# AUTOMATIC CALL DISTRIBUTION
## SOFTWARE SUBSYSTEM DESCRIPTION
### 2-WIRE NO. 1/1A ELECTRONIC SWITCHING SYSTEM

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**NOTICE**

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1.01 Automatic call distribution (ACD) systems are used to concentrate, queue, and uniformly distribute incoming calls to trained personnel called agents. The ACD system provides order-of-arrival service to incoming traffic, distributes the traffic equitably among the agents, maximizes attendant efficiency, and minimizes delays to the calling population.

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

1.03 Part 12 of this section provides a defined list of abbreviations and acronyms as used herein.

PURPOSE OF THE ACD SOFTWARE

1.04 The ACD software provides a centralized Stored Program Control System (SPCS) which controls the flow of traffic to the agent, by queuing and evenly distributing the incoming traffic.

SCOPE OF SECTION

1.05 This section provides an introduction to the ACD software operating in a No. 1/1A Electronic Switching System (ESS). Information unique to specific system applications (No. 1 or No. 1A) is so noted.

1.06 This section is based on the 1E7 (No. 1 ESS) and 1AE7 (No. 1A ESS) versions of the generic program. However, most of the ACD features were introduced in the CTX-8 (No. 1 ESS) and 1AE4 (No. 1A ESS) versions of the generic program.
2. ACD FUNCTIONAL DESCRIPTION

GENERAL

2.01 The ACD system is provided to optimize the call handling performance of the business customer with a large volume of incoming calls. It provides the capability to efficiently route incoming calls to a customer agent (at one or more locations) through functional groups (FGs) utilizing multiline hunting and interflow and intraflow queuing, if necessary, to minimum call delays. At the same time, it furnishes continuous traffic and performance data on visual and digital readouts and TTY printouts if desired. In automatic call distribution phase 1 (ACD1), the customer can control the composition of FGs, load compensating packages (LCPs), and reporting group packages (RGPs) by using the 90A CPS station. In ACD phase 2 (ACD2) the customer can control the composition of FGs and load compensating packages (LCPs) by using the video display and control station (VDCS). The VDCS may also be used to interrogate the ESS memory for the stored information concerning that ACD data accumulation group (DAG).

2.02 In the ACD offering, the agent lines function both as incoming ACD lines and extensions, thus providing a unified approach to ACD-ESS service. In phase 1 ACD-ESS service the No. 1 ESS is the combined ACD/centrex vehicle which provides access to customer leased communications facilities as well as to the DDD network. Figure 1 illustrates ACD-ESS service. The No. 1/1A ESS is the ACD vehicle which provides shared access to customer facilities as well as to the DDD network. With this arrangement, there is no need for multiple trunk groups or transfer trunks and, if local or INWATS trunks are provided, they are provided via a simulated facilities group instead of physical facilities.

2.03 The equipment associated with the ACD1 system located on the customer premises is listed below and illustrated in Fig. 2:

(a) 60A customer premises system (CPS) interface cabinet (J59205)

(b) Agent console (500A1) (maximum 72, including supervisors, per 60A)

(c) Supervisor console (500A1)

(d) Agent status console (103A1)

(e) Selector console (8A1)

(f) Call waiting indicator (BEEHIVE)

(g) 90A CPS (optional) (15 maximum per customer)

(1) Inquiry and display station (102A1-B)

(2) Printer

(3) Controller (79A1)

(h) 90B CPS (optional)

(1) Traffic display console (102B1-A)

(2) Controller (79B1)

(i) Teletypewriter (optional) (3 channels maximum per central office).

2.04 The equipment associated with the ACD2 system located on the customer premises is listed below and illustrated in Fig. 3:

(a) 60B customer premises system (CPS) interface cabinet (J59207)

(b) Agent console (600-A) (maximum 50, including supervisors, per 60B)

(c) Supervisor console (600-A)

(d) Agent status console (106A1-A)

(e) Selector console (106A1-A)

(f) Call waiting indicator (BEEHIVE)

(g) Video display and control station (VDCS)

(h) Agent status and traffic station (ASTS)

(i) ACD-ESS Management Information System (AEMIS)

2.05 The ACD system utilizes the following features to perform its function:

(a) ACD uniform call distribution

(b) Functional groups

(c) Reporting groups (ACD1 only)
(d) Queuing (order-of-arrival and priority)
(e) Alternate server intraflow/interflow
(f) Alternate queuing intraflow (ACD1 only)
(g) Control of outgoing mode for 2-way trunks.

2.06 Refer to Section 231-090-334 (ACD1) and Section 231-090-399 (ACD2) for a complete description of the operating hardware and system features.

3. ACD FEATURE PACKAGES

3.01 Table A provides a list of feature groups (including core) and their associated feature packages required to implement the ACD phase 1 feature in No. 1/1A ESS.

3.02 Table B provides a list of feature groups (including core) and their associated feature packages required to implement the ACD phase 2 feature in No. 1/1A ESS.

3.03 The feature packages involved in the ACD1 and ACD2 features are located among a large number of PIDENTs. The base generic for the ACD feature contains basic centrex feature packages plus feature packages that include queuing for trunks and lines (QTL).

4. ACD MULTILINE HUNT GROUP FEATURE

4.01 The ACD multiline hunt group (MLHG) equitably distributes an ACD customer's incoming traffic among agents. Figure 4 and 5 show the ACD feature flowchart for ACD1 and ACD2 respectively. It also provides the capability of controlling the distribution of traffic and adjusting the agent assignments according to traffic load. Assigned agents are arranged in FGs (2 through 31) based on the type of calls to be handled. The calls are routed to the FGs based on the listed directory number (LDN). Each assigned FG must be assigned a queue on which will hold incoming calls and connect them (in the same sequence as received) to agents as they become available. To accomplish this, a block of call store is designated as a mask block for each FG to overlay the MLHG activity block (the agent not assigned to the group is masked out with zeros).

4.02 ACD2 is an improved service over ACD1 as seen by comparing Fig. 4 and 5. The ACD2 offering has a night service feature which will either route an incoming call to a night directory number or place it on a queue if night service is not operating. ACD2 also has a delay announcement feature which will route an incoming call to give a delay announcement or the call path will continue and select the idle facility which will give the best grade of service. There are three types of facilities which may be employed:

(1) Agent in primary functional group
(2) Agent in alternate functional group
(3) Trunk in outgoing trunk group (interflow).

If the facility is a trunk, an outgoing facility will be seized; otherwise, the call path will proceed similar to an ACD1 incoming call.

4.03 The customer may have the ability to reassign individual agents or various predetermined groupings of agents by the use of the 90A CPS for ACD1 or by the use of VDCS for ACD2. The predetermined groupings are known as load compensating packages (LCPs) (Fig. 6) and there may be 1 through 8 LCPs in each data accumulation group (DAG). Within each LCP, each agent console must be assigned to one and only one FG.

4.04 The reporting group packages (RGPs) (Fig. 7) furnish performance data on the agent console for the ACD1 service. These packages have similar translations as LCPs but do not affect the MLHG configuration for call handling. Each agent may be assigned to a maximum of four reporting groups (RGs) or to none.

5. ACD QUEUING FEATURE

A. General

5.01 The queuing feature permits the incoming calls to an ACD customer to be placed on queue and connected in proper sequence to an agent (Fig. 8). If the ACD customer has more than one queue, alternate routing (within a central office [CO]) among the FGs may be accomplished by alternate server intraflow (ASI) for both ACD1 and ACD2 or alternate queuing intraflow (AQI) for ACD1 only. Interflow (between different COs) may be accomplished similarly (Fig. 9). It is possible to assign a priority status to specific LDNs which will permit these
### TABLE A

**ACD PROGRAM STORE MEMORY**  
**FOR FEATURE LOADED GENERIC PROGRAM IN NO. 1/1A ESS**

<table>
<thead>
<tr>
<th>FEATURE GROUP</th>
<th>NO.</th>
<th>ACRONYM</th>
<th>PACKAGE CODE</th>
<th>CODE WORDS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIXED</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Generic</td>
<td>3</td>
<td>CCAD*</td>
<td>960</td>
<td>1,222</td>
</tr>
<tr>
<td>(Core)</td>
<td>9</td>
<td>CTX*</td>
<td>10,368</td>
<td>14,233</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>CXIX*</td>
<td>1,600</td>
<td>3,628</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>HCTX*</td>
<td>9,856</td>
<td>14,081</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>SATT*</td>
<td>896</td>
<td>1,103</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>BQTL*</td>
<td>2,688</td>
<td>3,795</td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>CQFX*</td>
<td>320</td>
<td>362</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>QDAN*</td>
<td>1,216</td>
<td>1,704</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACD1</td>
<td>6</td>
<td>ACDT</td>
<td>1,024</td>
<td>1,120</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>ACD*</td>
<td>2,432</td>
<td>3,008</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>SIG*</td>
<td>320</td>
<td>327</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>BAQI*</td>
<td>192</td>
<td>117</td>
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<td></td>
<td>39</td>
<td>BASI*</td>
<td>512</td>
<td>584</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>BQNS*</td>
<td>256</td>
<td>246</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>BTRK*</td>
<td>1,664</td>
<td>2,155</td>
</tr>
<tr>
<td>IRES</td>
<td>19</td>
<td>IRES</td>
<td>4,480</td>
<td>5,929</td>
</tr>
<tr>
<td>CTRF</td>
<td>12</td>
<td>CTRF</td>
<td>2,048</td>
<td>2,624</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>OPSW</td>
<td>192</td>
<td>139</td>
</tr>
</tbody>
</table>

**Note 1:** The arithmetic difference between package words and code words is patch space.

**Note 2:** Each feature package contains two words of overhead that define the package name and size.

* Feature packages are shared between two or more feature groups.

---

calls to be entered in front of routine calls on the queue. An abandoned call check is performed on FX and centrex tie trunks to prevent a vacant trunk from being connected to an attendant. Night calls are directed to night directory numbers (DNs) controlled from the supervisor console.

### B. Alternate Routing

**Alternate Server Intraflow/Interflow (ASI)**

5.02 When the initial queue is in a poor service state and an alternate queue has an agent available, ASI will provide the ability to route an incoming call for one queue to an agent in another queue (Fig. 8, 10, and 11). The alternate server pool has a maximum of 32 (0 through 31) queues but only 31 will be available to assist an overload queue.

**Alternate Queuing Intraflow (AQI)**

5.03 Alternate queuing intraflow (AQI), which is an ACD1 offering only, will provide the ability to route an incoming call from one queue to a different queue when the initial queue is in an overload or poor service state and an alternate queue has an
### Table B

**ACD2 Program Store Memory for Feature Loaded Generic Program No. 1/1A ESS**

<table>
<thead>
<tr>
<th>GROUP FEATURE</th>
<th>NO.</th>
<th>ACRONYM</th>
<th>FEATURE PACKAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>3</td>
<td>CCAD*</td>
<td>Customer Changeable Speed Calling</td>
</tr>
<tr>
<td>Generic (9SB4)(Core)</td>
<td>9</td>
<td>CTX*</td>
<td>Basic Centrex</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>CX1X*</td>
<td>Centrex Tandem Tie Line</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>HCTX*</td>
<td>Centrex 1B/2B Console</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>SATT*</td>
<td>Centrex Satellite</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>BQTL*</td>
<td>Basic QTL Queuing and Line Termination</td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>CQFX*</td>
<td>QTL Incoming FX Call Queuing</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>QDAN*</td>
<td>QTL Delay Announcement</td>
</tr>
</tbody>
</table>

#### Fixed

<table>
<thead>
<tr>
<th>NO.</th>
<th>ACRONYM</th>
<th>Feature Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>ACD*</td>
<td>Automatic Call Distribution</td>
</tr>
<tr>
<td>27</td>
<td>SIG*</td>
<td>TOUCH-TONE Key Signaling</td>
</tr>
<tr>
<td>39</td>
<td>BASI*</td>
<td>Basic ASI Intra/Interflow for QTL Customers</td>
</tr>
<tr>
<td>40</td>
<td>BQNS*</td>
<td>Basic QTL Queuing Night Transfer Service</td>
</tr>
<tr>
<td>41</td>
<td>BTRK*</td>
<td>Basic Intraflow QTL Trunk Termination Code</td>
</tr>
<tr>
<td>43</td>
<td>GINF*</td>
<td>General Intra/Interflow Logic for QTL Customers</td>
</tr>
<tr>
<td>45</td>
<td>QPRI*</td>
<td>Priority QTL Queuing</td>
</tr>
<tr>
<td>48</td>
<td>DDDT*</td>
<td>Direct Distance Dialing Terminations</td>
</tr>
<tr>
<td>49</td>
<td>MIS1</td>
<td>Management Information System</td>
</tr>
<tr>
<td>50</td>
<td>ACD2</td>
<td>Automatic Call Distribution Phase 2</td>
</tr>
<tr>
<td>54</td>
<td>DLIO</td>
<td>Data Link Input/Output</td>
</tr>
<tr>
<td>95</td>
<td>DLSO</td>
<td>Data Link Sequencing</td>
</tr>
<tr>
<td>19</td>
<td>IRES</td>
<td>Inquiry and Response System</td>
</tr>
<tr>
<td>53</td>
<td>CRAF</td>
<td>Common Systems Recorded Announcement Frame</td>
</tr>
<tr>
<td>86</td>
<td>RCXI*</td>
<td>Recent Change Digit Interpreter</td>
</tr>
</tbody>
</table>

#### Conditional

<table>
<thead>
<tr>
<th>NO.</th>
<th>ACRONYM</th>
<th>Feature Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>DLIO</td>
<td>Data Link Input/Output</td>
</tr>
<tr>
<td>95</td>
<td>DLSO</td>
<td>Data Link Sequencing</td>
</tr>
<tr>
<td>19</td>
<td>IRES</td>
<td>Inquiry and Response System</td>
</tr>
<tr>
<td>53</td>
<td>CRAF</td>
<td>Common Systems Recorded Announcement Frame</td>
</tr>
<tr>
<td>86</td>
<td>RCXI*</td>
<td>Recent Change Digit Interpreter</td>
</tr>
</tbody>
</table>

**Note 1:** In 1AE4, code words are the same as package words; feature packages share a common patch space.

**Note 2:** The code words shown for feature package 48 and 50 are approximations and may be subject to change.

* Feature packages are shared between two or more feature groups.
agent available (Fig. 8 and 12). In the alternate queuing sequence (AQS), there is a maximum of four alternate queues which may be provided to assist an overload queue.

C. Priority Calling

5.04 The call processing for a priority call is illustrated in Fig. 13. Priority calling offers the ability to assign priority status to specific calls made to or within a centrex multiline hunt group (MLHG) for queuing purposes. There are two methods of establishing priority status:

(1) An LDN for an MLHG may be designated as a priority line for queuing.

(2) A member of a centrex complex (master centrex group) may be designated as a priority line for queuing.

D. Abandoned Call Check

5.05 The abandoned call check is required only for trunks from electromechanical central offices which do not give an on-hook signal to the called line after answer. The abandoned call check prevents an open line from being connected to an agent which could cause confusion or an error in the trouble line report. Figure 14 contains the flow diagram for the abandoned call check feature.

E. Night Transfer Service

5.06 The night transfer service permits a queue to reroute its incoming calls to another customer location by the use of a night directory number. All calls to that FG will then be forwarded to (1) another FG, (2) another ACD, or (3) to a group of telephones as predesignated by the ACD customer. The Local Night key on the supervisory console controls this feature. Figure 15 shows the flow diagram for the night service feature.

6. ACD ZIP TONE AND ANNOUNCEMENT FEATURES

A. General

6.01 Zip tone (ZIP) and the city-of-origin announcement (COA) are features which aid the agent in servicing incoming calls. The delay announcement (DA) notifies the calling line of the circumstances of termination at that time.

B. Zip Tone Announcement

6.02 Zip tone is used to alert the agent that an incoming call is being terminated to that console. The zip tone consists of a 500 ±100 millisecond burst of 480 Hz tone. The only difference between zip tone for ACD1 and zip tone for ACD2 is that in the ACD2 service if the customer has the zip tone feature and the incoming call was intraflowed or interflowed a stutter zip tone is applied to the agent line instead of the regular zip tone burst.

C. City-of-Origin Announcement

6.03 The city-of-origin (COA) announcement flowchart, which is illustrated in Fig. 16, provides a recorded identification of the incoming line being terminated to that console immediately following the zip tone, if provided. The agent may recall the COA during the call by depressing the console Call ID key.

D. Delay Announcement

6.04 The delay announcement (DA) feature provides recorded announcements (1 through 4) to an incoming call if the call is delayed in connecting to an agent. Figure 17 illustrates the flow diagram of the delay announcement feature. The content of the announcement is specified by the ACD customer. The customer can choose the interval between announcements (6 through 42 seconds), and the sequence of the announcements. Three additional features are also available with the delay announcement.

(a) Special tone feature provides either music or silence to the calling party after the first delay announcement rather than the normal audible ringing.

(b) Service after delay announcement (SADA) is a feature for the night service, which will give a complete announcement, even if the night number is idle. ACD2 differs in that if the trunk is a (SD-1A221) “Q” option trunk it will open the delay announcement cut-through and bypass the trunk for audible (Fig. 18).

(c) Flexible first delay announcement, available with ACD2 only, permits the use of either of two recorded first announcements depending on the projected delay in termination.
7. CUSTOMER TRAFFIC REPORT FEATURE (CTRF)

A. General

7.01 The selected traffic data to customer feature (CTRF), available only with ACD1, collects and reports traffic counts related to a customer's agents, trunk groups, simulated facilities groups, and other miscellaneous counts for the ACD data group (DAG). These counts are gathered at the ESS central office and are transmitted to the customer premises where they are printed out via a TTY or displayed.

7.02 As part of the CTRF feature, the nonusage trunk scan (NUTS) and the locked-up trunk scan (LUTS) service is provided to check the usage of certain trunks during a 2-hour time period.

7.03 The CTRF feature can be used with an ACD-ESS or centrex customers.

B. 90B-CPS Dynamic Traffic Display Console

7.04 The 90B-CPS dynamic traffic display console provides an ACD customer with the CTRF feature five preselected 3-digit traffic counts. Figure 19 illustrates the feature flow for the 90B-CPS dynamic traffic display when feature CTRF is loaded. This feature will update the traffic counts which are sent from the ESS to the customer premises every 100 seconds over a dedicated trunk.

C. Teletypewriters

7.05 Teletypewriters, located on customer premises, are connected over a dedicated path to TTY channels in the central office. These TTYs output both traffic count data and NUTS data. The feature flow diagram for the CTRF TTY feature and the NUTS/LUTS service is given in Fig. 20. The CTRF feature has three TTY channels reserved for the use of CTRF customers. One customer may have two blocks of counts which are to be printed at different rates. One channel may be for this purpose. For example, one report scheduled every half hour and another report every 8 hours may both be printed using the same TTY channel.

D. Nonusage Trunk Scan (NUTS) and Locked-Up Trunk Scan (LUTS) Service

7.06 In this service every 10 seconds a program is entered to scan each trunk to determine if it is idle, busy, or on the high and wet (maintenance busy list). Once a previously idle trunk is found busy, it is no longer scanned until the next collection period. Every two hours, beginning at 12:15 a.m., this information is used to generate a list of trunks which were not used or were locked on the high and wet list for the entire 2-hour period. If the customer requests this information, it is formatted and sent to the customer's terminal. The list includes the trunk group number and member ID of the trunk on the list. LUTS entries are marked with an asterisk.

8. PROCON DATA BASE UPDATE (PRDU)

8.01 The PROCON was introduced as a customer premises (CU) agent console controller for No. 1/1A ESS ACD2 offering. The PROCON is a small general purpose programmable controller to provide the sequencing and control functions for various types of electronic and electromechanical equipment. The PROCON data base update defines the PROCON: (1) The type of electronic hardware connected to its interface ports, and (2) which interface ports are equipped. The data included in the PROCON data base update is:

(a) Special hardware ports

(b) Agent ports and type of agent console

(c) Fixed lamp agent status display ports

(d) Functional group/call type display index and display codes

(e) Supervisor call-waiting ports and type of supervisor console.

Each of the five previously listed categories is a software routine in the PROCON Data Base Update (PRDU) program. PRDU uses the 1-second entries provided by the block data link loading functions of the centrex data link to format and load data link orders. The PRDU program will not function unless the DLIO feature package is loaded, because it has the block data link loading capability. A feature flow diagram giving the functional operation of the PROCON data base is illustrated in Fig. 21.

9. ACD-ESS MANAGEMENT INFORMATION SYSTEM (AEMIS) DATA BASE (MSDU)

A. General

9.01 The ACD-ESS Management Information System (AEMIS) (available with ACD2 only) is a
minicomputer-controlled system designed to measure and analyze agent/traffic data and provide detailed agent/traffic information, performance calculations, summarize past history, and short-term forecasts to the ACD manager. To perform all of the AEMIS functions, a data base of the necessary data (describing the ACD) has to be established for the AEMIS by the No. 1/IA ESS. This is accomplished by the management information data base update program (MSDU) via a centrex data link (Fig. 22). MSDU uses the 1-second entries provided by the block data link loading function of the centrex data link (DLIO) feature (refer to Part 10 of this Section) to format and load the data link orders. System configuration and control requires the inquiry-response system (IRES) feature; therefore, the IRES feature must be loaded for the AEMIS feature. The necessary data for the AEMIS data base includes: (a) time of day; (b) the AEMIS trunk groups and associated TNNs; (c) the facilities; (d) the queue data; (e) the agent-to-functional group assignments for each LCP and the active LCP; (f) the four 4-digit extension assigned to each agent terminal.

(1) Time of Day: The time-of-day function gives the AEMIS a snapshot of the ESS real-time clock. The time sent to the AEMIS is the year, month, date, hours, minutes, and seconds. The AEMIS resets the PDP*-11 clock to equal this time. See Fig. 23 for AEMIS data link message formats.

*Trademark of Digital Equipment Corporation

(2) Call Store Configuration: The call store configuration function provides the AEMIS with a snapshot of the ACD changeable data, namely, the active LCP, the functional group (FG) patterns of the active LCP, and the queue data. The active LCP is the current invoked LCP. The FG patterns are the FG patterns of the active LCP plus any changes made by the ACD customer. The queue data is the interflow threshold, primary outflow threshold A, primary threshold B, primary alternate server pool number, secondary alternate server pool number, queue size, number of queue registers, inflow queue indicator, functional group number associated with this queue, directory number of this queue, base night directory number of this queue, and the primary alternate server pool.

The AEMIS can also request a subset of the initialization or program store refresh data. That is, any of the individual blocks of initialization or program refresh data can be requested separately.

9.02 When interrogation requests are received by ESS, appropriate data is sent to the AEMIS to satisfy these requests. This data may include a copy of the current program store data and a call store configuration or some subset of this program store (Fig. 23).

9.03 In addition to sending the AEMIS data to satisfy the interrogation requests, the ESS sends a continuous stream of messages describing the call processing activity of the ACD customer. In order to report events to the AEMIS minicomputer, the ESS keeps a record of each incoming or outgoing call over customer trunking facilities and simulated facilities.
group. The ESS also keeps track of calls terminated to and originated from the agent consoles in order to maintain a record of the agent console state.

9.04 The AEMIS messages themselves may consist of one or two 24-bit words: 23 data bits, and one parity bit. The bits are numbered from right to left (0 through 23). Bit 23 is the parity bit. Bit 22 is a maintenance bit. When the maintenance bit is zero, this indicates an ESS maintenance request. When bit 22 is a one, the data link message contains AEMIS data.

9.05 Bits 21 through 17 in single word messages contain the operation code (SOP). Bits 21 through 17 in the first word of a double word message are always set to “11101.” The operation code (DOP) is contained in bits 16 through 13. Bits 17 through 21 of the second word of a double word message are always set to “11111” as an indicator that this is the last word of a double word message. The individual SOP and DOP code messages are listed in Fig. 23.

B. Call Processing

9.06 A series of call processing AEMIS messages are generated whenever an ACD simulated facility or a dedicated ACD-ESS trunk becomes involved in a call (Fig. 23).

9.07 The sequence of facility messages that are sent to the AEMIS is essentially identical whether a simulated facility or a trunk is used. The messages sent to AEMIS are as follows:

(a) Facility seizure message (SOP2 for trunks, DOP1 for simulated facilities)

(b) Facility queued (DOP2)

(c) Facility dequeued (SOP3)

(d) Facility connected (DOP0)

(e) Facility idle (SOP4).

9.08 As indicated in (a) above, the facility seizure messages are unique for trunks and simulated facilities as shown below:

(a) Bit 16 of the SOP2 message is 0 for incoming trunks and 1 for outgoing trunks. When a trunk is seized and becomes traffic busy, the SOP2 message must be sent. The only exception to this is trunk seizures for a RADR test. No message is sent on a RADR seizure.

(b) Bit 16 of the second word of the DOP1 has the same function for simulated facilities.

9.09 In all facility messages a constant identifier, the facility number field (bits 14 through 0), is used throughout the call as a tag. When the facility is a trunk, the facility number field contains a TNN; bit 15 is 0 to indicate a trunk.

9.10 When a simulated facility is involved, the facility number field contains a simulated facility register address (bits 2 through 0 of the address is truncated in bits 14 through 0). Bit 15 is 1 to differentiate a simulated facility from a trunk. In addition, bit 14 of the facility number is always 1 to differentiate a simulated facility register from a queuing register (Fig. 23).

9.11 In addition to the call processing facility messages, AEMIS messages are sent for various trunk maintenance states. These states may be initiated either via the TTY, the trunk and line test panel, or as a result of a hardware failure during call processing. The AEMIS maintenance messages listed below are detailed in Fig. 23:

(a) Trunk disabled (SOP5)

(b) Trunk high and wet (SOP6)

(c) Trunk locked out (SOP11)

(d) Trunk active-in-service (SOP12)

(e) Trunk make busy (TMB) or carrier group alarm (CGA)-(SOP7).

10. DATA LINK INPUT/OUTPUT AND SEQUENCING FEATURES (DLIO/DLSQ)

INTRODUCTION

10.01 The data link input/output (DLIO) feature provides a software interface between the data link, call processing, and maintenance programs. The data link sequencing (DLSQ) feature maintains the integrity of the ACD2 AEMIS by ensuring that messages sent from the ESS to the AEMIS minicomputer over multiple data links arrive in the correct time sequence.
10.02 The DLIO feature performs data link loading procedures which allow the following functions:

(a) Multiple word data link orders
(b) Increased buffering and multiple data links to one destination
(c) Data link unloading procedure, which provide for multiple data link types
(d) An interface for providing CPS functions over a data link
(e) Maintenance diagnostic and audit changes to interface with new loading and unloading procedures
(f) Ability to load a large block of data link orders at a regulated rate.

10.03 In ACD2 the DLIO feature can accommodate the connection of more than one centrex data link between the AEMIS minicomputer and the CPS. Therefore, feature DLSQ will be loaded for sequencing in addition to the DLIO feature.

SOFTWARE COMPONENTS

10.04 The DLIO feature package software consists of the following components:

(a) Audits (PIDENTS SAIO, DLGC): These programs build the call store output buffers and related pointers, and periodically verify the integrity of the buffer structure.

(b) Buffer Loading Subroutines (PIDENT DILLD): This is a set of subroutines that will load one, two, or a multiple number of data link orders into an output buffer.

(c) Block Loading Routines (PIDENT DILLD): This is a set of routines that are used when a client needs to transmit a very large block of data link orders. One-second main program entries will continue loading small groups of orders until the entire block has been outputted.

(d) Input Analysis (PIDENT CXKY): This routine routes input data link orders to the proper application processing routine. PIDENT CXKY processes centrex console key signals, ISIG processes ACD console key signals, and CRTC processes CRT related messages.

(e) Input/Output (I/O) (PIDENTS SPCX, CXIO): These routines unload the output buffers and control the transmission of data link orders (DLOs) on the data link hardware. Also these routines monitor the data link circuit for arrival of input data link orders, and load the input DLOs into the centrex key hopper.

(f) Maintenance (PIDENTS CXMS, CXMA, CXDX): The new DLIO data structures and new customer premises hardware require changes to maintenance control for removing data links from service, and diagnosing the data links.

(g) CRT Control (PIDENT CRTC): The control of transmitting and receiving messages from the customer premises CRT used in ACD2 is included in the DLIO feature package. This PIDENT will be moved from feature package DLIO to feature package ACD2 for 1E6 (No. 1 ESS) and 1AE6 (No. 1A ESS) and later generic programs.

11. TRANSLATORS

11.01 Each particular feature in the ACD service has a different type of translation block. The flow diagram for building ACD1 and ACD2 translation blocks is illustrated in Fig. 24 and 25 respectively. For further details on a particular transition block, refer to Part 13 of this section for that particular Feature Document.

12. ABBREVIATIONS AND ACRONYMS

12.01 The following abbreviations and acronyms are used within this document.

ACD Automatic Call Distribution
ACD1 Automatic Call Distribution Phase 1
ACD2 Automatic Call Distribution Phase 2
AEMIS ACD-ESS Management Information System
AQI Alternate Queuing Intraflow
AQS Alternate Queuing Sequencing
ASl      Alternate Server Intraflow and Interflow
ASTS     Agent Status and Traffic Station
CGA      Carrier Group Alarm
CO       Central Office
COA      City-of-Origin Announcement
CPS      Customer Premises System
CTRF     Customer Traffic Report Feature
CTX      Centrex
DA       Delay Announcement
DAG      Data Accumulation Group
DDD      Direct Distance Dialing
DLO      Data Link Input/Output
DLSQ     Data Link Sequencing
DN       Directory Number
DOP      Double Operation Code
ESS      Electronic Switching System
FG       Functional Group
INWATS   Inward Wide Area Telephone System
IRES     Inquiry-Response System
LCP      Load Compensating Package
LDN      Listed Directory Number
LUTS     Locked-Up Trunk Scan
MLHG     Multiline Hunt Group
MSDU     Management Information Data Base Update
NUTS     Nonusage Trunk Scan
PRDU     PROCON Data Base Update
QTL      Queuing for Trunks and Lines
RG       Reporting Group
RGP      Reporting Group Packages
SADA     Service After Delay Announcement
SOP      Single Operation Code
SPCS     Stored Program Controlled System
TMB      Trunk Make Busy
TNN      Trunk Network Number
VDCS     Video Display and Control Station

13. REFERENCES

13.01 The following documentation contains information pertaining to or affected by features in this document.

OFFICIAL DOCUMENTATION

A. Bell System Practices

(1) Section 231-061-050—Service Features, Network Design, No. 1 Electronic Switching System

(2) Section 231-061-450—Program Store, Network Design, No. 1 Electronic Switching System

(3) Section 231-061-510—Centrex, Network Design, No. 1 Electronic Switching System

(4) Section 231-062-050—Service Features, Network Design, No. 1A Electronic Switching System

(5) Section 231-062-460—Processor Community Engineering, Program Stores, No. 1A Electronic Switching System

(6) Section 231-062-510—Centrex, Network Design, No. 1A Electronic Switching System

(7) Section 231-090-082—Calls Waiting Lamps—2-Wire No. 1 and No. 1A Electronic Switching Systems (Changes planned)
(8) Section 231-090-123—Delay Announcement—2-Wire No. 1 and No. 1A Electronic Switching Systems

(9) Section 231-090-334—Automatic Call Distribution Feature Phase 1 Description—2-Wire No. 1 and No. 1A Electronic Switching Systems (When published)

(10) Section 231-090-336—ACD Multiline Group Hunt—2-Wire No. 1 and No. 1A Electronic Switching Systems

(11) Section 231-090-337—ACD Interface With 60A and 60B Customer Premises Systems—2-Wire No. 1 and No. 1A Electronic Switching Systems

(12) Section 231-090-338—Tones and Announcements to Agents—2-Wire No. 1 and No. 1A Electronic Switching Systems

(13) Section 231-090-339—ACD Queuing and Call Distribution to Agents—2-Wire No. 1 and No. 1A Electronic Switching Systems

(14) Section 231-090-411—Interface with Common Systems Recorded Announcement Frame—2-Wire No. 1 and No. 1A Electronic Switching Systems

(15) Section 231-090-412—Basic Data Link Input/Output Control—2-Wire No. 1 and No. 1A Electronic Switching Systems

(16) Section 231-090-413—Interface With ACD-ESS Management Information System (AEMIS)—2-Wire No. 1 and No. 1A Electronic Switching Systems

(17) Section 231-090-414—ACD Interface With 90A CPS and Coordinator CRT Terminal—2-Wire No. 1 and No. 1A Electronic Switching Systems

(18) Section 231-118-331—Centrex CO RC Procedures for CTXCB, CTXDI, CTXEXR, CXDICL, DITABS, DLG, FLXDG, FLXRD, and FLXRS (CTX-6 Through 1E5 Generic Programs)

(19) Section 231-118-335—Line RC Procedures for LINE, TWOPTY, MPTY, SCLIST, MLHG, ACT, and CFV (CTX-7 Through 1E5 Generic Programs)

(20) Section 231-118-339—Overall Procedures for Implementing Automatic Call Distribution ACD Phase 2

(21) Section 533-205-000—60B-Customer Premises System Installation and Maintenance

(22) Section 533-205-100—Phase 2 ACD-ESS, 60B-Customer Premises System, Theory of Operation Descriptive Information

(23) Section 533-210-100—Phase 2 ACD-ESS, Management Information System, General Description

(24) Section 533-320-000—ACD-ESS Management Information System Installation and Maintenance

(25) Section 966-102-100—Centrex-CO Service General Description (Changes planned)

B. General Letters

(1) GL 74-11-227—ACD Service From No. 1 ESS Status Report

(2) GL 75-06-165—ACD-ESS Planning Information, Phase 2

(3) GL 77-01-004—Phase 2 ACD/ESS System Description

(4) GL 77-11-220—Type C (Phase 2) ACD-ESS Pricing and Traffic Guidelines

C. Other Documentation

(1) Translation Guide
Fig. 1—ACD ESS Service
null
CALLS WAITING INDICATOR (BEEHIVE) (5 PAIRS/PC)

AGENT CONSOLE

25 PAIRS

SUPERVISOR CONSOLE

25 PAIRS

SELECTOR CONSOLE

35 PAIRS

DISPLAY UNIT

6 PAIRS

AGENT STATUS AND DYNAMIC SUMMARY DISPLAY

RECONFIGURATION CONTROL AND DISPLAY

COORDINATION (OPTIONAL)

ACD CUSTOMER PREMISES

OUTSIDE PLANT

ESS CENTRAL OFFICE

ACD LINES (TIP AND RING) (1 PAIR/AGENT AND SUPV)

MONITOR (6 PAIRS/ACD MAX.)

AGENT ASSIST (1 PAIR/ACD MAX.)

AGENT CALL (1 PAIR/ACD MAX.)

SPECIAL PURPOSE CONTROL PAIRS (20/ACD MAX.)

CENTREX DATA LINK (2 PAIRS/100 CONSOLES)

CENTREX DATA LINK(S) APPROXIMATELY 1 PER 100 AGENT CONSOLES*

* NUMBER OF DATA LINKS REQUIRED DEPENDS ON CUSTOMER TRAFFIC CHARACTERISTICS (EACH DATA LINK CONSISTS OF 2 PAIRS)

ACD-ESS MANAGEMENT INFORMATION SYSTEM (EXCLUDES MINI COMPUTER AND DATA LINK INTERFACE)

NO. 1 OR NO. 3A ESS

RECONFIGURATION CONTROL AND DISPLAY

COORDINATION (OPTIONAL)

ACD-ESS MANAGEMENT INFORMATION SYSTEM (EXCLUDES MINI COMPUTER AND DATA LINK INTERFACE)

Fig. 3 — ACD2 Equipment
Fig. 4—ACD1 Feature Flow Diagram
INCOMING ACD CALL IS RECEIVED BY THE CENTRAL OFFICE

GET QUEUE NUMBER ASSOCIATED WITH LISTED DIRECTORY NUMBER

IS QUEUE ON NIGHT SERVICE

ROUTE TO NIGHT DIRECTORY NUMBER

FINISH

IS THERE SPACE ON THE QUEUE

GIVE BUSY TONE

FINISH

IF FX, GO HI AND WET

IS CALL PRIORITY

LOAD ON QUEUE IN FRONT OF NONPRIORITY CALLS

LOAD CALL AT END OF QUEUE

PROVIDE AUDIBLE TO CALLING PARTY

IS DELAY ANNOUNCEMENT REQUIRED

GIVE ANY REQUIRED DELAY ANNOUNCEMENT

UNLOAD QUEUE

SELECT IDLE FACILITY WHICH WILL GIVE BEST GRADE OF SERVICE

THIS FACILITY MAY BE
1. AGENT IN PRIMARY FUNCTIONAL GROUP
2. AGENT IN ALTERNATE FUNCTIONAL GROUP
3. TRUNK IN OUTGOING TRUNK GROUP (INTERFLOW)
LOAD COMPENSATING PACKAGE 0

LOAD COMPENSATING PACKAGE 1

LOAD COMPENSATING PACKAGE 2

ACD CUSTOMER

Fig. 6—Load Compensating Packages
Fig. 7—Reporting Group Packages
INCOMING CALL TO PRIMARY QUEUE

PLACE CALL'S LOADING TIME IN WORD 8 OF QUEUEING REGISTER

COMPUTE NEW EXPECTED HOLDING TIME EVERY SIX SECONDS OR WHEN FIRST NON-PRIORITY CALL ON A GIVEN QUEUE IS SERVICED OR ABANDONED

COMPARE CALL'S EXPECTED HOLDING TIME WITH TIME TRIGGERS (IFT AND OFT)

IN UNIT TYPE 55 AUX BLK FOR THIS QUEUE

COMPUTE NEW EXPECTED HOLDING TIME EVERY SIX SECONDS OR WHEN FIRST NON-PRIORITY CALL ON A GIVEN QUEUE IS SERVICED OR ABANDONED

COMPARE CALL'S EXPECTED HOLDING TIME WITH TIME TRIGGERS (IFT AND OFT)

WHAT IS EXPECTED CALL HOLDING TIME

0 ≤ IFT

ALLOW ALTERNATE ROUTED CALLS TO BE LOADED ON THIS QUEUE

PROCESS CALLS THROUGH QUEUE

FINISH

T > OFT

IS INTRAFLOW INHIBITED

YES

AS DETERMINED BY WORD 5 BITS 22, 21 OF UTYP 55 AUX BLK

AQI FAMILY

AOI OR ASI

AQI

(IFD ONLY)

IS THERE SPACE ON THE QUEUE

YES

PUT INCOMING CALL ON PRIMARY QUEUE

IS ALT QUEUE IS T < IFT

YES

15 ALT QUEUE IS PA BIT SET

NO

15 ALT QUEUE IS PA BIT SET

NO

IS ALT QUEUE IS T < IFT

YES

PUT INCOMING CALL ON PRIMARY QUEUE

IS THERE SPACE ON THE QUEUE

NO

GIVE BUSY TONE

FINISH

IF A BIT IN QUEUE'S CS HEAD CELL IS SET

POOR SERVICE BUT INTRAFLOW IS INHIBITED

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

IF IFA BIT IN QUEUE'S CS HEAD CELL IS SET

POOR SERVICE BUT INTRAFLOW IS INHIBITED

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

IF IFA BIT IN QUEUE'S CS HEAD CELL IS SET

POOR SERVICE BUT INTRAFLOW IS INHIBITED

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.

ACT BIT 0 IN QTL CS HEAD CELL

SATISFACTORY PERFORMANCE; WILL NOT HELP OTHER QUEUES AND WILL NOT REQUIRE HELP.
ATTEMPT TO GET ON PRIMARY QUEUE AGAIN

ATTEMPT TO GET ON NEXT ALT QUEUE

OBTAIN NEXT ALT QUEUE'S QUEUE NO. FROM PRIMARY QUEUE'S UTYP 55 AUX BLK WORD 11 OR 12

HAS FOURTH ALT QUEUE BEEN TRIED

IS ALT QUEUE'S INFX BIT SET

GIVE BUSY TONE TO INCOMING CALL

LOAD INCOMING CALL ON PRIMARY QUEUE

PROCESS CALL THROUGH PRIMARY QUEUE

IS PRIMARY QUEUE'S INFX BIT SET

GIVE BUSY TONE TO INCOMING CALL

LOAD INCOMING CALL ON PRIMARY QUEUE

PROCESS CALL THROUGH PRIMARY QUEUE

FINISH

Fig. 8—Intraflow Feature Flow Diagram
START

CALL IS ON QTL QUEUE

IS QUEUED CALL STABLE

YES

DON'T INTERFLOW; LEAVE CALL ON BASE QUEUE AND CONTINUE PROCESSING TO NEXT QUEUE

NO

ARE THERE AVAILABLE SIMULATED FACILITIES

YES

REMOVE CALL FROM QUEUE AND ASSOCIATE IT WITH ONE OF THE AVAILABLE SIMULATED FACILITIES

NO

ARE OUTGOING TRKS AVAILABLE

YES

PLACE CALL ON ONE SECOND TIMING

NO

SEIZE OUTGOING FACILITY; PREPARE FOR OUTPULSING

OUTPULSE DN FOR REMOTE FACILITY

IS OUTPULSING SUCCESSFUL

YES

TEAR DOWN PATH

NO

TEAR DOWN PATH

DID ABANDON OCCUR DURING OUTPULSING

YES

FINISH

NO

FINISH
OUTPULSING HAS SUCCEEDED; PREP FOR ANSWER

NON-POB FAILURE INCLUDES:
- TRANSMITTER TIME-OUT
- OPERATION FAILURE
- ETC.

DISASSOCIATE QTL QUEUING FACILITIES FROM CALL, SET UP ANSWER AND DISCONNECT SUPERVISION OF CALL.

ANSWER OCCURRED

YES

HAS ANSWER OCCURRED

NO

DISCONNECT OCCURRED

YES

IS THIS CALL FX

NO

ESTABLISH HARDWARE CONNECTION BETWEEN FX AND OUTGOING TRUNK

NO

IS CITY-OF-ORIGIN ANNOUNCEMENT REQUIRED

NO

ESTABLISH DISCONNECT SUPERVISION OF CALLING PARTY AND REMOTE FACILITY

YES

TEAR PATH DOWN LOGICALLY (NO HARDWARE)

YES

TEAR DOWN HARDWARE CONNECTION

NO

RESTORE OUTGOING TRUNK FACILITY AND CALLING LINE OR TRUNK

NO

IS THERE STILL ACTIVITY ON INTERFLOW QTL QUEUE

NO

RESTORE SIMULATED FACILITY TO IDLE LINK LIST

YES

SIMULATED FACILITY NOW AVAILABLE FOR USE BY NEXT CALL ON QUEUE

YES

IS NEW CALL STABLE

NO

THE CALL PROCESSING HAS BEEN COMPLETED

NO

FINISH

SYSTEM WAITS FOR DISCONNECT

FINISH

YES

IS THIS CALL FX

YES

ESTABLISH HARDWARE CONNECTION BETWEEN RX AND OUTGOING TRUNK

NO

IS CITY-OF-ORIGIN ANNOUNCEMENT REQUIRED

NO

ESTABLISH DISCONNECT SUPERVISION OF CALLING PARTY AND REMOTE FACILITY

YES

TEAR PATH DOWN LOGICALLY (NO HARDWARE)

YES

TEAR DOWN HARDWARE CONNECTION

NO

RESTORE OUTGOING TRUNK FACILITY AND CALLING LINE OR TRUNK

NO

IS THERE STILL ACTIVITY ON INTERFLOW QTL QUEUE

NO

RESTORE SIMULATED FACILITY TO IDLE LINK LIST

YES

SIMULATED FACILITY NOW AVAILABLE FOR USE BY NEXT CALL ON QUEUE

YES

IS NEW CALL STABLE

NO

THE CALL PROCESSING HAS BEEN COMPLETED

NO

FINISH
IS THIS THE SECOND TIME

NO

YES

DISASSOCIATE SIMULATED FACILITIES FROM CALL

RESTORE OLD OUTGOING FACILITY. PLACE ON GUARD TIMING

GIVE PERMANENT AUDIBLE SIGNAL

REPEAT IF ANOTHER OUTGOING TRK IS AVAILABLE

AUDIBLE GIVEN TO CALLING PARTY UNTIL ABANDON OCCURS

FINISH

DOES INCOMING TRK HAVE CITY-OF-ORIGIN ANNOUNCEMENT

NO

YES

GIVE OUTGOING TRK CITY-OF-ORIGIN ANNOUNCEMENT

GIVE INCOMING TRUNK CITY-OF-ORIGIN ANNOUNCEMENT

RELEASE CITY-OF-ORIGIN ANNOUNCEMENT CIRCUIT

ESTABLISH DISCONNECT SUPERVISION OF CALLING PARTY AND REMOTE FACILITY

SYSTEM WAITS FOR DISCONNECT

FINISH

Fig. 9—Interflow Feature Flow Diagram
Fig. 10—ASI Feature Flow Diagram
Fig. 11—ASI Method of Alternate Routing
Fig. 12—AQI Method of Alternate Routing
Fig. 13—Priority Calling Feature Flow Diagram
Fig. 14—Abandoned Call Feature Flow Diagram
Fig. 15—Night Transfer Flow Diagram
START

PREPARE TO RING AGENT

PLACE ATTENDANT INTERFACE CIRCUIT IN CUT THRU STATE

APPLY RINGING CURRENT TO 60A/60B CPS

AUTOMATIC ANSWER TRIP

YES IF COA BIT OF SSDP WORD IS SET TO 1

YES IF TCCCOA BIT OF FOURTH WORD IS SET TO 1

DOES ACD CUSTOMER HAVE ZIP TONE FEATURE

YES

WAS CALL INTRA/INTERFLOWED (ACD2 ONLY)

NO

GIVEN VIA ATTENDANT INTERFACE CIRCUIT SD-1A353-01

APPLY ZIP TONE TO AGENT LINE

APPLY STUDDER ZIP TONE TO AGENT LINE (ACD2 ONLY)

RELEASE ZIP TONE

YES IF TGCOA BITS OF FIRST WORD SET TO EITHER 10 OR 11

IS REMOTE COA TO BE GIVEN

YES

LOCAL COA

NO

VIA TRUNK CIRCUITS SD-1A358-01 OR SD-1A359-01 OR SD-1A360-01 OR SD-1A241-01 AND SD-1A342-01

GIVE TRUNK COA FROM LOCAL OFFICE

ZIP TONE LASTS FOR 0.5+0.1 SECOND

YES IF ZIP BIT OF SSDP WORD IS SET TO 1

GIVEN VIA ATTENDANT INTERFACE CIRCUIT SD-1A353-01
Fig. 16—Zip Tone and COA Feature Flow Diagram
MILAMP

ENTER HERE ONCE EVERY 6 SECONDS

START

ASSUME IF CALLS ON QUEUE WAITING FOR SERVICE, WORD 8 OF ASSOCIATED QUEUING CONTAINS THAT CALL'S LOADING TIME IN SECONDS

DOES ACD CUSTOMER HAVE DA FEATURE NO

YES

ACTIVITY ON GIVEN QTL QUEUE NO

YES

SYSTEM TAKES REAL TIME BREAK

LOOK AT NEXT QTL QUEUE

ARE THERE MORE QTL QUEUES IN OFFICE

YES

NO

OBTAIN ADDRESS OF FIRST OR NEXT QR ON QUEUE FROM HEAD CELL

IS CALL ALREADY UP TO DA

NO

YES

UPDATE ADDRESS OF NEXT QR ON QUEUE

IS ADDRESS OF NEXT QUEUING REGISTER=0

YES

NO

Determine WHICH DA IS TO BE GIVEN TO CALLING PARTY

COMPARE DELAY TIME AGAINST 6K'M'n WHERE: M'n = 3 * Mi + 4 * n

Mi IS STORED IN CS HEAD CELL

HAS CALL BEEN WAITING LONG ENOUGH TO GET Nth DA

NO

YES

DELAY TIME IS = PT-LT (WHERE: PT IS THE PRESENT TIME AND LT IS THE LOADING TIME)

COMPUTE CALL DELAY TIME

OBTAIN ADDRESS OF NEXT QR ON QUEUE

Compute CALL DELAY TIME

A
IS DA TO BE GIVEN USING RELAY METHOD

CLOSE DA RELAY ON SD-IA221 TRUNK WITH "Q" OPTION

NOTE: ONLY FIRST DA USES RELAY IF OFFERED

SWITCH PATH FROM TONE TO DA TRUNK "Q" OPTION

FAIL DA

BILLING (IF REQUIRED) IS DONE WHEN FIRST DA GIVEN. ALL SUBSEQUENT DA's ARE FREE

DA FREE

NUMBER OF DA's TO BE GIVEN KEPT IN BITS (14-18) OF WORD 3 IN THE QTL CS HEAD CELL

REPORT ANSWER AND CHARGE FOR CALL

INCREMENT NUMBER OF DAs GIVEN

Fig. 17—Delay Announcement Feature Flow Diagram
Fig. 18—Service After Delay Announcement Feature Flow Diagram
100-SECOND MAIN PROGRAM
ENTRY FOR 90B-CPS GROUP
TRAFFIC DISPLAY UPDATE

NOTE:
TOTALING REGISTERS
UPDATED EVERY 100
SECONDS FOR USAGE
COUNTS AND EVERY
15 MINUTES FOR PEG
COUNTS

START

SCHEDULE AND ASSIGN
CUST TO AVAILABLE
TRANSMITTERS

SEIZE AN OUTPULSING
CONTROL REG. FOR
EACH AVAILABLE
TRANSMITTER

CONNECT TRANSMITTER
TO CUSTOMER TRUNK
(SD-1A192)

LOAD ONE DISPLAY
GRP OF DIGITS
INTO OPLC

OUTPULSE DIGITS
TO CUST DISPLAY

ARE ALL DISPLAY
GRPS OUTPULSED

DISCONNECT
TRANSMITTER FROM
CUST TRUNK

HAVE ALL CUST
BEEN SERVED

FINISH

Fig. 19—CTRF 90B-CPS Feature Flow Diagram
CHECK CUSTOMER TRAFFIC TIMETABLE MAP FOR EACH CTFG

IS THERE A TTY OUTPUT SCHEDULED

NO

RETURN TO MAIN PROGRAM

YES

OBTAIN TTY CHANNEL NO. FOR CTFG FROM CTFG AUXILIARY BLOCK

USE LIST OF COUNTS (STORED IN CTFG AUX BLOCK) AND LIST OF CUSTOMER TRAFFIC LABELS (STORED IN CUSTOMER TRAFFIC LABEL AUXILIARY BLOCK) TO PRINT STD02 REPORT

FINISH

15 MINUTE MAIN PROGRAM ENTRY (STD02 SUMMARY REPORT) (NOTE 1)

LOCATE LIST OF TNN'S FOR EACH CTFG

RETURN TO MAIN PROGRAM

WAIT FOR NEXT 15 MINUTE ENTRY

USE LIST OF TNN'S TO PRINT STD03 REPORT

2 HOUR MAIN PROGRAM ENTRY (STD03 NUTS SUMMARY REPORT) (NOTE 2)

NOTES:
1. TOTALING REGISTERS UPDATED EVERY 100 SECONDS FOR USAGE COUNTS AND EVERY 15 MINUTES FOR PEG COUNTS.
2. NUTS TNN CS LIST UPDATED EVERY 10 SECONDS FOR A CTFG'S TNN'S FOUND TRAFFIC BUSY.
OUTPUT MESSAGE LOADER LOADS ENCODED MESSAGE (CRR AND DATA, IF NEEDED) IN OMBA

WAITS UNTIL HIGHEST PRIORITY MESSAGE FOR THIS CHANNEL

UPDATE PROGRAM Assigns MESSAGE TO CHANNEL

OUTPUT MESSAGE TRANSLATION PROGRAM GENERATES ASCII CHARACTERS FROM OUTPUT MESSAGE CATALOG AND/OR CLIENT DATA AND LOADS INTO TELETYPewriter CHANNEL BUFFER (TCS)

SP

SIGNAL PROCESSOR OR CENTRAL CONTROL OR NO. 1A ESS OFFICE

OUTPUT PROCESSOR PROGRAM TRANSFERS CHARACTERS FROM TCB TO SP OUTPUT HOPPER FROM WHICH SP OUTPUTS CHARACTERS

OUTPUT PROCESSOR PROGRAM DIRECTLY OUTPUTS CHARACTERS FROM TCB TO TTY EVERY 100 MILLISECONDS

IS MESSAGE OR MESSAGE SEGMENT COMPLETE

NO

MARK MESSAGE ON SEGMENT COMPLETE

YES

IS THIS A SEGMENTED MESSAGE

NO

DELETE MESSAGE FROM OMB

YES

IS SEGMENTED MESSAGE COMPLETE

NO

RETURN TO CLIENT PROGRAM AND WAIT FOR A NEW PRINT REQUEST

FINISH

USE DSAVE OPTION

FINISH

HOLD MESSAGE IN OMB UNTIL NEXT SEGMENT LOADED

Fig. 20—CTRF TTY Feature Flow Diagram
ISS 1, SECTION 231-045-435

Fig. 21—PROCON Data Base Flow Diagram (Sheet 1 of 4)
Fig. 21—PROCON Data Base Flow Diagram (Sheet 2 of 4)
Fig. 21—PROCON Data Base Flow Diagram (Sheet 3 of 4)
INCREMENT THE TERMINAL NUMBER

GET THE PORT NUMBER AND THE LAMP INDEX

DETERMINE MAX STATUS DISPLAY AUX ADDRS

GET THE CURRENT STATUS DISPLAY AUX INDEX

OBTAIN, FORMAT AND LOAD LOCAL PORT NUM. DLO

INCREMENT THE TERMINAL NUMBER

CHECK TERMINAL NUMBERS

TERM = 0

FORMAT AND LOAD TERMINAL NUMBER DLO

ALL DATA SENT

FORMAT AND LOAD ALL ZERO DLO WITH E BIT SET

PREPARE FOR FUNCT. GRP CALL TYPE DISPLAY

LOCAL AUX > 11
INCREMENT INDEX, FORMAT AND LOAD 2 ZERO DLO

GET ADDRESS AND SIZE DISPLAY AUX BLK

IF ICI/COS = 0
GET THE CURRENT ICI/COS INDEX

FORMAT AND LOAD CHAR 1 DLO

IS FIXED LMP INDEX SET?

FORMAT FIXED LAMP VALIDITY BIT IN DLO

FORMAT AND LOAD CHAR 2 AND CHAR 3 DLO

INCREMENT ICI/COS INDEX

SET UP FOR SUVP CALL WAIT SUB FUNCTION

NO MORE DATA
Fig. 21 — PROCON Data Base Flow Diagram (Sheet 4 of 4)
REQUEST

FOR MIS
DATA MADE

DETERMINE
BLOCK LOADING
INITIALIZATION ROUTINE
BASED ON REQUEST
MADE

P.S.
REFRESH
REQUEST

INITIAL-
IZATION
REQUEST

TIME
OF DAY
REQUEST

C.S.
REFRESH
REQUEST

TRK GRP
DATA
REQUEST

LCP
REQUEST

SFG
DATA
REQUEST

TERM TO
EXT. DATA
REQUEST

QUEUE
DATA
REQUEST

BLOCK LOADING
INITIALIZED,
WAIT FOR 1 SEC.
ENTRY

(SHEET 2)
Fig. 22—Initialization of AEMIS Memory (Sheet 1 of 2)
USE SUB-FUNCTION INTERNAL INDEX TO DETERMINE WHAT DATA REMAINS TO BE SENT (AT INITIAL ENTRY INDEX = 0)

ENOUGH SPACE IN BUFFER TO LOAD NEXT BLOCK OF ORDERS

NO

INSUFFICIENT ROOM IN DL OUTPUT BUFFER, WAIT FOR NEXT 1 SECOND ENTRY FROM DLIP

YES

RETRIEVE AND FORMAT APPROPRIATE TRANSLATION DATA

EXIT SUB-FUNCTION

LOAD DATA LINK ORDERS FOR SUB-FUNCTION

IS SUB-FUNCTION COMPLETE

YES

ALL DATA FOR THIS SUB-FUNCTION HAS BEEN SENT

NO

INCREMENT SUB-FUNCTION INTERNAL INDEX WHICH INDICATES DATA STILL TO BE SENT
IS TOTAL DATA BIT SET INDICATING P.S. REFRESH OR INITIALIZATION REQUEST

NO

END SUB-FUNCTION

YES

INCREMENT SUB-FUNCTION AND SET INTERNAL CONTROL ITEMS

TURN OFF 1 SECOND BLK LOADING ENTRY

LAST BLOCK OF REQUESTED DATA IN BUFFER, SEND THESE AND END BLOCK LOADING

SEND OUT FORMATTED DATA LINK ORDERS

WAIT FOR NEXT DL ENTRY

EXIT SUB-FUNCTION

(SHEET 3)

(SHEET 5)
The following type messages are sent to the MIS during call processing:

1. Terminal state change
2. Terminal event
3. Trunk seized
4. Facility dequeued
5. Facility idle, SZR disclaim
6. Trunk disabled
7. Trunk high and wet
8. Trunk M.B. or CGA
9. Split overflow
10. Facility group overflow
11. Trunk locked out
12. Trunk active
13. Audit correction
14. Facility connected
15. Simulated facility seized
16. Facility queued
17. Add-on call

Note 1. Some of these messages will be formatted and sent individually from the call processing programs.

Note 2. In all cases where MIS messages are sent the routines are logically equivalent to the flow indicated.

Fig. 22—Initialization of AEMIS Memory (Sheet 2 of 2)
1. TRANSLATION BRACKETS

1.1 BEGIN BLOCK

WHERE:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>PARAMETER</th>
<th>MESSAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>LCP NO.</td>
<td>AGENT TO FUNCTIONAL GROUP ASSOCIATION</td>
</tr>
<tr>
<td>1</td>
<td>QUEUE NO.</td>
<td>QUEUE INFORMATION</td>
</tr>
<tr>
<td>2</td>
<td>TRUNK GRP. NO.</td>
<td>TNN TO TRUNK GROUP ASSOCIATION (OUTGOING TRUNK GROUP)</td>
</tr>
<tr>
<td>3</td>
<td>TRUNK GRP. NO.</td>
<td>TNN TO TRUNK GROUP ASSOCIATION (INCOMING TRUNK GROUP)</td>
</tr>
<tr>
<td>4</td>
<td>TRUNK GRP. NO.</td>
<td>TNN TO TRUNK GROUP ASSOCIATION (TWO WAY TRUNK GROUP)</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>SIMULATED FACILITY GROUP SIZE</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>AGENT TO CTX EXT ASSOC.</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>CALL STORE CONFIGURATION</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>TRUNK STATUS</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>NIGHT TRANSFER DN</td>
</tr>
<tr>
<td>31</td>
<td>-</td>
<td>SET OF TRANSLATION BLOCKS</td>
</tr>
</tbody>
</table>

1.2 END BLOCK

WHERE:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>IS AS IN &quot;BEGIN BLOCK&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUNT</td>
<td>IS THE NUMBER OF MESSAGES SENT EXCLUDING THE BRACKETS. FOR TYPES 8, 9, 31 THE COUNT FIELD IS NOT USED. FOR TYPE 7 THE FIELD IS USED FOR NOTIFYING MIS THAT THE CSC WAS ABNORMALLY TERMINATED AND SHOULD NOT BE INSTALLED.</td>
</tr>
</tbody>
</table>

2. TIME OF DAY

2.1 YEAR
### 2.2 MONTH, DAY, HOURS, MINUTES, SECONDS

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | 1  | 1  | 1  | 0  | 0  | DOP | 15 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|    | OP | 1  | 1  | 1  | 1  | 1  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

### 3. FACILITY EVENTS

Facility messages use the following parameters to identify information concerning an event. The parameters are:

- **D(irection)**  
  - 0 = Incoming  
  - 1 = Outgoing  

- **T(ype)**  
  - 0 = Physical trunk  
  - 1 = Simulated facility register or queue register number

When the T(ype) item is 1, the facility number field will contain either a simulated facility register (SFR) number or a queue register number (QRN). The distinction between SFR's and QRN's is that the next high order item, item 14, if an SFR is 1, while for a QRN item 14 is 0.

#### 3.1 TRUNK SEIZED

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  |   | SOP | 2 | D | 0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Where: Item 15 must be 0 identifying a trunk

#### 3.2 SIMULATED FACILITY SEIZED

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | 1  | 1  | 1  | 0  | 1  | DOP | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| OP | 1  | 1  | 1  | 1  | 1  | 1  | D | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Where: Item 11 in the first message and item 15 in the second message must be 1 identifying a simulated facility

*Fig. 23—AEMIS Data Link Message Format (Sheet 1 of 5)*
3.3 FACILITY QUEUED

```
<table>
<thead>
<tr>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
<th>16</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
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<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>DOP2</td>
<td>I</td>
<td>P</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

WHERE:
- I(INTERFLOW) 0 = QUEUE ASSOCIATED WITH FUNCTIONAL GROUP
  1 = INTERFLOW QUEUE
- PRIORITY 0 = ROUTINE ROUTING
  1 = PRIORITY ROUTING

FOR THIS MESSAGE, WHEN THE TYPE ITEM IS 1 THE FACILITY NUMBER FIELD CONTAINS EITHER A SIMULATED FACILITY OR A QUEUE REGISTER NUMBER.

3.4 FACILITY DEQUEUED

```
<table>
<thead>
<tr>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
<th>16</th>
<th>15</th>
<th>14</th>
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<th>8</th>
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<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SOP3</td>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

WHEN THE TYPE ITEM IS 1, THE FACILITY NUMBER FIELD CONTAINS EITHER A SIMULATED FACILITY REGISTER NUMBER OR A QUEUE REGISTER NUMBER.

3.5 FACILITY CONNECTED

```
<table>
<thead>
<tr>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
<th>16</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>DOP0</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

WHERE:
- I(INTERFLOW) 0 = DESTINATION - TERMINAL NUMBER
  1 = DESTINATION - SIMULATED FACILITY GROUP NUMBER

WHEN THE TYPE ITEM IS 1, THE FACILITY NUMBER FIELD CONTAINS EITHER A SIMULATED FACILITY REGISTER NUMBER OR A QUEUE REGISTER NUMBER.
3.6 FACILITY IDLE OR SEIZURE DISCLAIMER

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   | SOP4 | B | T |

WHERE: B(IT) 0 = FACILITY IDLE
1 = SEIZURE DISCLAIMER

WHEN THE T(YPE) ITEM IS 1, THE FACILITY NUMBER FIELD CONTAINS EITHER A SIMULATED FACILITY OR QUEUE REGISTER NUMBER. THE SEIZURE DISCLAIMER MESSAGE INFORMS THE MINICOMPUTER THAT NETWORK BLOCKING OCCURRED WITH THE FACILITY NUMBER CONTAINED IN THE MESSAGE. THIS MEANS THAT THE PREVIOUS SEIZURE ON THAT FACILITY SHOULD BE IGNORED AND THE FACILITY RETURNED TO THE IDLE STATE.

3.7 TRUNK DISABLED

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   | SOP5 | 0 |

WHERE: ITEM 15 MUST BE 0 IDENTIFYING A PHYSICAL TRUNK

3.8 TRUNK HIGH AND WET (THAW)

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   | SOP6 | 0 |

WHERE: ITEM 15 MUST BE 0 IDENTIFYING A PHYSICAL TRUNK

3.9 TRUNK LOCKED OUT

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   | SOP11 | 0 |

WHERE: ITEM 15 MUST BE 0 IDENTIFYING A PHYSICAL TRUNK

Fig. 23—AEMIS Data Link Message Format (Sheet 2 of 5)
3.10 TRUNK ACTIVE (INTO SERVICE)

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP  | 1  | SOP  | 12 | 0  | TNN |

WHERE: ITEM 15 MUST BE 0 IDENTIFYING A PHYSICAL TRUNK

3.11 TRUNK MAKE BUSY KEY OPERATED (TMB) OR CARRIER GROUP ALARM (CGA)

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP  | 1  | SOP  | 7  | B  | 0  | TNN |

WHERE: B(IT) 0 = KEY OFF
       1 = KEY ON
       ITEM 15 MUST BE A 0 IDENTIFYING A PHYSICAL TRUNK

3.12 FACILITY GROUP OVERFLOW

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP  | 1  | SOP  | 9  | D  | T  | FACILITY GROUP NUMBER |

WHERE: A TRUNK GROUP CAN ONLY RECEIVE AN OVERFLOW MESSAGE IN THE OUTGOING DIRECTION.

4. PROGRAM STORE QUEUE INFORMATION

4.1 PRIMARY ALTERNATE SERVER POOL

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP  | 1  | SOP  | 25 | QUEUE NUMBER 2 | QUEUE NUMBER 1 |

WHERE: IF ONLY ONE QUEUE NUMBER IS SENT, QUEUE NUMBER 2 IS 0.
4.2 DIRECTORY NUMBERS

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | 1  | 1  | 1  | 0  | 1  | D0P12 | B | D6 | D5 | D4 |

| OP | 1  | 1  | 1  | 1  | 1  | D3 | D2 | D1 | D0 |

WHERE:
B(IT) 0 = QUEUE DIRECTORY NUMBER
1 = BASE NIGHT TRANSFER DIRECTORY NUMBER

4.3 PROGRAM STORE QUEUE PARAMETERS

THE PARAMETERS ARE:
1. IN FLOW THRESHOLD (IFT)
2. PRIMARY OUT FLOW THRESHOLD (POFT)
3. SECONDARY OUT FLOW THRESHOLD (SOFT)
4. CALLS WAITING LEVELS THRESHOLDS (CWLT)
5. PRIMARY ALTERNATE SERVER POOL NUMBER (PASPN)
6. SECONDARY ALTERNATE SERVER POOL NUMBER (SASPN)
7. QUEUE SIZE (QS)
8. NUMBER OF QUEUE REGISTERS (NQR)
9. INTERFLOW QUEUE ITEM
10. FUNCTIONAL GROUP NUMBER

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | 1  | 1  | 1  | 0  | 1  | D0P11 | B | PARAMETER VALUE 1 |

| OP | 1  | 1  | 1  | 1  | 1  | NAME | B | PARAMETER VALUE 2 |

WHERE:
B(IT) 0 = NO PARAMETER VALUE
1 = PARAMETER VALUE

<table>
<thead>
<tr>
<th>NAME</th>
<th>VALUE 1</th>
<th>VALUE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>IFT</td>
<td>CWLT</td>
</tr>
<tr>
<td>001</td>
<td>POFT</td>
<td>SOFT</td>
</tr>
<tr>
<td>010</td>
<td>PASPN</td>
<td>SASPN</td>
</tr>
<tr>
<td>011</td>
<td>QS</td>
<td>NQR</td>
</tr>
<tr>
<td>100</td>
<td>INTERFLOW ITEM</td>
<td>FUNCTIONAL GROUP NUMBER</td>
</tr>
</tbody>
</table>

Fig. 23—AEMIS Data Link Message Format (Sheet 3 of 5)
4.4 AGENT TO FUNCTIONAL GROUP

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  | 0  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   | 1   | 1   | 1   | 0   | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

WHERE:
THE AGENT ITEMS REPRESENT A ROW OF TERMINALS WITH THE LOW END ITEM
(ITEM 0) REPRESENTING THE LOW NUMBERED AGENT IN THE CURRENT ROW (E.G. ROW 0
AGENTS 0-15, HOWEVER AGENT 0 IS NOT ASSIGNED). AN ITEM POSITION SET INDICATES
THAT PARTICULAR AGENT IS A MEMBER OF THE CURRENT FUNCTIONAL GROUP.

4.5 AGENT TO EXTENSION

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  | 0  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   | 1   | 1   | 1   | 0   | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

WHERE:
THE DIGITS D3-D0 ARE ENCODED IN ESS BCD WITH D0
BEING THE LEAST SIGNIFICANT DIGIT OF THE CENTREX EXTENSION NUMBER

4.6 TRUNK TO TRUNK GROUP

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  | 0  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| OP  | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

WHERE:
ITEM 15 MUST BE A 0 IDENTIFYING A TRUNK
4.7 SIMULATED FACILITY GROUP SIZE

<table>
<thead>
<tr>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
<th>16</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
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<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OP</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td><strong>DOP14</strong></td>
<td>1</td>
<td><strong>SIMULATED FACILITY GROUP NO.</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>OP</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td><strong>SIMULATED FACILITY GROUP SIZE</strong></td>
<td></td>
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</tr>
</tbody>
</table>

WHERE:

ITEM 11 MUST BE A "1" IDENTIFYING A SIMULATED FACILITY REGISTER

5. AGENT MESSAGES

5.1 STATE

<table>
<thead>
<tr>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
<th>16</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
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<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OP</strong></td>
<td>1</td>
<td><strong>SOPO</strong></td>
<td><strong>AX</strong></td>
<td><strong>PM</strong></td>
<td><strong>IX</strong></td>
<td><strong>TR</strong></td>
<td><strong>TM</strong></td>
<td><strong>AGENT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

WHERE:

AX IS THE STATE OF THE POSITION'S AUX WORK KEY
PM IS THE STATE OF THE POSITION MANNED ITEM IN ESS
IX IS AN ITEM INDICATING AN INCOMING EXTENSION CALL
TR REFLECTS THE STATE OF TIP AND RING
TM IS THE STATE OF THE AGENT MAKE BUSY FERROD

STATE

<table>
<thead>
<tr>
<th><strong>STATE</strong></th>
<th><strong>INP</strong> IN POOL (AVAILABLE)</th>
<th><strong>ACW</strong> AFTER CALL WORK</th>
<th><strong>OEX</strong> OUTGOING EXTENSION</th>
<th><strong>ACD</strong> AUTOMATIC CALL DISTRIBUTION</th>
<th><strong>IEX</strong> INCOMING EXTENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INP</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>ACW</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>OEX</strong></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>ACD</strong></td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>IEX</strong></td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

THE IX, TM, AND TR ITEMS CAN BE CONSIDERED TO BE AN ENCODED STATE AS FOLLOWS:

5.2 EVENT

<table>
<thead>
<tr>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
<th>16</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
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<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
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<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OP</strong></td>
<td>1</td>
<td><strong>SOP1</strong></td>
<td><strong>BUTTON</strong></td>
<td><strong>AGENT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Fig. 23—AEMIS Data Link Message Format (Sheet 4 of 5)
WHERE BUTTON IS ENCODED AS FOLLOWS:

<table>
<thead>
<tr>
<th>BUTTON</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALERT-DEP</td>
<td>0</td>
</tr>
<tr>
<td>ALERT-RLS</td>
<td>1</td>
</tr>
<tr>
<td>ASSIST</td>
<td>2</td>
</tr>
<tr>
<td>TROUBLE</td>
<td>3</td>
</tr>
<tr>
<td>DIR-CALL</td>
<td>4-7</td>
</tr>
<tr>
<td>SUPV</td>
<td>8</td>
</tr>
</tbody>
</table>

5.3 ADD-ON CALL

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  | 0  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | 1  | 1  | 1  | 0  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

AGENT NUMBER 1

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  | 0  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | 1  | 1  | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

AGENT NUMBER 2

WHERE:
AGENT NUMBER 1 IS THE ORIGIN OF THE CALL, AND AGENT NUMBER 2 IS THE DESTINATION OF THE CALL. IF AGENT NUMBER 2 IS 0, THIS INDICATES THAT THE CALL WAS TRANSFERRED OUT OF THE ACD.

6. FUNCTIONAL GROUPS

6.1 FUNCTIONAL GROUP OVERFLOW

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  | 0  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

NAME 00 = QUEUE FULL (NO QUEUE SLOTS AVAILABLE)
01 = QUEUE REGISTER OVERFLOW (NO QUEUE REGISTER AVAILABLE)
10 = HARDWARE (NO AUDIBLE CIRCUITS AVAILABLE)
11 = UNASSIGNED
7. MISCELLANY

7.1 PHASE RECOVERY

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | SOP26 | PHASE # |

WHERE:

PHASE NO. 0-2: SHOULD BE IGNORRED
3-6: MIS WILL REQUEST PROGRAM STORE REFRESH
AND A CALL STORE CONFIGURATION.

UPON RECEPTION OF AN ESS PHASE 3, 4, 5, OR 6 THE MIS
MINICOMPUTER WILL BE REQUIRED TO WAIT A SPECIFIED PERIOD
OF 120 SECONDS BEFORE REQUESTING THE PROGRAM STORE REFRESH
AND CALL STORE RECONFIGURATION. THIS PERIOD WILL ALLOW THE
ESS MACHINE AMPE TIME TO RESTORE ITS MEMORY.

7.2 ERROR ON REQUEST

| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| OP | 1  | SOP27 | TYPE |

WHERE:

TYPE 0000 -_OPCODE
0001 - INITIALIZATION
0010 - TIME OF DAY
0011 - TRUNK STATUS
0100 - CALL STORE CONFIGURATION
0101 - PROGRAM STORE REFRESH
0110 - RETRANSMIT REQUEST
0111 - BASE NIGHT TRANSFER DIRECTORY NUMBER
1000 - REMOTE NIGHT TRANSFER DIRECTORY NUMBER
1001 - TRUNK GROUP NUMBER
1010 - LOAD COMPENSATING PACKAGE NUMBER
1011 - SIMULATED FACILITY GROUP NUMBER
1100 - AGENT TO CENTREX EXTENSION
1101 - QUEUE IDENTIFIER
1110 - QUEUE THRESHOLD VALUE
1111 - UNASSIGNED

Fig. 23—AEMIS Data Link Message Format (Sheet 5 of 5)
1. T-READ
   SECTION 231-118-320
   VERIFY LENGTH OF MASTER HEAD TABLE ANNEX (10.01)

   MIN. 40 WORDS NO INCREASE LENGTH
   YES

   RC: CTXCB
   SECTION 231-118-331
   BUILD DR CHANGE CENTREX COMMON BLOCK (10.01)

   RC: CTXDI
   SECTION 231-118-331
   BUILD DIGIT INTERPRETER TABLES (10.01)

   RC: SUBTRAN
   RC: PSDO
   SECTION 231-118-325
   SEIZE AND LINK THE DAG HEAD TABLE (10.04)

   BUILD A DAG SUB-TRANSLATOR FOR EACH DAG (10.04)

   RC: DALT
   BUILD AND LINK THE DAG AUXILIARY BLOCKS (10.04)

   RC: DALT
   LINK THE DAG SUBTRANSLATOR TO THE DAG HEAD TABLE (10.04)

   RC: DATER
   ADD DR CHANGE MASK BLOCK AUX. BLOCK HEADER INFORMATION (10.05)

   RC: MLHG
   BUILD AND LINK COMMON BLOCK (10.06)

2. RC: SUBTRAN
   RC: PSDO
   SECTION 231-118-325
   SEIZE AND LINK THE SDA HEAD TABLE (10.08)

   BUILD AND LINK THE SDA AUX BLOCKS (10.09)

   RC: GENT
   SECTION 231-118-325
   BUILD AND LINK THE ASP HEAD TABLE (10.09)

   RC: OAMNI
   BUILD AND LINK THE ASP AUXILIARY BLOCKS (10.09)

   RC: OALNK
   LINK THE ASP SUBTRANSLATOR TO THE ASP HEAD TABLE (10.10)

   RC: LINE
   SECTION 231-118-335
   BUILD AND LINK CONSOLE ON AUXILIARY BLOCKS (10.10)

   RC: LINE
   SECTION 231-118-335
   BUILD AND LINK CONSOLE LEN AUXILIARY BLOCKS (10.11)
Fig. 24—Flow Diagram for Building ACD1 Translations
T-READ
SECTION 231-119-320
VERIFY LENGTH OF MASTER HEAD TABLE ANNEX
(PAR 10)

MIN. 40 WORDS

NO
INCREASE LENGTH

YES

RC:PSWD
SECTION 231-118-325 OR 231-048-305
BUILD NEW LCC AND NOGR TRANSLATIONS AS REQUIRED

RC:RATPAT
RC:DIGTRAN
SECTION 231-118-324 OR 231-048-304
BUILD RATE AND ROUTING TRANSLATIONS AS REQUIRED

RC:PSBLK
RC:PSWD
SECTION 231-119-320
231-118-325 OR 231-048-305
BUILD AND LINK TCC EXPANSION TABLES FOR TRUNKS
(PAR. 10.36-10.40)

RC:SUBTRAN
RC:PSWD
SECTION 231-118-325 OR 231-048-305
SEIZE AND LINK THE ROIKS HEAD TABLE
(PAR 10.10)
SEIZE A RDKS SUBTRANSLATOR FOR EACH CONSOLE CODE (PAR 10.10)

BUILD KEY LIST IN RDKS SUBTRANSLATOR (PAR 10.10)

BUILD AND LINK THE RDKS AUX BLOCKS (PAR 10.10)

SEIZE AND LINK THE RDIP HEAD TABLE (PAR 10.12)

BUILD AND LINK THE RDIP AUX BLOCKS (PAR 10.12)

SEIZE AND LINK THE CLDSPI TRANSLATOR (PAR 10.13)

SEIZE AND LINK THE VDC HEAD TABLE (PAR 10.14)

BUILD AND LINK THE VDC AUX BLOCKS (PAR 10.14)

SEIZE AND LINK THE SO HEAD TABLE (PAR 10.15)

BUILD AND LINK THE SO AUX BLOCKS (PAR 10.15)

SEIZE AND LINK THE LMPG HEAD TABLE (PAR 10.16)

BUILD AND LINK THE LMPG AUX BLOCKS (PAR 10.16)

SEIZE AND LINK THE ASP HEAD TABLE (PAR 10.19)

BUILD AND LINK THE ASP BLOCKS (PAR 10.19)

SEIZE AND LINK THE DLG HEAD TABLE (PAR 10.07)

BUILD AND LINK THE DLG MASK BLOCK HEAD TABLE (PAR 10.03)

SEIZE A DAG SUBTRANSLATOR FOR EACH DAG (PAR 10.04)

SEIZE AND LINK THE DAG HEAD TABLE (PAR 10.04)

Fig. 25—Flow Diagram for Building ACD2 Translations (Sheet 1 of 2)
SECTION 231-118-331 OR SECTION 231-048-309
ESTABLISH CENTREX EXTENSION RANGES (PAR 10.01)

SECTION 231-118-331 OR SECTION 231-048-309
BUILD OR CHANGE CENTREX COMMON BLOCK (PAR 10.01)

SECTION 231-118-331 OR SECTION 231-048-309
BUILD DIGIT INTERPRETER TABLE LEVELS (PAR 10.01)

SECTION 231-118-331 OR SECTION 231-048-309
BUILD DIGIT INTERPRETER TABLES (PAR 10.01)

SECTION 231-118-335 OR SECTION 231-048-022
BUILD TRANSLATIONS FOR SUPERVISORS AGENT ASSIST AND CALL LINES

SECTION 231-118-330 OR SECTION 231-048-308
BUILD AND LINK THE MASK BLOCK AUX. BLOCKS (PAR 10.03)
Fig. 25—Flow Diagram for Building ACD2 Translations
(Sheet 2 of 2)