

SERIES COMPLETION FEATURE
NO. 2 ELECTRONIC SWITCHING SYSTEM

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NOTICE

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FEATURE DEFINITION AND DESCRIPTION

1. DEFINITION

1.01 Series completion is a feature that allows calls to a busy line to be routed to another specified directory number in the same switching office.

1.02 In the No. 2 Electronic Switching System (ESS), a series completion directory number is one to which completion is to be attempted when the dialed directory number is busy. When a dialed number with series completion is found to be busy, the series completion number is used in place of the dialed number just as though it had been dialed. Each directory number is allowed only one series completion number; however, several numbers may be linked together by making each number series complete to the next number in the list. A customer may have as many numbers in a series completion list as desired; however, the series completion program will stop the hunt after eight busy lines have been encountered from the point a call entered the series completion list. The directory numbers that make up the series completion list do not have to be numbered sequentially.

1.03 No hardware is required to incorporate series completion into a No. 2 ESS office.

1.04 The series completion feature is available with any version of the No. 2 ESS generic program and is available to any noncentrex customer.

2. DESCRIPTION

A. Customer (User) Perspective

2.01 When a calling party dials a directory number that has series completion, no indication is given that hunting is taking place. The calling party is connected to the first idle line in the series completion list or if all of them are busy, the calling party receives busy treatment.

2.02 The customer subscribing to the series completion feature receives calls in the order that the series completion list is arranged until all members are busy.

B. System Implementation

2.03 When a call is placed to a number that has the series completion feature, the call is handled the same as any incoming or intraoffice call until the 4-digit translation is done. The 4-digit translation indicates that the called line has series completion and checks the busy/idle status of the line. If the line is idle, the call is completed in the normal manner.

2.04 If the line is found busy, the program determines if the line has the call waiting feature. If it does, the custom calling program then checks to determine if the feature is already in use or can be activated for the present call.

2.05 If the call waiting feature cannot be activated, the program checks the number of completion tries to determine if the maximum number of tries has been reached. If the maximum has been reached, busy tone is returned to the calling party. If not, the number of tries is incremented and the series completion number associated with the busy line is read. The translation program reenters the translation sequence with the series completion number. This number is translated and the corresponding line is checked for its busy/idle status. This process continues until an idle series completion number is found, until eight numbers in the series completion list have been checked and found busy, or no series completion number is found for a busy line.

3. FEATURE FLOW DIAGRAM

3.01 Figure 1 illustrates the sequence of actions that occurs when series completion lines are called.

4. INTERACTIONS

4.01 The *call forwarding* feature cannot be assigned to a series completion customer since the series completion hunt would be interrupted if call forwarding was in effect.

4.02 The *call waiting* feature may be assigned to a series completion customer, but takes precedence over the series completion feature. If call waiting is assigned to a series completion customer, call waiting will be activated each time the called party is busy unless the call waiting

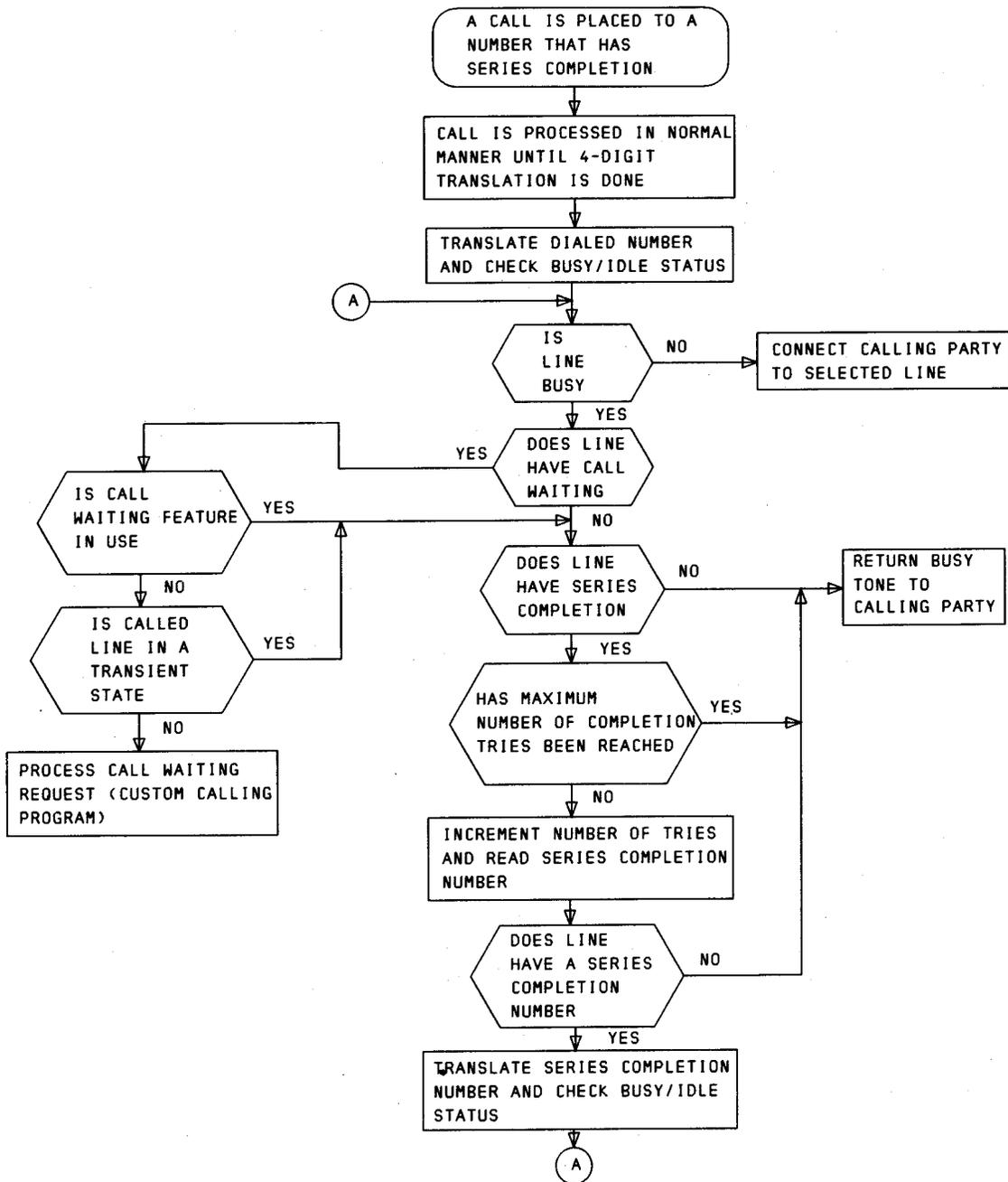


Fig. 1—Sequence of Actions When Series Completion Lines are Called

feature is already in use or the called line is in a transient state.

ATTRIBUTES

5. STATION/SYSTEM

5.01 The series completion feature is assigned on a per-line basis. Series completion numbers do not have to be sequential. A series completion list may include any 7-digit number in the office except centrex stations. Centrex stations have two similar features called call forwarding—busy line and station hunting (refer to Section 232-190-309). A trunk group may be included in a series completion list by using a directory number whose translation data contains a route index; however, series completion to a trunk terminates the hunt.

6. LIMITATIONS

6.01 The following limitations apply to the series completion feature:

- A maximum of eight lines may be included in a series completion hunt. More lines may be included in the list, but hunting will continue only until eight busy lines have been encountered, starting from the point the call enters the series completion list.
- No remote overflow or message registers can be associated with a series completion list as a group. Message registers may be assigned to individual lines.
- A series completion list cannot be arranged such that the last number completes to another number in the list. The No. 2 ESS does not permit circular hunting.
- The series completion feature is not recommended for ground start lines. Ground start lines should be assigned to multiline hunting.
- No night stop or stop hunt or other features normally available to multiline hunt groups are available to series completion customers.

7. RESTRICTION CAPABILITY

7.01 The series completion feature may only be restricted by removing the feature from a line via a recent change message.

8. COST DATA

Hardware

8.01 No hardware additions are required to implement the series completion feature in the No. 2 ESS.

Translations

8.02 For each directory number that has the series completion feature, one additional translation word is required in a 2-word or 4-word expansion in the general purpose expansion table. One word per directory number is required in the hundreds group table of the 4-digit translator to address the expansion.

Processor Capacity

8.03 Each time series completion is activated, the new number must be translated. Thus, a call could involve as many as eight translated numbers. This additional translation time should be taken into account when determining the cost of this feature.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 The ultimate size of the series completion list should be estimated before implementing the feature. Series completion may be used to hunt over up to eight numbers; however, it is recommended that the multiline hunting feature be used for more than four numbers.

10. HARDWARE ENGINEERING

10.01 This feature requires no hardware engineering.

11. SOFTWARE ENGINEERING

11.01 Refer to Traffic Facilities Practices, Division D, Section 12 for information concerning calculation of processor time used by this feature.

12. COMPATIBILITY

12.01 The series completion feature should only be used with loop start lines. If ground start lines are assigned series completion, problems may be encountered with ringer pretrip failures and attempts by operators to rering off-hook lines. Refer to the Translation Guide, TG-2H, Division 5, Section 2b under *Hunting Arrangements* for more details.

13. OFFICE DATA

13.01 To incorporate series completion into a No. 2 ESS office requires changes in the office translation data. Figure 2 shows the translation words involved. These words are part of the general purpose expansion tables and are addressed by the 4-digit translator.

2-WORD EXPANSION FOR DIRECTORY NUMBERS WITH SERIES COMPLETION

P						SERIES COMPLETION DIRECTORY NUMBER (15-0)
P	MAJOR CLASS				TEN (14-0)	

4-WORD EXPANSION FOR DIRECTORY NUMBERS WITH SERIES COMPLETION THAT ALSO HAS A SCAN POINT

P	/ / / /					KEY SPN (13-0)
P						SERIES COMPLETION DIRECTORY NUMBER
P	MAJOR CLASS				TEN (14-0)	
P	/ / / / / /					

Fig. 2—Translation Layouts for Directory Numbers With Series Completion

13.02 An office data administration (ODA) run or recent change messages may be used to add series completion to the No. 2 ESS translations. For an ODA run, the following ESS input forms must be completed and submitted to the WECO Regional Data Center.

• **2100 Directory Number Table:** This form is used to assign series completion to a directory number. The series completion number may also be included on this form if series completion is the only supplementary feature assigned to this directory number.

• **2107 Supplementary Information Table:** This form is needed when more than one supplementary item is needed on the 2100 form. The series completion number is listed on this form if it does not appear on the 2100 form.

13.03 To change a series completion number by recent change, use the A RC:L message along with the SER keyword. Refer to IM-2H200 for complete details on use of this message.

14. GROWTH/RETROFIT PROCEDURES

14.01 The addition of the series completion feature to an existing office is accomplished the same way as for a new installation. An ODA run or recent change is required to establish the required translations. Follow the procedures given in OFFICE DATA for adding series completion to an existing office.

15. TESTING

15.01 Test calls should be made to directory numbers with series completion to verify operation of the series completion feature. As many calls as series completion numbers in the list should be made to insure the entire list is working correctly.

15.02 Verify correct translations for each directory number that has series completion by using the A VY:L input message. Refer IM-2H200 for complete details on use of this message.

ADMINISTRATION

16. MEASUREMENTS

16.01 The only traffic measurements done on series completion lines are peg and usage counts that are normally done on all customer lines.

17. RECORD KEEPING

17.01 All output forms resulting from ODA runs should be retained as part of the office records. When recent change messages are used to change a series completion assignment, the applicable ESS forms should be marked to indicate the change.

18. CHARGING

18.01 Series completion is limited to numbers in the same local calling area. No provisions have been made for special AMA billing due to series completion.

AVAILABILITY**19. NEW INSTALLATIONS**

19.01 Series completion is available for all new No. 2 ESS installations with any issue of any generic program.

20. GROWTH/RETROFIT

20.01 This feature may be added to all existing No. 2 ESS offices.

SUPPLEMENTARY INFORMATION**21. GLOSSARY**

21.01 The following is a list of terms used in this document that may be unfamiliar to the reader.

- **Ground Start Lines**—Lines that signal a bid for service by applying ground to either the tip or ring lead.
- **Loop Start Lines**—Lines that signal a bid for service by going off-hook (loop closure).

- **Multiline Hunting**—A hunting arrangement in which sequentially numbered lines are hunted over in an attempt to find an idle line.

- **Office Data Administration (ODA) Run**—Mechanism by which No. 2 ESS office data may be changed. Information from the ESS input forms are inputted into the WECO Regional Data Center computer, assembled, then sent to the No. 2 ESS and installed into the system.

- **Transient Call**—A call that is not in a stable (talking) connection, such as dialing, ringing, etc.

- **Peg Count**—A register count of the number of times a facility is accessed.

- **Usage Counts**—A register count of the number of facilities that are simultaneously busy when examined at regular intervals.

22. REASONS FOR REISSUE

22.01 This is the initial issue of this section.

23. REFERENCES

23.01 The following is a list of documents that may be consulted for additional information related to the series completion feature.

- Dial Facilities Management Practices, Division H, Section 10e(2)
- TG-2H, No. 2 ESS Translation Guide
- PD, PR, PF-2H204-01 Digit Interpretation Program
- Traffic Facilities Practices, Division D, Section 12