

FEATURE DOCUMENT
DIRECTED CALL PICKUP—NONBARGE-IN FEATURE
2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS

CONTENTS	PAGE	CONTENTS	PAGE
<i>FEATURE DEFINITION AND DESCRIPTION</i>	3	12. COMPATIBILITY	11
1. DEFINITION	3	13. OFFICE DATA	11
2. DESCRIPTION	3	14. GROWTH/RETROFIT PROCEDURES	12
3. FEATURE FLOW DIAGRAM	5	15. TESTING	12
4. INTERACTIONS	5	<i>ADMINISTRATION</i>	12
<i>ATTRIBUTES</i>	7	16. MEASUREMENTS	12
5. STATION/SYSTEM	7	17. RECORD KEEPING	12
6. LIMITATIONS	8	18. CHARGING	12
7. RESTRICTION CAPABILITY	8	<i>AVAILABILITY</i>	12
8. COST DATA	8	19. NEW INSTALLATIONS	12
<i>INCORPORATION INTO SYSTEM</i>	8	20. GROWTH/RETROFIT	13
9. PLANNING	8	<i>SUPPLEMENTARY INFORMATION</i>	13
10. HARDWARE ENGINEERING	11	21. GLOSSARY	13
11. SOFTWARE ENGINEERING	11	22. REASONS FOR REISSUE	13
		23. REFERENCES	13

NOTICE

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SECTION 231-090-371

FIGURES	PAGE	FIGURES	PAGE
1. Centrex Digit Interpreter Word . . .	4	5. Setup of Incoming Call for Possible DPNB Answer	7
2. Line Equipment Number Class (LENCL) 3 Word	4		
3. Directory Number Auxiliary Block Translation Words	5	6. DPNB Actions—Feature Flow Diagram	9
4. Parameter Word Z3PUGT, Pickup Queue, and Ringing Register Relationship	6	7. Procedure for Adding DPNB	13

FEATURE DEFINITION AND DESCRIPTION**1. DEFINITION**

1.01 The *directed call pickup nonbarge-in (DPNB)* feature enables a station user to answer calls directed to station lines in any pickup group in the same Centrex group or Centrex complex. The incoming call is answered by dialing the DPNB access code and the extension number of the station to be answered. If the incoming call has not been answered, the station dialing the DPNB access code is connected to the incoming call. If the incoming call has already been answered at the called station, the station user who dialed the DPNB access code receives busy tone.

2. DESCRIPTION**INTRODUCTION**

2.01 The DPNB feature operates in a manner similar to the *directed call pickup with barge-in feature (DPU)*. There are two important differences: DPNB will not enter into an existing talking connection, and feature availability is determined from the originating party rather than the terminating party. This means that the station initiating the request to pick up a call must have the DPNB feature; whereas, in the DPU case, the ringing station must have the DPU feature.

2.02 The DPNB feature is most convenient when used with a Line Status Indicator allowing discrete identification of incoming calls.

CUSTOMER PERSPECTIVE

2.03 The DPNB feature allows a user at station A to pick up an unanswered call to station B in any pickup group (PUG) in the master Centrex. A request is initiated by dialing an access code (typically one to three digits) followed by the extension number of station B (currently being rung). After the DPNB feature has been initiated, the ESS verifies that station A has the DPNB feature. If station A does not have the DPNB feature, it is given regular overflow tone. If DPNB is allowed, the talking connections are completed to the incoming call unless the call has already been answered. In this case, busy tone is returned to station A. Once station A is connected to the call, the DPNB user may converse with the calling party.

2.04 The station being picked up (station B) must have the *call pickup (CPU)* feature; however, the station initiating the DPNB request (station A) does not have to have the CPU feature.

2.05 The one- or 2-digit speed calling feature can be used following the DPNB access code in lieu of the extension number of the station to be picked up.

SYSTEM IMPLEMENTATION**Setup of Incoming Call**

2.06 When a call is placed to a station within a pickup group, a ringing register (RR) is initialized with the appropriate data and the RR is placed on a pickup queue. At this time, the ESS program waits for ring-trip, abandon, or DPNB action.

2.07 If the called party answers, the ringing register is removed from the pickup queue. Normal actions are followed to take down the ringing and audible connections and to set up a talking path.

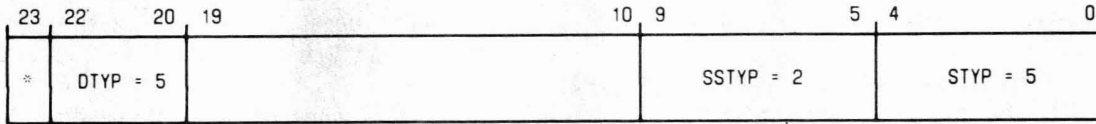
2.08 If the calling party abandons, the ringing register is removed from the pickup queue and normal disconnect actions are followed.

Directed Call Pickup—Nonbarge-In Actions

2.09 When the DPNB access code is dialed, the digits are collected in an originating register and interpreted through the Centrex digit interpreter table. The digit interpreter table contains a data type (DTYP) 5, subtype (STYP) 5, sub-subtype (SSTYP) 2 entry for the DPNB access code (Fig. 1).

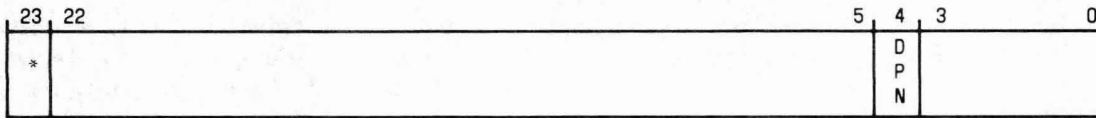
2.10 When the DPNB access code is recognized, the originating party's line equipment number (LEN) translation is checked for the availability of the DPNB feature. The directed call pickup nonbarge-in item (DPN) in the LENCL3 word is set to 1 if the line has the feature (Fig. 2). If the feature is not available to the line (DPN=0), regular overflow tone (RI 80) is returned and the request is disallowed. If DPNB is available, the program proceeds with the call pickup actions.

2.11 The originating register is reinitialized to collect the digits of the extension number, and dial tone is returned to the station. The dial



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS SET TO ZERO IN NO. 1A ESS.

Fig. 1—Centrex Digit Interpreter Word



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS SET TO ZERO IN NO. 1A ESS.

LEGEND:

DPN = 1 WHEN LINE OR MULTILINE HUNT GROUP HAS DPNB FEATURE.

Fig. 2—Line Equipment Number Class (LENCL) 3 Word

tone indicates that the extension number of the station to be picked up is needed. After the extension number is collected, a check is made to determine if the dialed station is busy or idle. If the extension is idle, the originating station is given busy tone. If the station is busy, the system continues call pickup operations.

2.12 The directory number (DN) auxiliary block of the called extension is examined to see if the line has call pickup. If a station can be picked up, item DCPU in its DNCL2 word must be set to 1 (Fig. 3). If the station does not have call pickup, overflow tone is returned to the user who initiated the DPNB action.

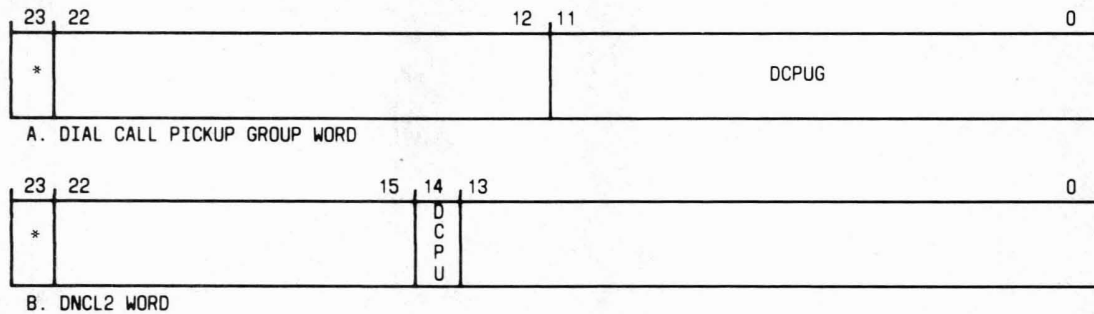
2.13 If the pickup operation is allowed, a comparison check is made between the master Centrex complex numbers (MCPXN) of the dialing and dialed stations. If these numbers do not match, then overflow treatment is given to the station requesting use of the DPNB feature. When the stations are in the same Centrex complex, a translation routine recovers the dial call pickup group number (DCPUG)—also called pickup group number (PUGN)—from the called extension's directory number translations (Fig. 3). Using DCPUG, the system searches the

pickup queue for the ringing register of the called station. As previously noted, the ringing register was placed on the pickup queue during the setting up of the incoming call. Refer to Fig. 4 for the interrelationship of the pickup queue and ringing register.

2.14 If the ringing register is not found on the pickup queue, the called extension is assumed to have been answered since the extension checked busy. In this case, busy tone is returned to the user who originated the DPNB request.

2.15 If the ringing register is found on the pickup queue, the called extension has not answered the incoming call and DPNB is allowed. A talking connection is established between the incoming call and the station user who dialed the DPNB access code. If the connection operation fails, the station that originated the DPNB request is given regular overflow tone. The called station continues ringing, and the incoming call party continues to hear audible ringing.

2.16 Prior to translation of the DPNB access code and the associated extension number, other features may have been requested. For example,



* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS. IT IS SET TO ZERO IN NO. 1A ESS.

LEGEND:

DCPUG - DIAL CALL PICKUP GROUP
DCPU = 1 IF LINE CAN BE PICKED UP

NOTE: THESE TRANSLATION WORDS REQUIRED FOR LINE THAT IS TO BE PICKED UP BY DPNB FEATURE.

Fig. 3—Directory Number Auxiliary Block Translation Words

the DPNB requesting station may initiate a call hold request prior to the DPNB request. Then, a 3-port conference circuit is also connected to the DPNB requesting station before the incoming call is picked up. Other feature requests are also allowed before completing the DPNB feature.

3. FEATURE FLOW DIAGRAM

3.01 Figure 5 is a feature flow diagram depicting the setting up of an incoming call to a Centrex station within a pickup group. This feature flow diagram highlights the facets of the program action that are important to processing the call in relation to the DPNB feature.

3.02 Figure 6 is a summary of the feature flow actions that occur once a station requests the DPNB feature.

4. INTERACTIONS

4.01 For a station to be answered by the DPNB feature, the line must translate for the regular call pickup feature. A pickup group number (PUGN) is associated with the call pickup feature. Therefore, all extensions that are to be answered by the DPNB feature must be associated with a pickup group.

4.02 The CPU, DPU, and DPNB features may exist simultaneously on a line or multiline hunt group (MLHG). When an incoming call exists on a pickup queue, any of these three features may pick up the call. CPU can only pick up the incoming call when its ringing register is in the first position of the pickup queue; whereas, DPU and DPNB direct the pickup to a particular extension, regardless of the position of the ringing register on the pickup queue.

4.03 The speed calling feature can be used with the DPNB feature to yield extension numbers if desired.

4.04 The DPNB feature may interact with the call pickup, speed calling, call hold, call forwarding—don't answer, directed call pickup with barge-in, and call waiting features. These interactions result from the sequence of events as indicated above. For example, a station having the call hold feature, in addition to the DPNB feature, may first place an existing call on hold before picking up an incoming call by using DPNB. The other interactions are similar. If the call forwarding—don't answer feature is provided on the called line, the incoming call can be picked up via DPNB only prior to the actual transfer to the call forwarding directory number.

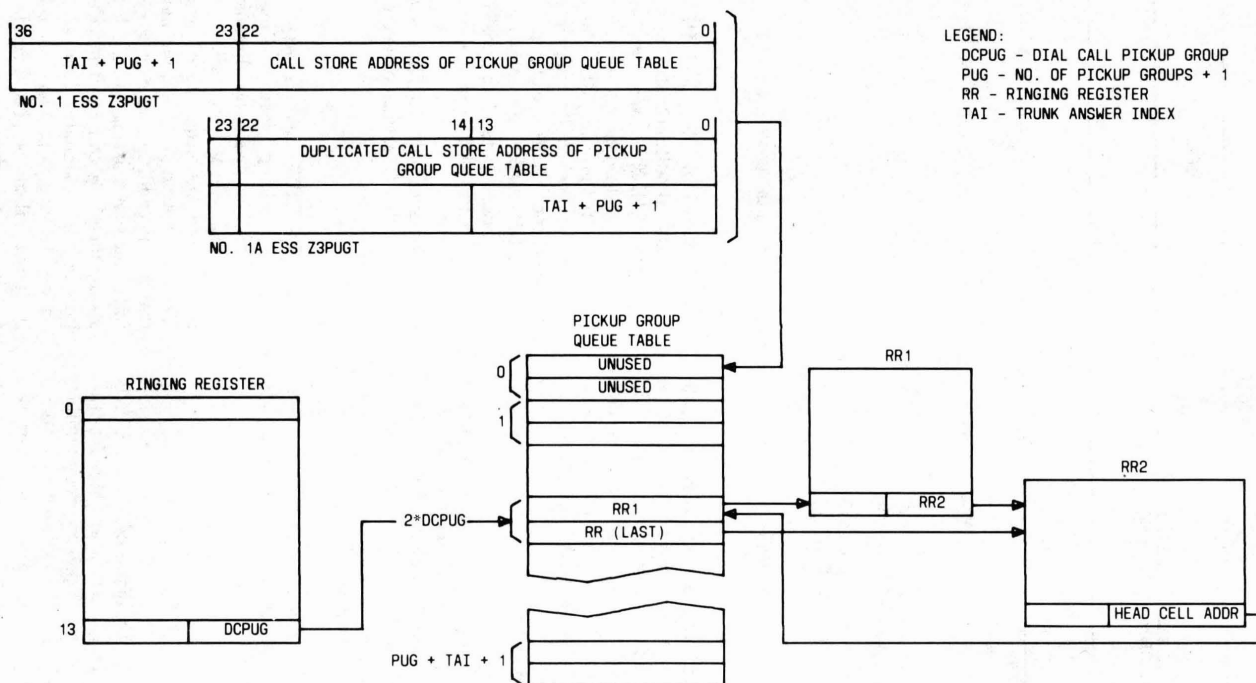


Fig. 4—Parameter Word Z3PUGT, Pickup Queue, and Ringing Register Relationship

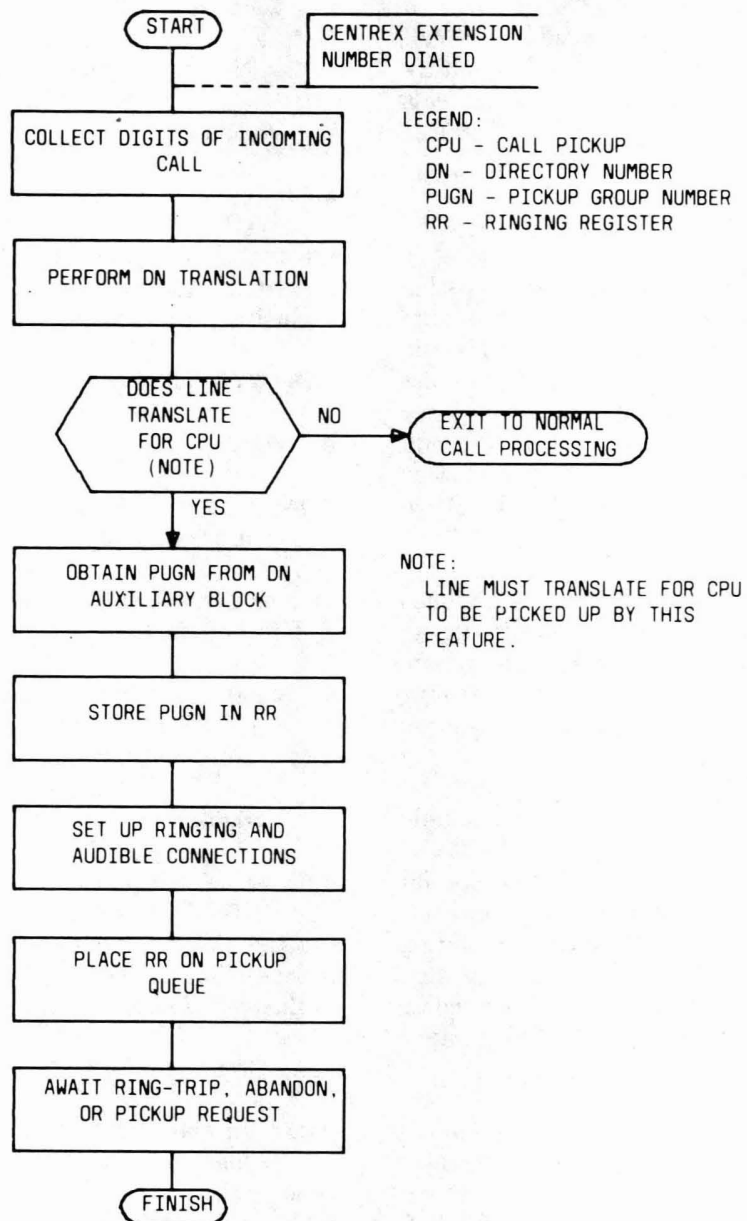


Fig. 5—Setup of Incoming Call for Possible DPNB Answer

ATTRIBUTES**5. STATION/SYSTEM**

5.01 The DPNB feature is available to customers on a per-station basis within a single Centrex group or Centrex complex. This feature is provided to multiline hunting stations on a per-multiline hunting group basis. In a series completion group the feature is available to a Centrex station on a per-line basis.

5.02 The DPNB feature may be used with 50A Customer Premises Systems positions (121-, 131-, or 151-type consoles). It is not available for use with the 51A Customer Premises Systems positions (1B-, 2B-, 27-, or 47-type consoles).

5.03 The DPNB feature has certain distinct benefits. It is highly effective in reducing otherwise needed key equipment. The feature allows each station to discreetly identify the call to be answered versus the random answering

fashion of the call pickup feature. Also, directed call pickup nonbarge-in does not invade on a call already in progress. This aspect allows this feature to avoid one of the possibly undesirable side effects of the directed call pickup with barge-in feature.

6. LIMITATIONS

6.01 A maximum of 4095 pickup groups is possible in a No. 1 or No. 1A ESS office. The sum of the quantity of pickup groups (PUG) plus the quantity of trunk answer index groups (TAI) must not exceed 4095. There is no limit on the number of lines that can have the same pickup group number or the number of ringing registers that may be on any pickup queue, up to the office limit.

6.02 Only one pickup group number can be assigned to a station, and only one pickup group number can be assigned to a multiline hunt group. Incoming calls to a line within a multiline hunt group cannot be picked up unless the terminal has a defined directory number.

6.03 Normally, the distance over which an audible or visual signal can be recognized limits the use of the DPNB feature. By utilizing special arrangements such as the Line Status Indicator, the distance may be extended between the ringing extension and the station requesting to use this feature. One can be notified that a particular extension is ringing by paging or remote light indication.

7. RESTRICTION CAPABILITY

7.01 Not applicable.

8. COST DATA

MEMORY—NO. 1 ESS

A. Fixed

8.01 There is an increase in the 1E3, generic program of approximately 20 program store words directly attributable to the DPNB feature. This increase is in addition to the 950 words required to implement the call pickup feature, which is a basis for this feature.

B. Conditional

8.02 Not applicable.

C. Variable

8.03 One translation word for final data type (DTYP 5, STYP 5, SSTYP 2) is required for the DPNB access code. One LEN translation word (LENCL3) per line is chargeable if required exclusively for this feature.

MEMORY—NO. 1A ESS

A. Fixed

8.04 The No. 1A ESS requires an additional 25 program store words for the 1AE4 and later generic programs. This requirement is in addition to the 1200-word fixed requirement of the basic call pickup feature.

B. Conditional

8.05 Not applicable.

C. Variable

8.06 One translation word for final data type (DTYP 5, STYP 5, SSTYP 2) is required for the DPNB access code. One LEN translation word (LENCL3) per line is chargeable if required exclusively for this feature.

REAL TIME

8.07 In the No. 1 ESS environment, the DPNB feature uses 200 cycles plus approximately 3850 cycles for basic call pickup. Similarly, an additional 400 cycles are added to the No. 1A ESS real-time costs in addition to approximately 7675 cycles needed for call pickup.

8.08 The cycle time is 5.5 microseconds for the No. 1 ESS and 0.7 microsecond for the No. 1A ESS.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 In order to prevent wasted call store area, the pickup group numbers (PUGN) should be assigned in consecutive sequence, beginning with

0001. The quantity necessary is equal to (PUG + TAI + 1). Using the lower values of the pickup group numbers first reduces the engineered size of the call store area. Since the PUGN indexes into the pickup group queue table, which is sized at $2 \times (\text{PUG} + \text{TAI} + 1)$, a smaller quantity saves data storage area.

9.02 There are no restrictions on assigning lines with different major class codes to the same pickup group number. For example, a fully restricted line could be connected to an outside world call (or attendant) if it is in the same pickup group as the unrestricted line. The resolution of conflicts of this type is left to the discretion of the operating company.

10. HARDWARE ENGINEERING

10.01 Not applicable.

11. SOFTWARE ENGINEERING

11.01 Not applicable.

12. COMPATIBILITY

12.01 Not applicable.

13. OFFICE DATA

TRANSLATIONS

A. Translation Layout

13.01 In the digit interpreter table of the Centrex common block is a special service entry for the DPNB feature. This entry is a data type 5, subtype 5, (call pickup), sub-subtype 2 (DPNB). The layout for this translation data word is shown in Fig. 1. When the DPNB access code is dialed, this is the final data type derived from digit interpretation of the access code. All office data requirements are basically the same for the various call pickup feature options. The difference occurs in the digit interpretation results for the options.

13.02 Directed call pickup nonbargain-in is an originating type of feature and, as such, the pertinent translation information is contained in the line equipment number (LEN) data. The DPN item in the LENCL3 word is used to indicate the availability of the feature to a station. This item is set to 1 in the LEN auxiliary block or in

the multiline hunt group common block when DPNB is available for use by stations in the group (Fig. 2).

13.03 A directory number auxiliary block is required to store the pickup group number and to indicate that the station translates for regular call pickup (Fig. 3); therefore, lines which are to be picked up using the DPNB feature cannot be abbreviated as a terminating class. The line equipment number, however, need not have an auxiliary block and may be abbreviated as an originating class.

B. Recent Change (RC) Messages

13.04 Recent change message formats affected by the DPNB feature are as follows:

RC Message	Function
RC:CTXDI	Builds Centrex digit interpreter table entries for the final data type required for this feature using keyword STYP 5. Refer to Section 231-118-331 or Section 231-318-309.
RC:LINE	Add the DPNB feature to Centrex lines using keyword PNB. Refer to Section 231-118-335 or Section 231-318-302.
RC:MLHG	Adds the DPNB feature to Centrex multiline hunt group common blocks using keyword PNB. Refer to Section 231-118-335 or Section 231-318-302.

C. Uniform Service Order Code (USOC)

13.05 The uniform service order code (USOC) for the directed call pickup nonbargain-in feature is E6D.

PARAMETERS

13.06 No additional parameter words are required for the DPNB feature. Two parameter words, B6DPUP and Z3PUGT, required by the call pickup feature are also used by this feature. Since having call pickup is a prerequisite of having the DPNB feature, these two words are available for use.

14. GROWTH/RETROFIT PROCEDURES

14.01 If there are no available unused pickup groups, a new parameter run is necessary to increase the engineered maximum. The added pickup group can then be assigned via recent change messages.

14.02 The DPNB feature may be associated with a line by using the recent change message RC:LINE or RC:MLHG and keyword PNB. Refer to 13.04.

14.03 Figure 7 illustrates the procedure required to add the DPNB feature to a business customer group.

15. TESTING

15.01 Teletypewriter input and output messages found in the Input Message Manual (IM-1A001 for No. 1 ESS or IM-6A001 for No. 1A ESS) and the Output Message Manual (OM-1A001 for No. 1 ESS or OM-6A001 for No. 1A ESS) can be used to verify the translations for the DPNB feature. These messages are:

- (a) VFY-DN input message verifies entries in the directory number (DN) translations. System response should be OK followed by a TR01 output message.
- (b) VFY-LEN input message verifies entries in the line equipment number (LEN) translations. System response should be OK followed by a TR03 output message.
- (c) VFY-CSTG 34 input message verifies entries in the multiline hunting group (MLHG) common block. System response should be an OK followed by a TR15 and TR16 output message.
- (d) VFY-XDGNT input message verifies entries in the Centrex digit interpreter tables. System response is an OK followed by a TR18 output message.

15.02 To test the operation of the DPNB feature, place a test call to a station in a pickup group and initiate DPNB actions to verify that the call can be picked up. Also, in the same manner verify that if the called station has been answered, busy tone is returned to the station dialing the DPNB access code.

ADMINISTRATION

16. MEASUREMENTS

16.01 No traffic measurements are kept for the directed call pickup nonbarge-in feature. Traffic peg counts for the call pickup feature activations are kept per customer group. These are available for H, C, and DA 15 schedules under measurement code 42.

17. RECORD KEEPING

17.01 The responsibility of properly assigning pickup group numbers is left with the telephone company. Also, an indicator bit must be set for all stations that have the ability to access the directed call pickup nonbarge-in feature. The applicable ESS Translation forms, found in TG-1A, are as follows:

- (a) ESS 1101—Directory Number Record: This form is used to provide a DPNB indicator on a per-station basis.
- (b) ESS 1107—Supplementary Information Record: This form is used to provide a call pickup group number (DCPUG) on a per-line basis.
- (c) ESS 1108—Call Pickup Groups: Index identifies PUGN and the associated Centrex group, plus ESS 1107 form entries.
- (d) ESS 1109—Centrex Group Record: This form is used to provide the Centrex access codes for the directed call pickup nonbarge-in feature (DTYP 5, STYP 5, SSTYP 2).
- (e) ESS 1115—Multiline Hunt Group Record: This form provides the DPNB indicator on a per-group basis for multiline hunting groups,

18. CHARGING

18.01 Not applicable.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 The DPNB feature is available beginning with the 1E3 generic program for No. 1 ESS and the 1AE4 generic program for No. 1A ESS.

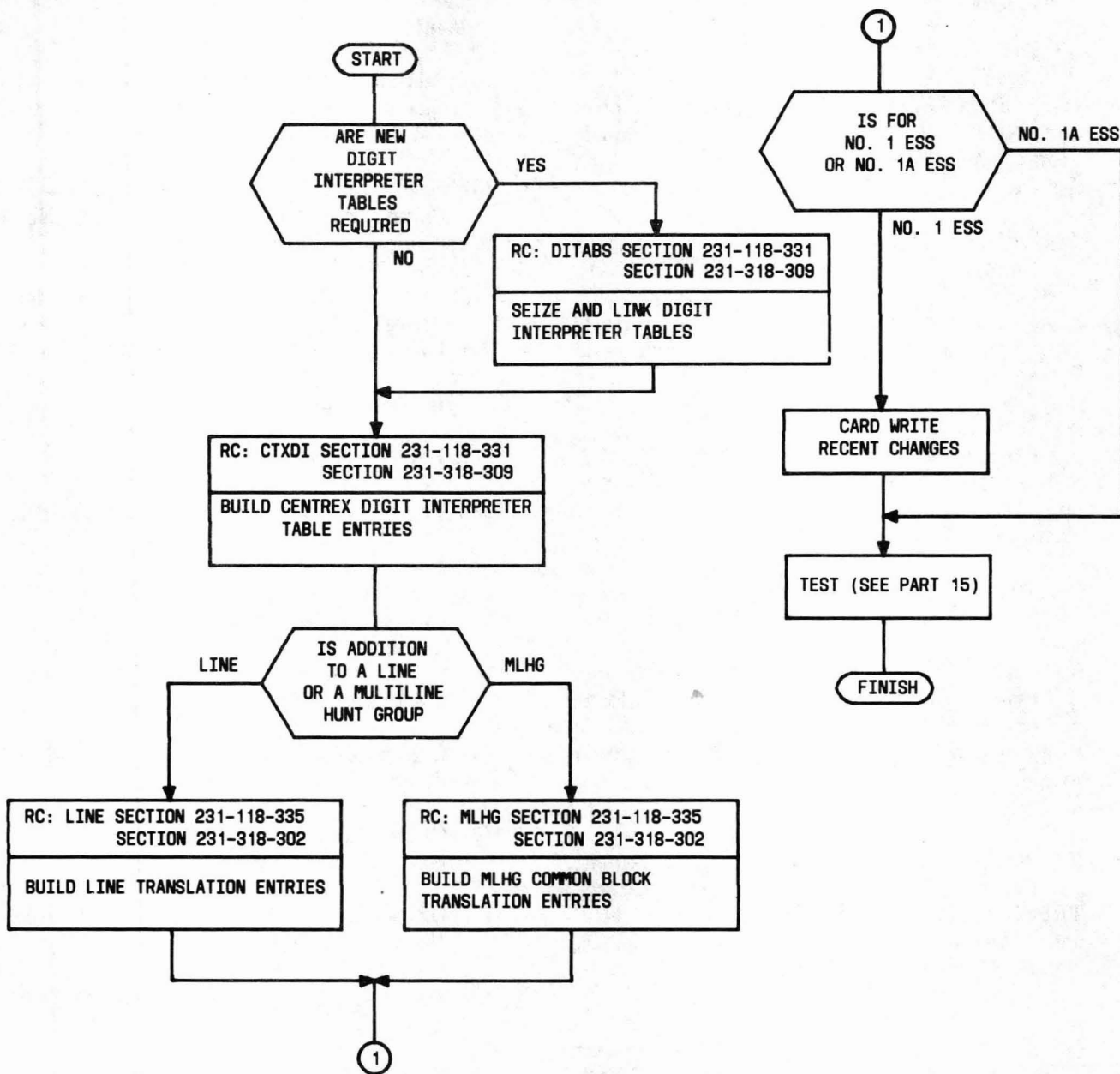


Fig. 7—Procedure for Adding DPNB

20. GROWTH/RETROFIT

20.01 Not applicable.

SUPPLEMENTARY INFORMATION

21. GLOSSARY

21.01 Not applicable.

22. REASONS FOR REISSUE

22.01 Not applicable.

23. REFERENCES

23.01 The following documentation is pertinent to the DPNB feature.

SECTION 231-090-371

A. Bell System Practices

- (1) Section 231-118-329—Traffic Measurement Recent Change Procedures for DIGTRN, TRFSLB, TRFLCU, TRFHC, TNCTX, CTRF, and NUTS—(CTX-6 Through 1E4, Generic Programs)—2-Wire No. 1 Electronic Switching System
- (2) Section 231-118-331—Centrex CO Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (CTX-6 Through 1E4 Generic Programs)—2-Wire No. 1 Electronic Switching System
- (3) Section 231-118-335—Line Recent Change Procedures for Line, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV—CTX-7, CTX-8, and 1E4 Generic Programs—2-Wire No. 1 Electronic Switching System
- (4) Section 231-120-301—Traffic Measurements—2-Wire No. 1 Electronic Switching System
- (5) Section 231-318-302—Line Recent Change Procedures for Line, TWOPTY, MPTY, SCLIST, MLHG, and CFV Through 1AE4 Generic Program—2-Wire No. 1A Electronic Switching System
- (6) Section 231-318-307—Traffic Measurement Recent Change Procedures for DIGTRN, TRFSLB, TRFLCU, TRFHC, TNCTX, CTRF, and NUTS (Through 1AE4 Generic Program)—2-Wire No. 1A Electronic Switching System
- (7) Section 231-318-309—Centrex CO Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (Through 1AE4, Generic

Programs)—2-Wire No. 1A Electronic Switching System

- (8) Section 231-090-089—Feature Document—Call Pickup (CPU) Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems
- (9) Section 231-090-401—Feature Document—Speed Calling Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems (when published)
- (10) Section 231-090-403—Feature Document—Directed Call Pickup With Barge-In—2-Wire No. 1 and No. 1A Electronic Switching Systems.

B. Other Documentation

- (1) Translation Guide—TG-1A
- (2) Input Message Manual IM-1A001—No. 1 Electronic Switching System
- (3) Input Message Manual IM-6A001—No. 1A Electronic Switching System
- (4) Output Message Manual OM-1A001—No. 1 Electronic Switching System
- (5) Output Message Manual OM-6A001—No. 1A Electronic Switching System
- (6) Office Parameter Specification PA-591001—No. 1 Electronic Switching System
- (7) Office Parameter Specification PA-6A001—No. 1A Electronic Switching System
- (8) Translation Output Configurations PA-591003—No. 1 Electronic Switching System
- (9) Translation Output Configurations PA-6A002—No. 1A Electronic Switching System.