DIVISION OF REVENUE MEASUREMENTS
(1E8/1AE8 GENERIC PROGRAM AND LATER)
FEATURE DOCUMENT
1 AND 1A "ESS*" SWITCHES

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INTRODUCTION

1. GENERAL INFORMATION

SCOPE

1.01 This section provides information concerning the capabilities and method of operation of the Division of Revenue Measurements feature used with the 1 and 1A ESS switches.

REASON FOR REISSUE

1.02 Whenever this section is reissued, the reason(s) will be given in this paragraph.

FEATURE AVAILABILITY

1.03 The Division of Revenue Measurements feature is an optionally loaded feature initially available with the 1E8 generic program for the 1ESS switch and the 1AE8 generic program for the 1A ESS switch. Feature group 9SDRPC and feature package 9FDRPC are loaded to provide the Division of Revenue Measurements feature.

1.04 The Division of Revenue Measurements feature is an extension of the existing Division of Revenue Peg Counts feature (Section 231-090-350) available with 1E7/1AE7 and earlier generic programs.

2. DEFINITION/BACKGROUND

DEFINITION

2.01 The ***Division of Revenue Measurements feature*** provides the capabilities for 1 and 1A ESS switches to collect and display peg and usage counts required to perform the division of revenue function.

BACKGROUND

2.02 Division of revenue traffic data forms the basis for sharing toll revenues. These revenues are generated by three types of calls: intra-LATA (local access and transport area), inter-LATA, and international. Depending upon type of call, revenues may be shared between originating telephone company, terminating telephone company, inter-LATA carrier (IC), and international carrier (INC). The revenues are shared in proportion to each company's plant investment and varies from month to month.

2.03 The Division of Revenue Peg Counts feature, available through the 1E7/1AE7 generic programs, collects data based on assigned incoming separation (INSEP) and destination separation (DESEP) of revenue categories. This function is performed on a sampling basis and counts only the number of calls made, not their holding time. The Division of Revenue Measurements feature expands the allowable range of INSEP values which may be used and provides usage (holding time) measurements in addition to peg counts. An hourly output option is also provided.

2.04 The Division of Revenue Measurements feature provides the capability to count, on a sample basis, the number of message network calls originating from 16 different incoming separations categories, each directed toward 16 destination separation categories. These measurements can be accumulated and printed out on the traffic TTY or transmitted to the Engineering Administration and Data Acquisition System (EADAS).

2.05 The division of revenue traffic schedule contains daily totals and hourly option totals of the following:

(1) Intraoffice calls

(2) Centrex/ESSX-1 intragroup calls

(3) Common control switching arrangement (CCSA) intrastate calls

(4) CCSA interstate calls

(5) Enhanced private switched communication service (EPSCS) intrastate calls (1ESS switch only)

(6) Enhanced private switched communication service interstate calls (1ESS switch only)

(7) Electronic tandem switching (ETS) calls

(8) Division of revenue matrix peg counts

(9) Division of revenue usage counts (peg counts and usage counts are controlled separately).

2.06 Usage (holding time) measurements are accumulated according to the INSEP and DESEP categories plus 11 miscellaneous measurements. Usage data is collected on a sample basis of 1-out-of-64 calls. The miscellaneous peg counts for which corresponding usage measurements are provided are as follows:

- Intragroup centrex calls
- Originating interstate CCSA calls
- Through-switched interstate CCSA calls
- Originating state CCSA calls
- Through-switched state CCSA calls
- Through-switched state CCSA (HILO) calls
- Through-switched interstate CCSA (HILO) calls
- Through-switched state EPSCS calls (1ESS switch only)
- Through-switched interstate EPSCS calls (1ESS switch only)
- Originating ETS calls
- Through-switched ETS calls.

Corresponding usage measurements are not provided for the following:

- Originating calls
- Outgoing interstate CCSA calls
- Outgoing state CCSA calls
- Outgoing ETS calls.

An additional error count is also included which records the number of times no usage measurement call register was available.

DESCRIPTION

3. USER PERSPECTIVE

CUSTOMER

3.01 Not applicable.

TELEPHONE COMPANY

3.02 Each month the network administrators in all operating telephone companies are required to collect selected traffic measurement data to perform division of revenue separation studies. This data is collected on a 24-hour basis for a minimum of two to five business days in each dial entity. The data is used to develop subscriber line usage and local dial equipment minutes traffic factors to separate the interstate investment in subscriber plant and local dial switching equipment.

3.03 When the DRPC feature is present in the office, data collection is under control of the TDR-SEP-aaa. TTY input message. See references B(1) and B(2) in Part 18. This message may be used to activate or inhibit collection of:

- Data in the separations peg count matrix
- Data in the usage measurements separations matrix.

3.04 Data collection will begin immediately upon activation and will continue until a request is received to inhibit collection. Reporting of data is done at 2:30 a.m. (output message TDR02) unless the hourly output option is requested; in which case, reporting will also be done hourly, on the hour, 24 hours a day. If an attempt is made to activate usage measurements before activating the peg count option, the peg count feature will be forced active. Data collection may be activated or inhibited by the TDR-SEP-aaa. TTY message as follows:

aaa = ALW—Allow division of revenue peg counts

= INH—Inhibit division of revenue peg counts

= AUM—Allow usage measurements

= IUM—Inhibit usage measurements

= AHC—Allow hourly reporting

= IHC—Inhibit hourly reporting.

3.05 Toll counts are provided by the TDR01 TTY output message. The TDR01 output message contains the number of completed toll calls or the number of calls carried on trunk groups capable of carrying both local and toll calls.

3.06 Division of revenue peg counts and usage measurements are provided by the TRD02 TTY output message. Output message TDR02 appears on the traffic TTY at 2:30 a.m. daily unless the EADAS feature is active, contingent upon the following requirements:

- Peg counts will appear daily in the TRD02 message only if the DRPC modular package is loaded in the office and collection of the peg counts has been active (as requested by input message TDR-SEP-ALW.) at least once during the previous 24-hour period (2:30 a.m. to 2:30 a.m.).

- Usage measurements will appear daily in the TRD02 message only if the DRPC modular package is loaded in the office and collection of the usage measurements has been active (as requested by input messages TDR-SEP-ALW. and TDR-SEP-AUM.) at least once in the previous 24-hour period (2:30 a.m. to 2:30 a.m.).

3.07 Output message TDR02 will appear on the traffic TTY hourly, on the hour, 24 hours a day unless the EADAS feature is active, contingent upon the following requirements:

(1) Peg counts will appear hourly in the TRD02 message only if the DRPC modular package is loaded in the office and collection of the peg counts has been active (as requested by input messages TDR-SEP-ALW. and TDR-SEP-AHC.) at least once during the previous 1-hour period.

(2) Usage measurements will appear hourly in the TRD02 message only if the DRPC modular package is loaded in the office and collection of the usage measurements has been active (as requested by input messages TDR-SEP-ALW., TDR-SEP-AUM., and TDR-SEP-AHC.) at least once in the previous 1-hour period.

4. SYSTEM OPERATION

HARDWARE

4.01 Not applicable.

OFFICE DATA STRUCTURES

A. Translations

Line Equipment Number

4.02 The Common Control Switching Arrangement (CCSA) and Enhanced Private Switched Communication Service (EPSCS) calls, both on- and off-network, are categorized as either interstate or intrastate. This categorization is based on the originating major class obtained from the line equipment number (real or pseudo) of the initiating entity on all CCSA and EPSCS calls. There are four originating major classes as follows:

- 4FNAL (decimal 28)—network access line—interstate customer (non-Centrex/ESSX-1)

- 4FNALS (decimal 33)—network access line—intrastate customer (non-Centrex/ESSX-1)

- 4FCNAL (decimal 34)—network access line—interstate customer (Centrex/ESSX-1)

- 4FCNALS (decimal 35)—network access line—intrastate customer (Centrex/ESSX-1).

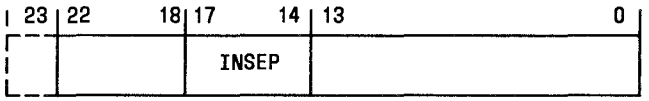
4.03 This state/interstate specification by originating major class is reflected in the instructions concerning the ESS 1306 form, Line Class Record, in the Translation Guide TG-1A. This form describes originating major class code assignments. If this translation information is not updated, the CCSA and EPSCS peg counts on the division of revenue traffic schedule will be incorrect; otherwise, CCSA and EPSCS traffic division of revenue will function normally.

Incoming Separation (INSEP) of Revenue Assignment

4.04 The INSEP categories are contained in the trunk group number supplementary translator, which contains a primary translation data word for each trunk group number in an office. For those trunks that carry no direct distance dialing network incoming traffic, zero is specified for this item. Figure 1 displays the layout of the trunk group number supplementary translator primary translation word.

Destination Separation (DESEP) of Revenue Assignment

4.05 The DESEPs are listed in the auxiliary blocks of appropriate rate and route patterns (Fig. 2 and 3). The DESEP item is located in word 0 (CIW2) of the rate and route pattern auxiliary block. All rate and route patterns that specify a DESEP require a CIW2 word. The format of the CIW2 word, when present, is shown in Fig. 2 and 3.



NOTE:
1. Bit 23 exists in the 1A "ESS" switch only

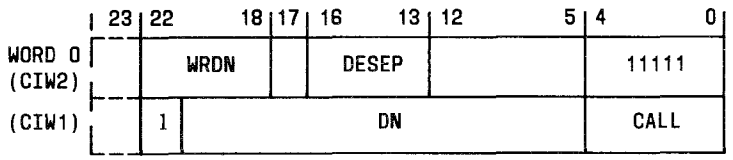
LEGEND:

INSEP - Incoming separation of revenue class

Fig. 1—Supplementary Primary Translation Word for Incoming Trunk Group

4.06 The INSEP and DESEP information is required for the proper functioning of the separations matrix counts. This information may be included but is not required if the feature is not being used.

4.07 Word 0 (CIW2 word) of the 2-word rate and route pattern auxiliary block (Fig. 2) contains call type 31 (for internal use only) to indicate that the first word of the auxiliary block is the CIW2 word. Item DESEP specifies the destination separation of revenue class. Word 1 (CIW word) contains the call type (28) and directory number. Bit 17 in the CIW2 word is 0 to indicate that screening codes are not required.

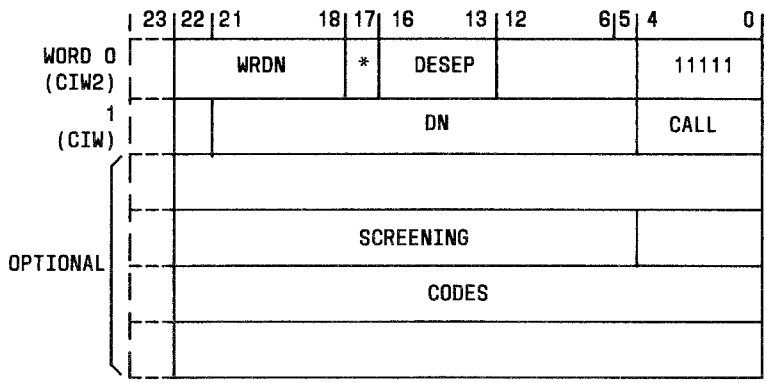


NOTE:
1. Bit 23 exists in the 1A "ESS" switch only.

LEGEND:

CALL - Call type.
DESEP - Destination separation of revenue class.
DN - Directory number.
WRDN - Number of words in the auxiliary block. A 2-word auxiliary block is built if CIW2 word is built but no screening codes are required.

Fig. 2—Two-Word Rate and Route Pattern Auxiliary Block



NOTE:
1. Bit 23 exists in the 1A "ESS" switch only.

* SCRI

LEGEND:

CALL - Call type
DESEP - Destination separation of revenue class
DN - Directory number
SCRI - 0 if no screening codes
1 if screening codes exist
SCREENING CODES - SCR1 through SCR15
WRDN - Number of words in the auxiliary block
A 6-word auxiliary block is built if screening codes are required.

Fig. 3—Six-Word Rate and Route Pattern Auxiliary Block

4.08 The CIW2 word and the CIW word in the 6-word rate and route pattern auxiliary block (Fig. 3) are identical to the words shown in the 2-word rate and route pattern auxiliary block. Bit 22 in the CIW word must be 0, and bit 17 in the CIW2 word must be set when screening codes are required. When bit 17 is set, four words are built in the auxiliary block for screening codes.

4.09 Translation programs will generate a CIW2 equals 0 if CIW2 does not exist in a rate and route pattern translation. Therefore, CIW2 is built only when:

- There is nonzero data in bits 5 through 16 of the CIW2 word.
- The CIW word contains data in bits 18 through 21 (ie, call type 28), and screening is required.

B. Parameters/Call Store

4.10 Parameter word U2SRCM contains the address of a 1637-word block of call store (call store table SRCM), which is used to collect and hold the division of revenue data. Call store table SRCM does not need to be in the restricted address area of call store.

4.11 Parameter word I4UM specifies the beginning address of the 8-word senior call registers required to obtain the division of revenue usage data. These senior call registers are defined by information contained in the I4REGS table. The I4REGS table is a table of pointers to call store, giving the starting address of the first register and the number of registers required. The pointer giving the starting address of the first register is located at I4REGS+27 (1A ESS switch only). The 1ESS switch uses left half of I4REGS+27. Set card NUMR specifies the

number of registers required. The value of set card NUMR is determined as follows:

> NUMR = P.01 (1,HDBH, [(ABS Originating plus incoming calls 2-wire)* (HD/ABS peak factor for originating plus incoming calls 2-wire) + (ABS incoming HILO calls)*(HD/ABS peak factor for incoming HILO calls)]*(usage measurement call register holding time)*.01/64).

FEATURE OPERATION

A. General

4.12 The Division of Revenue Measurements feature creates a daily traffic schedule of measurements pertinent to division of revenue. The counts displayed on this schedule describe the following division of revenue classifications:

- Originating traffic
- Intra-Centrex/ESSX-1 traffic
- CCSA traffic
- EPSCS traffic (1ESS switch only)
- ETS traffic
- Direct Distance Dialing message network traffic.

4.13 The peg and usage counts are printed on a separate daily or hourly option traffic schedule called the division of revenue traffic schedule. When the printout is daily, the collection period is unconditionally 2:30 a.m. to 2:30 a.m. When the printout is hourly option, the collection period is each hour on the hour in addition to the daily output.

4.14 Upon activation of the collection of data, or if at sometime during the hourly period or during the whole day period collection of the counts have been turned off, a flag is set in the output indicating that the data is only partial data. Separate flags exist for peg counts and usage measurements.

4.15 Sixteen items appear on the division of revenue traffic schedule. These items appear conditionally on the traffic schedule. A description of these items follows.

4.16 The first item on the division of revenue traffic schedule is the originating calls peg count. The second count is one count of all intra-Centrex/ESSX-1 call attempts.

4.17 The next eight items on the division of revenue traffic schedule classify common control switching arrangement traffic. They are:

- Interstate CCSA originating
- Interstate CCSA outgoing
- Interstate CCSA through-switched
- Intrastate CCSA originating
- Intrastate CCSA outgoing
- Intrastate CCSA through-switched
- Intrastate CCSA (HILO) through-switched
- Interstate (HILO) through-switched.

4.18 The next two items on the division of revenue traffic schedule classify EPSCS traffic (these apply to the 1ESS switch only). They are:

- Intrastate EPSCS through-switched
- Interstate EPSCS through-switched.

4.19 The next three items on the division of revenue traffic schedule pertain to electronic tandem switching (ETS) traffic. These items are:

- ETS originating
- ETS outgoing
- ETS through-switched.

4.20 The final item on the division of revenue traffic schedule is the separation matrix. The purpose of the separation matrix is to place all public network calls in the system into various classes as required for the division of revenue function.

B. Detailed Description

4.21 The ***originating calls peg count*** is a duplicate of the originating calls peg count type

measurement code (TMC) 05, equipment group (EGO) 014 which appears on the TC24A daily traffic schedule.

4.22 The ***intra-Centrex/ESSX-1 calls peg count*** is a daily peg count which includes the following types of calls:

- Centrex/ESSX-1 station-to-station call attempts
- Centrex/ESSX-1 station-to-attendant (dial 0) call attempts
- Centrex/ESSX-1 manual station originations.

4.23 For offices that do not serve Centrex/ESSX-1 customers, this item appears on the division of revenue traffic schedule as zero.

4.24 The next eight items (items three through ten) concern CCSA traffic. For division of revenue purposes, the ***toll*** classification and the ***machine-facilities-use*** classification must be determined on a common control switching arrangement call. The ***toll*** classification indicates whether a particular CCSA call is initiated from a ***state*** or an ***interstate*** customer. ***State*** and ***interstate*** pertain to the type of tariff under which the CCSA can be sold. The ***machine-facilities-use*** classification indicates the type of call being switched; that is, the call is one of the following:

- Line-to-line
- Line-to-trunk
- Trunk-to-trunk.

4.25 A sufficient set of CCSA-related ***machine-facilities-use*** peg counts is composed of the following three types of counts:

(a) ***Originating CCSA Peg Count:*** This count is made upon receipt of the first digit or upon recognition of the CCSA access code; thus, it includes both on- and off-network call attempts from the following:

- All network access line originations
- All Centrex/ESSX-1 station dial "8" attempts
- All Centrex/ESSX-1 attendant dial "8" attempts.

(b) ***Outgoing CCSA Peg Count:*** This count is made after successful completion of outpulsing and includes both on- and off-network calls originated by the three sources listed under originating CCSA peg count.

(c) ***Through-Switched CCSA Peg Count:*** This count also is made after successful completion of outpulsing and includes both on- and off-network calls from the following:

- Call outpulsed over CCSA incoming and 2-way trunks are included in this count.
- Calls outpulsed over Centrex/ESSX-1 access tie trunks that dial "8" are also included.

4.26 The three peg counts described in paragraph 4.25 are used to develop counts for the various call types. The line-to-line calls are determined by subtracting the outgoing CCSA peg count from the originating CCSA peg count. The line-to-trunk and trunk-to-trunk calls are obtained directly from the outgoing CCSA peg count and through-switched CCSA peg count registers. The line-to-line and trunk-to-trunk usage must be estimated by multiplying the associated calls by the network holding time as measured on the network trunks.

4.27 The eight items concerned with CCSA traffic are:

- Interstate CCSA originating
- Interstate CCSA outgoing
- Interstate CCSA through-switched
- Intrastate CCSA originating
- Intrastate CCSA outgoing
- Intrastate CCSA through-switched
- Intrastate CCSA (HILO) through-switched
- Interstate CCSA (HILO) through-switched.

4.28 The tenth and eleventh items on the division of revenue traffic schedule concern EPSCS traffic. As with CCSA calls, the ***toll*** and ***machine-facilities-use*** classifications must be determined. This is accomplished in essentially the same manner as described for CCSA calls. The through-switched EPSCS peg count is made after successful completion of outpulsing and includes both on- and off-network calls for the following:

- Calls outpulsed over EPSCS incoming and 2-way trunks are included in this count.
- Calls outpulsed over Centrex/ESSX-1 access tie trunks that dial "8" are included in this count.
- EPSCS intrastate and interstate through-switched calls are also included.

4.29 The next three items on the division of revenue traffic schedule indicate ETS traffic. As with CCSA calls, the ***machine-facilities-use*** classification must be determined to indicate the type of call being switched. The call can be one of the following:

- Line-to-line
- Line-to-trunk
- Trunk-to-trunk.

4.30 The following peg counts are recorded on the division of revenue traffic schedule for ETS calls.

(a) ***Originating ETS Peg Count:*** This count is made upon receipt of the first digit or upon recognition of the ETS access code; thus, it necessarily includes both on- and off-network call attempts from the following:

- All network access line originations
- All Centrex/ESSX-1 station dial "8" attempts
- All Centrex/ESSX-1 attendant dial "8" attempts.

(b) ***Outgoing ETS Peg Count:*** This count is made after successful completion of outpulsing and includes both on- and off-network calls originated by the three sources listed under originating ETS peg count.

(c) ***Through-Switched ETS Peg Count:*** This count is also made after successful completion of outpulsing and includes both on- and off-network calls from the following:

- Calls outpulsed over ETS incoming and 2-way trunks are included in this count.
- Calls outpulsed over Centrex/ESSX-1 access tie trunks that dial "8" are also included.

4.31 The final item on the division of revenue traffic schedule is the separations matrix, which consists of 1637 words. For the separations matrix to appear on the division of revenue traffic schedule, the matrix must exist as determined by U2SRCM parameter word. The second requirement is that the TTY input message TDR-SEP-ALW has been received or is in effect.

4.32 The peg count separations matrix includes the basic peg count matrix (256 words), 2 translation error counts, and 15 miscellaneous counts. Also, a 272-word matrix is required for usage measurements. The usage matrix includes the basic usage measurement matrix (256 words), the 11 miscellaneous measurements, and 1 word for the number of errors encountered due to the unavailability of usage measurement call registers. Two additional words are required to indicate partial peg counts and partial usage measurements. Two new matrices, one for hourly data collection and the other for data reporting, are also required. These matrices contain both the peg count and usage measurement data and require 1090 call store words. One matrix (the data reporting matrix) requires an additional two words to indicate partial hourly peg counts and partial hourly usage measurements.

4.33 The purpose of the separations matrix is to place all public network calls in the system into various classes as required for the division of revenue function, particularly as applied to toll switching systems. This matrix is 16 columns by 16 rows. Each column represents an INSEP category. Each row represents a DESEP category.

4.34 Every 2-way or incoming trunk group is assigned an INSEP from 1 to 15. Incoming sepa-

ration category zero is not allowed for trunk groups and will cause an error message to be printed if encountered by the call processing programs; INSEP zero is used for locally originated calls. Automatic error checking is described in Part 13—TESTING. All lines in the office are automatically defaulted by the call processing programs to be included in INSEP category zero.

4.35 Every nonintraoffice destination code (typically 3- or 6-digit routing codes) is assigned a DESEP from 1 through 15. Destination separation category zero is only allowed for intraoffice destination codes and will cause an error message to be printed if a nonintraoffice destination code is encountered by the call processing programs. Automatic error checking is described in Part 13—TESTING. All intraoffice destination codes are automatically assumed by the call processing programs to be included in DESEP category zero. This is possible because intraoffice destination codes are identified by call type. When the program encounters a destination code with the intraoffice call type (4FITRA=5), DESEP zero is supplied and used by the program. Figure 4 displays the layout of the separations matrix.

4.36 By the use of INSEP and DESEP classifications, every incoming and outgoing direct distance dialing call can be categorized for division of revenue purposes. The INSEP and DESEP classifications are determined on every eighth call in the system when the collection of data has been activated in the peg count separations matrix by the TDR-SEP-ALW TTY input message. The collection of peg count separations matrix data may be inhibited with the TDR-SEP-INH TTY message. When the peg count separations matrix data is printed on the division of revenue traffic schedule, all of the peg count separations matrix elements are scaled up by eight so direct comparisons with other peg counts can be made.

4.37 The actual peg count is made for the following types of calls:

(a) On calls to destination codes served by the office, the peg count is made when all digits have been received prior to performing the terminating directory number translation.

(b) On calls to destination codes not served by the office, the peg count is made after successful completion of outpulsing when the call is logically proceeding to the "waiting for answer" state.

(c) On calls to service codes, such as operator codes, the peg count is made at the end-of-digit analysis. The terminating entity of such calls is a nonoutpulsing trunk. These calls are:

- Calls that are served by the office in which the call was made are pegged.
- Calls for which digit analysis is completed out of the destination code translator (identified by call type 4FCOMP equals 3, complete without outpulsing) are also pegged.

(d) On calls via a HILO intraprocessor trunk, the peg count for an originating (local-to-toll side of an office) call is made after the toll side to which the digits were successfully transferred completes outpulsing. The peg count for a terminating (toll-to-local side of an office) call is made after the digits are successfully transferred to the local side, but before the completion of the connection.

4.38 Calls counted in the matrix are as follows:

- All non-Centrex/ESSX-1 line or trunk-initiated calls
- All Centrex/ESSX-1 extension, tie trunk, or attendant dial "9" access
- All Centrex/ESSX-1 extension, tie trunk, or attendant wide area telecommunications system (WATS) access
- All Centrex/ESSX-1 extension, tie trunk, or attendant flexible route selection access which either goes via WATS or overflows to the direct distance dialing network.

4.39 Calls to 10X type codes are generally routed directly out of the destination code translation to a nonoutpulsing trunk group. Thus, they are counted in the matrix just as calls to service codes are counted. A separate DESEP category should be used for the classification of such test codes. However, not all test codes can be as easily classified because calls to test codes can be handled in two ways in 1 and 1A ESS switches. First, they may be handled directly out of a destination code translator in the manner of a service code. Calls to such test codes are commonly

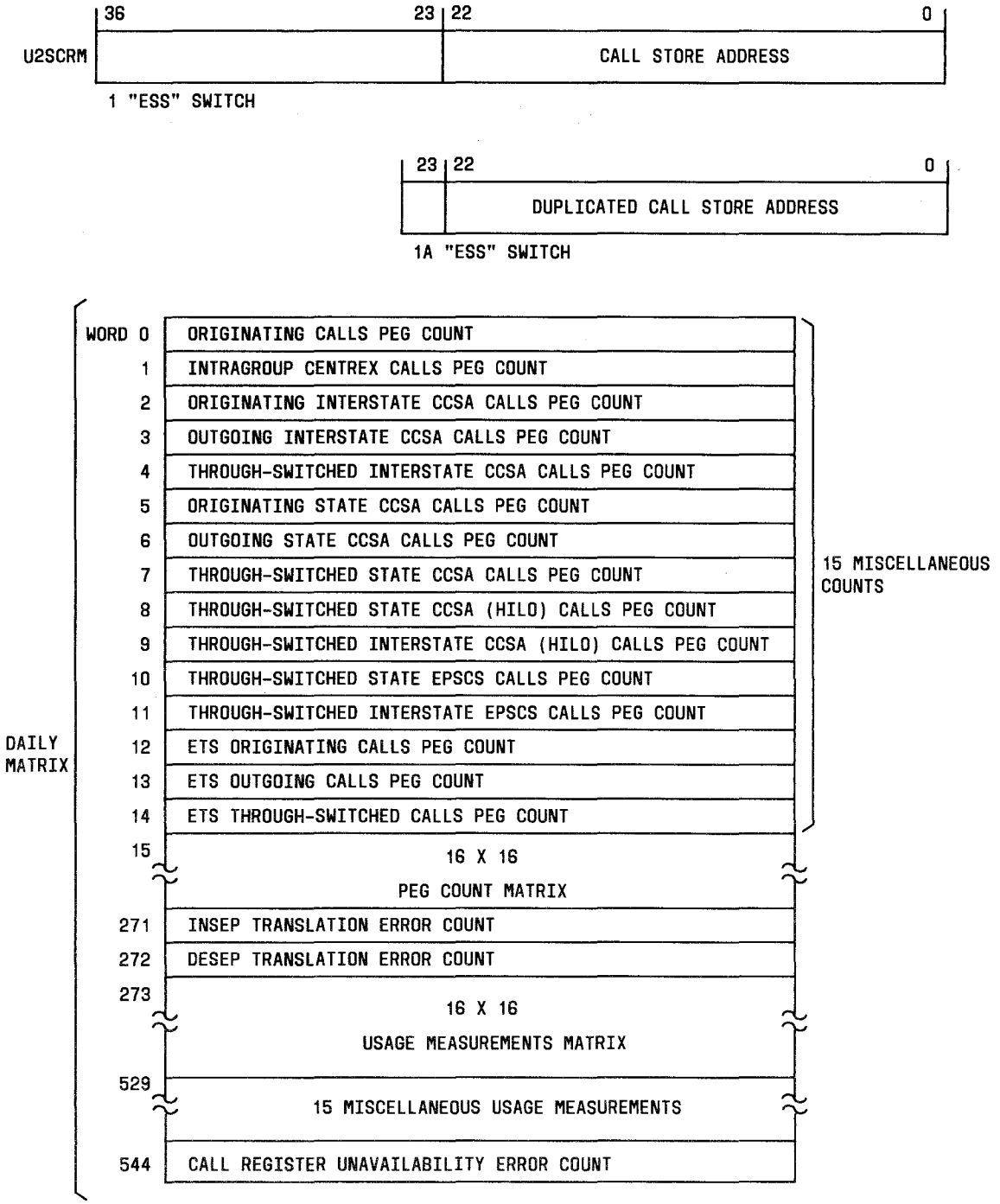
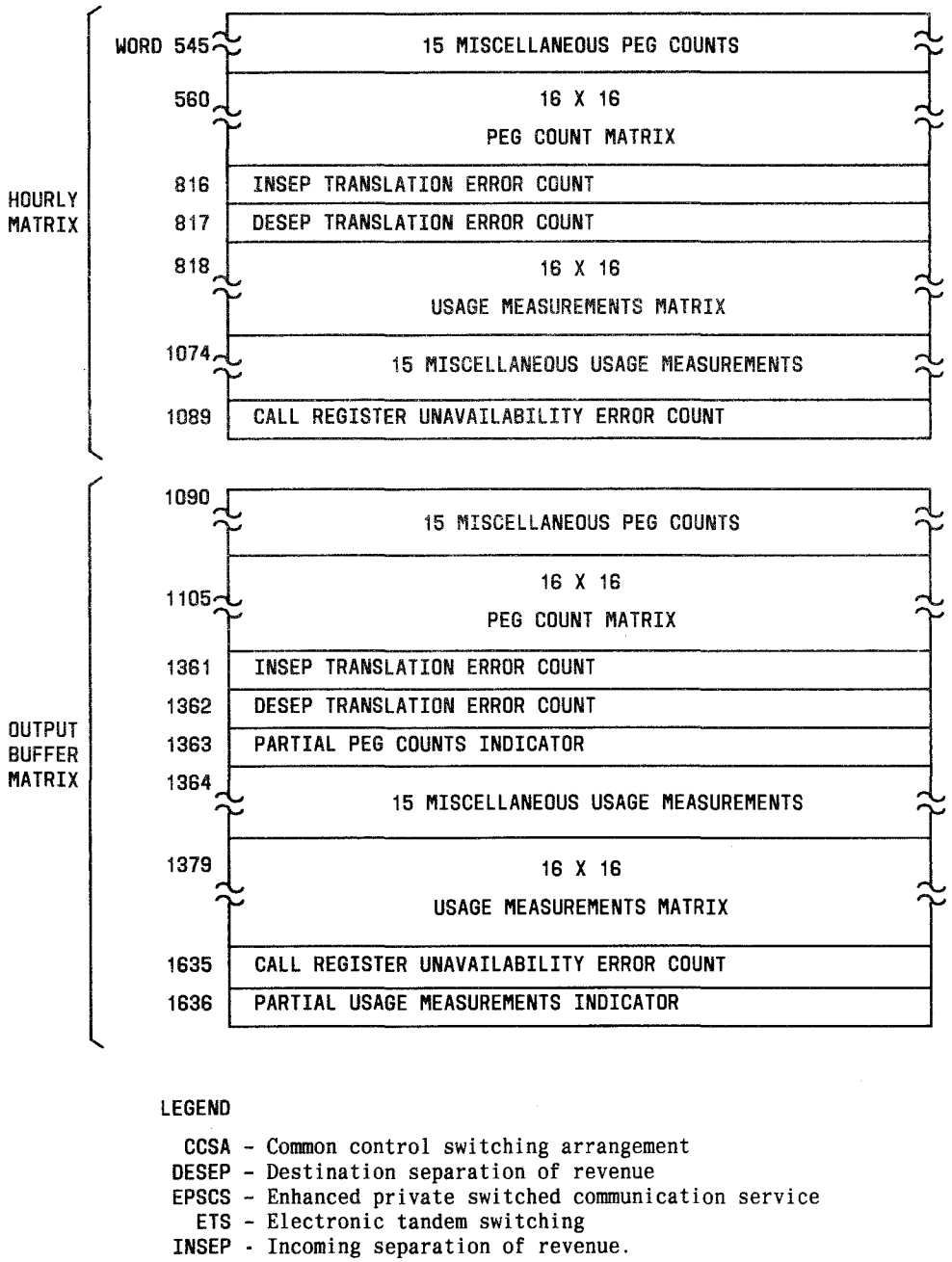


Fig. 4—Layout of Allocated Call Store for the Separations Matrix (Sheet 1 of 2)



LEGEND

CCSA - Common control switching arrangement
DESEP - Destination separation of revenue
EPSCS - Enhanced private switched communication service
ETS - Electronic tandem switching
INSEP - Incoming separation of revenue.

Fig. 4—Layout of Allocated Call Store for the Separations Matrix (Sheet 2 of 2)

called test calls to test trunks. Second, the 3-digit codes can be translated out of the 3-digit translator with call type 4FIDN, which means "expand to a directory number." The directory number is supplied out of the translation. A terminating directory number translation is then done on this directory number which supplies a route index leading to a trunk group with no outpulsing. Calls to such test codes are commonly called test calls to test lines. Using the second method, a count is also made in the separations matrix, but the DESEP classification will be zero since a terminating directory number translation has been performed. Therefore, test calls to test trunks can be separated into a distinct DESEP category, but test calls to test lines cannot be separated from calls to locally served directory numbers.

4.40 The type of calls not counted in the matrix include all direct distance dialing network calls or call attempts that do not satisfy any of the conditions listed in paragraph 4.38. This includes calls to invalid destination codes which are given intercept treatment, all nondirect distance dialing network calls, unsuccessful call attempts, and miscellaneous services. Examples are:

- All purely Centrex/ESSX-1 calls
- All Centrex/ESSX-1 special features such as dialed dictation, paging, tandem tie-line calling, etc
- All CCSA, EPSCS, and ETS originated calls, ***even those which go off-network*** (thus, onto the public network), via this office's translations
- Activations of services such as call-forwarding activation.

4.41 On calls to directory numbers, which in turn are call forwarded, the count in the separations matrix is based on the call to the ***original called directory number***; the count is not influenced by the call forwarding.

4.42 Usage measurements are collected when the collection of data has been activated in the usage measurement separations matrix by the TDR-SEP-AUM TTY input message. The matrix peg counts are done on a sample one-out-of-eight calls. The usage measurement is based on a further sample of one-out-of-eight of the calls that are used for the peg counts, giving a 1-out-of-64 sample. Each time the peg count for a given INSEP-DESEP category is a multiple of eight, the corresponding call will be chosen for a usage measurement. The existing miscellaneous peg counts are actual counts rather than being sampled, so the miscellaneous usage measurements will be done on a simple 1-out-of-64 basis. The collection of usage measurement separations matrix data may be inhibited with the TDR-SEP-IUM TTY message.

4.43 The division of revenue traffic schedule information is provided via the TRD02 output message. ***See references B(3) and B(4) in Part 18.*** This message may appear on the traffic TTY at 2:30 a.m. daily, if collection of peg counts or usage measurements has been active at least once during the previous 24-hour period (2:30 a.m. to 2:30 a.m.) and the EADAS feature is not active. This message may also appear on the traffic TTY hourly, on the hour, 24 hours a day if collection of peg counts or usage measurements has been active at least once in the previous 1-hour period and the EADAS feature is not active.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 The Division of Revenue Measurements feature is provided on a per office basis.

6. LIMITATIONS

OPERATIONAL

6.01 Not applicable.

ASSIGNMENT

6.02 The size of the separations matrix does not allow for greater than 16 INSEPs or 16 DESEPs.

7. INTERACTIONS

STATIC

7.01 Not applicable.

DYNAMIC

7.02 After a zeroing phase (4, 5, or 6), data collection peg counts and usage measurements in the separations matrix automatically is on, if the Division of Revenue Measurements feature are on. The hourly reporting option will also be turned on.

7.03 When the Engineering Administration and Data Acquisition System feature interface package is loaded and functional in the 1 or 1A ESS switch, the division of revenue traffic schedule is not printed; instead, this data comprises data block 65 (daily reporting) and data block 67 (hourly reporting) for the EADAS feature. The EADAS feature must interrogate for this block prior to 2:30 a.m. daily and every hour on the hour (optionally).

8. RESTRICTION CAPABILITY

8.01 Not applicable.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 Refer to Fig. 5 for the implementation procedure for the Division of Revenue Measurements feature. Refer to Part 13 for testing procedures.

9.02 The following set cards are required for the Division of Revenue Measurements feature:

- DRPC—Indicates whether or not the division of revenue counts are provided
- NUMR—Indicates the number of usage measurement call registers allocated for use by the Division of Revenue Measurements feature
- 9FDRPC—Required for the DRPC feature package
- 9SDRPC—Required for the DRPC feature group.

10. HARDWARE REQUIREMENTS

10.01 Not applicable.

11. SOFTWARE ENGINEERING

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.

MEMORY—1A "ESS" SWITCH

11.01 Software engineering data is provided for program stores (PS), unduplicated call stores (UCS), duplicated call stores (DCS), file stores (FS) and attached processor system (APS).

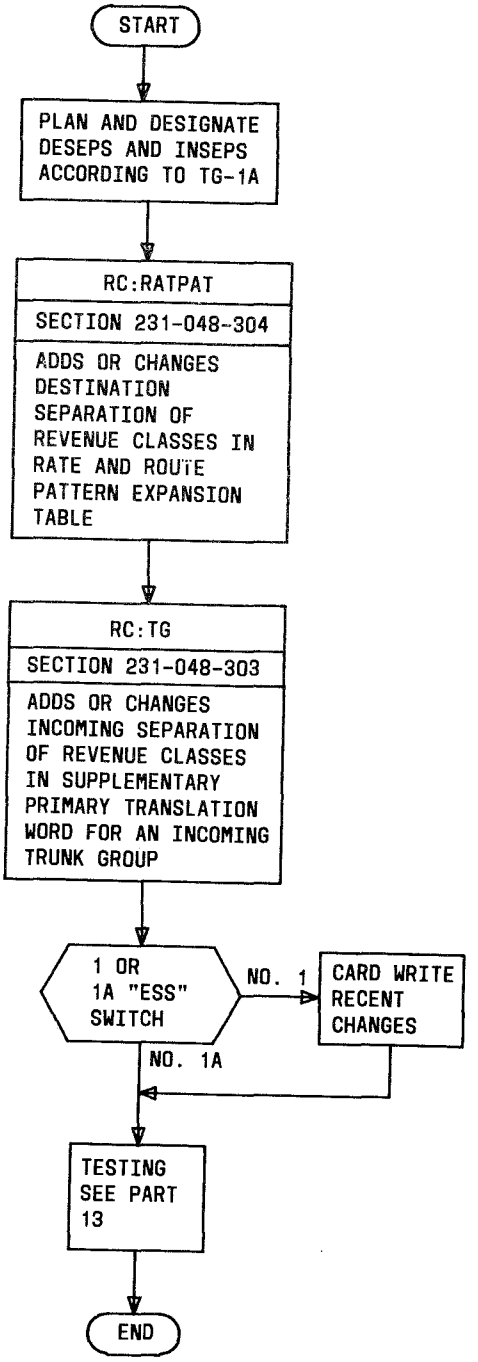


Fig. 5—Procedure for Adding the Division of Revenue Measurements Feature

A. Base Generic Program (PS and FS or APS)

11.02 Approximately 550 words are added in the base generic program. This memory is required whether or not the Division of Revenue Measurements feature is used.

B. Optionally Loaded Feature Packages (PS and FS or APS)

11.03 The DRPC feature package/group requires approximately 1500 words. This memory is required when the Division of Revenue Measurements feature is activated.

C. Parameters (UCS and FS or APS)

11.04 Three fixed parameter words are required. This memory is required whether or not the Division of Revenue Measurements feature is used.

D. Call Store Requirements (DCS)

11.05 The following call store memory is required when the Division of Revenue Measurements feature is activated.

- Separations matrix—The separations matrix requires 1637 words.
- Idle register list—Two words are required.
- Control word—One word is required.
- Usage measurement call register—Eight words are required per register. The number of registers allocated is determined by set card NUMR. Refer to PG-1A for set card engineering information.

E. Translations (UCS and FS or APS)

11.06 The following memory is required when the Division of Revenue Measurements feature is applied:

- One word (shared) in the trunk group number supplementary auxiliary block for the INSEP designator
- Two or six words (shared—nonscreening or screening, respectively) in the rate and route pattern auxiliary block.

MEMORY—1 "ESS" SWITCH

A. Base Generic Program (PS)

11.07 Approximately 400 words are added in the base generic program. This memory is required whether or not the Division of Revenue Measurements feature is used.

B. Optionally Loaded Feature Packages (PS)

11.08 The DRPC feature package/group requires approximately 800 words.

C. Parameters (PS)

11.09 Two fixed parameter words are required. This memory is required whether or not the Division of Revenue Measurements feature is used.

D. Call Store Requirements

11.10 The call store requirements are the same as specified for the 1A ESS switch. See paragraph 11.05.

E. Translations (PS)

11.11 The translation memory requirements are the same as specified for the 1A ESS switch. See paragraph 11.06.

REAL TIME IMPACT

11.12 For the 1AE switch, two speeds of stores exist: fast and slow. Cycle counts in this document are stated in terms of ***fast stores***. For an approximation of cycle counts for slow stores, multiply the fast store count by 1.3.

11.13 The Division of Revenue Measurements feature requires an average of 20 additional cycles per call, including the separations matrix counts when implemented on a 1A ESS switch. On a 1ESS switch, the time requirement is approximately ten additional cycles.

11.14 Without the separations matrix counts, the additional processor time requirements decrease to eight cycles for the 1A ESS switch and to four cycles for the 1ESS switch.

11.15 Cycle time for the 1A ESS switch is 0.7 microsecond. Cycle times for the 1ESS switch are 5.5 microseconds (no clock speedup) or 5.0 microseconds (10 percent clock speedup).

12. DATA ASSIGNMENTS AND RECORDS

TRANSLATION FORMS

12.01 The following translation forms, detailed in TG-1A, are applicable to the Division of Revenue Measurements feature:

- ESS 1216—Trunk Group Supplementary Record
- ESS 1305—Rate and Route Pattern Record
- ESS 1306—Line Class Code Record.

RECENT CHANGES

12.02 Recent change messages required for the Division of Revenue Measurements feature which contain unique keywords are as follows:

RC MESSAGES	FUNCTIONS
RC:RATPAT	Adds or changes an existing destination division of revenue class in the rate and route pattern expansion table via keyword DESEP
RC:TG	Adds or changes the incoming division of revenue class in the supplementary primary translation word for an incoming trunk group via keyword INSEP.

12.03 See references A(1) and A(2) in Part 18 for details.

13. TESTING

13.01 Translation data for the DRPC feature should be verified using the following TTY input messages. See references B(1) through B(4) in Part 18 for detailed information.

(a) Use the VFY-OFFC- input message to verify DESEP in the rate and route pattern expansion table. The system response is OK followed by a TR04 output message with translation information.

(b) Use the VFY-TKGN- input message to verify INSEP in the trunk group number supplementary translator. The system response is OK followed by a TR10 output message with translation information.

13.02 Continual validity checking for INSEP and DESEP is done automatically by the call processing programs. Whenever an error in an INSEP or DESEP is detected by the call processing programs, an 8-word TW02 TTY output message is printed out on the maintenance TTY with the identifying code 35353535. The third word contains the absolute address of the print routine. At the absolute address of the print routine, in pident DRUM, appropriate comments will be found describing the exact translation error found and a listing of the contents of the other words which contain information required to identify the problem.

13.03 Whenever an INSEP error is detected, a peg count will be made in the matrix; this is the INSEP error count word. Whenever a DESEP error is detected, a peg count will be made in the matrix; this is the DESEP error count word.

13.04 The translation errors which can be detected by the call processing programs are as follows:

(a) There is no trunk group number supplementary translator in the office. (Thus, there are no INSEPs available.)

(b) An unexpected return from the trunk group number supplementary translation occurs.

(c) A 1-way incoming or 2-way trunk group has been encountered during the processing of a direct distance dialing network call which has no INSEP assigned to it.

(d) A destination code has been found for which more than one DESEP category is associated; for example, a 6-digit code (number plan area office code) which has a DESEP associated with both the number plan area and the office code.

(e) A nonintraoffice destination code has been found which has no DESEP assigned to it.

13.05 Whenever any separations matrix-related translation error is found, an internal error counter is incremented. Whenever this error counter exceeds 32, no further TW02 messages with identifying code 35353535 are printed; this prevents flooding the maintenance TTY with TW02 output messages when there are significant errors in INSEP/DESEP translations (a likely possibility when the feature is first implemented in an office). The error counts described above continue to accumulate, whether or not printing of these TW02 messages is suppressed. The one exception is the item described in paragraph 13.04(a); if that error should be encountered, the separations matrix peg count collection and printing are immediately turned off.

13.06 As previously mentioned, the system of INSEP and DESEP may contain errors when the feature is first implemented in an office. This is probably due to the need for coordination of data from pertinent translators. When the package and attendant translations are first loaded in an office, a "shakedown" period of the system of INSEP and DESEP translations is required and time must be allocated to debug those translations.

13.07 Specifically, the INSEP and DESEP error counts and associated TW02 error messages should be examined, and corrective measures should be taken accordingly. After 32 INSEP and DESEP error counts are collected, further error message printing is automatically suppressed by the ESS program; however, there are two ways to reinitialize this error print collection.

(a) Every day at 2:30 a.m. the error print counter is automatically recycled by the program (assuming matrix collection is taking place).

(b) Whenever the TDR-SEP-ALW TTY input message is received and matrix collection has been suppressed by a previous TDR-SEP-INH TTY input message, the error print counter is recycled.

13.08 This debugging procedure should be implemented as soon as possible after the translations are loaded into an office after office cutover and should continue until the error count words of the matrix are consistently zero. This procedure assumes that a running office receives a call mix which uses all its translations fairly regularly. When the translations are debugged, the debugging effort will naturally cease but the two error words should always be looked at whenever the matrix is examined.

13.09 The automatic error checking by the call processing programs does not include the capability to insure that DESEPs are unique across multiple nontoll and toll destination code digit translators. This aspect of the integrity of DESEP can be realized by strict adherence to the rules for filling out the record keeping forms. No nonintraoffice destination code may be assigned a zero DESEP, and no destination code may be assigned more than one DESEP. These DESEPs must be explicitly made for every destination code in every direct distance dialing network destination code translator.

14. ADVANCE PLANNING

INSEPs

14.01 All 2- or 1-way incoming trunk groups carrying direct dialing traffic (except CCSA-, EPSCS-, and ETS-only 2- or 1-way incoming trunk groups) are assigned to 1 of 15 incoming division of revenue classes. Trunk groups assigned to INSEPs include local, tandem, centralized automatic message accounting, and toll trunk groups. Also included are trunk groups consisting of centrex tie trunks from which direct distance dialed network calls can be originated (for example, dial "9" WATS, or flexible route selection with the possibility of WATS and/or direct distance dialing network access). No CCSA-, EPSCS, or ETS-only trunk groups, even ones from which calls go off-network in the given ESS switch, are to be assigned INSEPs. The CCSA-, EPSCS-, or ETS-only trunk groups are identified as those with the centrex type trunk group auxiliary block with the originating major class of the pseudo line equipment number 4FNAL(28), 4FNALS(33), 4FCNAL(34), or 4FCNALS(35).

14.02 The rules for assigning INSEPs are as follows:

(a) All lines in the office are automatically considered to be in INSEP category zero by the call processing programs. No explicit assignment can be made.

(b) All 1-way incoming or 2-way trunk groups which may carry direct distance dialing traffic are to be assigned among INSEP categories 1 through 15.

(c) The INSEP category zero is illegal for trunk groups. This implies that the following procedure is required with respect to the assignment of INSEPs to trunk groups.

- All 1-way incoming or 2-way trunk groups from which there is any possibility of receiving direct distance dialing network traffic (except CCSA, EPSCS, and ETC incoming trunk groups) have to be identified.

- Once identification is made, these trunk groups must be assigned to a nonzero INSEP category.

DESEPs

14.03 Certain dialable direct distance dialing network destination codes and toll operator and test codes are to be assigned to one of 15 DESEP classes. These DESEPs will be specified in the auxiliary blocks of appropriate rate and route pattern (RRP). A DESEP is optional for the following call types: 3, 4, 6, 7, 10, 15, 23, 24, 25, 26, and 27. A DESEP may not be assigned to any other call type. The following guidelines for DESEPs apply to both 2-wire and HILO networks.

14.04 One unique DESEP must be associated with every dialable destination code (that is, one unique DESEP obtained from the ESS switch destination code translators). The requirement of a unique DESEP for any given destination code does not adapt to the structures of the 1 or 1A ESS switch destination code translators. This uniqueness requirement implies that if a given destination code is received from any line or trunk in the entire office, then the same unique DESEP must be obtained from translations. The problem is that different translation tables are referenced for the same digits dialed, depending on the source from which the digits are dialed. Therefore, a method must be devised to ensure that for each dialable destination code the DESEP obtained for that code is the same for every direct distance dialing network destination code translator in a 1 or a 1A ESS switch.

14.05 In order to understand this multiple assignment problem, it is necessary to understand, to some extent, the structure of destination code translations.

Structure of Destination Code Translations and Effect of Structure on Assignments of DESEPs

14.06 The structure of destination code translations will be discussed first. The destination code translations have been built around the concept of routing originating traffic (that is, calls initiated by lines). Each line in an office belongs to an entity called a rate center (RAC). Specifically, each line equipment number is assigned a billing directory number and the number group of the billing directory number is assigned to a RAC. Frequently, all direct distance dialing network lines in an office are assigned to one RAC. (Private line network lines will definitely be assigned to different RACs, indicating that private networks have nondirect distance dialing network dialing patterns. In this feature, only direct distance dialing network lines will be considered.) However, it is possible that the set of direct distance dialing network lines will be apportioned among more than one RAC. For example, consider a 1 or 1A ESS switch that serves customers in two adjacent calling plan areas. The operating company, in this situation, would probably assign lines in each calling plan area to a different RAC. All direct distance dialing network 1-way incoming or 2-way trunk groups, except those which have an associated pseudo line equipment number, are arbitrarily assigned to RAC number zero; RAC number zero is normally used by at least some direct distance dialing network lines in the office. Trunk groups which have an associated pseudo line equipment number are assigned to the RAC of the billing directory number of the pseudo line equipment number. (In fact, some of these trunk groups may belong to private line networks.)

14.07 Toll-type trunk groups are not a part of this RAC structure. Toll-type trunk groups belong to an entity called a toll digit index (TLDI). Here, the association is direct; that is, a toll trunk group is directly assigned to a TLDI. Again, it is common that all toll trunk groups in an office are assigned to one TLDI. However, it is quite possible that the set of toll trunk groups will be apportioned among more than one TLDI. For example, consider a 1 or 1A ESS switch which is equipped with incoming direct distance dialing access, intertoll, and secondary intertoll trunks. Secondary intertoll and intertoll trunks have essentially similar dialing patterns, and thus all would likely belong to the same TLDI. The direct distance dialing access trunks can have much

simpler dialing patterns and may well be assigned to a different TLDI.

14.08 The facilities in a local/toll 1 or 1A ESS switch from which destination code digits can be received are lines, nontoll trunk groups with no associated pseudo line equipment number, nontoll trunk groups which possess an associated pseudo line equipment number, tandem trunk groups, and toll trunk groups. All call-initiating entities in a local/toll 1 or 1A ESS switch uniquely belong to an RAC or TLDI. A local/toll switch will possess at least one RAC and at least one TLDI. Whenever a call into a switch is initiated from an entity possessing a RAC, the item RAC is used as an index into a translation head table in order to select a subtranslator. The destination code digits received from the originating entity are used as an index into the selected subtranslator to obtain the data needed to complete the call. If the call-initiating entity (necessarily a trunk in a toll trunk group) possesses a TLDI, the item TLDI is used as an index into a different translation head table in order to select a similar type of subtranslator. Figure 6 illustrates this process for an office with two RACs and two TLDIs for the specific destination code 312 (Chicago numbering plan area). In order for one DESEP to be uniquely assigned to the dialable destination code 312, this same DESEP value must be uniquely obtainable from all four data blocks that can be referenced from the 312 code.

14.09 Figure 6 also shows that data is obtained from various destination code subtranslators for any given destination code, depending on the origin of the call. In general, this data consists of information describing the type of call, the routing of the call, and the type of screening (which is used to determine charging) required. Considerable program store space is saved by obtaining this information via a secondary means known as an RRP. The RRP can be thought of as a data-compressing device. In general, many destination codes share the same call type, routing, and screening information. This data usually occupies more than one program store word. Such destination codes all point to the same RRP, which in turn points to the complete set of call type, routing, and screening information. Figure 7 illustrates this process for an office with two RACs and two TLDIs, where the specific codes 223, 556, 791, 283, 579, 624, and 890 all share the same call type, routing, and screening. Within each RAC and TLDI, these codes lead to the same RRP (RRPa, RRPb, RRPc, and RRPd). There is no reason for the four RRPs to be different. For example, these seven codes may all represent office codes physically far removed from this office to which the call type, routing, and screening are the same for both RACs and both TLDIs. In this case, RRPa equals RRPb, and RRPc equals RRPd. It is also possible that RRPa equals RRPb equals RRPc equals RRPd.

14.10 A DESEP is attached to an RRP and not directly to digits received. An RRP, instead of defining three parameters, must now define four parameters: call type, routing, screening, and DESEP. This system of allowing for multiple destination code translators, the elements of which are abbreviations for sets of call disposition parameters, allows for flexibility in setting up efficient sets of destination code translations for different offices with different dialing patterns; it also can result in a very complex set of translators. There are two reasons for this. First, the structures of multiple RAC subtranslators in an office do not have to be identical; likewise, multiple TLDI subtranslators do not have to be identical structures. For example, in one RAC subtranslator, a number plan area (NPA) code may require 6-digit translation to determine final call disposition; whereas, in another RAC subtranslator, the NPA code may be enough to determine final call disposition. Second, the structure of an RAC subtranslator is never identical to that of a TLDI subtranslator. An RAC subtranslator basically has the ability to resolve NXX codes (N stands for digits 2 through 9, and X stands for digits 0 through 9); whereas, a TLDI subtranslator can resolve XXX codes. Furthermore, the variety of digit combinations that can be interpreted via TLDI tables is more comprehensive than that using RAC tables.

14.11 The following procedure is used to determine call disposition via an RAC table. The first three digits are used to obtain an RRP; hence, obtain final call type, routing, and screening information. (There are a few special cases where less than three digits are used, for example 0, for operator.) This information may indicate that sufficient data is present to dispose of the call or may indicate more information is needed before the call may be disposed. If the information is sufficient, then any remaining digits (such as the last four digits of a directory number numeric) are collected and the call is disposed. If it is not, then more digit information must be collected and examined. More information may be needed either to resolve a conflict code or to perform a 6-digit call disposition analysis. Conflict

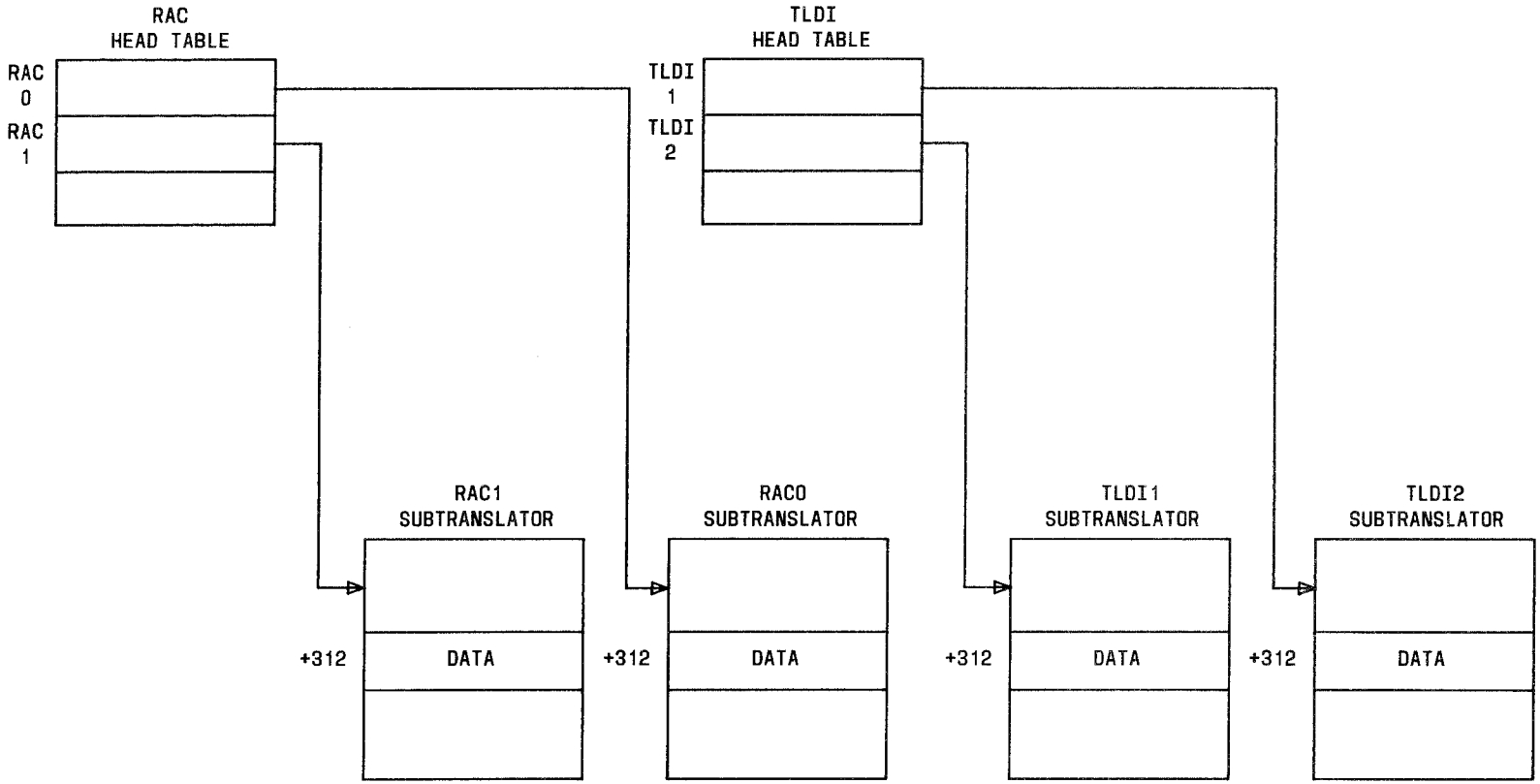
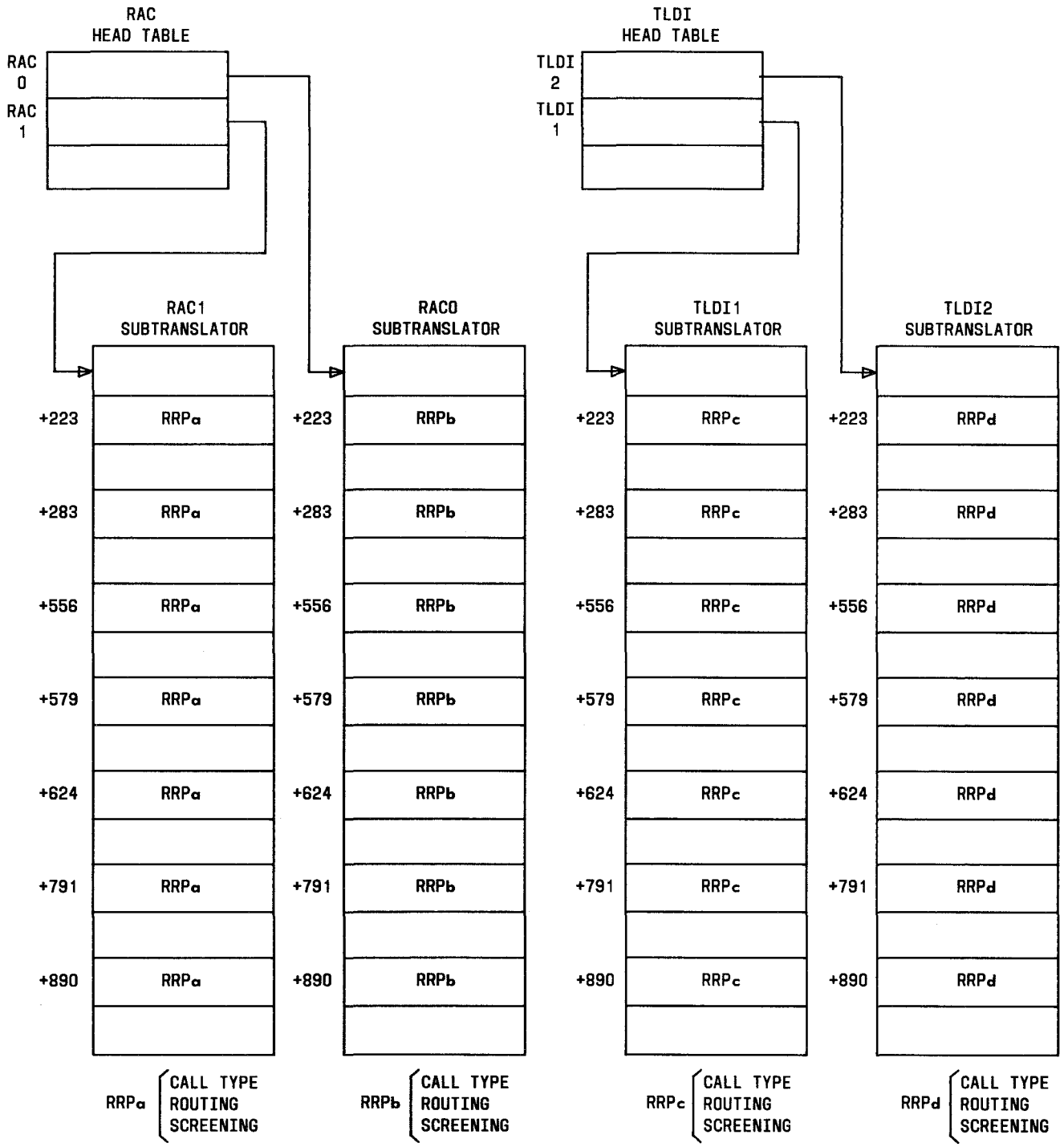


Fig. 6—Interpretation of the Destination Code "312" via Different Translations Tables Depending on the Origin of the Call



NOTE:

1. Destination codes 223, 556, 791, 283, 579, 624, and 890 all share the same call type, routing, and screening

Fig. 7—Codes Leading to One RRP

codes are resolved either by examining the total number of digits received (either 7 or 10), or by receipt or nonreceipt of a "1" or "0" prefix digit, depending on local practices. In such cases, the RRP originally obtained for the NXX code will lead to data specifying that more information is needed. The prefix and/or timing information will be used to select an RRP leading to proper call disposition. Figure 8 illustrates this process for a case where 812 is defined as both an NPA code and an office code, where local practices specify that "1-812" stands for NPA 812 and "812" stands for office code 812.

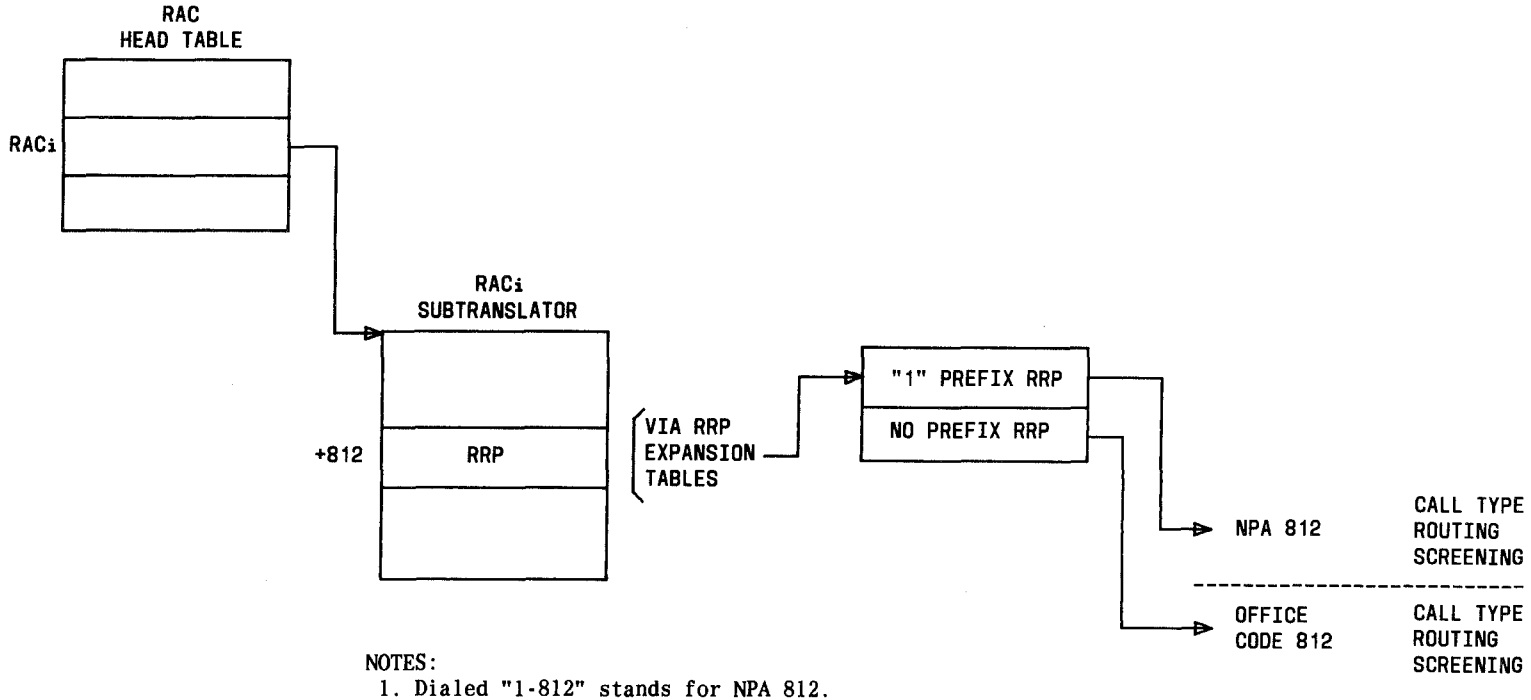
14.12 If 6-digit analysis is required to determine call disposition, then the data obtained from the RRP of the first three digits will specify this via the call type. The "routing" will consist of an index called a normalized area code (NAC), which points to another subtranslator. This subtranslator is indexed by the next three digits similar to the way in which an RAC selects a subtranslator which is indexed by the first three digits. The data obtained from this second translator is also an RRP, which leads to final call disposition. Figure 9 illustrates this process for 502-336. The RACs and NACs are used to index the same head table to obtain a digit subtranslator.

14.13 Two of the problems involved in attempting to correlate DESEPs across multiple RACs can now be explained. An RRP defines call type, routing, and screening and must be modified to define call type, routing, screening, and DESEP classification. For an NPA code requiring 6-digit resolution, two RRPs are referenced, one for the first three digits and one for the second three digits. If both RRPs include DESEPs, the possibility of contradictory DESEPs is introduced. In fact, depending on each particular instance, the DESEP belongs to one or the other RRP. Therefore, the DESEP should be optional information attached to an RRP as is screening. (That is, there now can exist RRPs that lead only to call type and routing; no screening is applicable and therefore does not apply.) Figure 10 illustrates various possibilities. Even if the routing, call type, and screening are the same for some NPA codes, if the DESEP is not the same for all NXXs in the NPA, then 6-digit translation is required to specify the DESEP. This means that a separate RRP or RRPs and a separate 800 (program store) word foreign area (NAC) subtranslator must be included for the NPA. The extra real time for a 6-digit translation must be taken if it is required to split DESEPs by NXX within an NPA, even if the call type, routing, and screening can be completely determined from the NPA code. This problem with DESEPs may be summed up and the DESEP must be attached to only the appropriate one of the two RRPs associated with an NPA-NXX 6-digit translation setup. This problem occurs within a given RAC.

14.14 Another DESEP problem concerning foreign area translation concerns offices with multiple direct distance dialing network RACs. Figure 11 illustrates a contradictory DESEP for the 602 NPA code. Calls to 602-887-XXXX will be counted in DESEP 2 for RAC0-initiated calls but in DESEP 3 for RAC1-initiated calls. This fails the requirement that any DESEP for a given destination code must be unique. This is a good example of cross-RAC/TLDI DESEP misassignments which can be introduced in error.

14.15 In order to describe another RAC-related DESEP misassignment possibility, the process of screening must be examined. To dispose of a call, the call type must be determined, as well as the routing it requires and the way it is to be charged. The RRPs define call type, routing, and screening (for charging purposes). In essence, screening allows for different charging on calls to a given NXX code depending on the origin of the call (specifically, depending on the class of service of the originating line as identified by its chart column, hence, the more formal name, "chart column screening"). Figure 12 illustrates this process. Screening, however, can also be used to alter routing and call type. For example, suppose that a certain group of lines require 6-digit translation to determine call disposition to an NPA; whereas, the rest of the lines require only 3-digit translation. This situation can be handled by placing the different groups of lines in different RACs, but it can also be handled by specifying call type and routing information in the chart column screening information which overrides the standard call type and routing. Figure 13 illustrates this situation, which again can result in contradictory DESEPs. The example in Fig. 13 demonstrates the rule that no RRP obtained from an NAC (which in turn is obtained from overridding chart column screening) should include DESEPs.

14.16 Primary consideration has been given to RAC subtranslators in this feature. Local/toll 1 and 1A ESS switches will be equipped with TLDI-selected toll translation tables. The reason that a different set of destination code translators



NOTES:
1. Dialed "1-812" stands for NPA 812.
2. Dialed "812" stands for office code 812.

Fig. 8—Local Conflict Code Resolution

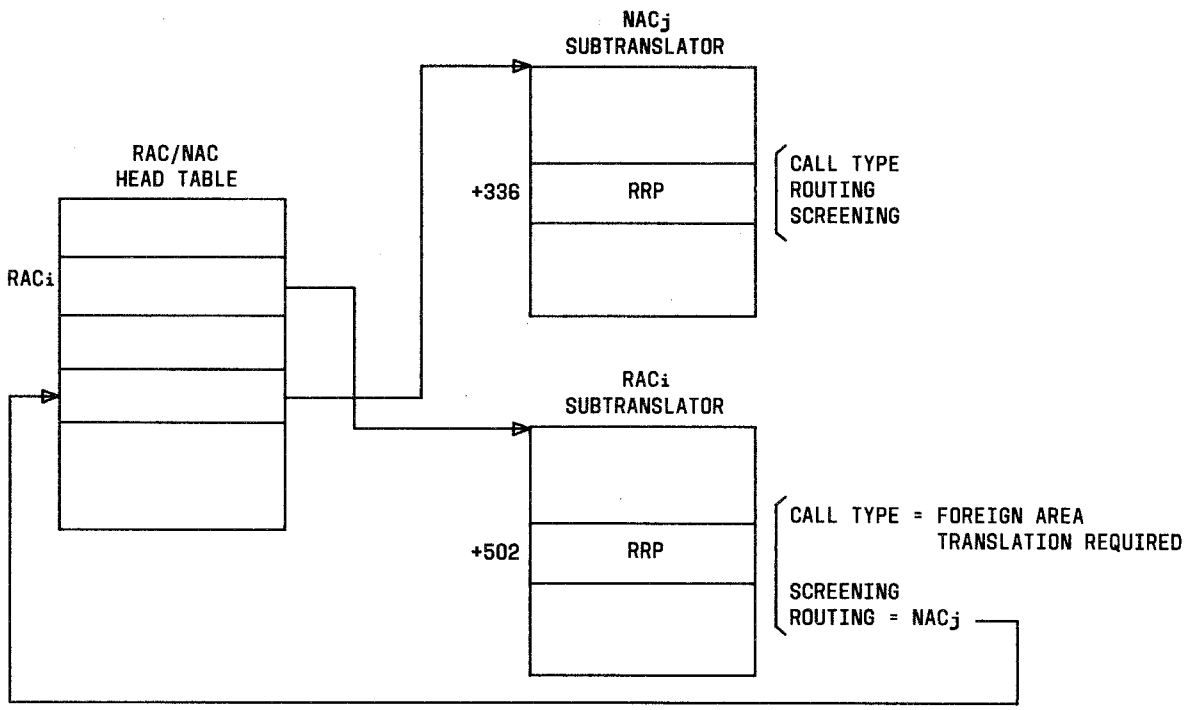


Fig. 9—Six-Digit Translation to Determine Final Call Disposition for "502-336"

NPA CODE SPECIFIES ALL:

NPA → RRP → CALL TYPE, ROUTING, SCREENING, DESEP

NPA CODE REQUIRES 6-DIGIT TRANSLATION FOR CALL TYPE, ROUTING, AND SCREENING, BUT NOT FOR DESEP ASSIGNMENT:

NPA → RRP → CALL TYPE = FOREIGN AREA; ROUTING = NAC → NXX → RRP; DESEP → CALL TYPE, ROUTING, SCREENING

NPA CODE REQUIRES 6-DIGIT TRANSLATION FOR ALL:

NPA ⇒ RRP → CALL TYPE = FOREIGN AREA; ROUTING = NAC → NXX → RRP → CALL TYPE, ROUTING, SCREENING, DESEP REQUIRED FOR EVERY RRP DERIVED FROM EVERY NXX IN THE FOREIGN AREA TRANSLATOR OF THE NPA CODE

Fig. 10—Possibilities for Specifying DESEP for an NPA Code

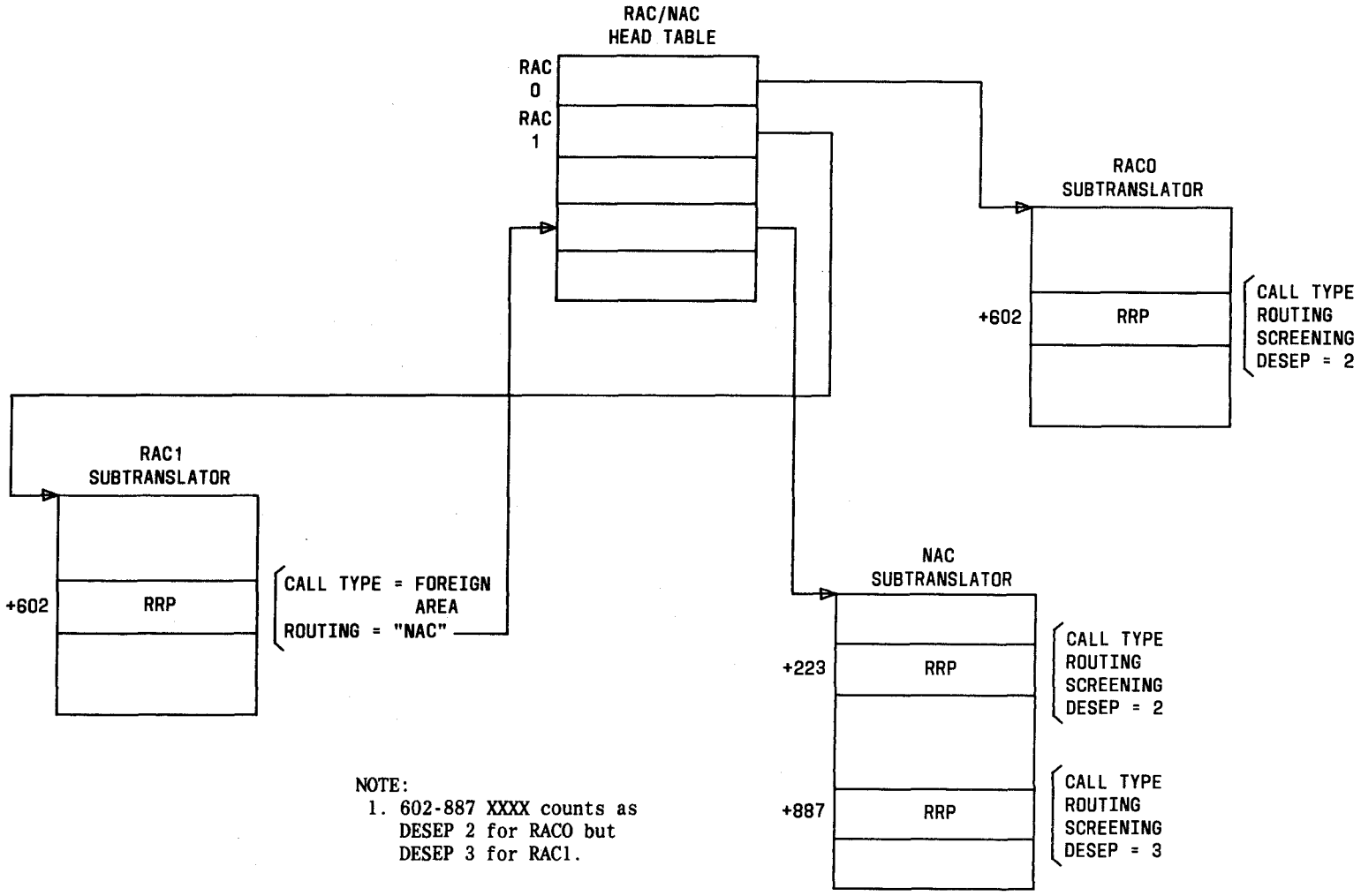


Fig. 11—Example of Contradictory DESEPs Across Two RACs for an NPA Code

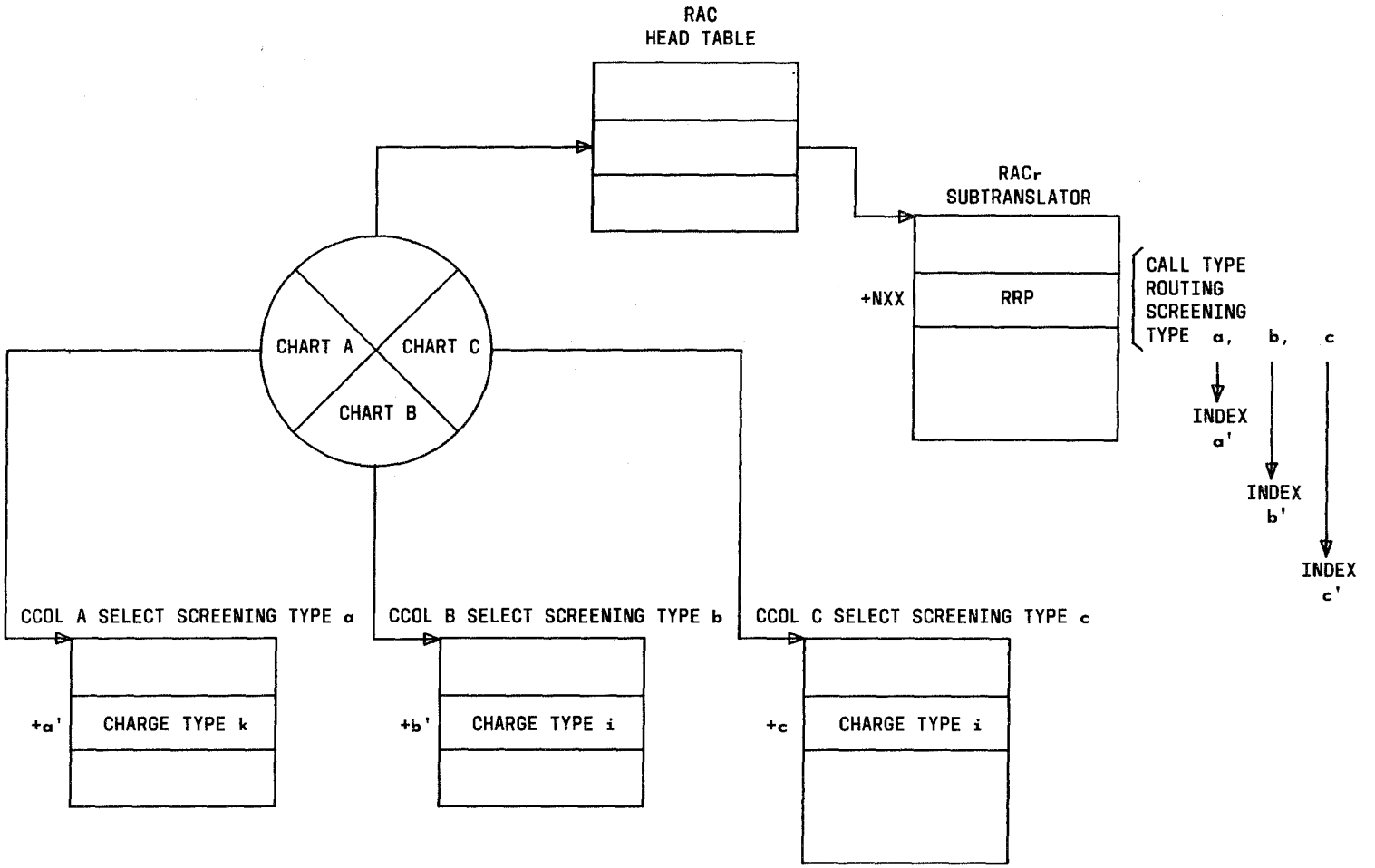
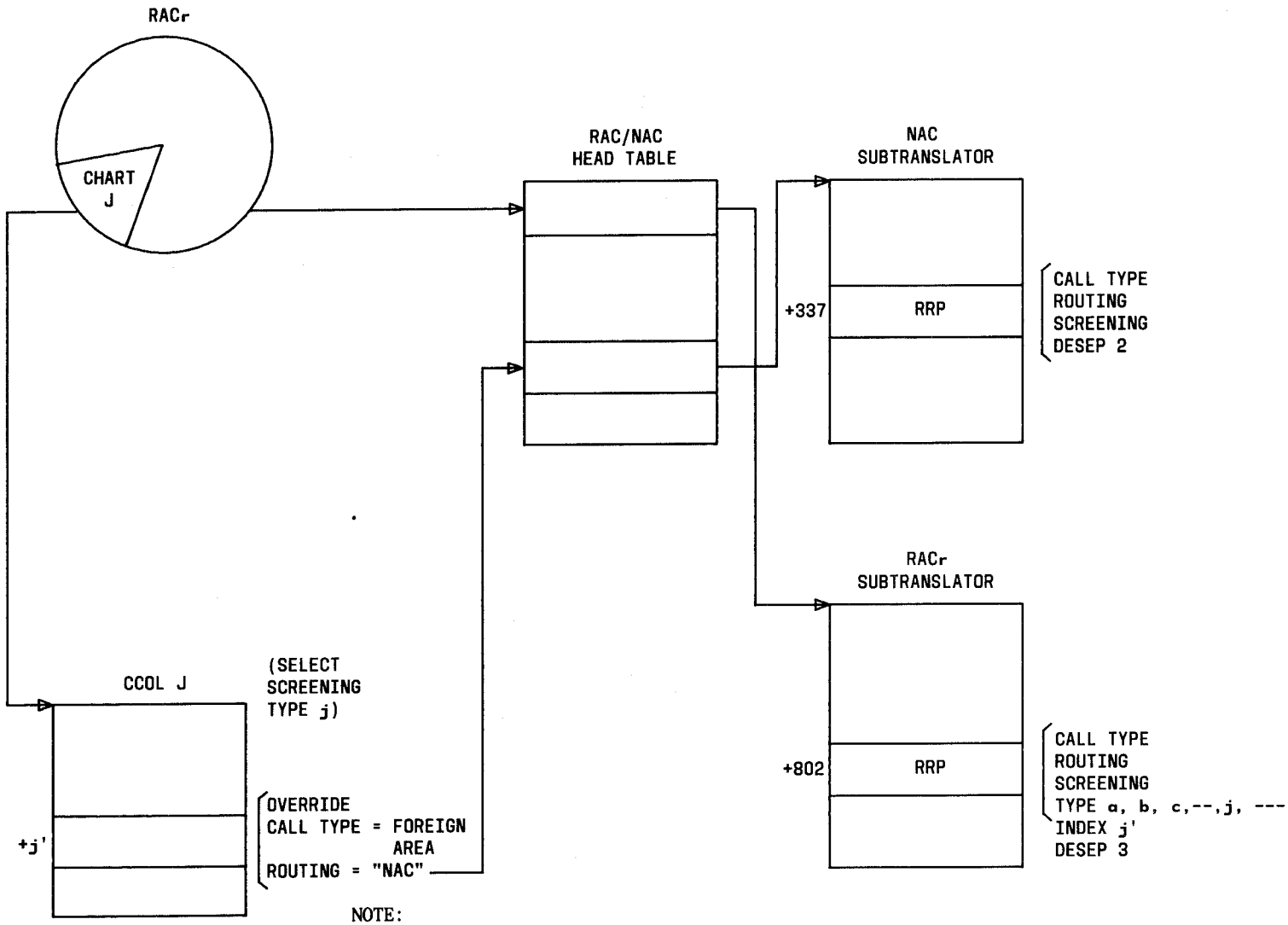


Fig. 12—Effect of Chart Column Screening on Charging



NOTE:
1. 802-337 XXXX classed in DESEP 3 except for lines in Chart J which are multiply (and incorrectly) assigned to both DESEP 3 and DESEP 2.

Fig. 13—Example of Doubly-Assigned DESEPs for a Fixed Destination Code (Due to Chart Column Screening With Override Information)

exist for toll trunks is that a greater variety and combination of digits can be received from such trunks. Simply stated, digit interpretation for toll trunks differs from class 5 type digit interpretation in the following ways:

(a) The XXX codes rather than NXX codes must be interpretable.

(b) A valid string of digits can consist of any number of digits from 3 through 11.

14.17 The mechanism for enabling a 1 or 1A ESS switch to recognize the various digit combinations consists of the following:

(a) Toll 3-digit translators selected by TLDIs rather than RACs which have an XXX (1000-word) index range rather than an NXX (800-word) index range.

(b) Toll 3-digit foreign area translators selected by toll foreign area indicators (TFAIs) rather than NACs which, likewise, have an XXX (1000-word) rather than an NXX (800-word) index range.

(c) Toll digit-by-digit interpreter tables with a range of up to five digits (digits 4 through 8); these are combined with (d).

(d) A pseudo digit interpreter table called a "timing table," which is indexed by the number of digits received on a call rather than the actual digits.

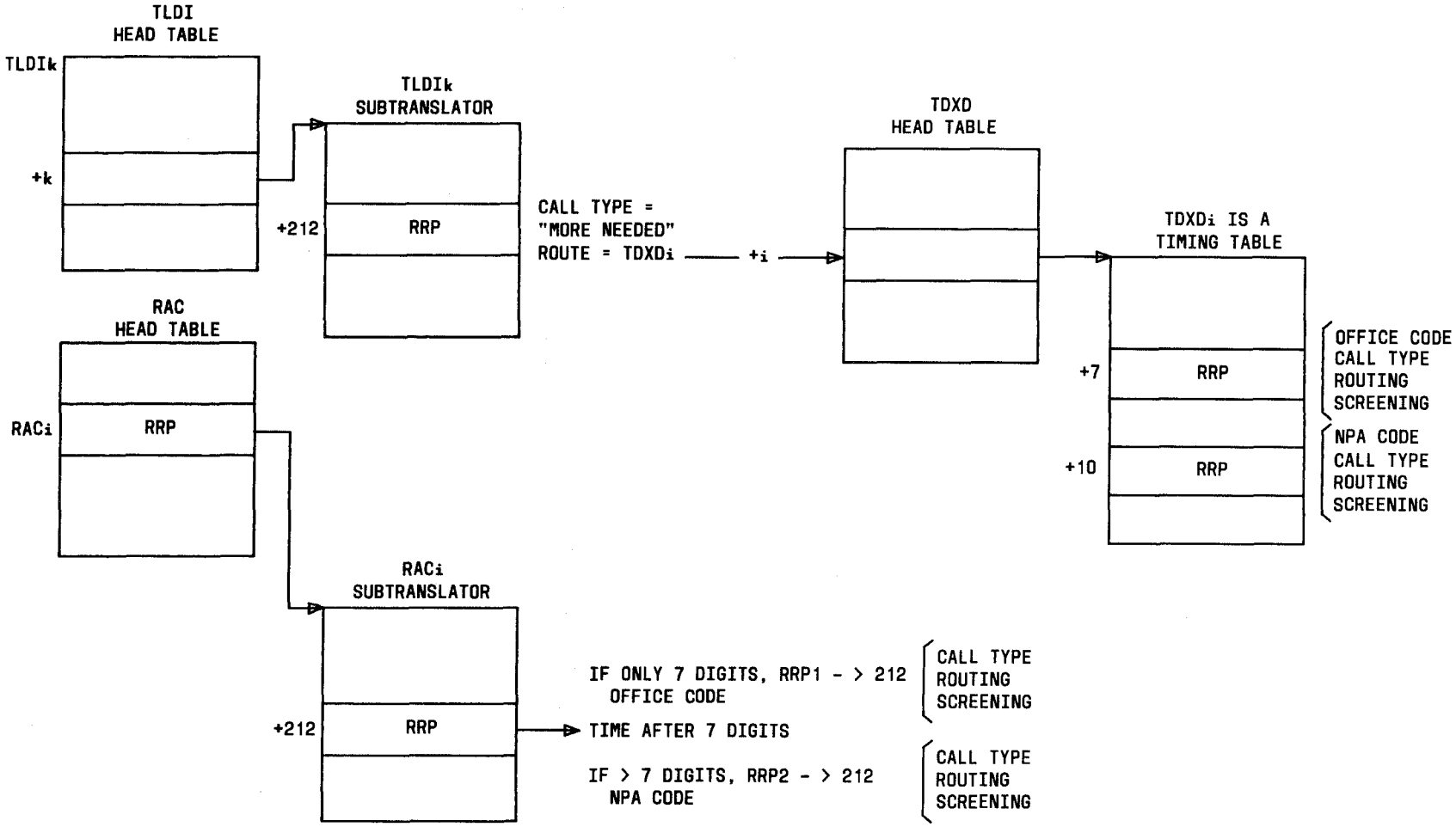
14.18 The final data obtained from any of these four types of toll destination code digits translation tables is again an RAC, just as is obtained from the nontoll destination code digit translation tables. Just as an RAC digit table derived RRP can lead to further digit translation by leading to a NAC and hence a NXX type foreign area translator, so can a TLDI digit table derived RRP lead to further digit translation by leading to a NACNXX-type foreign area translator or to a TFAI and hence an XXX-type toll foreign area translator. Specifically, the call type is "toll foreign area," and the route is the listed TFAI. An RRP obtained from a TLDI digit table can also lead to a digit-by-digit or timing table by specifying call type "more toll digits required" and route "toll digit-by-digit index;" a toll digit-by-digit index can also be obtained from a TFAI RRP. This toll digit-by-digit index is used to select a digit interpreter or timing table which is then indexed by digits or by the number of digits to obtain an RRP; this RRP can, in turn, lead to a foreign area translator. Thus, the toll digit translation scheme is a potentially complex scheme, which does not necessarily mimic the nontoll digit translation scheme even for matching NXX codes.

14.19 Figure 14 illustrates the two methods used for resolving a simple NPA code/office code conflict. In the RAC table, the RRP obtained from the dialed-in code is a conflict RRP, which specifies to the call processing programs that the presence or absence of an eighth digit will be used to select among two RRPs. One RRP describes the NPA code meaning of the code; the other RRP describes the office code meaning of the code. It is possible that the NPA code RRP leads to a foreign area translator. On the other hand, the TLDI table obtained RRP leads to a toll timing table. The timing table is indexed by the number corresponding to the total quantity of digits received in order to finally obtain either the NPA code RRP or the office code RRP. Again, the NPA code RRP may lead to either a TFAI or a nontoll foreign area translator. The DESEP specifications are to be tied to RRPs, and the DESEP must be unique for any destination code. By examining the number of RRPs involved in this example (six, of which four would need DESEPs) and the differing mechanisms from which these RRPs are obtained, it is seen that the necessity of correlating DESEPs across RAC/TLDI digit tables for conflict codes requires care in setting up the affected RRPs.

14.20 A more complex example involving conflict codes would include one RAC, one TLDI for intertoll and secondary intertoll trunks, and one TLDI for direct distance dialing access trunks. Suppose that NPA 703 is doubly defined as an office code; that within NPA 703, code 052 is a terminating toll center (TTC) code; that 703-052-111 identifies some toll operator at TTC 052 within NPA 703; that 703-052-1114 identifies a 'leave word' operator at TTC 052 within NPA 703; and finally, that 703-0521 is a valid directory number. The two operator codes can only be received over the intertoll or secondary intertoll trunks. The following is an example of conflicting call codes.

(a) Calls to office code 703 fall in DESEP 2.

(b) Calls to NPA code 703 are to be foreign area translated to determine DESEPs.



NOTE:
1. "212" is doubly defined as an NPA code and as an office code within the home NPA. Locally (in the example), the conflict is resolved by timing the number of digits received.

Fig. 14—Resolution of a Conflict Code Using TLDI Subtranslator and/or a RAC Subtranslator

(c) Calls to 703-052-111 (toll operator) fall in DESEP 7.

(d) Calls to 703-052-1114 ("leave word" operator) fall in DESEP 11.

14.21 Figure 15 illustrates a possible translation setup for this situation. This example is a bit unrealistic, but it does illustrate the degree of complexity that can occur with toll translations. It is also possible for the different translators to become interleaved. For example, the 703 NPA code RRPs in Fig. 15 obtained from the RAC table and the intertoll and direct distance dialing access TLDI might be the same; hence, the NAC would be the same, which would therefore lead to the same RRPs for all NXX codes in the given foreign area translator. Furthermore, for the intertoll and secondary intertoll TLDI 703 NPA code RRP, which leads to a toll foreign area translator, the NXX-type codes could lead to the same RRPs as the NXX codes in this nontoll foreign area translator. Thus it may well be that all NXX codes following NPA code 703 lead to the same RRPs; hence, the same DESEP for 703-NXX type destination code if six digits are used to determine DESEP for the 703 NPA code.

14.22 These examples demonstrate the almost endless number of ways in which the destination code translators can be set up to recognize many different dialing patterns. For most dialable destination codes, such complex translations are not required. Usually, the translations required for any given code are relatively straightforward. Also, DESEPs for most dialable destination codes will simply be attached to initial 3-digit codes and will not require 6-digit foreign area translation. Furthermore, most codes are not conflict codes. Finally, it is unusual for separate DESEP classifications for the more peculiar types of toll dialing patterns to be required distinct from customer dialable codes. For any given office, the DESEP problem would consist of correlating DESEPs for almost all initial 3-digit codes across multiple direct distance dialing network RAC and TLDI 3-digit subtranslators with perhaps a few special, more complex codes for which DESEPs are to be made with extra caution.

14.23 The DESEPs pertain to the direct distance dialing network only, not to any CCSA private network. Thus all RRPs pertaining to any CCSA private network are not to be assigned any DESEPs.

14.24 The most complex portion of the Division of Revenue Measurements feature is the assignment and maintenance of the DESEP categories. Furthermore, an automatic procedure has not been designed to verify the integrity of the DESEPs. Included in the Translation Guide—TG-1A (Division 5, Section 9) is a worksheet that can be used as a tool for planning and maintaining DESEPs. Any procedure that is initiated should simply and accurately correlate all pertinent information. In summary, an assignment and maintenance procedure should:

(a) Identify all destination codes that can be used by the central office.

(b) Specify unique DESEPs per destination code.

(c) List all places in the destination code translation tables in program store where a DESEP is actually stored for each destination code.

(d) Be used as a reference when setting up or changing any sort of destination code translator or any RRP expansion table.

ADMINISTRATION

15. MEASUREMENTS

15.01 Not applicable.

16. CHARGING

16.01 Not applicable.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 The following terms are defined with respect to this section.

Direct Distance Dialing Network: This term refers to the entire public telephone switching network.

Centrex/ESSX-1: This term refers to any customer whose telephone service is provided using centrex translations.

Non-Centrex/ESSX-1: This term refers to any customer whose telephone service is ***not*** provided using centrex translations.

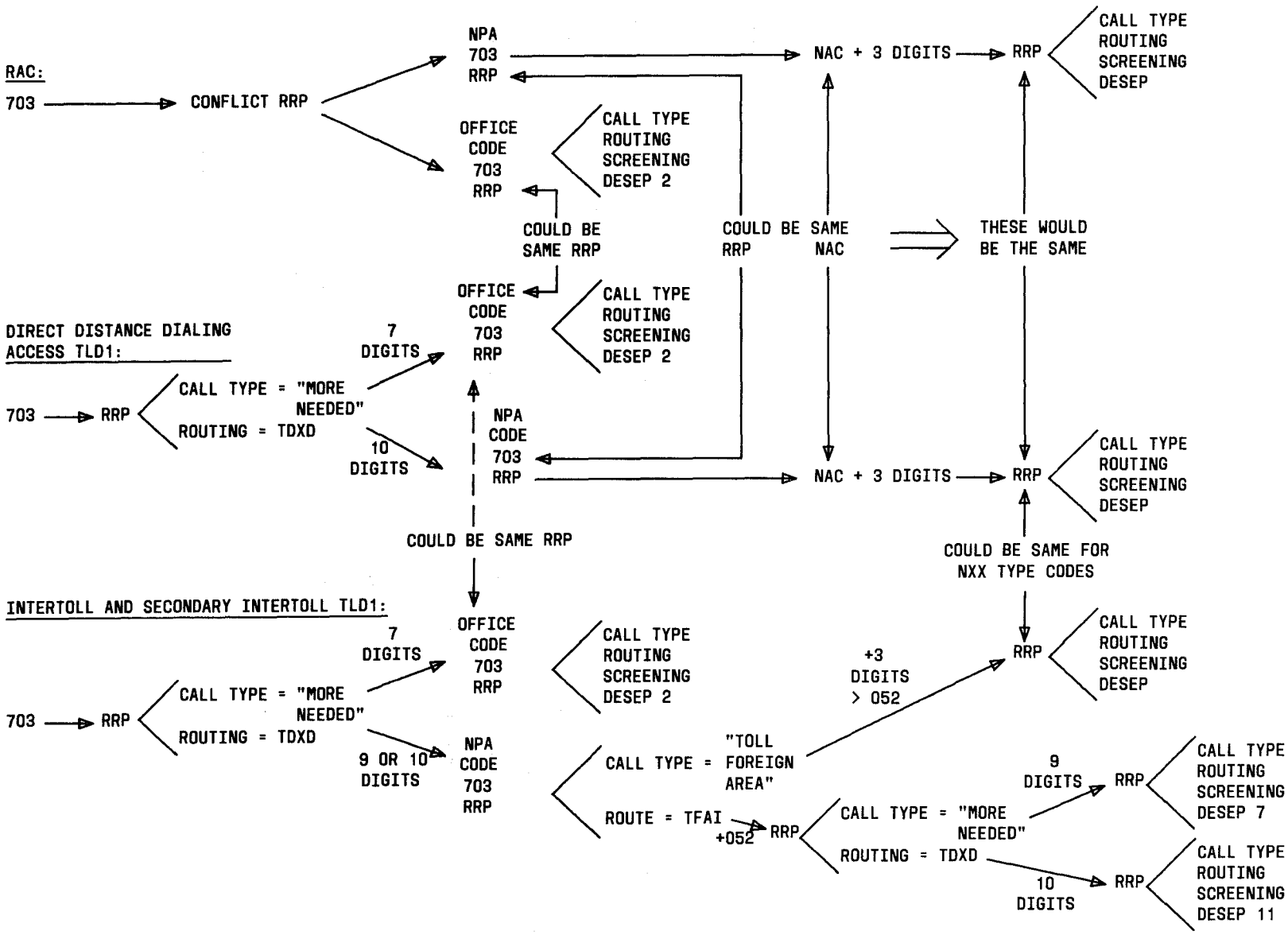


Fig. 15—Example of an Involved Conflict

18. REFERENCES

18.01 The following documentation contains information pertaining to or affected by the Division of Revenue Measurements feature.

A. AT&T Western Electric Practices

(1) Section 231-048-303—CCIS, CFTRK, TG, TGBVT, TGMEM, TKCONV, and TRK Trunk Translation Recent Change Formats (1E6/1AE6 and 1E7/1AE7 Generic Programs)

(2) Section 231-048-304—ARS, CCOL, CHRGX, DITABS, DIGTRN, DNHT, IDDD, IWSA, NOCNOG, NOGRAC, RATPAT, RI, RLST, TDXD, and TNDM Rate and Route Translation Recent Change Formats (1E6/1AE6 and 1E7/1AE7 Generic Programs)

(3) Section 231-090-350—Division of Revenue Peg Counts Feature—Feature Document.

B. TTY Input and Output Manuals

(1) Input Message Manual IM-1A001

(2) Input Message Manual IM-6A001

(3) Output Message Manual OM-1A001

(4) Output Message Manual OM-6A001.

C. Other Documentation

(1) Translation Guide TG-1A

(2) Translation Output Configuration PA-591003

(3) Translation Output Configuration PA-6A002

(4) Parameter Guide PG-1

(5) Parameter Guide PG-1A

(6) Office Parameter Specification PA-591001

(7) Office Parameter Specification PA-6A001

(8) 759-100-000 BISP—Subject Index—Central Office Equipment Engineering (COEES)—Business Information System Programs

(9) 759-100-100 BISP General Description—Central Office Equipment Engineering (COEES)—Business Information System Programs.