FEATURE DOCUMENT
CHARGING ARRANGEMENTS
NO. 3 ELECTRONIC SWITCHING SYSTEM

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INTRODUCTION

1. GENERAL INFORMATION

1.01 This section describes the various types of charging as used in the No. 3 Electronic Switching System (ESS). In addition to providing standard billing information, charging arrangements include means of gathering call data used in statistical studies by the customer, in planning and administering the telephone system, or other uses not directly involved in preparing customer bills. Various types of calls resulting in charging are covered in detail in other sections. Figure 1 is a diagram showing various methods of charging in No. 3 ESS for various types of calls and how they relate to each other and to other documents.

1.02 This document is being reissued to include information pertaining to the 3E3 generic, International Direct Distance Dialing (IDDD), and other items not previously included. Since this is a general reissue, no revision arrows will be used.

1.03 The various types of charging arrangements are generally available with the SO-2 generic program except where otherwise noted in this document.

2. DEFINITION

2.01 Charging arrangements are those methods by which the telephone company (and in certain cases the telephone user) can measure, record, or collect charges incurred by individual and coin stations for telephone usage. The various charging methods used in No. 3 ESS are as follows:

- Coin Telephone Charging
- Automatic Message Accounting Recording System
- Centralized Automatic Message Accounting
- Traffic Service Position (System)
- Message Register Charging.

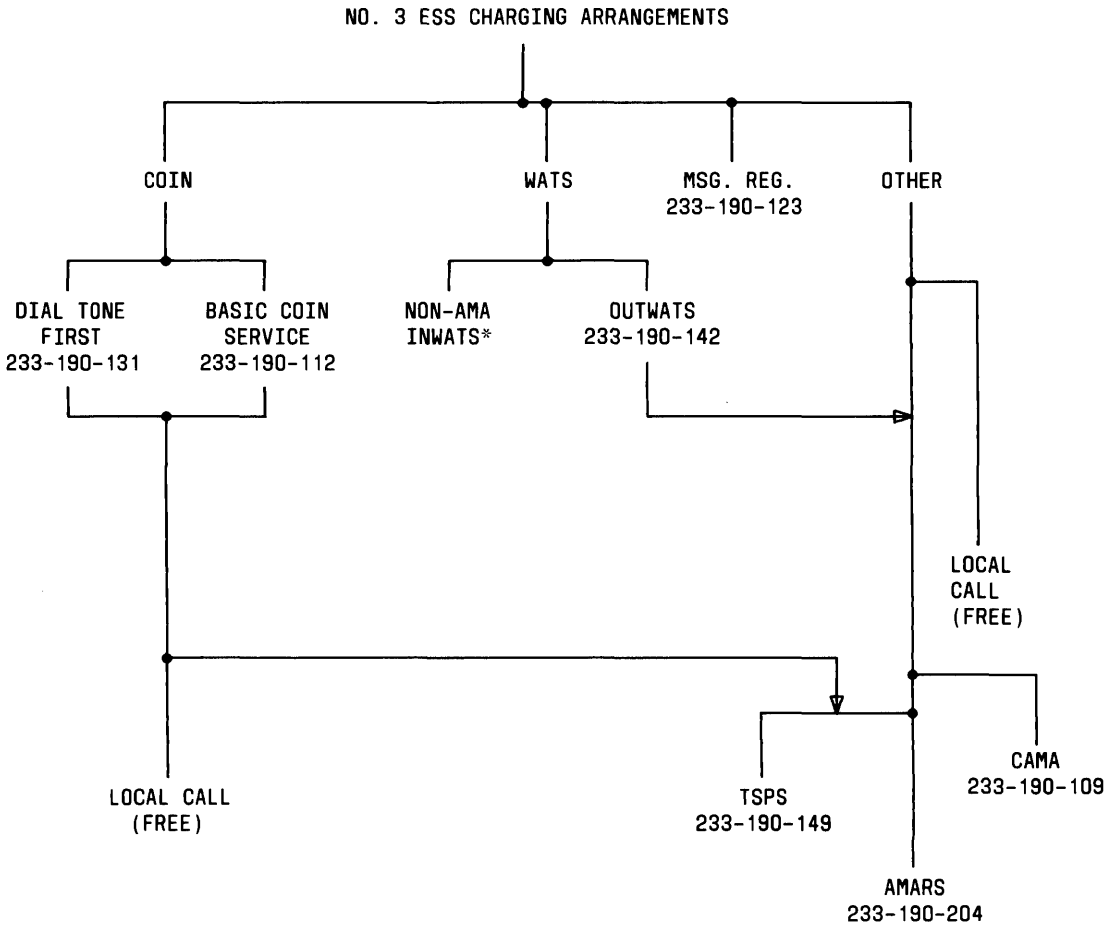
2.02 Coin telephone charging is telephone service provided by a coin telephone arranged to accept the deposit of a coin (or coins) at some time during the course of a chargeable call.

2.03 The AMARS feature is provided at a local central office and is used to generate and compile certain telephone call information associated with calls being originated through that office. The data is then temporarily stored for subsequent transmission to the Automatic Message Accounting Recording Center (AMARC) where all data for each telephone call is assembled into a data block and stored on magnetic tape. The data is then used to compute charges for customer-dialed billable calls and to perform special traffic studies. The AMARS feature performs the same functions as the Local Automatic Message Accounting (LAMA) feature, used in many central offices, except that the data is recorded at the remote AMARC instead of by a local Automatic Message Accounting (AMA) tape recording machine.

2.04 Centralized Automatic Message Accounting (CAMA) is a means of recording telephone call details on paper or magnetic tape at a tandem office (typically crossbar tandem). The local office connects to this office via outgoing trunks. When the local office has automatic number identification (ANI), the local office outpulses the billing number and other call information to the CAMA office for recording on AMA tape. Alternately, the CAMA office may be arranged for operator number identification (ONI) whereby an operator is connected to obtain the billing information verbally and to key it into the CAMA office.

2.05 Traffic Service Position (System) TSP/TSPS is an operator system interposed between local and toll or tandem offices that provides various operator services including coin charging on toll calls and records billing information for customer-dialed noncoin calls that require operator assistance. If the local office has ANI, the local office outpulses the billing number and other call information; and an AMA recorder within the TSP/TSPS control unit records call details in a manner similar to LAMA. If ONI or special billing is required, an operator is connected to verbally obtain the billing information and to key it into the TSP/TSPS office.

2.06 Message register charging is a method whereby each completed call made by a line with message register service increments a mechanical register and/or a software message register (counter in temporary store) by an amount determined by the length of the call and the called number. This register may be either at the central office or the customer premises (or both).



*THIS NON-AMA INWATS SERVICE IS PROVIDED VIA SD-99439--
COMMON SYSTEMS AUXILIARY LINE CIRCUIT ARRANGED FOR
MEASURED RATE INWATS SERVICE. THIS CIRCUIT PROVIDES
PEG COUNT AND USAGE DATA.

Fig. 1—No. 3 ESS Charging Arrangements

DESCRIPTION

3. USER OPERATION

3.01 Depending on the customer's class of service, the charging method in No. 3 ESS varies widely. Table A lists the methods of charging for the various classes of service in No. 3 ESS.

3.02 Customer billing in all cases is not always done to the calling line's directory number, but to the calling line's billing number. That billing number is usually the same as the calling party's directory number, but need not be. If desired, several directory numbers can have the same billing number.

COIN CHARGING

3.03 Coin telephone service is provided to the customer by either a single or multislot coin telephone set. With coin first service, a coin or coins in the amount equal to the initial deposit must be inserted to obtain dial tone. Thereafter, the customer may dial any local call and may be allowed dial toll calls depending on the charge options selected. With Dial-Tone-First service,

TABLE A

CHARGING METHODS

CLASS OF SERVICE OR TYPE OF CALL	METHODS OF CHARGING
COIN	DIRECT DEPOSIT OF COIN(S) IN COIN TELEPHONE, 3CL, TSPS,*
RESIDENCE	AMARS, CAMA, TSPS, MESSAGE REGISTER, 3CL,*
BUSINESS, PBX, MLHG	AMARS, CAMA, TSPS, MESSAGE REGISTER, 3CL,*
FX, TIE TRUNK	AMARS IS OPTIONAL
OUTWATS	AMARS, CAMA**

* Also credit card, third party, etc.
** WATS indicators not provided.

the initial rate deposit is only requested on local calls.

Local Untimed Charging

3.04 A local coin call is a call within the coin customer's local calling area. One or more coins (10, 15, 20, or 25 cents, depending on the local rate) must be deposited before the call is allowed to be completed. In coin first, the coin(s) must be deposited to obtain dial tone. There is no time limit on a local call. If the called customer does not answer, the deposit is returned upon disconnect.

Local Overtime Charging

3.05 A local coin call with overtime is divided into two distinct periods: initial and overtime. Both periods are defined by the operating company and each may be from 1 to 7 minutes in 1-minute increments (periods of less than 2 minutes are not recommended). The initial period begins when the called party answers. Thirty seconds before the end of the initial period, the initial deposit is automatically collected by the No. 3 ESS. This collection is an indication to the coin customer that the period is near completion and they must either disconnect or deposit the overtime rate in order to continue the calls.

3.06 At the expiration of the initial period, the No. 3 ESS tests the coin station for the coin deposit. If the deposit is present, the call is marked in overtime and is allowed to continue for the overtime period. If the coin is not present, the call is routed to a coin overtime announcement. If the overtime deposit is not present at the end of 30 seconds, the connection is torn down. If Dial-Tone-First, dial tone is returned to the customer. If coin first, the customer must deposit the initial rate to obtain dial tone.

Toll Charging

3.07 A call from a coin telephone to a point outside the local calling area is a toll call. The several methods of toll charging available interact with the customer in different ways as described in the following paragraph.

Operator Assisted Calls

3.08 All customers have access to an assistance operator by dialing "0". The initial deposit, if any, is always returned. The operator (either 3CL or TSPS) will place the call, request required coin deposits, and supervise the call for overtime or disconnect. If TSPS is available, the customer may dial the called number. With TSPS, the call may be handled by Automated Coin Toll Serivce (ACTS) equipment instead of an operator.

Dial-Tone-First

3.09 Coin calls to certain free numbers (eg, 911, 411, "dial 0") may be made without the deposit of an initial rate if the office is equipped with the Dial-Tone-First (DTF) feature. If the call is to a free number, and the office does not have DTF, the initial deposit is returned either at the beginning of the call or at the end of the call depending on local operating company option.

3.10 Refer to Section 233-190-112, Basic Coin Service, and Section 233-190-131, Dial-Tone-First Coin, for coin charging details.

AMARS CHARGING

3.11 Automatic message accounting is a means of recording accounting data on calls originating through the local class 5 office. The AMARS feature automatically identifies each individual and 2-party customer whenever a call to be recorded is placed. The calling directory number or billing number is recorded together with called number and the answer and disconnect times. This recording process is performed remotely by the AMARC facility.

3.12 When AMARS is implemented into a No. 3 ESS office, single and 2-party customers can directly dial toll calls and measured-rate calls without an operator identification. In addition, the AMARS feature may be used for complaint observing on calls made from measured-rate lines, for billing verification of AMA calls made from service observed lines, for gathering data for subscriber line usage (SLU) studies, and it may be used to detail bill all measured-rate calls.

3.13 Billing information for calls originating through the No. 3 ESS is compiled by the No. 3 ESS and stored in an AMA buffer to await transmission to the AMARC. When the AMARC is ready to receive data from this particular No. 3 ESS office, it polls the No. 3 ESS via a 4-wire link. The No. 3 ESS then responds by retrieving a block of billing information from the AMA buffer and transmitting it to the AMARC via the same data link. The AMARC receives the billing information, assembles it into self-contained records, and stores it on 9-track magnetic tape at 1600 bits per inch (BPI). The process is repeated continually in order to prevent an AMA-buffer overflow.

3.14 Included in the types of billable calls which may be recorded by the AMARS feature are:

- OUTWATS—full business day and measured-rate
- Local measured-rate (bulk or detail billed), including calls made using Threeway Calling, call forwarding, and a combination of the two features
- Station paid (toll) including calls made using Threeway Calling feature
- Calls requiring complaint observing or service observing
- Directory assistance.

The AMARS feature is also capable of recording charges for all local calls in cases where Measured Service (MS) is in effect. This includes charges for calls made using the custom calling features such as Threeway Calling, call waiting, and call forwarding.

3.15 Call information for nonbillable calls may also be recorded. Call types in this category include:

- Coin station-prepay and dial-tone-first (DTF), including forwarded calls
- INWATS calls originating from within the No. 3 ESS service areas; including originating INWATS calls made via Threeway Calling feature, calls forwarded to INWATS numbers, and a combination of the two situations
- Call forwarding activations and deactivations
- Calls made using call forwarding, call waiting, and Threeway Calling but charged on a flat rate basis
- Calls from lines involved in traffic sampling studies.

Provisions are also available to allow recording of call information for all locally originated calls for purposes of studies such as SLU, conference trunk usage, and other traffic studies. (SLU should not be confused with the Trunk and Line Usage (TLU) measurement available through TTY printouts.

Refer to Section 233-020-020 for details concerning the TLU measurement.)

3.16 Refer to Section 233-190-204, Automatic Message Accounting Recording System feature, for AMARS charging details.

CAMA CHARGING

3.17 The CAMA system is a centrally located facility that provides automatic billing of customer dialed toll calls (DDD) for nearby local switching offices.

3.18 In the No. 3 ESS, calls may be routed to a nearby CAMA facility for billing. The No. 3 ESS interfaces with CAMA offices both on an ANI and on an ONI basis. Normally, the No. 3 ESS office outpulses the called number and the billing number to the CAMA office. If ONI is required, only the called number is outpulsed and the caller is connected to a CAMA ONI operator.

3.19 When a customer's call is routed through a CAMA office and the calling party is automatically identified by the No. 3 ESS, the customer is given no indication of the billing process. However, if the calling party is not identifiable by the No. 3 ESS or if the customer has the Special Toll Billing feature, the customer is connected to a CAMA ONI operator. The operator verbally asks for the calling party identification or billing number and upon receipt of the number, the operator releases and the call is completed in the same manner as any other outgoing call to the CAMA office.

3.20 No actions are required of the No. 3 ESS personnel for CAMA interface.

Special Toll Billing

3.21 Special toll billing (formerly known as QZ billing) is a feature that allows calls from individual lines or multiline hunt group (MLHG) members to be billed to billing numbers that are not automatically identifiable by the No. 3 ESS (eg, customer internal accounting). Billing is accomplished by routing to a CAMA ONI operator who verbally obtains the billing number from the calling party.

3.22 CAMA interface and special toll billing require installation of trunks to the CAMA office. Some software data is also required which may be added via an office data administration (ODA) run or by recent change messages.

3.23 Refer to Section 233-190-109, Centralized Automatic Message Accounting Including Special Toll Billing, for CAMA charging details.

TSPS CHARGING

3.24 The TSPS provides a means for extending customer local and direct distance dialing (DDD) to include special toll calls, such as person-to-person, collect, credit card, and charge to third party. It also provides for coin station, 0- (dial 0), manual line calls, calls requiring special toll billing (formerly known as QZ billing), and international direct distance dialing (IDDD) calls. Additionally, this arrangement aids in the completing and recording of local and toll dial assistance calls. Operator assistance is needed to aid in the completion of these calls to assure recording correct charge data and to supervise coin deposits on calls originating from coin stations. This assistance may be furnished by operators at cordless positions under control of the TSPS.

3.25 Included in the types of calls which may be routed to TSPS are customer dialed 1+ noncoin calls and special toll calls (0+, 0-) of the following types:

- ***Noncoin—Person:*** paid, collect*, charge to third party, credit card special billing service, and IDDD calls.
- ***Noncoin—Station:*** collect*, charge to third party, credit card, special billing service, and IDDD calls.
- ***Coin—Person:*** paid, collect*, charge to third party, credit card, special billing service, and IDDD calls.
- ***Coin—Station:*** paid, collect*, charge to third party, credit card, special billing service, and IDDD calls.
- ***Coin and Noncoin:*** dial zero (0-).

*Includes calls charged to third party, credit card, and special billing service calls per ***called*** party instructions.

Additionally, a TSPS trunk group may be used to provide the necessary operator assistance to complete calls originating from manual lines (such as those provided for handicapped customers). When this type of service is provided, a special originating major class (10) and a dedicated route index (11) are required.

3.26 Trunks are provided from the No. 3 ESS to the toll office with TSPS trunk circuits interposed in between the two offices. These trunks may be considered as connecting the No. 3 ESS and the TSPS even though the ultimate connection is onward through the TSPS to the toll office. The TSPS provides the switching and control to the operator position through a bridged connection. When the operator functions are completed, the TSPS disconnects the operator and sets up the through connection to the toll office.

3.27 The TSPS times the call from called party answer through disconnect. It also provides supervision of both the calling and called parties until on-hook occurs. At that time, the TSPS causes the charging information for the call to be stored on a magnetic tape, and finally the TSPS trunk circuit is returned to its idle state to enable the processing of a new call. For coin calls, an operator or ACTS equipment may be connected to obtain overtime deposits. Since the charging is handled by the TSPS, the call is marked free within the No. 3 ESS.

3.28 The No. 3 ESS must have the abiliy to perform several functions in order to be compatible with TSPS. These functions are as follows:

- Recognize a call requiring TSPS handling
- Recognize and outpulse the type of handling required (ie, whether or not operator assistance is required)
- Identify the calling party's telephone number (provided the calling party is not a trunk or multiparty line)
- Outpulse the telephone numbers of the calling ***and*** called parties
- Outpulse pertinent information regarding the identity of the calling party (such as a hotel-motel customer or coin station)
- Receive and process commands from the TSPS to perform ringback, coin collect, and coin return operations. (With multiwink signaling, the operator attached and operator released signals are also sent to the No. 3 ESS).

3.29 The No. 3 ESS can route 1+, 0+, no prefix, 0- (dial zero), and IDDD calls to TSPS via separate trunk groups, the same trunk group or any combination of trunk groups. The single group method (called a "combined" group to TSPS) is recommended over the separate group method.

3.30 In addition, various combinations of coin, noncoin, selective class of call screening calls (including coinless public telephones), and hotel-motel calls are allowed over the same No. 3 ESS trunk group to TSPS. For offices not arranged for DTF coin, trunk groups can be set up to handle noncoin traffic only, prepay coin traffic only, or a combination of both types over the same trunk group. The latter is recommended. In offices arranged for DTF (+48 volts) operation, trunk groups may handle noncoin traffic only, coin traffic only (both prepay and DTF in the same group), or a combination of all three types over the same trunk group. Again, the latter is recommended.

3.31 The TSP (associated with crossbar tandem) performs the same functions as the TSPS except that it cannot perform timing and charging for 1+ noncoin calls or handle selective class of call screening calls. Also, the TSP requires that separate trunk groups be used for 0+ noncoin, 0+ coin, 1+ coin calls. The No. 3 ESS generic programs do not normally distinguish between TSPS and the TSP except on start digit and 0- calls; however, the translations must be properly written to access the necessary trunking. The remainder of this document pertains to TSP as well as TSPS except where these differences apply.

3.32 In order to complete a call through the TSPS office, the customer must perform the proper dialing requirements as established by the operating telephone company. Any of the following dialing procedures may be required for coin and noncoin originated calls.

- Dial 1, area code (if the call is to terminate outside the originating area code), office code, and telephone number

- Dial 0, area code (if the call is to terminate outside of the originating area code), office code, and telephone number

- Dial area code (if the call is to terminate outside of the originating area code), office code, and telephone number

- Dial 0 (no other digits required) for operator assistance.

In order to originate a call from a manual line, the customer simply goes off-hook.

3.33 Customers using the IDDD feature must dial one of three prefix codes. The prefix code "011" is dialed for direct distance dialing of station-to-station calls. International 0+ calls (those requiring the assistance of an operator, eg, person-to-person, credit card, etc) use a 2-digit prefix code of "01." Operator calls use "010" (international 0-) to reach an overseas assistance operator. In the latter case after dialing the code, dialing is considered complete. Operator assistance (010) calls are required when the called number consists of more than 12 digits.

3.34 When the call has been properly dialed, the TSPS operator is bridged onto the trunk (when operator assistance is required). At this time, the customer must provide the operator with the correct billing information. When this information has been obtained, the operator disconnects (except in the case of a person-to-person or collect call) and the call is allowed to complete through the tandem office and onward through the network until it reaches the called party. The customer then completes the call just like any other call. When paying for a call at a coin station, the customer must have the proper change to deposit in the coin station when the operator indicates the amount of deposit required. If ACTS is provided from a TSPS, the ACTS equipment requests and monitors the deposits.

3.35 No actions are required on the part of the No. 3 ESS personnel in order to complete the customer's call to the TSPS. The TSPS operator actions must be consistent with the requirements of the TSPS office.

3.36 Refer to Section 233-190-149, Interface With Traffic Service Position System (TSPS), for TSPS charging details and Section 233-190-503, IDDD, for interntional call charging details.

MESSAGE REGISTER CHARGING

3.37 The message register feature is used to provide the customer with charge information immediately upon completion of a message-rate call. The customer is then billed on a monthly basis for all message-rate calls. Private branch exchange (PBX) customers, such as hotels, motels, hospitals, and other business customers are the primary users of this feature; however, the feature can be used on any line. The feature enables the hotel, motel, or hospital to charge its customers individually for these message-rate calls without having to wait for the monthly bill. Both hardware and software message registers are provided (customers may have both if desired).

3.38 Hardware message registers (14 type) are located on the customer premises which provide the charge information (in terms of message units) used to compute the actual charge of the individual message-rate call.

3.39 The No. 3 ESS contains a software message register (comprised of electronic memory components rather than mechanical counters) which accumulates message units for the incoming PBX trunk or the individual line. (When AMARS is provided, these software message registers are not used.) In the case of a PBX, the accumulation would represent the total number of message units collected by all PBX members. The contents of the message registers are read out daily and are recorded by a local or remote teletype machine. This printout may be at either 10 or 120 characters per second.

3.40 The customer (user) is not required to perform any special procedures to activate the feature. The customer dials the call just like any other local call. When the call has been completed, the customer can read the hardware message register and subtract the previous reading from the present reading in order to determine the total number of message units to be paid for. In the case of a hotel, motel, or hospital, the hardware registers may be located in an office area instead of the individual rooms and are inspected by the employees rather than the guests. The number of message units is then computed with the cost per message unit (obtained from the

operating company's business office) to determine the charge for the call. This charge, plus a surcharge (if any), may then be added to the guest's lodging or hospital bill.

3.41 Refer to Section 233-190-123, Message Registers, for message register charging details.

4. SYSTEM OPERATION

General

4.01 When a customer goes off-hook and makes a call, the charging information pertaining to that call is determined by the customer's class of service and the prefix digit and/or next three or six digits the customer dials.

4.02 The line scan point number (SPN) translation, performed when the customer went off-hook, is used to obtain the customer's screening class. As soon as three digits have been collected by the customer dial pulse receiver (CDPR), the 3-digit translation subroutine (3DIGIT in XSL3DG, PR-3H181) is called in. If four digits have been collected, the first digit is a prefix of "1" or "0".

4.03 The 3-digit subroutine then converts the digits into a binary number (handled differently for an IDDD call which is described in paragraph 4.33). This number is used to index into a foreign area translator to obtain a code index. From the code index expansion, the appropriate screening table is founded and indexed by the screening class number. This provides a charge index (CHI) and a route index. The charge index is used to obtain an entry in the charge table. If 16 $\leq$CHI $\leq$31, the table provides message rate and coin charge data. Other charge indexes (1-16) are used by AMARS. A charge index of 1 is a free call. This entry gives the type of charging (coin, message rate, AMARS, CAMA, or TSPS) and the associated charging data (initial period, initial charge, overtime period, and overtime charge). At answer recognition, a 2-second charge delay interval is timed before the call is considered a charge call. If either subscriber disconnects before the end of the charge delay period, normal disconnect procedure is used. A calling party on-hook causes the call to be removed from the system. If the called party went on-hook first, then 10-second disconnect timing is performed. Once the charge delay period is over and the calling and called subscribers are in the talking state, no further action is required until recognition of a disconnect or an overtime period is applicable.

4.04 Refer to Figure 2 and the PA-3H3XX, No. 3 ESS Data Tables Layout Specification, for details of the translations required to obtain the proper charge data for a call.

Coin Charging

4.05 The Local Charge Program is involved three times during the processing of a call. These entries are as follows:

- At the completion of dialing to check the charging information, and if required, to set up timing entries for the various call types.
- After called party answers to activate timing entries.
- After disconnect to conclude charging and to clear any timing entries.

4.06 A customer at a coin station originates a call by removing the handset and depositing a coin (or coins). In the case of dial-tone-first lines, the customer simply removes the handset, waits for dial tone, and makes the required deposit before dialing is complete. A local untimed coin call proceeds as a normal call up to answer detection. This call may be intraoffice or interoffice. If, after answer recognition, either party disconnects before the end of the charge delay period, the coin deposit is returned. At disconnect, the coin deposit is collected.

4.07 Other types of coin charging and coin overtime are discussed in Sections 233-190-112 and 233-190-131.

AMARS Charging

4.08 During the normal progression of calls, the call processing programs determine which calls require AMA recording. The AMA program assembles the data to be recorded for these AMA related calls and prepares it for storage in the AMA buffer which resides in temporary storage. The AMA Buffer Management (ABM) program is responsible for controlling the flow of data into and out of the buffer. It also provides a timing check which insures that any data retrieved from the buffer for transmission to AMARC is valid

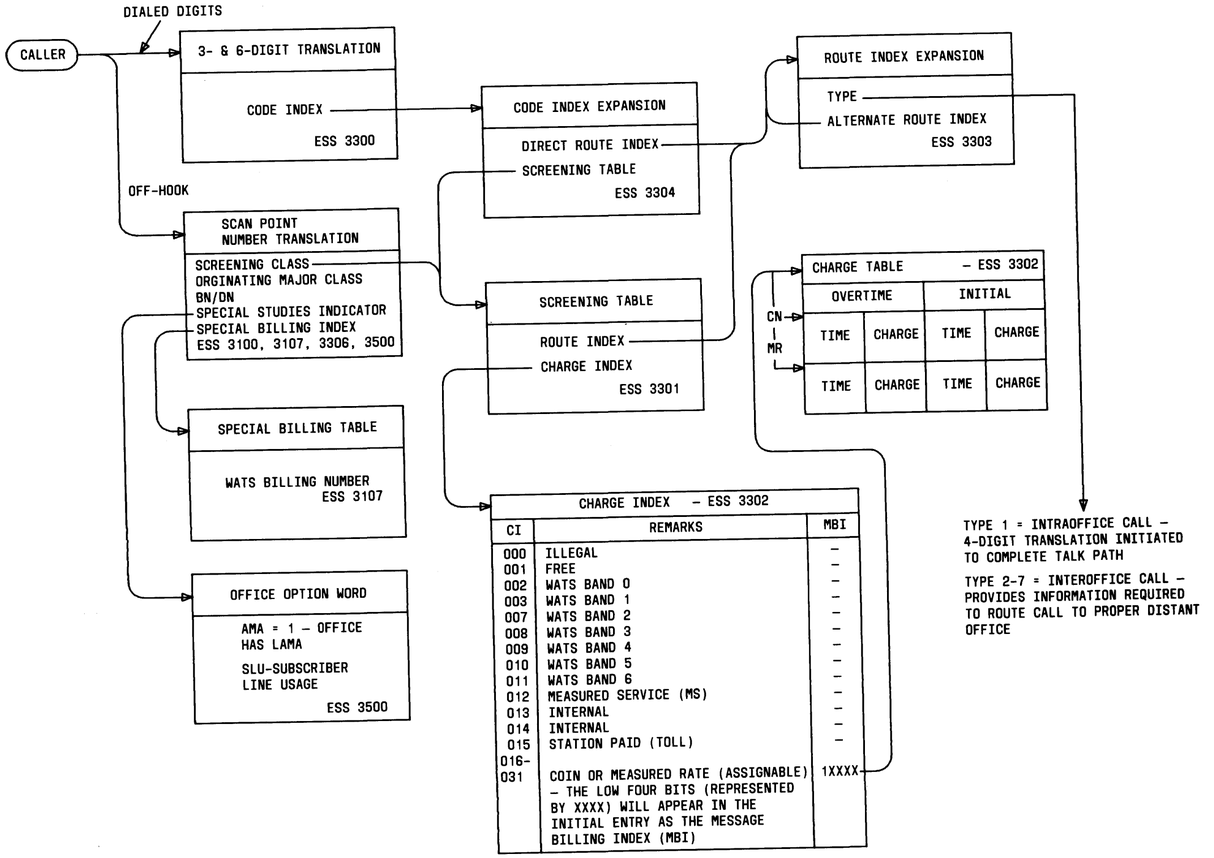


Fig. 2—Translation Data Related to Charging

and up-to-date. The Data Administration (DATADM) program controls the flow of data to and from the AMARC via the data link.

4.09 During the processing of calls, AMA information is stored in a 2800-word (minimum) buffer in temporary storage. The buffer is calculated to be large enough to allow switching of data links during a heavy traffic period without loss of data. The data is placed in the AMA buffer by the base level program as it becomes available. When the DATADM program recognizes that a polling command has been received from AMARC, it causes the AMA data to be transferred out of the AMA buffer (also during base level) and initiates the transmission sequence. The DATADM interrupt level program then causes the AMA data to be transmitted to the AMARC. The AMARC assembles the triple entries into a single AMA magnetic tape entry. This entry conforms to the standards for AMA 9-track magnetic tape recording for single entry systems.

4.10 There are three basic AMA buffer entry formats used to record information for AMA related calls. They are the ***initial, answer,*** and ***disconnect*** entry formats. Other miscellaneous and statistical entries are also made which, along with the initial, answer, and disconnect entries, provide all the information required to perform AMA billing and to complete the necessary traffic studies.

4.11 When the called number has been completely dialed, the usual call processing is performed in order to locate the called party terminal and to hunt for a talk path. If the call requires AMA recording, the ***initial*** entry is made at this time.

4.12 The AMA program compiles information received from the call processing programs and from translations to assemble the initial entry. The information necessary for the initial entry consists of the AMA call type, routing information, calling and called party telephone numbers, charging information, and record time stamp.

4.13 When the called party answers, the No. 3 ESS maintains off-hook timing, and the AMA program causes the ***answer*** entry to be written into the AMA buffer.

4.14 When the customer goes on-hook, the No. 3 ESS begins the normal disconnect process. At this time, the AMA program causes the ***disconnect*** entry to be loaded into the AMA buffer. If the customer goes on-hook before the called party answers, the abandon/attempt disconnect entry is made. If the called party goes on-hook and the calling party does ***not*** go on-hook within 10 seconds, the disconnect process will be performed. In this case, the timed release disconnect (TRD) entry is made. If the calling party goes on-hook within 2 seconds of answers recognition, the No. 3 ESS call processing programs begin the disconnect procedures. The AMA program causes the disconnect entry to be marked as a call of Minimum Recordable Duration (MRD) which is screened at the regional accounting office (RAO). If the called party goes on-hook within 2 seconds of answer recognition, a disconnect record marked as MRD is generated and the call processing programs wait 10 seconds to see if the called party goes off-hook again. If off-hook occurs, subsequent answer and disconnect entries are issued. If not, the connection is torn down when the calling party goes on-hook. An abandon/attempt disconnect entry is then made.

4.15 Other types of entries and details of AMARS charging are discussed in Section 233-190-204.

CAMA Charging

4.16 An outgoing call to a CAMA office is handled in the same manner as a normal outgoing call except both the called party number and the billing number must be outpulsed. The 3-digit translation yields a route index that points to a CAMA trunk group. After all digits have been received, a trunk is selected and seized as with any outgoing call. After a wink signal is received from the CAMA office, the called number is outpulsed to the CAMA office. The No. 3 ESS sends a keypulse (KP) signal plus the called number followed by a start (ST) signal.

4.17 At this point, the No. 3 ESS waits for an ANI signal (off-hook) from the CAMA office. If no signal is received within 2 seconds, the call times out and reorder tone is returned to the calling party. If the signal is received, the No. 3 ESS prepares to outpulse the billing number.

4.18 The billing number normally is obtained from the calling party originating translation. The billing number is outpulsed preceded by the KP signal and an information digit (ID) and followed by the ST signal. The ID digit is transmitted to

the CAMA office to indicate various information about the identity of the calling party.

4.19 In the normal case where the billing number is automatically identified, the billing number is outpulsed to the CAMA office preceded by the KP signal and information digit 0 or 3 and followed by the ST digit. The call is made stable within the No. 3 ESS office and the CAMA processes the call to completion.

4.20 If the calling party is normally identifiable, but due to some difficulty with the translation the billing number cannot be obtained, information digit 2 or 5 is outpulsed to the CAMA office. This digit tells the CAMA that because of some difficulty at the No. 3 ESS, the calling party was not identified. Only the KP signal, information digit, and the ST signal are outpulsed to the CAMA in this case. The calling party is connected to a CAMA ONI operator who verbally obtains the billing information. The call is then made stable to the CAMA office.

4.21 If the calling party is not normally identifiable (a multiparty line, PBX line, special toll billing, or MLHG), information digit 1 or 4 is outpulsed to the CAMA office. This causes the CAMA ONI operator to be connected with the calling party in order to verbally obtain the billing number. The call is then made stable to the CAMA office.

4.22 For other details of CAMA charging, refer to Section 233-190-109.

TSPS Charging

4.23 When a customer goes off-hook to make a call via TSPS, the origination process begins just as with any other call. The 3-digit translation provides a charge index and route index. (This is handled differently with an IDDD call. Refer to paragraph 4.33 for more information.) For routes to TSPS, charge index 01 is provided to indicate that the call is free. The TSPS will record all the required toll charging information for billing purposes.

4.24 The route index is used to access a route index expansion. This expansion provides an entry type which defines the number of dialed digits expected (type 02 or 04 representing 10 digits and 7 digits, respectively). The route index expansion also provides the TSPS trunk group number.

4.25 The trunk group number is translated next so that an idle member may be selected. The trunk group translation table provides the largest member number, selection status block address, member list index, circuit code, and TSP/CAMA indicator (11 represents a TSPS trunk group).

4.26 When the TSPS trunk has been properly selected, a path between the calling party and the trunk circuit must also be selected. The distributor triplet address (DTA) (obtained from the member list) is then used to place the trunk circuit in the bypass state and a multifrequency (MF) transmitter is selected and connected to the trunk circuit in order to outpulse the called party and calling party telephone numbers. (All communication between TSPS and No. 3 ESS is in the form of inband MF signaling.)

4.27 When the called number information has been received by the TSPS, an ANI signal (off-hook) is returned to the No. 3 ESS. Reorder tone is returned to the customer if this ANI signal is ***not*** received within 2 seconds. Upon reception of the ANI signal, the billing number must be retrieved from the TCR (this information was written into the TCR as a part of the originating translation) and outpulsed to the TSPS. The TCR also indicates whether or not special toll billing (QZ) is required (refer to Section 233-190-109 for further details on special toll billing).

4.28 The billing number is then outpulsed preceded by a keypulse (KP) signal and an information digit (based on the lines originating translation), and followed by the appropriate start (ST) code. The information digit tells the TSPS what type of handling is required for the call. If information digit 1, 2, 4, or 5 is present, no billing number is available; therefore, only the KP, information, and ST digits are outpulsed. The call is made stable and the TSPS operator is responsible for obtaining the necessary billing information. The TSPS then controls the call to completion.

4.29 If the calling party is a hotel or motel line (information digit 6), the TSPS is responsible for returning the charging information to the billing personnel at the hotel or motel when the call has been disconnected. This allows the hotel or motel

personnel to bill the guests immediately without having to wait for the monthly bill.

4.30 The TSPS operator can perform operator functions (such as coin collect, coin return, ringback, etc) for stable calls originated from the No. 3 ESS service area by initiating a series of events to be completed automatically by the TSPS. The TSPS first returns an on-hook wink to the No. 3 ESS to indicate that an operator signal is forthcoming.

4.31 Either of two signaling arrangements may be provided by supplying operator signals to the No. 3 ESS. The TSPS may return MF tones to represent the operator signals or for the other signaling arrangement, the TSPS returns a series of multiple winks which represent the individual operator signals. The No. 3 ESS decodes these signals so that the proper service circuit (coin control or ringing circuit) may be connected to the customer's line to perform the desired function.

4.32 When manual line treatment is required, the customer's originating translation yields an originating major class of 10. This major class is used only for manual lines. The system then automatically routes the call to TSPS via route index 11. Since the customer dials no digits, the call arrives at the TSPS as a 0- (dial 0) call. The TSPS operator then routes the call in accordance with the customer's wishes.

4.33 Customer routing and charging for IDDD calls from a No. 3 ESS office are provided via a TSPS. The TSPS office forwards the call to a gateway office or to an overseas assistance operator. A call intended for an overseas operator may be handled by the TSPS operator, or may be forwarded to a gateway center (TSPS option).

4.34 The No. 3 ESS recognizes a customer-dialed international call by the first two digits of the IDDD prefix (01). The third digit of the prefix (0, or the first digit of the country code) is used to index into the IDDD translator. This translator then translates the customer's dialed digits in order to identify a valid country code. When the country code has been identified, the IDDD translator specifies the number of digits to expect (maximum and minimum) for the international number and provides a code index which eventually points to a TSPS trunk group. If the country code is invalid, or if the office does not allow IDDD calls, the translator provides a code index which points to some error treatment as desired by the operating company.

4.35 If the IDDD prefix "010" is dialed, the call is intended for an overseas operator and no other digits are expected. The IDDD translator provides a code index leading to an overseas operator (via a TSPS trunk group). The No. 3 ESS performs a coin return operation if the originating translation indicates that the calling line is a coin line or a toll diversion operation if the calling line is a PBX line. A start code is then determined based on the type of line (coin or noncoin), and the leading zero of the prefix is deleted. The remaining digits of the prefix 10 are then outpulsed to the TSPS preceded by a keypulse signal and followed by the start code. The TSPS then has the option of handling the call or it may outpulse the proper code to the gateway office. When the TSPS is ready to receive the automatic number identification (ANI), an off-hook signal is returned to the No. 3 ESS. The operator then controls the call to completion.

4.36 When the prefix "011" or "01" is dialed, more digits are expected. A station-to-station call requires a "011" prefix and an international 0+ call (person-to-person, credit card, bill to third party, collect, etc) requires a "01" prefix. When proper billing information has been obtained, the operator connection is released and the TSPS provides the automatic message accounting (AMA) function until the call is completed just as if the call was placed without operator assistance.

4.37 When the "011" or "01" prefix is dialed, the IDDD translator interprets the digits following the prefix one at a time to identify a valid 1-, 2-, or 3-digit country code. The IDDD translator then provides a code index which leads to the appropriate disposition of the call. If the country code is valid, the same IDDD translation provides the number of digits to expect for the called party's national number. In some cases, the exact number of digits cannot be predicted, so a maximum and minimum number of expected digits is provided. These numbers are stored for later use. If the exact number of digits can be predicted, the maximum and minimum numbers are equal.

4.38 When the TSPS is ready to receive the billing information, an off-hook signal is returned to the No. 3 ESS. Upon reception of this signal, the No. 3 ESS returns an ANI signal followed by the calling telephone number, or billing number, and start code. If the calling line is a multiparty line, no calling line identification is provided; therefore, an ONI signal is outpulsed followed by the start code. The TSPS operator must than obtain the billing number just as if it was an operator-assistance call.

4.39 When the outpulsing is complete, the No. 3 ESS releases control of the call to the TSPS which is responsible for recording all AMA data for billing purposes.

4.40 For other details of TSPS charging, refer to Section 233-190-149. Refer to Section 233-190-503 for details of IDDD charging.

Message Register Charging

4.41 When a customer with message register charging goes off-hook, standard scan point and line translations are performed. From these translations, a charge index and a route index are obtained. The charge index is stored in the terminal memory record (TMR) to be used later. The route index is used to set up the appropriate talk path.

4.42 When the talk path is completed, ringing is applied to the called line and audible ringing is returned to the calling line. Normally, when the called line answers, the transient call record (TCR) is released and the TMR is used to hold information pertaining to the stable call; however, when charging is required, a 2-second waiting period must expire to verify that the called party has actually answered. At this time, the charge index is retrieved from the TMR and is translated in order to access the charge table. The charge table contains the charging information (in message units) required to increment the software and hardware message registers for initial time periods and overtime periods (when required). The charging information in this table will be as follows:

- Type=2 (indicating message rate charging)
- Time=0 (indicating local untimed message rate) or
- Time=1 through 7 minutes (timed message rate-initial time or overtime)
- Charge=1 through 15 message units (for timed or untimed message rate).

After the delay period, the hardware and software message registers are incremented to reflect the number of message units to be charged for the initial time period. A pulse is sent through the frame input-output controller to the peripheral pulse distributor (PPD) which addresses the proper peripheral decoder (PD) and sends the pulse to it. The PD then causes the appropriate relay to operate in a particular distribute point applique circuit. When this relay operates, -48 volts is applied to the hardware message register via the control wires. This causes the hardware message register to increment one message unit. This process is repeated until all message units for the initial charge are shown on the hardware message register. This charging information is retrieved from the charge table. Also, the initial time period, in minutes, is retrieved from the charge table so that timing can begin. If the initial time period is listed as 0 minutes, the call is identified as an untimed message-rate call and no overtime charging or timing (for initial time or overtime) is required. At this point, the call is considered stable and the TCR is released. The timing bit in the TMR is set to 0, indicating untimed message rate, and supervision for on-hook is begun.

4.43 If the initial time in the charge table is listed as being between 1 and 7 minutes inclusive, the call is identified as a timed message-rate call. The call is now considered stable, the timing bit in the TMR is set to 1 (indicating a timed message rate call), timing of the initial period is begun, and the TCR is released.

4.44 Supervision is maintained during the initial timing period. If the call is completed and on-hook occurs before the period ends, a TCR will be selected to begin the normal disconnect process. If the initial time expires and the call is still stable, a TCR will be selected to charge for the overtime period. The hardware and software message registers are then incremented to reflect the message units charged for the overtime period (the message unit charge and length of the overtime period are retrieved from the charge table). The TMR is then set to time the overtime period, the call is made stable, and the TCR is released.

4.45 Supervision is continued during the overtime period to recognize when the call is completed. If on-hook occurs before the end of the overtime period, a TCR will be selected to begin the normal disconnect process. If the overtime period expires and on-hook has not yet occurred, a second overtime period is required. The second overtime period is processed identically to the first, and additional overtime periods are processed, if necessary, until on-hook occurs. At that time, the normal disconnect procedures will be followed.

4.46 For further details of message register charging, refer to Section 233-190-123.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 Charging is provided on a per-customer and per-system basis.

5.02 Charging may be applied to all classes of service. Customers with flat rate telephone service may be billed for calls outside their free calling area even though their monthly rate is a fixed amount.

6. LIMITATIONS

6.01 Local AMA charging can be provided via the AMARS feature. However, software message registers and AMARS cannot be provided in the same office.

6.02 Refer to the appropriate section for limitations and restrictions on the various types of charging arrangements. These sections are listed in Part 18 of this document.

7. INTERACTIONS

7.01 The Charging Arrangements feature is an inherent part of the No. 3 ESS system program and, therefore, will interact with any other feature where charging and routing must be determined.

8. RESTRICTION CAPABILITY

8.01 Refer to the appropriate section for restrictions on the various types of charging arrangements. These sections are listed in Part 18 of this document.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 Refer to the appropriate section for installation, addition, and deletion procedures for any one particular type of charging as described in this document. These sections are listed in Part 18 of this document.

10. HARDWARE REQUIREMENTS

10.01 Hardware requirements for the various methods of charging may be determined by referring to the sections in Part 18 of this document and to the appropriate Network Switching Section, Series 233-060-XXX.

11. SOFTWARE REQUIREMENTS

11.01 Software for the charging function is provided in the generic program and in the translation memory area. Any current issue of the SO-2 or 3E3 generic program can provide charging functions.

11.02 Processor real-time data required by this feature will be supplied when the data becomes available.

11.03 Specific software requirements are provided in the applicable section in Part 18 of this document and in the appropriate Network Switching Engineering Practice, Series 233-060-XXX.

12. DATA ASSIGNMENTS AND RECORDS

12.01 The Charging Arrangements feature is derived from standard 3/6 digit translations. Charging and routing are the end product of these translations. Line translation data is also required to determine charging arrangements. Figure 2 shows the interrelation of translation data involved in the charging function. As an aid to understanding the translation process, the flow in Figure 2 is presented from the point of view of the translations forms rather than the actual structure of translations in program store. For actual word layouts in program store concerning charging, refer to the applicable issue of PA-3H3XX, No. 3 ESS Office Data Tables Layout Specifications, and the applicable feature referenced in Part 18 of this document.

12.02 Each line must be assigned the proper screening class in order to point to the appropriate charge index and route index. This assignment may be made through the use of recent change messages or, in the case of an initial installation, an office data administration (ODA) run.

12.03 The recent change messages associated with the translations maintained in paragraph 12.01 are as follows:

RC:LINE — This message is used to specify a line class code, rate area, bill-to number, WATS billing number, service observing indicator, special studies (SLU, complaint observing, or traffic sampling) indicator, terminal equipment number, and scan point number for a particular line.

RC:DIG — This message defines a code index for a 3- or 6-digit code or a default code index for an area translator.

RC:CDI — This message is for code index entries. It is used to define a new entry, change an existing entry, or remove an existing entry. The entry data contains the screening table, directed route index, and code indexes for the optional prefixing.

RC:LCC — This format is used to input the line class index, the line class code, the rate area, originating and terminating major classes, screening class, and the party number.

RC:CHI — This message is used to input the charge index which identifies a call as an OUTWATS, MS, toll, coin, or measured-rate call.

RC:OFFICE — This format is used to specify AMA recording for the No. 3 ESS office and to specify complaint observing, traffic sampling, and/or SLU for the particular office.

RC:SCR — Used to input screening class, screening table, route index, and charge index identities.

RC:MPTY — Used to specify line class code, rate area, scan point number, and party number for a 4- or 8-party line.

RC:MTL — Used to specify line class code, rate area, bill-to number, and terminal equipment number for a particular line within a multiline hunt group (for PBX). Information pertinent to other features is also specified by this message.

RC:MLHG — Used to specify line class code, rate area, bill-to number, and group number for a multiline hunt group. Information pertinent to other features is also specified by this message.

RC:RTI — This message adds, changes, or deletes a route index expansion entry and its associated alternate route index expansion entry. Information pertinent to other features is also specified by this message.

RC:TWOPTY — Used to specify line class code, rate area, scan point number, and party number for a 2-party line.

RC:TTY — Used to specify the controller number, port number, and high speed option for the AMA link.

Refer to the Input Message Manual (IM-3H300) and the Recent Change Users Guide, Section 233-154-130, for further details on these recent change messages.

12.04 For the initial ODA run, the following forms must be completed and sent to the WECo Regional Data Center.

- ***Form ESS 3100 Telephone Number Table*** is used to assign line class codes and line features to directory numbers.

- ***Form ESS 3105 Multiline Hunting Table*** is used to assign PBX lines to a group and to assign the rate area, line class code, and the billing number for the group.

- ***Form ESS 3107 Supplementary Information Table*** is used to assign a billing number to each member within multiline hunt group.

- ***Form ESS 3300 Three- and Six-digit Translation Table*** is the starting point for establishing routing and charging treatment for all 3- and 6-digit NXX and NPA codes. This form provides a sequential listing of all dialable codes and provides the initial code reduction when all codes of similar treatment are assigned into code groups.

- ***Form ESS 3301 Rate and Route Table*** is used to construct the screening tables by providing the proper charge and route indexes for each screening class.

- ***Form ESS 3302 Charge Table*** is used to assign the time periods and message units for initial and overtime periods for coin and message rate lines.

- ***Form ESS 3303-2 Route Index Expansion Table*** is used to assign the call type, outgoing trunk identification, the type of outpulsing to be used, and the alternate route index to each route index.

- ***Form ESS 3304 Code Index Table*** is used to construct the code index expansion by assigning the screening table and the direct route index to each code index.

- ***Form ESS 3306 Line Class Code Table*** is used to relate various combinations of line class code, rate area, and party number to the originating and terminating major class combinations.

- ***Form ESS 3500 General Information Table*** is used to assign TTY controllers for use with the AMARC data links, AMA recording, and specify the particular special study for the office.

Refer to TG-3 for further details concerning the completion of the forms. It should be noted that the special studies (SS) indicator cannot be set via the ODA run. It must be set using the RC:LINE recent change message.

13. TESTING

13.01 The following verification messages are used to verify the proper assignment of this feature:

- ***VER:CHI*** is used to verify charge index assignments (replaced by OP:OFR in 3E3).

- ***VER:DIG*** is used to verify the 3- and 6-digit translations which eventually lead to the charge index and route index (replaced by OP:OFR in 3E3).

- ***VER:GRP*** is used to verify assignment of group and member data for a PBX/MLHG (replaced by OP:OFR in 3E3).

- ***VER:LCC*** is used to verify the line class code assignments (replaced by OP:OFR in 3E3).

- ***VER:LINE*** is used to verify line information.

- ***VER:MTL*** is used to verify the assignment of PBX/MLHG lines.

- ***VER:OE*** is used to verify customer line originating translations.

- ***VER:OFFICE*** is used to verify the office options and the terminal identification (replaced by OP:OFR in 3E3).

- ***VER:SCR*** is used to verify the screening table entries (replaced by OP:OFR in 3E3).

- ***VER:TWOPTY*** is used to verify originating translation associated with 2-party lines.

- ***OP:OFR*** is used to request a printout of office records, either all or individually, or to add a remark to be associated with a telephone number. To be used only with 3E3 and later generic programs.

13.02 Refer to the appropriate section in Part 18 for testing of any specific type of charging arrangement. Refer to the IM-3H300 and OM-3H300

for details of the input of and reply to the previously listed verification messages.

14. OTHER PLANNING TOPICS

14.01 Refer to the appropriate section in Part 18 for planning information pertaining to any one type of charging arrangement.

ADMINISTRATION

15. MEASUREMENTS

15.01 Peg count, usage, overflow, and maintenance busy traffic measurements are available for the lines, trunks, and service circuits associated with the Charging Arrangements feature. The details of these measurements can be found in Section 233-152-135, Traffic and Plant Measurements No. 3 ESS.

16. CHARGING

16.01 There is no charge for the Charging Arrangements feature itself. Tariffs for the charging arrangements described in this document are an operating company option and are subject to state and federal tariff regulations.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 The following list identifies abbreviations and terms used in this document.

- ACTS (Automatic Coin Telephone Serivce)—A subsystem of TSPS that uses announcements to notify the coin customer of the proper initial and overtime deposits and also monitors these deposits for the proper amounts. An operator is not called in unless a problem occurs.

- AMA (Automatic Message Accounting)—The overall facility for automatically recording on magnetic tapes the numbers of the calling and called customers and other information required for automatically computing charges for customer-dialed calls.

- AMARC (Automatic Message Accounting Recording Center)—Where all data sent by an AMARS for each telephone call is assembled into a data block and stored on magnetic tape. The data is then used to compute charges for customer-dialed billable calls and to perform special traffic studies.

- AMARS (Automatic Message Accounting Recording System) Feature—Provided at a No. 3 ESS office to compile billing information for calls originating through the No. 3 ESS. This information is temporarily stored in an AMA buffer and subsequently transmitted to the AMARC.

- ANI (Automatic Number Identification)—A means of making an automatic number identification of the calling party for recording on the automatic message accounting tape. This eliminates the necessity for operator intervention. The equipment is located in the local office and responds to signals from a CAMA or TSPS office for transmitting the calling number.

- ANI (Automatic Number Identification) Signal—An off-hook signal sent from the TSPS to the No. 3 ESS upon the reception of the called telephone number. The signal indicates that the CAMA or TSPS is ready to receive the billing number.

- CAMA—Centralized Automatic Message Accounting—A centralized system for automatically recording the required billing data for toll calls. Calls from a number of offices may be concentrated and recorded there.

- CDPR—Customer Dial Pulse Receiver.

- DATADM (Data Administration) Program—Used to control the flow of data to and from the AMARC via the data link.

- DDD (Direct Distance Dialing)—Customer dialed toll calls.

- DTF (Dial-Tone-First)—A feature by which No. 3 ESS returns dial tone to a coin station before the initial deposit is made. The customer can then complete a call to any number which has been designated by the operating company as a free number without making an initial deposit.

- IDDD (International Direct Distance Dialing)—Customer dialed toll calls outside the North American continent.

- INWATS (Inward Wide Area Telephone Service)—Allows customers to reach a customer with this service toll free by dialing a special "800" number.

- Initial Period—The initial unit of time of which a call is charged a predetermined amount.

- KP (Keypulse)—An MF signal transmitted to indicate the beginning of an MF encoded message (ie, a called or calling party telephone number).

- LAMA (Local Automatic Message Accounting)—A system for automatically recording data for toll calls which is located at the office where the calls are originated.

- Manual Line—A customer's line (and originating major class) that is automatically routed to an operator upon detection of off-hook.

- MS (Measured Service)—A pricing plan by which all customers are billed according to usage for local and toll calls.

- MF Signaling (Multifrequency Signaling)—A method of sending numerical address information between telephone offices by sending simultaneously a combination of two tones out of a group of six frequencies.

- MLHG—Multiline Hunt Group.

- ODA (Office Data Administration) Run—Mechanism by which software may be changed in the No. 3 ESS. Information from the ODA input forms are inputted into the regional ODA computer, then sent back to the No. 3 ESS.

- OEN (Office Equipment Number).

- ONI (Operator Number Identification)—A means of identifying the calling party in cases where ANI is not possible (ie, 4- and 8-party service, some special billing arrangements, 0+ calls, etc).

- Off-Hook—The condition indicating that a station or trunk is in use (line loop closed).

- On-Hook—The condition indicating that a station or trunk is idle (line loop open).

- Outpulse—The process of sending called and calling party telephone numbers from the No. 3 ESS to the TSPS or CAMA.

- OTC—Operating Telephone Company.

- OUTWATS—Outward Wide Area Telecommunications Service.

- PBX (Private Branch Exchange)—A switching system which provides internal telephone communications between stations located on customer premises as well as between these stations and exterior networks.

- QZ—Designation used to indicate whether a line has special toll billing (formerly known as QZ billing).

- RC Messages (Recent Change Messages)—Mechanism for making changes to information stored in the program store via TTY input messages.

- Rering—A signal used by a TSPS operator to call the calling subscriber after the completion of a toll call.

- SLU (Subscriber Line Usage)—A long term study of a sample of an office's lines (typically 100 lines). The study provides an OTC with data that may be used to obtain point-to-point calling habits of flat rate subscribers, to assist in the preparation of MS tariffs, or to monitor the effects of such tariffs. AMA records produced for calls from SLU lines contain complete toll-like billing details.

- SPN (Scan Point Number)—The location number of the scan point assigned to a particular line. This number is translated to a directory/billing number and other line data needed to provide service to the customer desiring to place a call.

- Start (ST) Pulse—An MF signal transmitted to indicate the end of an MF encoded

message. TSPS and CAMA processing begins with the reception of this pulse.

- Tandem Office—A center used exclusively for the switching of calls between other central offices.
- TCR (Transient Call Record)—A block of temporary storage assigned to monitor calls in a transient state.
- TMR (Terminal Memory Record)—A block of temporary storage used to store information relating to calls in a stable state.
- Translation—The conversion of information from one form to another; in ESS, for example, conversion of dialed digits into routing and terminating information.
- TSPS (Traffic Service Position System)—An electronic system to provide a means for extending customer direct distance calling to include person-to-person, collect, credit card, charge to a third party, and coin service.
- TTY—Teletypewriter.

18. REFERENCES

18.01 The following is a list of documents which may be consulted for further information related to this feature.

- Section 233-190-109—Centralized Automatic Message Accounting Including Special Toll Billing No. 3 ESS
- Section 233-190-112—Basic Coin Service No. 3 ESS
- Section 233-190-123—Message Registers No. 3 ESS
- Section 233-190-126—Multiparty Service No. 3 ESS
- Section 233-190-131—Dial-Tone-First Coin No. 3 ESS
- Section 233-190-139—Toll Diversion and Toll Restriction No. 3 ESS
- Section 233-122-100—Automatic Message Accounting Recording Center Data Link Description of Theory and Operation No. 3 ESS
- Section 233-154-130—Recent Change Users Guide
- Section 984-100-100—Traffic Service Position System No. 1 General Description
- Section 233-190-142—Outward Wide Area Telecommunication Service (OUTWATS) No. 3 ESS
- Section 233-190-013—Service Oberserving Arrangements No. 3 ESS
- Section 233-152-135—Traffic and Plant Measurements No. 3 ESS
- Section 233-190-149—Interface With Traffic Service Position System (TSPS) No. 3 ESS
- Section 233-190-010—No. 3 ESS System Description
- Section 233-190-204—Automatic Message Accounting Recording System
- Section 233-020-020—Trunk and Line Usage
- Section 233-060-XXX—Network Switching Engineering Practices
- Section 233-190-503—International Direct Distance Dialing (IDDD) No. 3 ESS
- IM-3H300—Input Message Manual No. 3 ESS
- OM-3H300—Output Message Manual No. 3 ESS
- PA-3H3XX—Office Data Tables Layout Specification No. 3 ESS
- TG-3—Translation Guide
- PR-3H186-02—AMA Buffer Management (ABM) Program
- PR-3H187-02—Automatic Message Accounting (AMA) Program

- PR-3H262-02—Data Administration (DATADM) Program
- PR-3H181-02—3-Digit Translation (XSL3DG) Program
- SD-99439—Common Systems Auxiliary Line Circuit Arranged for Measured Rate INWATS Service