

CIRCUIT EXPLANATION

CONNECTOR CKT. - GRP. HUNTING
 CAMP ON BSY-BREAK IN-SW THRU
 IMMEDIATE RING ON LOCAL CALL
 SPECIAL RING ON TRUNK CALL
 DIVERT - NO TERM TEST
 H-580370-B

(Written specifically for circuit issue 2,
 but may also apply to later issues. Refer
 to H print for appropriate E issue number.)

GENERAL

On a local call, this circuit selects the called line, tests the condition of the line, returns ringback tone to the calling party, and rings the called line or returns busy tone. If the circuit selects a diverted call terminal, high tone is returned to the calling party, who must then disconnect. During conversation, this circuit supplies battery feed to the calling and called parties. The circuit has last party or calling party release and, if the called party disconnects first, provides timed release of the preceding equipment. When a line in a PBX group is selected, other than the last, trunk hunting may take place.

On a trunk or link call, this circuit produces a dry loop for conversation. If a busy line is selected, the Attendant can make this circuit "camp on" the line until the line becomes idle. When this circuit "camps on" a busy line, high tone is sent to the called party. After a line has been "camped on", the Attendant can "break in" on the busy line. After the Attendant has finished, the circuit returns to a "camp on busy" condition. When a diverted call terminal is selected, this circuit sends interrupted booster battery back to the trunk or link. This causes the trunk or link to call in the Attendant and release this circuit. When a listed number diverted call terminal is selected using selected station night service, the "C" lead is opened to insure a divert when two switches are trying to divert on the same terminal. On a trunk or link call, release is under control of the calling party.

E- 580370-B
 SHEET 1 TOTAL 18
 AUTOMATIC ELECTRIC CO.
 NORTHLAKE, ILLINOIS U.S.A.

SIZE **A**

8/69 k
 Issue 1

Sections
 1.04.2,
 1.04.3.1,
 1.04.3.2,
 1.05,
 1.06.2.1,
 1.06.2.2,
 1.06.4.1.11
 1.06.4.1.12
 1.06.4.1.2
 1.06.4.2.1
 2.02,
 2.04.2
 2.05, and
 2.06.3
 7/70:11k
 R.J.Kandell
R.J. Kandell
WCB

Issue 2

RR
6/19/70

WRITTEN BY

R. Rainer RR

APPROVED

WCB

ISSUE

2

DRAWING NO.

E- 580370-B

FEATURES

- (a) Provides local or trunk-link call detection
- (b) Provides immediate ring on local calls
- (c) Provides special ring on trunk or link calls
- (d) Provides switch through on trunk or link calls
- (e) Provides group hunting
- (f) Provides last party or calling party release (local calls only)
- (g) Provides timed release (local calls only)
- (h) Provides "camp on busy" (trunk or links calls)
- (i) Provides "break in" (trunk or link calls)
- (j) Provides call diversion (trunk or link calls)
- (k) Provides trunk and link call restriction
- (l) Provides "camp on busy-break in" restriction
- (m) Provides nuisance trip feature (local to local call only)

CIRCUIT OPERATION1.00 Local Call1.01 Seizure (Operated: VON and RON springs)

This circuit is marked idle to preceding switches by resistance (#2C) battery on lead C. When this circuit is seized, a loop is closed across leads +T and -R, closing relay A and ground is forwarded via lead C, closing #2C. Relay C operates. Relay A operates and closes relay B. Relay B operates and connects resistance (#1H) ground to lead C, short-circuiting #1H. The preceding switch removes ground from lead C, closing #1H in series with #2C. Relay H operates to its "X" contacts, locks via its #2 winding, operates fully, and connects direct ground to lead C.

FIG BD
TYPICAL ARRANGEMENT

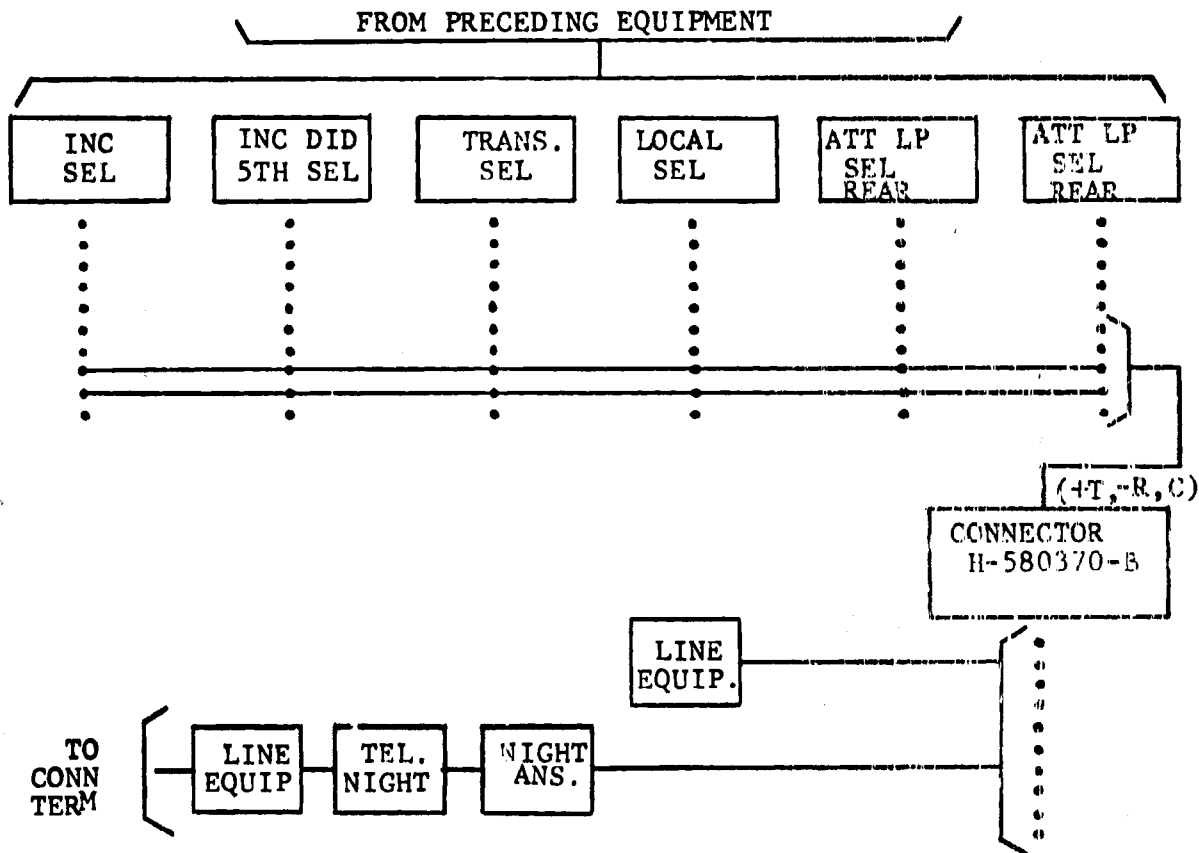


FIGURE (12/66)

ISSUE NO. 2
DRAWING NO. E-580370-B

1.02 Vertical Stepping (Operated: Relays A, B, and C; VON and RON springs)

When the calling party dials, the loop across leads +T and -R is opened on each pulse, opening relay A. Relay A follows the pulses and, when at normal, opens relay B, and closes #1C and the VERT magnet in series. The VERT magnet operates and steps the wipers to the dialed level. On the first vertical step, the VON springs restore and open #2C. When the wipers are stepped to a listed number level or to a divert as assigned level, the LT NP SPGS operate (see NOTES 8, 57 and 60, H-580370-B). Relays B and C remain operated during pulsing due to their slow-to-release characteristics. At the completion of pulsing, relay A operates, closes relay B, and opens #1C and the VERT magnet. The VERT magnet restores. After its slow-to-release interval, relay C restores, connects resistance (#1J) ground to wiper C, and closes #1G. Relay G operates, disconnects resistance (#1J) ground from wiper C, closes relay Z1 if a listed number level is dialed ("G" wiring - see TABLE B, H-580370-B) via strap "N" or leads A() and B() (see NOTE 60, H-580370-B), and closes #2C. Relay C operates. Relay Z1 operates and locks.

1.03 Rotary Stepping (Operated: Relays A, B, C, H, G and possibly Z1; RON springs)

When the last digit is dialed, the loop across leads +T and -R is opened on each pulse, opening relay A. Relay A follows the pulses and, when at normal, opens relay B, and closes #1C in series with #2G and the ROT magnet in multiple. The ROT magnet operates and steps the wipers to the dialed bank contacts. On the first rotary step, the RON springs restore and open #2C. Relays B and C remain operated during pulsing due to their slow-to-release characteristics. At the completion of pulsing, relay A operates, closes relay B, and opens #1C, #2G and the ROT magnet. The ROT magnet restores. After its slow-to-release interval, relay C restores, opens #1G, and connects relay F to wiper C (if relay Z1 is not operated).

1.04 Testing the Called Line

1.04.1 Called Line Busy (Operated: Relays A, B, H and G)

When the called line is busy, ground on wiper C closes relay F. Relay F operates and connects #1E to wiper EC. After its slow-to-release interval, relay G restores,

disconnects relay F from wiper C, connects relay F to resistance (resistor R7) ground, connects ground to lead INT ST, disconnects #1E from wiper EC, and connects lead BSX TN to lead -R via resistor R3 and capacitor C2 to return busy tone to the calling party.

1.04.2 Called Line Idle (Operated: Relays A, B, H and G)

When the called line is idle, battery on wiper C short-circuits relay F. After its slow-to-release interval, relay G restores, grounds lead INT ST, closes #1Z via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B), discharges capacitor C7 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91 (H-580370-B), and transfers wiper C from resistance (relay F) battery to resistance (#1J) ground, closing #1J. After its slow-to-operate interval, relay J operates to its "X" contacts, locks via its #2 winding, operates fully, short-circuits #1J, opens relay Z before it operates, charges capacitor C7, connects ground to wiper C, closes #2E via thermistor TR1, connects lead RRT to lead -R via capacitors C6 and C2 to return ring-back tone to the calling party, and connects lead DIR GEN to wiper "-" via #1K and ground to wiper "+" ("G" or "F" & "X" wiring - see TABLE B, H-580370-B) or connects lead DIR GEN to wiper "+" via resistor R1 and battery to wiper "-" via #1K ("F" & "U" wiring - see TABLE B, H-580370-B) to ring the called line. After its slow-to-operate interval due to thermistor TR1, relay E operates, locks via its #2 winding, transfers wiper "-" ("G" or "F" & "X" wiring) or wiper "+" ("F" & "U" wiring) from lead DIR GEN to lead INT GEN, and short-circuits thermistor TR1.

1.04.3 No Test

1.04.3.1 Open "C" Wiper or Divert As Assigned Levels (Operated: Relays A, B, H and G)

When the called line does not test idle or busy, relays J or F will not operate. After its slow-to-release interval, relay G restores, grounds lead INT ST, closes #1Z via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B), discharges capacitor C7 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B),

and transfers wiper C from resistance (relay F) battery to resistance (#1J) ground. When capacitor C7 discharges sufficiently, relay Z operates, and connects lead HIGH TN to lead -R via capacitors C5 and C2 to send tone to the calling party.

1.04.3.2 Listed Number Levels (Operated: Relays A, B, H, G and Z1)

When the called line does not test idle or busy, relays J or F will not operate. After its slow-to-release interval, relay G restores, grounds lead INT ST, and closes #1Z via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B). Relay Z operates, connects lead HIGH TN to lead -R via capacitors C5 and C2 to send tone to the calling party.

1.05 Called Party Answers (Operated: Relays A, B, E, H, and J)

When the called party answers, a loop is closed across wipers "+" and "-", closing #1K. After its slow-to-operate interval, relay K operates to its "X" contacts, locks via its #2 winding, operates fully, opens #1K, #2J, #2E and relay B, removes ringing current from wipers "+" and "-", and closes the loop to relay D via wipers "+" and "-". Relay D operates, closes relay B, and reverses battery polarity on leads +T and -R to give answer supervision. Relay E restores and removes the short circuit from thermistor TR1. Relay J restores, and disconnects lead RBT from lead -R to remove ringback tone from the line. Conversation may now take place.

1.06 Release

1.06.1 From Busy Condition (Operated: Relays A, B, F and H)

When the calling party disconnects, the loop to relay A is opened. Relay A restores and opens relay B. After its slow-to-release interval, relay B restores, opens relay F and #2H, closes the RLS magnet, removes ground from lead INT ST, and removes ground from lead C. Relay H restores. Relay F restores and disconnects lead BSY TN from lead -R. The RLS magnet operates, releases the switch shaft, and grounds lead C. As the shaft returns to

rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.2 From No Test Condition

1.06.2.1 Open "C" Wiper or Divert As Assigned Levels
(Operated: Relays A, B, H and Z)

When the calling party disconnects, the loop to relay A is opened. Relay A restores and opens relay B. After its slow-to-release interval, relay B restores, opens relay Z and #2H, charges capacitor C7, removes ground from lead INT ST, and removes ground from lead C. Relay Z restores, disconnects lead HIGH TN from lead -R, and closes the RLS magnet. Relay H restores. The RLS magnet operates grounds lead C and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.2.2 Listed Number Levels (Operated: Relays A, B, H, Z and Z1)

When the calling party disconnects, the loop to relay A is opened. Relay A restores and opens relay B. After its slow-to-release interval, relay B restores, opens relay Z1 and #1Z and #2H, charges capacitor C7, and removes ground from lead INT ST. Relay Z restores, disconnects lead HIGH TN from lead -R, and closes the RLS magnet. Relay Z1 restores. Relay H restores. The RLS magnet operates, grounds lead C and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.3 From Abandoned Call (Operated: Relays A, B, H and possibly J and E)

When the calling party disconnects before the called party answers, the loop to relay A is opened. Relay A restores and opens relay B. After its slow-to-release

interval, relay B restores, removes ground from lead C, removes ground from lead INT ST, closes the RLS magnet (if relay J has not operated), removes the short circuit from #1J (if relay J has not operated), disconnects resistance (#1J) ground from wiper C, and opens relays E, H and J. Relay J restores (if operated), removes ringing current from the called line, removes ground from wiper C, removes ringback tone from the calling line, and closes the RLS magnet. Relay E restores (if operated). Relay H restores. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.4 From Completed Call (Operated: Relays A, B, D, H and K)

1.06.4.1 Last Party Release ("LPR" wiring - see NOTE 59, H-580370-B)

1.06.4.1.1 Calling Party Disconnects First

1.06.4.1.1.1 "NT" (nuisance trap) Wiring Omitted

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, grounds lead SUPY 2 ("E" wiring - see NOTE 58, H-580370-B), removes ground from lead C, and opens #2H. Relay H restores and grounds lead C.

When the called party disconnects, the loop to relay D is opened. Relay D restores, returns battery polarity on leads +T and -R to normal, removes ground from lead SUPY 2 ("E" wiring), removes the short circuit from #1J, removes ground from lead C, and opens #2K. Relay K restores, removes ground from wiper C, and closes the RLS magnet. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.4.1.1.2 "NT" (nuisance trap) Wiring Added

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, grounds lead SUPi 2 ("E" wiring - see NOTE 58, H-580370-B), and opens #2H. Ground is held on lead C via diode CR10 to hold the calling party switchtrain. Relay H restores.

When the called party disconnects the loop to relay D is opened. Relay D restores, returns battery polarity on leads +T and -R to normal, removes the short circuit from #1J, removes ground from lead SUPY 2 ("E" wiring), removes ground from lead C to release the calling switchtrain, and opens #2K. Relay K restores, removes ground from wiper C, and closes the RLS magnet. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.4.1.2 Called Party Disconnects First

When the called party disconnects first, the loop to relay D is opened. Relay D restores, returns battery polarity on the calling line to normal, grounds lead SUPY 1, and connects relay B to lead TIMED RLS or lead TD. After a timed interval, ground is removed from lead TIMED RLS or lead TD opening relay B. After its slow-to-release interval, relay B restores, removes ground from lead C to release the preceding equipment, removes the short circuit from #1J, opens #2H and #2K, and removes ground from lead SUPY 1. Relay H restores. Relay K restores, removes ground from wiper C, and closes the RLS magnet. When the preceding equipment releases, the loop to relay A is opened and relay A restores. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.4.2 Calling Party Release ("LPR" wiring omitted - see NOTE 59, H-580370-B)

1.06.4.2.1 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, removes the short circuit from #1J, disconnects resistance (#1J) ground from wiper C, removes ground from lead C, and opens #2H and #2K. Relay H restores, removes ground from wiper C, opens the loop via wipers "+" and "-" to relay D, and closes the RLS magnet. Relay D restores and returns battery polarity on leads +T and -R to normal. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

1.06.4.2.2 Called Party Disconnects First

Operation is the same as that described in Section 1.06.4.1.2.

1.07 Group Hunting (Operated: Relays A, B, H and G)

All lines in a PBX group except the last have their C and EC bank contacts strapped together. If the dialed line is part of a PBX group other than the last and is busy, ground on wiper C, closes relay F. Relay F operates and closes #1E via ground on wiper EC. Relay E operates and closes #2G and the ROT magnet in multiple. The ROT magnet operates, opens #1E, and steps the wipers to the next bank contacts. Relay E restores and opens the ROT magnet and #2G. If the next line is busy, ground on wipers C and EC close relay F and #1E, respectively. This operation continues until either an idle line is found or the last line in the group is reached. When an idle line is found, relay F is short-circuited and relay E is not closed. Relay F restores and the following operation is the same as that described in Section 1.04.2.

When the last line in a group is reached, hunting ceases because the C and EC bank contacts are not strapped. If

the last line is busy, relay F remains operated and the following operation is the same as that described in Section 1.04.1.

2.00 Trunk or Link Call

2.01 Seizure (Operated: VON and RON springs, strap "A" omitted)

The operation is similar to that described in Section 1.01 except that the preceding equipment does not remove ground from lead C causing relay H to remain unoperated.

2.02 Vertical Stepping (Operated: Relays A, B and C; VON and RON springs)

When the calling party dials, the loop across leads +T and -R is opened on each pulse, opening relay A. Relay A follows the pulses and, when at normal, opens relay B, and closes #1C and the VERT magnet in series. The VERT magnet operates and steps the wipers to the dialed level. On the first vertical step, the VON springs restore and open #2C. When the wipers are stepped to a listed number level or divert as assigned level or to a restricted level the LT NP SPCS operate (see NOTES 8, 57 and 60, H-580370-B) or the RT NP SPCS operate (see Section 2.10.2 and NOTE 8, H-580370-B), respectively. Relays B and C remain operated during pulsing due to their slow-to-release characteristics. At the completion of pulsing, relay A operates, closes relay B, and opens #1C and the VERT magnet. The VERT magnet restores. After its slow-to-release interval, relay C restores, connects resistance (#1J) ground to wiper C, and closes #1G. Relay G operates disconnects resistance (#1J) ground from wiper C, closes relay Z1 if a listed number level is dialed ("G" wiring - see TABLE B, H-580370-B) via strap "N" or leads A() and B() (see NOTE 60, H-580370-B), and closes #2C. Relay C operates. Relay Z1 operates and locks.

2.03 Rotary Stepping (Operated: Relays A, B, C, G and possibly Z1; RON springs)

Operation is similar to that described in Section 1.03 except that relay H is not operated.

2.04.1 Called Line Busy (Operated: Relays A, B and G)

When the called line is busy, operation is similar to that described in Section 1.04.1 except that relay H is not operated.

2.04.2 Called Line Idle (Operated: Relays A, B and G)

When the called line is idle, battery on wiper C short-circuits relay F. After its slow-to-release interval, relay G restores, grounds lead INT ST, closes #12 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B), discharges capacitor C7 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B), and transfers wiper C from resistance (relay F) battery to resistance (#1J) ground, closing #1J. After its slow-to-operate interval, relay J operates to its "X" contacts, locks via its #2 winding, operates fully, short-circuits #1J, opens relay Z before it operates, charges capacitor C7, connects ground to wiper C, closes #2E via thermistor TR1, connects lead RBT to lead -R via capacitors C6 and C2 to return ring-back tone to the calling party, closes #1L, and connects lead TRK GEN to wiper "-" via #1K and ground to wiper "+" ("G" or "F" & "X" wiring - see TABLE B, H-580370-B) or connects lead TRK GEN to wiper "+" via resistors R1 and battery to wiper "-" via #1K ("F" & "U" wiring - see TABLE B, H-580370-B) to ring the called line. Relay L operates to its "X" contacts, operates fully, locks via its #1 winding to ground on lead C, short-circuits #1J, disconnects resistance (#1H) ground from lead C, opens the loop via leads +T and -R to relay A, transfers lead -R from lead RBT via capacitors C6 and C2 to lead RBT via capacitor C6, and opens relay B. Relay A restores. After its slow-to-operate interval due to thermistor TR1, relay E operates, locks via its #2 winding, and short-circuits thermistor TR1. After its slow-to-release interval, relay B restores.

2.04 No Test

2.04.3.1 Open "C" Wiper or Divert As Assigned Levels (Operated: Relays A, B and G)

When the called line does not test idle or busy, relay J or F will not operate. After its slow-to-release interval, relay G restores, grounds lead INT ST, closes #12 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B), discharges capacitor C7 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B), and transfers wiper C from resistance (relay F) battery to resistance (#1J) ground. When capacitor C7 discharges sufficiently, relay Z operates, connects resistance (resistor R9) ground to lead CWS, disconnects resistance (#1J) ground from wiper C, and closes #1L via lead INT +12V BB. Relay L operates to its "X" contacts, operates fully, locks via its #1 winding, transfers lead C from resistance (#1H) ground to lead INT +12V BB, connects resistance (resistor R2) ground to lead +T via LT NP SPGS 1 and 2 (divert as assigned level - see NOTE 8, H-580370-B), opens the loop via leads +T and -R to relay A, and opens relay B. Relay A restores. After its slow-to-release interval, relay B restores.

When the call has been diverted, ground is removed from lead C, opening #1L. Relay L restores, removes ground from lead INT ST, disconnects resistance (resistor R9) ground from lead CWS, disconnects lead INT +12V BB from lead C, disconnects resistance (resistor R2) ground from lead +T (divert as assigned level), and opens relay Z. Relay Z restores and closes the RLS magnet. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal the RON springs operate. As the shaft returns to vertical normal, the LT NP SPGS restore (divert as assigned levels) and the VON springs operate, removing ground from lead C and opening the RLS magnet. The RLS magnet restores. The circuit is now at normal.

2.04.3.2 Listed Number Levels (Operated: Relays A, B, G and Z1)

When the called line does not test idle or busy, relay J or F will not operate. After its slow-to-release interval, relay G restores, grounds lead INT ST, and closes #12 via resistors R12 and/or R13 ("D1" and/or "D2" wiring omitted - see NOTES 12 & 91, H-580370-B). Relay Z operates,

connects resistance resistor R9) ground to lead CWS, and closes #1L via lead INT +12 V BB. Relay L operates to its "X" contacts, operates fully, locks via its #1 winding, transfers lead C from resistance (#1H) ground to lead INT +12V BB, connects resistance (resistor R2) battery to lead -R via LT NP SPCS 1 and 2 (see NOTE 8, H-580370-B), opens the loop via leads +T and -R to relay A, and opens relay B. Relay A restores. After its slow-to-release interval, relay B restores.

When the call has been diverted, ground is removed from lead C, opening #1L. Relay L restores, removes ground from lead INT ST, disconnects resistance (resistor R9) ground from lead CWS, disconnects lead INT +12V BB from lead C, disconnects resistance (resistor R2) battery from lead -R, and opens relays Z and Z1. Relay Z1 restores. Relay Z restores and closes the RLS magnet. The RLS magnet operates, ground lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the LT NP SPCS restore (if operated) and the VON springs operate, removing ground from lead C and opening the RLS magnet. The RLS magnet restores. The circuit is now at normal.

2.05 Called Party Answers (Operated: Relays E, J and L)

When the called party answers, a loop is closed across wipers "+" and "-", closing #1K. After its slow-to-operate interval, relay K operates to its "X" contacts, locks via its #2 winding, operates fully, opens #2J and #2E, removes ringing current from wipers "+" and "-", opening #1K, connects wipers "+" and "-" to leads +T and -R, respectively, and removes ground from lead INT ST. Relay E restores and removes the short circuit from thermistor TR1. Relay J restores, and disconnects lead RBT from lead -R to remove ringback tone from the line. Conversation may now take place.

2.06 Release

2.06.1 From Busy Condition (Operated: Relays A, B and F)

When the calling party disconnects, the loop to relay A is opened. Relay A restores and opens relay B. After its slow-to-release interval, relay B restores, opens relay F, removes ground from lead INT ST, removes resistance (#1H) ground from lead C, and closes the RLS magnet.

Relay F restores and disconnects lead BSY TN from lead -R. The RLS magnet operates, releases the switch shaft, and grounds lead C. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

2.06.2 From Completed Call (Operated: Relays K and L)

When the calling party disconnects, ground is removed from lead C, opening #1L. Relay L restores, opens #2K, removes the short circuit from #1J, connects relay A across leads +T and -R, and disconnects leads +T and -R from wipers "+" and "-", respectively. Relay K restores, removes ground from wiper C, and closes the RLS magnet. The RLS magnet operates, grounds lead C, and releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

2.06.3 From Abandoned Call (Operated: Relays J and L and possibly B and E)

When the calling party disconnects before the called party answers, ground is removed from lead C, opening #1L. Relay L restores, disconnects ground from lead INT ST (relay B not operated), disconnects resistance (#1J) ground and ground from wiper C (relay B not operated), connects resistance (#1H) ground to lead C (relay B operated), connects relay A across leads +T and -R, transfers lead -R from lead RBT via capacitor C6 to lead RBT via capacitors C₀ and C₂, removes the short circuit from #1J (relay B not operated), and opens #2E and #2J (relay B not operated). After its slow-to-release interval, relay B restores (if operated), disconnects resistance (#1H) ground from lead C, removes the short circuit from #1J, disconnects ground from lead INT ST, disconnects resistance (#1J) ground and ground from wiper C, and opens #2E and #2J. Relay E restores (if operated) and removes the short circuit from thermistor TR1. Relay J restores, disconnects lead RBT from lead -R, removes ringing current from wipers "+" and "-", and closes the RLS magnet. The RLS magnet operates, grounds lead C, and

releases the switch shaft. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical normal, the VON springs operate, remove ground from lead C and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

2.07 Group Hunting (Operated: Relays A, B and G)

The operation is similar to that described in Section 1.07 except that relay H is not operated. When an idle line is found, the operation is similar to that described in Section 2.04.2 except that relay H is not operated.

2.06 Camp On Busy (Operated: Relays A, B and F)

When the calling party desires to "camp on" a busy line, the Attendant connects booster battery on lead C, closing #2L. Relay L operates to its "X" contacts and closes #2M. Relay M operates to its "X" contacts, short-circuits its #1 winding, and connects lead HIGH TN via capacitor C5 to wiper "-" to apply tone to the called line. The Attendant then removes booster battery from lead C, opening #2L. Relay L restores and closes #1 and #2M in series aiding. Relay M operates fully, disconnects lead HIGH TN from wiper "-", closes #1G, and connects resistance (resistor R5) ground on wiper EC to prevent other calls from "camping-on" this line. Relay G operates, disconnects ground from lead INT ST, connects resistance (relay F) battery to wiper C, and disconnects lead BSY TN from lead -R to remove busy tone from the calling line.

When the "camped on" line becomes idle, battery on wiper C short-circuits relay F. Relay F restores and opens #1G and #1 and #2M. Relay M restores. After its slow-to-release interval, relay G restores and the following operation is similar to that described in Section 2.04.2 except that relay H is not operated.

When the calling party disconnects before the call is completed, relay A is opened. Relay A restores and opens relay B. After its slow-to-release interval, relay B restores, disconnects resistance (#1H) ground from lead C, opens #1G and #1 and #2M, and closes the RLS magnet. Relay M restores. After its slow-to-release interval, relay G restores and opens relay F. The RLS magnet operates, grounds lead C, and releases the switch shaft. Relay F restores. As the shaft returns to rotary normal, the RON springs operate. As the shaft returns to vertical

normal, the VON springs operate, remove ground from lead C, and open the RLS magnet. The RLS magnet restores. The circuit is now at normal.

2.09 Break In ("BI" wiring) (Operated: Relays A, B, F, G and M)

When the Attendant wishes to "break in" on a busy line, a "camp on busy" condition must be established. The Attendant then places booster battery on lead C again, closing #2L. Relay L operates to its "X" contacts and closes #2K. After its slow-to-operate interval, relay K operates to its "X" contacts, operates fully, connects ground to wiper C, and connects leads +T and -R to wipers "+" and "-" via capacitors C1 and C2, respectively. The Attendant may now speak to the talking parties. When the Attendant is finished, booster battery is removed from lead C, opening #2L. Relay L restores and opens #2K. Relay K restores, disconnects ground from wiper C, and disconnects leads +T and -R from wipers "+" and "-", respectively. The circuit is now in the camp on busy condition described in Section 2.08.

2.10 Restriction

2.10.1 Camp On Busy-Break In

To prevent the Attendant from "camping on" a particular line, resistance ground is connected to the EC bank terminal of that line. After the line tests busy, relay G restores and closes #2H. Relay H operates and prevents the "camp on" feature from being used by disconnecting the "C" lead from #2L.

To prevent the Attendant from "camping on" a line that already has a Connector "camped on" it, resistance (resistor R5) ground is placed on wiper EC as explained in Section 2.08. The resistance ground on wiper EC will close #2H and prevent "camp on" as previously described in this Section.

2.10.2 Connector Levels Restricted to Trunk and Link Calls

On levels which are to be restricted, the RT NP SPGS operate, closing relay F via lead TRK REST. Relay F operates and returns a busy condition as explained in Section 1.04.1. Relay F is held operated thru resistance (resistor R10) ground during the period relay C has restored until relay G restores.