FEATURE DOCUMENT
INTERCEPT TREATMENTS
CENTREX AND NONCENTREX
NO. 2/2B ELECTRONIC SWITCHING SYSTEM

CONTENTS PAGE

INTRODUCTION

1. GENERAL INFORMATION

1.01 This document covers the various methods that may be used to intercept calls and advise the calling customer of the situation that prevents completion of a connection to a called number (such as the line has been changed or disconnected, is unassigned, is out of order, or an improper set of digits has been dialed).

1.02 This section is being reissued to include the latest generic program (2BE3) information.

Revision arrows are used to emphasize the more significant changes.

1.03 These features are available in the No. 2/2B Electronic Switching System (ESS). The applicable generic programs are discussed elsewhere in this document.

2. DEFINITION

2.01 Intercept treatment provides the means for calls to be automatically routed to locations where arrangements are provided for advising the calling customer of the situation that prevents completion of a connection to a called number (such as the line has been changed or disconnected, is unassigned, is out of order, or an improper set of digits has been dialed).

DESCRIPTION

3. USER OPERATION

3.01 For this feature, the user is defined as a station, incoming trunk, centrex attendants, etc. The user performs no special procedure (other than reaching a disconnected station, or any of the other situations described in this document) in order to activate the intercept treatment features. The intercept treatment of dialed numbers (either centrex or noncentrex) may come in a variety of forms. This document discusses these forms.

3.02 Audible indications (announcements or tones) are provided when the user attempts to call a telephone number that has been changed, disconnected, or is temporarily out of service. These announcements or tones explain to the user the condition of the called number (changed, disconnected, or temporarily out of service). The user must then hang up before trying to redial. Also, when the user has dialed an invalid office code or telephone number, a vacant code or blank number announcement is provided to explain that the call cannot be completed as dialed, and that the user should check the number and try again.

3.03 ⧫In addition, a call intended for a directory number hundreds group that is awaiting cutover must be routed to the office where the number is currently working or to some announcement or intercept.⧫

3.04 Centrex station users may be routed to the attendant instead of being provided with audible indications.

3.05 Any call can be intercepted at various points in the call process and be routed (intercepted) to a recording, route index (RI), or, in the EF-1 generic or later, centrex calls may be routed to the centrex attendant. The RI can in turn have one of several definitions. In particular, the RIs most common to intercept are routing to:

(a) Local announcement

(b) Tone

(c) The 6A Intercept System (More detailed information concerning the 6A Intercept System may be found in Section 232-190-023.)

(1) Trouble intercept

(2) Machine intercept

(3) Regular intercept.

(d) Automatic Intercept System (AIS) (More detailed information concerning AIS may be found in Section 232-190-023.)

(e) An operator

(f) A centrex attendant

(g) A trunk group to

(1) Another office

(2) A centrex CU.

3.06 When a call is intercepted at any point in the call process, there are certain dedicated RIs that are used by the program to initiate the necessary intercept treatment. These RIs and their definitions are described below. How each RI is defined is up to the operating companies. They typically are defined using one of the definitions in paragraph 3.05.

- RI 8—Regular intercept (announcement, AIS, or operator).
- RI 9—Disconnect intercept (announcement, AIS, or operator).
- RI 10—Trouble intercept (announcement, AIS, or operator). Also used when the program encounters a line on the plugged up list.

- RI 12—Used when a customer with at least one custom calling feature attempts to use a custom calling feature which the customer is not entitled to have. Also used when a dialing error related directly to a custom calling feature is encountered.

- RI 14—Used on all blank 4-digit numbers, blank hundreds groups, and all 4-digit translation errors.

- RI 19—Used for all translation errors other than 4-digit errors. This RI cannot go to an AIS.

For additional information concerning these RIs, refer to the No. 2/2B ESS Translation Guide, TG-2H, Division 4, Section 3d.

3.07 Several intercept treatments are actually specified in certain translations by the operating companies. For example, when a 7- or 10-digit number is dialed without a prefix even though the operating company has specified a 1 prefix requirement, the call will be routed to an operating company specified RI. When a 1 prefix is dialed followed by a number which has not been designated by the operating company as requiring a prefix, the call may at the operating company option also be so routed.

3.08 If a customer dials an invalid office code, the call will be routed to an operating company specified RI and the customer will receive an announcement explaining that the call cannot be completed as dialed. The customer must then hang up and redial.

3.09 The tens and units digits from the directory number ("CD" in this example) are used to index the hundreds group table. Each entry in this table represents one directory number and takes on one of the following forms mentioned below:

- In the EF-1 or later generic program, the hundreds group RI (HRI) allows a hundred directory numbers in bulk to be intercepted with one recent change message. (See paragraph 10.03.)

- Also in the EF-1 or later generic program, the hundreds group fully restricted terminating bit (FR) allows marking a hundred centrex stations as fully restricted terminating with one recent change.

- In the EF-1 or later generic program, centrex attendant intercept allows all calls to a given directory number to be intercepted by the appropriate centrex attendant.

- Special routing allows all calls to a given directory number to be intercepted to a RI.

- In the LO-1 generic program, blank number treatment per hundreds group allows all calls to blank numbers within a given hundreds group to be intercepted to RI 14.

- In the EF-1 or later generic program, blank number treatment per hundreds group allows all calls to blank numbers within a given hundreds group to be handled in one of three ways: intercepted by centrex attendant, given special routing (via a RI), or sent to RI 14 for noncentrex lines or to the dialing error RI for centrex lines.

- In the LO-1 generic program, when a denied terminating station is dialed, the call is routed to the proper RI for intercept treatment. With centrex, a call to a denied terminating station is given the centrex dialing error treatment.

3.10 Table A shows which of the various types of intercept are available in the various generic programs.

4. SYSTEM OPERATION

4.01 When a typical call to an in-service station (centrex or noncentrex) with directory number NXX-ABCD is dialed, the No. 2/2B ESS translation programs convert the prefix NXX to a 4-bit (3-bit in the LO-1 generic program ▶and 6-bit in the 2BE3 generic program)◀ normalized office code (NOC). This NOC is used to index the NOC table which results in a pointer to a number group table. The thousands and hundreds digits from the directory number are used to index this number group table. Each 2-word entry in the number group table represents one hundred directory numbers and generally takes on one of three forms: unassigned; a route index which directs the call to another central office (used when two offices share one prefix); or a pointer to a hundreds group table for termination in this office.

4.02 When a dialing error is made in the first three digits or in the "1+" prefix, the 3-digit trans-

▶TABLE A◀

AVAILABILITY OF VARIOUS TYPES OF INTERCEPT

	TYPE OF INTERCEPT	IS THIS TYPE OF INTERCEPT AVAILABLE?		IS THIS TYPE OF INTERCEPT RECENT CHANGEABLE?	
		LO-1	EF-1 AND LATER	LO-1	EF-1 AND LATER
0.	Route Index in Number Group Table	Yes	Yes	No	No
1.	Unassigned Hundreds Group	Yes	Yes	No	No
2.	Hundreds Route Index	No	Yes	No	Yes
3.	Centrex Fully Restricted	No	Yes	No	Yes
4.	Centrex Attendant Intercept (per line)	No	Yes	No	Yes
5.	Special Routing in Hundreds Group (per line)	Yes	Yes	Yes	Yes
	Blank Number Treatment:				
6.	Per Office	Yes	No	Yes	No
7.	Per Hundreds Group	No	Yes	No	Yes
8.	Precut	Yes	Yes	No	No
9.	Deny Terminating	Yes	Yes	Yes	Yes

lation portion of the translation program provides a RI for routing to the desired treatment.

4.03 If a vacant 3-digit code is reached, the translator provides a RI for intercept.

4.04 The NOC is used to provide entry into the NOC table which supplies a pointer to the number group table. At this point, the thousands and hundreds digits of the dialed number are used to index the number group table. When two central offices share the same prefix, a RI is provided to route the call to another central office or anywhere else such as announcement, AIS, etc. If the hundreds group is unassigned, RI 14 is used by the generic program and must be defined by the operating company.

4.05 In the EF-1 or EF-2 generic program, an entry in the number group table can directly address the hundreds group table, or it can address a 2-word expansion which addresses the hundreds group table. This 2-word expansion also contains a HRI, and a FR bit. This expansion is used when it is known that the manner in which calls are to be completed to a given hundred directory numbers will change from time to time. When the HRI is zero, all calls to this hundred directory numbers complete to the hundreds group table. When the HRI is not zero, all calls to this hundred directory numbers complete to the HRI given. The HRI thus allows a hundred directory numbers to be intercepted and sent to an announcement or to another central office with one recent change. (See Part 10.)

4.06 ▶For the 2BE3 generic program, all entries are either unassigned (all zeros) or address a hundreds group. The entry also contains a hundreds

route index, FR bit, and a route index activate bit (RIB). Calls will be completed to the hundreds group if the RIB is zero, even if there is a HRI present and the FR bit is zero (centrex only). When the RIB is set, all calls complete to the HRI. It also allows HRIs to be predefined and then activated at a later date or deactivated yet remain on the number group entry for later reactivation.◀

4.07 In the EF-1 or later generic program, the FR bit in the 2-word expansion ▶(hundreds group entry for the 2BE3 generic program)◀ allows one recent change message to change the nature of all centrex stations in the hundreds group. When the FR bit is one, all numbers which correspond to centrex stations are treated as fully restricted terminating stations. (Station-to-station calls are allowed; other calls to stations are denied. See Section 232-190-320 for details of treatment.) When the FR bit is zero, the corresponding stations are as defined in each of their centrex line expansions.

4.08 In the EF-1 or later generic program, centrex attendant intercept allows all calls to a given centrex directory number to be routed to the centrex attendant for intercept treatment. (The appropriate centrex group number is stored in the entry.) The SOURCE and DESTINATION lamps on the attendant console both flash at 120 interruptions per minute (ipm) and an "intercept" incoming call indicator lamp also may light (customer option).

4.09 Special routing allows all calls which reach this directory number to be routed to the RI stored in this entry. This is typically a test tone (like milliwatt tone) or an announcement informing the calling party about the nature of this intercepted directory number, such as the regular intercept RI.

4.10 In the LO-1 generic program, if the 4-digit translation process yields a blank number (translation word truly empty), RI 14 is provided to obtain the proper treatment. This could be a local announcement or routing to a 6A Intercept System or to an AIS as described in Section 232-190-023.

4.11 In the EF-1 and later generic programs, if a blank number is reached, the program reads the 101st word in that hundreds group table to obtain any desired common treatment for that group. The 101st word is then analyzed and routing proceeds according to any one of the treatments described in paragraph 3.09. If the 101st word is also blank, the program uses RI 14 and proceeds as described in paragraph 3.09.

4.12 When a No. 2/2B ESS office ▶which is equipped with the EF-2 or earlier generic◀ is in the "precutover" mode, and one or more hundred directory numbers groups are cut over, the groups are marked with a bit in the number group table. Normal calls intended for these numbers must be routed to the office where the numbers are currently working or to some announcement or intercept for this purpose. A cutover RI is supplied in the RI expansion for the NOC corresponding to the affected office code.

4.13 ▶For No. 2/2B ESS offices equipped with the 2BE3 generic, a 4-word block has been added to each hundreds group to recall the cutover status of the ESS lines and each Remote Switching System (RSS) individually. With this scheme, up to 31 RSSs can be interleaved along with the ESS in one hundreds group and cut over one at a time or as a hundreds group.

4.14 The 4-word status block is divided into two 2-word blocks. These blocks are called the "precutover service status block" and the "post cutover service status block." To identify which of the above states the office is currently in, two bits in OFFOP2 are used for the current office state. Two more bits are used for the next office state. When a cut message is entered, the next office state is copied into the current office state. The current office state determines which service status block is to be used in determining which lines in any particular hundreds will be active or inactive. In addition to defining the No. 2B ESS office state, the remote terminal state bits in each RSS common block data, reflect the current office state determined by OFFOP2, but also define an additional state that allows test calls to be made over RSS lines that are in the precut state. The state is referred to as the "test" state and indicates that office-to-office testing is in progress in an RSS remote terminal. Normal calls intended for RSS lines must be routed to the office where the lines are currently working or to some announcement or intercept for this purpose.◀

4.15 The flow diagrams illustrated in Fig. 1 and 2 are graphical representations of the intercept treatments.

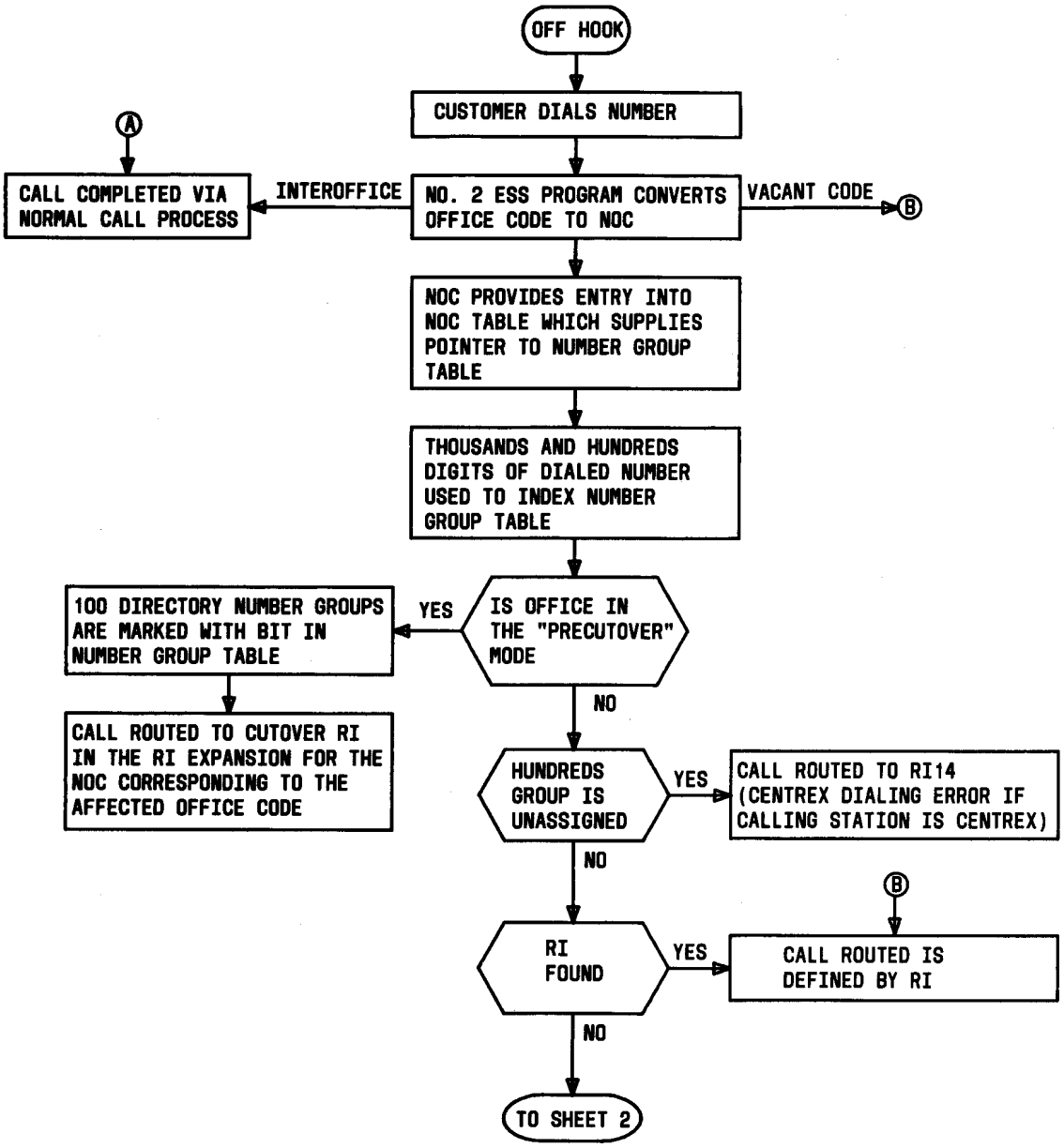

Fig. 1—Feature Flow Diagram Intercept Treatment (EF-1) (Sheet 1 of 2)

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The intercept treatments described in this document are provided on a per-system basis and are available for use in the No. 2/2B ESS.

6. LIMITATIONS

6.01 There is no limit on the number of intercepts available; however, the number of RIs available in a No. 2/2B ESS office is 512 and certain of these are dedicated ▶(0 through 19 for EF-2 and earlier, and 6 through 19 in 2BE3 with 0 not usable).◀

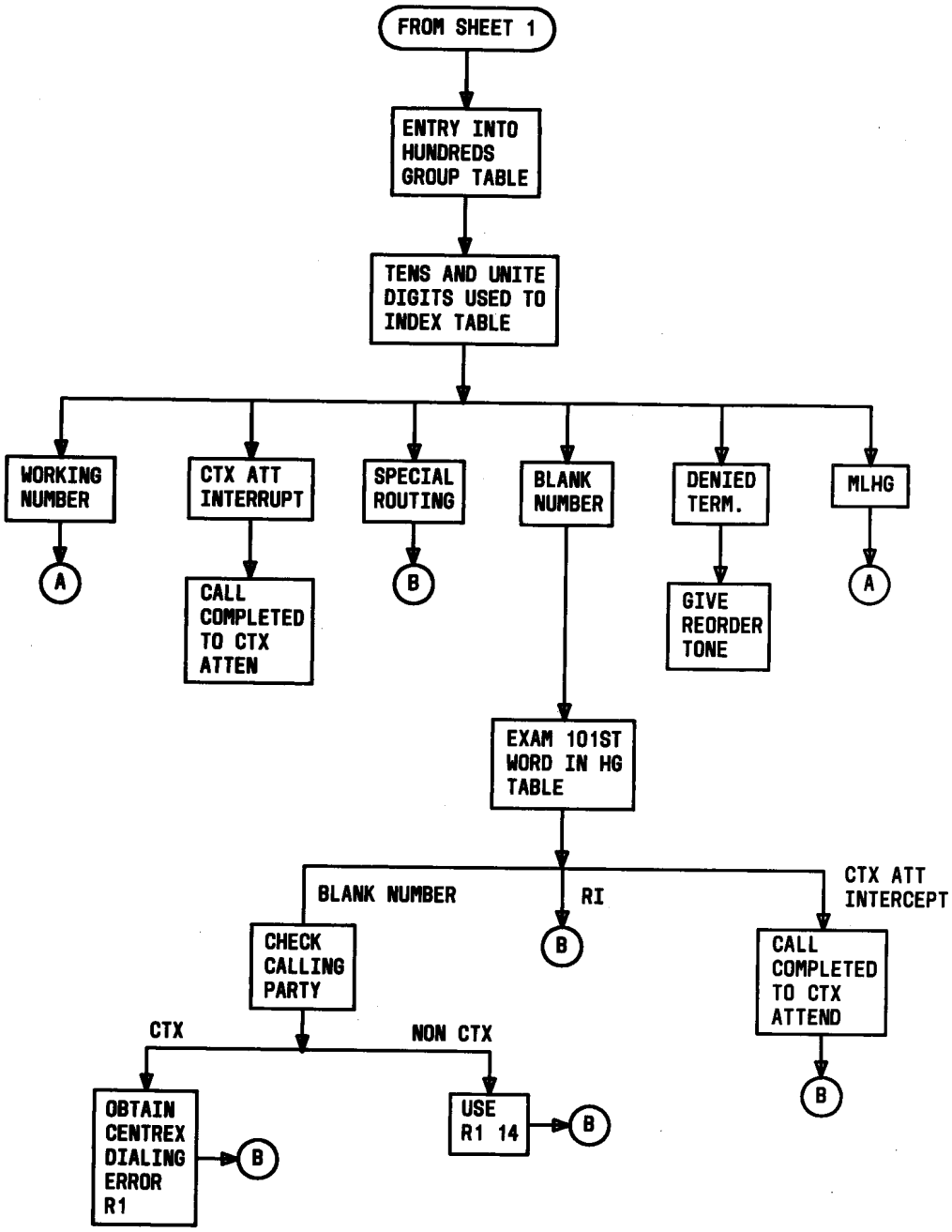

Fig. 1—Feature Flow Diagram Intercept Treatment (EF-1) (Sheet 2 of 2)

7. INTERACTIONS

7.01 There are interactions between centrex and noncentrex calls and between the attendant and centrex stations. These calls and the treatment they receive are as follows:

- Noncentrex calls to a disconnected centrex number receive any desired common treatment prescribed for the 101st word of the hundreds group. (See paragraph 4.11.)

- Noncentrex calls to a spare number assigned to a particular customer group receive any desired common treatment prescribed for the

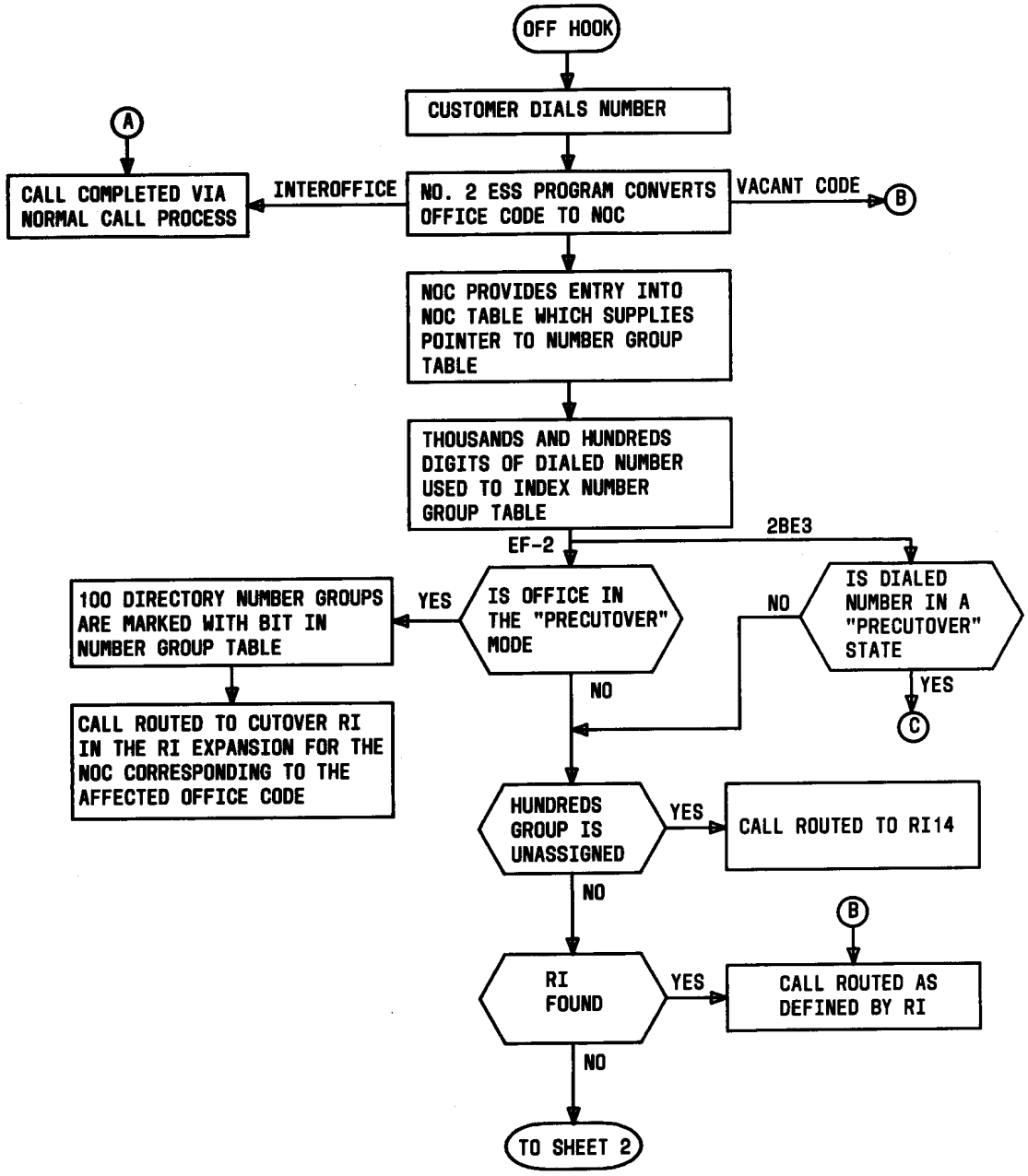

Fig. 2—Feature Flow Diagram Intercept Treatment (EF-2 and 2BE3) (Sheet 1 of 2)

101st word of the hundreds group. (See paragraph 4.11.)

- Noncentrex calls to a spare number not assigned to a particular customer group receive any desired common treatment prescribed for the 101st word of the hundreds group. (See paragraph 4.11.)

- Noncentrex calls to a fully restricted (terminating) centrex number are provided with RI 14 to obtain the proper treatment, either local announcement, 6A intercept, or AIS. For additional information on 6A intercept or AIS, see Section 232-190-023.

- Centrex station calls to a disconnected cen-

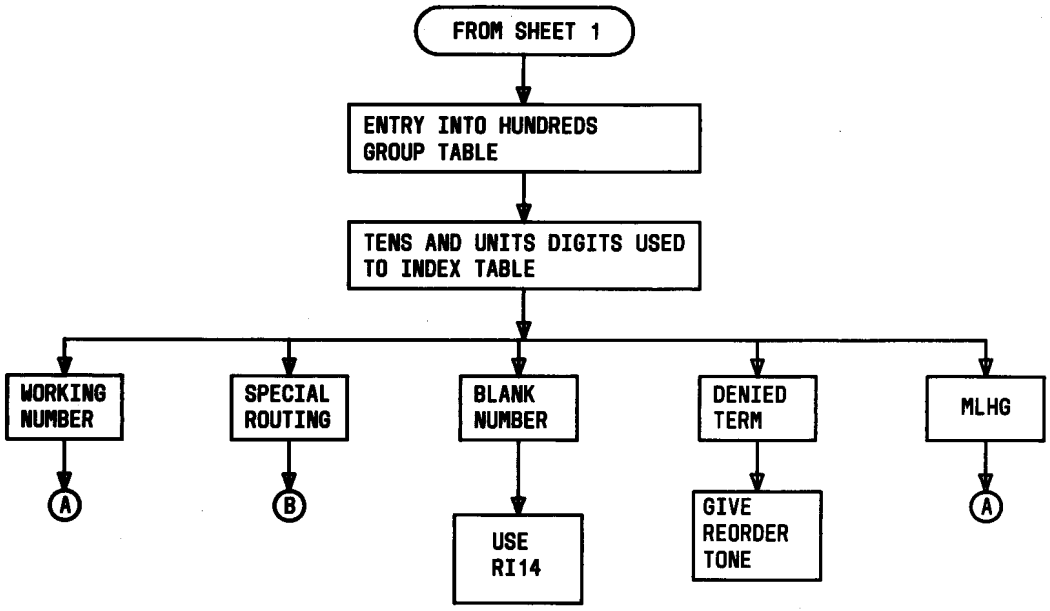

Fig. 2—Feature Flow Diagram Intercept Treatment (EF-2 and 2BE3) (Sheet 2 of 2)

trex number in the same customer group (intracentrex) receive centrex dialing error (CDE) treatment.

- Centrex station calls to numbers not in the same customer group receive CDE treatment.

- Centrex station calls to services not allowed generally receive CDE treatment or reorder. (See Section 232-190-011.)

- Centrex station calls misdialed receive CDE treatment.

- Attendant calls to a disconnected number in the same customer group receive CDE treatment.

- Attendant calls to fully restricted centrex stations receive CDE treatment.

- Attendant calls to services not allowed receive CDE treatment.

8. RESTRICTION CAPABILITY

8.01 There are no restrictions that apply to the intercept treatments.

INCORPORATION INTO SYSTEM

9. COST FACTORS

9.01 The intercept treatments described in this document require memory space. ▶When using the EF-2 or earlier generic,◀ the translation area of program store requires one word per hundreds group. ▶When using the 2BE3 generic, an additional four words are required in the 4-digit translations for each hundreds group.◀ For hardware related cost, refer to HARDWARE ENGINEERING, Section 232-190-023.

10. DATA ASSIGNMENTS AND RECORDS

10.01 The following ESS input forms must be properly completed by the Western Electric line engineer and the dial administrator of the operating company and submitted to the office data administration (ODA) system (Western Electric Regional Center). Normal scheduling procedures should be used for completing these forms.

- ***ESS 2109-Centrex Group Table:*** Used to assign the RI for the centrex dialing error announcement.

- ***ESS 2202-Trunk Group Table:*** Used to establish a trunk group number for the spe-

cific intercept trunk groups used in a given office. The traffic schedule and highest member number are also listed here.

- ***ESS 2303-Route Index Expansion:*** Used to define the treatment to be given to a RI.

10.02 Refer to Translation Guide, TG-2H, Division 4 for instructions for filling out the ESS forms. Copies of the reproducible input forms are in Division 11, Section 1, of the Translation Guide, TG-2H.

10.03 Recent change messages are available for adding and deleting the various types of intercepts available for a No. 2/2B ESS office.

RC MESSAGE	FUNCTION
A RC:L	To remove an active line from service, but to leave the telephone number (TN) defined as routing to intercept. Keyword TYP ICP/ is used for intercept. To completely remove a line from service, the keyword TYP OUT/ is used to give this line the blank number treatment.
A RC:HRI	To change, add, or delete the RI, RIB, and the centrex fully restricted terminating feature.
A VY:HRI	To verify whether a number group entry is fully restricted terminating or route indexed.
A RC:VTN	To change the 101st word.
A VY:VTN	To verify the treatment given to any unassigned TN within a range of 100 TNs.

11. HARDWARE RESTRICTIONS

11.01 There are no special hardware restrictions that apply to the intercept treatments described in this document.

12. INSTALLATION/ADDITION/DELETION

12.01 Refer to Section 232-190-023 for additional information on announcement arrangements.

12.02 The intercept arrangements described in this document are available with all generic programs. There are certain differences between the generic programs that affect these intercept arrangements. These differences should be noted when completing the input forms. Refer to DATA ASSIGNMENTS AND RECORDS for the proper input forms required and the recent change messages available.

13. TESTING

13.01 This feature can be tested by placing the appropriate test calls to verify the desired results. (See Section 232-190-023.)

14. OTHER PLANNING TOPICS

14.01 When planning for the intercept arrangements described in this document, the telephone company must use careful planning when deciding how to intercept blank numbers within various hundred groups and in planning precut ▶and post cut◀ RIs.

ADMINISTRATION

15. MEASUREMENTS

15.01 Traffic measurements are available in the standard form of a peg count. For details concerning the measurements available with the intercept feature, refer to Section 232-120-301 Traffic and Plant Measurements.

16. CHARGING

16.01 Not applicable.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 For definitions of all acronyms, abbreviations, and terms used in this document, see Section 232-190-003.

18. REFERENCES

18.01 The following documents may be referenced for supplementary information concerning operations related to the Intercept Treatments feature.

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

- Section 232-190-003 Glossary of Terms, No. 2/2B Electronic Switching System
- Section 232-190-023 Announcement Arrangements, No. 2/2B Electronic Switching System
- Section 232-024-501 Recorded Announcement Facilities Adjustments and Tests, No. 2/2B Electronic Switching System
- CD and SD-2H118-01—Electronic Switching System No. 2/2B Arranged With 2-Wire Features—Tone or Recorded Announcement Circuit
- PD-2H119-01—Electronic Switching System No. 2/2B Arranged With 2-Wire Features—Service Circuit Maintenance Program
- Translation Guide, TG-2H
- IM-2H200 Input Message Manual, No. 2/2B ESS
- OM-2H200 Output Message Manual, No. 2/2B ESS.