BUSINESS COMMUNICATION SERVICES
SOFTWARE SUBSYSTEM DESCRIPTION (SSD)
2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS

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1. GENERAL

INTRODUCTION

1.01 This section briefly describes the software needed to administer specific functions used in a business communication environment.

1.02 When this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Part 4 of this document provides a defined list of abbreviations and acronyms used in this section.

PURPOSE OF BUSINESS COMMUNICATION SERVICES

1.04 The purpose of business communication services is to provide operations considered essential to the Centrex/ESSX-1. These operations allow a Centrex/ESSX-1 to complete calls over special trunk groups, outward calls which require billing, and tandem connections. Other operations maintain records of specific types of calls originating from the Centrex/ESSX-1.

SCOPE OF SECTION

1.05 This section is intended to briefly describe the pidents controlling simulated facilities usage, hotel-motel billing, automatic identified outward dialing, trunk verification, tandem connections, and 4-wire trunk interface. A pident-to-program record (PR) cross reference is provided in Table A. Descriptions in this section are based upon the 1E6/1AE6 versions of the pidents. Information unique to No. 1A Electronic Switching System (ESS) application is so noted. Applications unique to No. 1 ESS are not described in this section.

2. BRIEF DESCRIPTION OF PIDENTS

2.01 The 1XX Tandem Tie Line (CX1X) program is the control pident which enables a No. 1 or No. 1A ESS to provide tandem tie trunk service (nonsenderized). Pident CX1X controls both regular tandem tie line service (1XX) and improved tandem tie line service (I1XX). Pident CX1X allows Centrex/ESSX-1 to complete calls using these services by providing transmitting and receiving paths through the ESS network as shown in Fig. 1, 2, and 3. 1XX and I1XX service may originate from Centrex/ESSX-1 stations (Fig. 1), attendant consoles (Fig. 2), or the service may originate in a distant office and appear as an incoming call (Fig. 3). See Section 231-090-254 for a complete explanation of tandem tie trunk service (nonsenderized).

2.02 The centrex trunk preemption program (CXTP) is the control pident which enables a No. 1 or 1A ESS to interface with the automatic voice network (AUTOVON). AUTOVON is a 4-wire

TABLE A

BUSINESS COMMUNICATION SERVICE PIDENTS

PIDENT	TITLE	NO. 1 ESS PR	NO. 1A ESS PR
CX1X	1XX Tandem Tie Line	1A170	6A170
CXTP	Centrex Trunk Preemption	1A167	6A167
CXSF	Centrex Simulated Facilities	1A169	6A169
HMTL	Hotel-Motel	1A162	6A162
AIOD	Automatic Identified Outward Dialing	1A088	6A088
CXBV	Busy Verify on Lines and Trunks	1A171	6A171

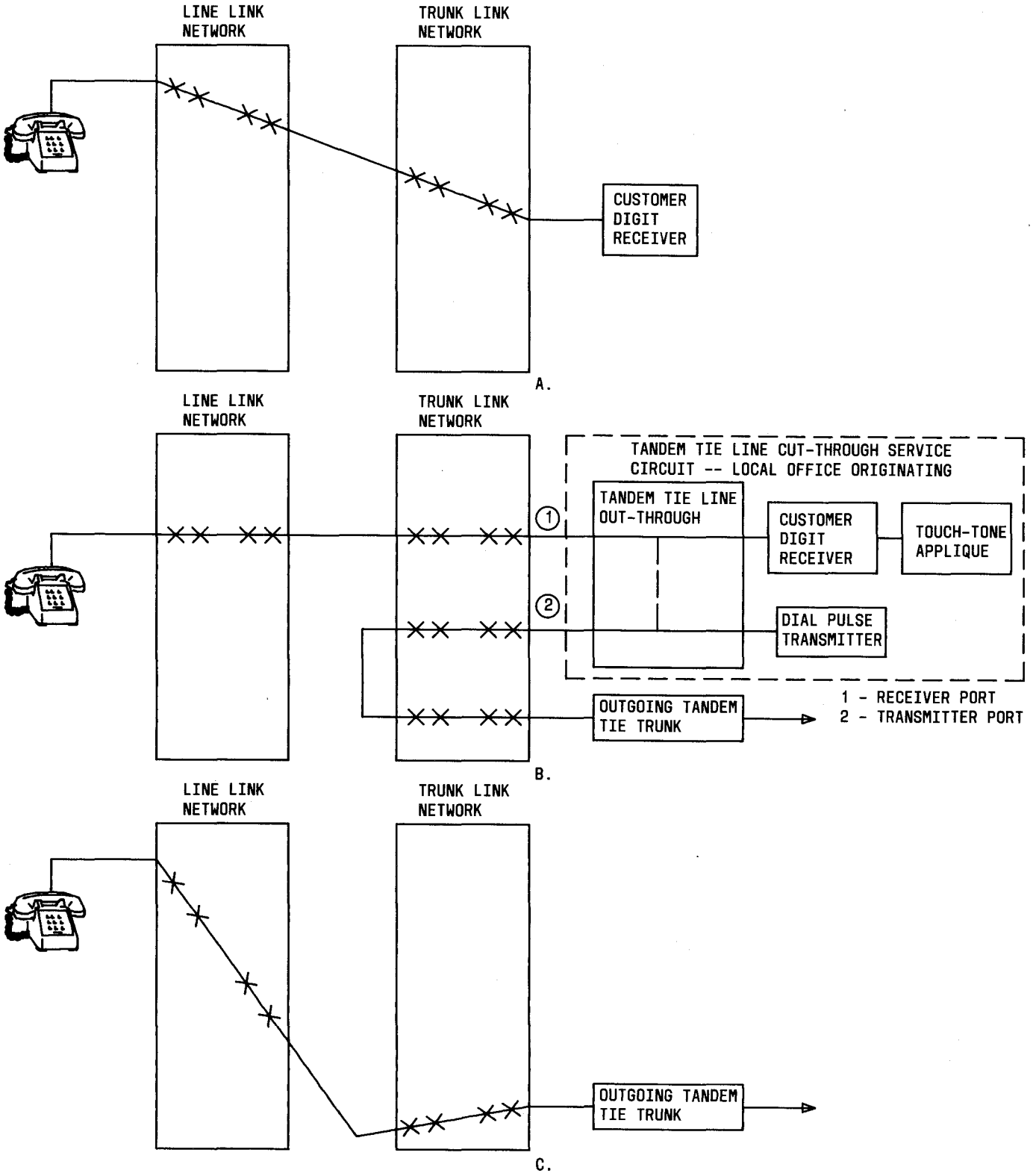


Fig. 1—Station Call—Local Office Origination

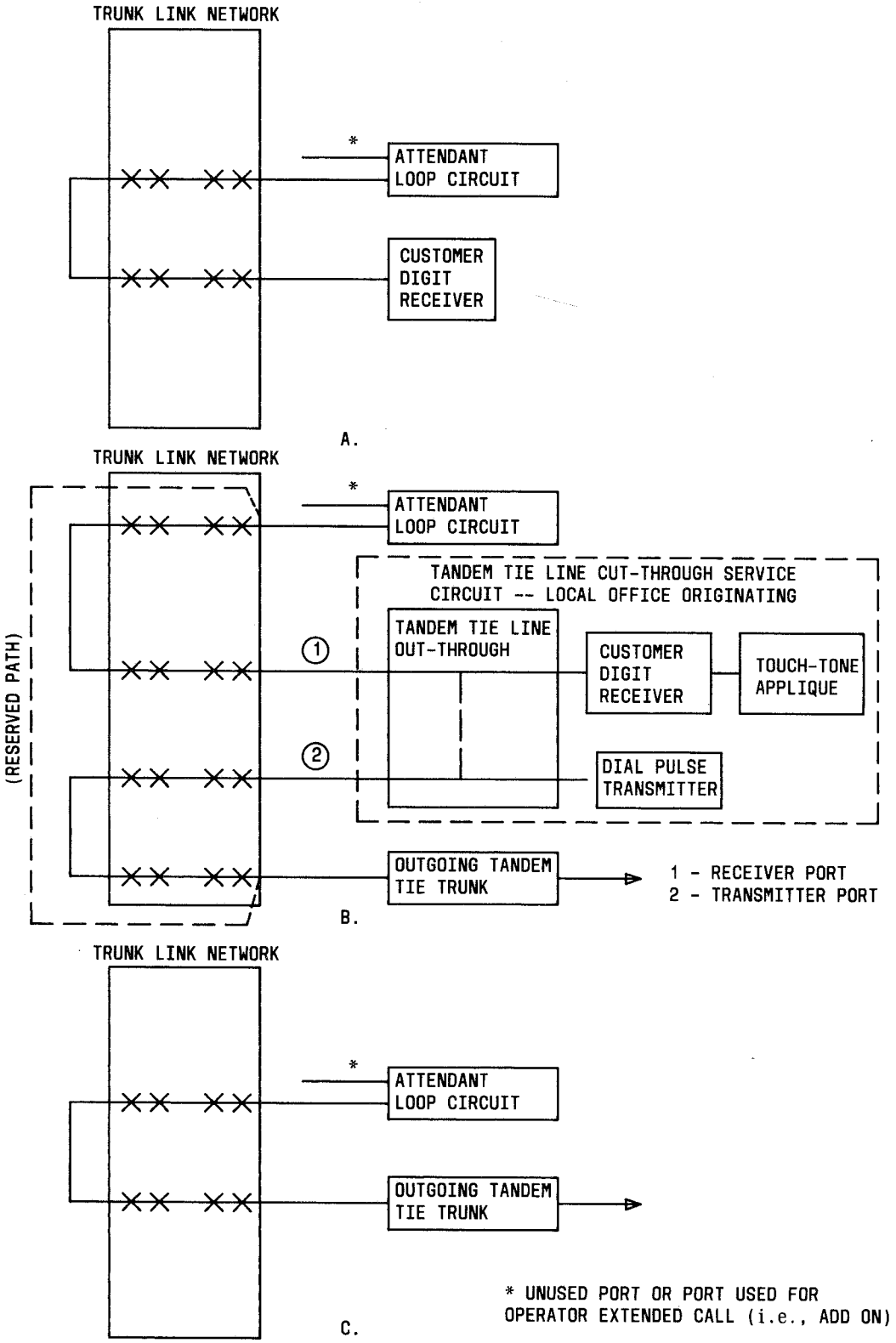


Fig. 2—Attendant (Trunk Link Network Appearance) Call—Local Office Origination

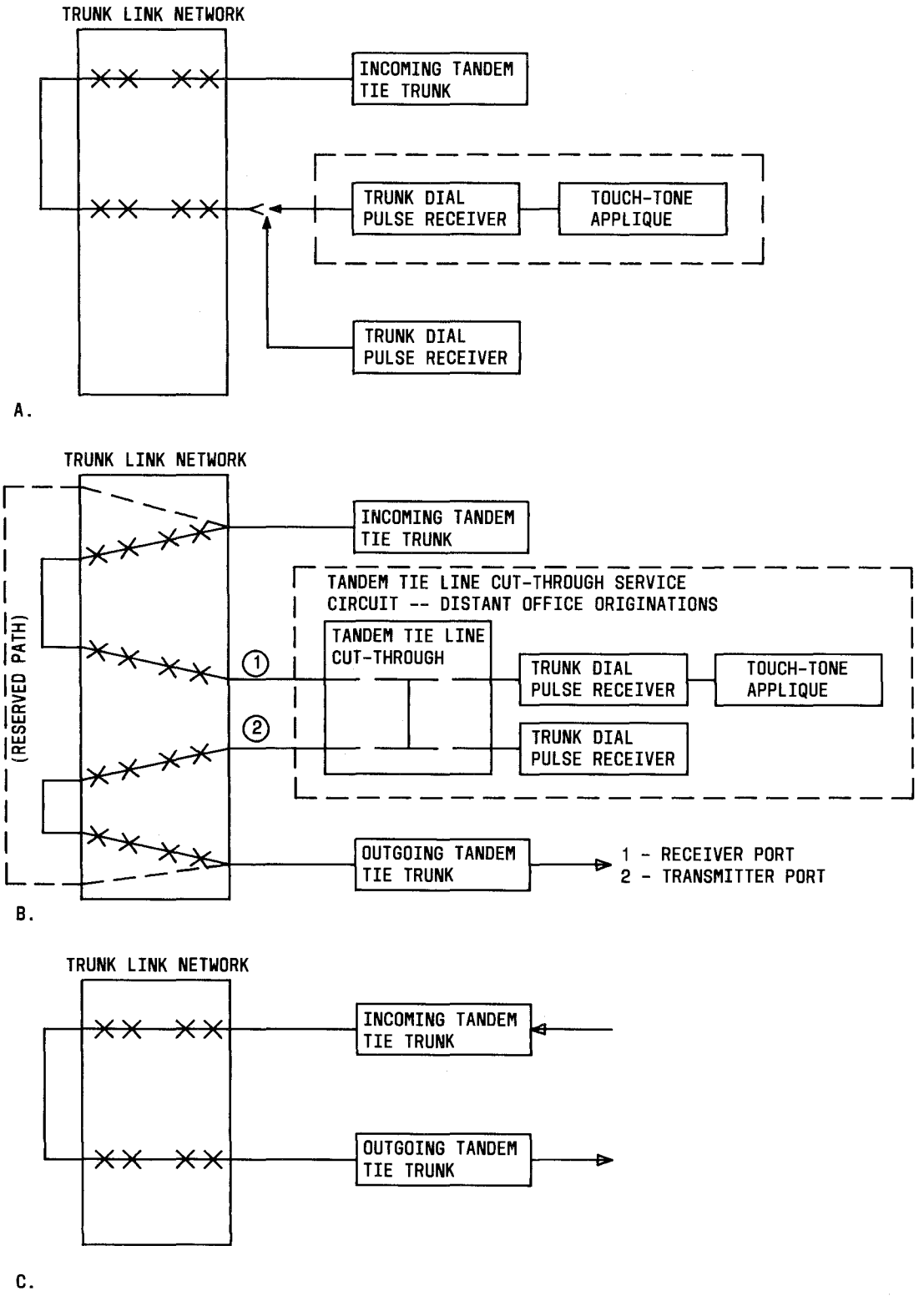


Fig. 3—Incoming Call—Distant Office Origination

switching network used by various authorized agencies of the government to complete priority calls. CXTP gives the No. 1 or No. 1A ESS the ability to preempt (or interrupt) incoming and outgoing trunks to allow priority calls to the AUTOVON network. The AUTOVON Interface feature (also called Precedence Network In-Dialing [PNID]) allows priority calls to originate from a Centrex/ESSX-1 station or attendant console. Figure 4 provides an interface block diagram for an AUTOVON Interface feature Centrex/ESSX-1 served by a No. 1 or No. 1A ESS. Pident CXTP is responsible for recording the number of priority and routine calls in the ESS, seizing, releasing, and administering the trunk preemption control (TPC) registers, and reserving paths through the ESS network for transmitting and receiving data to and from the AUTOVON network. See Section 231-090-065 for specific details on the AUTOVON Interface feature.

2.03 The purpose of the centrex simulated facilities program (CXSF) is to maintain a record of specific types of calls where the number of these types of calls is limited in the ESS. The volume of certain calls is controlled by software. They are:

(a) Access of a Centrex/ESSX-1 to the plain old telephone service (POTS) network using wide area telecommunications service (WATS).

(b) Access of a Centrex/ESSX-1 to a collocated common control switching arrangement (CCSA) network.

(c) Access of the CCSA network to the POTS network.

The sole function of CXSF is to determine when a call, using a volume-controlled service, has been completed. Based on this determination, associated usage counts and centrex console trunk busy lamps are administered. See Section 231-090-229, Issue 2 for an updated explanation of the Simulated Facilities feature.

2.04 The hotel-motel (HMTL) program records the number of message units to be charged to a hotel or motel guest each time he places a call. Billing information determines whether a call is a timed or an untimed call. An untimed call means that a call is to be billed a specific number of message units regardless of the length of the call. After the initial charge, pident HMTL releases the hotel-motel register and discontinues further timing and charging. If the call is to be charged for overtime as well as initial charging, HMTL calls for translation output to indicate the initial and overtime charge intervals. HMTL will seize and link a hotel-motel register to record the message units scored during initial and overtime charging intervals. Billing is accomplished by releasing the recorded message units to the automatic message accounting (AMA) subsystem. See Section 231-090-280 for a list of features available to hotel-motel Centrex/ESSX-1.

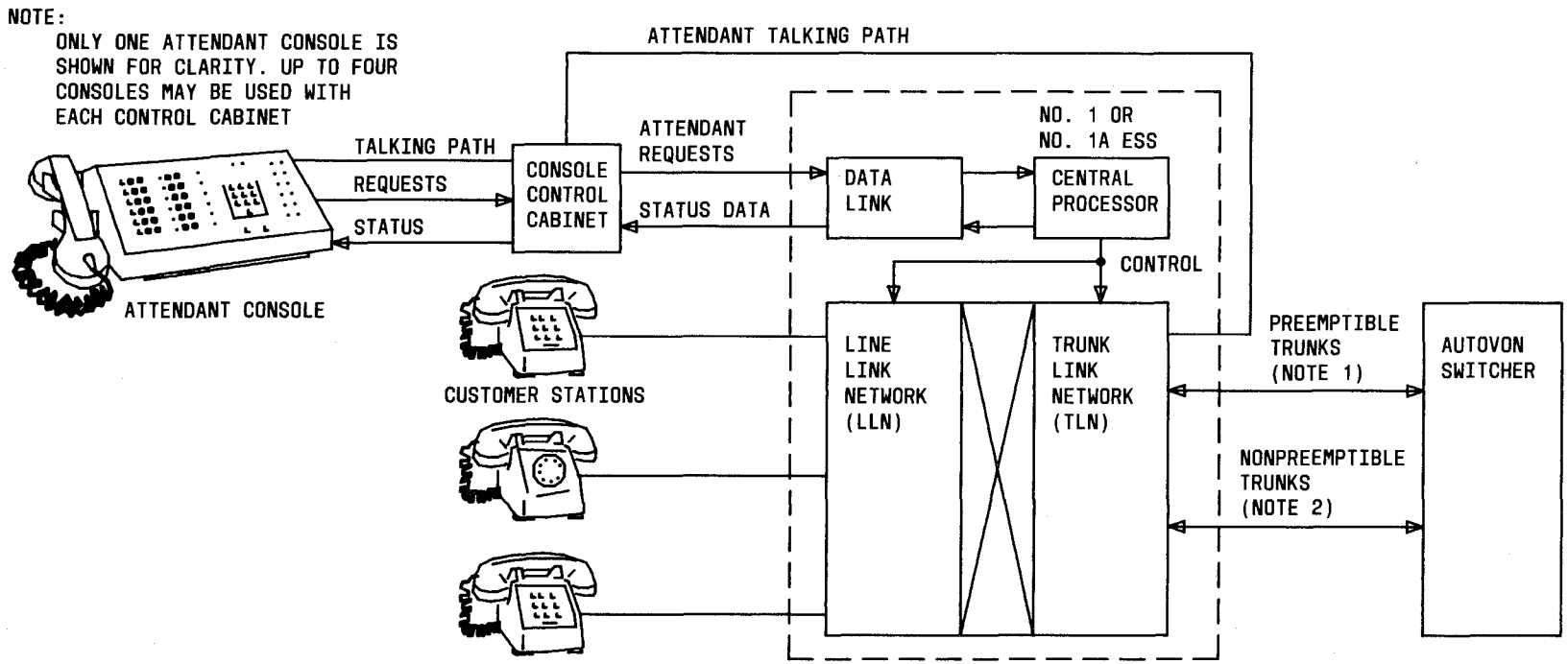
2.05 The automatic identified outward dialing (AIOD) program identifies calling stations in a Centrex/ESSX-1 group or private branch exchange (PBX) making outward calls that require AMA billing. On every outward call (dial 9 or dial 8), an automatic number identification (hardware equipment) attempts to identify the calling station and the trunk being used. This information is sent via data link from the Centrex/ESSX-1 group or PBX to the No. 1/1A ESS. Pident AIOD stores the station number in the proper buffer using the trunk number as an index. This is referred to as the store cycle. After answer, pident AIOD performs a fetch of the calling station number and uses the trunk index and normalized office code (NOC) to form a 7-digit billing number.

2.06 The busy-verify on lines and trunks (CXBV) program is the control pident for the Busy-Verification of Station Lines (BVL) and Centrex Trunks (BVT) features. These two features allow an attendant to establish a connection to an apparently busy station or trunk to determine if the line or trunk is in working condition. The attendant operates several control keys to busy-verify a line or trunk. Pident CXBV is responsible for reacting to the key operations, initiating alerting tones, and establishing network connections to accomplish the test. Figure 5 shows the busy-verify call setup. See Section 231-090-070 for details of attendant actions associated with busy-verify calls.

3. BUSINESS COMMUNICATION SERVICES PIDENTS

PIDENT CX1X

3.01 Pident CX1X is used in conjunction with call processing programs to give a No. 1/1A ESS the ability to act as a switching office in a nonsenderized tandem tie line network, which



NOTES:
1. PREEMPTIBLE TRUNKS MAY BE USED FOR INCOMING AND OUTGOING ROUTINE AND PRIORITY AUTOVON CALLS.
2. NONPREEMPTIBLE TRUNKS ARE GENERALLY USED FOR ROUTINE CALLS. OUTGOING PRIORITY CALLS CANNOT USE NONPREEMPTIBLE TRUNKS.

Fig. 4—Interface Block Diagram for an AUTOVON Centrex/ESSX-1 Served by a No. 1 or No. 1A ESS

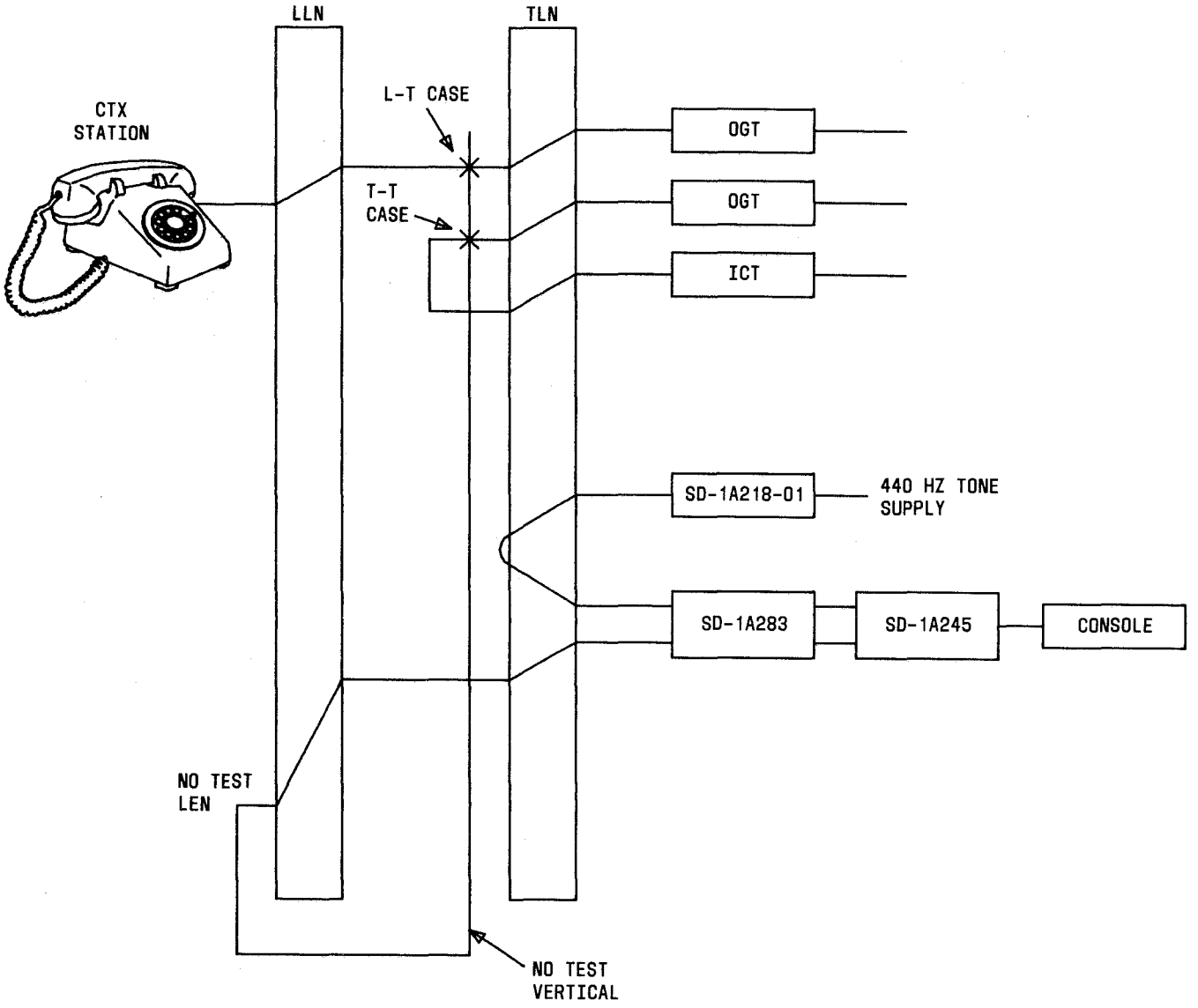


Fig. 5—Typical Busy—Verify Call Setup to an Established Connection

simulates cut-through operations to allow Centrex/ESSX-1 stations to dial transfer to a tie line or trunk, and to allow an attendant to make a call-through test.

3.02 Pident CX1X is entered from the digit analysis for lines (ORDL) and trunks (ICAL) programs. When an incoming tie trunk has dialed the 1XX access code, pident CX1X is entered at global CX1TDL. When a Centrex/ESSX-1 station has dialed the 1XX access code, pident CX1X is entered at global CX1LDL. When an attendant dials the 1XX access code, pident CX1X is entered at global CX1ADL.

3.03 The routing of a tandem tie line call is controlled by the customer's dialed digits at each switching point. The originating office or tandem office does not have all the routing information at the time of trunk seizure or outpulsing. Therefore, outpulsing and digit collection are interrupted periodically as the calling party must wait for dial tone from the next switching office. A talking path must be provided between the calling party and the outgoing trunk (OGT) to allow dial

tone to be heard from the distant office as the call progresses.

3.04 CX1X program flow is controlled by several control routines which act on data stored in the originating register (OR), the incoming register (IR) and the program store data table resident in CX1X at local IMPTB. The entry point to CX1X defines the initial configuration of the call. Control data is updated to reflect the initial configuration data, and translation data (route index of outgoing trunk group and the second dial tone indicator) is extracted and stored in the dialing register (IR/OR). If second dial tone is indicated, an idle trunk is seized to allow the dial tone. If no trunks are available, overflow actions are taken.

3.05 Entry into CX1X is made after the calling party has dialed a tie line access code. Depending on which entry point is reached (paragraph 3.02), the proper initial network configuration is set up according to the configuration index (CSXN). Control routine IR10 operates on the corresponding data in the IMPTB table to determine the initial implementation address where the hardware actions are started. Then the change in network (CIN) and the change in circuit (CIC) subroutines, resident in CX1X, are used to load peripheral orders in a peripheral order buffer (POB). During every fifth J-level interrupt, the POB execution program sends the orders to the peripheral units affected. Section 231-045-120 provides details of peripheral control. If the POB execution is successful, control routine ECINS is entered. The ECINS routine uses the original CSXN and the IMPTB table to update the CSXN. The ECINS routine then uses the new CSXN to determine the next action needed on the call. The operation of the CINs, CICs, POBs, and routine ECINS continues in this manner to configure the network as the call progresses to completion. Figure 1A, 1B, and 1C are the different network configurations necessary for a locally-originated tandem tie line call.

3.06 Once the network has the outpulsing set up for the proper call (Fig. 1B, 2B, 3B), digits are outpulsed to the distant office via the cut-through circuits' transmitter. Outpulsing returns are processed via register identifier/program tag (RI/PT) methods and controlled by ORDL. Final actions for trunk calls are processed by pident TAND. Pident CX1X relinquishes control of attendant calls to pident ADCX after outpulsing.

3.07 I1XX service is essentially the same as 1XX service. The difference is that the digits are not outpulsed using the cut-through circuits' transmitter. Instead, the OGT receives digits directly from the calling line or the incoming trunk (ICT). The cut-through circuit is released before dialing and is used only to detect start dial signals or glare. This prevents the annoying click that occurs with 1XX service when the cut-through circuit is released.

PIDENT CXTP

3.08 Pident CXTP is used in conjunction with other call processing programs to provide a No. 1/1A ESS the capability to complete calls over trunk groups which interface with AUTOVON 4-wire offices. The trunk group may be preemptible or nonpreemptible. Calls over preemptible trunk groups may be either routine or priority calls. Calls over nonpreemptible trunks are always treated as routine calls. A TPC register is associated with each preemptible trunk in an ESS office. The TPC is linked to any call using the trunk. The TPC register contains data enabling the ESS to terminate a routine call and use the preemptible trunk to place a priority call. Data in the TPC register is also used for preemption by the AUTOVON switch. The AUTOVON switch may preempt both routine and priority calls. Pident CXTP provides entries for a routine call from a Centrex/ESSX-1 station to the AUTOVON network, a centrex tie trunk routine call to the AUTOVON network, and a priority call from a Centrex/ESSX-1 station to the AUTOVON network.

A. Routine Call From Centrex/ESSX-1 Station

3.09 When a Centrex/ESSX-1 station originates a routine (nonpriority) call to the AUTOVON network, pident CXTP is entered after successful outpulsing has been completed by normal call processing programs. Control is passed to CXTP at global CXPLOS. The CXPLOS routine initializes the call for a possible preemption if the call is using a preemptible trunk. The trunk network number (TNN) of the OGT is used to determine if the trunk is preemptible. If the trunk is not preemptible, control is passed to ORDL at global ORRNNO. If it is a preemptible trunk, routine SZREGO in CXTP is used to seize the TPC register associated with the trunk. The TPC register is initialized to indicate a routine call and is linked to the call. Preempt scanning is turned on to

detect a preempt of this trunk from the AUTOVON office. Control is passed to ORRNNO in ORDL to continue normal call processing. After answer, the preempt bit (P bit) is set to a 1 to indicate that the call is in a stable talking state for preemption.

B. Centrex Tie Trunk Call Originating to AUTOVON

3.10 After normal call processing programs have collected all digits for outpulsing and determined through translations that this is a routine AUTOVON call, pident CXTP is entered at global CXPICR. The CXPICR routine increments the AUTOVON traffic count and initializes the incoming register for outpulsing to the AUTOVON office. The program tag value in the IR is manipulated to cause different outpulsing returns for preemptible trunk-to-trunk calls. If outpulsing fails, control returns to pident CXTP of global CXTBB. The CXTBB routine increments the AUTOVON overflow traffic count due to a busy or blocked condition. The CXPTSA routine is entered if outpulsing is successful. This routine checks the TNN of the OGT to determine if the trunk is preemptible. If the trunk is preemptible, routine SZREGO is used to seize a TPC register and link it to the call. The TPC register is initialized and control is passed to the tandem connection program where normal tandem call processing resumes. When a trunk-to-trunk connection is completed (after answer), routine CXPZER is used to set the P bit to 1 indicating that the call is in a stable talking state and preemptible.

C. Priority Call From Centrex/ESSX-1 Station

3.11 Normal call processing programs collect all digits to be outpulsed, the same as a routine call. However, translation returns indicate that this is a priority call and control is passed to pident CXTP at global CXPORP. The CXPORP routine increments a priority AUTOVON traffic count and initiates a search for an idle preemptible trunk. If no idle preemptible trunks are found, a search is made for a preemptible trunk in a stable talking state on a routine call. If no preemptible trunks are available, overflow is given, otherwise routine PREMPL is entered to preempt a routine call.

3.12 When a preemptible trunk becomes available, control is passed to local TRKFND and the P bit is set to 0. The TRKFND routine initializes the TPC register for this trunk to indicate a priority call. A path is reserved from the calling line to the preemptible trunk and the TPC register is made the master register. The call is now in a stable state before answer.

PIDENT CXSF

3.13 The ***Simulated Facilities*** feature provides a software method of restricting certain customer services sold on a limited access basis. A simulated facilities group simulates hardware facilities and is assigned on a per customer basis. The quantity of facilities subscribed to by a particular customer is stored in memory and is used to identify and control the number of simultaneous calls for a given customer service.

3.14 The purpose of pident CXSF is to maintain a record of these types of calls as part of the instantaneous volume control function. The actual operation of the CXSF is independent of the particular service involved. The term "simulated facilities" is used to emphasize the distinction between software volume control and the alternative method of limited circuit facilities.

3.15 Specifically, the sole function of CXSF is to determine when a call using a volume-controlled service has been completed. Based on this determination, associated usage counts and possibly associated centrex console trunk-busy lamps are administered.

3.16 The translation programs initially decide when simulated access is required on a specific call and, if volume control is specified, also determine whether or not the call is to be permitted at that moment. This decision is based on information in the simulated facilities translator, which specifies the number of simultaneous calls of the given type permitted, and information in the call store block B6SFGN, which contains the number of calls of that type currently active in the system.

3.17 If translation output to the digit analysis programs indicate that the call involves simulated facilities, and that volume control is required, digit analysis enters pident CXTP at global CXSZSF for seizure and initialization of a simulated facilities register.

3.18 Simulated facilities registers are 8-word blocks of call store engineered on a nonblocking

basis. Basic input information for the seizure routine consists of the controlling call register address and the simulated facilities group number. (This number identifies the particular service and is used to index both the simulated facilities translation and the B6SFGN block of current usage counts.) If a centrex console trunk-busy lamp is associated with the service, the quantity of calls of this type permitted simultaneously is also included as input. An idle simulated facilities register is seized, linked to the controlling call register, and initialized with the input data.

3.19 For the remainder of the call, the simulated facilities program receives call progress reports directed to the simulated facilities register via standard system reporting techniques described in Section 231-045-155. Standard system interfaces are used to process these reports.

3.20 Special action is required only in the case where a report indicating call termination is received. At this time, the appropriate usage count in the B6SFGN block is decremented, and the simulated facilities register is released. If the maximum number of calls permitted were in progress, and a centrex console trunk-busy lamp is associated with the service, the lamp is extinguished, indicating that the service will no longer be blocked.

PIDENT HMTL

3.21 Pident HMTL assumes control from pident ORDL when all digits have been dialed and digit analysis has determined that the call requires hotel-motel service. The S1X1 routine is used to seize a hotel-motel register and set the AMA request bit in the originating register. The hotel-motel register is linked to the originating register and an AMA register is also seized and linked to the originating register. The PT value in the hotel-motel register is set to PT1. When an answer is detected, the hotel-motel register is placed on a timing list by a service routine to do a 2- to 4-second charge delay timing.

3.22 At the end of this period, a translation is performed to determine how the guest is to be billed. The billing is accomplished by generating an AMA entry on the AMA tape and by operating a remote signal distributor point associated with each hotel-motel line.

3.23 The signal distributor point in turn scores a message register provided for each line at the customer's location. The number of scores (message units) on the message register is determined by a line equipment number translation and the called directory number. The number of message units determines the amount charged the hotel by the operating company.

3.24 The billing information determines whether a call is a timed or an untimed call. An untimed call means that each call is to be billed a specific number of message units, regardless of the length of the call. After the initial charge has been signaled via the remote signal distributor point, the hotel-motel register is released, and control is returned to the main program. The call is allowed to continue without further timing or charging. Any charging, however, will commence only if both parties are still in the off-hook condition at the end of the 2- to 4-second charge delay timing.

3.25 If the call is to be charged for overtime as well as for an initial period, the translation output indicates the length of the initial and overtime charge intervals and the number of message units to be charged for each.

3.26 The hotel-motel register is placed on a timing list to time the initial period. At the end of the initial period, if the call is still in progress, the overtime charge is scored on the message register. The overtime period is timed in charge intervals until the call is ended and the number of charge intervals used is recorded.

PIDENT AIOD

3.27 Pident AIOD is the control program for the AIOD feature. The purpose of the AIOD feature is the identification of calling stations, within a Centrex/ESSX-1 group, making outward calls requiring AMA billing or sampling. With AIOD, the station identification may be used in local automatic message accounting (LAMA) billing or outpulsed to a Traffic Service Position System (TSPS).

3.28 There are three basic hardware items in the AIOD system. The first is the central office data link terminating and receiving equipment. In a No. 1/1A ESS this equipment is the AIOD interface circuit (AIODIC) and is mounted on a

miscellaneous trunk frame. Figure 6 shows a simplified block diagram of the AIOD interface circuit. The main purpose of the AIODIC is to receive the coded station and trunk numbers from the Centrex/ESSX-1 group and to perform data validation checks. The second is the automatic number identification circuit (ANI) used to identify the Centrex/ESSX-1 station and the particular PBX trunk being used to connect to the central office. The third is a dedicated data link between the AIODIC and the ANI.

3.29 On every outward call (dial 9 or dial 8) as the Centrex/ESSX-1 is receiving dial tone from the ESS (ie, second dial tone), the ANI attempts to identify both the station placing the call and the PBX trunk carrying the call to the ESS. This identification is encoded and transmitted via the data link to the AIODIC where it is received, parity checked, and stored in call store in the AIOD buffer table. On completed charged calls, this information will be used in constructing the billing number required for the AMA record.

3.30 The AIOD Program is entered at global AISTRT from the change director program when a bid (1 to 0 change) signal has been detected on the ANI's data link. Input requirements are a

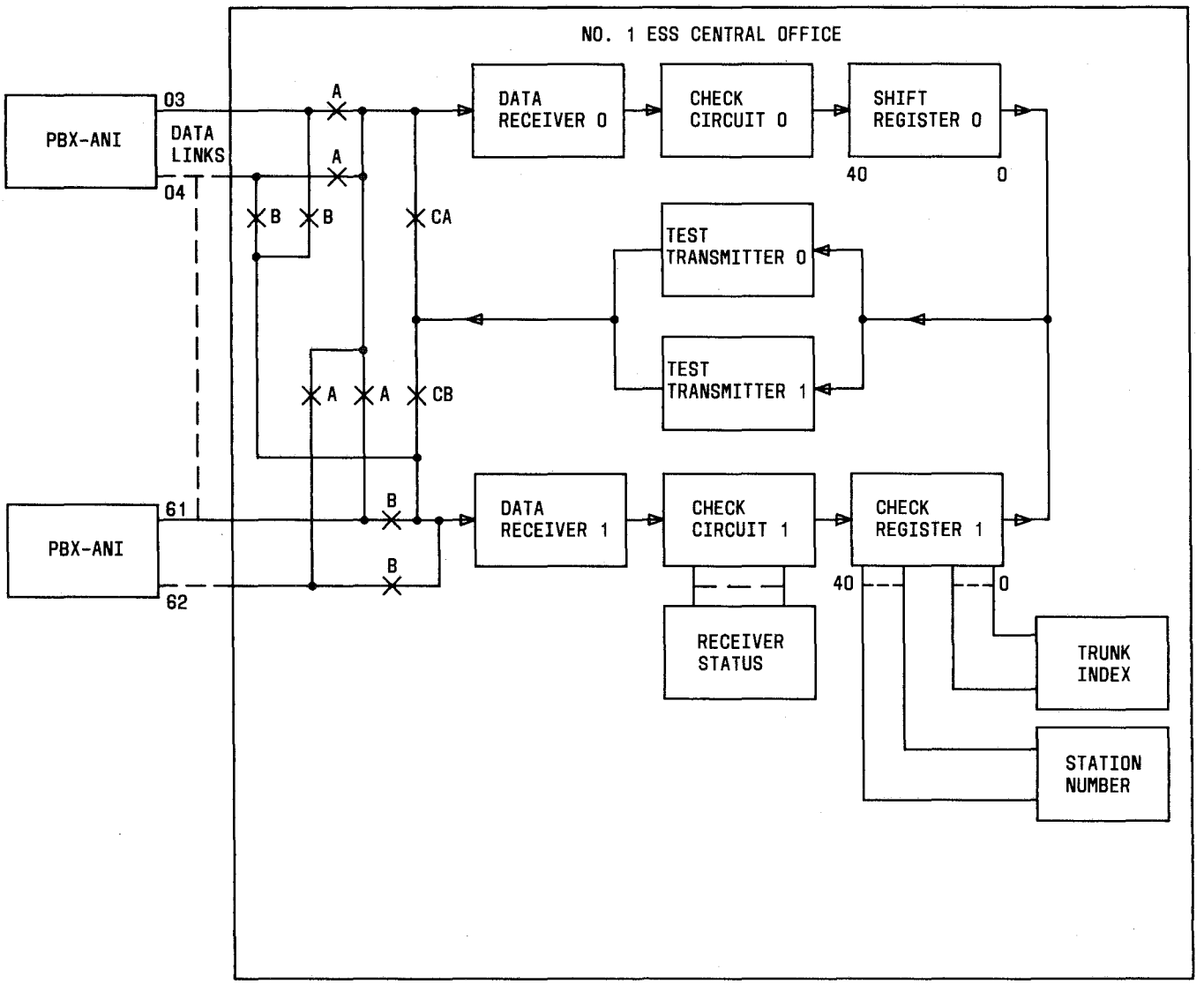


Fig. 6—Automatic Identified Outward Dialing Interface Circuit (AIODIC) Block Diagram

master-scanner number and a unit-type member number. Each ANI has a unique member number associated with it.

3.31 With this request from the supervisory scanning program, AIOD performs a scan to verify that the ANI is still bidding and a hit did not occur. An AIOD register is seized and the total number of bids is incremented. One of the two AIOD receivers in the AIODIC is connected to the data link by operating a signal distributor controlled relay. The relay operation also causes a transmit signal to be sent to the ANI. Immediately, the ANI transmits the message to the AIODIC in a 2-out-of-5 code. At the central office, the message is converted to a truncated 2-out-of-5 code.

3.32 When a complete message is detected, the ANI is disconnected from the receiver which allows the receiver to be used again. During this time, the number of successful connections to a receiver is incremented. The message from the ANI must be scanned for parity. In the event that parity is invalid, control is transferred to the AIOD fault recognition program AIFR. Information which has been sent over the data link is comprised of a 4-digit trunk number and a 4-digit station number. The trunk number is used as an index for the AIOD buffer table. At that particular slot, the station number will be stored so that billing can take place later if it is required. Prior to storing the station number, the trunk index must be converted from a 2-out-of-5 code to binary.

3.33 After storing the station number, a peripheral order buffer (POB) is loaded to supervise restoral of battery to the data link by ANI. If the ANI rebids quickly (within 30 ms), or if it does not restore battery to the link within 150 ms, control is transferred to ANI rebid routine AIRBID in AIOD where both of these cases will be treated as rebids. The count of quick rebids will be incremented and control will be transferred to handle the ANI's bid. However, the ANI's failure-to-restore case will result in the ANI failing to respond to transmit, which will cause an entry to automatic number failed to restore routine AIFTRE in AIFR.

3.34 Hits, which are a measure of DC noise on the data link can be detected by the program. After detection of a hit, the count of hits is incremented and the T2 bit is set to allow the ANI to rebid.

3.35 Since the AIOD registers are engineered one for each ANI, the lack of a register is a serious error condition. The call register audit, call register audit program SARG and the queue audit are requested on a high priority basis since no AIOD identification can be performed without a register.

3.36 If both receivers are busy, the ANI will have to queue to get one. A total count is made of every ANI identification that must queue. Most ANIs will be entered on a low-priority queue. However, if a PBX has had billing failures within an hour (which constitutes at least one-eighth of the total billing failures in the office) the ANI for that PBX will be placed on a high-priority queue.

3.37 Just prior to storing the station number in the AIOD buffer table, a check is made of the existing contents. If the current contents are a station number, a translation error is suspected and a transfer is made to local SBNF. The SBNF routine store the station number and ANI number just received in the AIOD buffer table and control transfers to global AISBNF in pident AIFR. The AISBNF routine increments a count and checks it against the limit. If the limit has been reached, output message AIO6_ SBNFF is printed.

3.38 If the current contents of the AIOD buffer table are the ignore code instead of an idle code, a race condition exists. The ignore code is stored in the AIOD table by the fetch cycle when it finds an idle code in the table instead of a station number. If the AIOD data is slow in arriving and AMA data accumulation program AMAC requests it before it arrives, an ignore code will be stored in the table. The ignore code which is the at-that-time reading of the system, 15-minute counter is compared against the current reading. A difference of less than 2 or 3 seconds is presumed to mean that the station number received is too late to be used in billing and therefore an idle code will be stored in the table. Since a difference of more than 2 or 3 seconds is presumed to mean the received station number will be used on the next call, the number is stored in the table. The ignore code provides a mechanism for keeping the AIOD table free of stale station numbers, thus, preventing the possibility of false billing.

3.39 Pident AIOD is entered at global AIORIG immediately after the originating translation. The dialing connection program DCNL checks the

first line equipment number class word (LENCL1) for AIOD. If AIOD is indicated, the normalized office code (NOC) and trunk index are obtained from the translation routine TRLNOP. This data is then copied into the originating register.

3.40 After the dialing connection program for trunks (DCNT) determines that the seized incoming trunk has its tie-trunk bit set, an originating translation is performed on the associated pseudo-LEN. If AIOD is indicated, the NOC and AIOD trunk index should be obtained. Calling the translation routine (TRLNOP) will provide the NOC. The AIOD trunk index is assembled from both words of the TNN-TGN auxiliary block. This data is then stored in the incoming register.

3.41 As soon as the digit analysis for lines (ORDL) program determines that an originating line is making a toll call and seizes an AMA register, a test is made for AIOD. If the OR contains AIOD data, the data will be copied into the answer time word in the AMA register.

3.42 AIODNO is the most important routine in the AIOD program. It is entered just after AMAC has received an answer report on a charge call if the answer word is nonzero. The station number is fetched out of the AIOD buffer table using the trunk index combined with the NOC. This will form a 7-digit billing number which replaces the listed directory number (LDN) in the AMA register. If answer time occurred on a call before the completion of the store cycle, a billing identification failure would result.

PIDENT CXBV

3.43 Pident CXBV is the control program which interfaces with other call processing programs to provide the BVL and BVT features. Figure 7 and 8 show a flow diagram of BVL and BVT respectively. CXBV has four major entries. When a trunk access code and the trunk group member number is dialed by the attendant, CXBV is entered at global CXBVTT. CXBVTT verifies the trunk group member number and the trunk network number and transfers externally to find the state of the trunk. Upon returning to CXBV, transfers are made internally to provide a steady high tone, overflow (idle trunk), or busy tone depending on the state of the trunk.

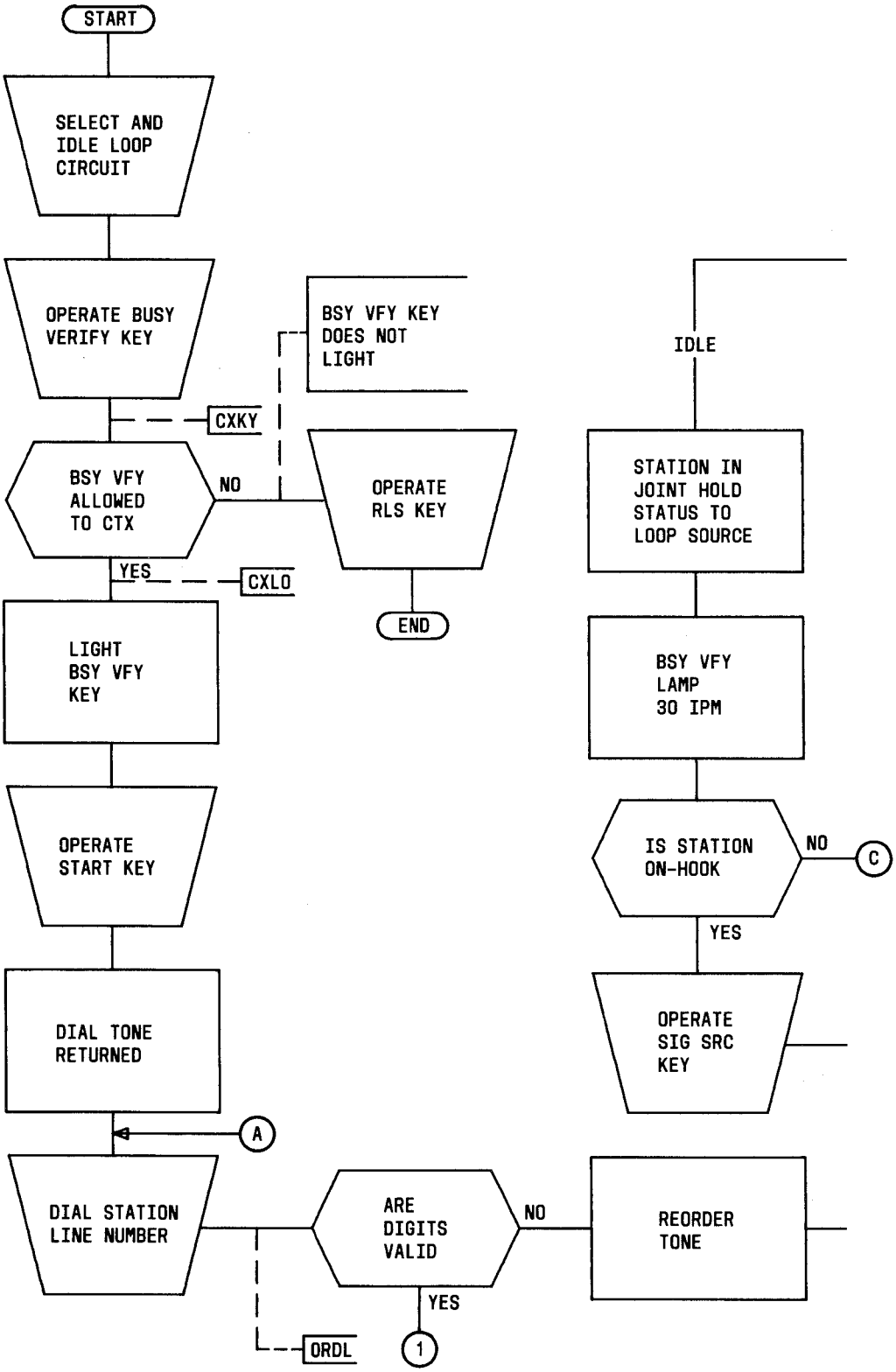
3.44 CXBV is entered at global CXCMPN to interface with pident CXKY when attendant has the camp-on feature. Routine CXCMPN calls for centrex digit translation TRPAEA and transfers to routine TRACEL if the line is still busy, or routine ORIDLE if the line is now idle, or externally to routine ADDCIB if an unexpected translation return results.

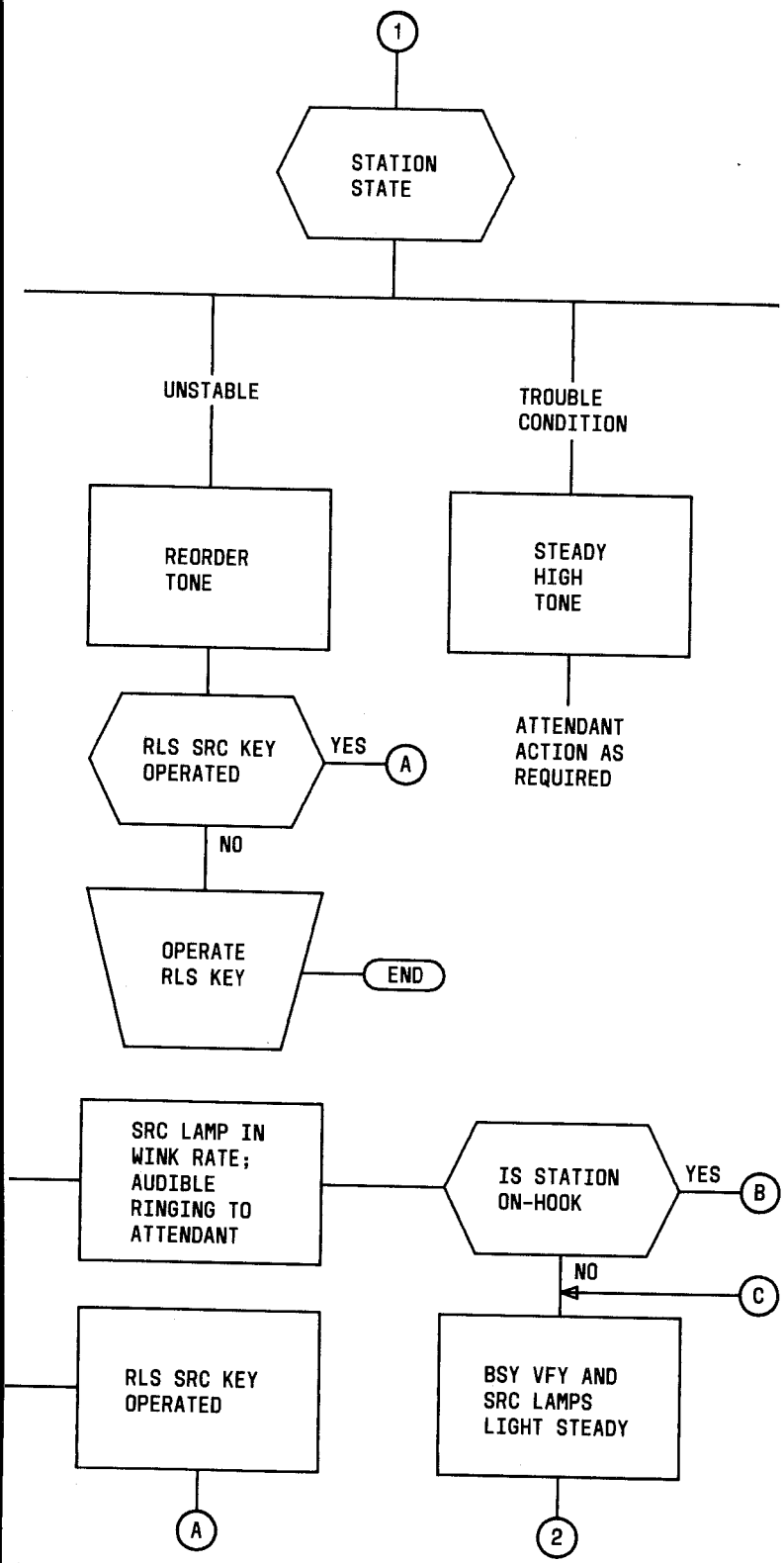
3.45 CXBV is entered at global CXBSLI if a busy line has been dialed. The CXBSLI routine will transfer to routine ADDBV where table REGTBL is indexed using the RI of the controlling register to determine the treatment of the line.

3.46 Routine CXBVDC is entered from pident WAIT to release the call registers, check for leg stability, and drop the line to port connection.

4. ABBREVIATIONS AND ACRONYMS

AIODIC	AIOD Interface Circuit
AMA	Automatic Message Accounting
ANI	Automatic Number Identification
AUTOVON	Automatic Voice Network
BVL	Busy-Verification of Lines
BVT	Busy-Verification of Trunks
CCSA	Common Control Switching Arrangement
CIC	Change in Circuit
CIN	Change in Network
CSXN	Configuration Index
ESS	Electronic Switching System
ICAL	Digit Analysis for Trunks
ICT	Incoming Trunk
IR	Incoming Register
I1XX	Improved Tandem Tie Line Service
LAMA	Local Automatic Message Accounting


START
SELECT AND IDLE LOOP CIRCUIT
OPERATE BUSY VERIFY KEY
BSY VFY KEY DOES NOT LIGHT
CXKY
BSY VFY ALLOWED TO CTX
NO
OPERATE RLS KEY
END
YES
CXLO
LIGHT BSY VFY KEY
OPERATE START KEY
DIAL TONE RETURNED
A
DIAL STATION LINE NUMBER
ARE DIGITS VALID
NO
REORDER TONE
YES
ORDL
1
IDLE
STATION IN JOINT HOLD STATUS TO LOOP SOURCE
BSY VFY LAMP 30 IPM
IS STATION ON-HOOK
NO
C
YES
OPERATE SIG SRC KEY


1
STATION STATE
UNSTABLE
TROUBLE CONDITION
REORDER TONE
STEADY HIGH TONE
RLS SRC KEY OPERATED
YES
A
NO
ATTENDANT ACTION AS REQUIRED
OPERATE RLS KEY
END
SRC LAMP IN WINK RATE; AUDIBLE RINGING TO ATTENDANT
IS STATION ON-HOOK
YES
B
NO
C
RLS SRC KEY OPERATED
BSY VFY AND SRC LAMPS LIGHT STEADY
A
2

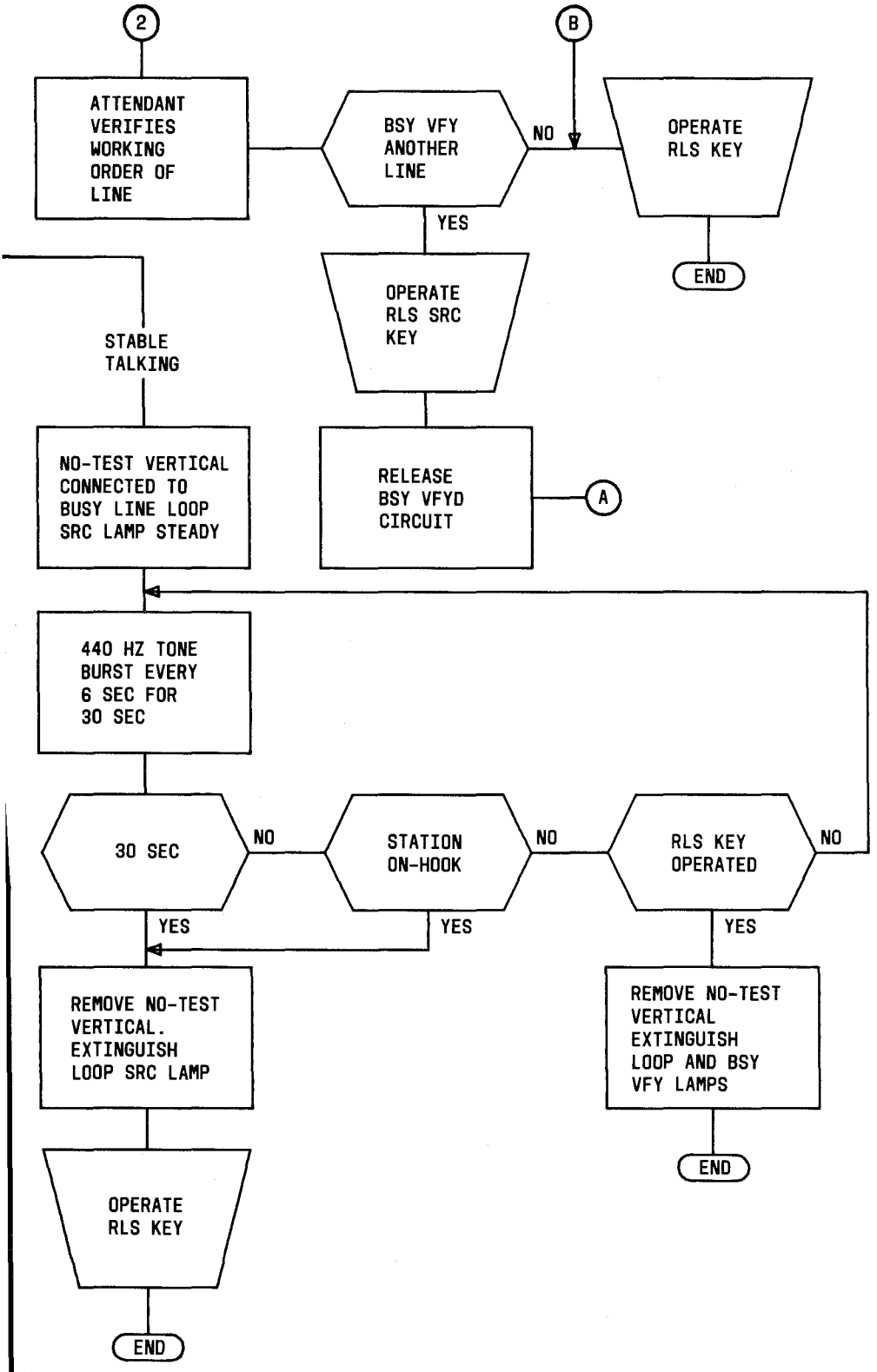
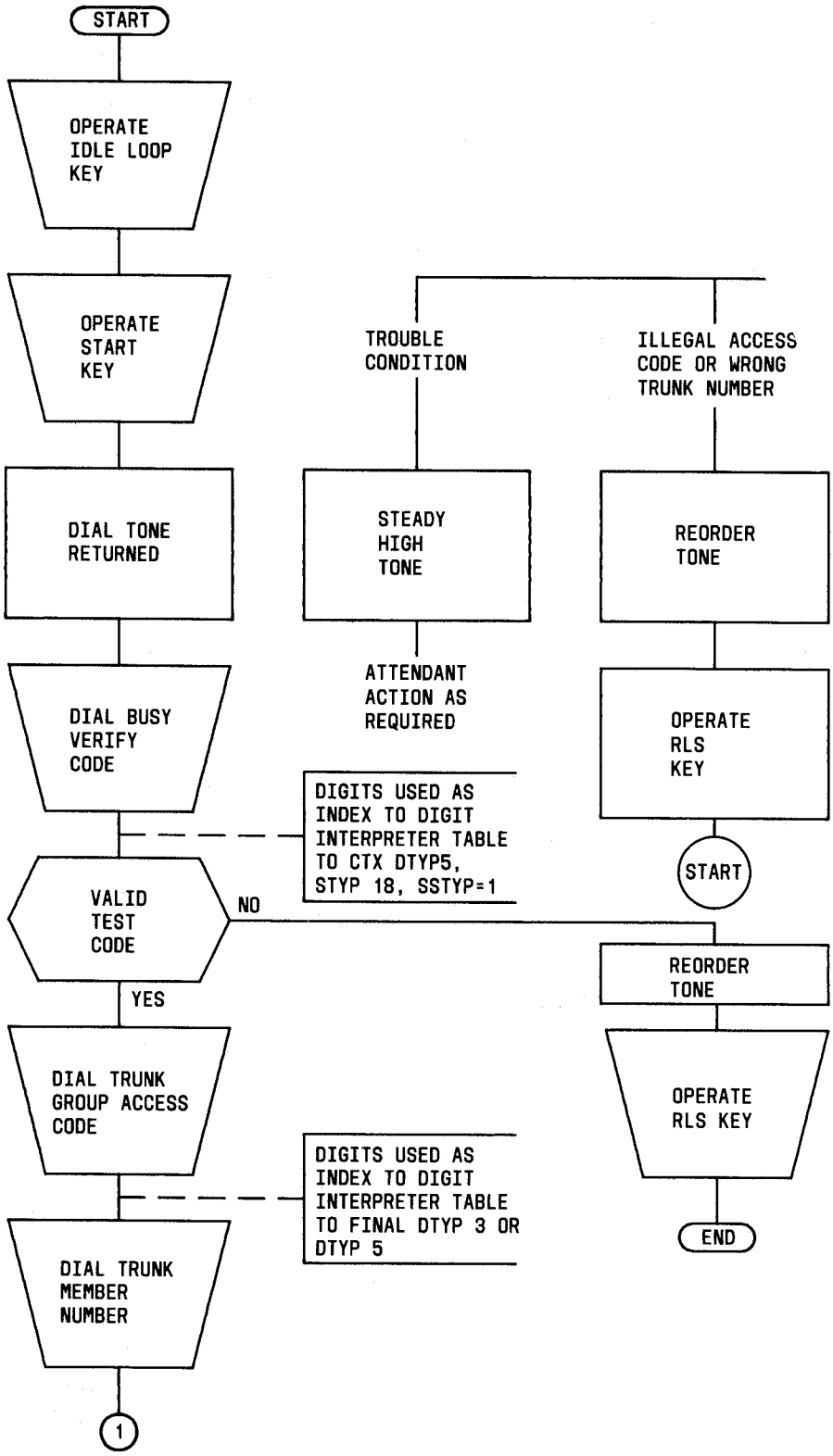


Fig. 7—BVL Feature Flow Diagram


START
OPERATE IDLE LOOP KEY
OPERATE START KEY
DIAL TONE RETURNED
DIAL BUSY VERIFY CODE
VALID TEST CODE
NO
YES
DIAL TRUNK GROUP ACCESS CODE
DIAL TRUNK MEMBER NUMBER
1
DIGITS USED AS INDEX TO DIGIT INTERPRETER TABLE TO CTX DTYP5, STYP 18, SSTYP=1
DIGITS USED AS INDEX TO DIGIT INTERPRETER TABLE TO FINAL DTYP 3 OR DTYP 5
TROUBLE CONDITION
STEADY HIGH TONE
ATTENDANT ACTION AS REQUIRED
ILLEGAL ACCESS CODE OR WRONG TRUNK NUMBER
REORDER TONE
OPERATE RLS KEY
START
REORDER TONE
OPERATE RLS KEY
END

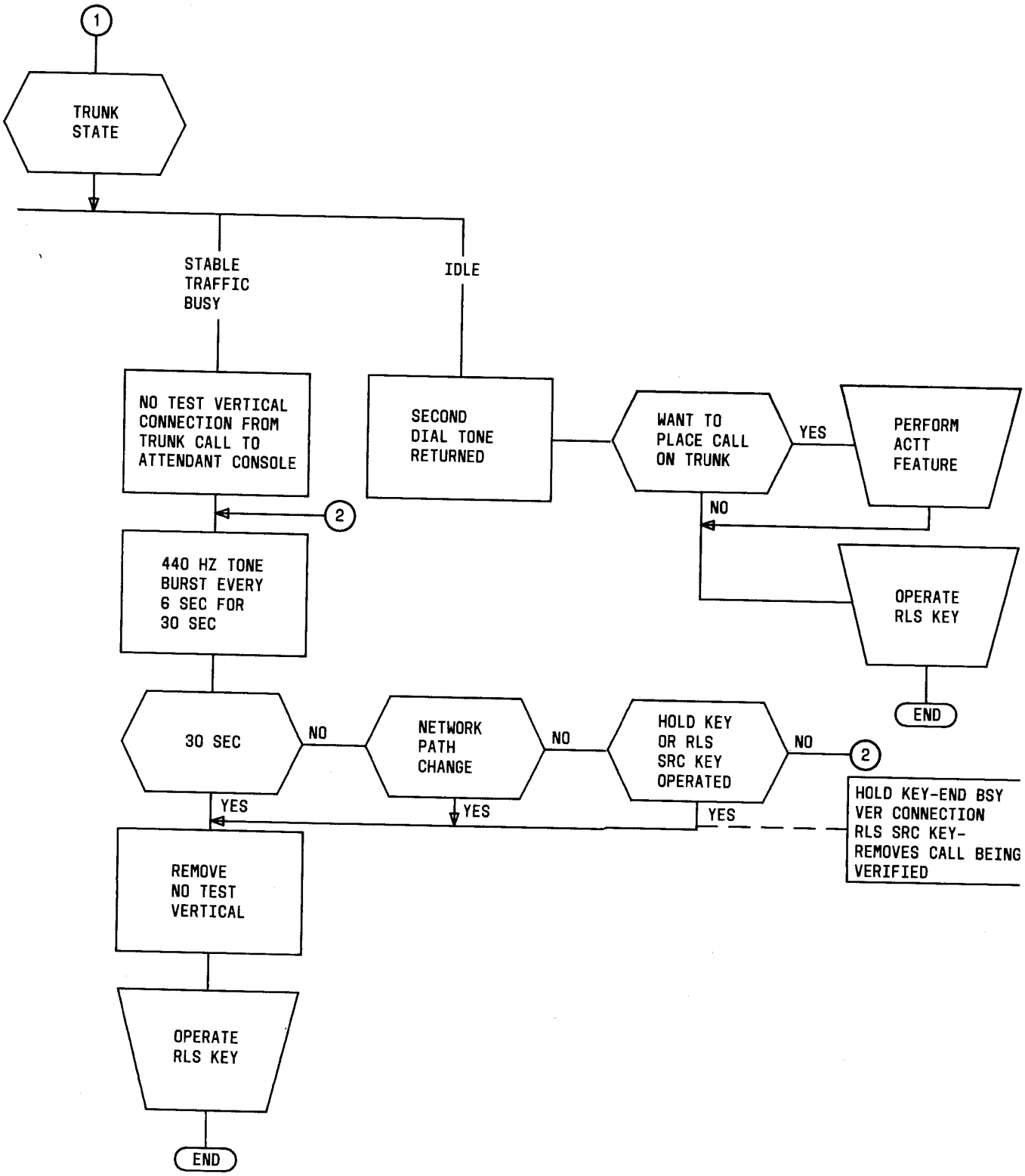


Fig. 8—BVT Feature Flow Diagram

LDN	Listed Directory Number
LEN	Line Equipment Number
LENCL1	LEN Class Word 1
NOC	Normalized Office Code
OGT	Outgoing Trunk
OR	Originating Register
ORDL	Digit Analysis for Lines
PBX	Private Branch Exchange
POB	Peripheral Order Buffer
POTS	Plain Old Telephone Service
PR	Program Record
PT	Program Tag
RI	Register Identifier
SSD	Software Subsystem Description
TNN	Trunk Network Number
TPC	Trunk Preemption Control
TSPS	Traffic Service Position System
WATS	Wide Area Telecommunications Service
1XX	Tandem Tie Line Service

5. REFERENCES

Section 231-090-254—Tandem Tie Line Service (Nonsenderized)

Section 231-090-065—AUTOVON Interface Feature

Section 231-090-229—Simulated Facilities Feature

Section 231-090-280—Hotel/Motel Service Feature

Section 231-090-070—Busy-Verification of Station Lines and Centrex Trunks Features

Section 231-045-120—Peripheral Control SSD

Section 231-045-155—Queue and General Purpose SSD

Business Communication Service Pidents (See Table A).