FEATURE DOCUMENT
THREEWAY CALLING
NO. 3 ELECTRONIC SWITCHING SYSTEM

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Printed in U.S.A.

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INTRODUCTION

1. GENERAL INFORMATION

1.01 The Threeway Calling feature, offered as a part of the No. 3 Electronic Switching System (ESS) custom calling package, enables the subscriber to talk with two other parties simultaneously. The Threeway Calling feature is provided by Issue 3 of the SO-2 generic program. Additionally, traffic engineered 3-port conference circuits are required if this feature is to be provided.

1.02 When this section is reissued, the reasons for reissue will be included in this paragraph.

2. DEFINITION

2.01 Threeway Calling is an arrangement that allows a customer already involved in a telephone conversation to add a third party to the conversation without operator assistance.

2.02 In the No. 3 ESS, a customer subscribing to the Threeway Calling feature may add a third party to an existing conversation by momentarily depressing the switchhook (flashing), dialing the third party's telephone number, and flashing again. The result is a true 3-way connection, in which all parties may converse with each other.

DESCRIPTION

3. USER OPERATION

3.01 A customer subscribing to the Threeway Calling feature may add a third party to a stable connection by flashing (depressing the switchhook for more than 150 ms but less than one second), receiving a special dial tone (three spurts of dial tone followed by steady dial tone), dialing the third party, and flashing again. The final connection is a 3-way conference call allowing the three parties to talk at the same time. For clarity, in this document the three parties are designated A, B, and C. The A and B parties represent the stable 2-party call with A being the controlling party (activating the Threeway Calling feature). The C party represents the third or add-on party.

3.02 Upon receiving the interrupted dial tone, if the A party fails to dial or completely dial the C party, or if the A party flashes before dialing is completed, the original 2-party connection is reestablished.

3.03 If the A party reaches an announcement, reorder, or busy tone while attempting to dial the C party, the original 2-party connection is established when the announcement or tone has timed out. If the A party flashes during the announcement or tone, the 3-way connection is established so that the B party also hears the announcement or tone. A third flash by the A party causes the announcement or tone to be disconnected and the original 2-party connection to be reestablished. However, if the third flash does not occur, the original 2-party connection is reestablished when the announcement or tone times out.

3.04 If the A party flashes while audible ringing is being provided for the C party connection, the 3-way connection is immediately established and all parties may converse as soon as the C party answers. However, the A party ***may*** talk privately with the C party as long as desired before flashing to add the B party to the connection.

3.05 After the 3-way connection has been established, the controlling party may disconnect the last added party by flashing. The controlling party may terminate the 3-way conference by going on-hook. If either of the other two parties goes on-hook, the call is returned to a stable 2-party connection.

4. SYSTEM OPERATION

4.01 A customer subscribing to the Threeway Calling feature may activate the feature by flashing while participating in a 2-party conversation, regardless of which party originated the connection. If both parties have the feature, either one may request the third party. For this description, the A party is the flashing party.

4.02 The disconnect program detects a flash and determines that a Threeway Calling customer is attempting to add a third party to an existing 2-party connection. The disconnect program then causes the A and B party terminal equipment numbers (TENs) and the A to B path identity to be written into a TCR (called the 3-way TCR). The address of this TCR is then passed on to the conference calling (TREWAY) program. This program then selects another TCR to monitor the

add-on connection (called the add-on TCR). The address of the add-on TCR is then stored in the 3-way TCR.

4.03 At this point, a 3-port conference circuit is selected and paths are selected between the A party and port 0 of the 3-port circuit (the controlling port) and between the B party and port 1 of the 3-port circuit. The reserved conference circuit and path identities are then stored in the 3-way TCR for later use. The A party is written into the add-on TCR as the calling party to allow the origination of the third-party connection.

4.04 The A party is split from the B party and connected to a customer dial pulse receiver (CDPR) so that the digits representing the third party telephone number may be collected and processed. At this time, a special tone (three bursts of dial tone followed by steady dial tone) is given to the A party to indicate that the Threeway Calling feature has been successfully activated. The B party continues to be supervised by the original talk junctor.

4.05 Upon hearing the special dial tone, the A party may dial the third party telephone number. A flash by the A party while still connected to the CDPR results in the release of the conference circuit and a stable A and B party connection. If the A party goes on-hook while still connected to the CDPR, the call is disconnected. The conference circuit and all paths are then released and idled.

4.06 When the C-party telephone number is completely dialed, the usual call processing is performed to locate and connect to the C party. The A party is disconnected from the CDPR, and the reserved path between the A party and port 0 of the 3-port circuit is activated. A junctor is selected, and a path between the junctor and port 2 of the 3-port circuit is selected and activated. A path between the C party and the junctor is selected and reserved, and ringing current is applied to the C-party line. Audible ringing is then provided through the junctor and the 3-port circuit to the A party. When the C-party connection must be made via an outgoing trunk, audible ringing is provided by the distant office; therefore, the reserved conference connections between the C party (represented by the trunk circuit) and port 2 of the 3-port circuit are activated as soon as the C-party telephone number has been outpulsed. Audible ringing is then provided from the distant office through the 3-port circuit to the A party.

4.07 If the controlling party flashes before the C party answers, the B party is added to the conference connection so that both parties can hear the ringing tone. A subsequent flash by the A party causes the C party connection to be dropped and the A and B parties are connected in the usual 2-party configuration. If the A party should go on-hook before C answers, the conference circuit and all paths (including the B party-to-junctor path) are idled to disconnect the entire call.

4.08 If an announcement or tone is reached instead of the C party, the original 2-party connection is reestablished as soon as the announcement or tone times out and goes on-hook. If the A party flashes before this time-out occurs, the B party is added to the connection and may listen to the announcement or tone. Another flash causes the announcement to be disconnected and the original 2-party connection to be reestablished. If no flash occurs, the original 2-party connection will be reestablished when the announcement or tone times out.

4.09 When the C party is reached through an intraoffice call and the C party answers, the ringing circuit is disconnected from the C-party line. The reserved path between the C party and the junctor (which is still connected to port 2 of the 3-port circuit) is then activated. (If the C-party connection is made via an outgoing trunk, the associated conference connections are established prior to answer as described in paragraph 4.06.) The A and C parties may then talk privately until the A party flashes to connect the B party to port 1 of the 3-port circuit.

4.10 If the B or C party should go on-hook at this time, the two remaining parties are connected in the usual 2-party configuration. If the B or C party subscribes to the Threeway Calling feature, they may flash to become the controlling party of a new conference circuit while remaining a noncontrolling party of the original conference circuit. This chains the two conference circuits together so that additional parties may be added to the conference connection.

4.11 When the A party flashes again, the B party is connected to the conference circuit to complete the 3-way connection. If charging is

required, the controlling party is charged in the usual manner for either or both of the connections to the other parties.

4.12 When a stable 3-way connection has been established, the B or C party may flash to add an additional party (provided they subscribe to the Threeway Calling feature). If either the B or C parties goes on-hook, the remaining parties are connected in the usual 2-party configuration. The controlling party may flash to disconnect the C party and reestablish the original 2-party connection. If the A party goes on-hook, the conference circuit and all paths to it are disconnected and idled. A functional flowchart showing operations performed by the Threeway Calling feature is shown in Figure 1. The connections made to the 3-port conference circuit to provide the feature are shown in Figure 2.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The Threeway Calling feature is provided on a per-line basis.

6. LIMITATIONS

6.01 There is no limit on the number of customers having the Threeway Calling feature. However, the number of lines with Threeway Calling in progress at one time is limited to the number of 3-port conference circuits available. A maximum of 128 3-port conference circuits may be allowed in any No. 3 ESS office.

6.02 A customer with the Threeway Calling feature cannot be the controlling party of more than one 3-way call at any given time.

7. INTERACTIONS

7.01 A customer having the Threeway Calling feature may be the noncontrolling party of one call and simultaneously be the controlling party of another call. This allows conference circuits to be connected in tandem so that additional parties may be added to the 3-way connection by either or both of the noncontrolling parties of the original 3-way connection.

7.02 The noncontrolling parties of a 3-way connection may flash to answer a call-waiting

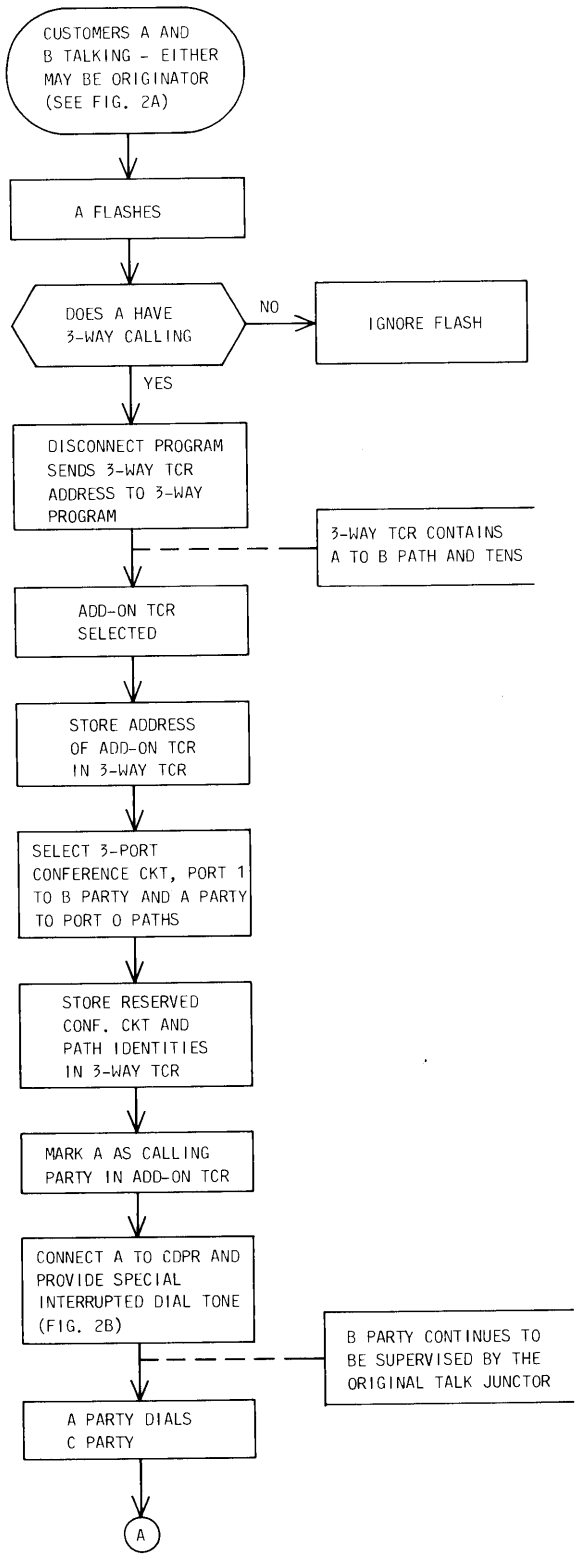


Fig. 1—Threeway Calling Flowchart (Sheet 1 of 3)

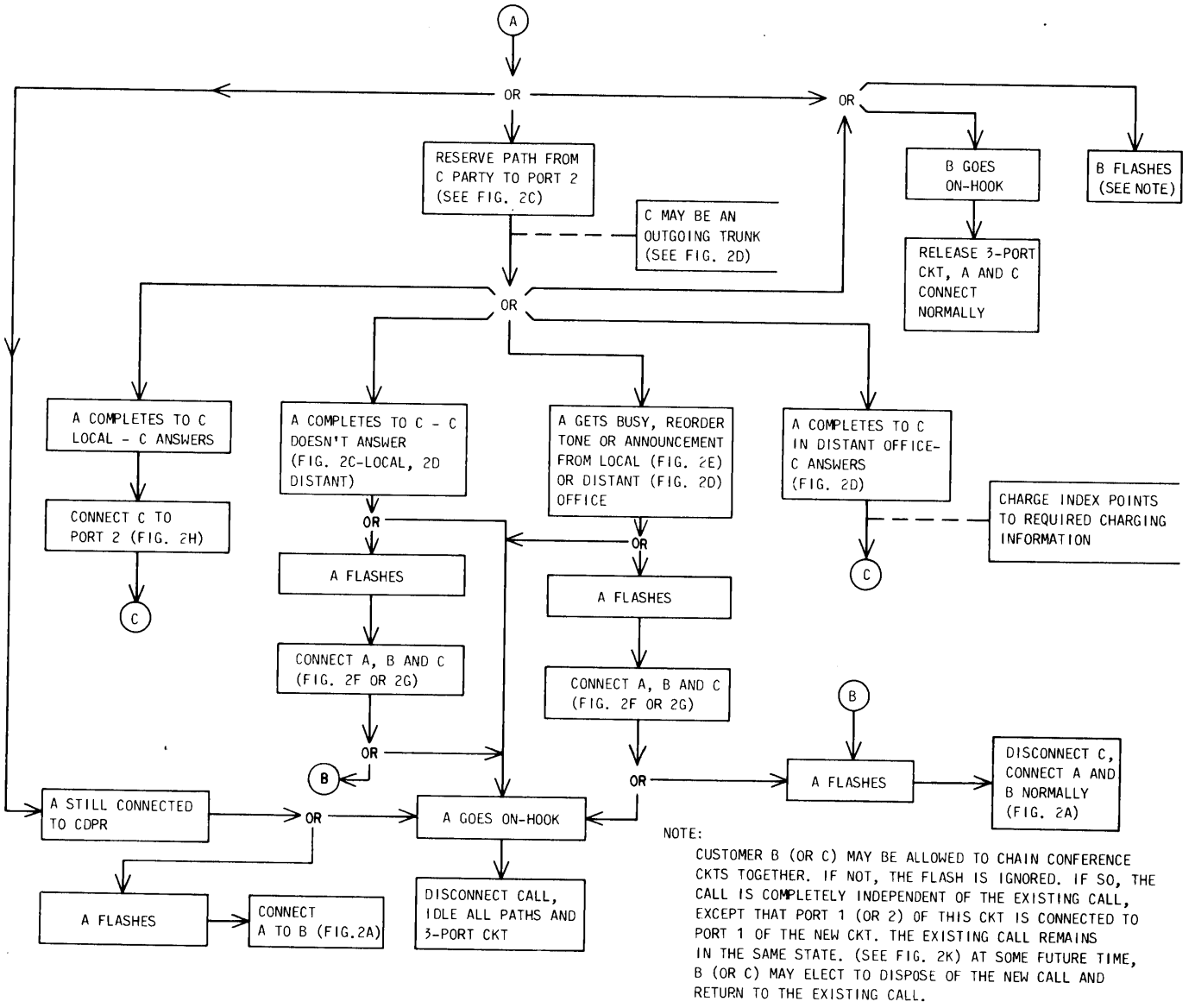
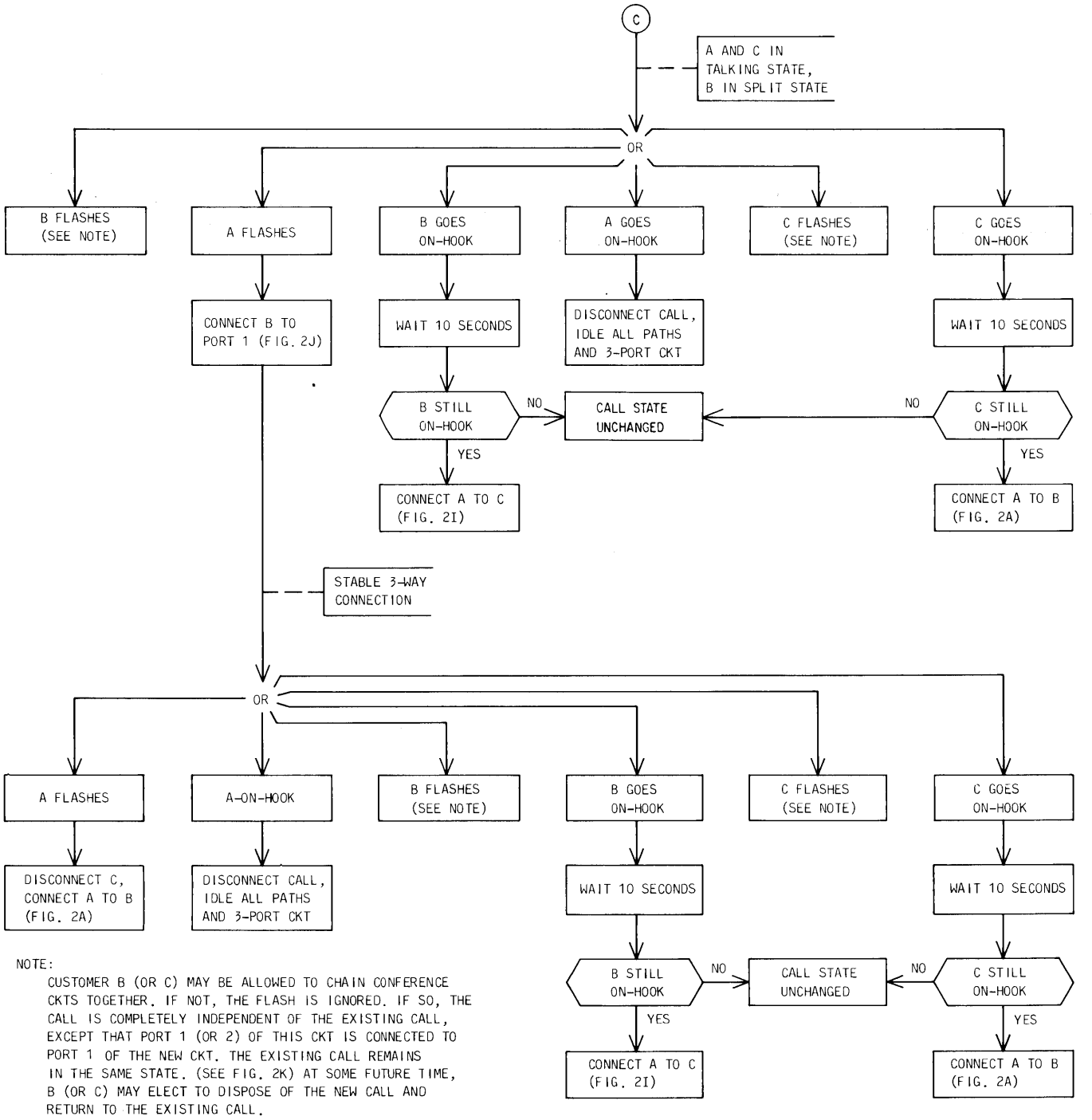


Fig. 1—Threeway Calling Flowchart (Sheet 2 of 3)



NOTE:
CUSTOMER B (OR C) MAY BE ALLOWED TO CHAIN CONFERENCE CKTS TOGETHER. IF NOT, THE FLASH IS IGNORED. IF SO, THE CALL IS COMPLETELY INDEPENDENT OF THE EXISTING CALL, EXCEPT THAT PORT 1 (OR 2) OF THIS CKT IS CONNECTED TO PORT 1 OF THE NEW CKT. THE EXISTING CALL REMAINS IN THE SAME STATE. (SEE FIG. 2K) AT SOME FUTURE TIME, B (OR C) MAY ELECT TO DISPOSE OF THE NEW CALL AND RETURN TO THE EXISTING CALL.

Fig. 1—Threeway Calling Flowchart (Sheet 3 of 3)

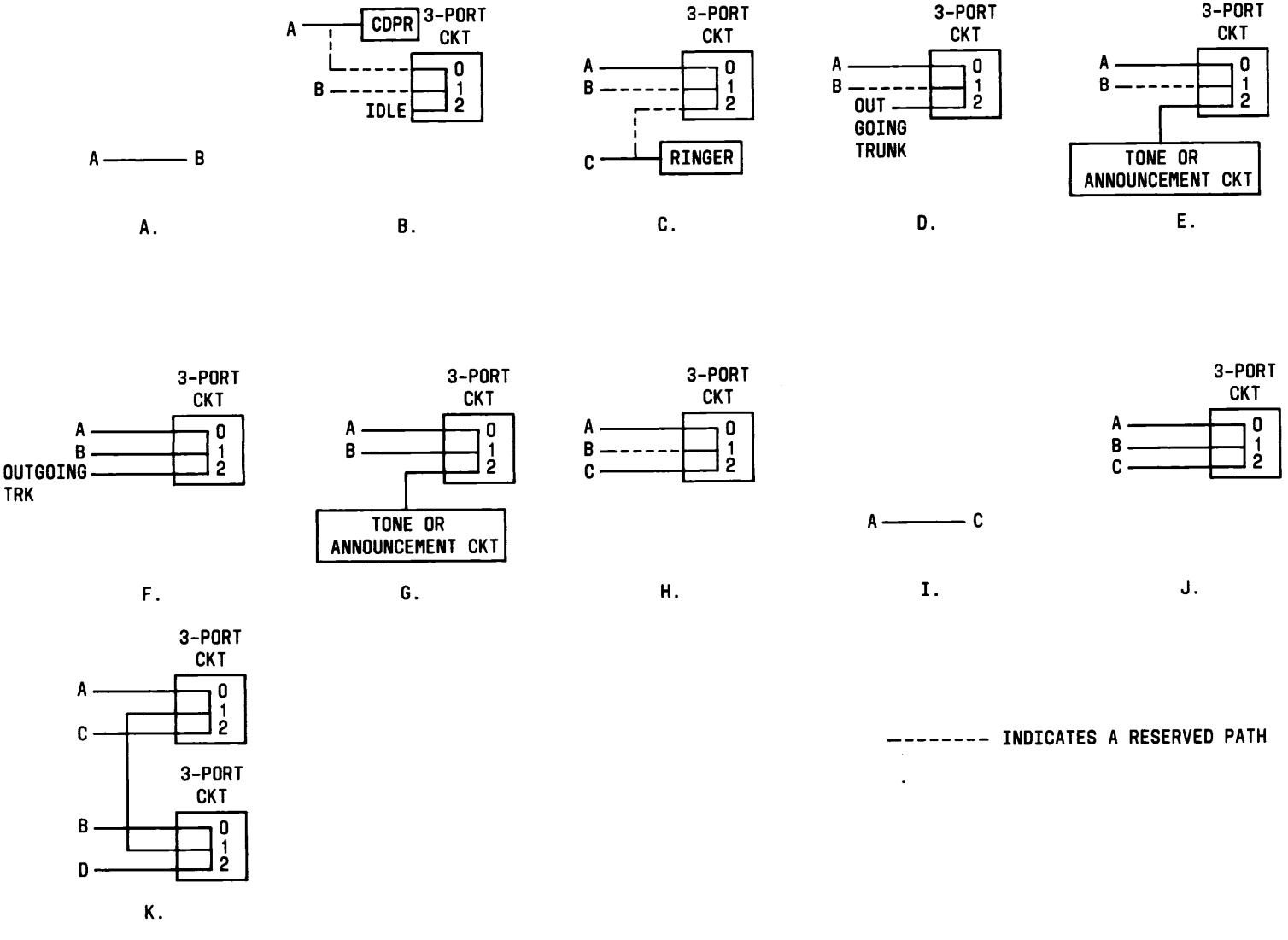


Fig. 2—Simplified Three-Port Conference Circuit Connections

call. Subsequent flashes allow the customer to alternate between the 3-way connection and the waiting call.

7.03 The controlling party of a 3-way connection is not allowed to answer a call-waiting call. Therefore, the calling party receives busy tone and the controlling party of the 3-way connection receives no indication of a waiting call.

8. RESTRICTION CAPABILITY

8.01 The following types of lines are not permitted to have the Threeway Calling feature:

- Manual lines
- Coin lines
- Multiparty lines.

INCORPORATION INTO SYSTEM

9. COST FACTORS

9.01 One bit per line or PBX/MLHG line is required in the originating translations for the Threeway Calling feature. The line expansion and PBX/MLHG expansion provide the necessary translation for all the custom calling features; however, if the line subscribes to only the Threeway Calling feature, the expansion is still required.

9.02 The 3-port conference circuits require the following translation space:

- 4 words per group (group No. 87 is assigned to the 3-port circuits) in the Service Circuit Group Translation
- 4 words per group in the Service Circuit Status Block
- 1 bit per circuit in the Service Circuit Status Block representing the selection status bit
- 1 word per group in the Service Circuit Member List
- 1/2 word per circuit in the Service Circuit Member List representing the member number
- 3 bits per circuit in the 3-Port Status Bit table.

9.03 Additional costs include the 3-port conference circuits (FB427 of SD-3H411). The number of these circuits required depends on the feature usage within the No. 3 ESS service area. Refer to Network Design Section 233-060-210, Network Design Worksheets—Service Circuits, No. 3 ESS for the criteria used to determine the number of 3-port circuits required.

9.04 Processor real time required by this feature will be supplied when the data becomes available.

10. DATA ASSIGNMENTS AND RECORDS

10.01 Each line subscribing to the Threeway Calling feature and the 3-port conference circuits must be properly assigned in order for the feature to operate properly. These assignments must be made through the use of recent change messages, or in the case of an initial installation, an office data administration (ODA) run.

10.02 The originating translations associated with the Threeway Calling feature are shown in Figure 3. The translations associated with the selection of the 3-port conference circuit are shown in Figure 4. The recent change messages associated with these translations are as follows:

RC:CKT—This message is used to assign the group number (87), member number, terminal equipment number, scan point number, and circuit code (16) to the 3-port conference circuits.

RC:GRP—This message is used with keyword SCHED to assign a traffic schedule to monitor the Threeway Calling feature usage.

RC:LINE—This message is used with keyword ESC to add or remove the Threeway Calling feature from a line.

RC:MLHG—This message is used with keyword ESC to add or remove the Threeway Calling feature from an entire multiline hunt group.

RC:MTL—This message is used with keyword ESC to add or remove the Threeway Calling feature from any line within an MLHG.

10.03 For the initial ODA run, the following forms must be completed and submitted to the WECo Regional Data Center. Refer to TG-3 for the details concerning the completion of these forms.

- ***Form ESS-3100*** is used to assign the Threeway Calling feature to a given telephone number (for an individual line or member of an MLHG).
- ***Form ESS-3105*** is used to assign the Threeway Calling feature to all members of an MLHG.
- ***Form ESS-3202-1*** is used to assign the traffic schedule, number of members, and circuit code (16) to a group of 3-port conference circuits.

10.04 When the Threeway Calling feature is implemented through an ODA run, the resulting output forms should be retained as a part of the office records. Records for trouble reports and maintenance should be kept in accordance with local procedures.

11. HARDWARE RESTRICTIONS

11.01 There are no hardware restrictions associated with this feature.

12. INSTALLATION/ADDITION/DELETION

12.01 The procedures required for providing the Threeway Calling feature consist of installing the 3-port conference circuits in the miscellaneous or control frame and making the necessary assignments through the use of recent change messages or the ODA run.

13. TESTING

13.01 The operation of the Threeway Calling feature may be tested by making test calls and by using the following verification messages to insure that the feature is properly assigned.

- ***VER:GRP*** is used to verify group and member data associated with the 3-port conference circuits.
- ***VER:LINE*** is used to verify that the feature has been assigned to a line.

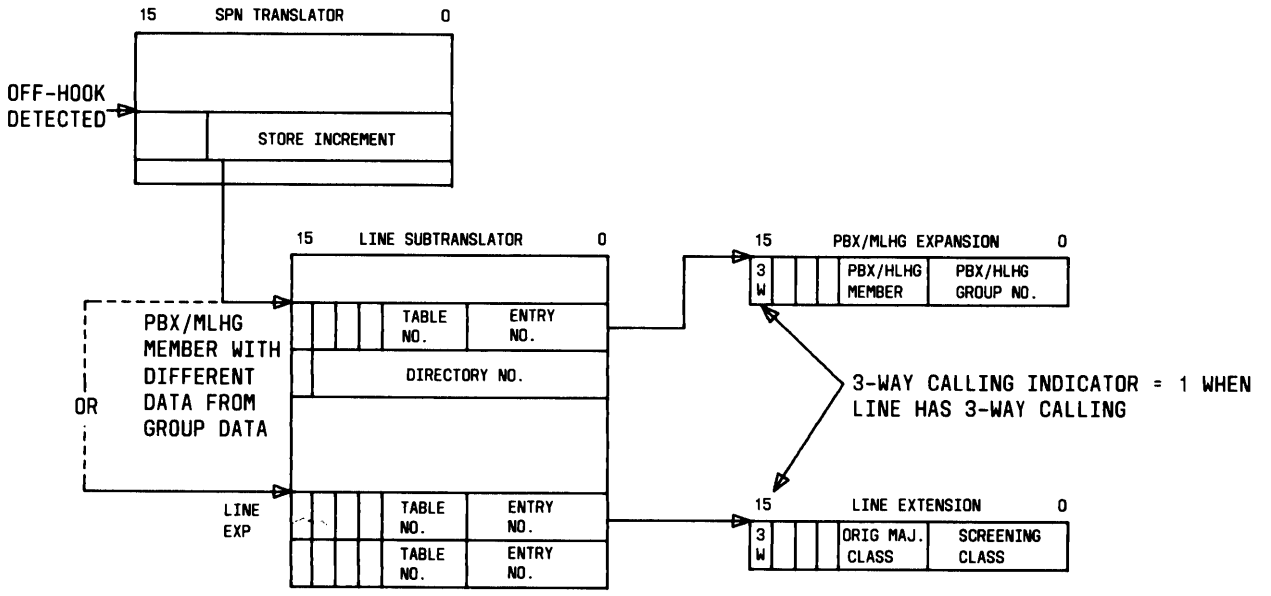


Fig. 3—Originating Translation Layout for Threeway Calling

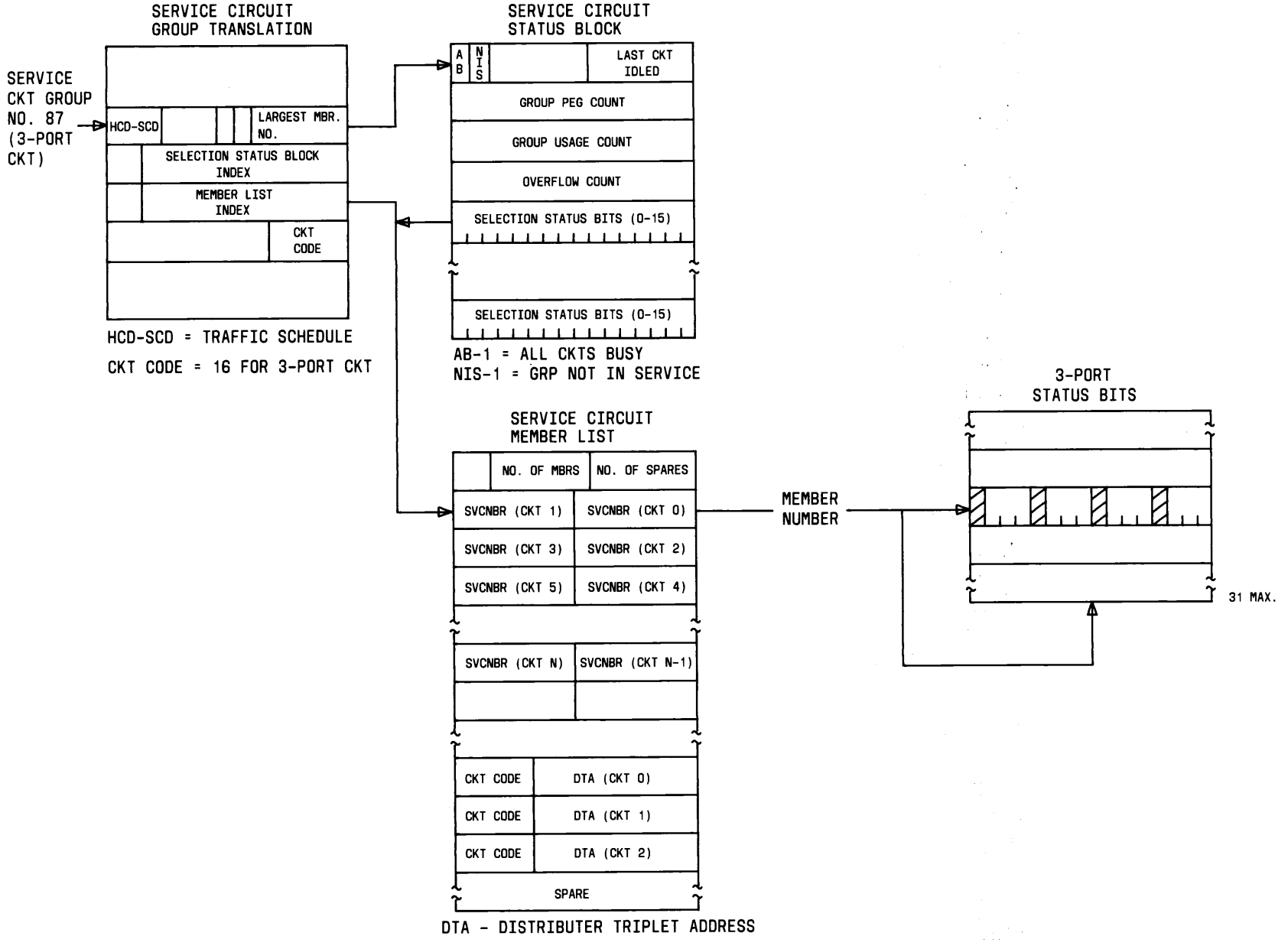


Fig. 4—Three-Port Circuit Selection Translation Layout

- ***VER:MTL*** is used to verify the assignment of the feature to MLHG lines.

14. OTHER PLANNING TOPICS

14.01 Care should be taken to insure that adequate 3-port conference circuits are provided to meet expected demand.

ADMINISTRATION

15. MEASUREMENTS

15.01 The following traffic measurement is available for the Threeway Calling feature. Refer to DFMP, Division H, Section 11h (Section 233-020-020) for additional details.

- ***OFT47***—Peg count of number of attempts to add on a third party.

16. CHARGING

16.01 Charging for the Threeway Calling feature is made in accordance with local tariff regulations. Toll calls that are added to an existing connection are charged to the controlling party just as with a non 3-way call.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 The following list identifies terms and abbreviations used in this document which may not be familiar to the reader.

- ***Customer Dial Pulse Receiver (CDPR)***—A circuit that provides dial tone to the customer and detects the dialed digits.

- ***Junctor***—A connecting circuit between switching networks within the same switching system.

- ***Multiline Hunt Group (MLHG)***—A customer feature that allows calls to hunt over a specified group of lines or PBX lines in an attempt to connect the calling party to an idle line or PBX line within the group.

- ***Off-Hook***—The condition indicating that a station is in use (line loop closed).

- ***Office Data Administration (ODA) Run***—Mechanism by which No. 3 ESS office data may be assembled. Information from the ESS input forms are inputted into the WECo Regional Data Center computer, assembled, then sent to the No. 3 ESS and installed into the system.

- ***On-Hook***—The condition indicating that a station is idle (line loop open).

- ***Recent Change (RC) Messages***—Mechanism for making changes to information stored in the program store via TTY input messages.

- ***Reorder Tone***—An audible signal (interrupted tone) sent back to the calling party to indicate that the call cannot be completed. It says that equipment between the calling and called parties is busy. It is interrupted at a 120-IPM rate and is sometimes called fast busy.

- ***Transient Call Record (TCR)***—A 16-word block of temporary store assigned to monitor calls in a transient state.

- ***Translation***—The conversion of information from one form to another; in ESS, for example, translation is the conversion of dialed digits into routing and terminating information.

18. REFERENCES

18.01 The following documents may be referred to for supplementary information concerning the Threeway Calling feature.

- Section 233-152-135—Traffic and Plant Measurements Software Subsystem Description No. 3 ESS

- Section 233-154-130—Recent Change Users Guide

- Dial Facilities Management Practices (DFMP), Division H, Section 11

- Network Design Sections 233-060-XXX

- CD- and SD-3H411—Coin Control, Tone or Recorded Announcement, and Conference Circuit—No. 3 ESS
- PR-3H152—Custom Calling Programs (CUSTOM) No. 3 ESS
- PR-3H154—Disconnect—Progress Marks (DISCON) No. 3 ESS
- PR-3H184—Conference Calling Program (TREWAY) No. 3 ESS
- Translation Guide—TG-3
- Input Message Manual—IM-3H300
- Output Message Manual—OM-3H300
- No. 3 ESS Layout Specification—PA-3H300.