

FEATURE DOCUMENT
FLEXIBLE INCOMING CALL RESTRICTON
(FICR) FEATURE

2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS

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INTRODUCTION

1. GENERAL INFORMATION

SCOPE

1.01 This document provides information concerning the use of the Flexible Incoming Call Restriction (FICR) feature (formerly referred to as Slumber Service).

REASON FOR REISSUE

1.02 When this document is reissued, the reason for reissue will be stated in this paragraph.

FEATURE AVAILABILITY

1.03 The FICR feature is available in all active generic programs for No. 1 and No. 1A ESS. There is no unique base program dedicated to the FICR feature. It relies on existing base programs instead.

2. DEFINITION/BACKGROUND

DEFINITION

2.01 The *Flexible Incoming Call Restriction (FICR)* feature is a line arrangement through which an individual customer station or a functional group of individual stations can be temporarily prohibited from receiving calls.

BACKGROUND

2.02 A station can be simultaneously affected by as many as three separate restrictions (individual plus group). Calls can still be originated on any restricted station provided that station is not under control of a restriction which prohibits call origination. An attendant can still reach a restricted station by using attendant emergency override.

2.03 Termination restriction is accomplished with make-busy keys, and *Call Forwarding-Busy Line (CFBL)* provides termination treatment for the restricted calls.

2.04 *Call Forwarding-Variable (CFV)* as well as disable ringer mechanisms, used in conjunction with *Call Forwarding-Don't Answer (CFDA)* for termination treatment, can also be

used to provide both call restriction and termination treatment. However, these methods will not be described further in this document because operating procedures for the CFV restriction are the same as those for the existing CFV feature [see reference A(2) in Part 18] and because no standard implementation method exists for the disable ringer restriction.

2.05 Individual stations which are to be restricted can often be placed in a nonhunt multiline group (MLG) arrangement in order to conserve translation memory. [See reference A(4) in Part 18.]

2.06 Several applications are available for FICR. One frequent application is in the control of hospital patient stations. In such an application, it is often desirable to prevent a single station from receiving calls (individual restriction) or to prevent an entire ward, floor, or hospital from receiving calls (group restriction). Other possible applications include hotels, college dormitories, or any other establishment where it is necessary to temporarily intercept incoming calls. Smaller applications include make-busy for switchboards, 50A CPS (customer premises system) consoles, and other stations.

DESCRIPTION

3. USER OPERATION

CUSTOMER

A. Termination Restriction and Treatment

3.01 Customer perspective for restriction via make-busy keys covers the following areas:

- (a) The restricted station
- (b) Special hardware on the customer's premises
- (c) Activation and deactivation of the restriction
- (d) Termination treatment
- (e) The alternate destination.

3.02 Any station can be associated with a make-busy key restriction. Calls can be made as usual on the restricted station, but no visual or audible indications are received when calls are placed to its number.

3.03 The association between this restriction method and its affected station(s) and the alternate destination can be changed only via arrangements with the telephone company.

3.04 Each restriction requires a 2-position device for activation and deactivation. The device (hereafter called a key) can be an otherwise unused button on a keyset, call director, or console or a switch attached to a telephone or adjacent box.

3.05 One of the key positions is the **restriction active position**. When a key is placed in this position, the associated station(s) is immediately restricted. The restriction remains active until the key is restored to the **inactive position**. At this time, any associated station can immediately receive calls, provided it is not under control of another active restriction.

3.06 After the directory number (DN) of a restricted station is dialed, the calling party immediately receives audible ringing tone until the alternate destination answers. If the alternate destination cannot be reached, busy tone is received and continues until the calling party hangs up. The called restricted station receives no indication of the attempted call.

3.07 The restricted call receives one of the following termination treatments. Generally, these treatments are fixed for a given restriction and can be changed only via arrangements with the telephone company. A treatment can be unique to a station, unique to a customer group, or occasionally shared by the restricted stations of several customers.

(a) **Call routed to a designated station or attendant:** In this case, the designated station or attendant will usually be on the customer's premises but can be located anywhere, even in another city.

(b) **Call routed to an announcement:** The context of the announcement is not standard, but a statement such as the following is recommended: "The party you have dialed is not to be disturbed at this time; if this is an emergency (or if you desire additional information), you may call nxx-xxxx for assistance."

(c) **Call routed to an announcement with time-out to a designated station or**

attendant: The restricted call is passed to a station or attendant if the caller does not disconnect after the announcement. In this case, a typical announcement would be: "The party you have dialed is not to be disturbed at this time. If this is an emergency (or if you desire additional information), do not hang up; an attendant will assist you shortly."

(d) **Incoming call routed to a designated station or attendant and intra-business customer call to busy tone:** This type of treatment is available only if the restricted station is in a group. The designated station or attendant may be located anywhere.

(e) **Incoming call routed to the business customer group attendant and intra-business customer call to an announcement:** This type is also available only if the restricted station is in a business customer group. An incoming call is routed to the business customer group's attendant. An intra-business customer call is routed to centrex common intercept.

3.08 So that restricted calls can be properly answered at the alternate destination, limited call identification aids are available. One obvious means of identifying restricted calls at a station is to use dedicated lines which receive only restricted calls. However, restricted calls may be routed to an attendant console which receives several types of calls. In this case, visual call identification is available via certain call indicator lamps.

3.09 If desired, the number of calls simultaneously directed to a single alternate destination can often be limited to a predetermined number. One use of this is to limit the load on the person(s) receiving the calls. Calls directed to a restricted station while the maximum number of simultaneous calls is in progress receive busy tone.

3.10 If a 51A CPS attendant is used as an alternate destination, call indicator lamp indications may not be unique. The lamps used are the same ones that are used for the regular CFBL feature.

B. Attendant Emergency Override

3.11 A business customer station with an active make-busy key restriction and that is not

off-hook can be reached by the attendant. The attendant accomplishes this by prefixing a special 1- to 3-digit code to the extension number of the desired station. The attendant can also extend calls to the restricted station in this manner. The special code has the effect of overriding any active restrictions and prohibiting line hunting. All other aspects of the call remain the same as a normal (nonprefixed) call to the station.

TELEPHONE COMPANY

3.12 Not applicable.

4. SYSTEM OPERATION

HARDWARE

4.01 Each make-busy key requires an SD-1A210 (J1A033GA) remote master scanner applique circuit. A key device is needed on the customer's premises, and a wire pair (or equivalent) is required to connect the key device to the applique at the central office.

4.02 If used for the alternate destination, additional SD-1A218 (J1A032DC or J1A084DC) or SD-1A221 (J1A033DT or J1A088DT) announcement circuits may be required. If no alternate destination (CFBL DN) is provided, additional SD-1A218 busy tone circuits may be required.

OFFICE DATA STRUCTURES

A. Translations

4.03 The translation layouts relevant to the FICR feature are summarized in Table A. See references A(2), A(4), and A(6) in Part 18 for detailed descriptions of the translation data.

B. Parameters/Call Store

4.04 There are no unique parameter words, associated set cards, or call store areas required for the FICR feature. However, any requirements of the features used to implement the FICR feature must be considered.

FEATURE OPERATION

A. Termination Restriction and Treatment

4.05 System implementation for restriction via make-busy keys covers the following areas:

- (a) Special hardware in the central office
- (b) Activation and deactivation of the restriction
- (c) Detection of an active restriction during a call
- (d) Termination treatment
- (e) The alternate destination
- (f) Attendant emergency override.

4.06 Each make-busy key is connected to a wire pair (or equivalent) which is connected to the central office. Each wire pair from a key is connected to the master scanner via a remote master scanner applique circuit.

4.07 The central office associates a given wire pair and its master scanner applique with a station or group of stations by using one of the following four features: Directed Scan Make-Busy (DSMB), Terminal Make-Busy (TMB), Random Make-Busy (RMB), or Group Make-Busy (GMB).

4.08 Each master scanner point associated with a key using the TMB, RMB, or GMB schemes is so identified in the master scanner number (MSN) translation data. This data includes the associated MLG (TMB, RMB, and GMB are relevant only to lines in MLGs, including nonhunt) and for TMB, a list of the individual stations (terminals) affected by the key. With the RMB scheme, the stations affected by a key are identified in the MLG hunt list. With the DSMB and TMB schemes, each station affected by a key has the MSN stored in its LEN and DN translations.

4.09 With all of these features, the position (active or inactive) of each key is detected at its associated MSN's ferrod. The TMB, RMB, and GMB schemes require supervisory scan points; whereas, DSMB usually uses directed scan points. A supervisory scan detects each change in the position of a key for the TMB, RMB, and GMB schemes. For RMB, this causes an "RMB active"

TABLE A
FICR FEATURE TRANSLATIONS

METHOD OF RESTRICTION OR TERMINATION TREATMENT	TRANSLATION DATA AFFECTED	REMARKS
MAKE-BUSY KEY		
Directed Scan Make Busy	LEN and/or DN auxiliary block.	Stores MSN in sleeve lead annex.
	MLG hunt list.	Sleeve lead indicator.
Terminal Make Busy	LEN auxiliary block.	Stores MSN in sleeve lead annex.
	MLG hunt list.	Sleeve lead indication.
	MSN auxiliary block.	Stores MLG and list of affected terminals.
	UTYP 54 auxiliary block.	Stores base MSN for row of keys.
Random Make Busy	MLG common block.	RMB feature indicator.
	MLG hunt list.	Indicates which RMB key affects each terminal.
	MSN auxiliary block.	Stores associated MLG.
	UTYP 37 auxiliary block.	Stores base MSN for row of keys.
Group Make Busy	MLG common block.	RMB feature indicator.
	MSN auxiliary block.	Stores associated MLG.
	UTYP 37 auxiliary block.	Stores base MSN for row of keys.
Call Forwarding — Busy Line Options: Call Forwarding Unrestricted Source Inhibit Forwarding If Line Busy	DN auxiliary block.	Contains CFBL feature indicator and CFBL DN.
	MLG common block.	Contains CFBL feature indicator and CFBL DN.
	CFBL DN word.	CFUS option indicator.
	CFBL DN word.	CFILB option indicator.
ATTENDANT EMERGENCY OVERRIDE		
Attendant Access to Restricted Station	Centrex digit interpreter tables.	Contains subtype 18, sub-subtype 11 final data for attendant override code.

indication to be updated in the MLG headcell and the affected terminals' MLG activity bits to be busied or idled. For GMB, a "GMB active" indicator in the MLG headcell is merely updated. For TMB, the MLG headcell is not altered, but the MLG activity bits of the affected stations are updated. The DSMB scheme does not use a supervisory scan, so no station memory is altered. Instead, a directed scan is made during each call.

4.10 The technique used to *detect* a restricted station during a call depends upon the feature used to provide the station's restriction. [See reference A(4) in Part 18.] These techniques are briefly described below:

(a) **Using DSMB:** Every call placed to or which hunts to a station controlled by this feature performs a directed scan using the MSN stored in the station's line translations. If the scan detects a busy condition, a scan point busy indicator (SPBI) is set in call store denoting that an active restriction was encountered during the call. At this point, any hunting in progress resumes; however, if the station is not part of a hunting arrangement or if the hunt is completed, the call proceeds to an all-stations-busy stage.

(b) **Using GMB:** Every call placed to a station which is controlled by this feature examines the "GMB active" indicator in the MLG headcell to see if the GMB restriction is active. If so, the SPBI is set, and the call proceeds to the all-stations-busy stage.

(c) **Using TMB:** When a call is placed to an individual station which is controlled by this feature but which is not part of a hunt MLG, the call proceeds as with DSMB. Unfortunately, when the TMB feature is used with stations which are part of a hunt MLG, detection of an active restriction is often not possible during a call. In particular, it is not possible if a station's activity bit is busy; therefore, the SPBI cannot always be set properly. However, the line will appear busy, so no calls can terminate to it.

(d) **Using RMB:** When a call is placed to an individual station which is not part of a hunt MLG, the "RMB active" indicator in the MLG headcell is examined. If it indicates the station is affected by an active RMB restriction, the SPBI is set and the call proceeds to the

all-stations-busy stage. When used with stations in a hunt MLG, this feature acts similarly to TMB.

4.11 By using the provisions of the CFBL feature [see **Table B and reference A(2) in Part 18**], the types of termination treatment described in paragraph 3.07 can be given to calls which reach the all-stations-busy stage. A station which desires such termination treatment must have the CFBL feature; its associated CFBL DN is usually used to route a call to the alternate destination. Because the basic CFBL offering does not distinguish between a busy condition resulting from a make-busy key and one resulting from an off-hook line, the call forwarding inhibit line busy (CFILB) option can be used to insure that only calls which encounter active restrictions are forwarded. Calls which are not given such termination treatment are normally routed to busy tone.

4.12 The following termination treatments apply to the make-busy key restriction:

(a) **Route calls to a designated station or attendant:** If the designation is served by the same central office, the CFBL DN is the DN of the desired station or attendant. If served by another central office, the CFBL DN must be that of a remote call forward base station and the Remote Call Forwarding feature [see reference A(6) in Part 18] will route the call to the desired office. If the restricted station is in a business customer group, the call forwarding unrestricted source (CFUS) option must be used so that intra-business customer calls can also be forwarded to the destination via the CFBL DN.

(b) **Route calls to an announcement:** The CFBL DN in this case is usually associated with a route index which points to the proper announcement trunk group.

(c) **Route calls to an announcement with time-out to a designated station or attendant:** The delay announcement capability of the Queueing for Trunks and Lines (QTL) feature [see reference A(3) in Part 18] is used to provide the announcement. If the designated station or attendant is served by the same central office as the restricted station, it must have the delay announcement capability, and its DN must be the CFBL DN. If served by another central office, the CFBL DN can be that of a

TABLE B

FICR FEATURE DOCUMENT REFERENCES

FEATURE USED FOR FICR	SECTION NUMBER	TITLE
Busy Verification of Lines	231-090-070	BUSY VERIFICATION OF STATION LINES AND TIE TRUNKS
Call Forwarding — Outside Call Forwarding — Variable Call Forwarding — Busy Line Call Forwarding — Don't Answer Call Forwarding — Unrestricted Source Inhibit Forwarding If Line Busy	231-090-073	CALL FORWARDING FEATURES
Queueing for Trunks and Lines	231-090-167	QUEUEING FOR TRUNKS AND LINES
Terminal Make Busy Random Make Busy Group Make Busy	231-090-180	HUNTING AND NO HUNTING FEATURE
Remote Call Forwarding	231-090-312	REMOTE CALL FORWARDING

remote call forwarding base station whose remote station has the delay announcement capability. For business customer group stations, the call forward unrestricted source (CFUS) bit must be set to 1.

(d) **Route incoming calls to a designated station or attendant and intra-centrex calls to busy tone:** To provide this type of treatment, the restricted station must be in a business customer group and have CFUS = 0. If the designated station or attendant is served by the same central office, the CFBL DN is that of the desired station or attendant. Otherwise, the CFBL DN must be that of a remote call forward base station. When CFUS = 0, intra-business customer calls are routed to busy tone.

(e) **Route incoming calls to the business customer group attendant and intra-business customer calls to an announcement:** The restricted station must be in a business customer group and have CFUS = 1. The CFBL DN must be that of an

unassigned DN in the business customer group extension range. The business customer group must have the attendant intercept option.

4.13 If no alternate destination is provided for the restricted station (i.e., CFBL is not provided), restricted calls are routed to busy tone.

4.14 In most cases, restricted calls are routed to the alternate destination just as if they had been dialed directly. If the alternate destination is a station, including a 50A CPS console, restricted calls can be recognized at the destination only if dedicated lines are used. This is accomplished by using CFBL DNs, which are not listed in any directory. If the final destination is a 51A CPS console, a restricted call will light one of three call indicator lamps on the display. These are the same lamps as are normally used with the CFBL feature.

4.15 The alternate destination can have any features which are applicable to it under non-FICR applications. In particular, the Simulated Facilities feature [see reference A(5) in Part 18]

can be used on the CFBL DN to restrict the number of calls simultaneously directed to the alternate destination. The QTL feature may also be useful.

B. Attendant Emergency Override

4.16 To allow attendant access to a restricted station, a centrex special service code translates into a special sub-subtype (sub-subtype 11) of subtype 18 in the centrex digit interpreter tables. This allows the dialed extension, which is dialed after the special code, to be translated as if no restrictions were active. Specifically, make-busy conditions, active call forwards, and line hunting are ignored. The attendant terminates to dialed individual station if it is idle; otherwise, the attendant receives busy tone.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The FICR feature is available on a per station or functional group basis.

6. LIMITATIONS

OPERATIONAL

6.01 Not applicable.

ASSIGNMENT

6.02 Individual stations with common terminating features can be placed in nonhunt MLGs to achieve considerable translation memory savings. (See Part 14.) However, all their terminating data must be in common, particularly the CFBL DN. Certain equipment options, such as ground start and sleevelead, may differ as with hunt MLGs.

6.03 The nonhunt MLG arrangement, as well as the hunt arrangement, allows a given station to be controlled by up to three restrictions. A station can have all the following methods of restriction: DSMB (or TMB) key, RMB key, and GMB key.

6.04 The following associations are possible for restriction via make-busy keys:

- (a) A DSMB key can be associated with any individual station or a group of such stations.

- (b) A TMB key can be associated with an individual station in an MLG or any group of such stations in the same MLG.

- (c) A RMB key can be associated with an individual station in an MLG or any group of such stations in the same MLG.

- (d) A GMB key can be associated with any MLG.

- (e) A CFBL DN can be associated with an individual station not in an MLG or with an entire MLG. The "call forwarding unrestricted source" and CFILB options are associated with a station in the same manner.

6.05 The attendant's ability to reach a restricted station is an advantage over earlier forms of the FICR feature. Attendant override is accessible only by attendants and can be used to reach any restricted station in the business customer group.

6.06 The FICR feature is generally not applicable to 2-party or multiparty lines because most of the features used to implement the FICR feature are not available for these lines. However, the DSMB and CFBL features are available for 2-party and multiparty lines, but the same scan point and CFBL DN must be used for each station on such a line. Thus, all stations are simultaneously affected by the make-busy key.

6.07 The following limitations apply to the make-busy key method of restriction:

- (a) The number of DSMB and TMB keys or the number of stations controlled by such keys is limited only by the available scan points, applique mounting space, and memory or (for TMB) by the number of MLG stations. Any number of stations can be affected by the same DSMB key, and up to 20 stations can be affected by the same TMB key. Each individual station can be associated with only one such key and cannot be controlled by both a DSMB and a TMB key.

- (b) The number of RMB keys or the number of stations controlled by such keys is limited by either the available master scanner points, applique mounting space, and memory or by the number of MLGs. Each MLG station can

be affected by only one such key, but any number of stations in the same MLG can be controlled by the same key. A single MLG can have up to 10 RMB keys.

(c) A MLG can have only one GMB key affecting all stations within the group. As with RMB keys, the limiting factor is either available scan points, applique mounting space, and memory or the number of MLGs.

(d) An individual station can be associated with only one CFBL DN.

7. INTERACTIONS

STATIC

7.01 Not applicable.

DYNAMIC

7.02 All normal interactions of the features used to implement the FICR feature also apply in FICR applications. These features and the respective feature document references are listed in Table B.

7.03 When the make-busy key method is used, line hunting takes precedence over the CFBL termination treatment. When a restricted individual station is encountered, line hunting continues. The alternate destination is reached only if the hunt fails.

7.04 If an individual station in a hunt MLG is controlled by a TMB or RMB key, an active restriction cannot always be detected during a line hunt. However, the line always appears busy, so calls will not terminate to it. The net result is that the CFILB option often has no effect, with some calls routing to the alternate destination and others routing to busy tone.

7.05 If a hunt MLG station is controlled by several make-busy restrictions, the system detects the restrictions in the following order: GMB, RMB, and TMB or DSMB. For all other stations, the order in which applicable restrictions take place is GMB, TMB or DSMB, and RMB. No station can have both the TMB and DSMB features. If a station also has CFV active, CFV takes precedence over all make-busy restrictions.

7.06 A station with a make-busy key restriction and using the CFBL feature for termination treatment can also have the regular CFBL feature (CFILB = 0). However, the alternate destination then receives both busy-line forwarded calls and make-busy forwarded calls because the same CFBL DN is used in both cases.

7.07 When a restriction is activated against an individual station, existing active restrictions affecting the station remain effective. Likewise, when a restriction is deactivated, all other active restrictions against the station remain effective.

7.08 If a station has an active restriction and its alternate destination is also under an active restriction with an alternate destination, then multiple-call forwarding can take place.

8. RESTRICTION CAPABILITY

8.01 Not applicable.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 Refer to Fig. 1 for an illustration showing the implementation procedure for the FICR feature. Refer to Part 13 for testing.

10. HARDWARE REQUIREMENTS

Note: This part contains cost factors and determination of quantities. Central Office Equipment Engineering System (COEES) Planning and Mechanized Ordering Modules are the recommended procedures for developing these requirements. However, for planning purposes or if COEES is not available, the following guidelines may be used.

10.01 It is recommended that entire master scanner rows be dedicated to RMB and GMB keys or to TMB keys rather than mix them with other types of MSN assignments. This conserves both program store memory and system real time.

10.02 The SD-1A210-01 remote master scanner applique circuit (order codes 10470, 10471, 10472, or 10473) is wired eight circuits per unit on a miscellaneous trunk frame. One circuit is required for each key restriction and is connected via a wire pair (or equivalent). In lieu of a physical

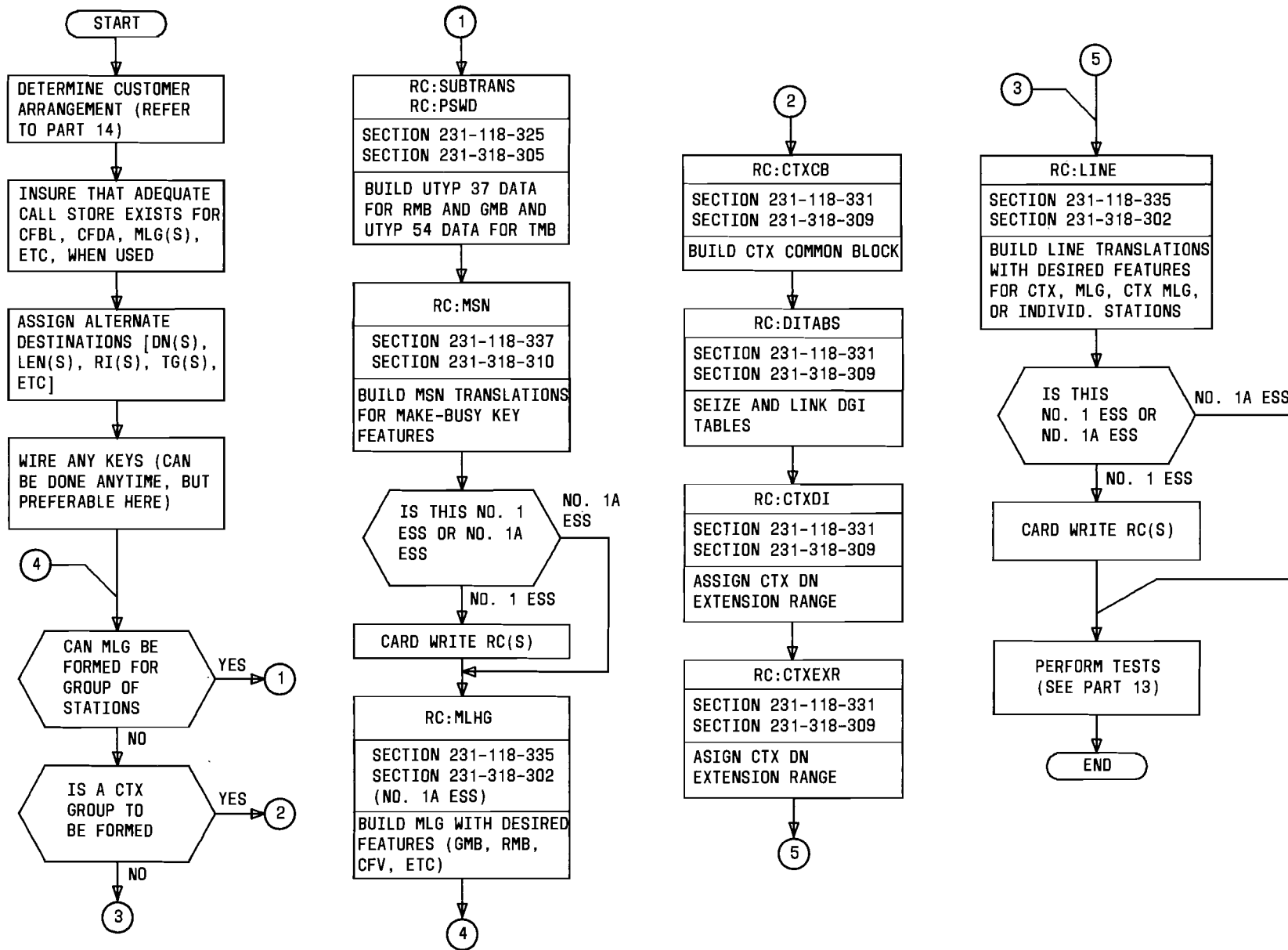


Fig. 1—Procedures for Adding FICR Feature

wire pair connecting each of a customer's keys to an applique circuit, a carrier facility can be used. One method uses standard off-the-shelf items (405A, B data set and 1C431 interface) to send from 8 to 32 key indications over a single wire pair. Other methods using commercial items can be devised on a local basis.

10.03 Announcement circuits SD-1A218-01 (order code 07870) and SD-1A221-01 (order codes 07970, 07971, 07972, 07904, 07905 or 07906) or miniaturized circuits SD-1A218-05 (order code 07800) and SD-1A221-05 (order codes 07901 or 07903) used for termination treatment are engineered in the standard manner. [See reference A(17) in Part 18.] The use of ESS announcement channels may not always be economical because the nature of the announcement may require that one or more channels be dedicated per customer. Recorded announcement devices located on customer premises and connected to the central office via lines should be considered in such cases.

10.04 The use of busy tone for treatment when an alternate destination is not provided has the effect of increasing the number of terminating calls which encounter busy. For most applications, this effect is negligible. However, it may have to be considered when engineering busy tone circuits SD-1A218-01 for new offices and large FICR additions.

10.05 For determination of quantities of service circuits, see reference A(17) in Part 18.

11. SOFTWARE REQUIREMENTS

Note: This part contains cost factors and determination of quantities. Central Office Equipment Engineering System (COEES) Planning and Mechanized Ordering Modules are the recommended procedures for developing these requirements. However, for planning purposes or if COEES is not available, the following guidelines may be used.

GENERAL

11.01 For several of the cost data areas covered here, it will only be necessary to provide approximations. This is particularly true when specifying PS and CS memory and system cycle time costs. Frequently, the possible data combinations and program sequences are too complex for exact

numbers to be provided. However, these approximations should be adequate.

11.02 The following cost data for controlled stations assumes that all other characteristics of the station have been taken into account. For example, if a DSMB key requires two additional words per LEN, this assumes the LEN already requires an auxiliary block. If the LEN were abbreviated, the PS word cost of going to an auxiliary block must be added to the two words. Similarly, the PS word cost of rearranging individual non-MLG stations into a nonhunt MLG must be taken into account. Usually, this amounts to about 1 additional PS word per station, plus 20 PS words and $4 + N/16$ CS words per MLG.

11.03 Other general cost items not covered in the following breakdown include those for the alternate destination—dedicated lines and DNs and the associated memory, announcement channels and trunks, and their associated memory. In addition, the basic overhead (nonstation related costs) of providing features such as CFBL must be taken into account.

MEMORY

A. NO. 1 ESS

Fixed

11.04 None.

Conditional

11.05 None.

Variable

11.06 The following memory is required when the feature is added on a per individual line or MLG basis using the make-busy key feature:

- **Translation (program store):**

(1) With DSMB feature: Four program store words for each non-MLG individual station or two words for each MLG individual station for storing the MSN in the LEN and/or DN translations.

(2) With TMB feature: Four program store words for each non-MLG individual

station or two words for each MLG individual station for storing the MSN in the LEN and/or DN translations. To identify the restricted stations in the MSN translations, $2 + N/2$ program store words (where N is the number of stations associated with the TMB key) are required.

- (3) With RMB feature: Two program store words per key for storing MSN data in the MSN translator.
- (4) With GMB feature: Two program store words per key for storing MSN data in the MSN translator.
- (5) Termination treatment for above methods: One program store word per non-MLG station or one program store word per MLG is required for storing the CFBL DN when the CFBL feature is used. If no alternate destination (i.e., no CFBL) is provided, additional memory is required if additional busy tone circuits are needed.

B. NO. 1A ESS

Fixed

11.07 None.

Conditional

11.08 None.

Variable

11.09 The following memory is required when the feature is added on a per individual line or MLG basis using the make-busy key feature:

- **Translation (unduplicated call store, file store):**

- (1) With DSMB feature: Four words for each non-MLG individual station or two words for each MLG individual station for storing the MSN in the LEN and/or DN translations.
- (2) With TMB feature: Four words for each non-MLG individual station or two words for each MLG individual station for storing the MSN in the LEN and/or

DN translations. To identify the restricted stations in the MSN translations, $2 + N/2$ words (where N is the number of stations associated with the TMB key) are required.

- (3) With RMB feature: Two words per key for storing MSN data in the MSN translator.
- (4) With GMB feature: Two words per key for storing MSN data in the MSN translator.
- (5) Termination treatment for above methods: One word per non-MLG station or one word per MLG is required for storing the CFBL DN when the CFBL feature is used. If no alternate destination (i.e., no CFBL) is provided, additional memory is required if additional busy tone circuits are needed.

REAL TIME IMPACT

A. No. 1 ESS

11.10 The real-time costs for the make-busy key method of restriction are as follows. These costs are above those incurred on calls to and from unrestricted stations or stations which do not have FICR.

- (1) For DSMB: 100 cycles per call placed to or from an associated non-MLG station or 150 cycles per call placed to or from an associated MLG station. (Note that 150 or more cycles are consumed for each associated individual MLG station examined during a hunt. Therefore, the DSMB method should be used cautiously with hunt MLGs.)
- (2) For TMB: 100 cycles per call placed to or from an associated MLG station. In addition, $100 + (10 * N)$ cycles per activation or deactivation where N is the number of individual stations controlled by the key, are consumed.
- (3) For RMB: 10 cycles per call placed to an associated nonhunt MLG station. In addition, 50 cycles per activation and $100 + (20 * N)$ cycles per deactivation, where N is the number of individual stations controlled by the key, are consumed.

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- (4) For GMB: 50 cycles per activation or deactivation of restriction.
- (5) For termination treatment: 100 cycles if a CFBL DN is used.

11.11 The cycle time in No. 1 ESS is 5.5 μ sec.

B. No. 1A ESS

11.12 The real-time costs for the make-busy key method of restriction are as follows. These costs are above those incurred on calls to and from unrestricted stations or stations which do not have FICR.

- (1) For DSMB: 200 cycles per call placed to or from an associated non-MLG station or 300 cycles per call placed to or from an associated MLG station. (Note that 300 or more cycles are consumed for each associated individual MLG station examined during the hunt. Therefore, the DSMB method should be used cautiously with hunt MLGs.)
- (2) For TMB: 200 cycles per call placed to or from an associated MLG station. In addition, $200 + (20 * N)$ cycles per activation or deactivation, where N is the number of individual stations controlled by the key, are consumed.
- (3) For RMB: 20 cycles per call placed to an associated nonhunt MLG station. In addition, 100 cycles per activation and $200 + (40 * N)$ cycles per deactivation, where N is the number of individual stations controlled by the key, are consumed.
- (4) For GMB: 100 cycles per activation or deactivation of restriction.
- (5) For termination treatment: 200 cycles if a CFBL DN is used.

11.13 The cycle time in No. 1A ESS is 0.7 μ sec.

12. DATA ASSIGNMENTS AND RECORDS

TRANSLATION FORMS

12.01 There are no new ESS translation forms or form entries for the FICR feature. Standard form entries on the following ESS forms

are required to implement the FICR feature. [See reference C(1) in Part 18.]

(a) ESS 1101—Directory Number Record—is used to identify the DNs belonging to the customer's MLG or centrex group. This form contains the CFILB option indicator.

(b) ESS 1107—Supplementary Information Record—is used to record CFBL, CFUS, TMB, and DSMB (MSN) options.

(c) ESS 1109—Centex Group Record—provides records of the business customer features and access codes. The attendant emergency override entry (sub-subtype 11) is made on this form.

(d) ESS 1115—Multiline Group Record—is used to maintain records of both hunt and nonhunt MLGs in CTX-8 and later generic programs. CFILB, RMB, and GMB entries are made on this form.

RECENT CHANGES

12.02 There are no new or unique recent change (RC) message formats used to implement the FICR feature. Details concerning the following RC formats used to implement the FICR feature can be found in the associated references.

RC MESSAGES

RC:LINE [References A(9) or A(11) in Part 18]
RC:MLHG [References A(9) or A(11) in Part 18]
RC:MSN [References A(7) or A(12) in Part 18]
RC:CTXCB [References A(8) or A(13) in Part 18]
RC:CTXDI [References A(8) or A(13) in Part 18].

13. TESTING

13.01 Testing consists of ensuring that calls originating from and terminating to the restricted station(s) are processed properly. Numerous combinations of active and inactive restrictions should be tried. These tests are normally performed after customer cutover. Limited terminating call tests can be performed prior to

office cutover by using cutover access lines to call customer stations.

13.02 The customer's translation data should be verified by using the following teletypewriter input messages:

- (a) Use the VFY-LEN input message to verify the line equipment number translations for the customer station(s). The system response to this message is a TR03 output message.
- (b) Use the VFY-DN input message to verify the directory number translations for the customer's station(s). The system response to this message is a TR01 output message.
- (c) Use the VFY-CSTG-34 input message to verify the common block entries for the customer's MLG. The system response to this message is a TR15 output message.
- (d) Use the VFY-CSTG-35 input message to verify the common block entries for the customer's centrex group. The system response to this message is a TR17 output message.
- (e) Use the VFY-CTSG-36 input message to verify the hunting list of the customer's MLG. The system response to this message is a TR16 output message.
- (f) Use the VFY-XDGNT input message to verify that the customer's centrex digit interpreter tables contain sub-subtype 11 final data for the attendant override code. The system response to this message is a TR18 output message.
- (g) Use the VFY-MSN input message to verify the master scanner number translation(s) for customers using the make-busy key control method of slumber service. The system response to this message is a TR12 output message.

14. OTHER PLANNING TOPICS

14.01 Certain methods of restriction and termination treatment may be more economical or feasible than others for a given application. There are no hard and fast rules for determining the best method; however, some guidelines are given in paragraphs 14.02 through 14.06.

14.02 If a station is not in a hunt MLG and cannot be part of a nonhunt MLG (does not have terminating data in common with other stations), the DSMB (or even the disable ringer or CFV methods) must be used for restriction.

14.03 A nonhunt MLG should be formed when 15 or more of a customer's stations satisfy the requirements of a nonhunt MLG. A hunt MLG should be formed when there are eight or more stations in a hunt sequence. If it is essential that a station have more than one make-busy restriction, it must be placed in an MLG.

14.04 If a MLG is to be used, the following guidelines apply:

- (a) GMB should be used for a group restriction when an entire MLG is to be affected by the same restriction and is to use the same alternate destination.
- (b) RMB should be used for a group restriction when five or more (but less than all) stations are to be affected by the same restriction and are to use the same alternate destination. In general, RMB should be used for a customer's larger group restrictions.
- (c) TMB should be used with a hunt MLG for individual restrictions, for group restrictions when RMB keys are exhausted, and when the same alternate destination is to be used.
- (d) DSMB should be used with a nonhunt MLG for individual restrictions, for group restrictions when RMB keys are exhausted, and when the same alternate destination is to be used.

14.05 Use of the make-busy key method without the CFBL feature should be avoided. Providing alternate destinations that provide useful information to the caller will increase the completion rate and decrease the retry rate.

14.06 A DN used to route calls to the alternate destination can be called directly, subject only to normal screening. To reduce the likelihood of people calling these destinations, unlisted DNs should be used when desirable.

ADMINISTRATION**15. MEASUREMENTS**

15.01 There are no new traffic or plant measurements for the FICR feature. However, the standard traffic measurements for MLGs, business customer groups, and CFBL can be useful. See reference A(16) in Part 18 for more information on type measurement codes.

15.02 The traffic line group measurement can be used to count the number of calls to a make-busy restricted DN. This should only be used for temporary studies since it requires additional program store and call store memory.

16. CHARGING**AUTOMATIC MESSAGE ACCOUNTING**

16.01 Not applicable.

UNIFORM SERVICE ORDER CODES

16.02 The uniform service order codes for the FICR feature are listed below:

- (a) FRD—Attendant position intercept, initial intercept line per FICR group
- (b) FRE—Control key
- (c) FRG—Common equipment, per group of stations
- (d) FRA—Each station line equipped.

SUPPLEMENTARY INFORMATION**17. GLOSSARY**

17.01 Not applicable.

18. REFERENCES

18.01 The following documentation contains information pertaining to or affected by FICR.

A. Bell System Practices

- (1) Section 231-090-070—Feature Document—Busy-Verification of Station Lines (BVL)

and Centrex Trunks (BVT) Features—2-Wire No. 1 and No. 1A Electronic Switching Systems

(2) Section 231-090-073—Feature Document—Call Forwarding Features—2-Wire No. 1 and No. 1A Electronic Switching Systems

(3) Section 231-090-167—Feature Document—Queueing for Trunks and Lines—2-Wire No. 1 and No. 1A Electronic Switching Systems

(4) Section 231-090-180—Feature Document—Multiline Groups—Hunting and No Hunting Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(5) Section 231-090-229—Feature Document—Simulated Facilities Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(6) Section 231-090-312—Feature Document—Remote Call Forwarding (RCF) Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(7) Section 231-118-325—RC Procedures for PSWD, GENT, PSBLK, and SUBTRAN (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(8) Section 231-118-331—Centrex-CO Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(9) Section 231-118-335—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLGH, ACT, and CFV (CTX-7 through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(10) Section 231-118-337—RC Procedures for ANIDL, CAMA, CFG, CPD, MSN, NMTGC, PLM, ROTL, SIMFAC, and TMBCGA (CTX-6 Through 1E5 Generic Programs)—2-Wire No. 1 Electronic Switching System

(11) Section 231-318-302—Line Recent Change Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, CFV and OBS (Through 1AE5 Generic Programs)—2-Wire No. 1A Electronic Switching System

(12) Section 231-318-305—RC Procedures for PSWD, PSBLK, SUBTRAN, and GENT (Through 1AE5 Generic Programs)—2-Wire No. 1A Electronic Switching System

(13) Section 231-318-309—Centrex-CO Recent Change Procedures for CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, DLG, FLXDG, FLXRD, and FLXRS (Through 1AE5 Generic Programs)—2-Wire No. 1A Electronic Switching System

(14) Section 231-318-310—RC Procedures for ANIDL, CAMA, CFG, CPD, JUNCT, MSN, NMTGC, PLM, ROTL, SIMFAC, TMBCGA, and CLAM (Through 1AE5 Generic Programs)—2-Wire No. 1A Electronic Switching System

(15) Section 966-102-100—Centrex and PBX-CO Service General Description—2-Wire No. 1 Electronic Switching System

(16) Section 231-120-301—Traffic Measurements—2-Wire No. 1 Electronic Switching System

(17) Section 231-060-210—Service Circuits—2-Wire No. 1 and No. 1A Electronic Switching Systems

(18) Section 231-061-450—Program Store—2-Wire No. 1 Electronic Switching System

(19) Section 231-062-470—Processor Community Engineering—Unduplicated Call Stores—2-Wire No. 1A Electronic Switching System

(20) Section 231-062-475—Processor Community Engineering—File Stores—2-Wire No. 1A Electronic Switching System.

B. TTY Input and Output Manuals

(1) Input Message Manual IM-1A001, No. 1 Electronic Switching System

(2) Input Message Manual IM-6A001, No. 1A Electronic Switching System

(3) Output Message Manual OM-1A001, No. 1 Electronic Switching System

(4) Output Message Manual OM-6A001, No. 1A Electronic Switching System.

C. Other Documentation

(1) Translation Guide TG-1A, 2-Wire No. 1 and No. 1A Electronic Switching Systems

(2) Translation Output Configuration PA-591003, No. 1 Electronic Switching System

(3) Translation Output Configuration PA-6A002, No. 1A Electronic Switching System

(4) GL 74-02-078 (EL 3098)—Development of Types of Hunting Arrangements and Make-Busy Keys for Multiline Hunt Groups.