5/69:11k
Issue 1
Changed Sections 3.00 and 6.01.3.1
11/69 11k
King J.W.K. DH 11-6-69 WRF 11/10/69
Issue 2

CIRCUIT EXPLANATION

M

CONNECTOR CIRCUIT
TIMED DISCONNECTION
H-580361-B

(Written specifically for circuit issue 5, but may also apply to later issues. Refer to H print for appropriate E issue number.)

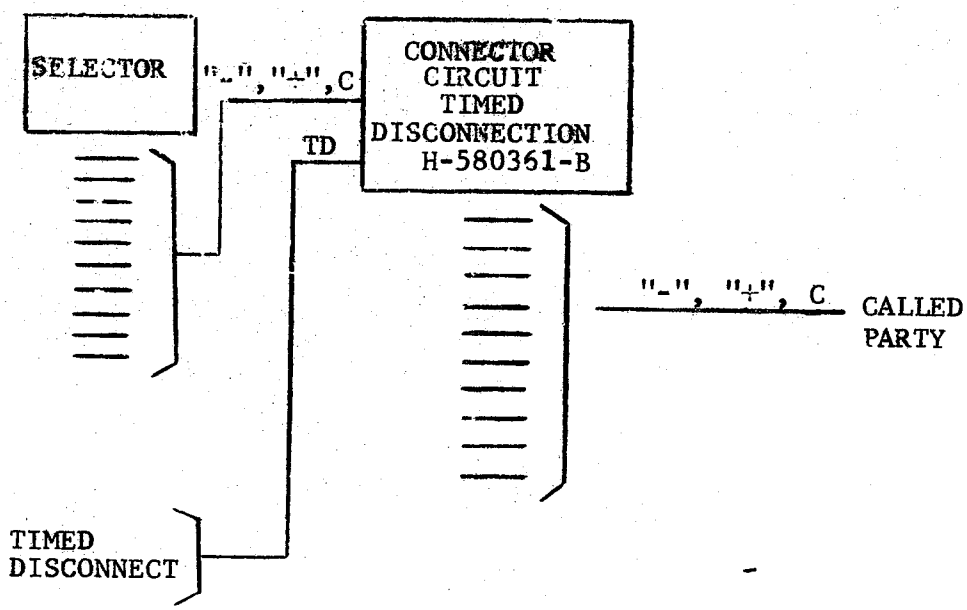
GENERAL

This circuit registers the last two digits of a dialed number to select 1 of 100 line terminations.

This switch provides for timed disconnect, which will release this switch and the entire switch train, after a predetermined time, if the calling party holds after the called party has disconnected.

FIG. BD shows a typical arrangement of equipment.

FIG BD



11-6-69

WRITTEN BY	APPROVED	ISSUE	DRAWING NO.
J. W. King J.W.K.	DH 5-26-69 WRF 5/26	2	E- 580361-B 5

FM 281 (12/66)

FEATURES

(a) Timed disconnect option

(b) Calling or last party release options

(c) Busy Tone and RB Tone leads

CIRCUIT OPERATION

1.00 Seizure (Operated: VON springs)

Resistance (#2C) battery on lead C marks this switch idle to the preceding equipment. When seized, ground on lead C closes #2C, and the loop via leads "-" and "+" closes #1 and #2A. Relay C operates. Relay A operates and closes relay B. Relay B operates, and grounds lead C to hold the preceding equipment and to mark this switch busy.

2.00 Vertical Stepping (Operated: Relays A, B and C, and VON springs)

Relay A follows the incoming loop pulses of the first digit and when, at normal opens relay B and closes #1C and the VERT magnet in series. Relay B remains operated during pulsing due to its slow-to-release characteristics.

The VERT magnet operates and follows the pulses from relay A, and steps its wipers to the dialed level. On the first vertical step, the VON springs restore, and open #2C. After the last pulse of the digit, relay A operates, closes relay B, and opens #1C and VERT magnet in series. The VERT magnet restores. After its slow-to-release interval, relay C restores, and closes #2E. Relay E operates.

3.00 Rotary Stepping (Operated: Relays A, B, and E)

Relay A follows the loop pulses of the second digit, and when at normal, opens relay B, and closes #1E via diode CR3 and the ROT magnet. The ROT magnet operates, and follows the pulses from relay A, stepping the wipers to the dialed bank contacts. On the first rotary step, the RON springs operate, open #2E, close #2C, and connects lead BUSY TONE to lead "-"via resistor R1 and capacitor C1. Relay C operates, and disconnects lead BUSY TONE from lead "-".

After the last pulse of the digit, relay A re-operates, closes relay B, and opens #1E and the ROT magnet. The ROT magnet restores. After its slow-to-release interval, relay E restores, opens #2C, and connects resistance (#1K) ground to wiper C via diode CR1.

4.00 Testing the Dialed Line (Operated: Relays A, B, and C, and RON springs)

The called line is tested during the slow-to-release interval of relay C.

4.01 Called Line Idle

If the called line is idle, resistance battery is returned via wiper C, and closes #1K. Relay K operates its "X" contacts, closes #2K, operates fully, opens #1K, grounds wiper C, connects ring back tone to lead "-" via capacitors C1 and C4, and connects BATTERY-CONNECTED GENERATOR through wipers - and + (via called party loop) to lead GENERATOR RETURN via #1F. After its slow-to-release interval, relay C restores.

4.02 Called Line Busy

If the called line is busy, ground is returned via wiper C short-circuiting #1K. After its slow-to-release interval, relay C restores, connects lead BUSY TONE to lead "-" via resistor R1 and capacitor C1, and disconnects the short-circuit from #1K.

5.00 Called Party Answers (Operated: Relays A, B, and K, and ROT springs)

When the called party answers, the loop via wipers - and + closes #1F. After its slow-to-operate interval, relay F operates its "X" contacts closing #2F, operates fully, connects ground to lead SUPY 1 ("C" wiring) or transfers relay B to low resistance ground ("A" wiring, see TABLE A on H-580361-B), transfers wipers - and + from BATTERY-CONNECTED GENERATOR and GENERATOR RETURN leads via #1F to #1 and #2D respectively, and disconnects lead RB TONE from lead "-". Relay D operates, reverses the polarity of the incoming loop, and disconnects ground from lead SUPY 1 ("C" wiring) or transfers relay B from lead TD to ground ("A" wiring). Conversation can now take place.

6.00 Release

6.01 Release From Completed Call (Operated: Relays A, B, D, F, and K, and ROT springs)

6.01.1 Calling Party Release ("C" wiring, see TABLE A on H-580361-B)

6.01.1.1 Calling Party Disconnects First

When the calling party disconnects first, the loop to relay A is opened. Relay A restores, and opens relay B. After its slow-to-release interval, relay B restores, opens #2K and #2F, grounds lead SUPY 2 (lamp removed) and disconnects ground from lead C to release the preceding equipment. Relay K restores, disconnects wipers - and + from #1 and #2D, disconnects ground from wiper C, and closes the RLS magnet via lead RLS GRD. Relay D restores, grounds lead SUPY 1 and returns normal polarity to the incoming loop. Magnet RLS operates, and releases the switch shaft. As the shaft returns to normal it restores the RON springs, and when at normal operates the VON springs which open magnet RLS, connects resistance (#2C) battery to lead C, and disconnects ground from lead SUPY 2. Magnet RLS restores. After its slow-to-release interval, relay F restores. This circuit is now at normal.

6.01.1.2 Called Party Disconnects First

When the called party disconnects first, the loop to #1 and #2D is opened. Relay D restores, returns normal battery polarity to leads "-" and "+" for disconnect supervision, and grounds lead SUPY 1 to indicate the calling party is holding the switch.

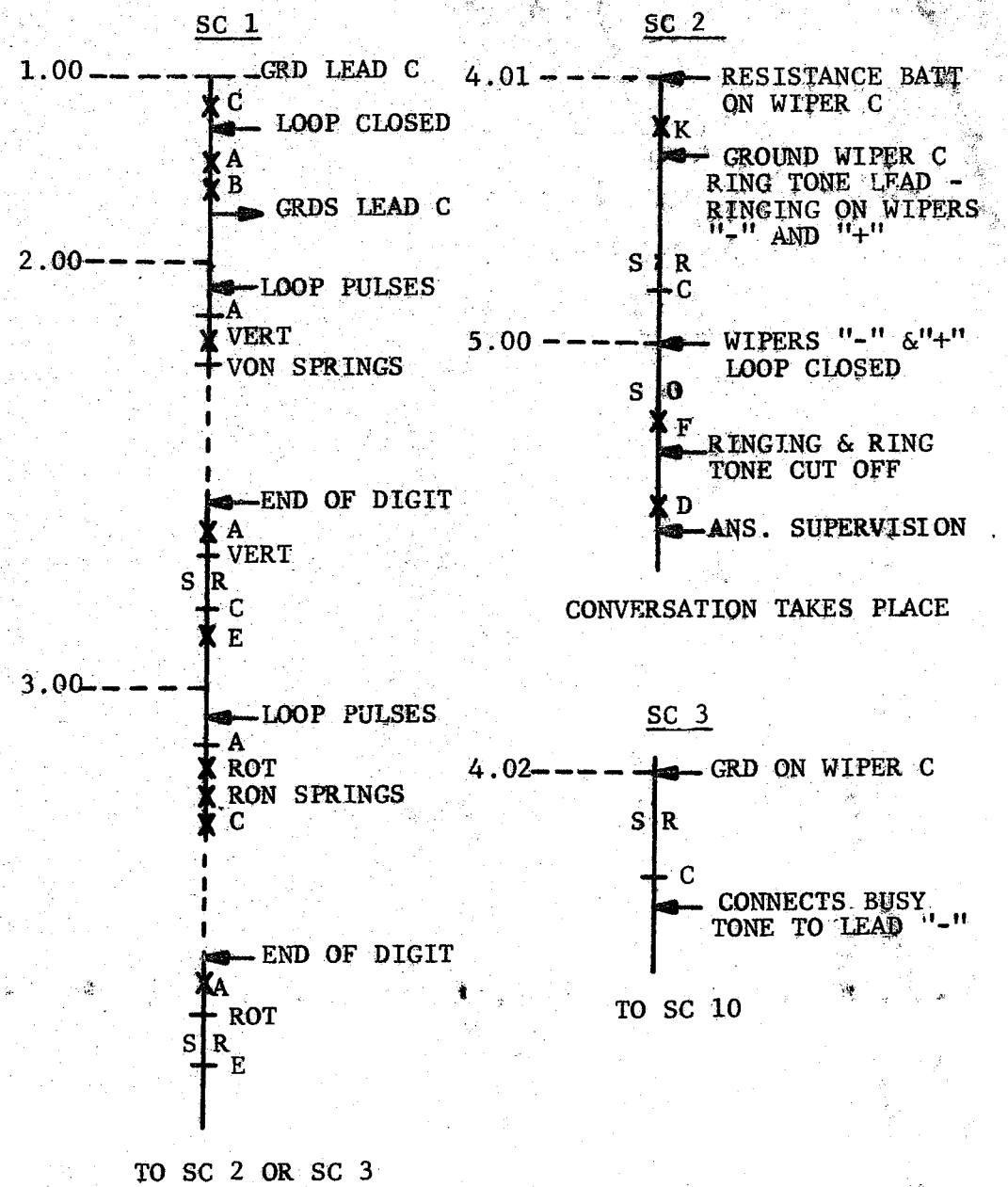
When the calling party disconnects, the loop to #1 and #2A is opened. Relay A restores and the operation is similar to that described in Section 6.01.1.1 except that relay D has restored and ground is removed from lead SUPY 1 when relay F restores.

6.01.2 Last Party Release ("L" and "C" wiring)

6.01.2.1 Calling Party Disconnects First

When the calling party disconnects first, the loop to #1 and #2A is opened. Relay A restores, opens relay B, and closes #1E.

SEQUENCE CHARTS



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Relay E operates, and locks. After its slow-to-release interval, relay B restores, disconnects ground from lead C to release the preceding equipment, grounds lead SUPY 1 and opens #1E. After its slow-to-release interval, relay E restores, and grounds lead C to mark this circuit busy to the preceding equipment.

When the called party disconnects, the loop to #1 and #2D is opened. Relay D restores, returns normal battery polarity to leads "+" and "-", grounds lead SUPY 1, and opens #2F and #2K. Relay K restores, disconnects leads - and + from #1 and #2D, disconnects ground from wiper C, and closes RLS magnet via lead RLS GRD. RLS magnet operates, and releases the switch shaft. As the shaft returns to normal it restores the RON spring, and when at normal operates the VON springs which open magnet RLS, transfers lead C from ground to resistance (#2C) battery, and disconnects ground from lead SUPY 2. Magnet RLS restores. After its slow-to-release interval, relay F restores disconnects ground from lead SUPY 1. This circuit is now at normal.

6.01.2.2 Called Party Disconnects First

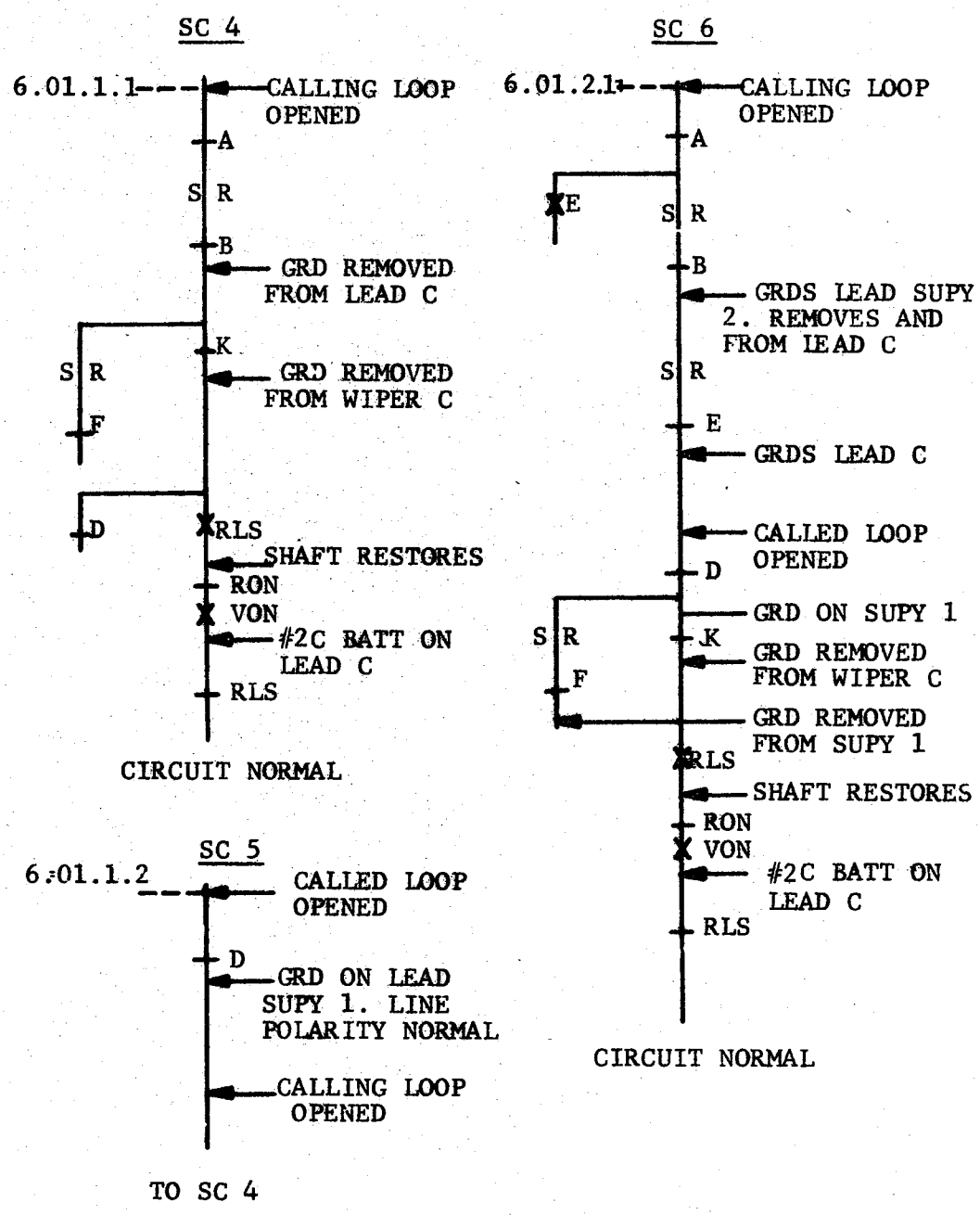
When the called party disconnects first, the loop to #1 and #2D is opened. Relay D restores, returns normal battery polarity to leads "-" and "+" for disconnect supervision, and grounds lead SUPY 1 to indicate that the calling party is holding the switch.

When the calling party disconnects, the loop to #1 and #2A is opened. Relay A restores, and operation is similar to that described in Section 6.01.2.1 with the exception that relay D has restored and lead SUPY 1 is opened when relay F restores.

6.01.3 Calling Party Release With Timed Disconnect ("A" wiring)

6.01.3.1 Calling Party Disconnects First

When the calling party disconnects first, the loop to #1 and #2A is opened. Relay A restores, and operation is the same as that described in Section 6.01.1.1 (SUPY 1 and 2 lamps are removed).


SC 4
6.01.1.1
CALLING LOOP OPENED
A
S R
B
GRD REMOVED FROM LEAD C
K
S R
GRD REMOVED FROM WIPER C
F
D
RLS
SHAFT RESTORES
RON
VON
#2C BATT ON LEAD C
RLS
CIRCUIT NORMAL
SC 5
6.01.1.2
CALLED LOOP OPENED
D
GRD ON LEAD SUPY 1. LINE POLARITY NORMAL
CALLING LOOP OPENED
TO SC 4
SC 6
6.01.2.1
CALLING LOOP OPENED
A
E
S R
B
GRDS LEAD SUPY 2. REMOVES AND FROM LEAD C
S R
E
GRDS LEAD C
CALLED LOOP OPENED
D
GRD ON SUPY 1
S R
K
GRD REMOVED FROM WIPER C
F
GRD REMOVED FROM SUPY 1
RLS
SHAFT RESTORES
RON
VON
#2C BATT ON LEAD C
RLS
CIRCUIT NORMAL

6.01.3.2 Called Party Disconnects First

When the called party disconnects first, the loop circuit to #1 and #2D is opened. Relay D restores, returns battery polarity to normal over leads "+" and "-" for disconnect supervision, and transfers relay B from ground to low resistance ground on lead TD.

After a specified time delay the Timed Disconnect circuit transfers lead TD from low resistance ground to high resistance ground opening relay B. After its slow-to-release interval relay B restores, opens #2F and #2K, opens lead TD, grounds lead SUPY 2 (lamp removed), and removes ground from lead C to release the preceding equipment. Relay K restores, disconnects wipers - and + from #1 and #2D, disconnects ground from wiper C, and closes RLS magnet. Release of the preceding equipment opens the loop to relay A. Relay A restores. Magnet RLS operates, and releases the switch shaft. As the shaft returns to normal it restores the RON springs,and when at normal operates the VON springs which open magnet RLS, disconnects ground from lead SUPY 2, and connects resistance (#2C) battery to lead C marking this switch idle. Magnet RLS restores. After its slow-to-release interval,relay F restores. This circuit is now at normal.

6.02 From Busy Condition (Operated: Relays A, and B, and RON springs)

When the calling party disconnects after receiving busy tone, the loop to #1 and #2A is opened. Relay A restores, and opens relay B. After its slow-to-release interval, relay B restores, grounds lead SUPY 2, and closes the RLS magnet. Magnet RLS operates, and releases the switch shaft. As the shaft returns to normal it restores the RON springs to disconnect lead BUSY TONE from lead "-", and when at normal operates the VON springs which open magnet RLS, transfers lead C from ground ("L" wrg) to resistance (#2C) battery, and disconnects ground from lead SUPY 2. Magnet RLS restores. This circuit is now at normal.

6.03 From an Abandoned Call (Operated: Relays A, B and K)

When the calling party disconnects, the loop to #1 and #2A is opened. Relay A restores, opens relay B, and closes #1E (if "L" wiring is used). After its slow-to-release interval, relay B restores, opens #2K, opens #1E if operated, and grounds lead SUPY 2.

Relay K restores, disconnects leads - and + from lead BATTERY-CONNECTED GENERATOR via #1F and lead GENERATOR RETURN respectively, disconnects lead R.B. TONE from lead "-" via resistor R1 and capacitor C1, disconnects ground from wiper C, and closes RLS magnet. The RLS magnet operates and further operation is the same as that described in Section 6.01.1.1.

7.00 Test Facilities

This circuit is marked busy to the preceding equipment by operating the BUSY KEY which transfers lead C from resistance (#2C) battery to ground.

This circuit can be tested from (switch springs) TEST JACKS 1 and 2, the operation that follows in the same as that described in the circuit operation.

Restoration of the BUSY KEY returns this circuit to normal.

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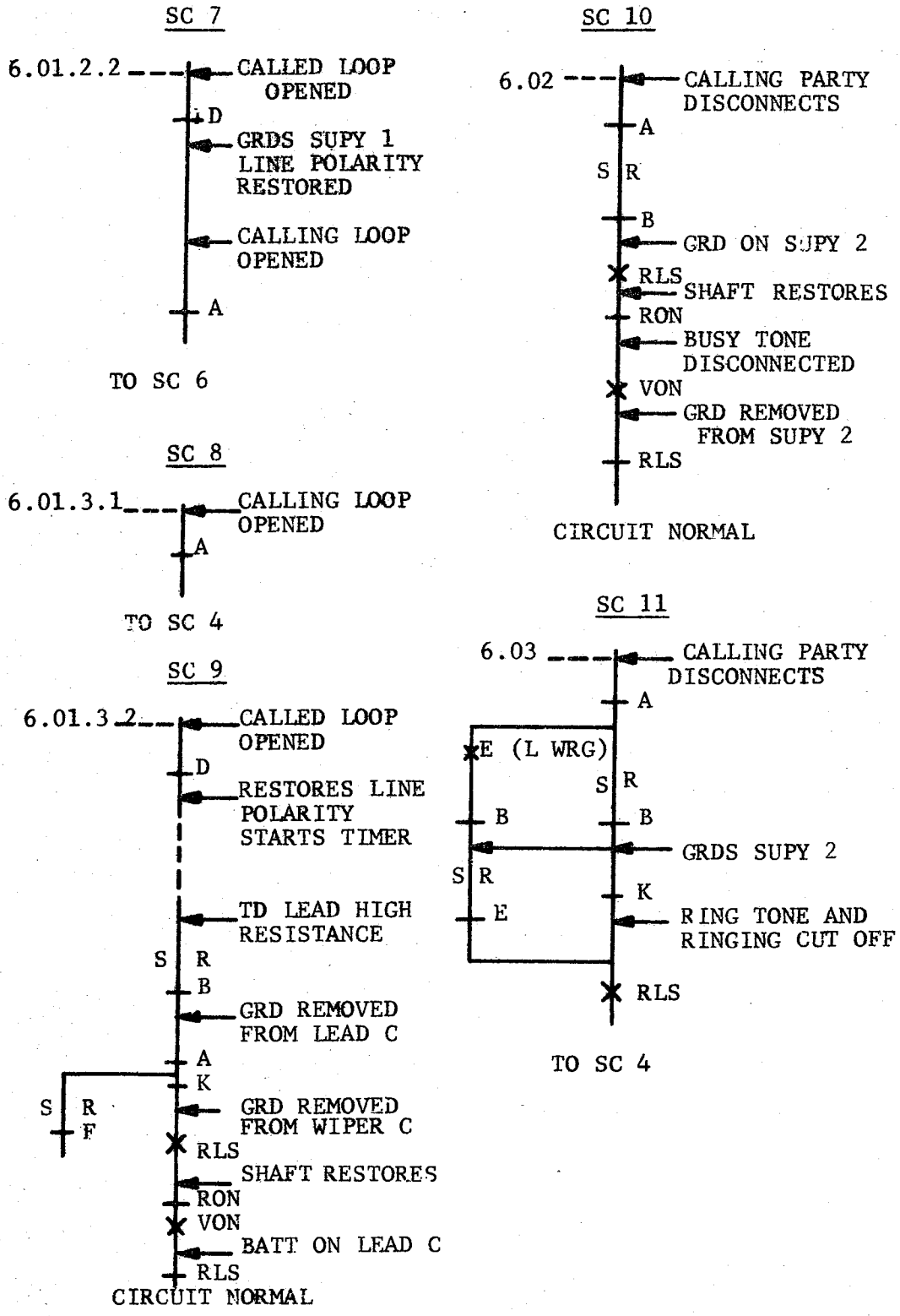

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