEP
DIAL SWITCHING SYSTEM**

VOLUME II

SEQUENCE CHARTS & OPERATIONAL SKETCHES

**THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY
OPERATING AND TRAINING DEPARTMENT
PLANT OPERATIONS DIVISION**

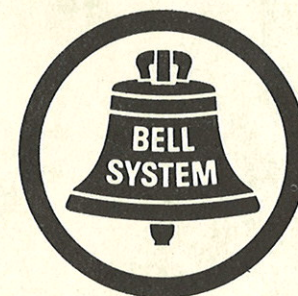
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THE NUMBER ONE STEP BY STEP DIAL SWITCHING SYSTEM

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VOLUME II

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OPERATION AND ENGINEERING DEPARTMENT

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For Training Purposes Only

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VOLUME II

PREFACE

This provisional training material represents a preliminary step toward improving the "learning" literature for the the Number One Step-by-Step System.

The material is divided into two volumes.

Volume I contains a general description of the system, which should aid the learner in gaining a good understanding of the basic principles. The aim is to introduce the learner to the subject by explaining the fundamentals in simple non-technical language.

Volume II contains a series of typical circuit diagrams. These are drawn in the simplified style which is used in teaching the complex 'Common Control' switching systems now in current use. This method makes use of sequence charts and operational sketches, and 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 Number One System 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. Also, those employees who must make mechanical or electrical adjustments of the apparatus should have actual practice on typical switches. In this connection a review of the Bell System training film "The Step-by-Step Switch" will be found helpful.

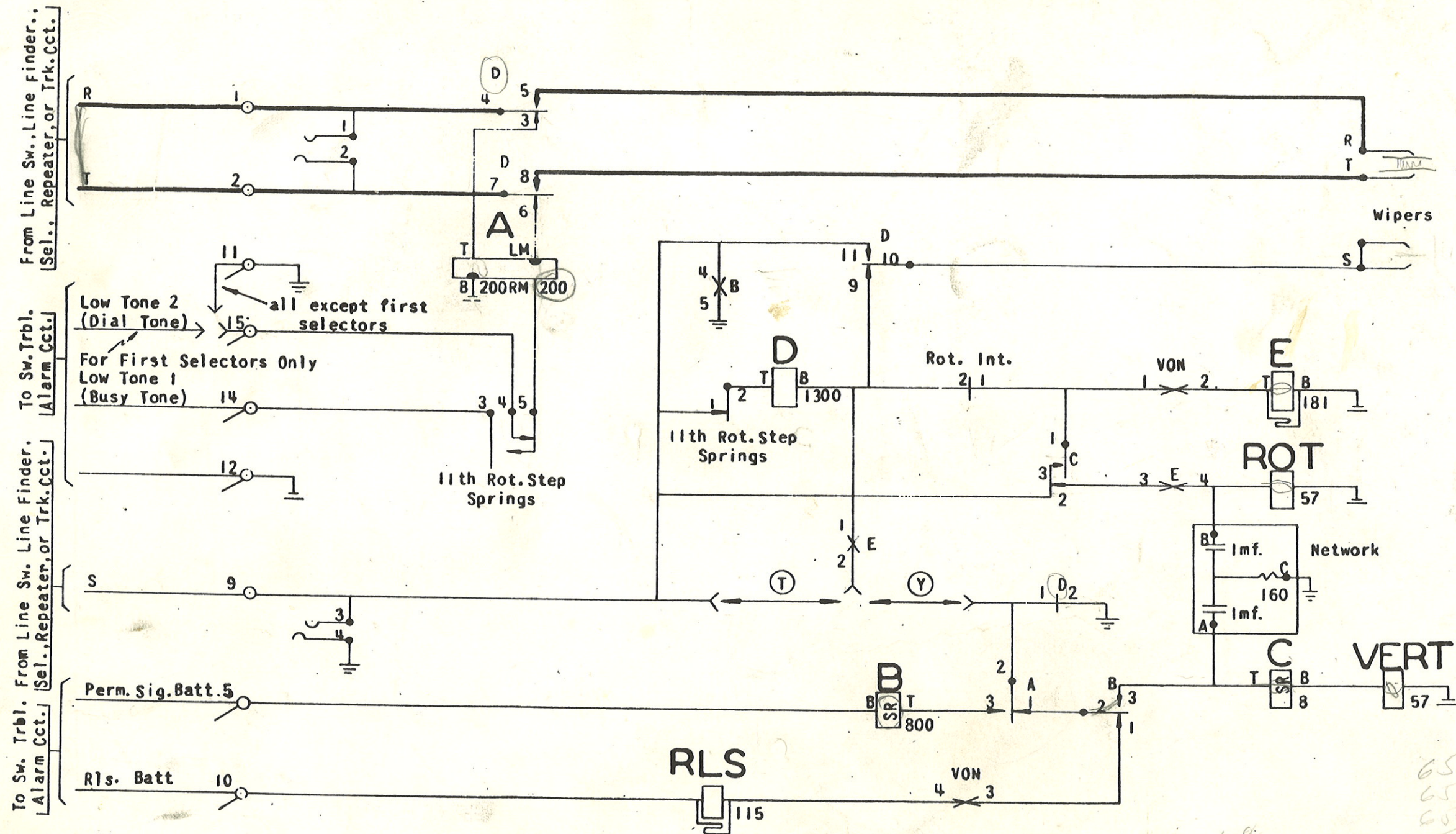
Students should be cautioned that the particular circuits contained in this manual are intended to be used *only* as training aids, and are not necessarily applicable for maintenance.

INDEX TO SEQUENCE CHARTS AND OPERATIONAL SKETCHES

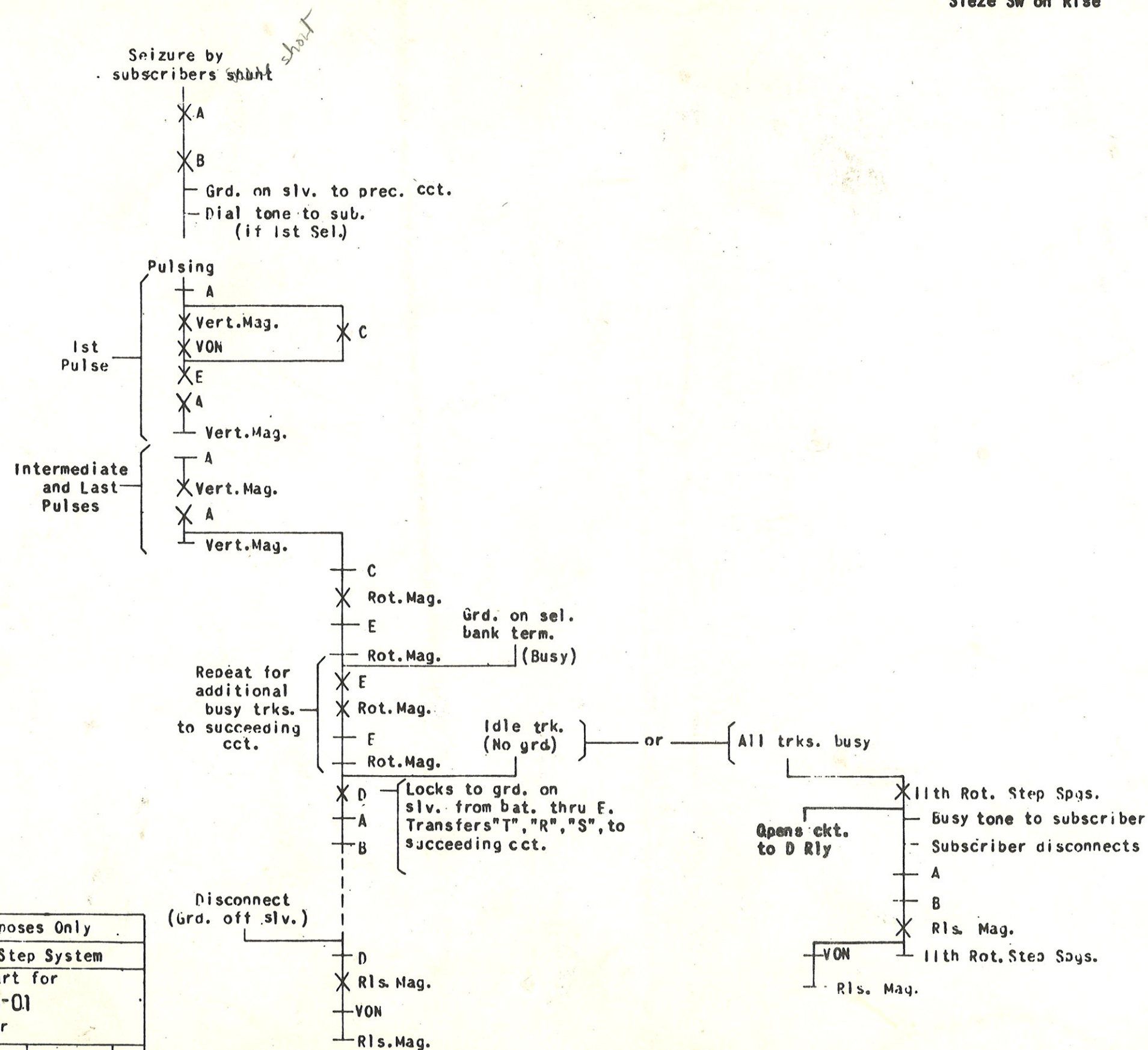
TITLE	SD NUMBER	ISSUE	CHART NUMBER
Selector	SD-30200-01	22-D	1
Local Rotary Connector	SD-30215-01	19-D	2
2-Ring Combination Connector	SD-30220-01	28-B	3
1-Ring Combination Connector	SD-30228-01	27-B	4
Incoming Repeater, Pulse Correcting	SD-30537-01	11-B	5
Digit Absorbing Selector	SD-30976-01	5-B	6
Digit Absorbing Selector	SD-32183-01	4	6A*
Toll Rotary Connector	SD-31114-01	16-D	7
Toll Intermediate Selector	SD-31179-01	21-D	8
Toll Connector-10 Party Terminal Per Station	SD-31300-01	15-D	9
Test Distributor Control Circuit	SD-31401-01	6-D	10
Test Trunk Circuit	SD-90018-01	16-D	10
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Outgoing Repeater	SD-31779-01	12-D	15
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Test Distributor	SD-32007-01	10-B	17
Recording Completing Trunk-3 Wire	SD-61605-01	12-D	18
Recording Completing Trunk-2 Wire Flat Rate	SD-32136-01	7-D	19
Recording Completing Trunk-2 Wire	SD-62426-01	10-D	19
Recording Completing Trunk-Coin Control (CDO)	SD-31123-01	18-D	20
Recording Completing Trunk-Coin Control (Toll)	SD-62428-01	16-D	20
Recording Completing Trunk-Coin Control	SD-62496-01	13-D	21

NOTE: General information concerning legends etc. on Sequence Charts and Operational Sketches will be found in B.S.P. A128.801.

* Added in May 1954



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Number 1 Step By Step System			
Operational Sketch for			
SD-30200-01			
Selector			
9/2/52	R.A. Ditlow	Issue 22-D	1



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Number 1 Step By Step System

Sequence Chart for

SD-30200-01

Selector

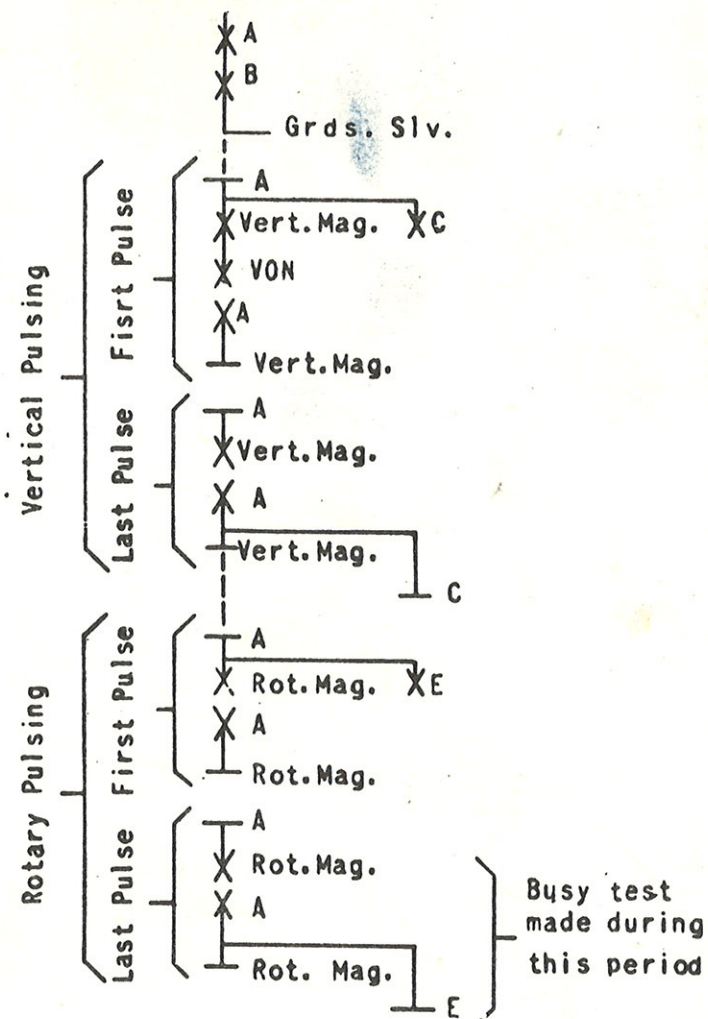
9/2/52

R.A:Oitlow

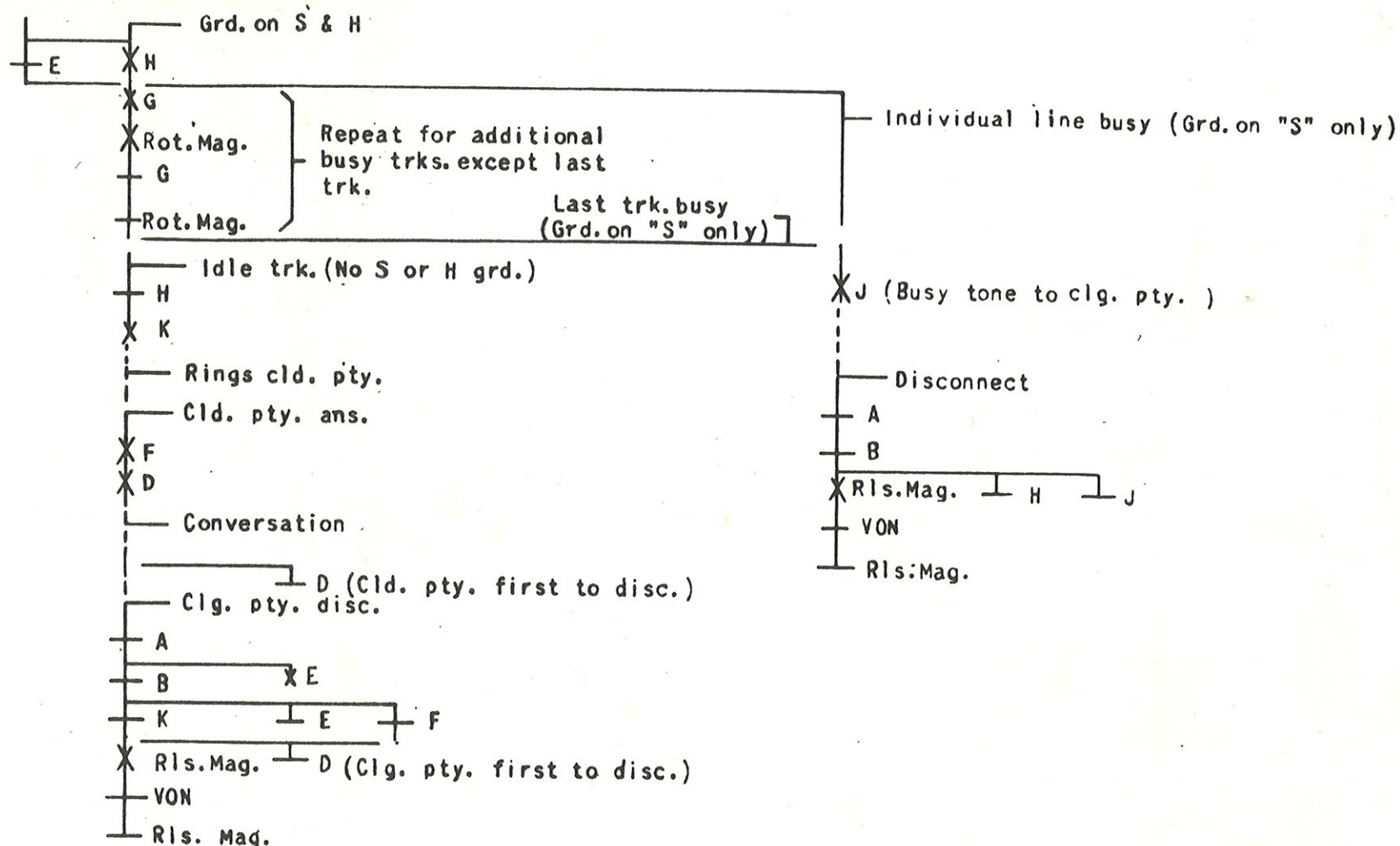
Issue 22D

1

Seizure by
subscriber shunt



Rotary hunting and
idle line seizure



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Number 1 Step By Step System

Sequence Chart for

SD-30215-01

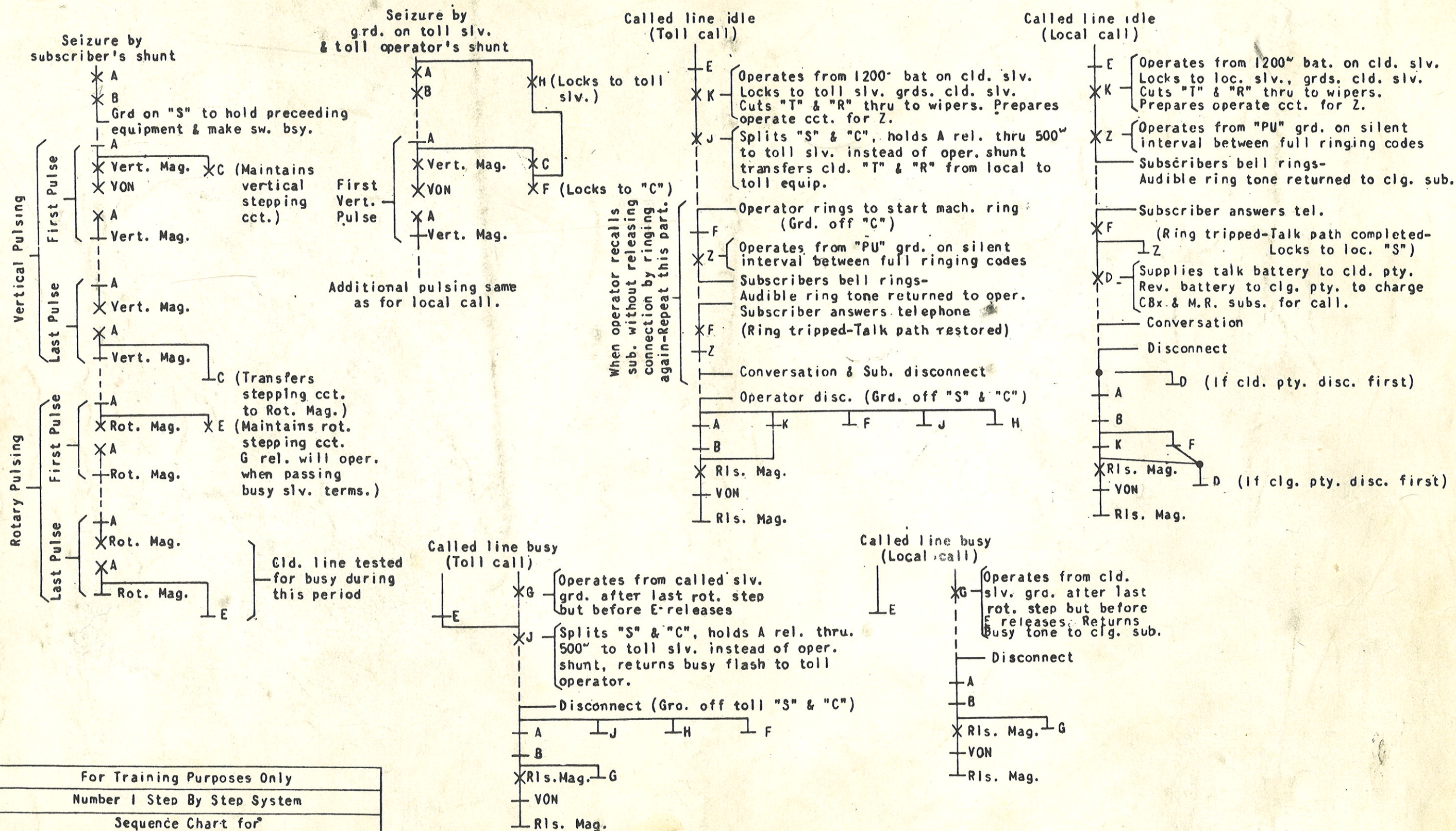
Local Rotary Connector

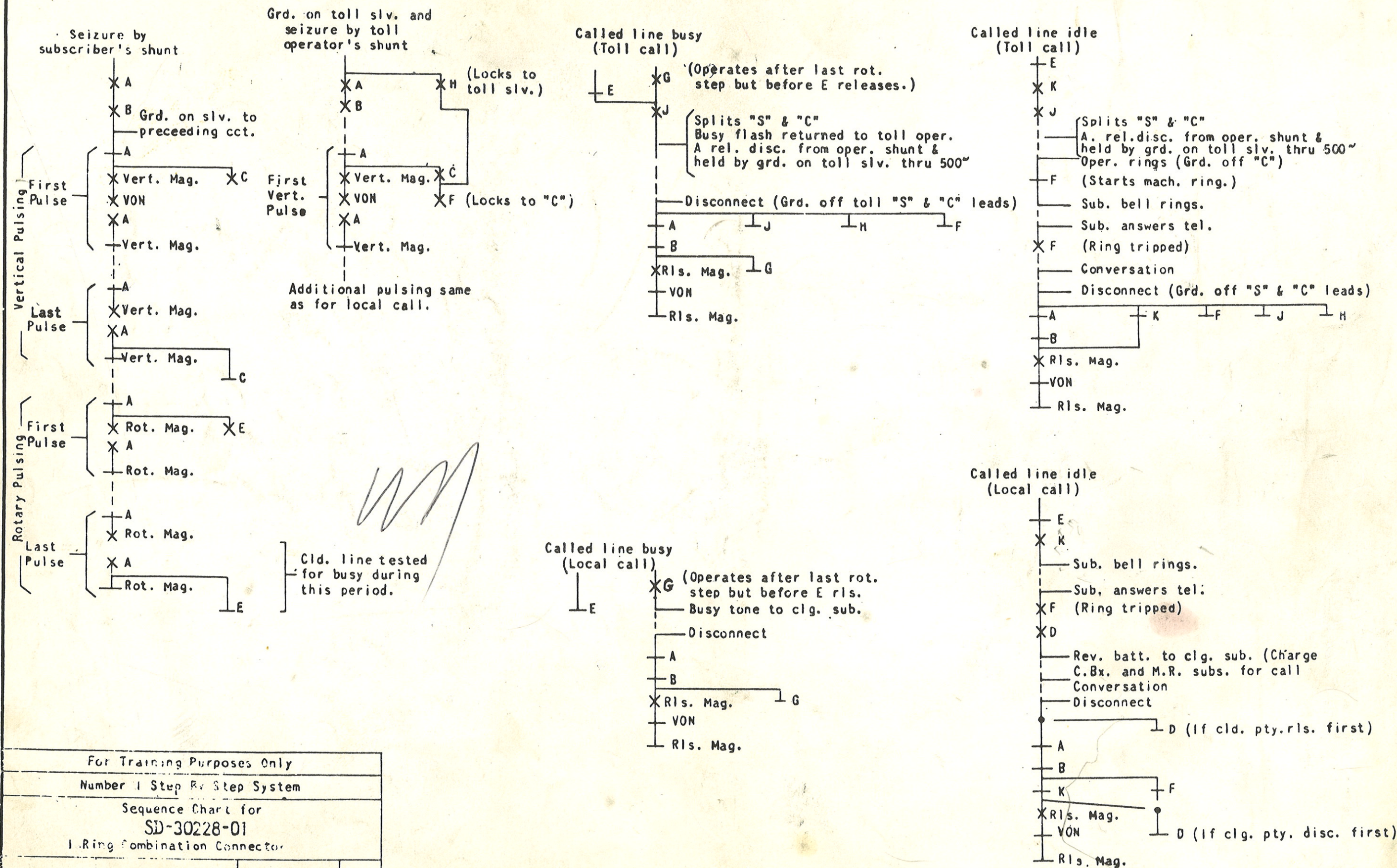
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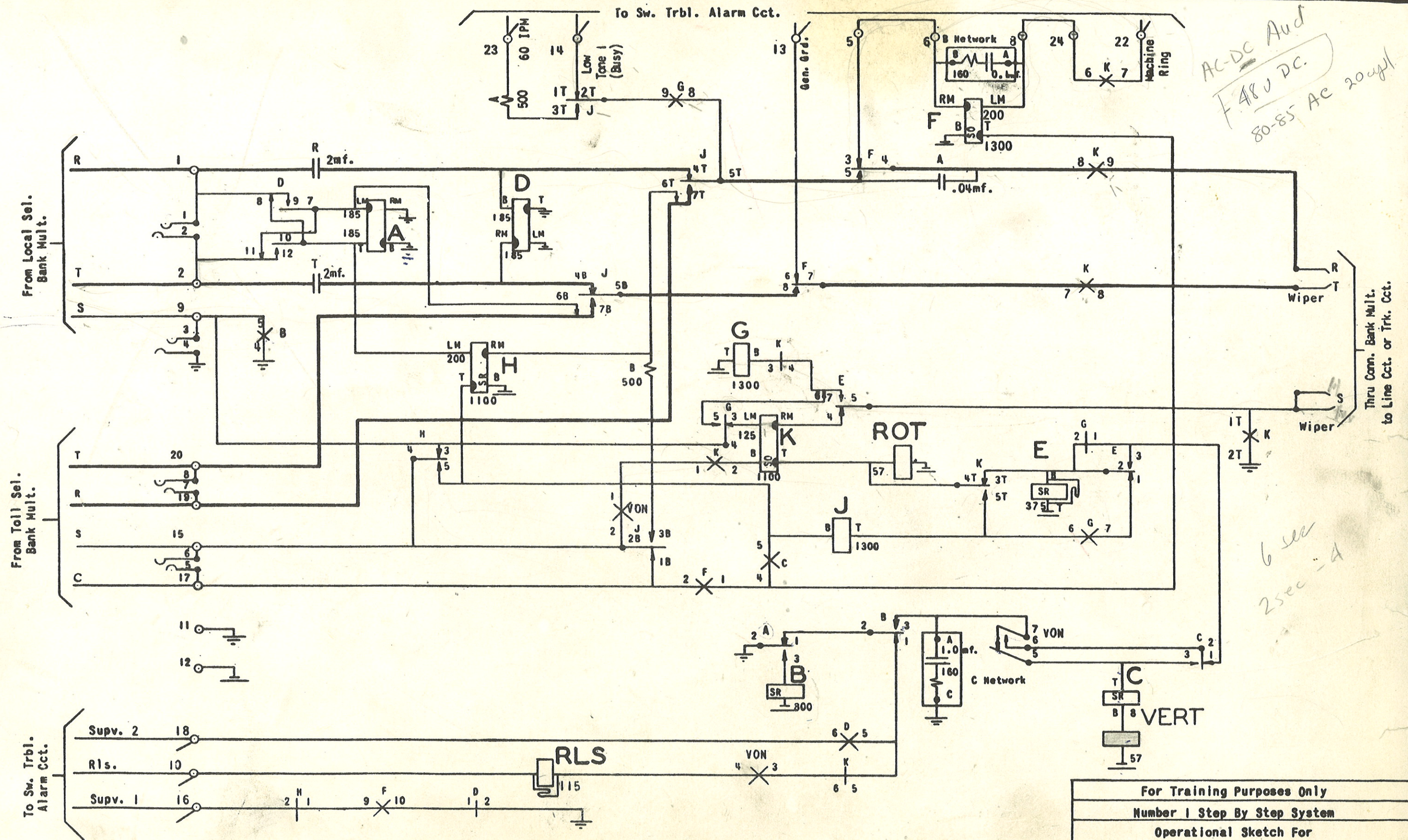
R.A.Ditlow

Issue 19 D

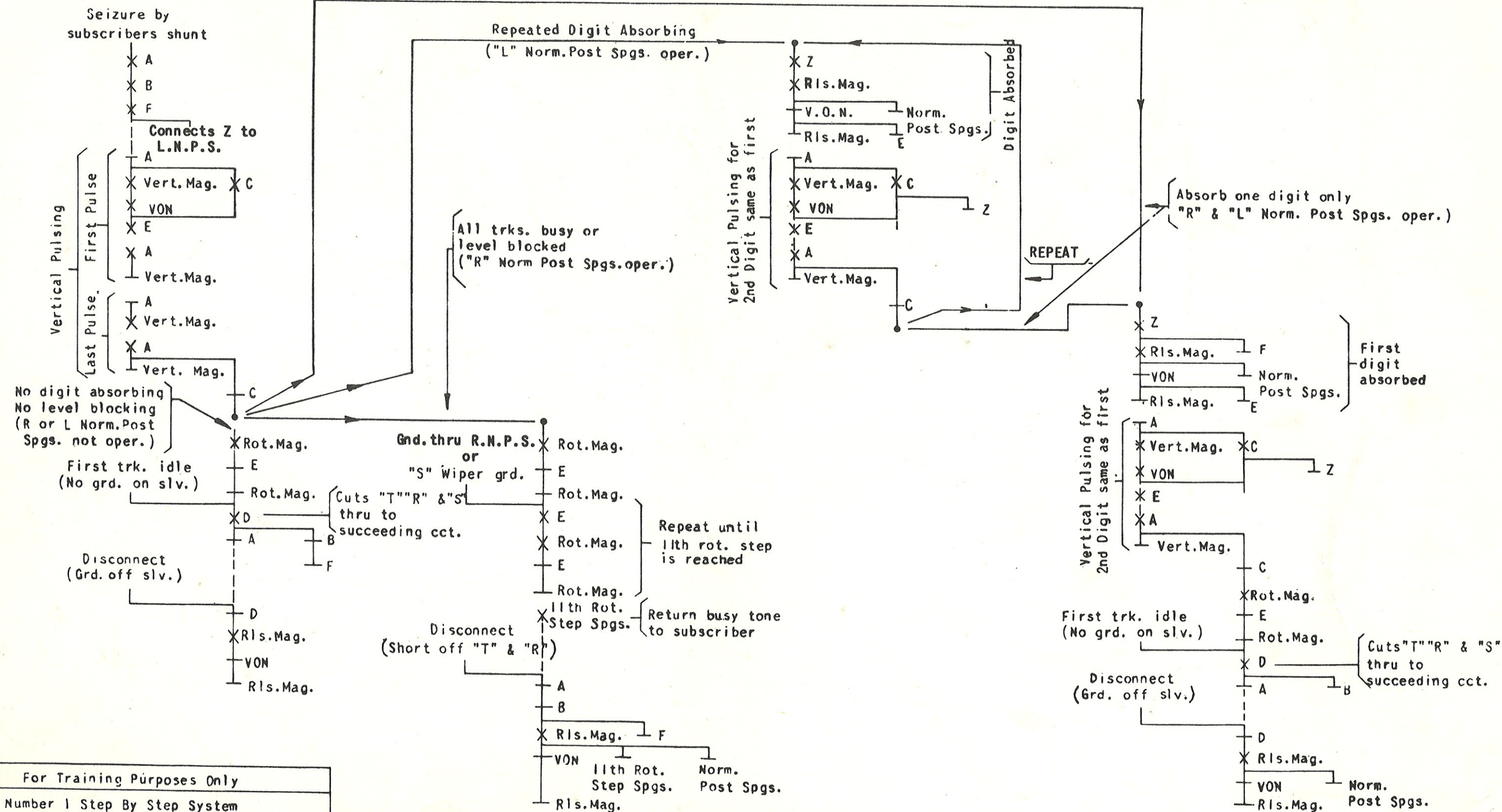
2







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Number 1 Step By Step System			
Operational Sketch For			
SD-30228-01			
1 Ring Combination Connector			
9/2/52	R.A. Ditlow	Issue 27 B	4



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Number 1 Step By Step System

Sequence Chart For

SD-30976-01

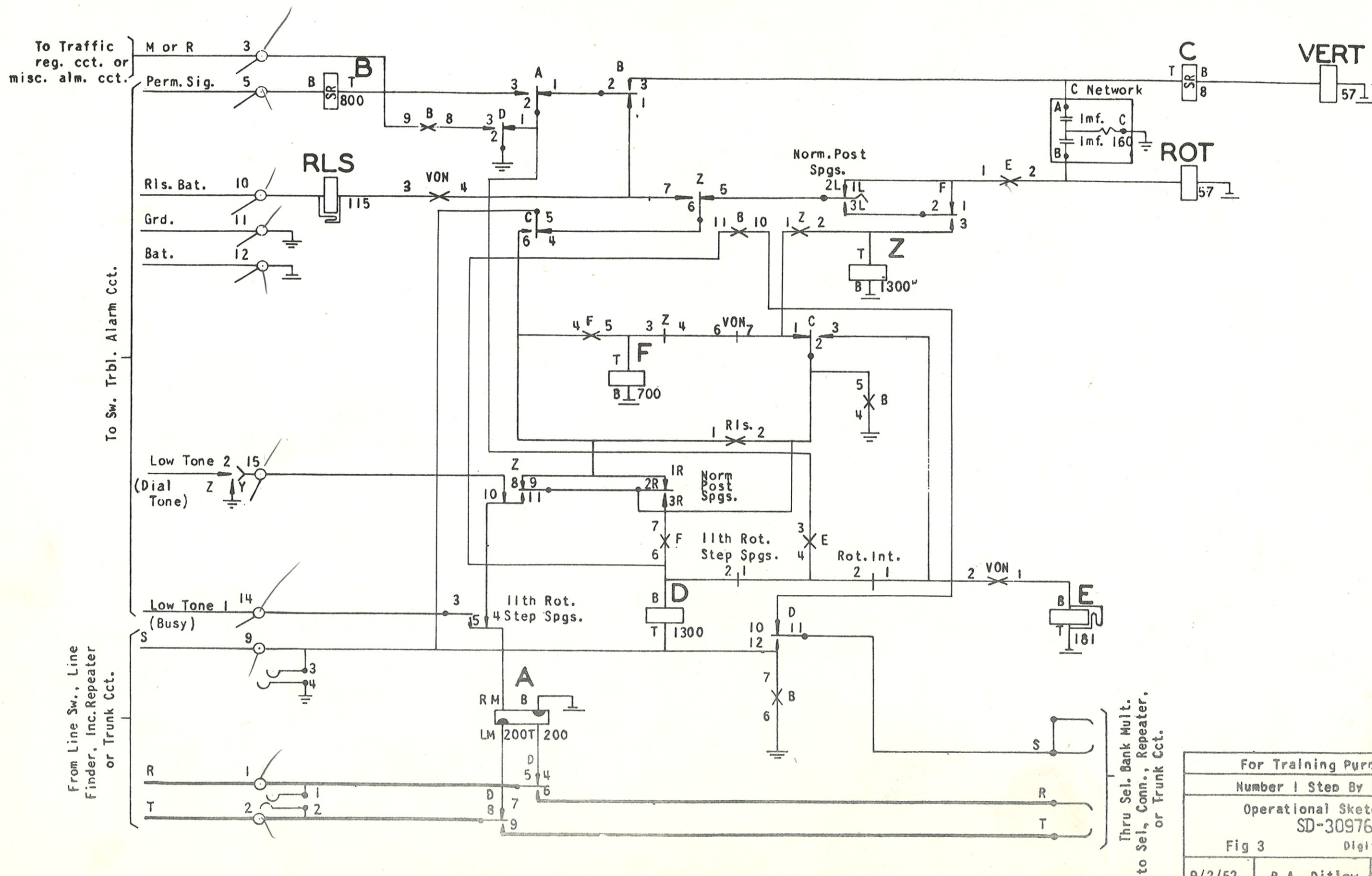
Digit Absorbing Selector

9/2/52

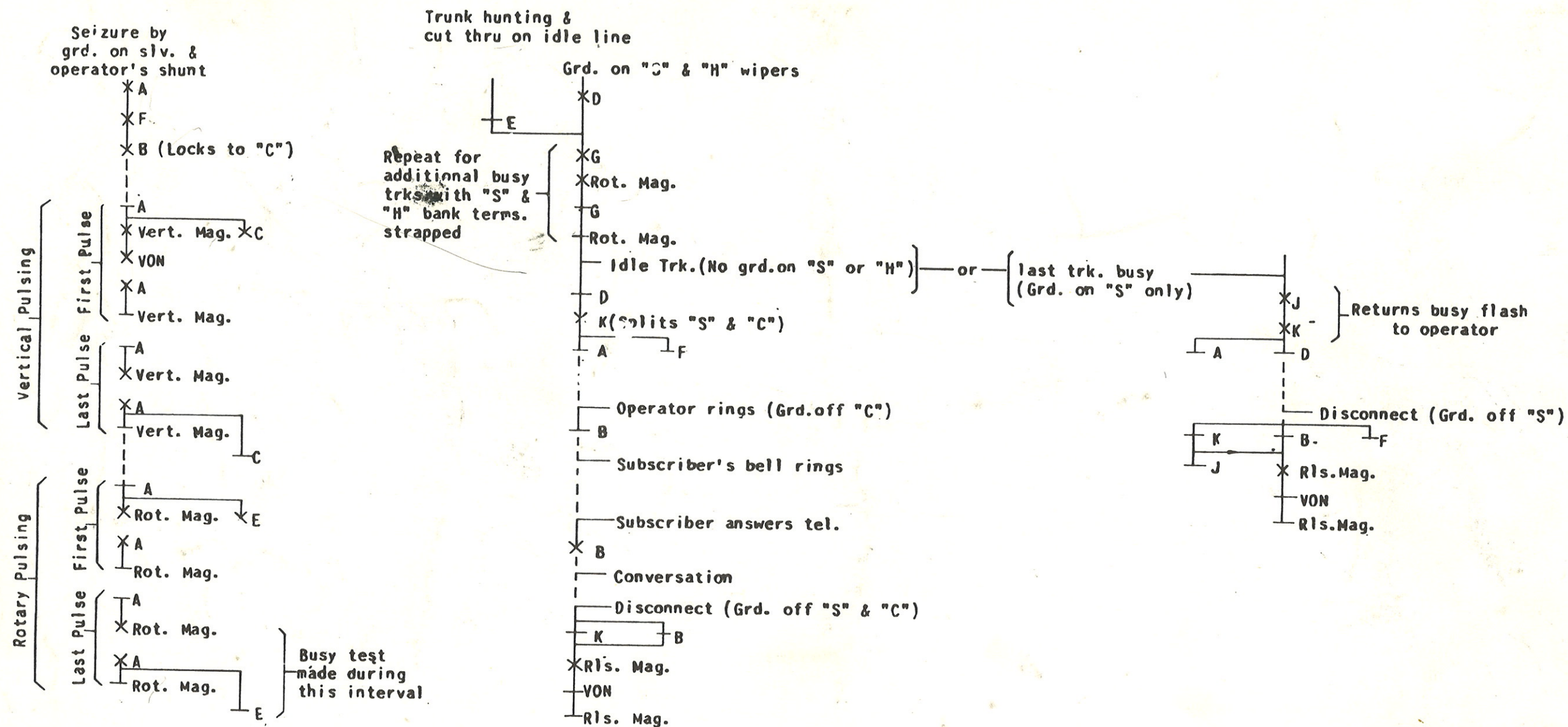
R.A. Ditlow

Issue 5B

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For Training Purposes Only			
Number 1 Step By Step System			
Operational Sketch For SD-30976-01			
Fig 3 Digit Absorbing Selector			
9/2/52	R.A. Ditlow	Issue 8 D	6



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Number 1 Step By Step System

Sequence Chart For

SD-31114-01

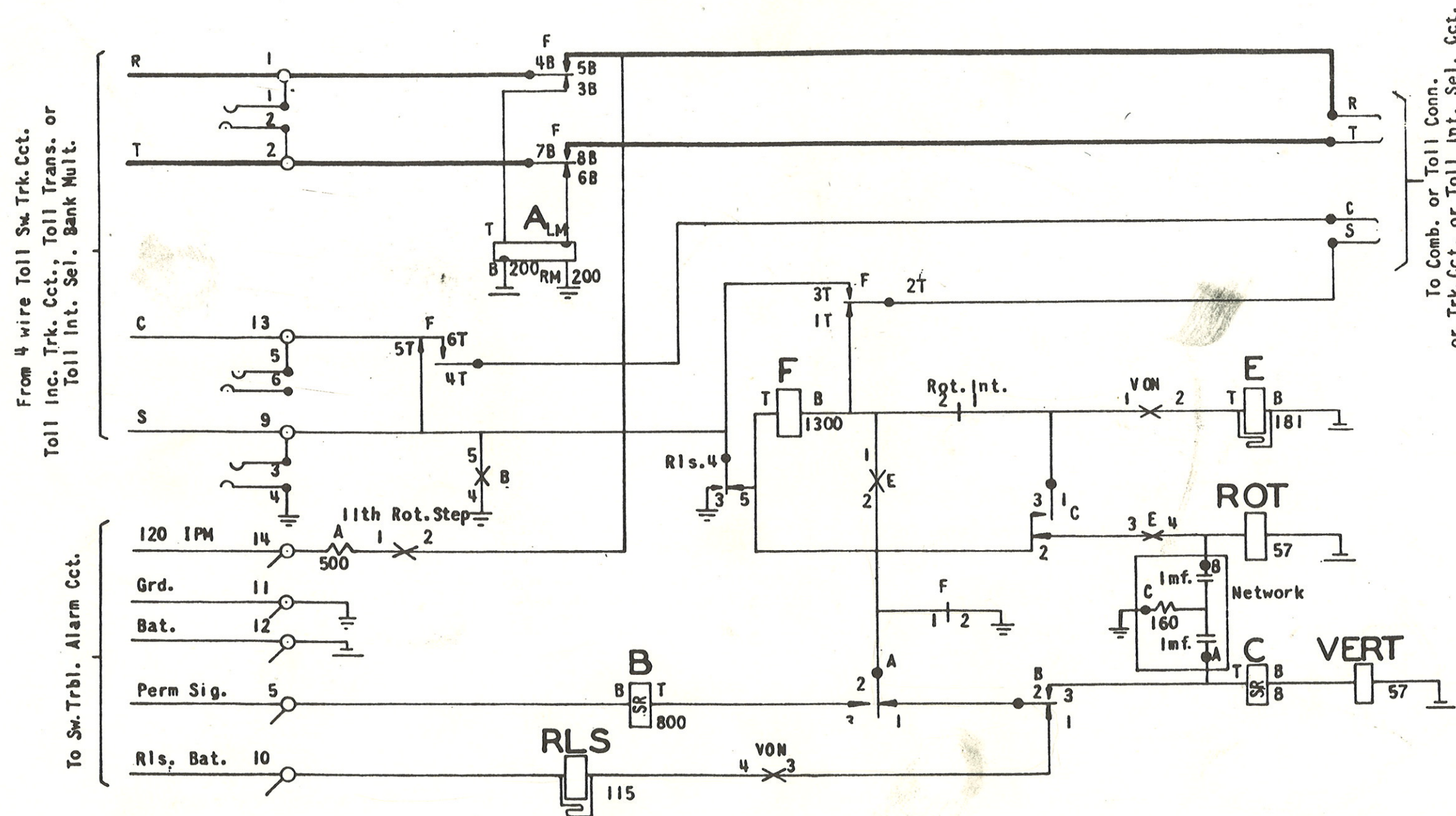
Toll Rotary Connector

9/2/52

R.A. Ditlow

Issue 16 D

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Number 1 Step By Step System

Operational Sketch For

SD-31179-01

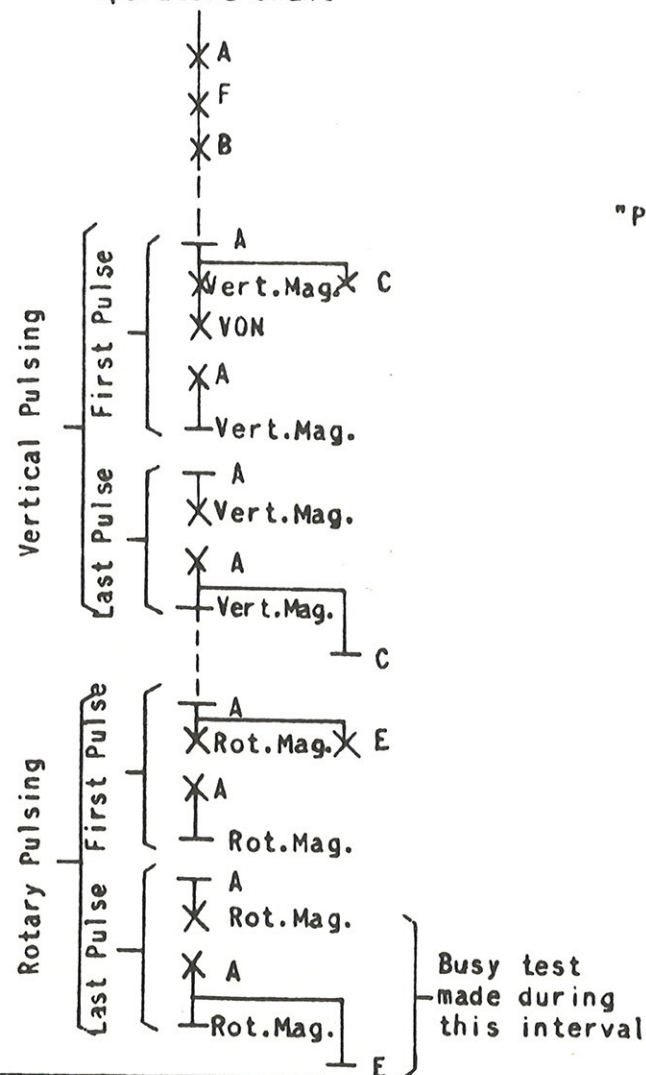
Toll Intermediate Selector

9/2/53

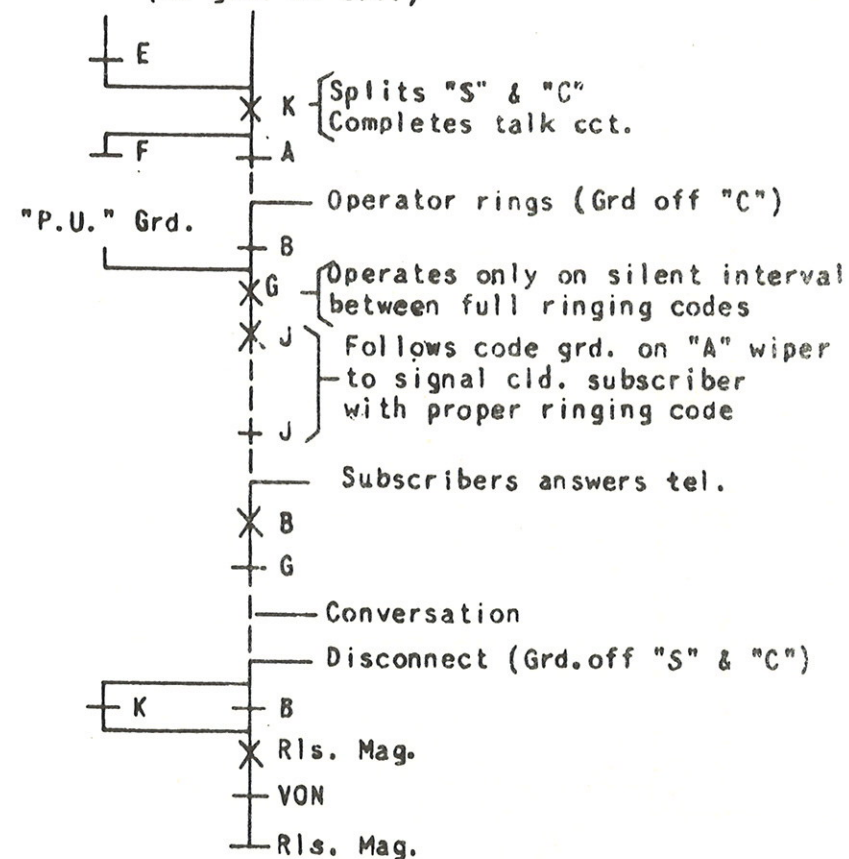
R.A.Ditlow

Issue 21 D 8

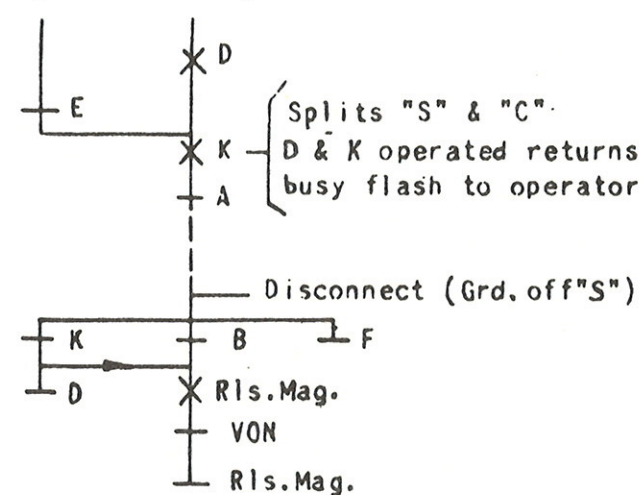
Seizure by grd.
on slv. and toll
operators shunt



Cld. line idle
(No grd. on slv.)



Cld. line busy
(Grd. on slv.)



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Number 1 Step By Step System

Sequence Chart For

SD-31300-01

Toll Connector

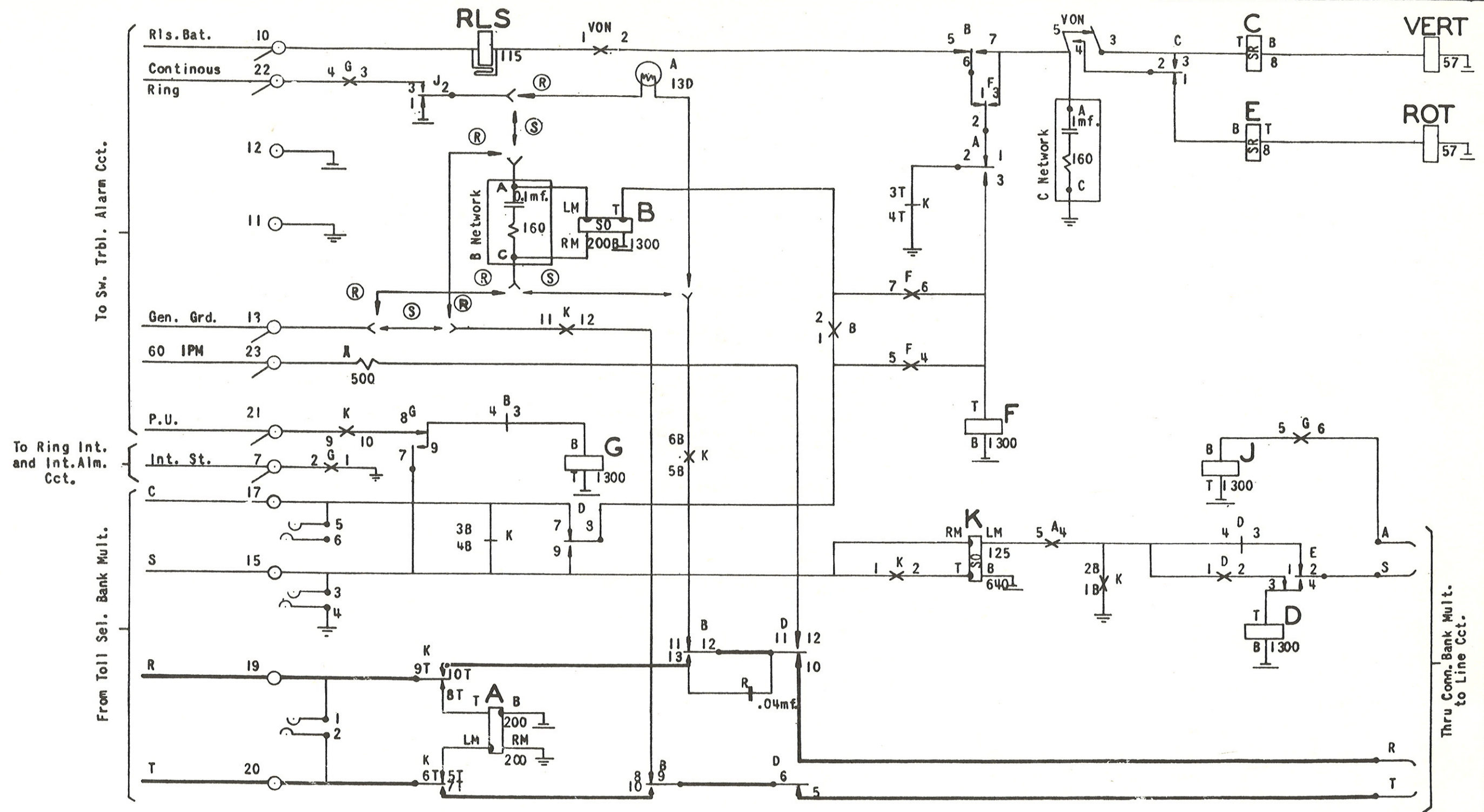
10 Party Terminal Per Station

9/2/52

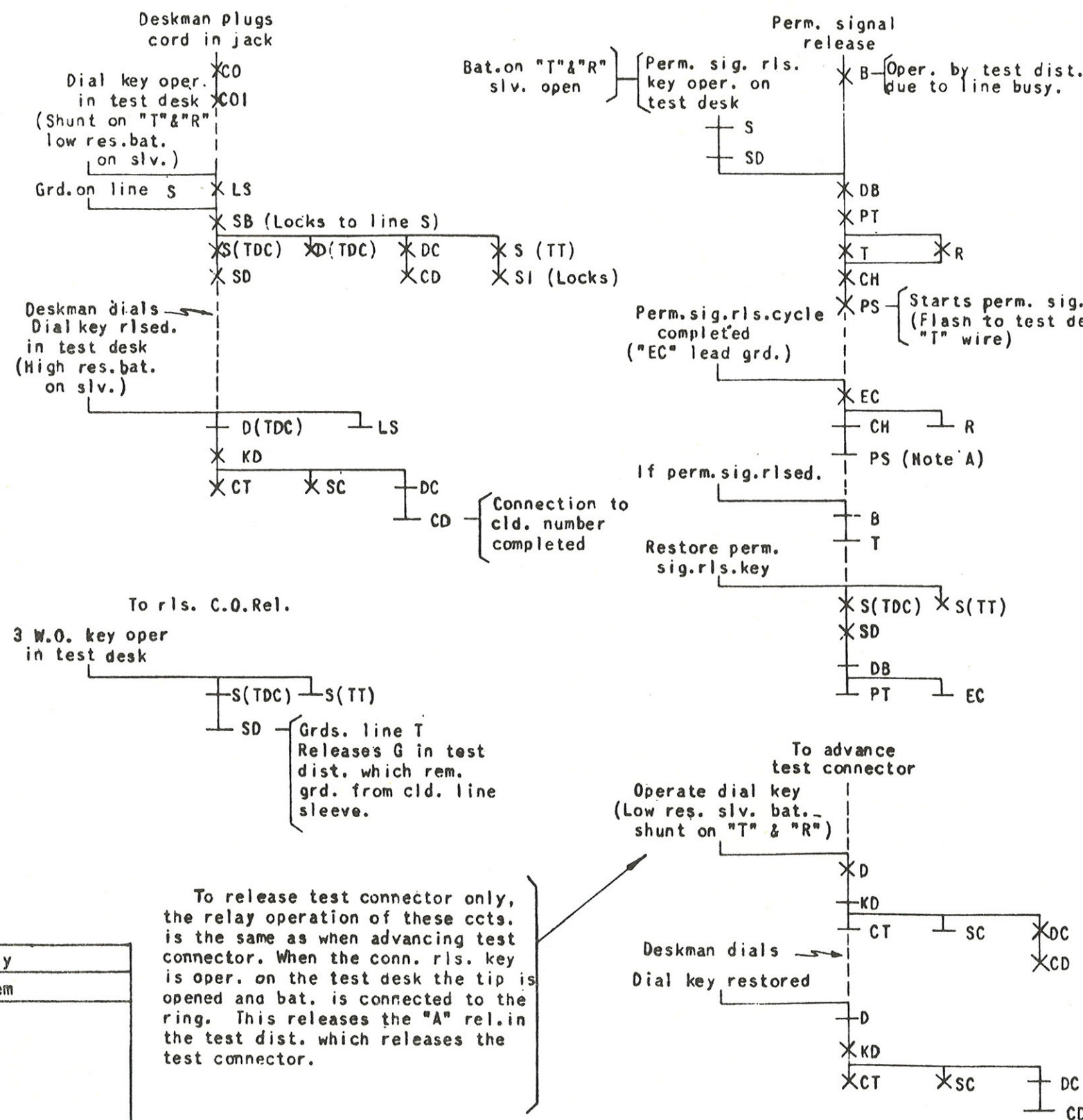
R.A. Ditlow

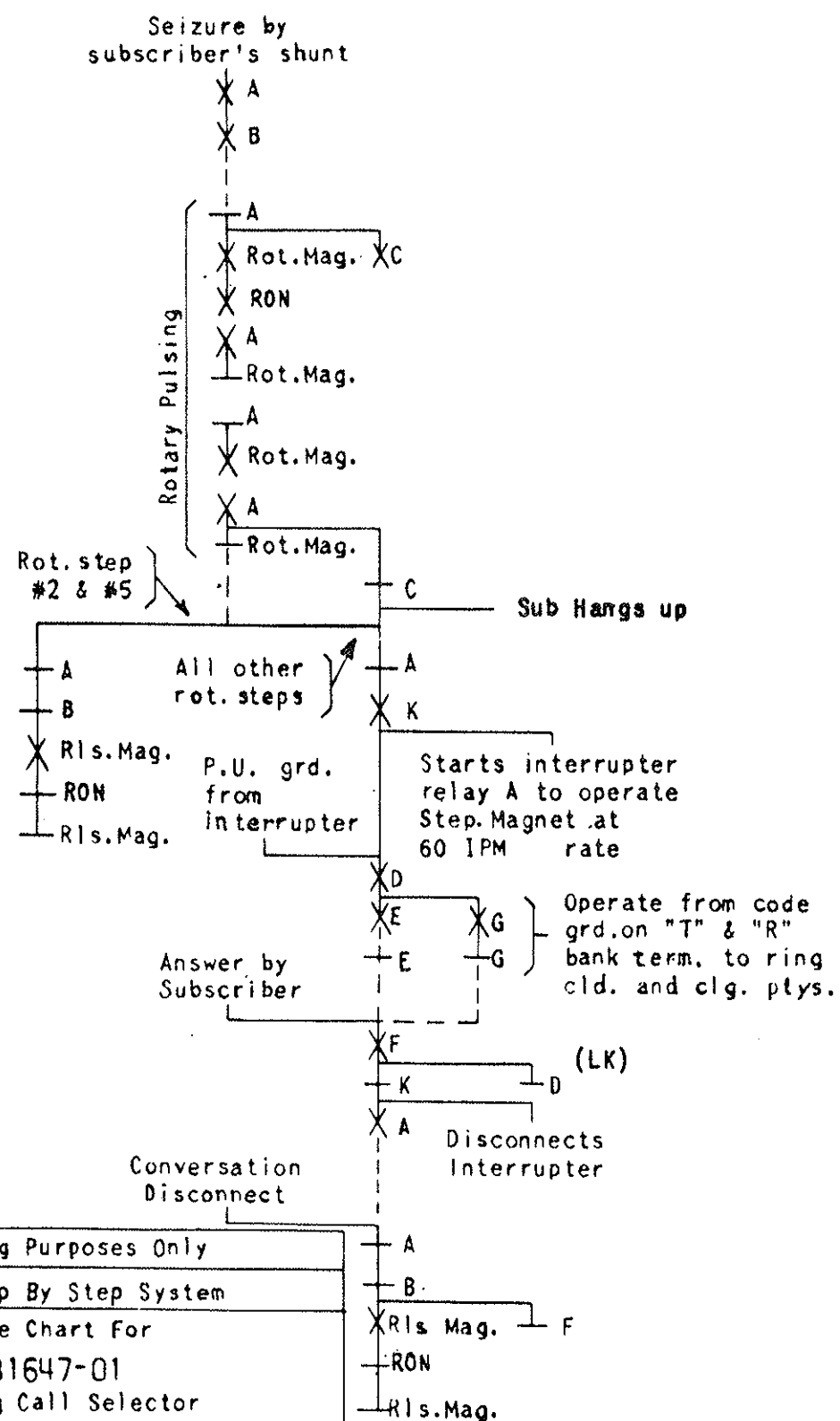
Issue 15D

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For Training Purposes Only			
Number 1 Step By Step System			
Operational Sketch For			
SD-31300-01			
Toll Connector			
10 Party Terminal Per Station			
9/2/52	R.A. Dittow	Issue 15 D	9





Code Grd.

Rotary Brushes on Bank Term.

	1	2	3	4	5	6	7	8	9	10	
1 T											E
1 R											G
3 T											E
3 R											G
4 T											
4 R											
6 T											
6 R											
7 T											
7 R											
8 T											
8 R											
9 T											
9 R											
0 T											
0 R											
PU											

Selector Bank Term.

Ringing Codes

	1	2	3	4	5	6	7	8	9	10	
1 T											
1 R											
3 T											
3 R											
4 T											
4 R											
6 T											
6 R											
7 T											
7 R											
8 T											
8 R											
9 T											
9 R											
10 T											
10 R											
PU											

Selector Bank Term.

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Number 1 Step By Step System

Sequence Chart For

SD-31647-01

Reverting Call Selector

SD-31501-01

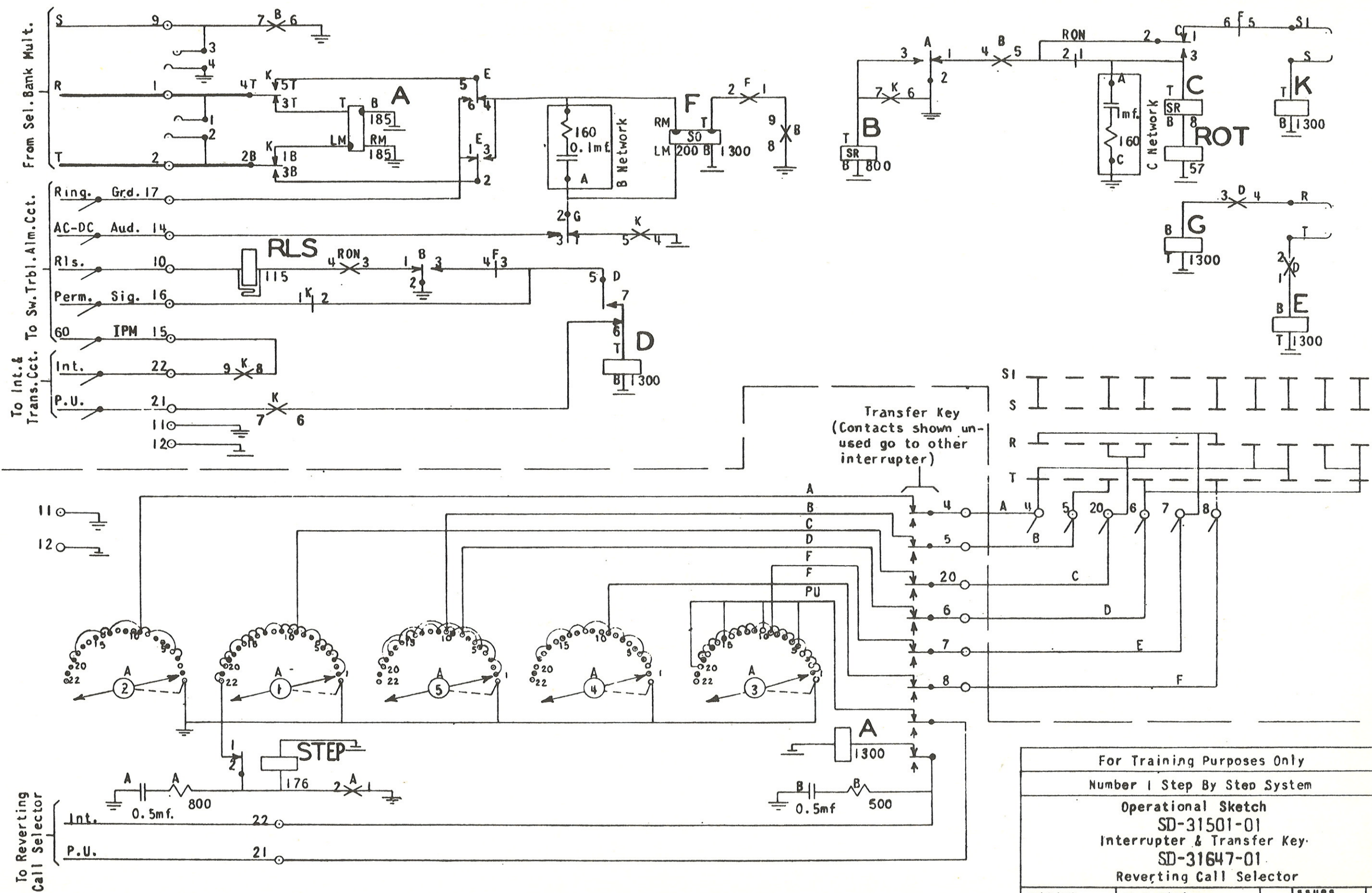
Interrupter and Transfer Key

9/2/52

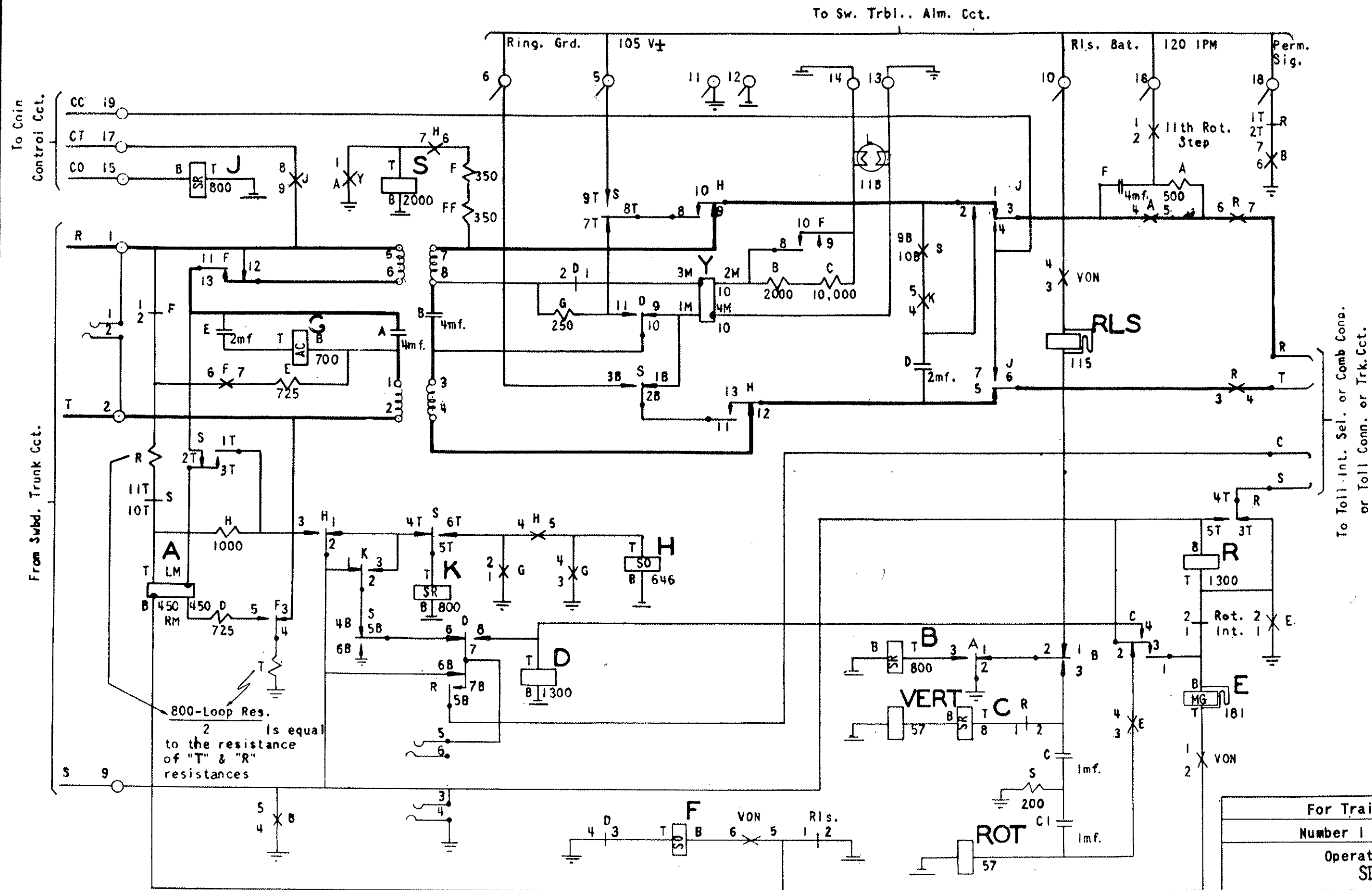
R.A. Ditlow

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For Training Purposes Only			
Number 1 Step By Step System			
Operational Sketch			
SD-31501-01			
Interrupter & Transfer Key			
SD-31647-01			
Reverting Call Selector			
9/2/52	R.A. Ditlow	Issues	11



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Number 1 Step By Step System

Operational Sketch For

SD-31522-01

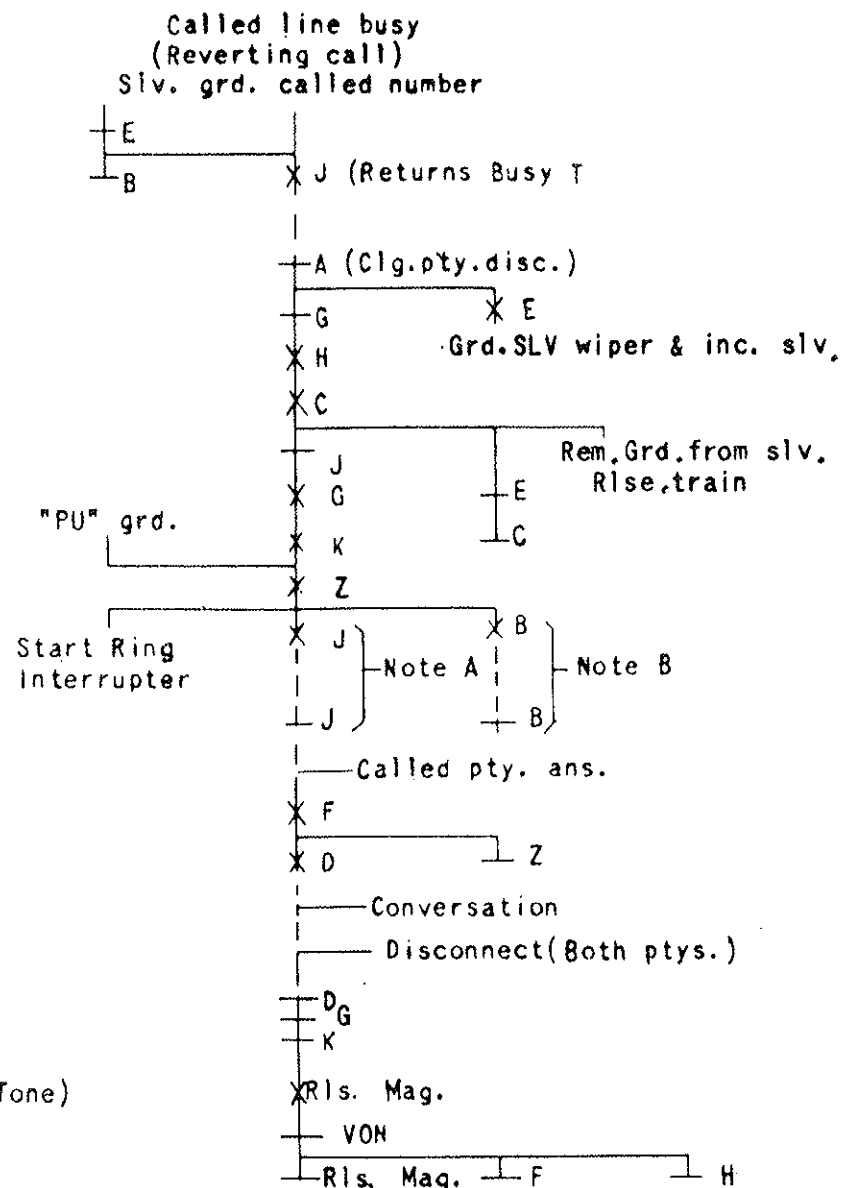
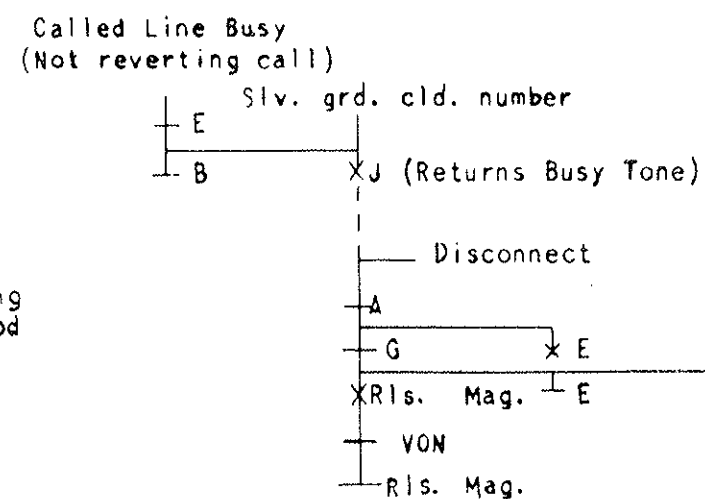
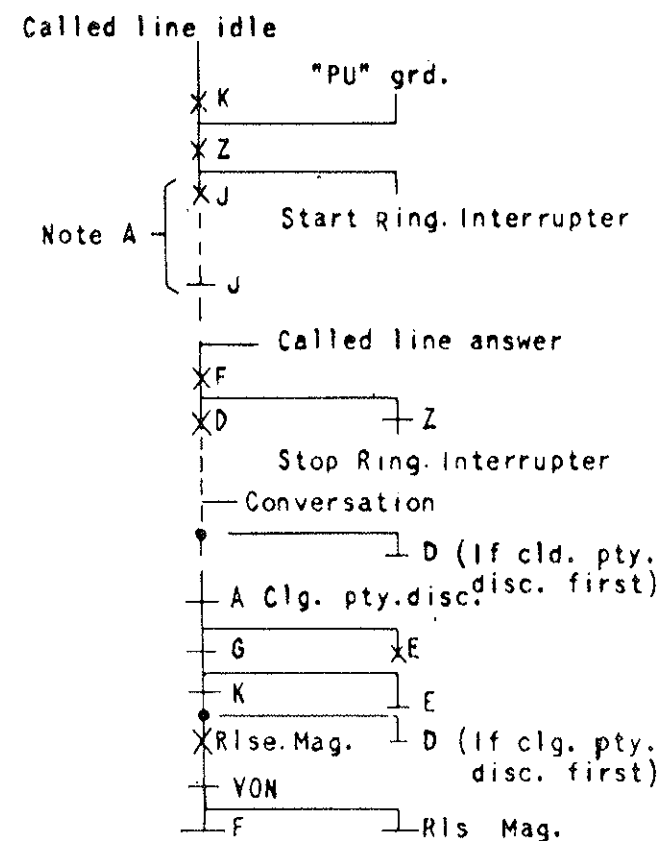
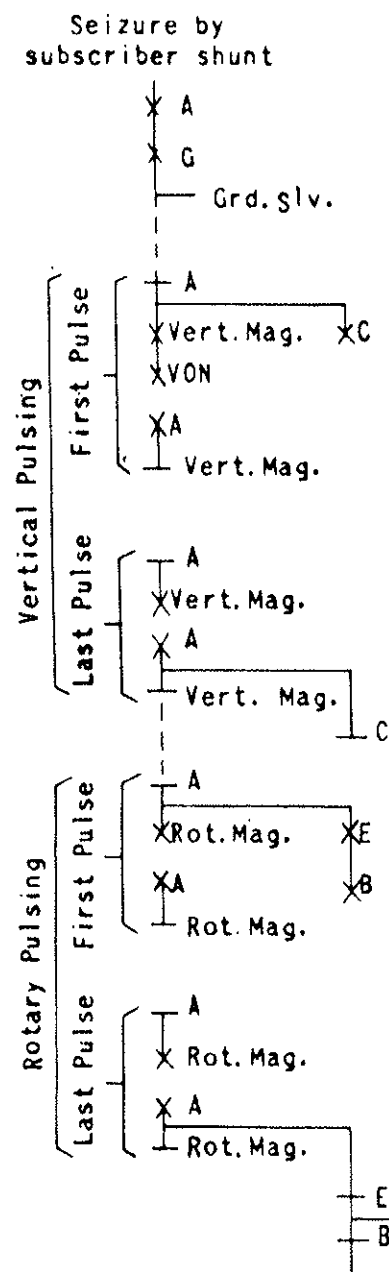
Toll Transmission Selector

9/2/52

R.A. Ditlow

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Note A

The J Rel. follows a code grd. from the Ringing Interrupter which is cross connected to the "A" bank mult. term. of the called party. This causes the proper ringing code to be sent to the called party.

Note B

The B Rel. operates twice per code ring from timed grd. on "RS". This provides a signal to the clg. pty. that is connected on the "Reversed Side" from the cld. pty.

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Number 1 Step By Step System

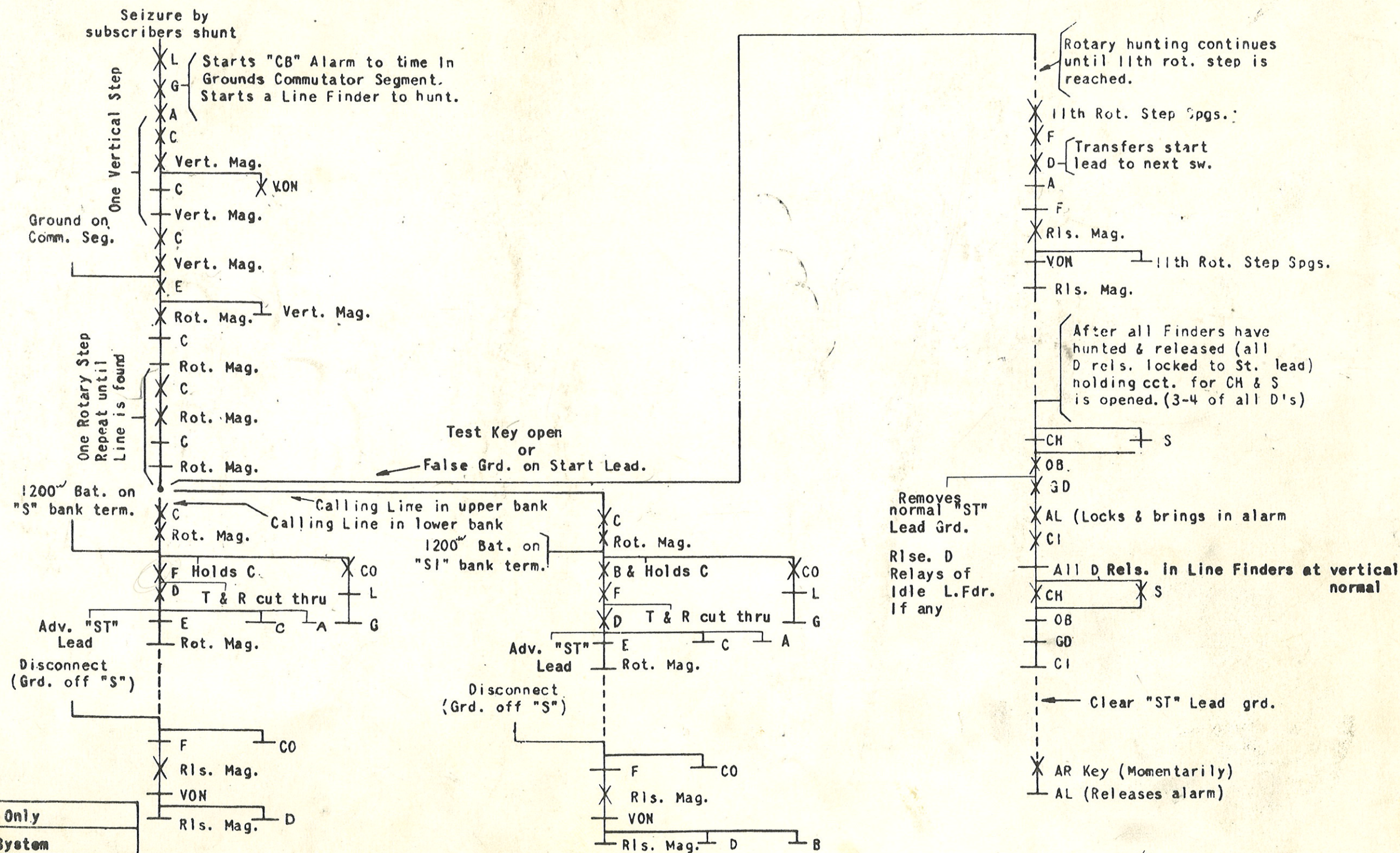
Sequence Chart For
SD-31526-01
10 Party Terminal Per Station
Local Connector

9/2/52

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Number 1 Step By Step System

Sequence Chart For
SD-32133-01 Subscribers Line Circuit

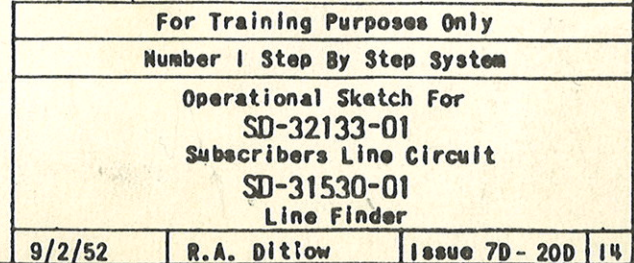
SD-31530-01 Line Finder

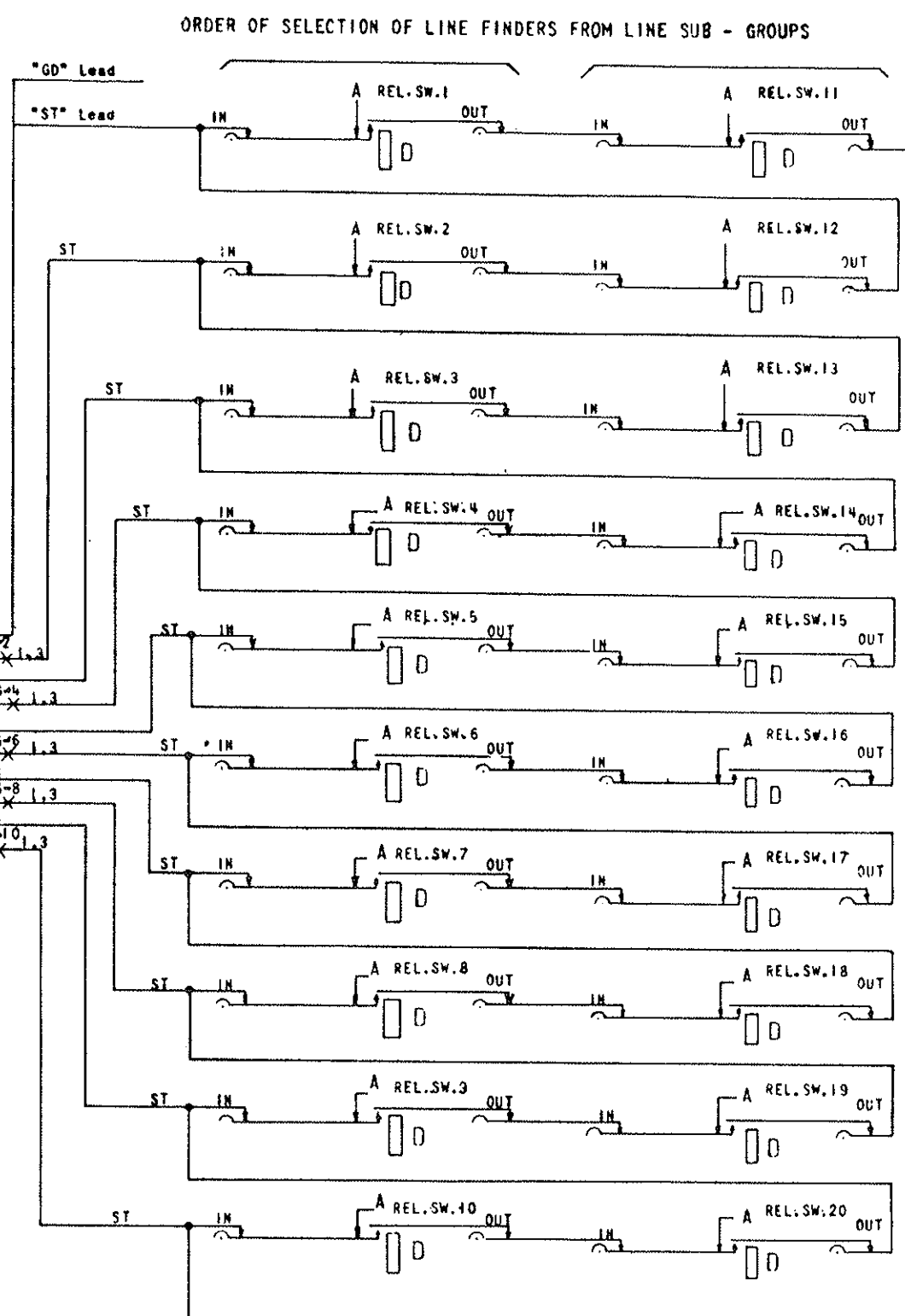
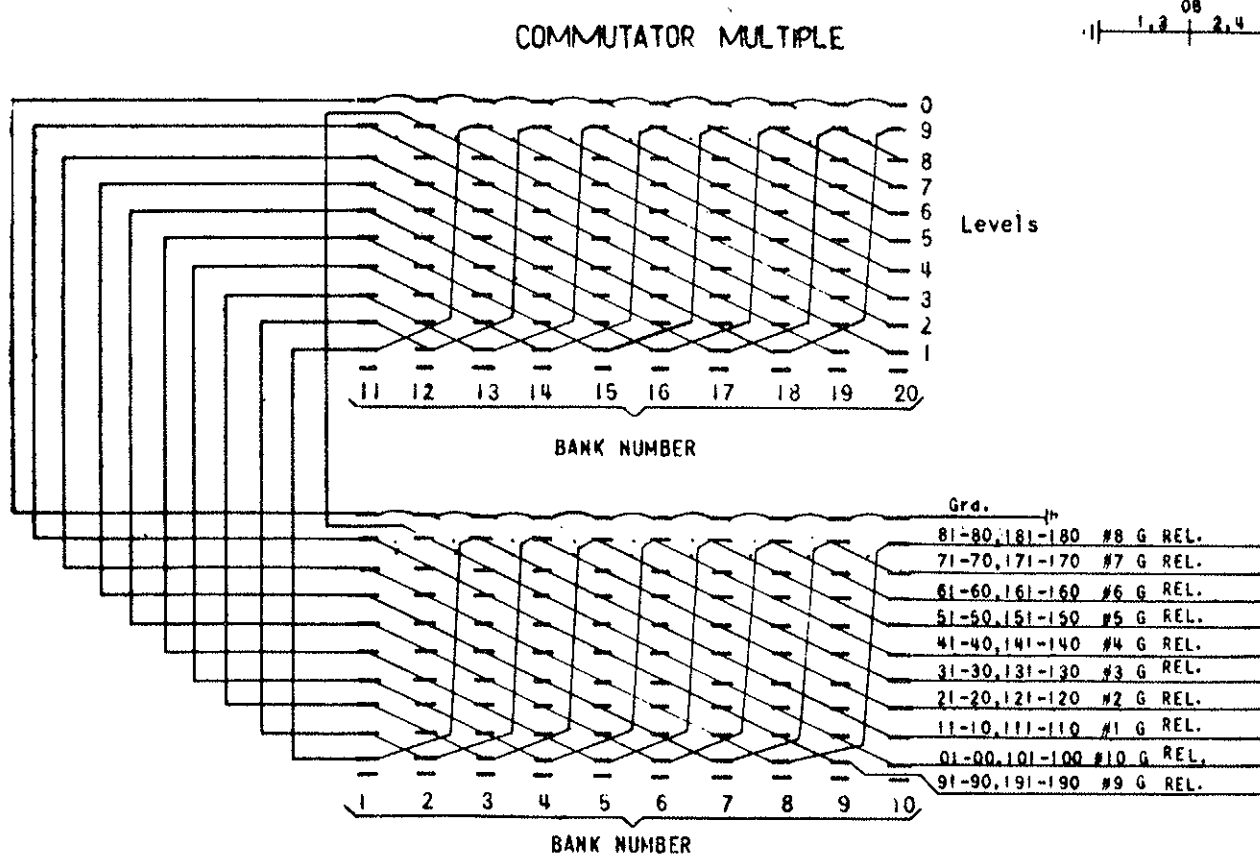
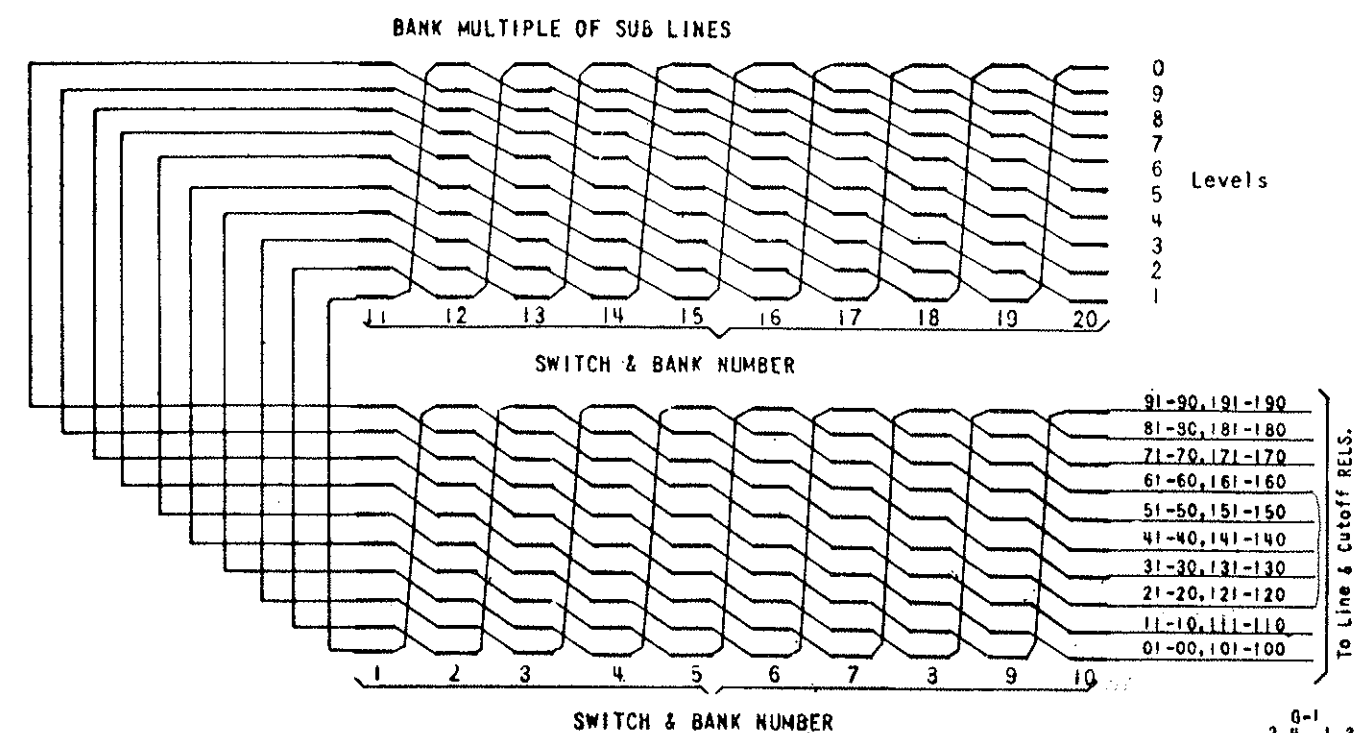
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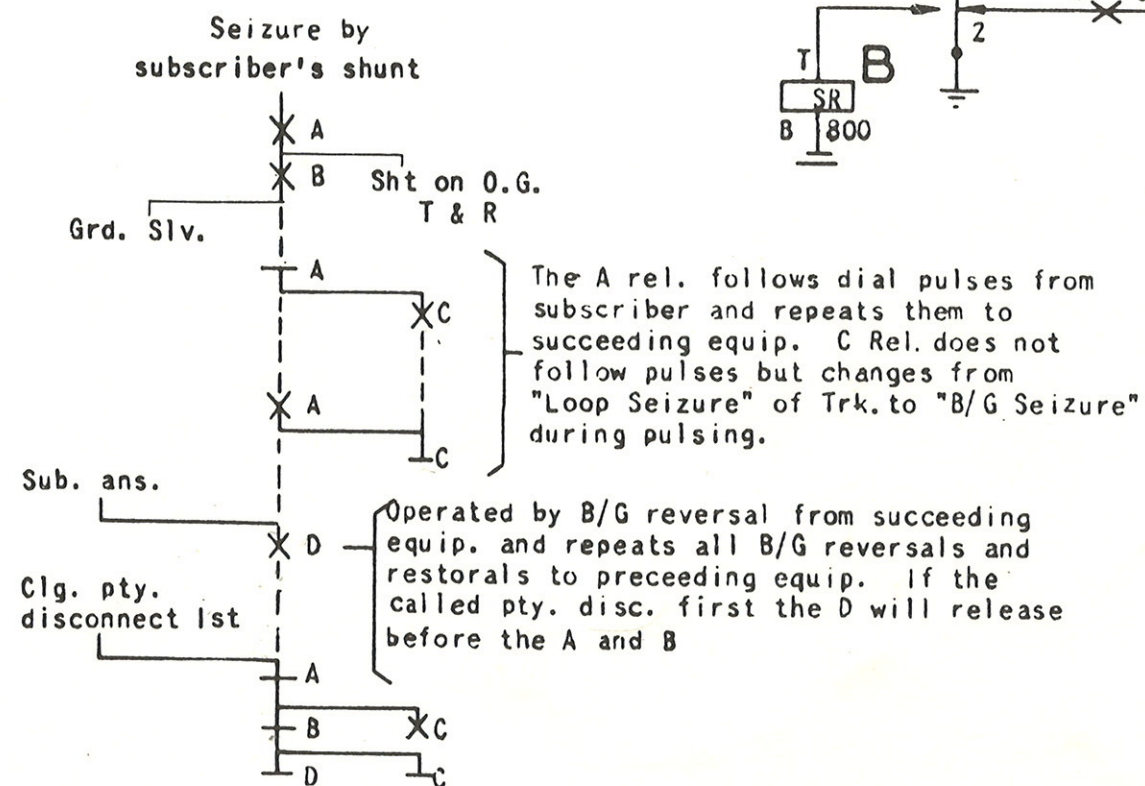
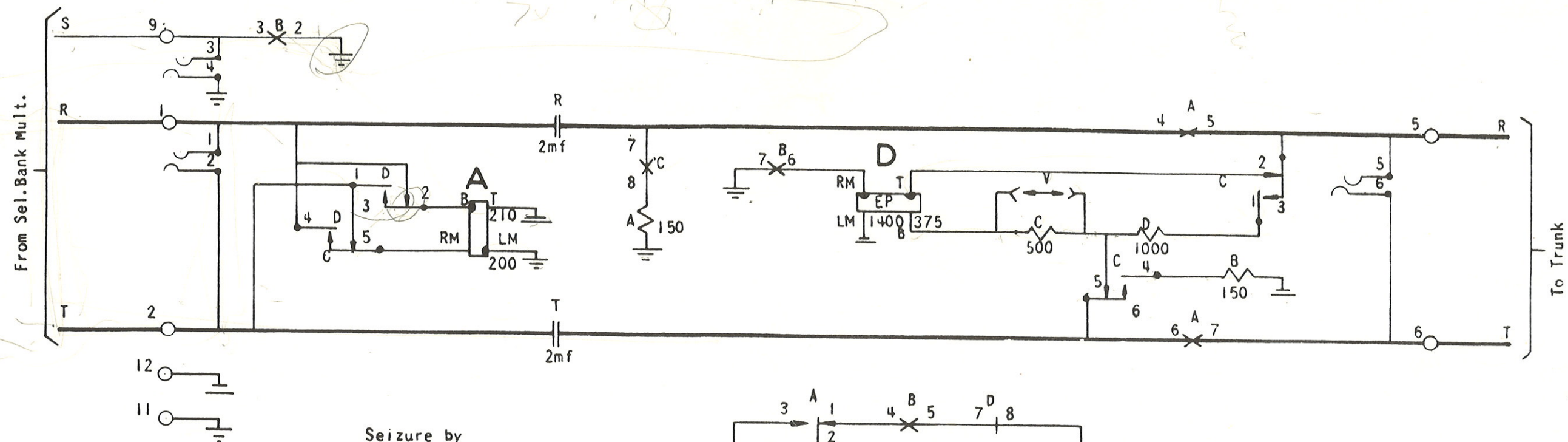
R.A. Ditlow

Issues 7D 20D 14

H1 of 350 A

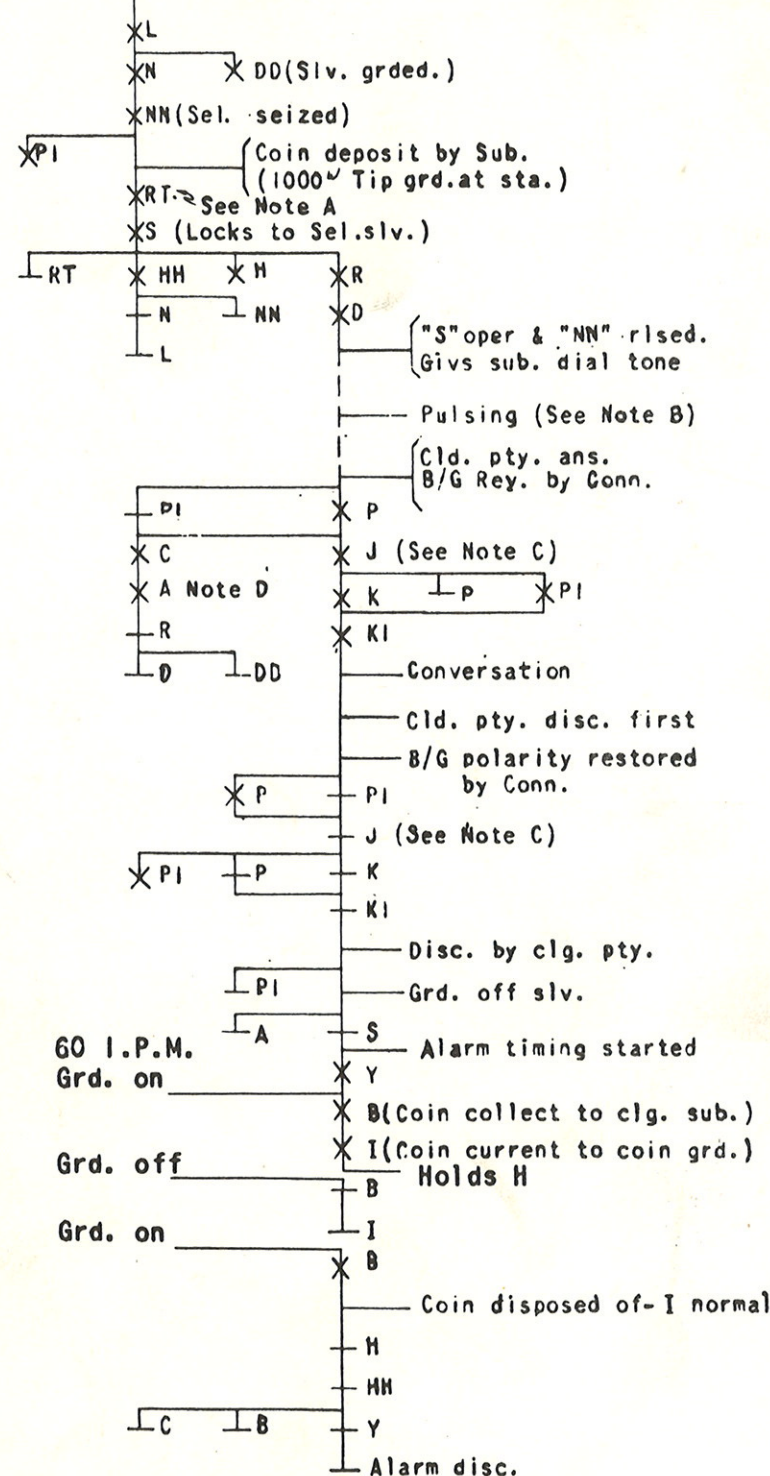




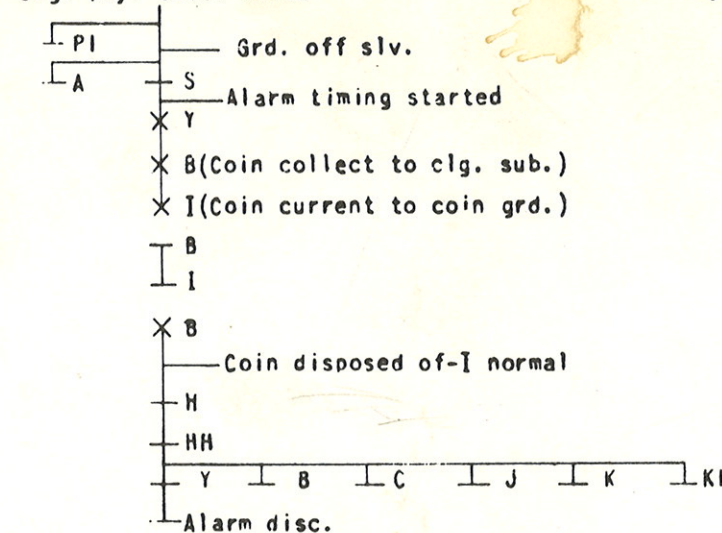


For Training Purposes Only			
Number 1 Step By Step System			
Operational Sketch & Sequence Chart For SD-31779-01			
Outgoing Repeater Circuit			
9/2/52	R.A.Ditlow	Issue 12 D	15

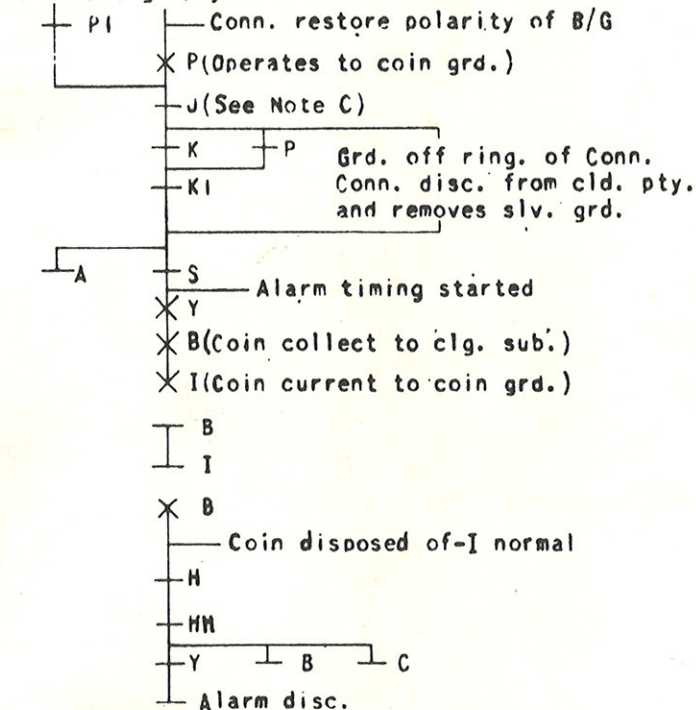
Seizure by subscriber shunt



Clg. pty. disc. first



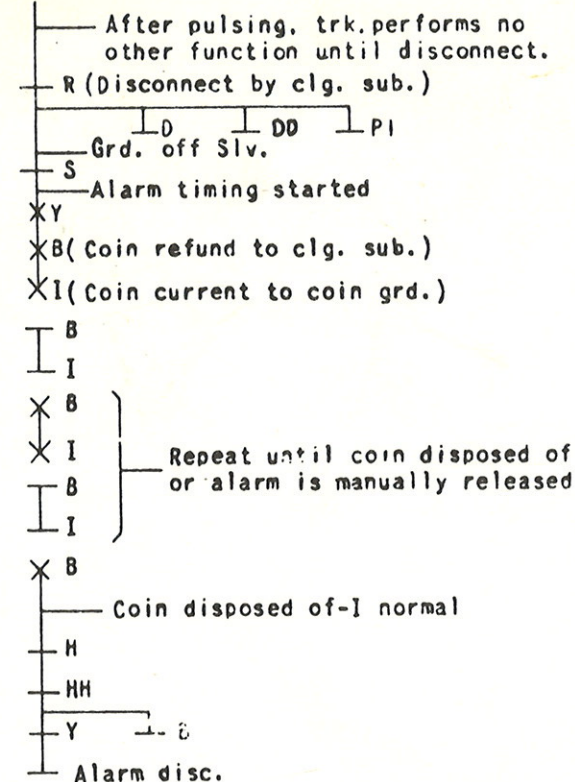
Simultaneous disc. by cld. & clg. pty.



Note D

The "A" rel. disconnects the bridged apparatus and series condensers and connects the Sub. straight through the trk. This improves transmission and provides better line balance to reduce noise.

Busy Line, Don't Answer or Free Call



Note A

The "BT" rel. where furnished will not operate from normal 1000 ohm Coin Grd. BT rel. will operate with RT if subscriber uses solid grd. on tip to avoid coin deposit. If BT operates call can proceed no further as S will be prevented from operating.

Note B

"R" rel. repeats sub. pulses to Selector. During pulsing D & DD will release on about the second pulse of each digit (to remove interaction between incoming and outgoing pulses through A & B condensers) and reoperate at end of digit.

Note C

The "J" rel. will operate and release as the polarity of battery & grd. on the T & R is reversed and restored by the succeeding ckt. This maintains the coin grd on the grounded side of the line. If the coin grd. was allowed on the battery side of the line the call would lock to it when the polarity is reversed. The purpose of the Batt. reversal is to signal the trk. that the call shall be charged for. This is accomplished when the "C" rel. operates & locks. J Rls by sht. ckt.

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Number 1 Step By Step System

Sequence Chart For

SD-31592-021

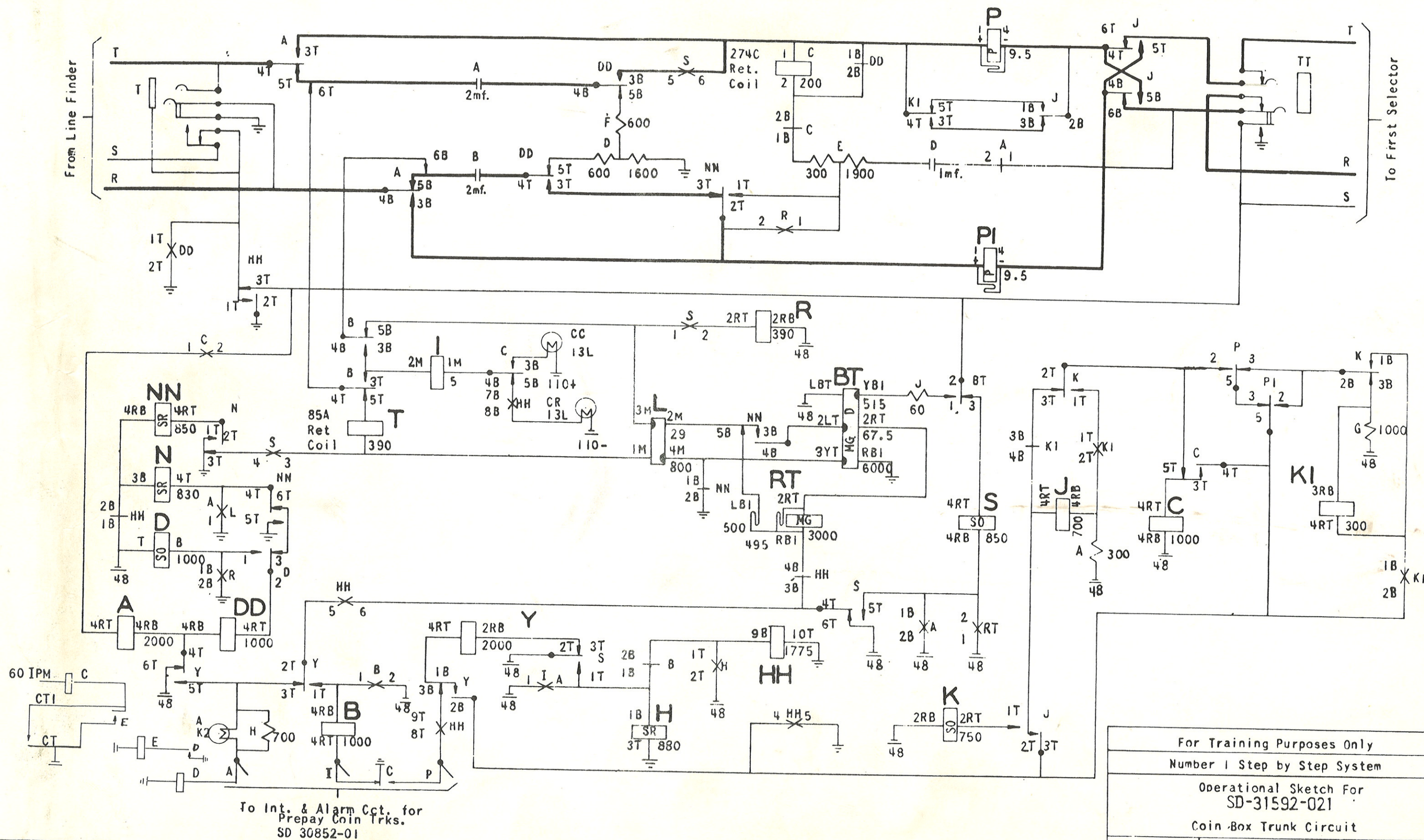
Coin Box Trunk

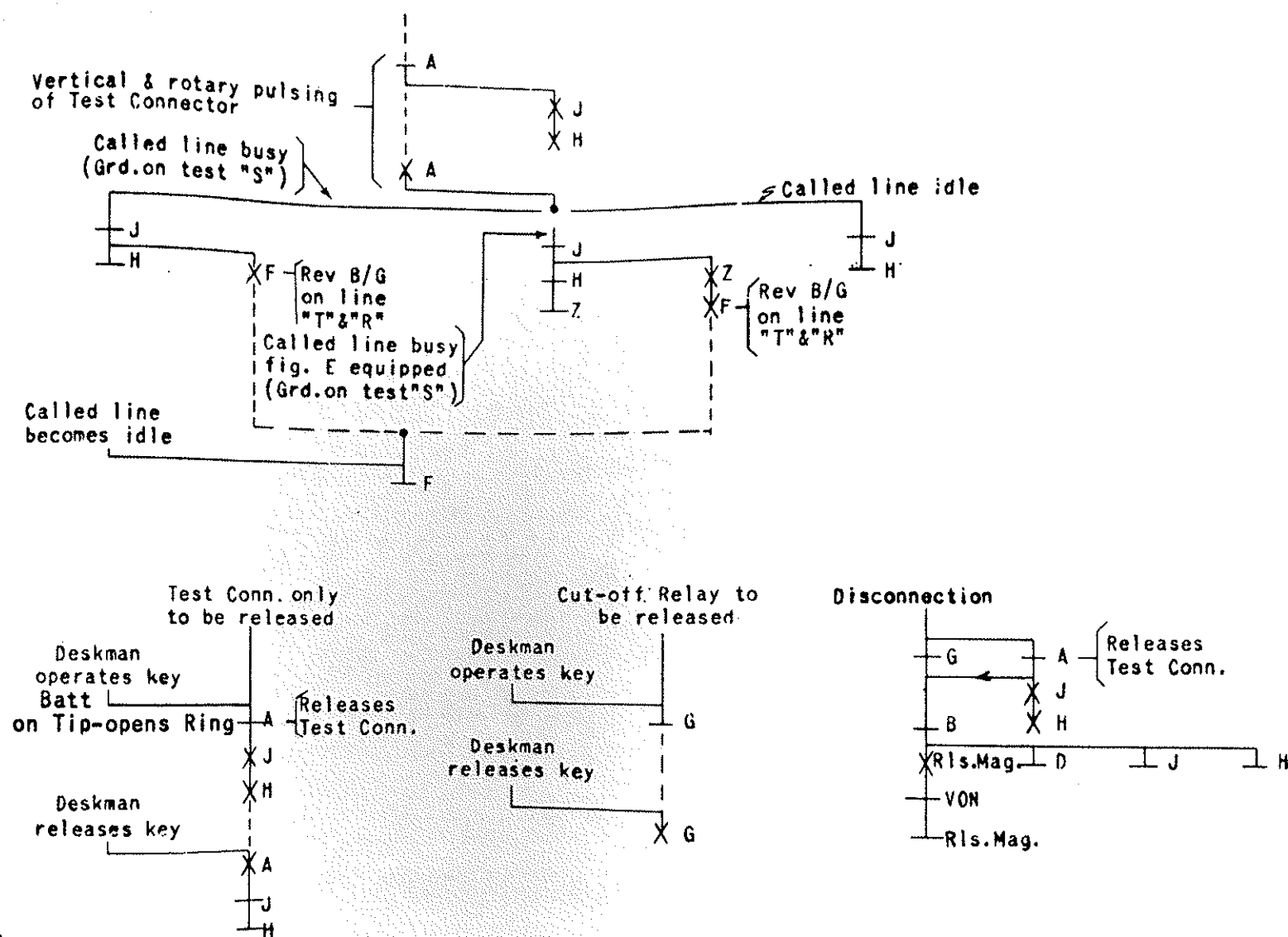
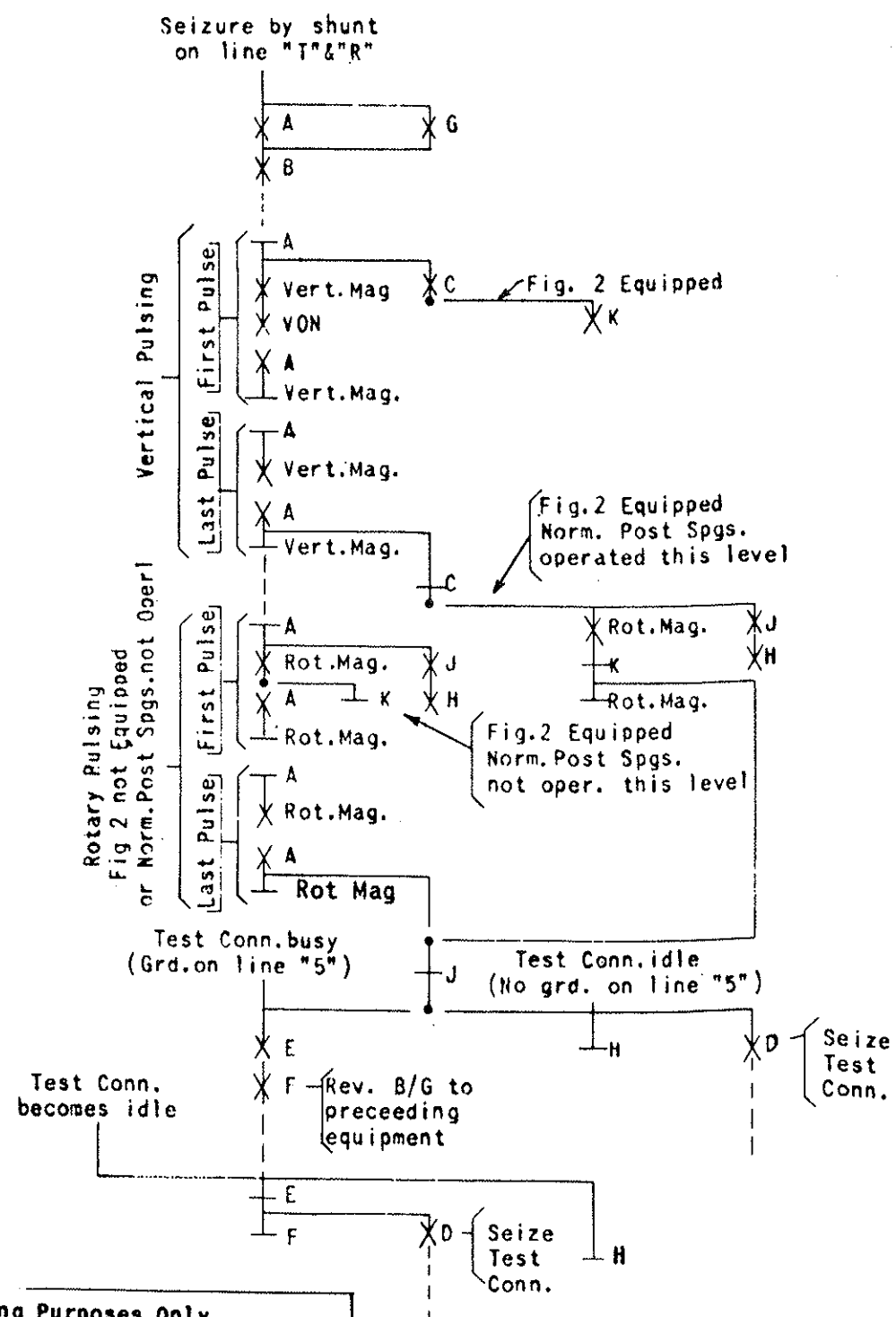
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Number 1 Step By Step System

Sequence Chart For

SD-32007-01

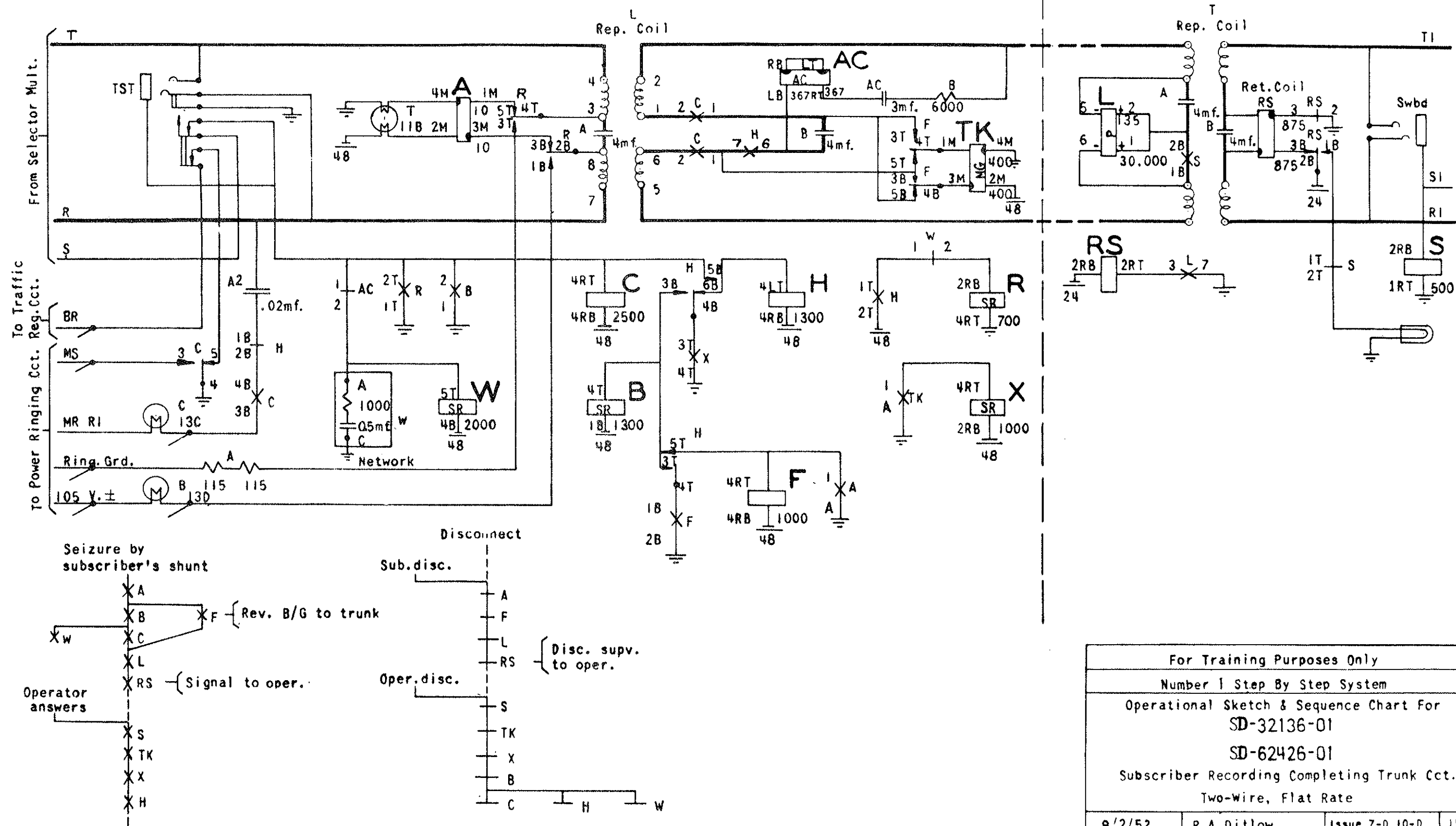
Test Distributor

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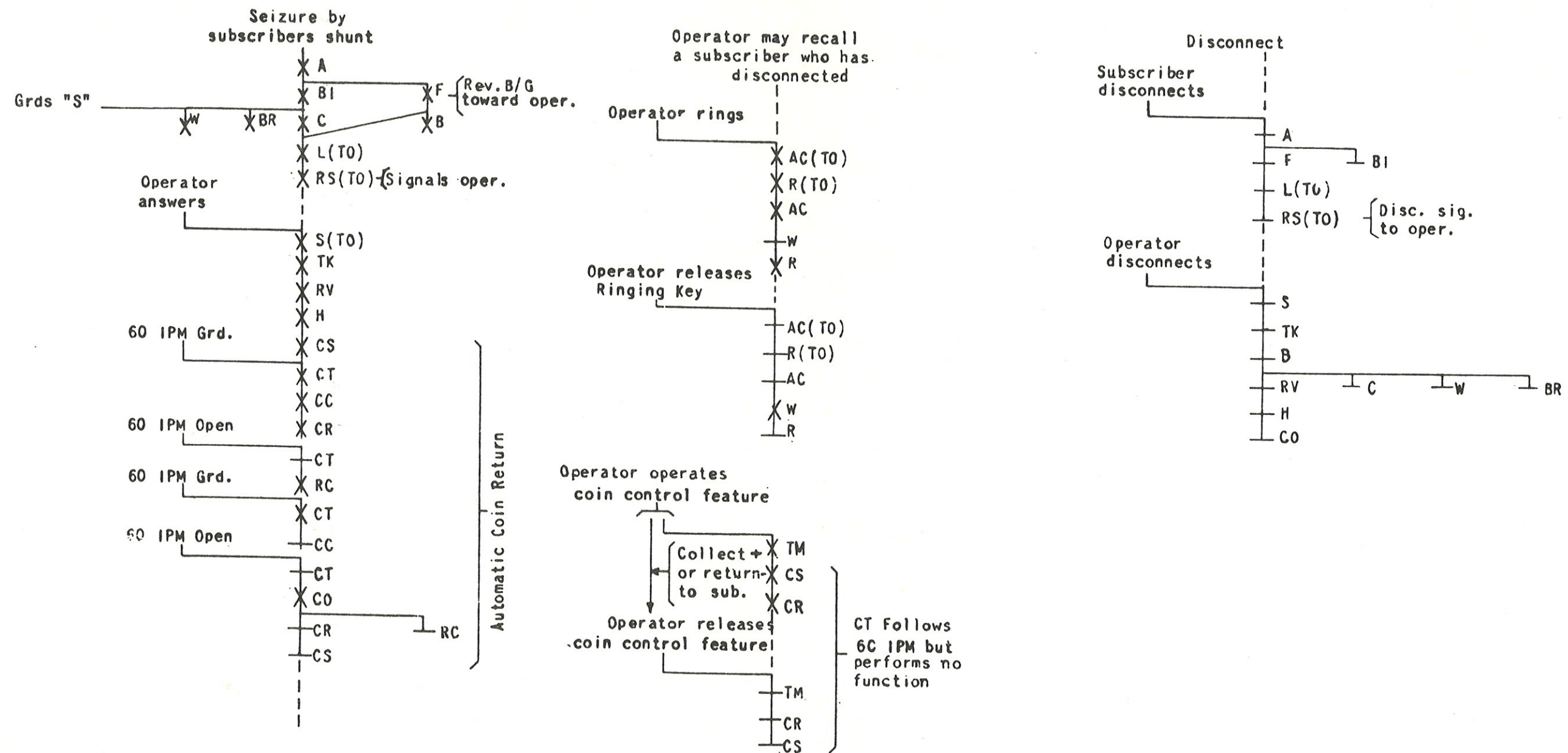
R.A. Ditlow

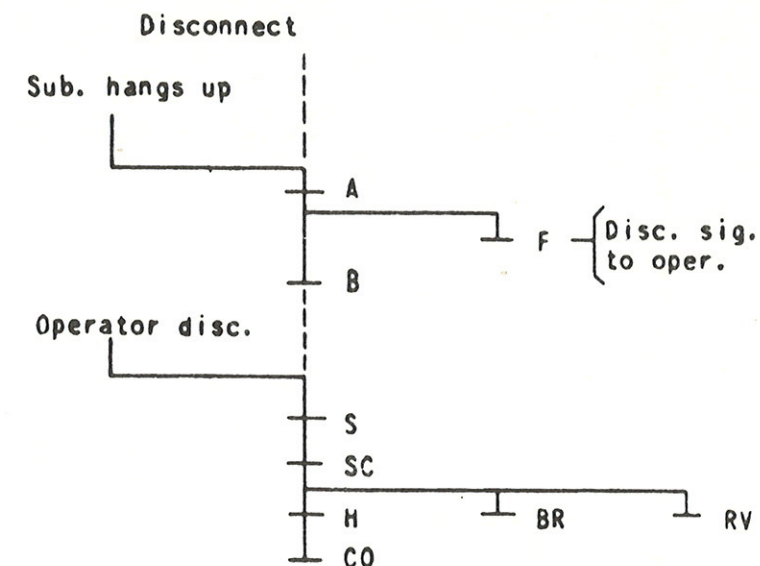
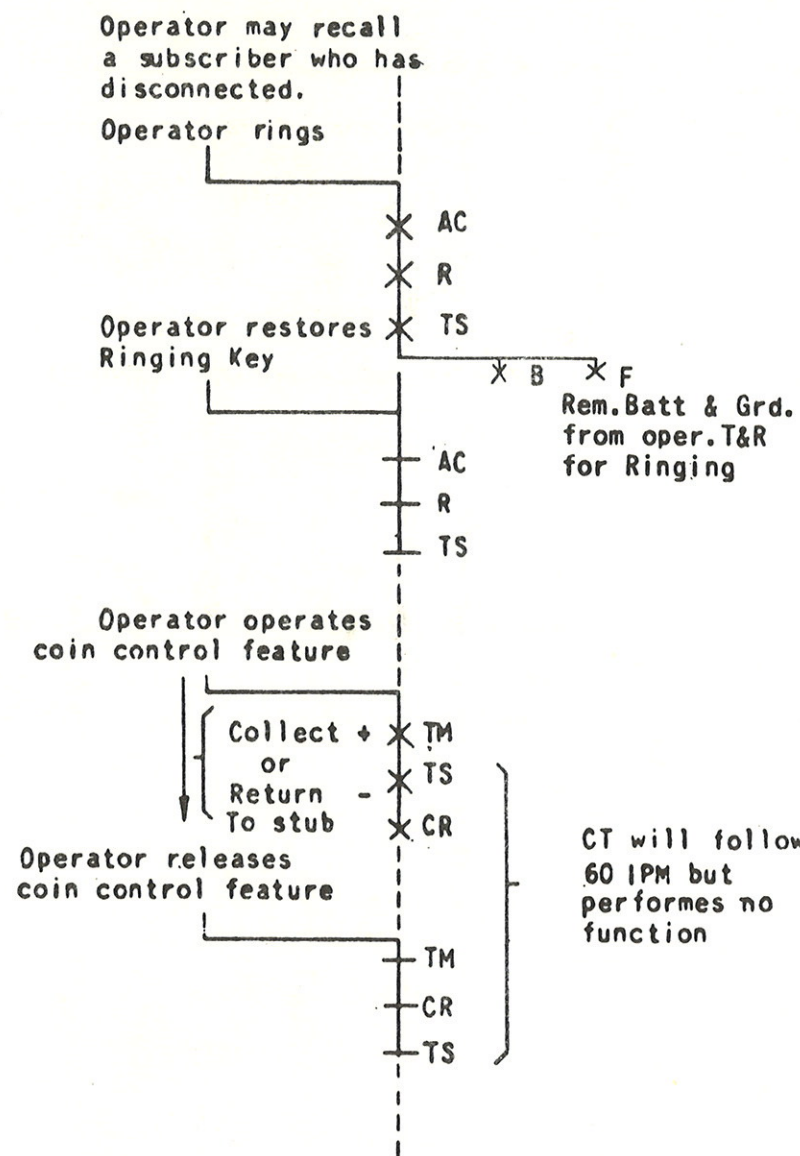
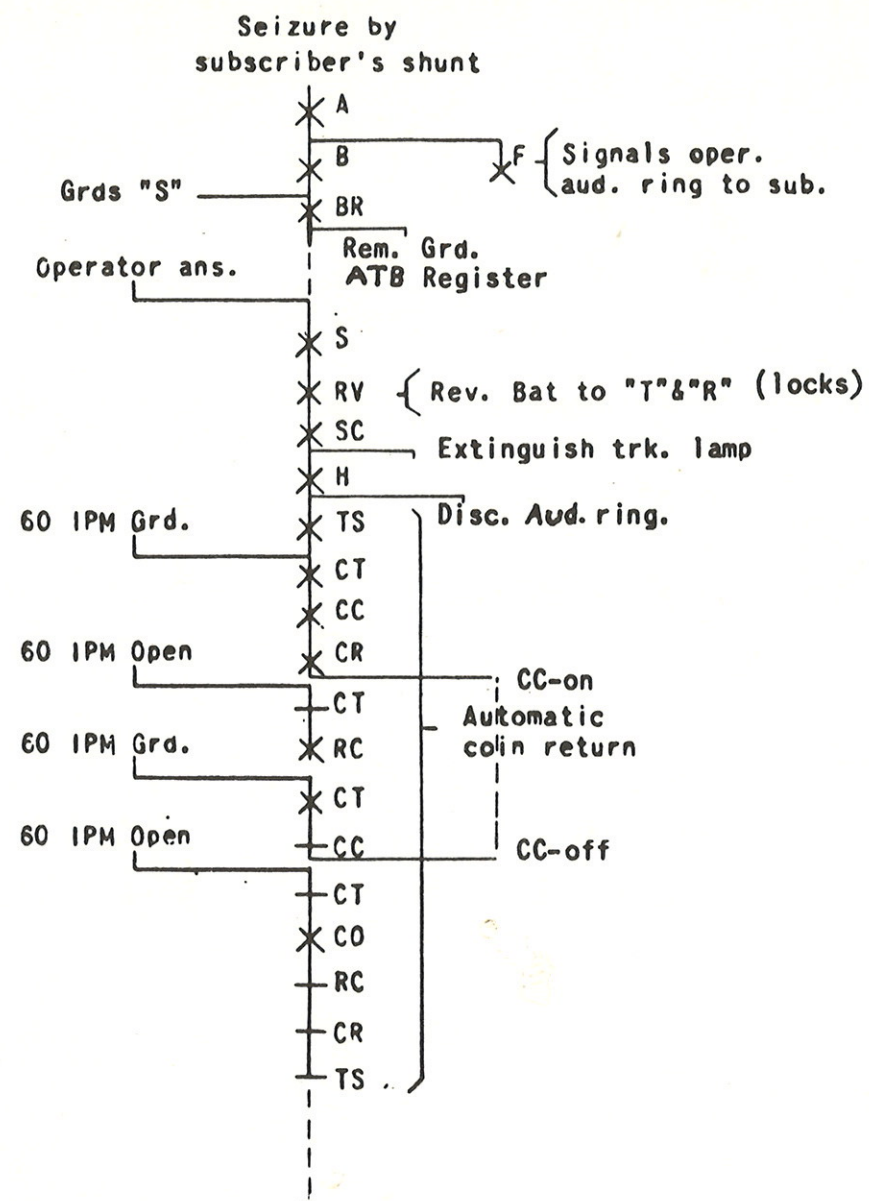
Issue 10-B

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For Training Purposes Only			
Number 1 Step By Step System			
Operational Sketch & Sequence Chart For			
SD-32136-01			
SD-62426-01			
Subscriber Recording Completing Trunk Cct.			
Two-Wire, Flat Rate			
9/2/52	R.A. Dittlow	Issue 7-D 10-D	19





CC Relay provides indirect control of CR
CT will oper. in ckt. when we do not want to oper. CR

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Number 1 Step By Step System

Sequence Chart For

SD-62496-01

Subscriber Recording Completing Trunk
Coin Control

9/2/52

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