

FEATURE DOCUMENT
CODE CALL, LOUDSPEAKER PAGING, AND
RECORDED TELEPHONE DICTATION
NO. 2 ELECTRONIC SWITCHING SYSTEM

232-190-314

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NOTICE

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FEATURE DEFINITION AND DESCRIPTION**1. DEFINITION**

1.01 Code Call: This feature allows centrex attendants and station users to dial an access code and a called party code to activate signaling devices (bells, gongs, horns, etc.) with a coded signal corresponding to the called code. The called party can then dial an answering code from any station within the centrex system and be connected to the calling party.

1.02 Voice Paging: This feature allows centrex attendants and station users to dial an access code and be connected to a single broadcast system. An answer code can be provided optionally with this feature.

1.03 Dial Paging: This feature, which is sometimes called zone paging, is the same as voice paging except that it allows paging to more than one location (or broadcast system) by dialing a code to indicate the zone (or broadcast system) desired. An answer code can be provided optionally with this feature.

1.04 Recorded Telephone Dictation (RTD): This feature allows centrex attendants and station users access to and control of customer-owned dictating equipment. The start and stop functions of the dictating equipment may be voice-controlled or dial-controlled. The record, playback, etc., functions are dial-controlled. An answer code does not apply to this feature.

1.05 Code call, dial paging, voice paging, and RTD features are provided with the EF-1 or later generic programs of the No. 2 Electronic Switching System (ESS).

1.06 Depending upon specific office requirements, additional SD-2H155-01 Dial Pulse Repeater Circuits may be required in the No. 2 ESS office to provide the features covered in this document.

2. DESCRIPTION**A. Customer (User) Perspective**

2.01 Code call, paging, and RTD facilities are accessed by a centrex party by dialing an appropriate access code of one to four digits. (The access code for each facility is different.) When

an access code is dialed, centrex access treatment (CAT) is applied to determine if the calling party is allowed access to the facility associated with the code. If the call is allowed, the call is either completed immediately in the case of voice paging or RTD, or by dialing the code corresponding to the desired party in the case of code call or dial paging.

2.02 Code Call: The calling party is connected to the code call circuit either after dialing the access code or after dialing the called party code. This arrangement depends on the type of customer-owned and maintained (COAM) equipment used and is governed by the centrex trunking rules (see 2.09). The audible devices (bells, gongs, etc.) sound corresponding to the called party code dialed. The called party can then dial a "code call pickup" code from any station (which is not a fully restricted terminating station) in the centrex group and be connected directly to the calling party.

2.03 Voice Paging: A centrex attendant or station user dials the voice paging access code. The calling party is connected directly to the voice paging trunk and voice paging can begin. If the voice paging service has answer capability, the paged party can answer in the same manner as with code call. When the page answer code is dialed, a talking path between the paged and paging party is established, and the connection between the paging party and speaker system is disconnected.

2.04 Dial Paging: A centrex attendant or station user dials the dial paging access code. After dialing the access code, the customer receives a second dial tone, if provided, and dials the code corresponding to a given location. The location code selects one amplifier and loudspeaker and the calling party can then page. If the dial paging service has answer capability, the paged party can answer in the same manner as with code call. When the page answer code is dialed, a talking path between the called and calling party is established, and the connection between the calling party and speaker system is disconnected.

2.05 Recorded Telephone Dictation: A centrex attendant or station user dials the RTD access code. Once the RTD circuit is seized, the calling party talks or dials directing digits, as appropriate, to start, stop, record, playback, etc., the RTD equipment.

B. System Implementation

2.06 Code call, paging, and RTD facilities are accessed by using the dialed digits to index the digit interpreter table (DIT) associated with the calling party's centrex group. As each digit is dialed, information is obtained from the DIT until a terminal entry is reached or the calling party is given dialing error treatment.

2.07 Interpretation of dialed digits leads to terminal entries which define access to trunk group facilities which results in CAT code screening. This screening is performed by using the 4-bit CAT code from the calling party originating translation (the attendant's CAT code is a fixed value = 0). This CAT code is used to test the appropriate restriction bit of the first word of the terminal entry. If the bit equals 0, that particular access code is denied and the calling party is given centrex dialing error treatment. If the restriction bit equals 1, call processing continues.

2.08 The terminal entry defines the trunk group number (TGN) for code call, paging, or RTD facilities. The call is routed to the centrex attendant or recorded announcement if the accessed trunk group is controlled by the attendant (ACOF feature, see Section 232-190-213). If the trunk group is not ACOF controlled, call processing continues by determining the type of digit outpulsing required for the accessed facility.

2.09 Code call, paging, and RTD are processed by standard tie trunk arrangements within the No. 2 ESS program. These may be arranged as manual or dial repeating as dictated by the customer-owned and maintained (COAM) equipment at the customer's premises. The arrangement at the No. 2 ESS depends on whether this COAM equipment returns off-hook upon seizure, dial tone, or other call progress tones, or reverse make busy. The arrangement at the No. 2 ESS also depends on whether the No. 2 ESS must convert TOUCH-TONE® digits to dial pulse, or whether the station user can dial directly into the COAM equipment. Section 232-190-313 describes the various aspects of tie trunking arrangements, including manual versus dial repeating, overlap outpulsing versus nonoverlap, number of digits specified versus not specified, 4-second timing, 10-second timing, or 40-second timing, possibility of using the "#" sign or not, etc. Figure 1 shows the various circuit configurations possible during the call setup. After the call has

been placed, the calling party is connected to the SD-2H155 dial pulse repeater circuit, and if there is no provision for called party answer, the call is set stable.

2.10 Any of the features mentioned herein (except RTD) may have an associated called party answer or "pickup." If so, the calling party's call remains in a state awaiting answer. The called party answers by dialing a special answer code. This code is checked for CAT code screening as described in 2.07, and if the call is allowed to continue, the called party is connected to the calling party and the SD-2H155 circuit is idled and made available for another call.

3. FEATURE FLOW DIAGRAM

3.01 The flow diagram illustrated in Figure 2 is a graphical representation of code call, paging, and recorded telephone dictation.

4. INTERACTIONS

4.01 The code call, paging, and RTD features interact with ACOF, when invoked. Attempted access to a restricted feature causes the call to be routed to an attendant or recorded announcement depending on the status of the call forward direction (CFD) bit. If a call is intercepted by the attendant due to the use of ACOF, the attendant can dial the call for the calling party.

4.02 When a centrex attendant is using the code call or paging features, the calling party and attendant cannot be connected to the code call or paging circuits at the same time. After an attendant has paged a party to use the pickup feature, the attendant can connect the calling party to an audible ringing tone to indicate that the called party has not yet answered. For more detailed description of centrex attendant use of these features, refer to Section 999-200-128, How to Operate the 1- and 2-Type Consoles.

4.03 The code call or paging feature with pickup cannot be used by incoming tie trunks.

4.04 Add-on while using code call, paging or RTD facilities is limited as follows:

- If the original call is code call, paging, or recorded telephone dictation, the controlling

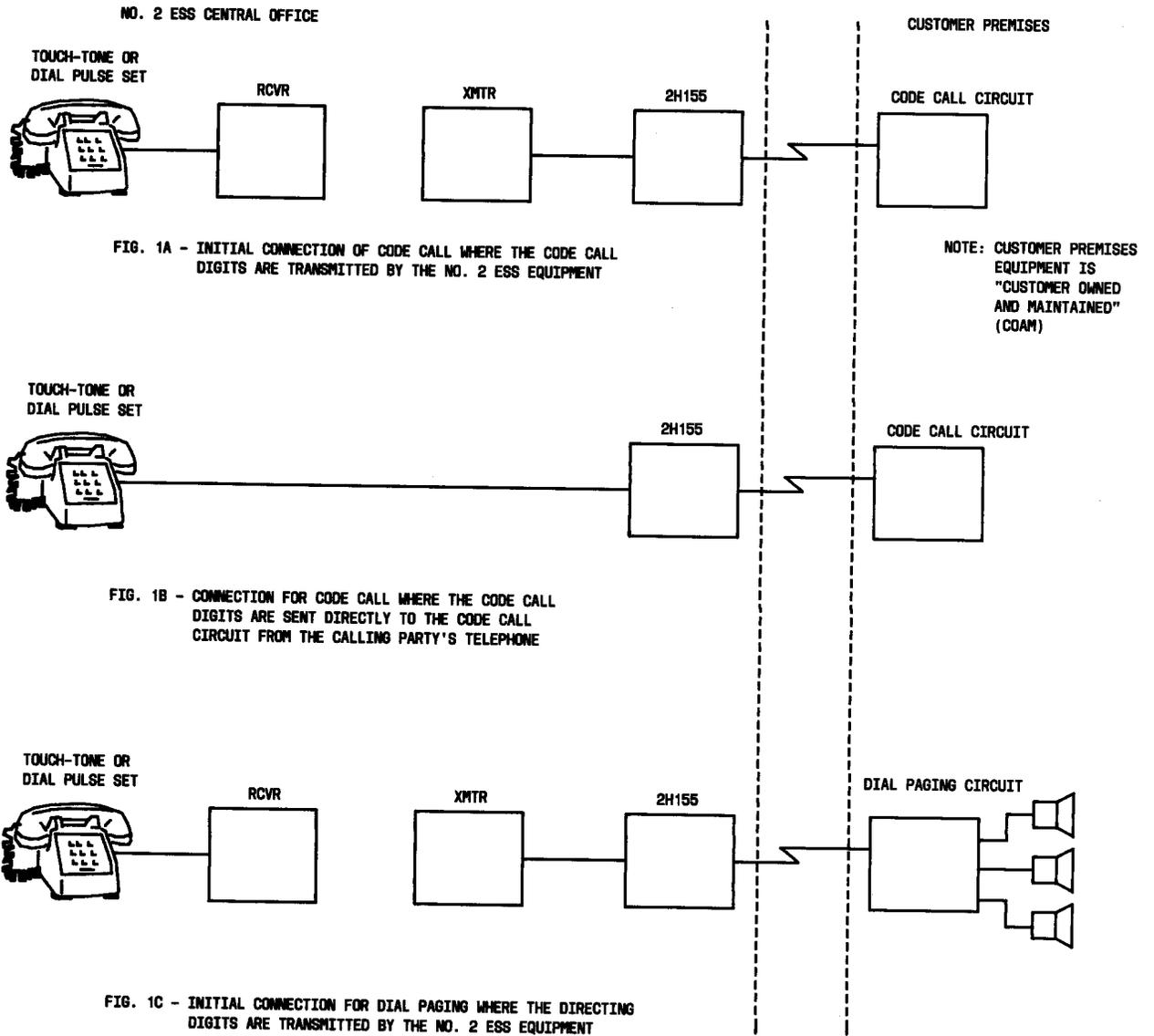


Fig. 1—Connection of Customer Code Call, Paging, and Recorded Telephone Dictation Circuits (Sheet 1 of 2)

party cannot add on anyone. In this case, the flash is essentially ignored.

- If the third party is a request for recorded telephone dictation, reorder tone is given. A centrex extension is not allowed to add on (or even proceed to consultation hold) with a recorded telephone dictation call.
- If the third party is a request for paging (without pickup) the call is allowed to proceed to consultation hold, but not to a 3-party

connection (add-on or 3-way call), and hence not to call transfer.

- If the third party is a request for code call (or paging with pickup), the call is allowed to proceed to consultation hold. When the third party answers (via code call pickup), the code call circuit (or paging circuit) is released and the controlling party and the third party can talk with consultation hold in effect. Should the controlling party flash before the third party answers, the code

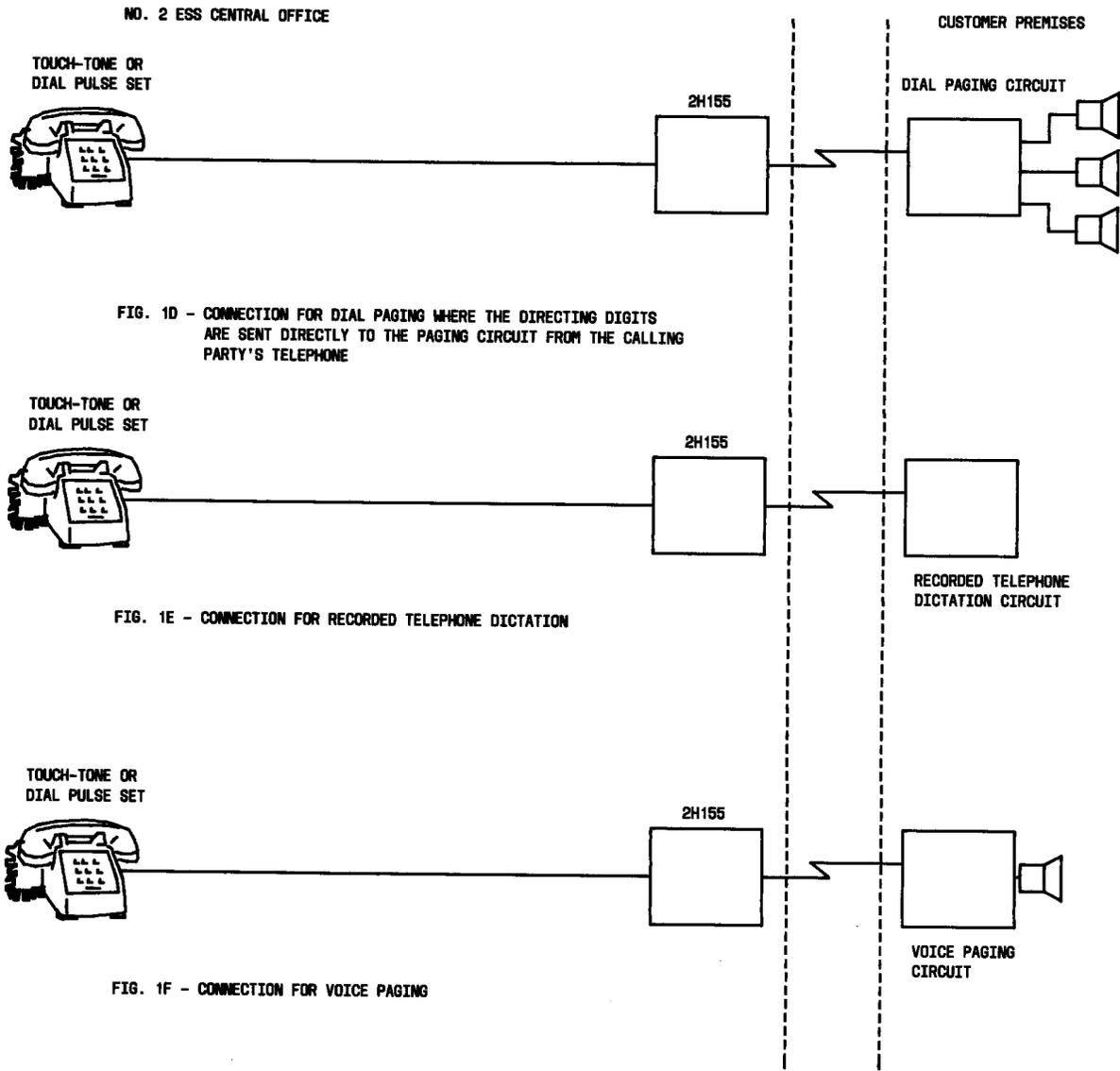


FIG. 1D - CONNECTION FOR DIAL PAGING WHERE THE DIRECTING DIGITS ARE SENT DIRECTLY TO THE PAGING CIRCUIT FROM THE CALLING PARTY'S TELEPHONE

FIG. 1E - CONNECTION FOR RECORDED TELEPHONE DICTATION

FIG. 1F - CONNECTION FOR VOICE PAGING

Fig. 1—Connection of Customer Code Call, Paging, and Recorded Telephone Dictation Circuits (Sheet 2 of 2)

call circuit (or paging circuit) is not released—audible ringing is returned. Now when the third party answers, all three parties are connected in a 3-way connection.

4.05 The SD-2H155 circuit monitors the busy-idle status of the code call, paging, or RTD circuits via the sleeve lead. If any of the circuits are busy, the No. 2 ESS processor marks that trunk busy and denies any other access to it until the circuit sends an idle signal back to the SD-2H155 circuit.

ATTRIBUTES

5. STATION/SYSTEM

5.01 Code call, paging, and RTD access dialing is provided on a per-centrex group basis. The CAT code assignment to each centrex station defines the trunk access allowed a particular station.

6. LIMITATIONS

6.01 Code call, dial paging, and voice paging trunk groups should only contain one member

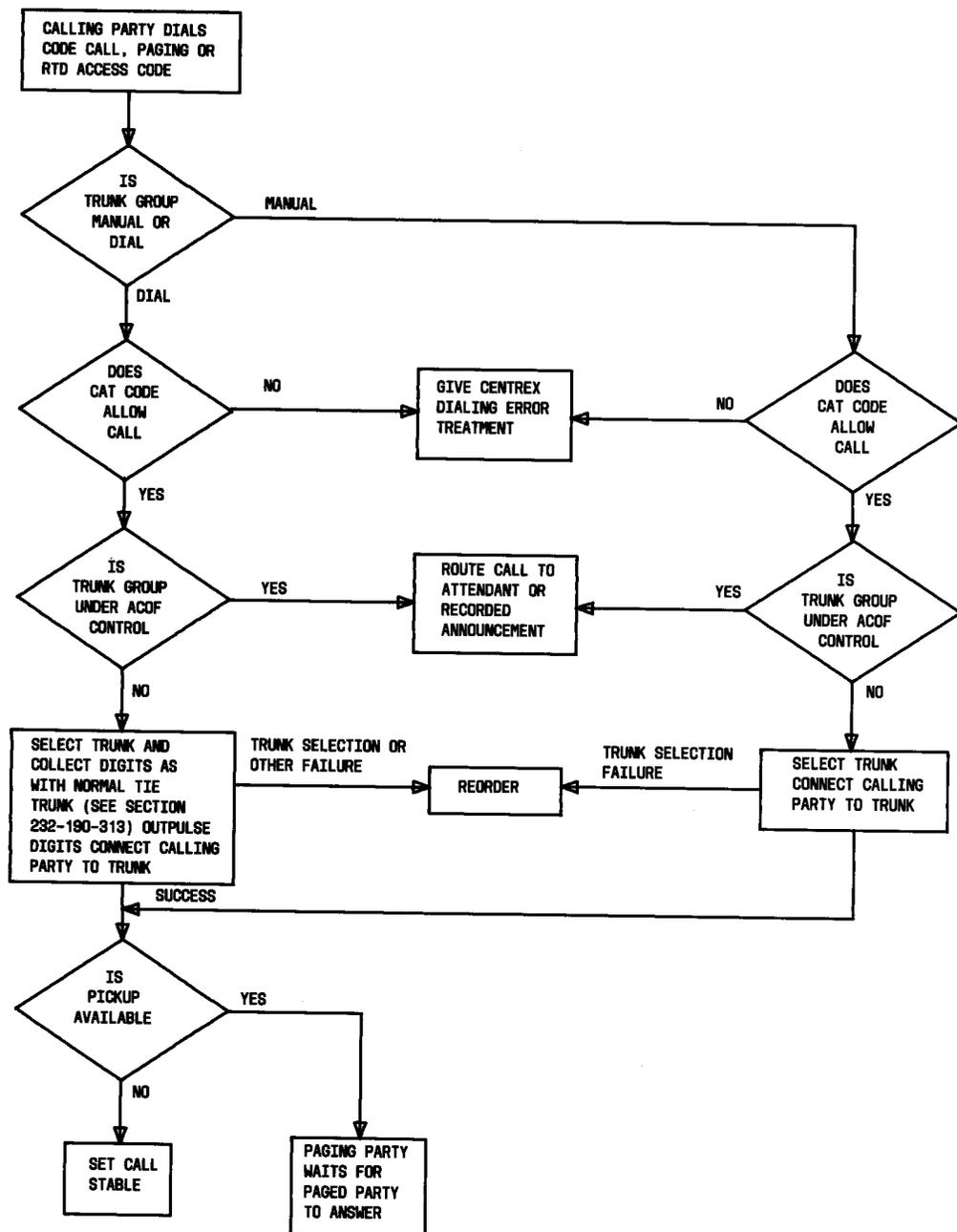


Fig. 2—Code Call, Paging, and Recorded Telephone Dictation Feature Flow Diagram (Sheet 1 of 2)

each. Should a given customer group require a second dial paging or voice paging circuit, a separate access code and trunk group (with one member) must be defined. Under no circumstances can a given customer group have more than one code call and/or dial paging circuit when the pickup feature is provided. The reason for this is that provision has not been made for more than one

pickup code, and this code picks up whatever call is being held by the code call monitor program.

6.02 The recorded telephone dictation trunk group may contain many members (maximum of 256). This allows a given customer group to have many different RTD channels.

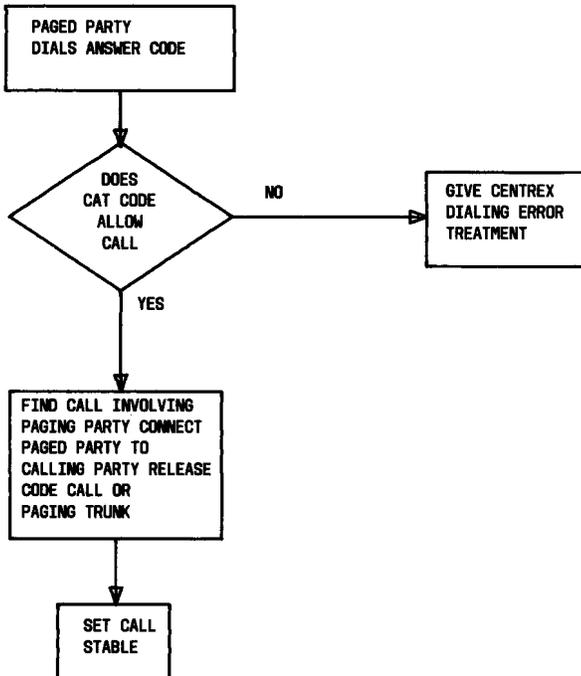


Fig. 2—Code Call, Paging, and Recorded Telephone Dictation Feature Flow Diagram (Sheet 2 of 2)

6.03 The access code for the code call, paging, and RTD features may be one to four digits.

7. RESTRICTION CAPABILITY

7.01 CAT codes assigned to individual centrex stations define access of features allowed the station. Each station can be allowed or denied access to code call, dial paging, voice paging, or RTD by recent change of CAT codes.

7.02 Trunk groups which are assigned to ACOF must have the CF bit in the group status block designated by an office data administration (ODA) run.

8. COST DATA

8.01 The cost for accessing the customer-owned code call, paging, and RTD circuits is attributable to:

- (a) Translation space necessary to store accessing information.

- (b) Translation and call store space necessary for the assigned trunk groups.

- (c) Additional costs include interface circuits SD-2H155 Dial Pulse Repeater Circuit (J2H018DS). These circuits can be used with other customer-owned and maintained equipment.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 The code call, paging, and RTD features are automatically provided as part of the EF-1 or later generic programs in No. 2 ESS offices.

9.02 In planning for these features, completion of certain translation input forms is required to indicate whether or not each line is allowed access to the features, for defining the trunk group data, and for defining the dialing tree.

10. HARDWARE ENGINEERING

10.01 Ordering of SD-2H155 (J2H018DS) circuits, to accommodate the anticipated number of customer-owned equipment, will be required. The circuit trunk order code is 66000.

10.02 The SD-2H155 circuits are used as an interface between the No. 2 ESS and the code call, paging, and RTD circuits. The purpose of the circuit is to repeat dial pulses and advise the No. 2 ESS processor of the status of the code call, paging, and RTD circuits so that no other centrex station can access these circuits while they are in use.

10.03 There are two options that the TELCo and customer can use when planning the code call and dial paging circuits. One option is the typical installation shown in Figure 1a and 1c. This arrangement accepts dial pulse as well as TOUCH-TONE pulses. The customer equipment is set up to receive the proper codes to activate the various amplifiers and speakers. TELCo supplies the proper equipment such as receivers and transmitters to send the code signal to the customer equipment. The other option is shown in Figure 1b and 1d. The customer equipment is set up to receive dial pulses or TOUCH-TONE from a dial pulse or TOUCH-TONE telephone set and to convert pulses or tone to the necessary code to activate the various amplifiers and speakers. That is, the

customer equipment must be equipped with a dial pulse or TOUCH-TONE digit detector with switching capability. This arrangement does not require TELCo to supply the transmitters and receivers required in the first option.

11. SOFTWARE ENGINEERING

11.01 No areas of memory are dedicated specifically for these features. The procedures for engineering the software needed to translate the access codes and trunk groups are found in Traffic Facilities Practices, Division D, Sections 1(9) and 1(10).

12. COMPATIBILITY

12.01 Although there are no compatibility or equipment interface problems associated with the code call, paging, or RTD features, the following items should be considered.

- (a) The SD-2H155 circuits should be set up as one-way outgoing trunks.
- (b) It is recommended, but not necessary, that SD-2H155 circuits be set up as nonoverlap outpulsing.
- (c) If the customer-owned and maintained equipment can supply second dial tone, then No. 2 ESS should not and vice versa. Whatever equipment supplies second dial tone is actually the choice of TELCo and should be decided when planning the office or retrofit.

13. OFFICE DATA

A. Translations

13.01 The translators affected by the addition of the centrex features covered by this document include the centrex number translator, the scan point translator, and the trunk group translation.

13.02 The translation layout for code call, paging, and RTD is shown in Figure 3.

B. ODA Information

13.03 An ODA run may be required for the initial implementation of code call, dial paging, voice paging, and/or RTD features. The following ESS input forms must be completed by the dial

administrator of the operating companies and submitted to WECco regional center for processing. Normal scheduling procedures should be observed in the preparation of these forms.

- ESS 2101 Centrex Directory Number Table: This form is used to indicate which centrex lines possess CAT codes allowing them access to the code call, dial paging, voice paging, and/or RTD equipment.
- ESS 2109-2 Centrex Group Table: The dialing assignments listed in this form are used to build dialing patterns for each centrex group. Included in this information is the "DATA" type and "SUB" type, CAT code, trunk access code, OA bit designation, and number of digits expected.
- ESS 2202-3 Trunk Group Table: Provides the trunk group number, highest member number, and trunk order code information pertaining to trunk groups 70 and above.
- ESS 2202-4 Trunk Group Table: Used to define centrex trunk group information necessary for the trunk groups listed in ESS 2202-3.
- ESS 2204 Trunk Feature Table: This form lists information pertaining to the features available to a particular trunk group.

14. GROWTH/RETROFIT PROCEDURES

14.01 The code call, dial paging, voice paging, and RTD features can be incorporated into a No. 2 ESS office only if the office is equipped with the EF-1 generic program. An ODA run may be required to implement these features for initial subscribing customers.

14.02 Once implemented, recent change methods may be used to add, delete, or change these features.

15. TESTING

15.01 Manual and operational testing of trunks can be performed using the trunk test panel. Local procedures should be followed when testing the customer-owned and maintained equipment.

15.02 Test calls may be placed to the code call, paging, and RTD facilities to verify connection through No. ESS and proper operation.

ADMINISTRATION

16. MEASUREMENTS

16.01 Refer to Section 232-120-301—Traffic and Plant Measurements for the detailed description of traffic measurements.

17. RECORD KEEPING

17.01 Records of the ESS-R forms must be maintained by each office whenever an ODA run is made. In addition, a record of all recent change messages must be maintained.

18. CHARGING

18.01 Use of the code call, paging, or RTD circuits are *not* recorded by the No. 2 ESS AMA.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 The features described in this document are available only with the EF-1 or later generic program.

20. GROWTH/RETROFIT

20.01 Those offices that are equipped with the LO-1 generic programs may be retrofitted with the EF-1 generic program so that the described features can be implemented. If retrofitted, new SD-2H155 circuits may be required.

SUPPLEMENTARY INFORMATION

21. GLOSSARY

21.01 The following list identifies terms used in this document.

- Attendant Control of Facilities (ACOF): An attendant can restrict dial access by all station lines to FX, WATS, and/or tie trunk groups (code call, paging, and RTD circuits are treated as tie trunks by the No. 2 ESS) by operating a key or dialing a code. When control is activated, calls to trunk groups

so restricted are routed to the attendant for subsequent completion or to a tone or announcement. Trunk group busy (TGB) lamps on the universal attendant consoles may be assigned to indicate activation of ACOF.

- Automatic Message Accounting (AMA): Means of providing automatic billing service for toll calls, coin calls, and message rate calls originating in the No. 2 ESS office.
- Centrex Access Treatment (CAT) Code: Code in translations used to deny or allow access to code call, paging, or RTD facilities.
- Centrex Group: All directory numbers and lines assigned to the same centrex customer that are treated as a group.
- Call Forward (CF) Bit: A bit in the group status block of the trunk group translation table that, when set, indicates a trunk group is under ACOF control.
- Call Forward Direction (CFD) Bit: A bit in the trunk and service circuit group data table that indicates whether the call under ACOF control is routed to the centrex attendant or recorded announcement.
- Digit Interpreter Table (DIT): A part of the centrex number translator that provides initial digit(s) interpretation for calls dialed from a centrex station or an attendant.
- MN Bit: A bit in the digit interpreter table expansion types that indicates if the trunk is a manual tie trunk (voice paging and RTD) or not (dial paging and code call).
- OA Bit: A bit in the digit interpreter table expansion types that indicates if the access code should be outputted (1) or not (0).
- Office Data Administration (ODA) System: Mechanism by which translation information is entered into a No. 2 ESS office. Information from the ESS input forms is inputted into the regional ODA computer, assembled, then sent back to the No. 2 ESS.
- Recorded Telephone Dictation (RTD): A feature of the No. 2 ESS (equipped with

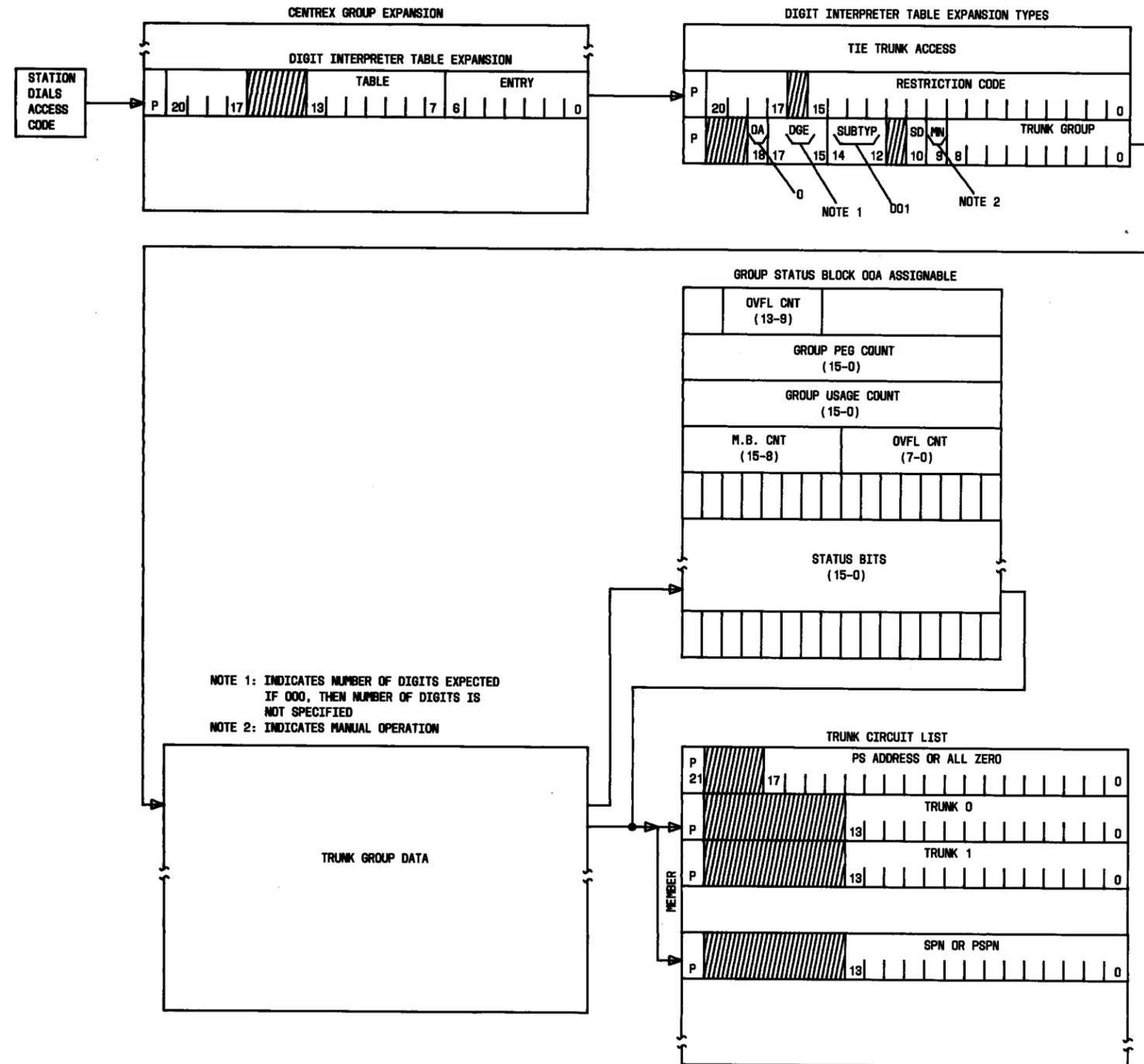


Fig. 3—Translation Layout for Code Call, Paging, and Recorded Telephone Dictation

EF-1 or later generic program) that permits access to and control of customer-owned dictating equipment by station users within the centrex group.

- SD Bit: A bit in the digit interpreter table expansion types that indicates if second dial tone should be returned to the calling party after dialing an access code.

22. REASONS FOR REISSUE

22.01 This is the initial issue of this document.

23. REFERENCES

23.01 Major references to the supporting documentation for code call, paging, and RTD feature are listed as follows:

- SD-2H155-Dial Pulse Repeater Circuit—Schematic Diagram

- CD-2H155-Dial Pulse Repeater Circuit—Circuit Description
- 232-120-301-Traffic and Plant Measurements
- 232-190-313-Centrex Group Trunk Facilities—Feature Document
- 999-200-128—How to Operate the 1- and 2-Type Consoles