

FEATURE DOCUMENT
SPEED CALLING
(NONCENTREX)
NO. 2 ELECTRONIC SWITCHING SYSTEM

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NOTICE

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FEATURE DEFINITION AND DESCRIPTION

1. DEFINITION

1.01 Speed calling is an arrangement that allows a customer to call frequently called numbers using fewer digits than normally required.

1.02 Speed calling (noncentrex) has two separate parts. The first is the provision for a customer to use an abbreviated number to access a repertory of stored directory numbers. The second is the ability of the customer to change the speed calling repertory. The customer may subscribe to 1-digit speed calling, which allows up to eight stored directory numbers, or 2-digit speed calling with up to 30 stored directory numbers, or both 8- and 30-code service. A customer with speed calling service may or may not be granted the ability to change the speed calling list.

1.03 The No. 2 Electronic Switching System (ESS) office can provide up to 1024 eight-code speed calling lists and up to 1024 thirty-code speed calling lists. Within these limits, each station may have one 8-code list and one 30-code list.

1.04 Speed calling is a software feature and is made available in any No. 2 ESS office equipped with either the LO-1 or EF-1 generic program. Since this is a software feature, no additional hardware is required. Speed calling is implemented into the No. 2 ESS via an office data administration (ODA) run or by recent change. For centrex speed calling, refer to Section 232-190-331.

2. DESCRIPTION

A. Customer (User) Perspective

2.01 To use speed calling, the customer goes off-hook and dials an abbreviated number of one or two digits followed by the sharp (#) button or a 4-second time-out (TO) to access the speed calling subtranslator. The central office then converts this abbreviated code into the entire telephone number represented by that dialed number. The entire number, which may consist of up to 11 digits, is used by the No. 2 ESS machine to complete the call by normal call processing procedures.

2.02 The digit (#) is the twelfth button on the TOUCH-TONE® dialing unit. If the customer does not have a 12-button TOUCH-TONE dialing unit, the 4-second time-out may be substituted. A customer may use either the # or time-out interchangeably. The makeup of the abbreviated code is defined as follows:

| <u>LIST</u> | <u>DIGITS</u> | <u>EXAMPLE OF ABBREVIATED CODE</u> |
|-------------|---|------------------------------------|
| 8-code | N# (or N followed by a 4-second time-out) | 2# (2 + time-out) |
| 30-code | AX# (or AX followed by a 4-second time-out) | 20# (20 + time-out) |

where: N = any digit 2 through 9
 A = any digit 2 through 4
 X = any digit 0 through 9

2.03 The Speed Calling feature cannot be used to replace part of a dialed number where additional digits are required to complete the call.

2.04 The contents of the speed calling lists associated with customers may be changed by a procedure using the customer's telephone as well as by the operating company via recent change procedures (see OFFICE DATA).

2.05 To dial a change into the speed calling list, the customer goes off-hook and dials 74 and then the # digit (or waits for a 4-second time-out) for a 1-digit speed calling list change, or 75 and then the # digit (or waits for a 4-second time-out) for a 2-digit speed calling list change. At this point, the station user receives second dial tone. Upon receipt of a second dial tone, the dial code for the number to be changed (one or two digits) and then the number to be associated with the code is dialed. The range of the 1-digit code is 2 through 9. Similarly, the range of the 2-digit code is 20 through 49. The number may be 7, 8, 10, or 11 digits in length. After dialing is completed, a confirmation is returned consisting of 100 milliseconds of dial tone, 100 milliseconds of silence, and then 300 milliseconds of dial tone. If the customer remains off-hook, the call is recycled to dial tone as a new origination.

B. System Implementation

Sizes of Speed Calling Lists a Customer May Select

2.06 There are two basic sizes of speed calling lists that can be used for speed calling. One is an 8-code list and the other is a 30-code list.

- **Eight-Code List:** A customer with an 8-code list can call up to eight different numbers using an abbreviated code of one digit.
- **Thirty-Code List:** A customer with a 30-code list can call up to 30 different numbers using an abbreviated code of two digits.

A customer may have either an 8-code list, a 30-code list, or both lists.

List Contents

2.07 Entries in the 8-code list have the same format as entries in the 30-code list. The

basic digit formats are shown in Figures 1 and 2 along with a brief description of each.

2.08 The maximum number of digits that can be stored for each speed calling code is 11. A partial list of examples of numbers that might be stored in either speed calling list is described below.

- A 7-digit DN (591-4404)
- A prefix + DN (1-591-4404)
- An area code + DN (301-591-4404)
- A prefix + area code + DN (1-301-591-4404)

Program Control Flow

2.09 The information in the originating register (OR) which is related to speed calling is shown in Figure 3.

2.10 When a customer is in the dialing phase of a call, the Digit Interpretation Program checks for either time-out or # after both the first and second digit. When either occurs, the possibility of speed calling is recognized. If the line has at

| | | | | | | | |
|-----------|-----------|---------------|---------------|--------------|-------------|-------------|---|
| 21 | | | | | | | 0 |
| P (21) | 0 (20) | D8 (19-16) | D0 (15-12) | D1 (11-8) | D2 (7-4) | D3 (3-0) | |
| P (21) | 0 (20) | D9 (19-16) | D4 (15-12) | D5 (11-8) | D6 (7-4) | D7 (3-0) | |

Fig. 1—Translation Arrangement for Storing Up to Ten Digits With No Prefix

| | | | | | | | |
|-----------|-------------|---------------|----------------|--------------|-------------|-------------|---|
| 21 | | | | | | | 0 |
| P (21) | 1 (20) | D8 (19-16) | D10 (15-12) | D1 (11-8) | D2 (7-4) | D3 (3-0) | |
| P (21) | PFX (20) | D9 (19-16) | D4 (15-12) | D5 (11-8) | D6 (7-4) | D7 (3-0) | |

PFX 1 = PREFIX DIGIT "1"
 0 = PREFIX DIGIT "0"

Fig. 2—Translation Arrangement for Storing Ten Digits Plus Prefix

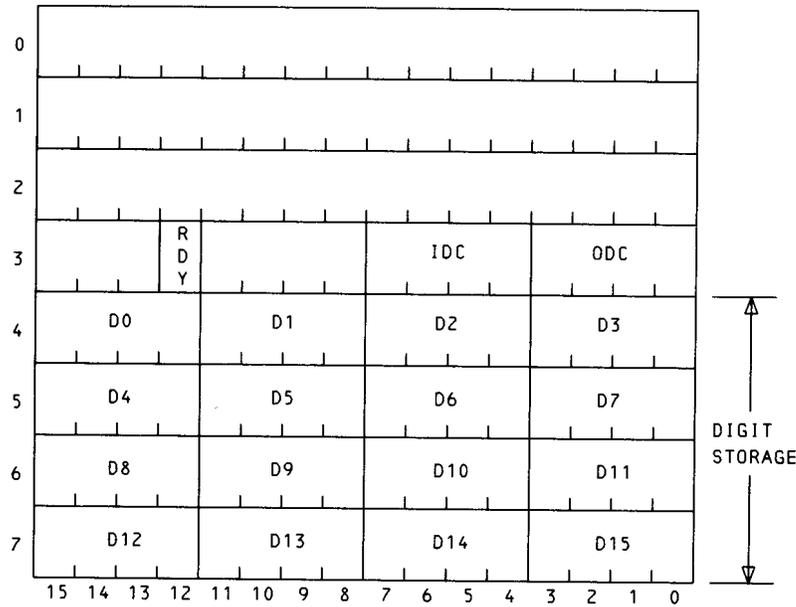


Fig. 3—OR Entries Related to Speed Calling

least one special service and the code dialed is a valid speed calling code, the Custom Calling Services Program (CCSER) is entered and the CCSER subroutine determines if the customer is allowed either or both the 8-code speed calling or 30-code speed calling.

2.11 When a valid speed calling request is received, the speed calling pointer is retrieved from the line terminal equipment number (TEN) translation. This pointer, together with the dialed code, locates the corresponding speed calling entry. There is one entry for each code (i.e., a total of 8 entries for 8-code, 30 entries for 30-code, and 38 entries for both). Each entry is a 2-word block of program store translation space and contains a 7-, 8-, 10-, or 11-digit directory number. The number is unpacked from the speed calling entry and inserted into the OR associated with the call. The OR is initialized to look as if the customer had actually dialed the directory number. Control is then returned to call processing, and the call continues in the normal manner.

Changing of Lists

2.12 Each customer accessing an 8-code list or 30-code list may have the ability to change the entries in these lists. The procedures for changing the 8-code and 30-code lists differ only

in the “change speed calling access code” to be dialed. A typical change to a 30-code speed calling list is as follows.

75#DT 23 727-3711 CT

75#=30-code speed calling change access code

DT=Dial tone

23=the calling entry to be changed

727-3711=the number to be used when the speed calling code (23) is dialed by the customer.

CT=Confirmation tone

2.13 The customer changes the speed calling list by dialing an access code (74# or 74 plus time-out for 8-code speed calling, or 75# or 75 plus time-out for 30-code speed calling). This signals the regular call processing programs that the speed calling routine should be entered. The speed calling routine then tests for a valid request by the customer. If the customer is not allowed to change the speed calling list, the call is routed to the custom calling error announcement. If the customer has the feature, an originating register is set up

to receive the 1- or 2-digit abbreviated code and a 7- or 10- digit number preceded by a 1+ or 0+ directing code, if required. The customer then receives second dial tone. A flag in the transient call record is set, and the transient call record is set up so that normal digit-receiving routines may be reentered. The customer then dials the code to be changed, followed by the new directory number for this code.

2.14 When a customer has completed dialing and the number has been successfully translated, confirmation tone as described in 2.05 is returned to the customer to indicate that this request has been successfully handled. If the customer then remains off-hook for one second, the call is recycled to dial tone as a new origination.

2.15 A paper tape TTY record of all customer dialed-in changes should be generated as they are inputted by the customer. These tapes provide a record of speed calling changes and are perforated in standard service order format so that they may be directly inputted through the service order channel should recent change areas be destroyed before the changes are updated in permanent memory. See 13.08 for details of the input message that will cause these tapes to be created.

3. FEATURE FLOW DIAGRAM

3.01 The flow diagram illustrated in Figures 4 and 5 is a graphical representation of speed calling—noncentrex.

4. INTERACTIONS

4.01 Speed calling can be used in lieu of any legitimate completely dialable 7- or 10-digit (with or without the 0 or 1 prefix) directory number; not 411, 611, 0, etc. (Speed calling cannot be used to replace part of a dialed number where additional digits are required to complete the dialing information. It must represent the entire number to complete the call.)

4.02 The call forwarding activate code cannot be stored in the speed calling list; however, a station user may dial the call forwarding activate code, receive second dial tone, and then dial a speed calling code.

4.03 If the Speed Calling feature is assigned to a multiline hunting group (MLHG), it must be assigned on a group basis to all members of the hunt group. Each MLHG may have either the 8-code list, 30-code list, or both lists. In addition, all members may have the ability to alter the information in the speed calling list; however, the ability to alter the speed calling list may be restricted to selected individual members of the MLHG, i.e., the ability to change a speed calling list may be assigned on a group or member basis.

ATTRIBUTES

5. STATION/SYSTEM

5.01 The Speed Calling feature covered by this document is provided on a per-station basis.

6. LIMITATIONS

6.01 The No. 2 ESS office can provide up to 1024 eight-code speed calling lists and up to 1024 thirty-code speed calling lists. Within the limits, each customer may have one 8-code list and one 30-code list.

6.02 A maximum of 11 digits can be stored in any speed calling entry associated with either of the speed calling list.

6.03 "Split" speed calling is not allowed. For example, 0 + 23 (where 0 represents operator access and 23 represents a 7-digit directory number) will not work. The speed calling entry must contain all prefix digits in addition to the directory number desired.

6.04 The call forwarding activate and deactivate code cannot be stored in a speed calling list by dial change.

7. RESTRICTION CAPABILITY

7.01 Speed calling is assigned on a per-station basis and each station may be assigned an 8-code list, a 30-code list, neither, or both.

7.02 The Speed Calling feature cannot be assigned to party lines, manual lines, or coin lines.

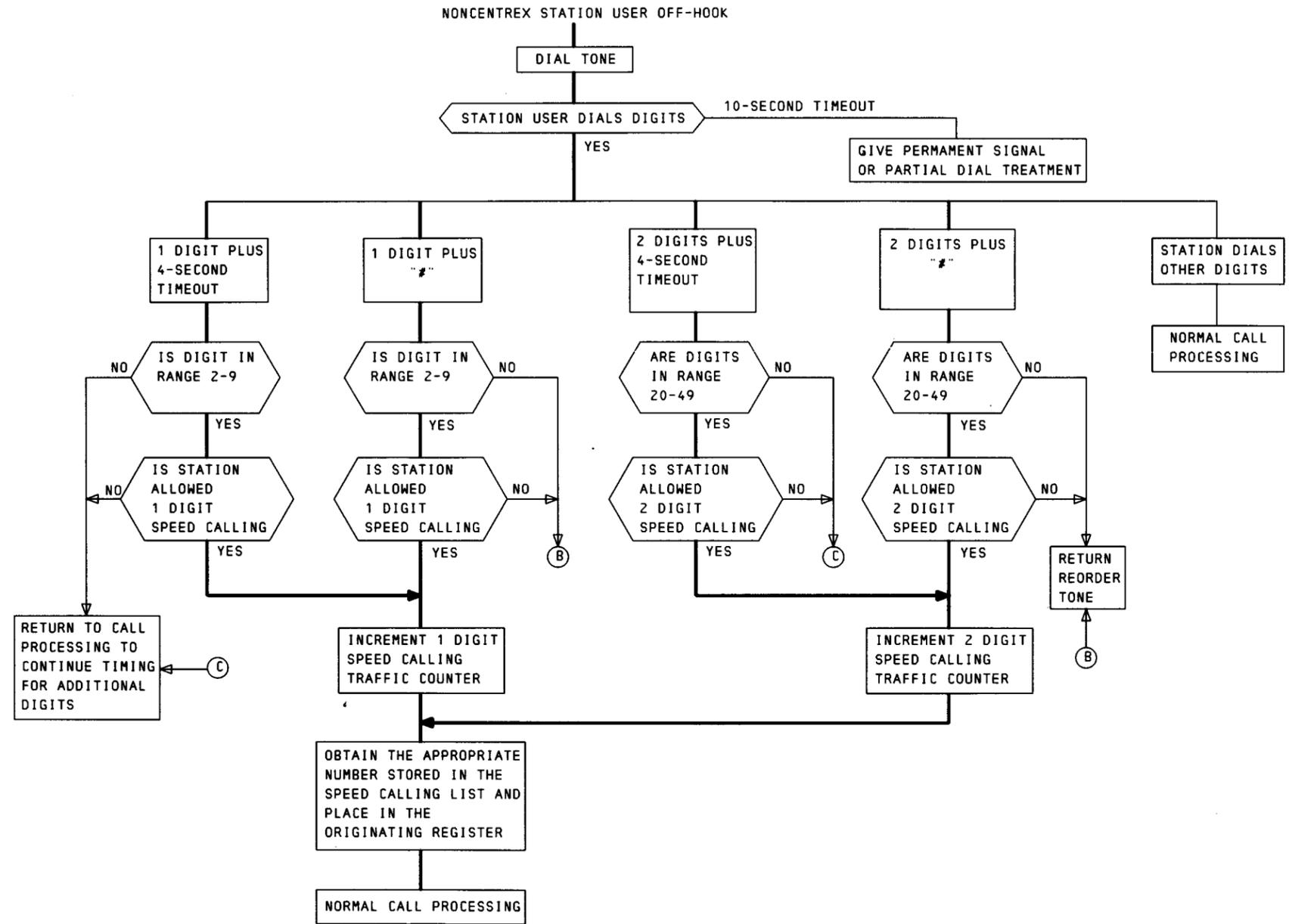


Fig. 4—Feature Flow Diagram Speed Calling

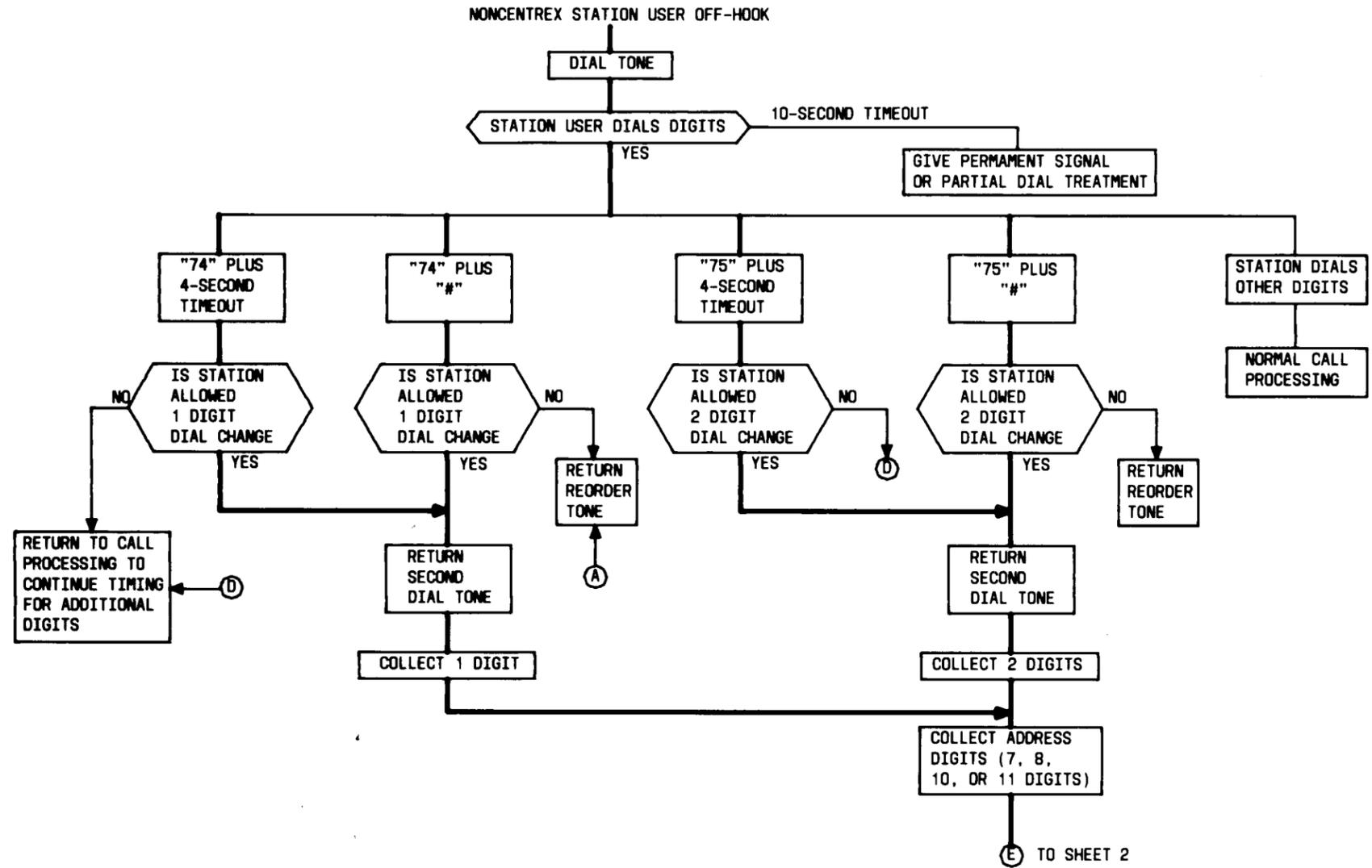


Fig. 5—Feature Flow Diagram Speed Calling—Dial Change (Sheet 1 of 2)

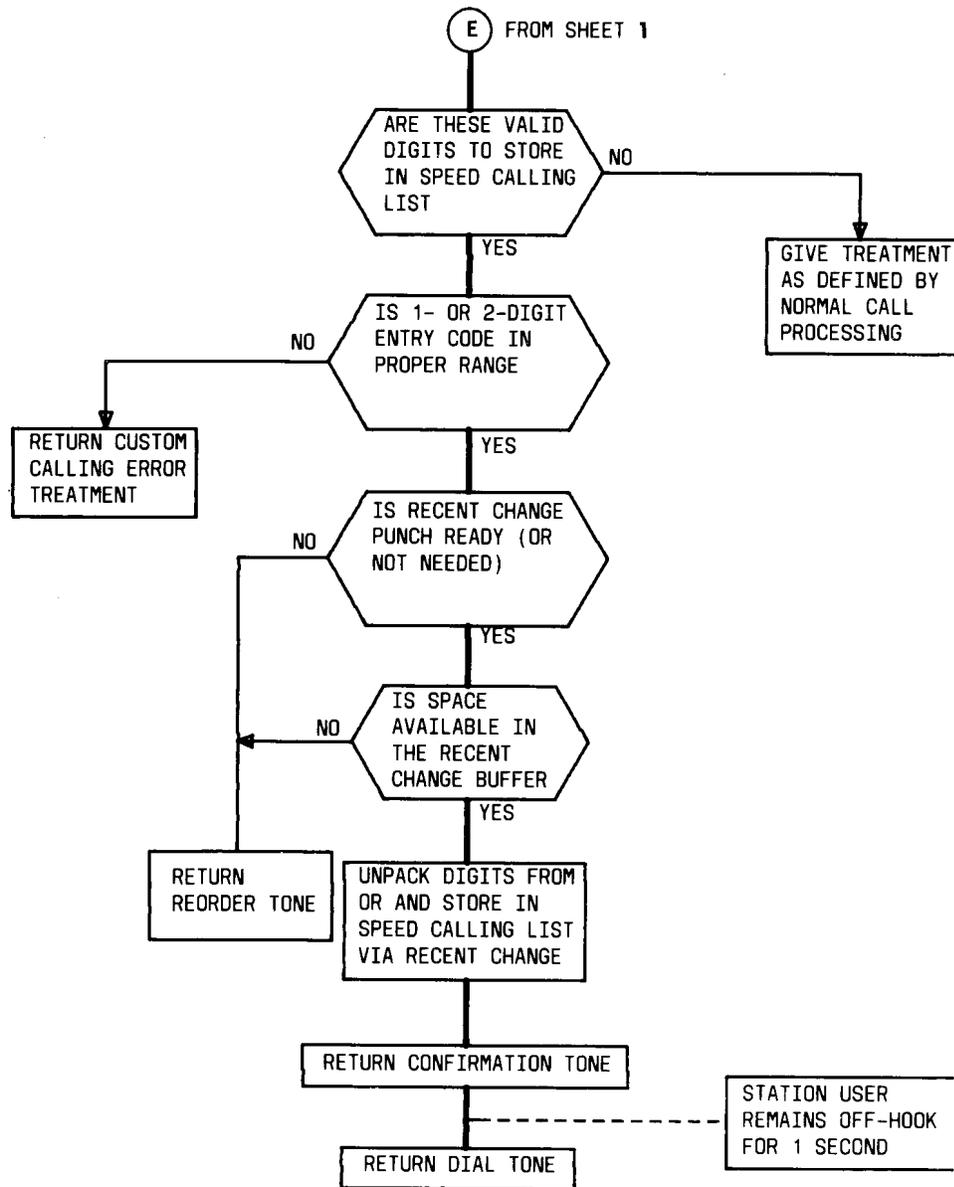


Fig. 5—Feature Flow Diagram Speed Calling—Dial Change (Sheet 2 of 2)

8. COST DATA

8.01 Program store translation requirements for speed calling include:

- 8-code list—16 words per list

- 30-code list—60 words per list

- Two words in the Master Table Index (MTI)

- Two words times the maximum number of 8- or 30- code lists as indicated in the MTI entry

- One bit required per customer line to change the 8-code list (see Figure 6)

- One bit required per customer line to change the 30-code list (see Figure 6).

8.02 Call store is required to store the recent change information resulting from a customer

dialed or telephone company administered speed calling change. The call store is required until the next recent change update is performed by the plant personnel and requires four words of call store for each change.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 This feature is provided as part of the LO-1 and EF-1 generic programs in a No. 2 ESS office.

9.02 In planning for this feature, completion of certain translation input forms is required to indicate whether or not each customer line is allowed this feature.

10. HARDWARE ENGINEERING

10.01 There are no special hardware engineering requirements for this feature.

11. SOFTWARE ENGINEERING

11.01 Provisions must be made for speed calling in the program store and call store. Refer to Traffic Facilities Practices, Division D, Section 12a, for details in engineering the stores.

12. COMPATIBILITY

12.01 There are no compatibility or interface problems associated with the Speed Calling feature.

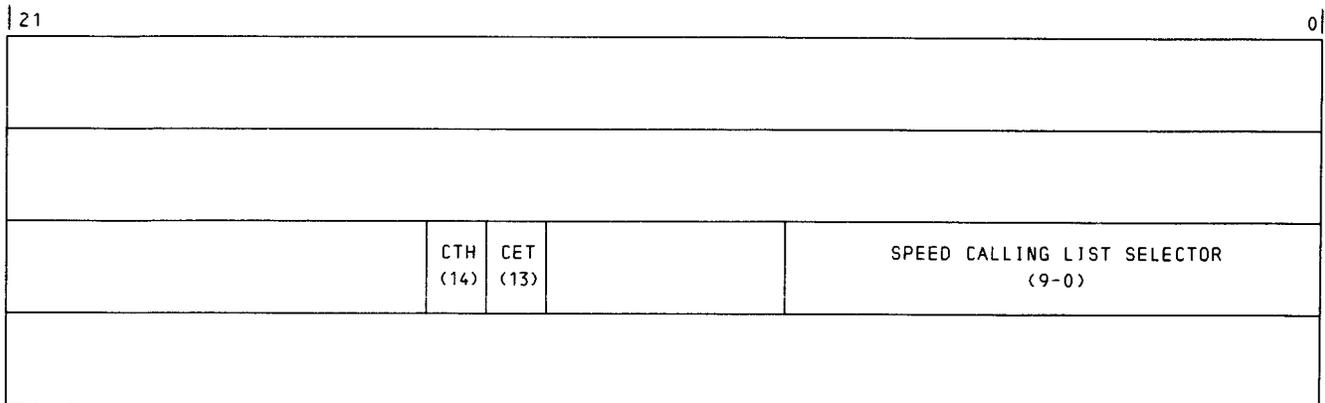
13. OFFICE DATA

Translations

13.01 Figure 6 shows the portion of the 4-word expansion used for speed calling. Bit 14 is used to indicate if this line is allowed to make changes in the 30-code list (CTH=1 if changes are allowed). Bit 13 is used to indicate if this line is allowed to make changes in the 8-code list (CET=1 if changes are allowed). The speed calling list selector is the index into the 8-code and 30-code expansion tables.

13.02 Figure 7 contains the complete layout used in accessing a particular entry in both 8-code and 30-code lists.

13.03 Translation space must be provided by an ODA run. Recent change capability is provided for adding or removing the Speed Calling feature to an existing line or to provide a customer with the ability to directly dial in changes to a list.



CTH-1 = PERMITTED TO CHANGE 30-CODE SPEED CALLING LIST
 CET-1 = PERMITTED TO CHANGE 8-CODE SPEED CALLING LIST

Fig. 6—4-Word Expansion Showing Portion Used for Speed Calling

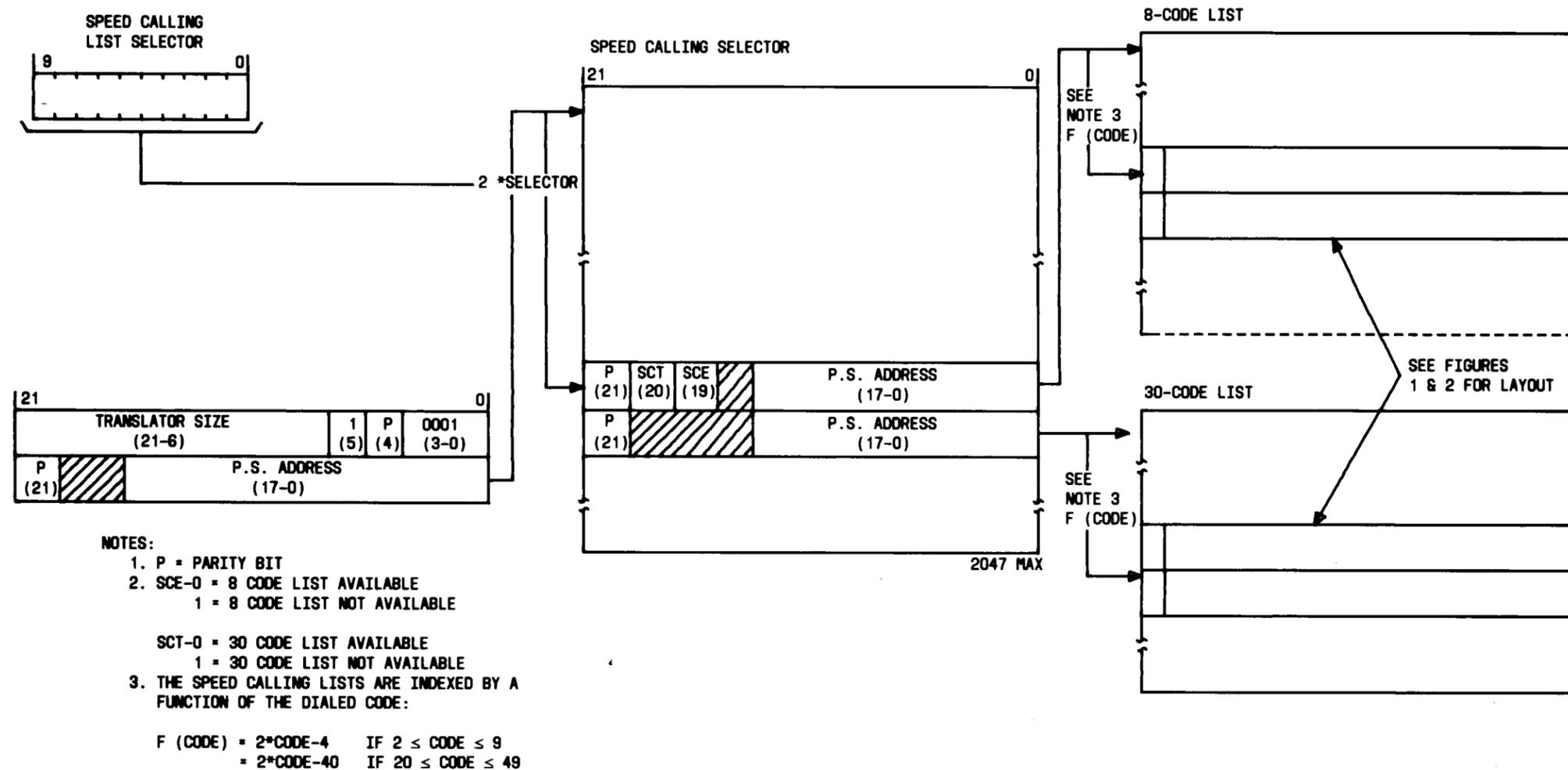


Fig. 7—Translation Layout of 8-Code and 30-Code Speed Calling Lists

13.04 All of the ODA output forms which result from initiating the Speed Calling feature are retained as part of the office records.

13.05 After the ODA run to allow speed calling is completed, the translation data associated with speed calling becomes a part of the office data base stored in the translation area of program store.

13.06 In order to allow the feature discussed in this document in a No. 2 ESS office, an ODA run may be made. This is accomplished by appropriately completing the following ODA input forms.

- **ESS 2100-Directory Number Table**—This form is used to define the directory numbers (DN) associated with the Speed Calling feature and to indicate telephone numbers referenced for speed calling that have the ability to alter the information in the list.

- **ESS 2105—Multiline Hunting Group Table**—This form is used to indicate the speed calling features for a MLHG and to indicate selected individual members who may have the capability to alter the information in the speed calling list. All members are allowed to alter the information unless indicated otherwise on this form.

- **ESS 2107—Supplementary Information Table**—This form is used to supplement the entries made on the ESS 2100 and ESS 2105 forms. This form must be completed for all initial and update ODA runs to incorporate the feature discussed herein.

13.07 The above forms must be completed by the Telephone Company Dial Administrator and submitted to WECO Regional Center for processing. Normal scheduling procedures should be observed. For additional information see Division D, Section 1 of the Translation Guide, TG-2H.

B. Recent Change (RC) Messages

13.08 Recent change message formats affected by the Speed Calling feature are as follows. Refer to IM-2H200 for details of the recent change messages.

RC MESSAGE

FUNCTION

A RC:L

Used to assign the Speed Calling feature to an existing line. The keyword SC is used to add or delete the Speed Calling feature. In addition, the keyword CH and either ADD 1/ or ADD 2/ or DLT 1/ or DLT 2/ is used to provide the customer with the ability to dial in changes to the speed calling list.

A RC:SC

Used to assign a number to a code on a customer speed calling list, or to change the number associated with a call.

A RC:MLH

Used to assign the Speed Calling feature to a MLHG. The keyword SC is used to add or delete the speed calling feature on a group basis. In addition, either ADD 1/ or ADD 2/ or DLT 1/ or DLT 2/ is used to provide the MLHG customer with either 1-digit or 2-digit speed calling.

A RC:PUN:1!

Used to cause a paper tape TTY record of all customer inputted changes to be created as the changes are dialed.

A RC:PUN:0!

Used to instruct the machine to no longer produce tapes from customer dialed changes.

A VY:SC

Used to verify the contents of both speed calling lists, given the telephone number of TEN.

A VY:MLH

Used to verify the MLHG and/or member translations.

A VY:L

Used to verify customer line originating and terminating translations.

14. GROWTH/RETROFIT PROCEDURES

14.01 To incorporate this feature into an existing system for which translator space has not been provided, an ODA run is necessary. After the ESS input forms have been submitted and the

update is ready to be incorporated, insert the new information in accordance with **Section 232-124-301 Office Update Procedures Using Regional ODA Program.**

15. TESTING

15.02 Testing of the Speed Calling feature may be done by making test calls to verify that the feature is operational.

ADMINISTRATION

16. MEASUREMENTS

16.01 The following traffic and plant measurements are available for the Speed Calling feature. Refer to Section 232-120-301 for additional details.

- **OFT41** Peg count to the number of times centrex stations or noncentrex lines use the 1-digit Speed Calling feature.
- **OFT42** Peg count of the number of times centrex stations or noncentrex lines use the 2-digit Speed Calling feature.

17. RECORD KEEPING

17.01 ODA forms are retained as part of the office records. In addition, the punch tapes and verify messages generated by recent change messages (13.08) are also retained as part of the office records.

18. CHARGING

18.01 Speed calls outside the free calling area are billed to the customer placing the call just as if the customer had dialed the entire number stored in the list associated with the abbreviated code dialed.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 The Speed Calling feature described in this document is available in any No. 2 ESS office equipped with either the LO-1 or EF-1 generic program.

20. GROWTH/RETROFIT

20.01 The Speed Calling feature described in this document may be retrofitted into any office equipped with the LO-1 or EF-1 generic program.

SUPPLEMENTARY INFORMATION

21. GLOSSARY

21.01 The following list identifies terms in this feature document.

- **Confirmation Tone (CT):** The CT consists of a 100-ms burst of dial tone followed by 100-ms silence, followed by a 300-ms burst of dial tone from the digit receiver still connected to the line.
- **Dial Tone (DT)**
- **Directory Number (DN)**
- **Multiline Hunt Group (MLHG):** A customer optional feature which allows calls to hunt over a group of customer facilities in order to connect a calling party with an idle facility within the group.
- **Office Data Administration (ODA):** Mechanism by which translation information may be assembled or changed for a No. 2 ESS. Information from the ESS input forms is inputted into the regional ODA computer, assembled, then sent to the No. 2 ESS.
- **Terminal Equipment Number (TEN):** A 6-digit number representing the physical location of a line, link, trunk, or service circuit in the switching network.
- **Transient Call Record (TCR):** Consists of eight call store words and controls the progress of the call from origination until an answer signal has been received and the connection is placed in a talking state. It also controls the action taken to disconnect a call.
- **Abbreviated Code:** In No. 2 ESS, a 1- or 2-digit number that is dialed to access a number that is stored in a speed calling list.

- **Access Code:** Those digits dialed to activate the change speed calling function.
- **List Entry:** Refers to the contents of a speed calling list associated with a particular abbreviated code.
- **Time-Out (TO):** Time-out occurs if no action is taken by the customer for a period of four seconds after dialing one or two digits. It is used to signify the completion of dialing. It is an alternative to Sharp (#) on a TOUCH-TONE telephone.
- **Sharp (#):** The # is the twelfth digit on a TOUCH-TONE telephone and is used in the same way that time-out is used.
- **Central Office (CO):** The switching equipment in a building which provides exchange telephone service for a given geographical area.
- **Program Store (PS):** The equipment unit of No. 2 ESS that stores the program and the translation information regarding lines and trunks.
- **Recent Change (RC):** The ability to change certain translations within No. 2 ESS via teletypewriter input.

22. REASONS FOR REISSUE

22.01 This is the initial issue of this document.

23. REFERENCES

23.01 The following documents provide supplementary information concerning the Speed Calling feature described in this document.

- PD-2H211-01, Program Specification—Custom Calling Service Program
- PA-2H200, Office Data Tables Layout Specifications
- Translation Guide, TG-2H
- Traffic Facilities Practices, Division D, Section 12
- IM-2H200 Input Message Manual
- OM-2H200 Output Message Manual
- Bell System Practices

Section 232-103-101, Call Processing Description, No. 2 Electronic Switching System

Section 232-118-102 Recent Change Procedures (Central Office Changes) LO-1

Section 232-118-103 Recent Change Procedures (Central Office Changes) EF-1

Section 232-120-301, Traffic and Plant Measurements, 2-Wire, No. 2 Electronic Switching System

Section 232-124-301 Office Update Procedures Using Regional ODA Program

FD 232-190-331, Centrex Speed Calling, No. 2 Electronic Switching System