# COMMON SYSTEMS
# CODE SELECTOR CIRCUIT
# LOCAL OR INCOMING
# STEP BY STEP NO. 1, 350A, 355A OR 360A
# CROSSBAR NO. 5 CAMA,
# CROSSBAR TANDEM WITH CAMA OR
# TOLL SWITCHING NO. 4A OR 4M OFFICE
# WITH CAMA
# ARRANGED TO ABSORB DIGITS ONCE ONLY
# AND/OR REPEATEDLY AND TO
# RESTRICT SERVICE UNTIL A DIGIT IS ABSORBED

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## SECTION I - GENERAL DESCRIPTION

### 1. PURPOSE OF CIRCUIT

This circuit is for use as a code selector in arrangements where access to CAMA trunks are desired. Access to CAMA trunks may be attained by either one digit or three digit access codes. Furthermore the code selector may be used in either the local or CAMA offices or in both.

The circuit is also arranged to absorb digits on specified levels once or repeatedly and to restrict service on all levels until a digit has been absorbed. In addition this circuit is capable of furnishing a local or CAMA completion signal to an associated auxiliary trunk circuit.

### 2. GENERAL SEQUENCE OF CIRCUIT OPERATION

#### 2.1 Local Office Usage

##### 2.11 When 3 Digit Access Code to CAMA is Used.

##### 2.111 Seizure and Pulsing

This circuit is seized by the closure of its input loop by an auxiliary trunk circuit at the same time that the auxiliary trunk causes a code selector to be seized in the CAMA office. Subscriber dial pulses are then repeated to both code selectors by the auxiliary trunk. The initial digit dialed by the subscriber is absorbed by both code selectors. The second digit dialed by the subscriber is also repeated to both selectors.

##### 2.112 Service Trunk Selected at the Originating Office

If the second digit steps both selectors to a level on which the service trunks are in the local office, this selector cuts through to an idle service trunk and sends a local completion signal to the auxiliary trunk to initiate a release of the CAMA connection.

2.113 Service Trunk or CAMA Trunk Selected at the CAMA Office

If the second digit dialed steps both selectors to a level on which the service trunks are in the CAMA office or on which CAMA trunks are selected, this selector sends a CAMA completion signal to the auxiliary trunk circuit which will cause the release of this selector and which will maintain the CAMA connection.

2.12 When One Digit Access Code to CAMA is Used. (H option)

2.121 Seizure and Pulsing

This circuit is seized by the closure of its input loop by an auxiliary trunk circuit at the same time that the auxiliary trunk causes a trunk to be seized to the CAMA office. Subscriber dial pulses are then repeated to both the code selector and CAMA trunk by the auxiliary trunk.

2.122 Service Trunk Selected at the Originating Office

If the first digit steps the code selector to a level on which the call is to be directed to the code selector, a local completion signal is sent to the auxiliary trunk to initiate a release of the CAMA connection.

2.123 Call Directed to CAMA Trunk

If the first digit steps the code selector to a level on which the call is to be directed to the CAMA trunk, a CAMA completion signal is sent to the auxiliary trunk to initiate a release of the code selector and maintain the CAMA connection.

2.2 CAMA Office Usage

2.21 Seizure and Pulsing

This circuit is seized by the closure of its input loop by an out repeater in the originating SXS office or an incoming repeater in the CAMA office if provided. Subscriber dial pulses are then repeated to this selector. The initial digit dialed is absorbed.

2.22 Service Trunk or CAMA Trunk Selected at the CAMA Office

When the second digit dialed by the subscriber causes this selector to step to a level on which CAMA trunks or service trunks are selected at the CAMA office this selector cuts through to an idle trunk.

## SECTION II - DETAILED DESCRIPTION

1. LOCAL OFFICE USAGE

1.1 Seizure

When this circuit is seized (A) operates over the auxiliary trunk loop closure operating (B). (B) connects ground to the incoming "S" lead to hold the preceding circuits, closes a path for operating (C) and the VERT magnet and prepares a circuit for operating (F) and the traffic register.

1.2 Vertical Stepping

The (A) relay follows subscriber dial pulses as repeated by the auxiliary trunk circuit. Each time the (A) releases, ground on its back contact operates the VERT magnet in series with (C) causing the selector to step vertically to the level corresponding to the digit dialed. (C) operates on the first release of (A) but remains operated during dialing of a digit since it is slow to release. (C) operates (E) through the V.O.N. springs which operate as soon as the selector takes the first vertical step.

1.3 Digit Absorbing

1.31 Normal Post Spring Adjustment - Fig. A

Levels on which it is required to absorb a digit shall have the "RF" normal post spring adjusted to operate.

1.32 Absorbing First Digit Only - "T" Option

When the selector reaches the level dialed and (C) releases, ground from the RLS magnet contact is connected through the (E), (F), the operated "RF" normal post spring and V.O.N. springs to operate the RLS magnet. The RLS magnet locks to its own and V.O.N. contacts. The operation of the RLS magnet restores the selector shaft to normal and the RLS magnet contacts open the ROT magnet operate path and close a path to operate (F). When the selector shaft has restored to normal, the V.O.N. springs open and release (E) and the RLS magnet. (F) operated, locks to B, makes the "RF" normal post springs ineffective and prepares a circuit for operating the ROT magnet and for grounding the "LC" and "CC" leads. When the next digit is dialed, the selector steps vertically as previously described. When the level dialed is reached, the ROT magnet operates when (C) releases regardless of the position of the "RF" normal post springs.

1.33 Absorbing Repeatedly - "S" Option

When the selector reaches the level dialed and the (C) releases the circuit functions as described in paragraph 1.32. However, when (F) operates and "S" option is furnished a path is closed to operate

the RLS magnet again if the next digit dialed operates the "RF" normal post spring.

1.34 Restricted Service

If the first digit dialed by the subscriber steps this selector to a level not arranged for absorbing the digit, the ROT magnet will operate when the (C) releases at the termination of the dialed digit. Because (F) is not operated, ground is connected to the outgoing "S" lead which will cause the selector wipers to rotate to the 11 rotary position as described in paragraph 1.5. Operation of the 11th rotary step springs will return a busy tone to the calling subscriber and with "Q" option will send a local completion signal to the auxiliary trunk over the "LC" lead to initiate the release of the CAMA connection.

1.35 Digit Absorbtion Once or Repeatedly When "H" Option is Also Specified in Addition to "T" or "S"

Operation is the same as that described in paragraphs 1.32 and 1.33, except that when (F) operates it also furnishes ground on the "LC" lead. The "CC" lead is prepared for ground whether or not a digit has been absorbed.

1.4 Signalling the Auxiliary Trunk

1.41 Fig. A and "J" Option

1.411 Normal Post Spring Adjustment

Levels on which it is required to furnish a local completion signal to the auxiliary trunk shall have the "LR" normal post spring adjusted to operate.

Levels on which it is required to furnish a CAMA completion signal to the auxiliary trunk shall have the "RR" normal post spring adjusted to operate.

1.412 Local Completion Signal

When the selector is stepped to a level on which the service trunks are located in the local office and the (C) releases ground is connected through (F) and the operated "LR" normal post spring to the "LC" lead.

1.413 CAMA Completion Signal

When the selector is stepped to a level on which the service trunks are located in the CAMA office or on which CAMA trunks appear and the (C) releases, ground is connected through (F) and the operated "RR" normal post spring to the "CC" lead.

1.42 Fig. A and "H" Option

1.421 Local Completion Signal

When the selector steps to a level on which the first digit is absorbed, the release of (C) connects ground through the operated (F) contacts to the "LC" lead. This will cause the Aux. Trk. to dismiss the CAMA connection and arrange for the local connection.

1.422 CAMA Completion Signal

Levels on which it is required to furnish a CAMA completion signal to the auxiliary trunk shall have the "RR" normal post spring adjusted to operate.

When this selector steps to a level on which the first digit determines that the call is to be completed at the CAMA office, the release of (C) connects ground through the operated "RR" normal post spring to the "CC" lead. This will cause the auxiliary trunk to dismiss this circuit and complete the call to the CAMA trunk.

This digit is not arranged for absorption and the selector will attempt to hunt to the 11th rotary step position. However, upon dismissal of this circuit by the auxiliary trunk the (A) releases and operates the (C) which in turn opens the rotary magnet and stops the hunting action. The (C) is able to operate because the (B) is slow release. The (A) releasing also releases the (B) which, with the V.O.N. springs operated, causes the release magnet to operate, thereby restoring the circuit to normal.

1.5 Trunk Hunting

When the (C) releases at the termination of the dialed digit and the call is to a service trunk in the local office, the ROT magnet will operate through the "RF" normal post spring. The ROT magnet causes the selector wipers to rotate to the first bank terminal. The ROT magnet contacts permits (E) to release which in turn opens the ROT magnet operate path. The "S" wiper is now in contact with the first multiple bank terminal and if this is grounded because of a busy condition, (E) reoperates causing the ROT magnet to operate and rotate the wipers to the next terminal. This automatic rotation will continue until an idle or nongrounded "S" terminal is found, or if all trunks on this level are busy the switch steps to the 11th rotary position and busy tone is applied to the calling line as described in paragraph 1.34.

1.6 Seizing the Idle Trunk

When an idle "S" terminal is found, (D) operates in series with (E) when the ROT magnet releases since it is no longer

short circuited by the ground through the "S" wiper. (E) does not operate due to the high resistance of the (D) in series with it, (D) disconnects the "T" and "R" leads from (A), cuts the "T", "R" and "S" leads and "C" lead when furnished, through to the trunk beyond and grounds the "M" lead to operate a peg, count register. The release of (A) allows (B) to release. (B) releasing removes the ground from the "R" lead and the "LC" lead, prepares a path for operating the RLS magnet and allows (F) to release. (D) is held operated by ground from the succeeding circuit.

1.7 Trunk Transfer (Fig. A and "J" Option)

Trunk transfer feature can only be utilized when code selectors are located in both the local and CAMA offices.

1.71 Normal Post Spring Adjustment and Transfer Key Operation

Specified selector levels can be arranged to transfer the selection of a service trunk from one of the local office to one at the CAMA office. Transfer is under control of the selector normal post springs and a transfer key. Levels on which it is required to transfer service trunk selection shall have the "LF" normal post spring adjusted to operate.

1.72 Transfer Key Operated

Operation of the transfer key operates a transfer relay on which one set of transfer contacts is used per selector. After the selector is stepped to a level on which the service trunk is normally selected in the local office and the "C" releases, ground is connected through the operated "LF" normal post spring to the "TT" lead. This ground is passed through the operated transfer relay and appears on the "C" lead to ground the "CC" lead through the operated (F) which gives a CAMA completion signal to the auxiliary trunk.

1.73 Transfer Key Normal

When the transfer key is normal, operation of the "LF" normal post spring is ineffective. After the selector is stepped to a level which completes to a service trunk in the local office and the (C) releases ground is connected through the operated "LF" normal post springs to the "TT" lead. This ground is passed through the unoperated transfer relay and appears on the "L" lead to ground the "LC" lead through the operated (F) which gives a local completion signal to the auxiliary trunk.

1.8 All Trunks Busy and Release Prior to Cut Through

When all trunks in a group are busy the selector wipers will pass off the bank terminals and operate the eleventh rotary step springs which causes busy tone to be returned to the called station and prevents the (D) from operating thereby keeping this circuit under control of (A). When the calling subscriber disconnects, (A) releases releasing (B) and in turn energizing the RLS magnet and restoring the selector to normal. The selector will release in this manner on a calling subscriber disconnect at any time prior to seizure of a service trunk.

1.9 Release After Cut Through

As mentioned in paragraph 1.6, (D) is held from the succeeding trunk after an idle trunk is seized. When the succeeding trunk has been allowed to release, ground is removed from the sleeve which allows (D) to release. The release of (D) energizes the (RLS) magnet which restores the selector to normal.

2. CAMA OFFICE USAGE

2.1 Seizure

When this circuit is seized (A) operates over the outgoing repeater loop from the SXS office or the incoming repeater loop in the CAMA office if provided. Subsequent circuit operation is the same as described in paragraph 1.1.

2.2 Vertical Stepping

Vertical stepping is the sames as described in paragraph 1.2.

2.3 Digit Absorbing

2.31 Normal Post Spring Adjustment - Fig. B

Levels on which it is required to absorb a digit shall have the "R" normal post spring adjusted to operate.

2.32 Absorbing First Digit Only - "T" Option

When the selector reaches the level dialed and (C) releases, ground from the RLS magnet contact is connected through the (E) and (F) and the operated "R" normal post spring to operate the RLS magnet. The RLS magnet locks to its own and V.O.N. contacts. The operation of the RLS magnet resotres the selector shaft to normal and the RLS magnet contacts open the ROT magnet operate path and closes a path to operate (F). When the selector shaft has restored to normal the V.O.N. springs open and release (E) and the RLS magnet. (F) operated, locks to (B) makes the "R" normal post springs ineffective and prepares a circuit for operating the ROT magnet. When the next digit is dialed, the selector steps vertically as previously described. When the level dialed

is reached, the ROT magnet operates when (C) releases regardless of the position of the "R" normal post springs.

2.33 Absorbing Repeatedly - "S" Option

When the selector reaches the level dialed and the (C) releases, the circuit functions as described in paragraph 2.32. However, when (F) operates and "S" option is furnished a path is closed to operate the RLS magnet again if the next digit dialed operates the "R" normal post springs.

2.4 Trunk Hunting

When the (C) releases at the termination of the dialed digit and the call is to a service trunk or CAMA trunk in the CAMA office the ROT magnet will operate through the "R" normal post spring. Subsequent circuit operation is the same as described in paragraph 1.5.

2.5 Seizing the Idle Trunk

When the idle "S" terminal is found, (D) operates in series with (E) when the ROT magnet releases since it is no longer short circuited by the ground through the "S" wiper. (E) does not operate due to the high resistance of the (D) in series with it. (D) disconnects the "T" and "R" leads from (A), cuts the "T", "R" and "S" leads and "C" lead when furnished, through to the trunk beyond and grounds the "M" or "R" lead through the "L" normal post spring which is adjusted to operate on all levels which complete to trunks in the CAMA office. The release of A allows (B) to release. (B) releasing removes ground from the "M" or "R" lead, prepares a path for operating the RLS magnet and allows (F) to release. (D) is held operated by ground from the succeeding circuit.

2.6 All Trunks Busy and Release Prior to Cut Through

Circuit operation is the same as described in paragraph 1.8.

2.7 Release After Cut Through

Circuit operation is the same as described in paragraph 1.9.

## SECTION III - REFERENCE DATA

1. FUNCTIONS

1.1 Local Office or CAMA Office Usage

1.101 To ground the sleeve lead to the preceding circuit when the selector is seized.

1.102 To step the switch vertically under control of subscriber dial pulses.

1.103 To release from any level arranged for absorbing on the initial digit.

1.104 To release from any level arranged for absorbing repeatedly each time the level is dialed.

1.105 To restrict service on all levels until a digit has been absorbed.

1.106 To select an idle trunk automatically.

1.107 To connect an "all trunks busy" tone to the calling subscriber when all the trunks in a group dialed are busy.

1.108 To extend the "T", "R" and "S" leads and "C" lead when furnished, to the selected idle trunk.

1.109 To restore to normal when succeeding trunk has released on disconnect and removed ground from the sleeve.

1.110 To operate a peg count register whenever an idle trunk is selected.

1.2 Local Office Use Only

1.21 To give a local or CAMA completion signal to the auxiliary trunk circuit as an indication whether the call is to be completed in the local office or the CAMA office.

1.22 To give a CAMA completion signal in place of a local completion signal to the auxiliary trunk when a transfer key is operated.

2. WORKING LIMITS

2.1 Limits are for single office areas. For multioffice areas, and for operator pulsing, see keysheets.

| | 45V. Min. | | | 48V. Min. | | |
|---|---|---|---|---|---|---|
| | Pulsing from Sub. | | | Pulsing from Sub. | | |
| Type of Dial | 2, 4 or 5 | 6 | 7 | 2, 4 or 5 | 6 | 7 |
| Max. Ext. Ckt. Loop* | 750ω | 1200ω | 1100ω | 850ω | 1500ω | 1400ω |
| Max. Ext. Ckt. Loop** | 850ω | 1400ω | 1300ω | 1000ω | 1500ω | 1500ω |
| Max. Ext. Ckt. Loop*** | 1000ω | 1400ω | 1400ω | 1115ω | 1500ω | 1500ω |
| Min. Ins. Res. | | 15000ω | | | 15000ω | |

*When using 1000ω loop - Leak B in pulsing test set.

**When using 1200ω loop - Leak A in pulsing test set.

***When using 1400ω loop - Leak A in pulsing test set.

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3. CONNECTING CIRCUIT

When this circuit is listed on a key sheet, the connecting information thereon is to be followed.

3.11 Auxiliary Trunk Circuit - SD-32281-01.

3.12 Outgoing Repeater Circuit - SD-32240-01.

3.13 Outgoing Repeater Circuit - SD-32241-01.

3.14 Incoming Repeater Circuit - SD-32184-01.

3.15 Incoming Repeater Circuit - SD-31726-01.

3.16 Selector Bank Multiple Circuit - SD-32123-01.

3.17 Switch Trouble Alarm Circuit or Miscellaneous Alarm Circuit - SD-32043-01.

3.18 Traffic Register Circuit - SD-30896-01.

SECTION IV - REASONS FOR REISSUE

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Revised CAD Figs. 1, 4, 5 and 6 on a "No Record" basis.

D.2 Added "H" option to provide "one digit access code to CAMA" feature on a "No Record" basis.

D.3 Added information Note 302.

D.4 Revised Notes 102 and 105 to reflect above changes.

All other headings under Changes, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

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