"DIMENSION*" 600 PBX

(FORMERLY "DIMENSION" 400E PBX)

SYSTEM DESCRIPTION

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1. GENERAL

1.01 This section describes the DIMENSION 600 PBX (formerly the DIMENSION 400E PBX). The DIMENSION 600 PBX is an electronic switching system that uses a stored program control for call processing and system diagnostics. This PBX is compatible with all central offices ***except panel.*** Figure 1 is a block diagram showing the component parts of the PBX. The DIMENSION 600 PBX meets Federal Communications Commission (FCC) registration requirements.

Unless otherwise noted, the information contained in this BSP pertains to both DIMENSION 400E and 600 PBXs. Where differences exist between the PBXs, separate coverage is provided.

1.02 This section is reissued for the following reasons:

(a) To provide current system information

(b) To provide coverage for Issue 3, Feature Package (FP) 8 optional services, features, and hardware. Major additions include:

(1) Optional Services

- Applications Processor
- Data Switching Level 1 and Level 2
- Distributed Communications System (DCS)

(2) Features

- Message Center Service
- Directory Service
- Automatic Message Waiting
- Call Coverage
- Five-Digit Dialing
- Leave-Word Calling
- Enhanced Uniform Call Distribution (EUCD)

(3) Hardware

- Control carrier J58882AK
- Circuit packs LC147B, LC500 through LC505, LC507, LC509, LC510, LC515, LC566, LC567, LC568.
- Minirecorder KS21447-L12

(c) Additions and changes to the following:

- Added FCC Part 15 compliance information to Part 4
- Marked Customer Premises Facility Terminal (CPFT) equipment in Part 3 to "MD"
- Added Packaged Metallic Facility Terminal Assembly (PMFTA) to Part 3.

Revision arrows are used to emphasize the significant changes.

1.03 ***Warning: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.***

1.04 The 554 Division of Bell System Practices covers the DIMENSION PBX product line and is

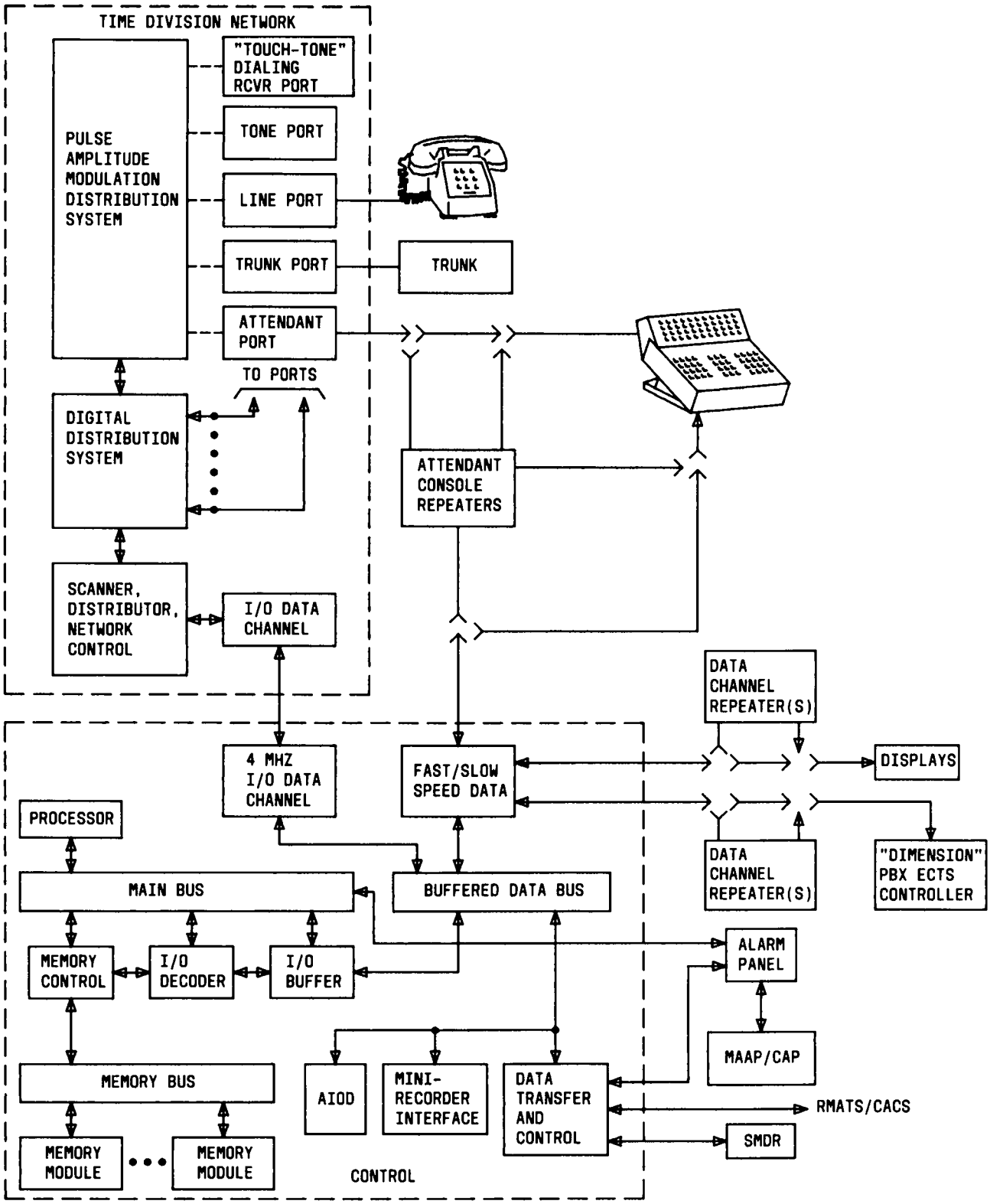


Fig. 1—DIMENSION 600 PBX—Block Diagram

structured so that related information is in the same layers as follows:

- Section 554-000-000 is an index of all issue 1 or later sections.
- Layer 554-010-XXX contains sections common to more than one DIMENSION PBX system. It covers consoles, auxiliary circuits, Customer Administration Center System (CACS), Customer Administration Panel (CAP), DIMENSION PBX Electronic Custom Telephone Service (ECTS), Remote Maintenance, Administration, and Traffic System (RMATS), Station Message Detail Recording (SMDR), and Automatic Voice Network (AUTOVON).
- Sections 554-101-XXX and 554-102-XXX pertain to the DIMENSION 100 and 400 PBX Systems.
- Section 554-105-XXX pertains to the DIMENSION 600 PBX System.
- Section 554-106-XXX pertains to Energy Communications Service Adjunct (ECSA) System
- Section 554-111-XXX pertains to the DIMENSION 2000 and Custom PBX Systems.
- Section 554-191-XXX contains feature documents.
- *How to Operate* instructions for the PBX consoles, CAP, CACS, and Force Administration Data System (FADS), are contained in 999-200-XXX sections.

1.05 The 554-1XX-XXX sections contain system description, engineering planning, and general software description of a tutorial nature. The Task Oriented Practices (TOP) for each system are numbered in the appropriate layers for each PBX system. Maintenance support is provided in a series of sections prepared for major system elements such as Pulse Amplitude Modulation (PAM), scanner/distributor, processor, etc. These maintenance sections are intended to convey operational theory to provide a background for troubleshooting complex problems. Section 554-105-115 contains description and procedures for all field X-ray tests.

1.06 This section is based on the drawings listed in Part 10. If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

1.07 A wide range of features and services is available in the DIMENSION PBX line. The features and services are engineered and tariffed into groups known as Feature Packages (FP). The five available for the DIMENSION 600 PBX are as follows:

- ***FP7:*** Deluxe intercity with DIMENSION PBX ECTS
- ***FP8:*** Deluxe intercity with ECTS, tandem switching, and retail service
- ***FP9:*** Hospitality Communications System (HCS) (deluxe hotel/motel service)
- ***PF11:*** Hospital Communications Management System (HCMS) or HCS (deluxe hotel/motel service) with ECTS
- ***FP12:*** Retail service and ECTS.

2. DESCRIPTION

2.01 DIMENSION PBXs use time division switching which involves sampling signals at port circuits, summing the sampled signals in a central amplifier, and distributing the signals to port circuits. Figure 2 is a simplified illustration of a single time division switching bus configuration. Figure 3 shows a dual (optional) time division switching bus. Sampling at fixed time intervals permits sequential transmission of 64 simultaneous conversations per time slot bus. The sampling rate per bus is approximately 16,000 Hz or once every 64 microseconds for a sample width of approximately 600 nanoseconds. Data transmission at speeds up to 9600 bits per second is possible via the system network.

2.02 Each port circuit (line, trunk, attendant interface, etc) contains a time slot memory (shift register) and a time division switch. The basic time division network includes a port circuit and a common bus wired to each port circuit with associated amplifiers and control circuits.

2.03 Functional operation of all portions of the PBX is under the control of the central proces-

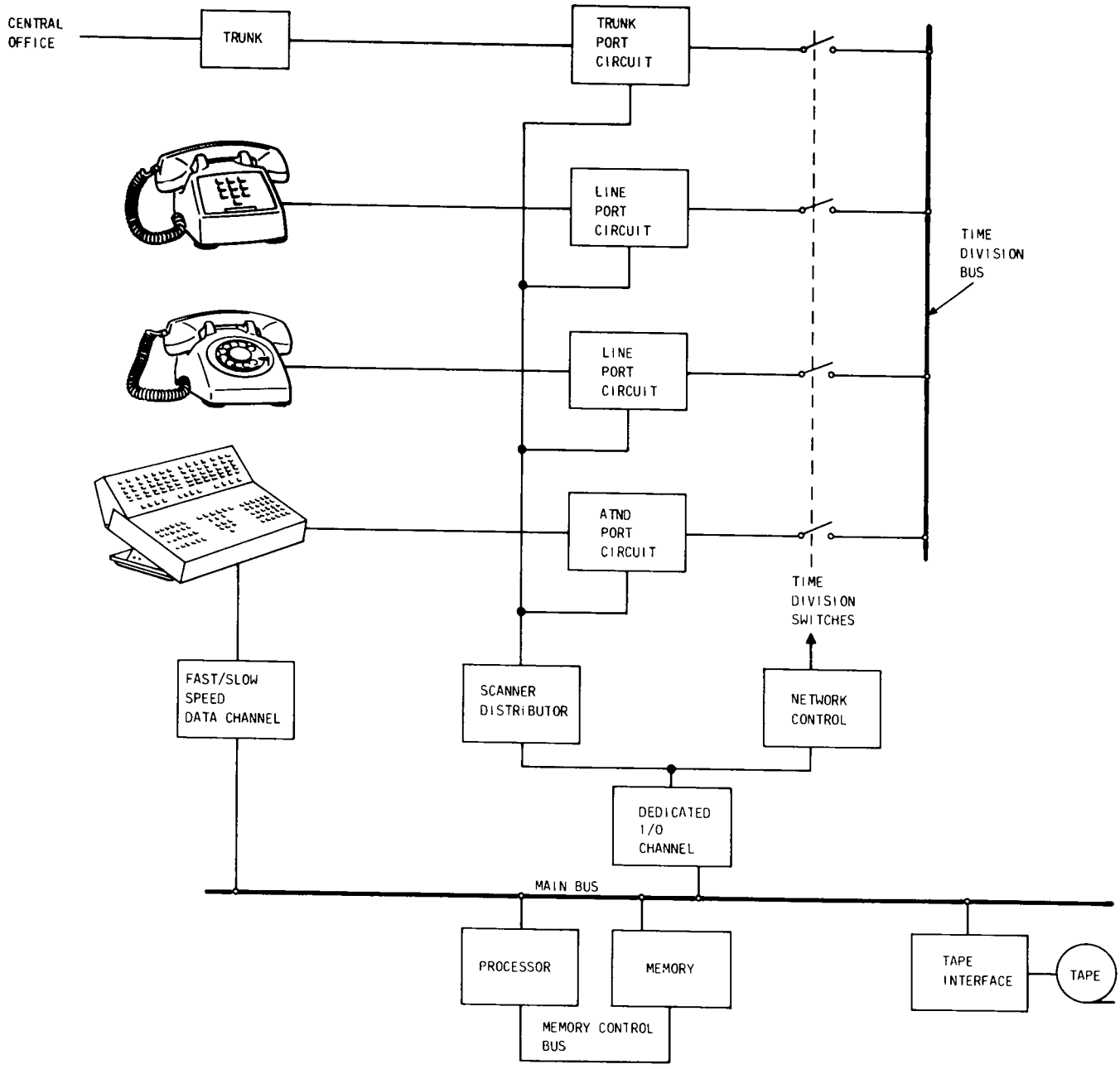


Fig. 2—DIMENSION 600 PBX—Single Time Division Switching Bus—Functional Block Diagram

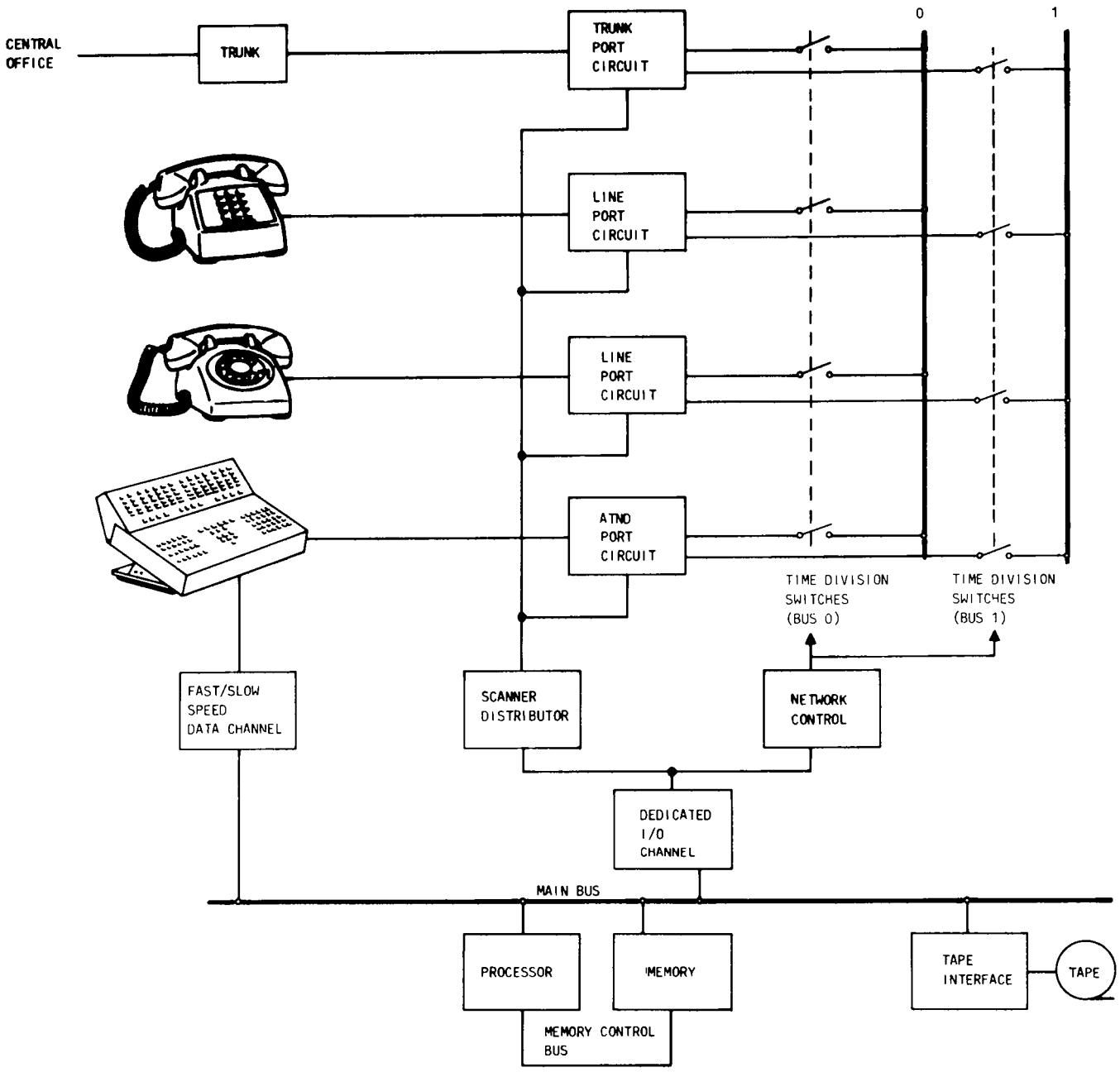


Fig. 3—DIMENSION 600 PBX—Dual Time Division Switching Buses—Functional Block Diagram

sor. The processor controls all system activities by executing instructions read from the main program memory. A high-level instruction is read from the Random Access Memory (RAM), and the processor executes a series of microinstructions in response to the high-level instruction. The processor communicates with the system via the main system bus and dedicated input/output (I/O) channels. Upon direct commands from the processor, the scanner/distributor scans for changes in port status, and time slots are assigned by the network control circuits. Once the time slots for active port circuits are assigned, the processor continues to scan the network ports by having the scanner/distributor scan for switchhook status.

2.04 The call processing operations and features provided by the system are controlled by the program that is loaded into the RAM. The particular generic program provided with each system is chosen to provide the required features. A tape cartridge is prepared for each system which contains a generic program (feature package) and the translation data for the system.

2.05 Translation data (class-of-service information, numbering plan, hunting, trunk grouping, and all similar customer information) may be provided either via a tape cartridge from the factory or by manual entry through the Maintenance and Administration Panel (MAAP). The data entered by the tape cartridge is generated from DIMENSION PBX Ordering Form E-8124, which details customer requirements. This form is processed at the factory and the data is loaded on the same cartridge which contains the generic program. If local translation data is entered via the MAAP, detailed translation forms supplied by business services personnel must be completed for record-keeping purposes.

2.06 Software programs are prepared for PBX systems prior to delivery, and include the services and features desired by the customer as indicated on the PBX Ordering Form.

2.07 The number of lines and trunks served by a particular PBX is limited by the memory size as well as the number and type of carriers and the number of circuit packs in the line and trunk carriers.

2.08 The basic equipment module is a circuit pack carrier. The system consists of line carriers, trunk carriers, and a control carrier. The control carrier is installed in the control cabinet while the line carriers and trunk carriers are installed in the line, module control, or control cabinets (Fig. 4, 5, and 6), depending on customer requirements. Circuit packs containing the circuits for lines, trunks, and control functions plug into connectors in these carriers.

2.09 Line port carriers are divided into two ringing groups. There can be a maximum of 32 lines in a ringing group. Only four lines in a ringing group can be rung simultaneously; any additional calls to a line in the same group will receive reorder tone.

2.10 In most cases, the ringing capability is more than adequate, since the probability of four station lines in a ringing group requiring simultaneous ringing is minimal. If ringing blockages are anticipated initially, stations with heavy ringing requirements may be designated as critical lines in the ordering questionnaire. These lines will be spread evenly over the equipped ringing groups. If blocking should occur due to ringing group imbalance after the system is installed, station lines may be easily reassigned to other ringing groups.

2.11 To ensure proper load testing before shipment, all stations in at least one hunt group, one pickup group, and one hot line group (in systems having these features) will be assigned in the first two line carriers at the factory.

2.12 The station and trunk conductor loop range is as follows:

LOOP	RANGE
Station conductor	950 ohms or less, plus the FCC registered terminal device resistance.
Trunk conductor	Trunk conductor loop resistance shall not exceed the external circuit resistance of the connecting central office, less 300 ohms.

2.13 Line and trunk capacities for each cabinet are shown in Fig. 4, 5, and 6. The first line carrier capacity is reduced by one for each pair of attendant positions to be provided. The tone plant circuit packs also occupy two slots, but displace only one line circuit slot (Code Calling Access [Chime Paging] feature also requires a line circuit slot) in the carrier.

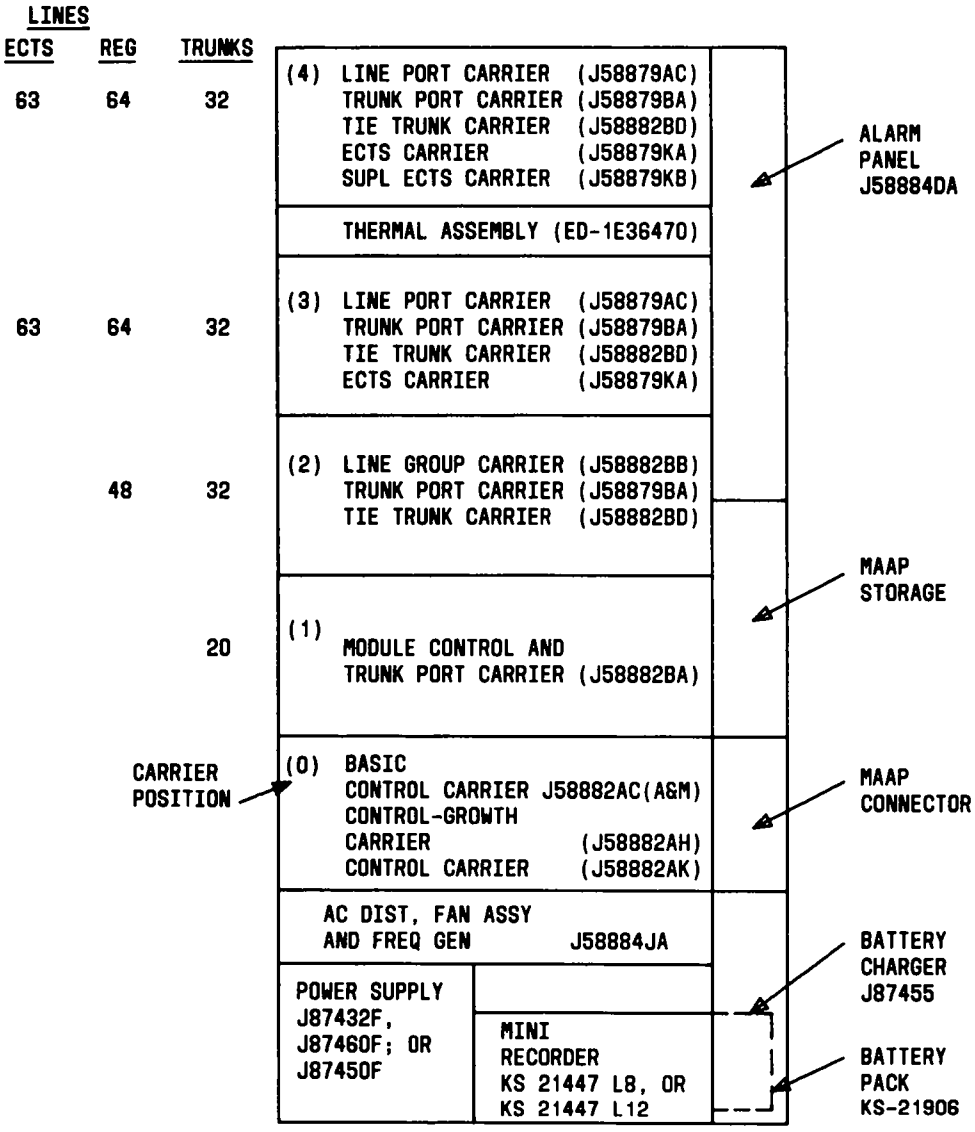


Fig. 4—Control Cabinet, J58884A

2.14 The capacity of the system is a function of both hardware and software. Tables A and B summarize the hardware and software capacities with respect to memory size. However, maximum numbers of all facilities cannot be provided in one system.

2.15 The network capacity of the DIMENSION 600 PBX is 1672 CCS (hundred call-seconds) for the single-bus and 3672 CCS for the dual-bus system. The CCS rate divided by the total number of lines determines the CCS per line at a P.01 blocking.

SYSTEM CONFIGURATIONS

2.16 The DIMENSION 600 PBX can be ordered as a 1-, 2-, 3-, or 4-cabinet system. All systems require a control cabinet (Fig. 4). The 1-cabinet sys-

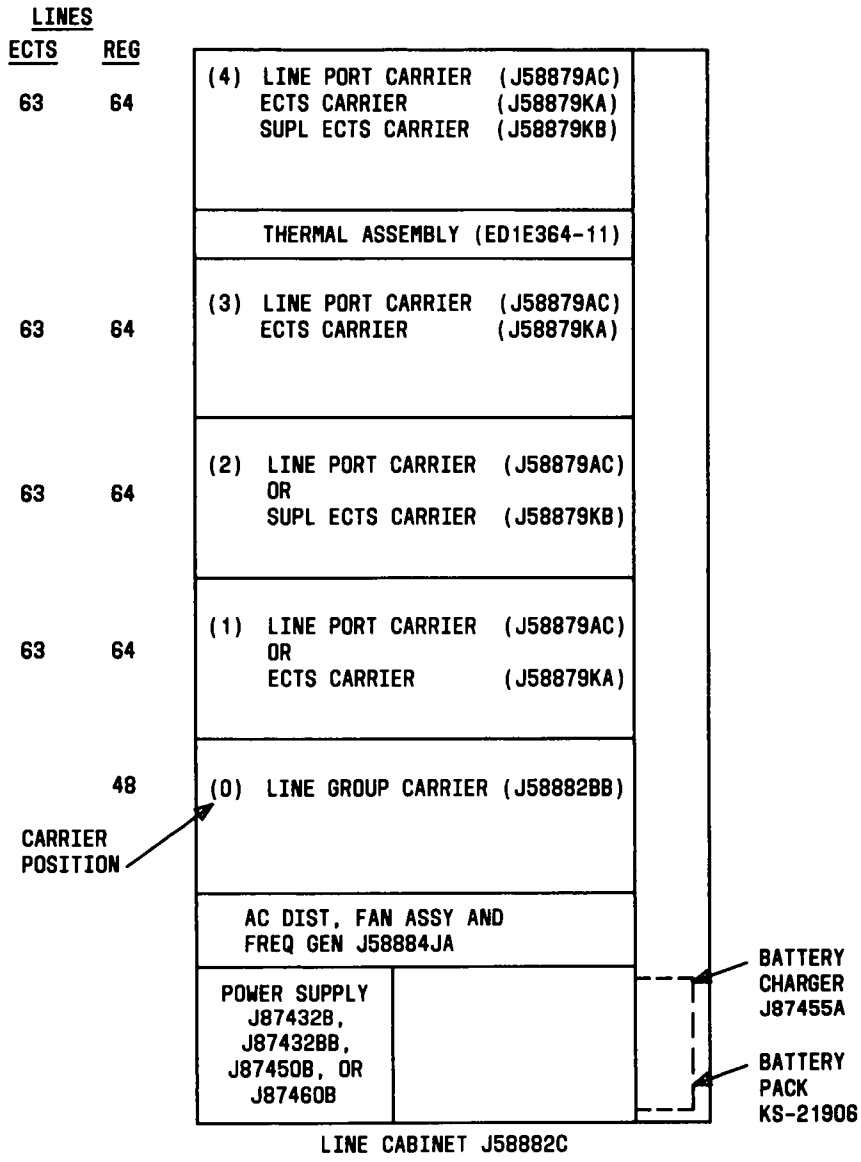


Fig. 5—Line Cabinet, J58882C

tem can only be provided with a single time slot bus and can be configured for maximum line and trunks through the appropriate choice of carriers. The 2-, 3-, or 4-cabinet systems may be provided with a single or dual time slot bus. System parameters are listed in Tables A and B. For details concerning line and trunk size configurations, refer to Fig. 7.

A. 2-Cabinet System

2.17 The 2-cabinet system can be ordered in two configurations. A maximum line size configuration requires a control cabinet (Fig. 4) and a line cabinet (Fig. 5). A maximum trunk size configuration requires a control cabinet and a module control cabi-

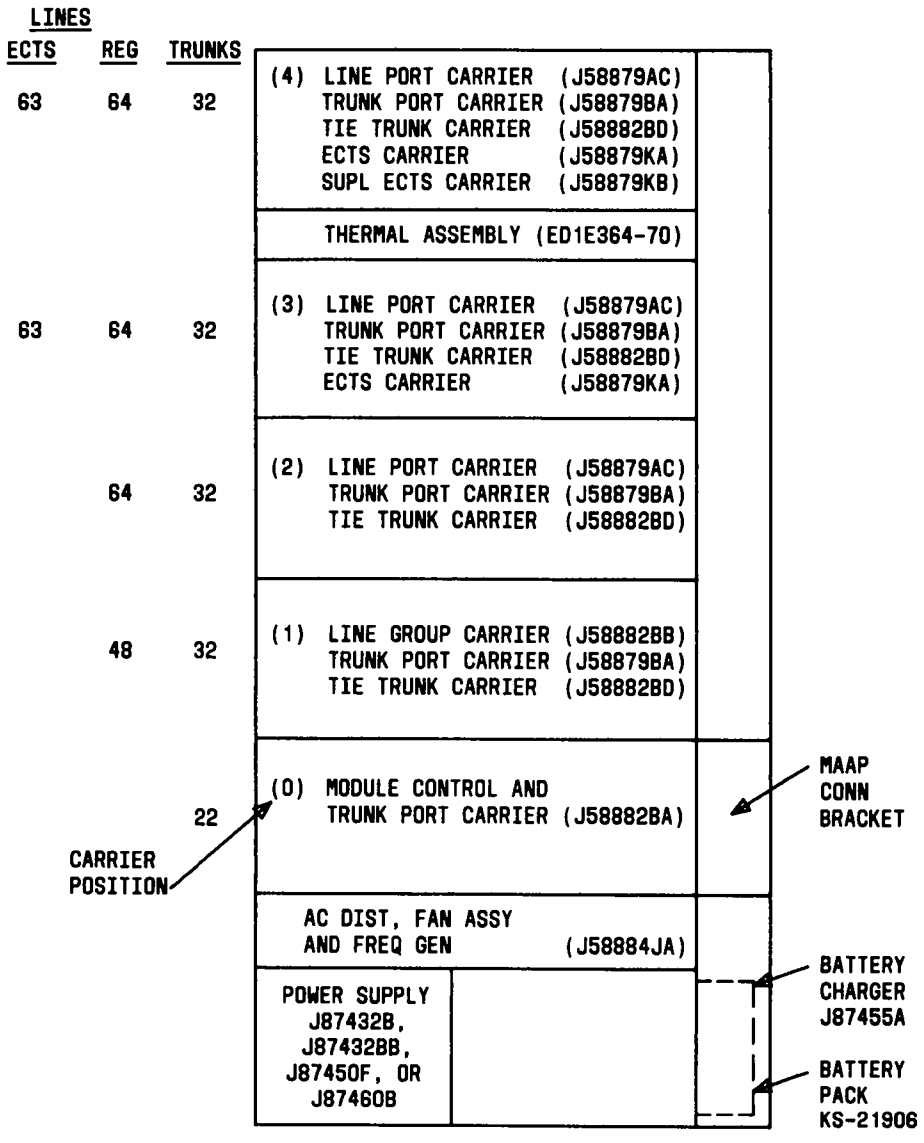


Fig. 6—Module Control Cabinet, J58882B

net (Fig. 6). The 2-cabinet system may be provided with either the single- or dual-bus configuration.

B. 3-Cabinet System

2.18 The 3-cabinet system can be ordered in two configurations. A maximum line size configuration requires a control cabinet (Fig. 4) and two line cabinets (Fig. 5). A maximum trunk size configuration requires a control cabinet, a module control cabinet, and a line cabinet. The 3-cabinet system can be provided with either the single- or dual-bus configuration.

C. 4-Cabinet System

2.19 The 4-cabinet system can be ordered with one or two time slot buses. The 4-cabinet configuration is available for the DIMENSION 600 PBX only. The 4-cabinet system can be provided with either the single- or dual-bus configuration.

TABLE A

"DIMENSION" 400E PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)	
			B	C
Equipment	Cabinet	7	3	3
		9	3	3
	Modules	7	1	1
		9	1	1
	Line Carrier	7	12	12
		9	12	12
	Trunk Carrier	7	6	8
		9	6	8
System	Attendant Console	7	6	8
		9	9	10
	Attendant Console Switched Loop	7	36	48
		9	54	90
	Attendant Console DSS Groups	7	18	18
		9	18	32
	Attendant Conference Circuits	7	2	2
		9	2	2
	ECTS Controllers	7	5	8
	ECTS Station Sets	7	325	500
	Custom Intercom Numbers	7	650	1000
	Station Line Records	7	712	1072
		9	832	1216
	Speed Calling Number	7	800	1000

See note at end of table.

TABLE A (Contd)

"DIMENSION" 400E PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)	
			B	C
System (Contd)	Calling Number Display*	7	6	6
		9	9	11
	Long Distance Billing Journal Printers	7	9	14
		9	9	14
	Assignable Software Input/Output Data Channels†	7	14	14
		9	14	14
	Peripheral Interface Circuit	9	12	18
	Remote Access Trunks	7	6	12
Traffic	Trunks Groups‡	7	99	99
		9	99	99
	Message Register Trunks	9	128	192
	OTQ SMDR Digit Records	7	84	87
	Assignable Trunk Records§	7	242	311
		9	242	311
	SMDR Records	7	76	105
	Dial Pulse and TOUCH-TONE Dialing Originating Register	7	24	31
		9	24	31
	Total Originating Register Records¶	7	32	41
		9	35	53
	Total Trunk Records**	7	317	407
		9	338	456

See note and footnotes at end of table.

▶TABLE A◀ (Contd)

"DIMENSION" 400E PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)	
			B	C
Traffic (Contd)	Total Memory Circuit Packs (16K words each)	7	8	9
		9	11	12
	Quantity of Memory Words Required	7	128K	144K
		9	176K	192K

Note: Maximum capacity is shown. Maximum quantities of both lines and trunks cannot be provided in the same system.

* The maximum number of I/O channels (LC34B circuits) that can be assigned to the calling number display feature is contingent upon the number of attendant consoles, and the number of ECTS controllers. One I/O channel is required for SMDR, one for RMATS, and one for MAAP.

† With 16KC memory, the number of available I/O channels would be 14.

‡ Trunk groups 1-17 are dedicated.
Trunk groups 18-99 to be administered as required.

§ Assignable trunk records include physical (hardware) trunks, intercom records, and outgoing trunk queuing records.

¶ Sum of consoles, attendant conferences, dial pulse and TOUCH-TONE dialing records.

** Sum of console switched loops, physical trunk records, intercom records and queue lengths, ANI queue records, and total originating register records.

Single-Bus Configuration

2.20 The single time slot bus configuration is available with either the 400E or 600 DIMENSION PBX. The 400E PBX consists of a control cabinet and one or two network cabinets. ▶Refer to 2- or 3-cabinet system for cabinet configurations. The 600 DIMENSION PBX can be configured as a 2- or 3-cabinet system. It can also be configured as a 4-cabinet system which includes one control cabinet, one module control, and two line cabinets (maximum trunk configuration) or one control cabinet, and three line cabinets (maximum line configuration).◀ Feature Package (FP) 7 is only available with a single time slot bus arrangement. The switching capacity of the single-bus system is 1672 CCS.

Two-Bus Configuration

2.21 This configuration ▶(DIMENSION 600 PBX only)◀ is optional for FPs 8, 9, 11, and 12. Hardware and software changes are required for the activation of the second time slot bus. Additional hardware required consists of:

- A second module control carrier (required for the two-bus system)
- One each of circuit packs LC103 and LC104 (in a second module control carrier)
- One LC102 circuit pack (in each of the two

◗TABLE B◖

"DIMENSION" 600 PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)		
			B	C	D
Equipment	Cabinets	8 & 12	—	4	—
		9	4	4	—
		11	—	—	4
	Modules	8 & 12	—	1	—
		9	1	1	—
		11	—	—	1
	Line Carriers	8 & 12	—	18	—
		9	12	18	—
		11	—	—	18
	Trunk Carriers	8 & 12	—	9	—
		9	6	8	—
		11	—	—	9
System	Attendant Console*	8 & 12	6	14	—
		9	9	14	—
		11	—	—	14
	Attendant Console Switched Loops	8 & 12	—	84	—
		9	54	90	—
		11	—	—	90
	Attendant Console DSS Groups	8 & 12	—	32	—
		9	18	32	—
		11	—	—	64
	Attendant Conference Circuits	8 & 12	—	6	—
		9	2	2	—
		11	—	—	6

See note and footnotes at end of table.

TABLE B (Contd)

"DIMENSION" 600 PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)		
			B	C	D
System (Contd)	ECTS Controllers	8 & 12	—	8	—
		11	—	—	8
	ECTS Station Sets	8 & 12	—	500	—
		11	—	—	800
	Custom Intercom Numbers	8 & 12	—	1000	—
		11	—	—	1280
	Station Line Records	8 & 12	—	1216†	—
		9	832	1216†	—
		11	—	—	2944†
	Speed Calling Numbers	8 & 12	—	1000	—
		11	—	—	2000
	Calling Number Display‡	8 & 12	—	6	—
		9	9	11	—
		11	—	—	13
	Long Distance Billing Journal Printers	9	9	15	—
		11	—	—	15
	Assignable Software Input/Output Data Channels§	8 & 12	14	28	—
		9	28	28	—
		11	—	—	30
	Peripheral Interface Circuits	9	12	18	—
		11	—	—	18
	Remote Access Trunks	8 & 12	—	30	—
		11	—	—	45

See note and footnotes at end of table.

▶TABLE B◀(Contd)

"DIMENSION" 600 PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)		
			B	C	D
System (Contd)	Release Link Trunks (Outgoing)	8 & 12	—	16	—
		11	—	—	16
	Release Link Trunks (Incoming)	8 & 12	—	110	—
		11	—	—	110
Traffic	Trunk Groups¶	8 & 12	—	99	—
		9	99	99	—
		11	—	—	99
	Message Register Trunks	9	128	192	—
		11	—	—	192
	OTQ SMDR Digit Records	8 & 12	—	246	—
		11	—	—	382
	Assignable Trunk Records**	8 & 12	—	563	—
		9	242	311	—
		11	—	—	993
	SMDR Records	8 & 12	—	298	—
		11	—	—	562
	Dial Pulse and TOUCH-/TONE Calling Originating Registers	8 & 12	—	82	—
		9	24	31	—
		11	—	—	120
	Total Originating Register Records††	8 & 12	—	82	—
		9	35	53	—
		11	—	—	141

See note and footnotes at end of table.

TABLE B (Contd)

"DIMENSION" 600 PBX SYSTEM PARAMETERS

ITEM		FEATURE PACKAGE	MAXIMUM PER MEMORY CONFIGURATION (NOTE)		
			B	C	D
Traffic (Contd)	Total Trunks Records ††	8 & 12	—	736	—
		9	338	456	—
		11	—	—	1231
	Total Memory Circuit Packs (16K/64K/256K Words Each)	8 & 12	—	16/4/4	—
		9	11/3/NA	12/3/NA	—
		11	—	—	NA/8/NA
	Quantity of Memory Words Required	8 & 12	—	256K	—
		9	176K	192K	—
		11	—	—	512K

Note: Maximum capacity is shown. Maximum quantities of both lines and trunks cannot be provided in the same system.

* Feature Package 8 PBXs that are equipped with Deluxe Queuing and Interposition Calling features reduce the maximum number of consoles shown in the table by two.

† Memory required for dual-bus system.

‡ The maximum number of I/O channels (LC34 or LC366 circuits) that can be assigned to attendant consoles, ECTS controllers, and the calling number display units is contingent upon the number of attendant consoles, the number of ECTS controllers, and the number of calling number displays if time of day and RMATS, SMDR, or a LSU is being used. Refer to Section 554-111-630 DIMENSION 600/2000/Custom PBX Processor Community Engineering for additional information.

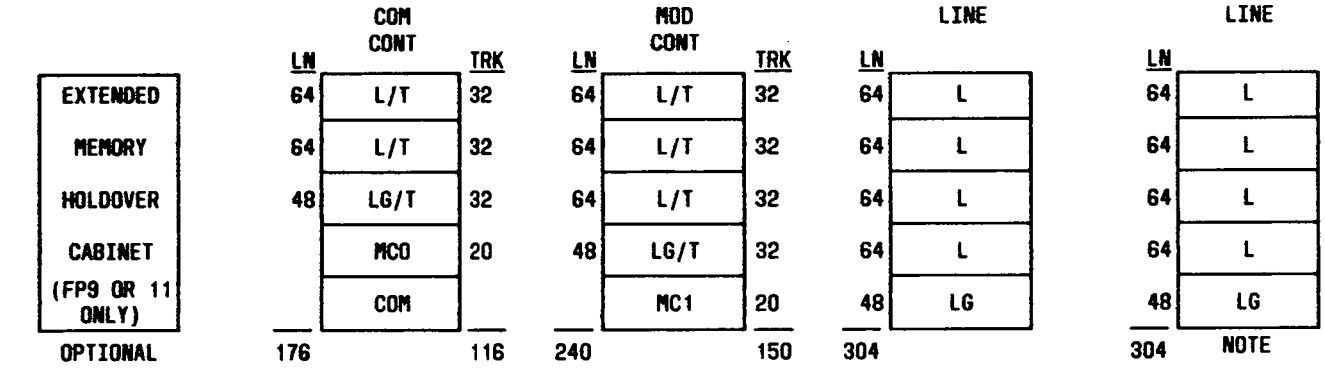
§ With 16KC memory, the I/O channels would be 14.

¶ Trunk groups for Issue 3, FP8 increases from 99 to 255.

** Trunk groups 1-17 are dedicated trunk groups.
Trunk groups 18-99 or 18-255 can be administered as required.

†† Sum of consoles, attendant conferences, and station dial records.

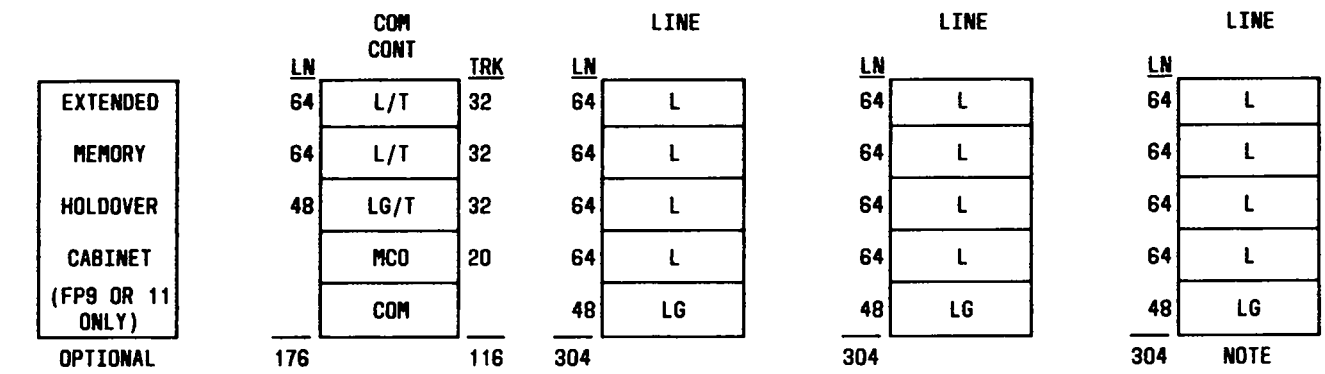
‡‡ Sum of console switched loops, physical trunk records, intercom records and queue lengths, ANI queue records, and total originating register records.



MINIMUM LINES - 48 WITH 84 TRUNKS - SINGLE BUS (400E/600 PBX)
- 48 WITH 234 TRUNKS - DUAL BUS (600 PBX)

MAXIMUM LINES - 746 WITH 20 TRUNKS - SINGLE BUS (400E PBX)
- 1020 WITH 20 TRUNKS - SINGLE/DUAL BUS (600 PBX)

MAXIMUM TRUNK CONFIGURATION - SINGLE OR DUAL BUS



MINIMUM LINES - 48 WITH 84 TRUNKS (400E/600 PBX)

MAXIMUM LINES - 746 WITH 20 TRUNKS (400E PBX)
- 1084 WITH 20 TRUNKS (600 PBX)

MAXIMUM LINE CONFIGURATION - SINGLE BUS ONLY

NOTE: NA AS STANDARD OFFERING ON 400E PBX, STANDARD ON 600 PBX.

Fig. 7—Trunk and Line Configuration

module control carriers). A second LC102 is also required in each line group control carrier, plus an additional LC204. A total of two LC204 circuit packs are required.

2.22 The software changes required for the activation of the second time slot bus cannot be administered by the Maintenance and Administration Panel (MAAP). The 4-cabinet system may be ordered new with the second bus activated or may have the second bus activated through "blowback" procedures. This requires sending a copy of the existing tape with up-to-date translations to Western Electric.

2.23 The two-bus configuration must have one module control cabinet (Fig. 6), a control cabinet (Fig. 4), and may have one or two line cabinets (Fig. 5). For maximum line circuits, this configuration can provide 1020 lines and 20 trunks (with C memory). With maximum trunk capacity, this configuration can provide 266 trunks and 608 lines (with C memory). The two-bus system provides a switching capacity of 3672 CCS.

2.24 The 400E DIMENSION PBX is available using FP7 or 9. The 600 DIMENSION PBX is available using FP8, 9, 11, or 12. The configurations of DIMENSION 400E/600 PBXs, with respect to feature packages, single bus, dual bus, and the (number of) cabinet arrangements, are given in Table C.

TABLE C

"DIMENSION" 400E/600 PBX CONFIGURATION

SYSTEM CONFIGURATION	DIMENSION 400E PBX	DIMENSION 600 PBX
1-Cabinet System	Yes	Yes
2-Cabinet System	Yes	Yes
3-Cabinet System	Yes	Yes
4-Cabinet System	No	Yes
Single Time Slot Bus (1672 ccs)	Yes	Yes
Dual Time Slot Bus (3672 ccs)	No	Yes
Feature Package 7	Yes	No
Feature Package 8	No	Yes
Feature Package 9	Yes	Yes
Feature Package 11	No	Yes
Feature Package 12	No	Yes

3. FEATURES AND SERVICES

3.01 ▶A brief description of features and services including major hardware items available with DIMENSION 400E/600 PBXs is provided in alphabetical order in this Part. A detailed description is provided for the more complex features and services. Additional feature information, if needed, is available in specific Feature Documents (FDs), Sections 554-191-XXX. Feature Document Reference Guide, Section 554-191-100, provides an alphabetical listing of the features and a numerical index for the individual FDs.

3.02 Table D provides an alphabetical listing of the features, the associated FP numbers, the issue of the program generic software that introduced the feature and indicates those features requiring hardware considerations or engineering.

3.03 Table E provides a listing of all Electronic Custom Telephone Service (ECTS) features. Descriptions and related information on the ECTS features is available in specific FDs as listed in the Feature Document Guide, Section 554-191-100.

INCREMENTAL MARKETING OF FP8 FEATURES

3.04 Currently, for DIMENSION 600 PBX systems, FP8 is marketed in two distinct increments. They are comprised of dot issues of Issue 1, and 3. All of the features currently marketed in the Issue 1 FP8 software base are shown on Table D with a "1" under the FP8 column. New features released with Issue 3 are also shown on Table D with a 3 in the FP8 column. The Issue 3 software of FP8 for DIMENSION 600 PBXs includes all features released with FP8, Issue 1 with the exception of Direct Department Calling, and Uniform Call Distribution including the Force Administration Data System (FADS).

3.05 The new Issue 3 software of FP8 will reside on either of two software bases. One of the bases is the current Issue 1 of FP8 which is referred to as

◗TABLE D◖

FEATURES AVAILABLE IN "DIMENSION" 400E/600 PBXs

FEATURE NAME	TYPE "DIMENSION" PBX					HARDWARE CONSIDERATIONS
	400E	600	400E/600	600	600	
	FEATURE PACKAGE NO.					
	7	8	9	11	12	
ADVANCED PRIVATE LINE TERMINATION (APLT)	1	1		1	1	
ALPHANUMERIC DISPLAY FOR ATND POSITION	1	1	1	1	1	X
ATTENDANT CONFERENCE	1	1	1	1	1	X
ATTENDANT CONSOLE	1	1	1	1	1	X
ATTENDANT CONTROL OF TRUNK GROUP ACCESS	1	1	1	1	1	
ADSS/BLF	1	1	1	1	1	X
- WITH EXTENDED DSS		1	1	1	1	
ATTENDANT LOCKOUT	1	1	1	1	1	
ATTENDANT RELEASE LOOP		1		1	1	
ATTENDANT TRANSFER - ALL CALLS	1	1	1	1	1	
AUTHORIZATION CODE		1				
AUTOMATIC ALTERNATE ROUTING (AAR)		1				
AUTOMATIC CALLBACK - CALLING	1	1		1	1	
AUTOMATIC CIRCUIT ASSURANCE (ACA)		1				X
AUTOMATIC IDENTIFIED OUTWARD DIALING (AIOD)	1	1	1	1	1	X
AUTOMATIC MESSAGE WAITING		3				X
AUTOMATIC OVERFLOW TO DIRECT DISTANCE DIALING (ODD)		1				
AUTOMATIC ROUTE SELECTION (ARS)	1			1	1	X
AUTOMATIC ROUTE SELECTION - DELUXE		-				
- WITH TIME OF DAY ROUTING		1				
- CLOCKED MANUAL OVERRIDE		1				
- CONTROLLED ALTERNATE FACILITIES RESTRICTION LEVELS		1				
- SPLIT ROUTING OF 0 AND 01X CALLS		1				
AUTOMATIC STATION RESTRICTION			1	1		
AUTOMATIC WAKEUP SERVICE			1	1		X
AUTOVON ACCESS	1	1		1	1	X
BED STATUS AND SELECTION			1	1		
BUSY LAMP FIELD	1	1	1	1	1	X
BUSY VERIFICATION OF STATION LINES	1	1	1	1	1	
CALL COVERAGE		3				
CALL FORWARDING	-	-	-	-	-	
- ALL CALLS	1	1	1	1	1	
- ALL CALLS - REMOTE		3				
- ALL CALLS - OVERRIDE		1			1	
- BUSY AND DON'T ANSWER	1	1		1	1	
- DON'T ANSWER	1	1		1	1	
CALL HOLD	1	1	1	1	1	
CALL PARK	1	1	1	1	1	

NOTE: PBXs WITH FP7 HAVE ONLY THE SINGLE BUS ARRANGEMENT. ONLY 400E PBXs CONTAIN FP7. PBXs WITH FPs 8, 9, 11, OR 12 MAY HAVE THE SINGLE OR DUAL BUS ARRANGEMENT.

TABLE D (Contd)

FEATURES AVAILABLE IN "DIMENSION" 400E/600 PBXs

FEATURE NAME	TYPE "DIMENSION" PBX					HARDWARE CONSIDERATIONS
	400E	600	400E/600	600	600	
	FEATURE PACKAGE NO.					
	7	8	9	11	12	
CALL PICKUP	1	1	1	1	1	
CALL WAITING	-	-	-	-	-	
- ATND CALL WAITING	1	1	1	1	1	
- ORIGINATING CALL WAITING	1	1	1	1	1	
- TERMINATING CALL WAITING	1	1	1		1	
CALLING NUMBER DISPLAY TO ATND	1	1	1	1	1	X
CALLING NUMBER DISPLAY TO STATION	1	1	1	1	1	X
CENTRALIZED ATND SERVICE		-		-	-	
- COMBINED PBX/ATND CONCENTRATOR		1		1	1	X
- W/SEPARATE ATND CONCENTRATOR		1		1	1	X
- W/FORCE ADMINISTRATION DATA SYSTEM (FADS)		1		1	1	
CLASS-OF-SERVICE DISPLAY TO ATTENDANT	1	1	1	1	1	X
CODE CALLING ACCESS	-	-	-	-	-	
- 3A	1	1	1	1	1	X
- CHIME PAGING		1		1	1	X
CODE RESTRICTION	1	1	1	1	1	
COMMON CONTROL SWITCHING ARRANGEMENT ACCESS	1	1		1	1	X
COMMUNICATION INTERFACE FOR PROPERTY MANAGEMENT SYSTEM			1	1		
- CALLING NUMBER DISPLAY OVER CIPMS			1	1		
- ROOM/BED CHANGE/SWAP OVER CIPMS			1	1		
- WITH DATA ENTRY BY TELEPHONE OVER CIPMS				1		
CONTROLLED OUTWARD RESTRICTION	1	1	1	1	1	
CONTROLLED STATION-TO-STATION RESTRICTION	1	1	1	1	1	
CONTROLLED TERMINATION RESTRICTION	1	1	1	1	1	
CONTROLLED TOTAL RESTRICTION	1	1	1	1	1	
CUSTOM INTERCOM	1	1		1	1	
CUSTOMER ADMINISTRATION CENTER SYSTEM (CACS)		1			1	X
CUSTOMER ADMINISTRATION PANEL	1	1	1	1	1	X
DATA COMMUNICATION ACCESS	1	1	1	1	1	X
- WITH DID CAPABILITY		1		1	1	
DATA PRIVACY	1	1	1	1	1	
DATA RESTRICTION	1	1	1	1	1	
DATA SWITCHING	-	-	-	-	-	
- LEVEL 1	1	1	1	1	1	X
- LEVEL 2		3				X

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◗TABLE D◖ (Contd)

FEATURES AVAILABLE IN "DIMENSION" 400E/600 PBXs

FEATURE NAME	TYPE "DIMENSION" PBX					HARDWARE CONSIDERATIONS
	400E	600	400E/600	600	600	
	FEATURE PACKAGE NO.					
	7	8	9	11	12	
DELUXE QUEUING		1				X
DIAL ACCESS TO ATND	1	1	1	1	1	
"DIMENSION" PBX ELECTRONIC CUSTOM TELEPHONE SERVICE (TABLE E)	1	1		1	1	X
DIRECT DEPARTMENT CALLING		1		1	1	X
DIRECT INWARD DIALING (DID)	1	1	1	1	1	
DIRECT OUTWARD DIALING (DOD)	1	1	1	1	1	
DIRECT TRUNK GROUP SELECTION	1	1	1	1	1	
DIRECTORY SERVICE		3				X
DISTINCTIVE RINGING	1	1	1	1	1	
DISTRIBUTED COMMUNICATIONS SYSTEM (DCS)		3				X
EMERGENCY ACCESS TO ATTENDANT				1		
ENERGY COMMUNICATIONS SERVICE (ECS)			1	1		X
ENHANCED UNIFORM CALL DISTRIBUTION (EUCD)		3				
EXECUTIVE OVERRIDE	1	1		1	1	
EXTENDED MEMORY HOLDOVER			1	1		
FACILITIES ADMINISTRATION AND CONTROL		1				
FACILITIES ASSURANCE REPORTS		1				
FACILITY RESTRICTION LEVEL		1		1	1	
FIVE DIGIT DIALING		3				
FLEXIBLE NUMBERING OF STATIONS	1	1	1	1	1	X
FLEXIBLE NUMBERING OF STATIONS-MIXED NUMBERING			1	1	1	
FORCE ADMINISTRATION DATA SYSTEM (FADS)		1		1	1	
FOREIGN EXCHANGE CENTRAL OFFICE ACCESS	1	1	1	1	1	X
- WITH VOICE SWITCHED GAIN (VSG)		1		1	1	
FULLY RESTRICTED STATION	1	1	1	1	1	
HOT LINE SERVICE			1	1		
HOTEL/MOTEL OR HOSPITAL CONSOLE/TERMINAL		1	1	1		X
IN-DIALING THROUGH MAIN		1				X
INCOMING CALL IDENTIFICATION	1	1	1	1	1	X
INTER-PBX CALL TRANSFER		1				X
INTER-PBX COORDINATED STATION NUMBERING		1				
INTERCEPT TREATMENT	-	-	-	-	-	
- ATTENDANT	1	1	1	1	1	
- TONE	1	1	1	1	1	
- RECORDED ANNOUNCEMENT	1	1		1	1	X
INTERFACE FOR LONG DISTANCE BILLING			1	1		X
INTERFACE TO NCOSS - LOCAL STORAGE UNIT (LSU)		1				X

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TABLE D (Contd)

FEATURES AVAILABLE IN "DIMENSION" 400E/600 PBXs

FEATURE NAME	TYPE "DIMENSION" PBX					HARDWARE CONSIDERATIONS
	400E	600	400E/600	600	600	
	FEATURE PACKAGE NO.					
	7	8	9	11	12	
INTERPOSITION CALLING AND TRANSFER	1	1	1	1	1	
INWARD RESTRICTION	1	1	1	1	1	
JOURNAL PRINTERS			1	1		X
LEAVE WORD CALLING		3				
LINE LOCKOUT WITH WARNING	1	1	1	1	1	
LISTED DIRECTORY NUMBER SERVICE	1	1	1	1	1	
- WITH VOICE SWITCHED GAIN (VSG)		1		1	1	X
LOCAL CALL BILLING			1	1		X
LOUDSPEAKER PAGING	-	-	-	-	-	
- BASIC	1	1	1	1	1	X
- DELUXE	1	1	1	1	1	X
- WITH TIE TRUNK ACCESS ALLOWED		1			1	
MAIN/SATELLITE		1				X
MANUAL ORIGINATING LINE SERVICE			1	1		
MANUAL TERMINATING LINE SERVICE	1	1	1	1		
MESSAGE CENTER SERVICE		3				X
MISCELLANEOUS TRUNK RESTRICTION	1	1	1	1	1	
MULTIPLE LDN (DID & NON DID)	1	1	1	1	1	
MUSIC ON HOLD ACCESS	1	1	1	1	1	
NIGHT CONSOLE POSITION	1	1	1	1	1	X
NIGHT STATION SERVICE	-	-	-	-	-	
- FIXED SERVICE	1	1	1	1	1	
- FULL SERVICE	1	1		1	1	
OFF-PREMISES STATIONS	1	1	1	1	1	X
OFF-PREMISES STATIONS WITH CALL CONTROL	1	1	1	1	1	X
ORIGINATION RESTRICTION	1	1	1	1	1	
OUTGOING TRUNK QUEUING	1					
OUTWARD RESTRICTION	1	1	1	1	1	
POWER FAILURE TRANSFER	1	1	1	1	1	X
PRIVACY AND LOCKOUT	1	1	1	1	1	
RADIO PAGING ACCESS	1	1	1	1	1	
RECALL DIAL TONE	1	1	1	1	1	

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TABLE D (Contd)

FEATURES AVAILABLE IN "DIMENSION" 400E/600 PBXs

FEATURE NAME	TYPE "DIMENSION" PBX					HARDWARE CONSIDERATIONS
	400E	600	400E/600	600	600	
	FEATURE PACKAGE NO.					
	7	8	9	11	12	
RECORDED TELEPHONE DICTATION ACCESS	1	1	1	1	1	X
REMOTE ACCESS TO PBX SERVICES	-	-	-	-	-	
- VIA AUTHORIZATION CODES		1				
- WITH TIME-OUT TO ATTENDANT		1				X
- WITH VOICE SWITCHED GAIN		1		1	1	X
RESERVE POWER	1	1	1	1	1	
ROOM STATUS AND SELECTION			1	1		X
- ROOM CHANGE/SWAP			1	1		
- UP/DOWN ROOM SEARCH			1	1		
ROTARY DIAL CALLING	1	1	1	1	1	
ROUTE ADVANCE	1	1	1	1	1	
SERIAL CALL	1	1	1	1	1	
SINGLE DIGIT DIALING			1	1		
SPEED CALLING	1	1		1	1	
SPLIT ACCESS TO OUTGOING TRUNKS			1	1		
SPLITTING - ONE-WAY AUTO/MANUAL	1	1	1	1	1	
STATION HUNTING	-	-	-	-	-	
- TERMINAL	1	1	1	1	1	
- CIRCULAR	1	1	1	1	1	
STATION MESSAGE DETAIL RECORDING (SMDR)	1	1		1	1	X
STATION NUMBER STEERING		1		1	1	
STATION REARRANGEMENT AND CHANGE	1	1	1	1	1	
STATION-TO-STATION CALLING	1	1	1	1	1	
STRAIGHTFORWARD OUTWARD COMPLETION	1	1	1	1	1	
SWITCHED LOOP OPERATION	1	1	1	1	1	
TANDEM TIE TRUNK SWITCHING	1	1		1	1	X
TERMINATION RESTRICTION	1	1	1	1	1	
THREEWAY CONFERENCE TRANSFER	1	1	1	1	1	
- WITH TRUNK-TO-TRUNK TRANSFER		1		1	1	
THROUGH DIALING	1	1	1	1	1	
TIE TRUNK ACCESS	1	1	1	1	1	X
TIME-OF-DAY SYNCHRONIZATION		1	1	1	1	X
TIMED RECALL ON OUTGOING CALLS	1	1		1	1	
TIMED REMINDER	1	1	1	1	1	
- WITH AUDIBLE SIGNAL	1	1	1	1	1	

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▶TABLE D◀ (Contd)

FEATURES AVAILABLE IN "DIMENSION" 400E/600 PBXs

FEATURE NAME	TYPE "DIMENSION" PBX					HARDWARE CONSIDERATIONS
	400E	600	400E/600	600	600	
	FEATURE PACKAGE NO.					
	7	8	9	11	12	
TOLL RESTRICTION	-	-	-	-	-	
- BATTERY REVERSAL	1	1	1	1	1	
- O/1	1	1	1	1	1	
- WITH TOLL RESTRICTION FOR TIE TRUNK	1	1	1	1	1	
TOLL TERMINAL ACCESS			1	1		X
"TOUCH-TONE" CALLING	1	1	1	1	1	
"TOUCH-TONE" DIALING SENDERIZED OPERATION	1	1		1	1	
"TOUCH-TONE" DIALING TO DIAL PULSE CONVERSION	1	1	1	1	1	
TRAFFIC DATA TO CUSTOMER		1		1	1	X
TRAVELING CLASS MARK		1				
TRUNK ANSWER FROM ANY STATION (TAAS)	1	1	1	1	1	X
TRUNK GROUP BUSY INDICATOR ON ATTENDANT POSITION	1	1	1	1	1	
TRUNK GROUP WARNING INDICATOR ON ATTENDANT POSITION	1	1	1	1	1	
TRUNK IDENTIFICATION BY ATTENDANT		1			1	
TRUNK-TO-TRUNK CONNECTIONS	1	1	1	1	1	
TRUNK VERIFICATION BY CUSTOMER	1	1		1	1	
TRUNK VERIFICATION BY STATION		1		1	1	
TWO-PARTY HOLD ON CONSOLE	1	1	1	1	1	
UNIFORM CALL DISTRIBUTION (UCD)		1		1	1	X
- WITH FORCE ADMINISTRATION DATA SYSTEM (FADS)		1		1	1	
UNIFORM NUMBERING		1		1		
UNINTERRUPTIBLE POWER SERVICE (UPS)	1	1	1	1	1	X
VISUALLY IMPAIRED ATTENDANT SERVICE	1	1			1	
WATS ACCESS	1	1	1	1	1	
WIDE FREQUENCY TOLERANT POWER PLANT	1	1	1	1	1	X

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Electronic Tandem Switching (ETS). The second base is comprised of what is now FP12, Issue 1. The base is referred to as Deluxe Voice. Current planning calls for a controlled release of the new Issue 3 software and hardware and the subsequent rating of FP8 and FP12, Issue 1, software to "A&M" only. Three new optional service offerings are introduced in Issue 3. They are:

- Applications Processor (AP) including Directory/Message Center Service
- Data Switching Level 1 and Level 2
- Distributed Communications System (DCS)

The Issue 3 software may be provided with or without the optional services. The deluxe voice software base will be available with the AP and/or Data Switching Service offerings. It will not be available with DCS. The ETS software base will be available with any combination of the three service offerings.

3.06 The Issue 3 of FP8 includes several new features not available with FP8/FP12 Issue 1. These features are:

(a) Automatic Message Waiting

(b) Call Coverage

(c) Enhanced Uniform Call Distribution

(d) Five-Digit Dialing

(e) Leave-Word Calling

3.07 The Issue 3 software includes additional capabilities for several Issue 1, FP8/FP12 features. It also includes additions to the software base not included in Issue 1. The additional feature capabilities are:

(a) ARS Deluxe

- Number of 6-digit tables expanded from 32 to 64
- Ten-digit ARS Deluxe to 7-digit AAR conversion

(b) Automatic Overflow to DDD

- Allows subnet trunking to systems with stations numbered with a zero thousands digit

(c) Call Forwarding All Calls - Remote

- Provides the capability for stations to call forward to a number outside the PBX

(d) Speed Calling

- Adds expanded Speed Calling for International Direct Distance Dialing (IDDD) numbers.

Descriptions of these additional capabilities are included with the feature descriptions provided in this Part.

3.08 The quantity of trunk groups is increased with the Issue 3 software base from the previous limit of 99 to a limit of 255. This increases the number of off-premises stations and foreign exchange (FX) groups available to trunking. The increase supports the addition of the Data Switching feature, the use of a single trunk group for each recorded announcement and off-premises station, and the need by large system for more FX lines.

◆TABLE E◆

"DIMENSION" PBX ELECTRONIC CUSTOM TELEPHONE SERVICE (ECTS) FEATURES, FEATURE PACKAGES 7, 8, 11 AND 12

FEATURE
Custom Calling Features
Automatic Callback - Calling
Call Forwarding - All Calls
Call Forwarding - All Calls - Override
Call Forwarding - Busy and Don't Answer
Call Hold
Call Pickup
Call Waiting Services
Executive Override
Last Extension Called
Key Service Features
Abbreviated and Delayed Ringing
Automatic Intercom
Bridged Call
Common Audible Ringing
Dial Intercom
Exclusive Hold
Hold
Idle Line Preference
I-Hold
Incoming Call Preference
I-Use Indication
Last Line Preference
Line Ringing
Line Status Indication
Manual Exclusion
Manual Intercom
Manual Signaling
Music On Hold Access
No Line Preference
PBX Line Access
Personal Central Office Line
Power Failure Transfer
Preselection
Prime Line Preference
Priority Hold
Recall Button
Ringing Line Preference
Ringing Transfer
Station Busy Indication
Station Direct Station Selection (DSS)
Station Message Waiting
Station Ringer Cutoff
Threeway Conference Transfer

3.09 Feature Package 8 systems which are now in operation with Issue 1 software can be upgraded to Issue 3 by application of the following new equipment:

- J58882AK control carrier
- KS21447 L12 minirecorder
- Data switching circuit packs LC566 and LC567

When the FP8, Issue 3 DCS or AP service options are provided, the J58882AK carrier must be equipped with the optional data communication interface unit (DCIU). Translations resident on the original minirecorder tape must be transferred to a List 12 minirecorder compatiable tape by the factory. Refer to Part 4, Physical Arrangements, for a description of the new equipment.◀

ADVANCED PRIVATE LINE TERMINATION (APLT)

3.10 This feature provides access to and termination from private switched networks. The private network may be a Common Control Switching Arrangement (CCSA) or Enhanced Private Switched Communications Service (EPSCS) network. The APLT provides for Network Inward Dialing, Direct Outward Dialing to the network, and other features similar to those provided on the public exchange network. The APLT trunks can tandem through the DIMENSION PBX without attendant assistance if the network has the Tandem Tie Trunk Switching feature. If off-net access is provided by the network, selected station lines can be denied off-net access.

ALPHANUMERIC DISPLAY FOR ATTENDANT POSITION

3.11 A visual display device is provided on the attendant position to display up to four digits, letters, or symbols as designated for the attendant display features. The display features include Calling Number Display to Attendant, Class-of-Service Display to Attendant, and Incoming Call Identification. ▶An 8-digit display is required when Five-Digit Dialing (FP8, Issue 3) is used with either an ETN or DCS configuration.◀

APPLICATIONS PROCESSOR (AP)

3.12 ▶The AP provides new feature capabilities to DIMENSION 600 PBXs equipped with Issue 3 of FP8. The AP is a multiprocessor that functions in either a stand-alone configuration for data processing or as a controller for intelligent peripherial devices. Special purpose applications software resident in the AP supports the following new PBX features that are available via the AP:

(a) Directory Service

(b) Message Center Service including:

- Call Coverage
- Leave-Word Calling
- Automatic Message Waiting

3.13 A brief description of each of the features is provided alphabetically under each feature name in this Part. Detailed descriptions and additional information on the features is provided in specific feature documents as listed in the Feature Document Reference Guide, Section 554-191-100.

3.14 A PBX equipped for AP features is shown in Fig. 8. The configuration consists of an AP with its associated terminals and printers, and the PBX equipped with an enhanced FP8, and station and terminal equipment. Analog station sets which may include models 500, 2500, and/or multibutton electronic telephone (MET) sets are required at the PBX. The analog sets provided to subscribers with the Automatic Message Waiting feature must be equipped with message waiting lamps.

3.15 The AP interfaces with the DIMENSION PBX via the data communications interface unit (DCIU). The DCIU is a carrier-mounted special purpose high-speed data link capable of operating at speeds up to 19.2 kilobits per second (kb/s). The AP to DIMENSION DCIU interface is provided by Electronic Industries Association (EIA) RS449 compatible ports. Since the DIMENSION PBX and the AP do not share a common equipment ground, a pair of local area data sets (LADS) is required at each end of the interface. The LADS units also extend the distance between the DIMENSION PBX and AP from 61 meters (200 feet) to 122 meters (400 feet). Since the LADS require an EIA RS232 interface, an adaptor is required for EIA RS449 to RS232 conversion as shown on Fig. 8. Transmit and receive tip and ring pairs provide the interface between the LADS.

3.16 The DCIU communicates with the PBX processor via the DCIU interface program (DIP)

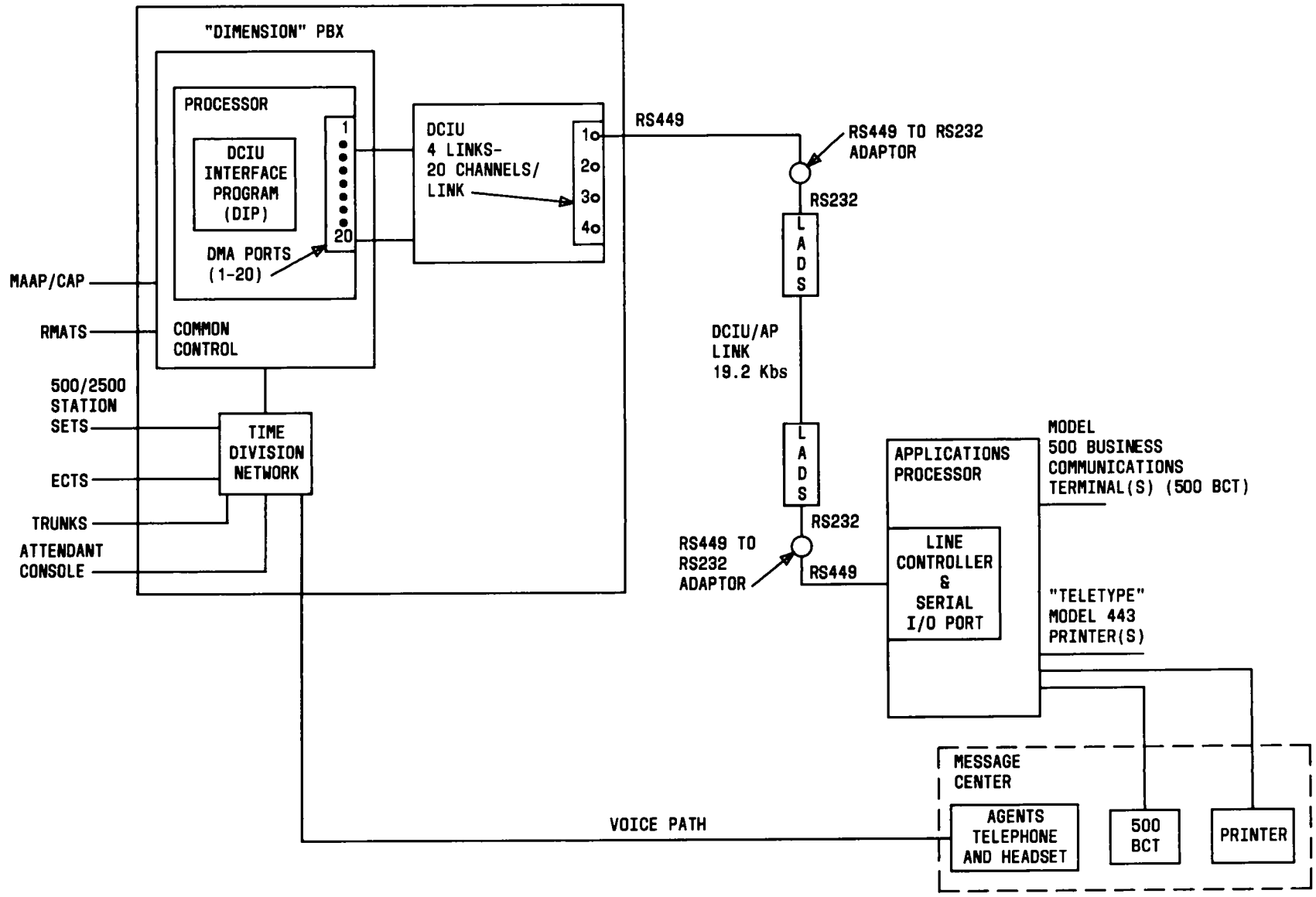


Fig. 8—Typical DIMENSION 600 PBX/Applications Processor Configuration

that resides in the processor. This program formats and generates an AP message and then enters the message in an appropriate Direct Memory Access (DMA) port storage area. The ports are the interface between the processor and DCIU and are used only by the processor or DCIU when messages are entered in a port storage area. The DCIU determines the location for which the message is destined and assigns the proper DCIU/AP link and associated channel within the link. At the AP, a line controller and compatible RS449 port provide the DCIU to AP interfaces.

3.17 A DIMENSION PBX equipped with an AP is administered remotely by RMATS and locally by the MAAP and CAP. The AP is administered locally through a model 500 Business Communications Terminal.

3.18 For additional information on the AP refer to Section 582-220-100, AP System Description.

ATTENDANT CONFERENCE

3.19 An attendant can establish a multiparty conference connection of up to six conferees in addition to the attendant. Not more than two trunks should be added to a conference. The conference circuit is accessed by using a direct trunk group select key. The Attendant Conference may be accessed and initiated from any attendant position. Two circuits cannot be bridged together. If at least one party on a conference call is a station, the attendant may release from the circuit. The attendant can be recalled by a station when required.

ATTENDANT CONSOLE

3.20 The Attendant Console is a desk-top position from which the attendant handles assistance calls by means of nonlocking keys. Keys are provided for each of the control functions and for the loops which appear on the position. All calls placed by the attendant to trunks and to station lines are made using the TOUCH-TONE* telephone dial provided or via the Attendant Direct Station Selection (ADSS) and Direct Trunk Group Selection features when available.

3.21 The Attendant Console is completely electronic, using light emitting diodes (LEDs) for indicator lamps and nonlocking keys for controls and loops. The console is designed for switched loop operation and can be provided with Attendant Direct Station Selection with Busy Lamp Field (ADSS/BLF) or with a busy lamp field only. A 4- or 8-character alphanumeric field, or six indicator lamps can be provided for incoming call identification. Two sizes of the Attendant Console can be provided and are similar in feature capabilities. Figure 9 shows a small Attendant Console. The large Attendant Console provides additional control and trunk group select keys. The LC366 is replaced by the LC366B when three or more consoles are assigned to a given LC366. The LC366 can be replaced by an LC34B when the LC366 is used as a dual-speed data channel.

3.22 The Attendant Console without the ADSS/BLF is 406 mm (16 inches) wide, 229 mm (9 inches) deep, 76 mm (3 inches) high in front, and 147 mm (5.8 inches) high at the rear. The Attendant Console with an ADSS/BLF measures 279 mm (11 inches) deep and 229 mm (9 inches) high at the rear. The Attendant Console is mounted on a 203-mm by 381-mm (8- by 15-inch) baseplate. The K1A handset or a headset is recommended for use by the attendant, but not simultaneously.

3.23 The console is equipped with a 2438-mm (8-foot) long, 12-pair mounting cord that is connected to a B12A (12-pair) or B25A (25-pair) distribution cable from the PBX. The mounting cord is equipped with a 50-pin KS-16689, List 1 connector, and the mating connector terminates the 12- or 25-pair distribution cable.

3.24 The length of the 12-pair cable is 213m (700 feet) and the length of the 25-pair cable is 300m (1,000 feet). This length can be extended to 3300m (11,000 feet) with attendant console repeaters. If a particular installation requires that a stub-ended console cable be used, an A25B cable should be used and cut down in the normal manner on the cross-connect field.

If the Attendant Console is located in a building other than the one in which the PBX is located, attendant console repeaters must be used.

3.25 For more detailed information on the Attendant Console, refer to Section 554-010-100.

ATTENDANT CONSOLE REPEATER

3.26 The attendant console repeater unit (Fig. 10) provides lightning protection and range ex-

*Trademark of AT&T.

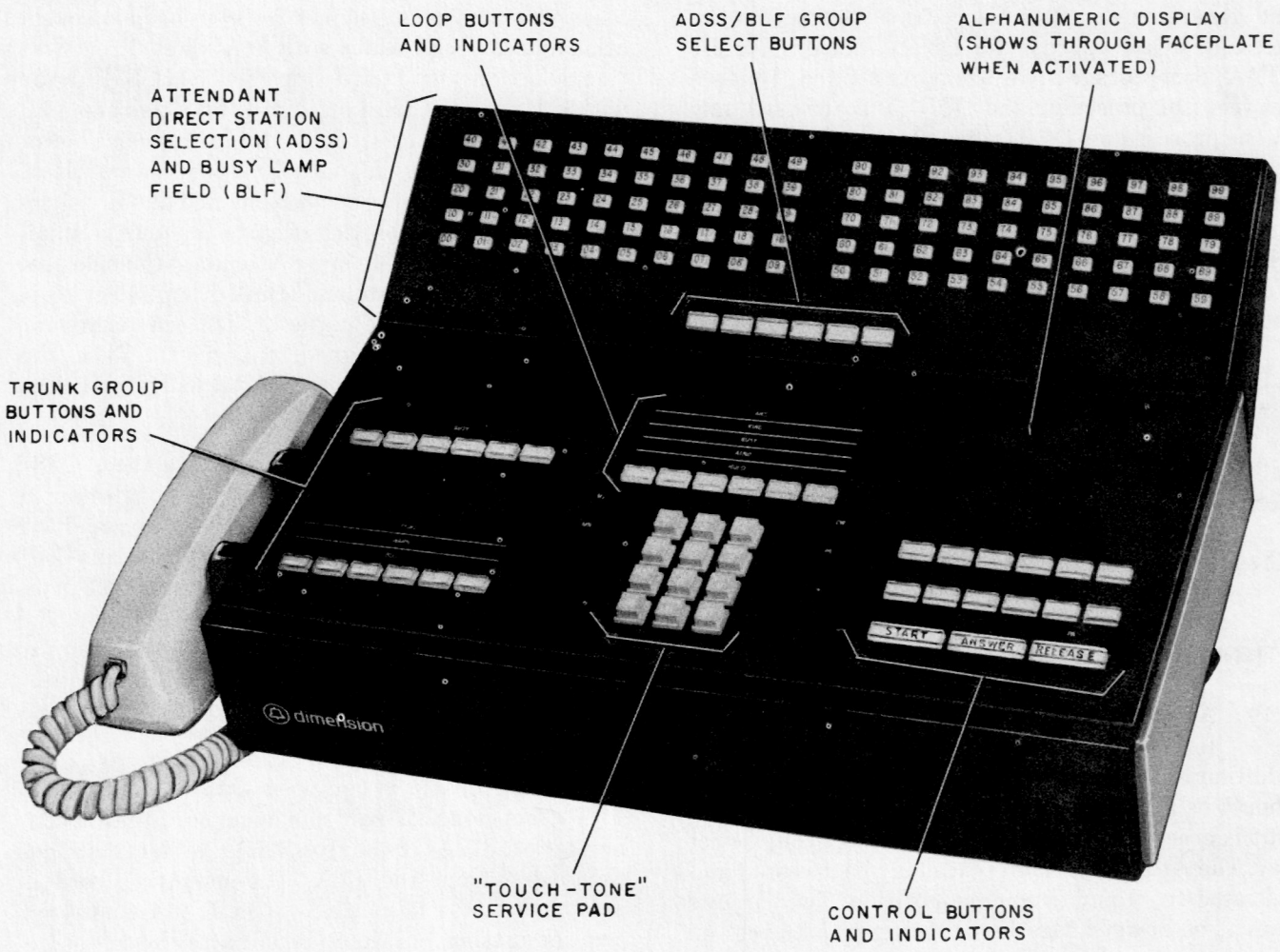


Fig. 9—PBX Attendant Console

tension for the Attendant Console low-speed data channel. The attendant console repeater can be used in two configurations:

- The attendant console repeater is used without range extension when the Attendant Console is located in a building different than the PBX and the distance is 300m (1000 feet) or less.

- The attendant console repeater is used with range extension when the Attendant Console is located more than 300m (1000 feet) from the PBX.

3.27 The repeater circuitry is housed in a modified key service unit approximately 240 mm (9-1/2 inches) wide by 430 mm (17 inches) long. This unit can be wall-mounted and must be connected to a 120-Vac 60-Hz outlet. A power cord (Lists A through D) is available in lengths from 610 mm (2 feet) to 3658 mm (12 feet). Each repeater unit can accommodate one attendant console repeater.

3.28 Application of the attendant console repeater is shown in Fig. 11. Two repeaters are used in series to connect the PBX to an attendant console located in a separate building approximately 900m (3,000 feet) away. Four attendant console repeaters can be used in series to extend the distance between the PBX and attendant console to 3300m (11,000 feet).

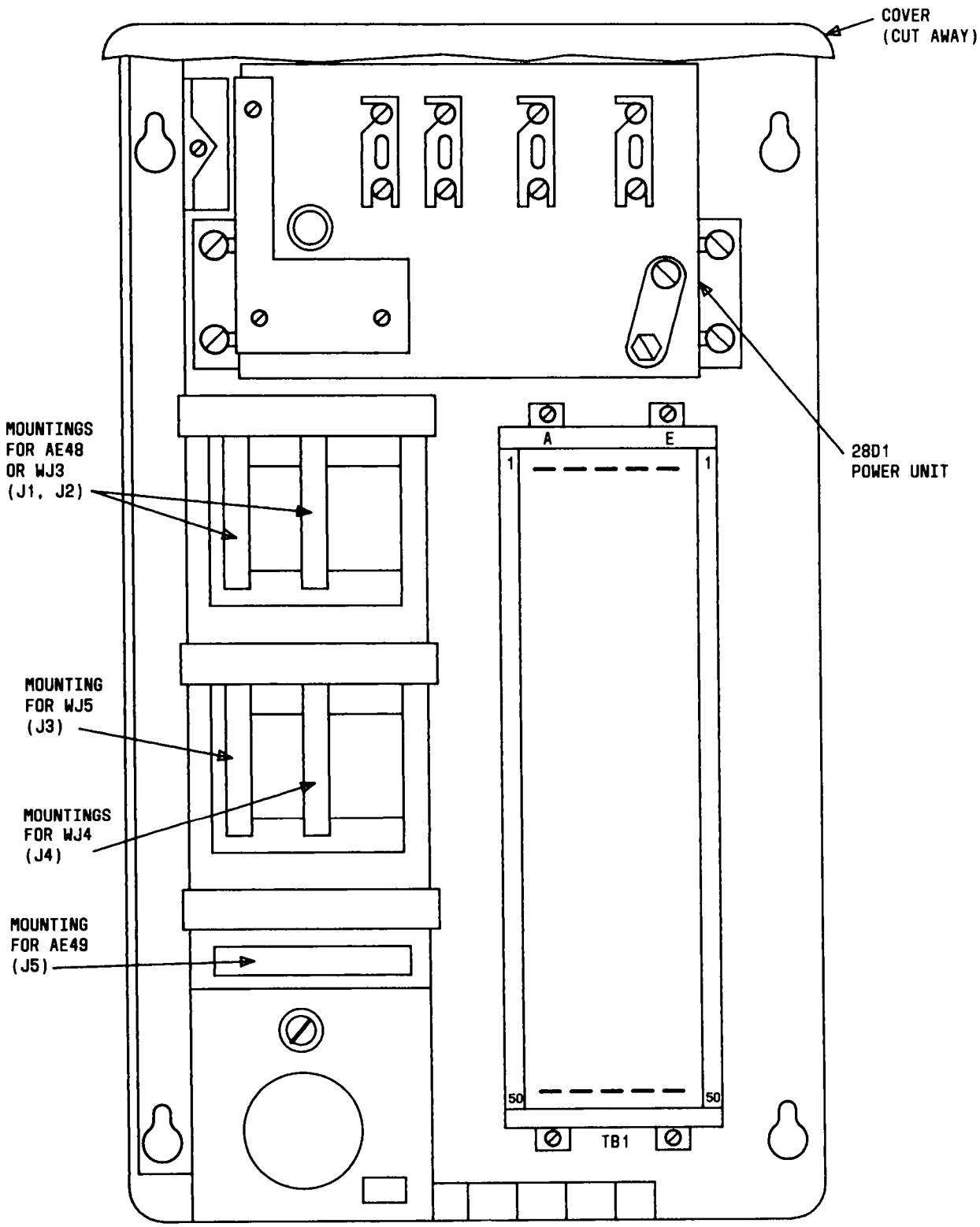
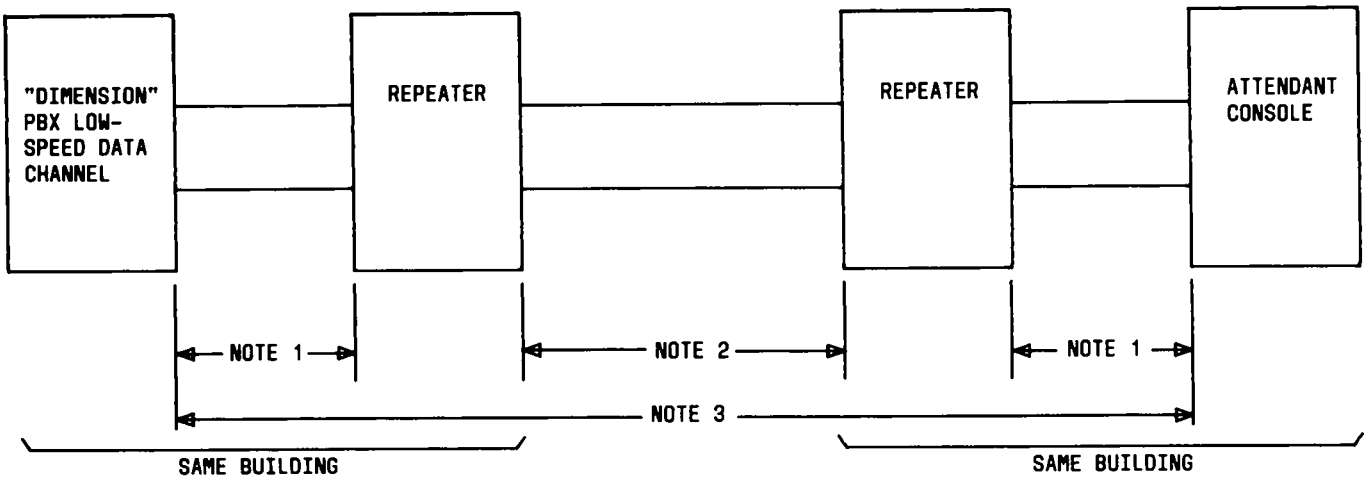


Fig. 10—Attendant Console Repeater



NOTES:
1. MAXIMUM DISTANCE FROM PBX TO REPEATER OR ATTENDANT CONSOLE TO REPEATER IS 300 m (1000 FEET).
2. MAXIMUM DISTANCE BETWEEN REPEATERS IS 900 m (3000 FEET). UP TO FOUR REPEATERS CAN BE USED IN SERIES.
3. MAXIMUM DISTANCE BETWEEN PBX AND ATTENDANT CONSOLE WITHOUT RANGE EXTENSION IS 300 m (1000 FEET).

Fig. 11—Attendant Console Repeater Arrangement

3.29 For more detailed information regarding the attendant console repeater, refer to Sections 554-010-100, 554-010-101, 554-010-104, and 554-105-101.

ATTENDANT CONTROL OF TRUNK GROUP ACCESS

3.30 An attendant can restrict dial access by all station lines to Central Office (CO), Foreign Exchange (FX), Wide Area Telephone Service (WATS), and/or tie trunk groups by dialing a code followed by the trunk group access code (or operation of a direct trunk group selection key when provided). Calls to groups so restricted will be routed to the attendant for subsequent completion or manual queuing.

3.31 When this feature is activated, access to a trunk group is only restricted if the controlled access code is dialed. Trunk groups appearing in more than one route advance sequence are accessible via a dial access code even if the other access codes are controlled. ▶With DCS (FP8, Issue 3) trunk group, selection keys can be assigned to trunk groups on other PBXs in the DCS.◀

ATTENDANT DIRECT STATION SELECTION WITH BUSY LAMP FIELD (ADSS/BLF)

3.32 This feature allows an attendant at a console to place or complete calls to stations within the PBX or to other PBXs in a main/satellite complex (FP8) by pressing a nonlocking pushbutton key associated with the desired station line. A visual indication of the busy or idle condition of the stations, with the exception of non-PBX stations, is provided via a Light Emitting Diode (LED) lamp associated with each numbered pushbutton. Direct Station Selection (DSS) keys and lamps are provided for only 100 station lines. When more than one hundreds group capability is desired, up to 18 group select keys are provided to allow preselection of the desired 100-line group. The average feature capacity console can be equipped with either 0 or 6 group select keys. The large feature capacity console can be equipped with 0, 6, or 18 group select keys.

3.33 ***With Extended DSS:*** When more than 18 hundreds groups are desired, extended DSS is provided to allow preselection of the desired thousands and hundreds group.

ATTENDANT LOCKOUT

3.34 The attendant is denied the ability to reenter an established connection held on an attendant position, unless recalled by a station user. The Two-Party Hold on Console feature is required for operation of this feature.

ATTENDANT RELEASE LOOP

3.35 This feature permits an incoming trunk call extended to an unanswered station to be held off-loop whenever the station is ringing or whenever attendant call waiting is provided for the call. This feature is effected by the attendant pressing the RELEASE key during ringing or after receipt of confirmation tone. A call unanswered within an administrable 0- to 98-second interval is placed in the attendant queue along with other waiting calls. The call, when served, is routed to an available console which may be different from the original console. These redirected calls are identified by an appropriate flashing RING or BUSY lamp on the applicable console.

ATTENDANT TRANSFER—ALL CALLS

3.36 A station user participating in any 2-party connection can call (recall) an attendant so that the attendant may transfer the call or provide other assistance as desired. A flash during any established call will return recall dial tone to the initiating station and hold the other party. The station user then dials the access code (usually dials "0") to call the attendant. If the call had been held on the console loop or the initiating station is a manual originating line, the flash will result in immediate attendant recall.

AUTHORIZATION CODE

3.37 The Authorization Code feature allows the user to dial a code which overrides the default Facility Restriction Level (FRL) associated with the originating local station, tie trunk, or attendant console (whenever the default FRL is insufficient to allow the call to continue). The system requests the authorization code by returning recall dial tone to the user. After dialing the authorization code, the authorization code translates to a new FRL which is used to route the call. As an alternative, certain incoming trunk groups can be administered such that they always require an authorization code, regardless of the value of the associated default FRL. The authorization code is recorded in the Station Message Detail Recording (SMDR) record of the call. Up to 9000 authorization codes may be provided per switch. This feature is used with the Automatic Route Selection—Deluxe and Automatic Alternate Routing feature.

3.38 Formerly, all 0 calls were routed over the same ARS-deluxe pattern. A split routing enhancement allows local operator calls (0) and international calls (01X) to route on different patterns. Formerly, an authorization code was never requested on 0 calls. An authorization code enhancement now allows an authorization code to be requested on 0 and (01X) calls if required, or if a higher FRL is needed to complete the call.

3.39 When all the digits have been dialed for a call requiring an authorization code, recall dial tone is returned to the user, who then dials an authorization code and waits 10 seconds for time-out, or dials # to cancel the time-out period. Dial 0 and 01X calls will be treated as any other call with respect to the Authorization Code feature. The FRL of the authorization code will be used to route the call. If alternate FRLs are in effect, they will be used.

3.40 Another enhancement involves Authorization Codes and Remote Access. An authorization code may be required in place of a barrier code on a remote access call. If an authorization code is required for remote access, an authorization code will not be requested for 0 and 01X purposes. An authorization code will never be requested more than once. The FRL, or alternate FRL, of the authorization code will be used to route the call.

AUTOMATIC ALTERNATE ROUTING (AAR)

3.41 This feature provides automatic routing of tie trunk calls over up to four alternate trunk groups. Facilities are selected in descending order of desirability for placing a particular call. The AAR is based on the Uniform Numbering Plan. It provides a convenient means of placing International Direct Distance Dialing (IDDD) calls by allowing the assignment of on-net numbers to specific foreign country locations. The AAR access code plus a uniform 4- to 7-digit number will result in the call being routed over the AAR route list. The objective of AAR is to make effective use of idle private network trunks.

3.42 TOUCH-TONE telephone senders (LC12) must be provided for AAR subnet trunking

calls even if the trunks are dial pulsed. The LC12 contains the TOUCH-TONE telephone senders and the precise dial tone detectors. The subnet program uses the detection of precise dial tone to cancel the programmed delays before sending, in order to prevent the degradation of the traffic handling capabilities of the PBX.

AUTOMATIC CALLBACK—CALLING

3.43 A station user calling a busy station line can be automatically connected to the called station when the station becomes idle. The non-electronic custom telephone service (non-ECTS) station user precedes the called number with an activation code and hangs up. When both are idle, the activating station is rung and, upon answer, the called station is rung. The activating station may originate or receive other calls while the feature is active. If the callback sequence is not successful within 20 to 40 minutes, the request is deactivated.

3.44 An ECTS station user can activate Automatic Callback—Calling by pressing the assigned button upon hearing a busy signal when calling another station. The automatic callback status lamp lights steadily, confirmation tone is heard, and the station hangs up to activate the feature.

3.45 ▶With DCS (FP8, Issue 3), a station user can activate the automatic callback feature toward a station in another PBX in the DCS.◀

AUTOMATIC CIRCUIT ASSURANCE (ACA)

3.46 This feature assists the customer in identifying possible trunk malfunctions. The PBX maintains a record of the performance of individual trunks relative to short-holding-time calls and long-holding-time calls. A significant increase in the number of short calls, or one long call of several hours duration, may indicate a trunk failure. When a possible failure is detected, a referral call is initiated to the PBX attendant. The attendant may test the trunk in question by using the trunk verification by customer feature. Trunks may also be tested by using the Trunk Verification by Station feature.

3.47 When the Attendant Console is placed in night service, all timing of calls will continue and all subsequent calls will be timed normally. No referrals will be sent to an attendant in night service, but a record of the referral is made in the audit trail. The referral value which was previously fixed at 24 is now administrable by trunk groups, using the CAP or by the telephone company. When the short call counter for a trunk reaches the referral value assigned for its trunk group, a referral is generated.

3.48 ▶With DCS (FP8, Issue 3), this feature will create referral calls from trunks in other PBXs in the DCS.◀

AUTOMATIC IDENTIFIED OUTWARD DIALING (AIOD)

3.49 Automatic Number Identification (ANI) of station lines is provided on outgoing calls in conjunction with Automatic Message Accounting (AMA) facilities at the serving central office (CO). This permits individual station billing on toll calls and the equivalent on Common Control Switching Arrangement (CCSA) calls. A limit of two COs can be connected to receive AIOD information (one for CO calls and the other for CCSA calls). The system may be arranged for five types of individual billing numbers:

(a) ***Individual Station Billing:*** Toll calls placed by stations are billed to an individual station.

(b) ***Auxiliary Station Billing:*** Toll calls placed by a group of stations or by remote access trunks may be billed to an auxiliary billing number.

(c) ***Auxiliary Trunk Billing:*** Toll calls placed by tie trunks may be billed to an auxiliary billing number.

(d) ***Attendant Billing:*** Attendant originated or completed AIOD calls are billed to the Listed Directory Number (LDN).

(e) ***Failure Billing:*** All ANI failures are billed to the LDN.

AUTOMATIC MESSAGE WAITING (AMW)

3.50 ▶The AMW feature provides an automatic lamp indication on the subscriber's telephone which, when lighted, indicates that a message(s) has been left in the message center for the subscriber. The messages are the result of either the Leave-Word Calling or Call Coverage feature, or are message-center-initiated messages. When all messages have

been delivered to the subscriber and marked "delivered" in the message center data base, the AMW lamp will go dark.

3.51 Hardware required to support the feature includes multi-button telephone (MET) sets equipped with an AMW lamp; non-MET sets such as hotel/motel-type 500Y or 2500Y sets equipped with neon lamps; line circuits (LC03) which switch interrupted lamp lighting voltage (+90V, 60 ipm) to the station lines equipped with hotel/motel-type sets; and network buffer circuits (LC41) which provide the +90, 60 ipm message waiting power for the hotel/motel sets.◀

AUTOMATIC OVERFLOW TO DIRECT DISTANCE DIALING (DDD)

3.52 This feature provides optional routing of private network calls via off-net facilities from a point on the network where all on-net (tie trunk) routes are busy or none are provided. Off-net facilities available include WATS, FX, and/or CO trunk groups. The PBX selects the most preferred available route and code-converts the on-net destination code to either an LDN for attendant-seeking calls or to the DID number (where appropriate) for calls to a station. Off-net routes are listed in the AAR pattern. If no on-net routes are provided to a given destination, up to four off-net routes may be assigned.

3.53 ▶***Subnet Trunking to Systems With Zero Thousands Digits:*** Issue 3 of FP8 insures that calls destined for centrex station numbers beginning with "0" in the thousands digit be correctly routed to the stations rather than being routed to the centrex location attendant. Previously the "0" immediately following the on-network office code (RNX) for the centrex location was recognized as the code for the attendant at that RNX. In order to reach the centrex location attendant from another location on the network, the user must dial RNX-0111 or RNX-XXXX (last four numbers of LDN). A centrex station will not be numbered 0111.

AUTOMATIC ROUTE SELECTION (ARS)

3.54 This feature provides automatic routing of outgoing calls over an alternate customer facility based on the DDD number. The station user dials the ARS access code followed by a DDD number. The PBX routes the call over the first available trunk facility (such as WATS, off-net CCSA, or FX) checking in a customer-specified order. Any number translation necessary to route the call is performed. Overflow routing to the toll facilities is optional. If a non-toll ARS access code is dialed, the routing will not include toll facilities. The ARS incorporates the functions of and replaces the Code Restriction and route advance features for routes included in the ARS route patterns.◀

AUTOMATIC ROUTE SELECTION (ARS)—DELUXE

3.55 This feature provides automatic routing of outgoing calls over alternate customer facilities based on the call destination. The station user or PBX attendant dials a facilities access code (eg, "level 8"), followed by a DDD number. The PBX routes the call over the first available trunk facility (such as CO, WATS, FX, or other similar facility equipped to accept a DDD-like number) checking in a customer-specified order. The DDD overflow may be included as a final route. Alternate routes may also include tie trunks to a distant PBX equipped with an ARS-deluxe-like capability. When such routing is used, the Facility Restriction Level (FRL) associated with the call is transmitted to the distant PBX as a traveling class mark. The feature provides all number translation and supervision necessary to route the call. This includes the capability to route calls off-net via a main PBX. Incoming tie trunks from subtending locations (ie, main, satellite or tributary PBXs) may be arranged to have automatic access to ARS. This permits station users at these PBXs to dial just a single access code to use the ARS feature at the PBX.

A. With Time-of-Day Routing

3.56 The selection of first choice and alternate routes for off-network calls may vary depending on which of up to three plans are selected. Each plan may have up to 64 patterns. Each pattern may have up to 10 preferences. This permits the customer to take advantage of variations in long distance calling rates or traffic patterns as a function of time and week day. Both automatic and manual controls of ARS routing pattern selections are provided.

B. Clocked Manual Override

3.57 This feature permits the customer to program a future time and day to Interrupt the time-of-day routing and to use a customer-designated ARS plan until a later (customer-programmed) day and time reinstates normal time-of-day routing. The cus-

tomer controls this feature through the use of the Customer Administration Center System (CACS) or the Customer Administration Panel (CAP). In addition, this feature can be administered by the Maintenance and Administration Panel (MAAP).

C. Controlled Alternate Facilities Restriction Levels (FRLs)

3.58 Facilities Restriction Levels associated with stations and attendants, incoming tie trunks, remote access trunks, and authorization codes may be upgraded or downgraded in accordance with the predetermined alternative set of FRLs. The FRLs are controlled from either the Attendant Console, the CACS, or the CAP.

D. Split Routing of 0 and 01X Calls

3.59 Formerly, all 0 calls were routed over the same ARS-Deluxe pattern. A split routing enhancement provided in Issue 3 of FP8 allows local operator calls (0) and international calls (01X) to route on different patterns. This allows International Direct Distance Dialing (IDDD) calls to be routed over FX trunks in locations where the local central office is not capable of providing IDDD. Dial 0 and 01X calls will be treated as any other call with respect to the Authorization Code feature. The FRL of the authorization code will be used to route the call. If alternate FRLs are in effect, they will be used.

E. Number of 6-Digit Tables Expanded to 64

3.60 ▶Issue 3 of FP8 increases the number of 6-digit translation tables from 32 to 64. At a customer's option, 6-digit translation can be used to route calls within a numbering plan area via different routing patterns, depending on the office code (NXX).

F. Conversion of 10-Digit ARS Deluxe To 7-Digit AAR

3.61 Issue 3 of FP8 provides for the screening of selected 10-digit DDD calls originating at a DIMENSION FP8 PBX. At a customer's option, calls to each number or range of numbers will:

- Continue via ARS-Deluxe
- Be converted into a 7-digit AAR
- Be blocked and sent to intercept.◀

AUTOMATIC STATION RESTRICTION

3.62 This feature prevents unauthorized (and unaccountable) telephone calls from vacant hotel guest rooms/hospital beds by automatically activating controlled outward restriction when the guest/patient is checked out of the hotel/hospital and deactivating the restriction when a guest is checked in. Activation and deactivation are automatically performed when the guest/patient is checked out or checked in via the console/terminal. The controlled outward restriction can be overridden and other controlled restrictions can be activated/deactivated via the console/terminal.

AUTOMATIC VOICE NETWORK (AUTOVON) ACCESS

3.63 This feature allows interconnection of a DIMENSION 600 PBX to a 4-wire AUTOVON switching center via AUTOVON access lines. The hardware arrangement uses specially designed AUTOVON trunk-type circuits. The interface arrangements have been designed to work with any feature package which includes Advanced Private Line Termination (APLT) capabilities.

3.64 The Attendant Console functions needed for AUTOVON have been incorporated in an adjunct console to the PBX console (Fig. 12). This new combination will permit an attendant to handle both regular and AUTOVON traffic. The selector console adjunct has a capacity of 30, 60, or 90 trunk buttons. Additional buttons near the lower keys of the console adjunct provide the four TOUCH-TONE dialing precedence level signals required for outgoing precedence calls. This arrangement permits the retention of 12-button TOUCH-TONE dialing in the standard PBX console. A data-link connection between each selector console adjunct and corresponding control circuits in the basic AUTOVON equipment carrier provides the means for completion of all AUTOVON calls requiring attendant handling and for driving the status lamp indicators.

This feature can only be used with the 02-system DIMENSION PBX Attendant Console.

3.65 For more detailed information regarding the AUTOVON access arrangement, refer to Section 554-010-135.

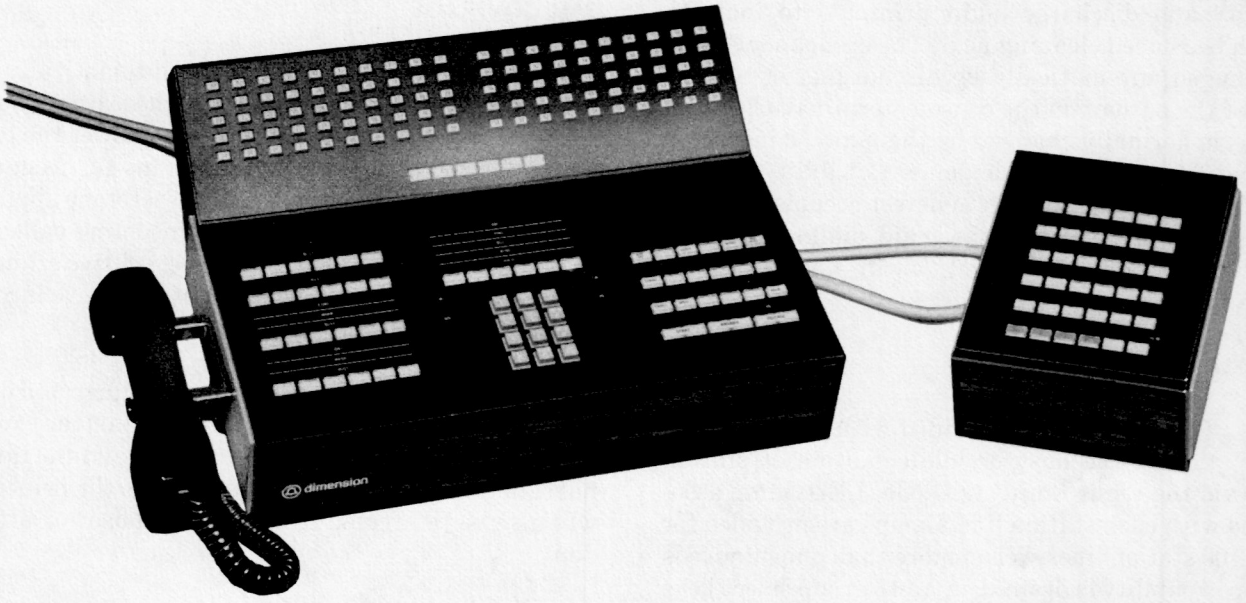


Fig. 12—DIMENSION PBX Attendant Console With 21A Selector Console

AUTOMATIC VOICE SWITCHED GAIN CONTROLLED AMPLIFIER

3.66 An Automatic Voice Switched Gain Controlled Amplifier is provided which meets registration specifications and can be used in outgoing calls if a trunk group is so equipped.

3.67 Software automatically turns on the amplifiers when a remote access incoming call is routed to the Electronic Tandem Network (ETN). The amplifiers may also be optioned (strap or switch on circuit pack) "on" so that they can be used in a special outgoing-only trunk group. In this way, calls from the ETN routed to the public message network use the special trunk group, while calls generated locally use a different trunk group not provided with the voice switched gain trunks. The outgoing case does not permit software control.

AUTOMATIC WAKEUP SERVICE

3.68 This feature records a hotel/motel or hospital guest's request for a wakeup call entered by hotel/hospital personnel via the console/terminal. The call is automatically placed at the requested time with an internal fixed or, optionally, with an external flexible wakeup announcement when the guest answers. A record is made on an optional audit trail printer of whether or not the guest answers. As an option, the hotel personnel can be alerted if the guest does not answer after two retries.

3.69 In addition, a digital display of the time of day in 24-hour time will appear on the console/terminal at all times when the console/terminal is not being used for hotel/motel functions. This display will be provided as a constant indication of the setting of the system internal clock which will be used for wakeup, status changes, energy communication service restriction, and report generation.

3.70 Automatic Wakeup Service is available as either a fixed message using an LC190 voice announcement circuit pack or a changeable message announcement using an H-9040 recorder/announcer.

BED STATUS AND SELECTION

3.71 This feature provides the capability to store and display the occupancy and cleaning status and the type number of each patient bed, facilitating

bedkeeping management, maid locating, and bed selection. Also, communications between the front desk and the bedkeeper are speeded up via real-time maid activity and discharge audit printouts to indicate which beds need cleaning next. The occupancy status is changed automatically by discharging or admission of the patient on the console/terminal. Cleaning status is normally changed by the maid or inspector dialing from the bed telephone. Capability is provided on an optional basis to detect occupied/vacant status discrepancies via the maid dialing separate "clean—looks occupied" and "clean—looks vacant" codes.

BUSY LAMP FIELD (BLF)

3.72 The attendant is provided with visual indication of the busy or idle condition of station lines via the Light Emitting Diode (LED) lamp associated with each station line. Lamps are provided for only 100 station lines. When more than one hundreds group capability is desired, up to 18 group select keys are provided to allow preselection of the desired 100-line group. When more than 18 hundred groups are desired, extended Direct Station Selection (DSS) is provided. The busy lamp field does not indicate busy/idle status for extensions not on the same PBX as the attendant (main/satellite stations) or extensions assigned to Data Communication Access/Off-Premises Station with Call Control ports.

3.73 ▶When FP9/FP11 is used in a hotel/motel or hospital installation, an attendant or station console/terminal can be provided with DSS/BLF, or extended DSS/BLF. The BLF only is not available. When the console/terminal is in the hotel/motel or hospital mode, the DSS field serves as a room number entry and the busy lamp field serves as a ready room display of the selected hundreds group. When the console is in the telephone mode, the DSS field serves as a means of selecting a station line to be called and the BLF serves as a busy/idle line status of the selected hundreds group.◀

BUSY VERIFICATION OF STATION LINES

3.74 The attendant can establish a "talking" connection to an apparently busy station line to determine if the station line is in working order. Prior to connection of the attendant to a busy line, a 2-second spurt of tone is applied to alert the talking parties of the attendant's presence, and a 1/2-second spurt of tone is reapplied every 15 seconds until attendant disconnects. An idle station line is rung normally when busy verification is attempted.

CALL COVERAGE

3.75 ▶The Call Coverage feature automatically redirects calls of a subscriber whose line is busy, doesn't answer, or are unavailable to answer the telephone to alternate answering stations for assigned screening of calls. In the executive/secretary application, for example, the executive's incoming calls are redirected to the secretary if the executive's line is busy, or if the executive chooses not to receive incoming calls.

3.76 Call-coverage service provides integrated call-handling features for the principal (the executive), the covering user (the secretary), and the internal caller. Externally originated calls to the principal will also be redirected to the covering user or attendant.

3.77 Call Coverage service is based on a system of assigned coverage criteria for the principal. Coverage criteria, such as "line busy" or "don't answer", are the conditions under which the system redirects a call to the principal's assigned coverage. When a call is placed to the principal, the system determines whether assigned coverage criteria are fulfilled. If they are, the Call Coverage service determines which coverage point (line or group of lines) is available to answer the call. Any ringing to the principal is then stopped and the call is redirected to the available covering user. An end point in an assigned call coverage path can be a message center. Message Center service is provided in Issue 3 of FP8.◀

CALL FORWARDING—ALL CALLS

3.78 This feature allows all calls destined for a station to be routed to another station (or to the attendant), designated during activation, regardless of the busy or idle state of the called station. This feature can be activated or canceled by the station user from an idle station (or busy state if call hold is in the same feature generic) or by the attendant. The activating station may be used to originate calls while activated. All PBX stations can use this feature simultaneously.

3.79 An electronic custom telephone service (ECTS) station user can activate Call Forwarding—All Calls by pressing the assigned but-

ton after going off-hook and dialing the number of the station which is to receive the calls. When activated, the status lamp lights. Deactivation is accomplished by going off-hook on the line and pressing the Call Forwarding—All Calls button.

CALL FORWARDING—ALL CALLS—OVERRIDE

3.80 This capability allows the station (station B) to which calls have been forwarded to either call the forwarding station (station A) or to transfer a call to the forwarding station. For example, the station (B) receiving the forwarded calls from a forwarding station (A) can transfer important calls back to the forwarding station (A). The above example assumes that station A has its Call Forwarding—All Calls—Override directed to station B.

CALL FORWARDING—BUSY AND DON'T ANSWER

3.81 This feature allows calls destined for a station to be routed to another station (or to the attendant), designated during activation, whenever the called station is either busy or does not answer. This feature can be activated or canceled by the station user from an idle station (or busy state if call hold is in the same feature generic) or by the attendant. The don't answer interval is variable per system and is based on the number of ring cycles desired before transfer. The activating station may be used to originate calls while activated. All PBX stations can use this feature simultaneously.

3.82 An ECTS station user can activate Call Forwarding—Busy and Don't Answer by pressing the assigned button after going off-hook and dialing the number of the station which is to receive the calls. When activated, the status lamp lights. Deactivation is accomplished by going off-hook on the line and pressing the Call Forwarding—Busy and Don't Answer button.

CALL FORWARDING—DON'T ANSWER

3.83 This feature allows calls destined for a station to be routed to a designated location (attendant or another station) whenever the called station does not answer. This feature can be activated or deactivated by the station user or attendant. The don't answer interval is variable and is based on the number of ring cycles desired before transfer. The activating station may be used to originate calls while activated. All PBX stations can use this feature simultaneously.

3.84 An ECTS station user can activate Call Forwarding—Don't Answer by pressing the assigned button after going off-hook and dialing the number of the station which is to receive the calls. When activated, the status lamp lights. Deactivation is accomplished by going off-hook on the line and pressing the Call Forwarding—Don't Answer button.

CALL FORWARDING ALL CALLS—REMOTE

3.85 ▶This feature, provided in Issue 3 of FP8, enhances the Call Forwarding feature to include the capability for stations to call forward their calls to a number outside the PBX. The dialed number must contain only an access code and seven digits. The software will not permit forwarding to a number that will result in a toll call. Calls may be directed to central office trunk groups, tie trunks, AAR, or ARS. This function is provided as a class-of-service option so that it can be provided to a select group of users.◀

CALL HOLD

3.86 A station user can hold any call in progress by flashing and then dialing a "hold" code. The station user is now free to do any of the following without the risk of causing a Threeway Conference connection:

- Originate another call on the user's line
- Activate a service
- Return to another call that had been held via Call Hold.

3.87 If the station user does not dial any further digits after the "hold" code, muting of the station set and removal of dial tone will occur after about 6 seconds. The call will remain on hold until the controlling station user either hangs up, causing the station to ring with the held call, or flashes and redials the "hold" code to return to the original call. Only one call per station line may be held at a time. The held call ***cannot*** be added to the other call.

3.88 If a previous call has been placed on hold, dialing the call hold automatically places the existing call on hold and returns the control station to the previous call. The control station may alternate between two parties using the call hold code, holding one while speaking with the other, but all three parties may not be placed on the same talking connec-

tion. A station may hold only one call at a time. If the controlling station completes one conversation and hangs up, it is rung back with the held call.

3.89 An ECTS station user can activate Call Hold by pressing the Call Hold button while busy on a call, using the Call Hold status lamp to wink. The user returns to the held call by pressing the Call Hold button. Disconnecting from the line causes the line to ring back with the held call.

CALL PARK

3.90 This feature provides a station user the ability to place a call on hold without tying up the holding line. The call is transferred to a vacant port and then can be picked up by any PBX line dialing the appropriate code.

CALL PICKUP

3.91 A non-ECTS station user can answer any call directed to another station line within his preset pickup group by dialing a pickup code from an idle or busy station. If more than one station line in the pickup group is ringing, the individual call to be answered will be selected by the system. There can be a maximum of 255 call pickup groups and each group can contain an unlimited number of stations.

3.92 An ECTS station user can activate Call Pickup by pressing the assigned button when a station line within the same pickup group is ringing. When a line in the pickup group is ringing, the call pickup status lamp will flash. If activated while busy, the present call will automatically be placed on hold.

CALL WAITING

3.93 This feature allows a call to a busy station line to be held waiting while a tone signal is directed towards the busy station user. (Only the called station user hears this tone.) The called station user may connect to this waiting call by hanging up, whereby the station will be rung and will be connected to the call upon answer. Alternatively, the station user may flash and dial an answer-hold code to hold the original call and answer the waiting call. Distinctive call waiting tone signals are provided to indicate the source of the call. One burst is used for station-to-station calls, two bursts are used for attendant and outside calls, and three bursts are used for originating call waiting calls. Call Waiting is denied and busy tone is returned if the called station is not in a 2-party talking state, if a call is already waiting, or if the called station has activated a conflicting feature.

3.94 An ECTS station user can activate Originating Call Waiting by pressing the assigned button upon hearing a busy tone when calling another station. The associated status lamp lights steadily, and the 3-burst priority call waiting tone is applied towards the busy station. A busy ECTS station user, upon hearing any call waiting tone, can answer the waiting call by pressing the assigned button. If the original call is not terminated prior to the button depression, it will automatically be placed on hold.

A. Attendant Call Waiting (Replaces Attendant Camp-On)

3.95 All calls the attendant completes to a busy station are held waiting. A 2-burst tone signal is directed towards the busy station user when the attendant leaves the connection. Subsequent tone signals are applied each time the attendant leaves the waiting connection after verifying the caller's desire to wait.

B. Originating Call Waiting

3.96 The originating class of service provides the station user with the ability to direct a 3-burst priority call waiting tone signal towards any other busy station or a 3-burst distinctive ringing signal to an idle station.

C. Terminating Call Waiting

3.97 The terminating class of service provides the station user with call waiting service with distinctive tone signals on any call attempting to terminate on the user station when the user is busy on another call.

CALLING NUMBER DISPLAY TO ATTENDANT

3.98 This feature provides the attendant with a visual display of the station number of any PBX station seeking attendant assistance. The number is displayed on the alphanumeric display.

3.99 ⧫With DCS (FP8, Issue 3) the calling number of a station at one of the other PBXs in the DCS can be displayed.⧫

CALLING NUMBER DISPLAY TO STATION

3.100 Equipment is provided at a called station to display the number of the calling station within the same PBX. This may be used, for example, in hotels/motels to display the number of the room calling a station such as room service. Capability for displaying up to four digits is provided.

3.101 A block diagram of the Calling Number Display to Station arrangement is shown in Fig. 13. A maximum number of six display units can be provided. The following is a description of the equipment required for this feature.

(a) ***102D1-A Display Circuit (Fig. 14):*** This unit is a terminal device capable of displaying up to four digits. It enables the user to determine the calling party number. This unit can be either desk- or wall-mounted and is available in black, white, or ivory with either a teak or walnut faceplate.

(b) ***211A Power Unit (Fig. 15):*** This unit supplies 5 Vdc to the 102D1-A. It can be wall-mounted and is available in avocado, blue, gold, orange, red, teak, or walnut faceplates.

(c) ***KS-19252, List 7 Adapter:*** This unit is used to interconnect the PBX serial data link from the cross-connect field to the 211A power unit and the display circuits.

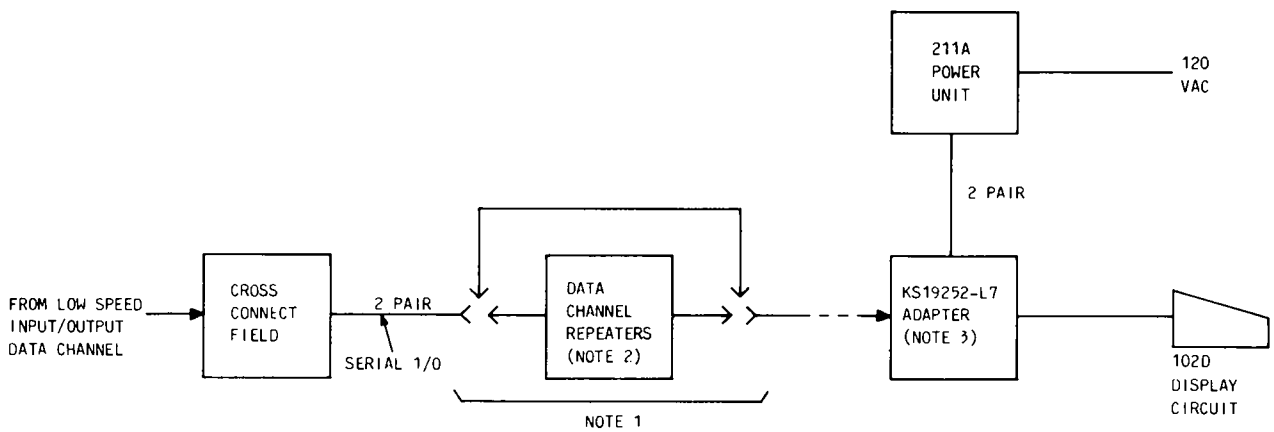
CALLS WAITING

3.102 When a call is waiting to be answered by the attendant and the attendant position is in use or busied out, the CW (call waiting) or PR (priority) lamp (depending on the caller) is illuminated. If the Attendant Console is of the 01C-type or later or an 02-system console, when one or more calls are waiting, a 20-ms burst of 1.95 kHz tone is generated at the console once every 800 milliseconds. When the number of calls waiting to be serviced exceeds the established calls waiting level (1 through 99), the CW lamp flashes.

CENTRALIZED ATTENDANT SERVICE (CAS)

3.103 ▶Two optional features are available for PBXs equipped with CAS:

- Combined PBX/Attendant Concentration
- Separate Attendant Concentrator.



NOTES:

1. MAXIMUM DISTANCE BETWEEN PBX AND DISPLAY UNIT.
   WITHOUT DATA CHANNEL REPEATERS - 300 m (1000 FEET)
   WITH DATA CHANNEL REPEATERS - 3300 m (11,000 FEET)
2. DATA CHANNEL REPEATERS MUST BE LOCATED IN THE SAME BUILDING AND WITHIN 300 m (1000 FEET) OF THE PBX AND DISPLAY CIRCUIT
3. DISPLAY UNITS MUST BE CONNECTED DIRECTLY TO ADAPTER USING MOUNTING CORDS, WITH NO EXTENSION CORDS.

Fig. 13—Calling Number Display to Station Arrangement

Fig. 14—102D1-A Display Unit

A. CAS With Combined PBX/Attendant Concentration

3.104 This feature (Fig. 16) permits multilocation PBX customers served by separate PBXs to concentrate the attendant positions at a single location, called the ***main*** location. The other locations (typically without attendants) are called ***branch*** locations. The branch locations are connected to the main location via release link trunks (RLTs), which provide short holding time connections for CAS calls. Attendant-seeking calls at a branch location are routed to a main location attendant over an RLT. The attendant extends the call back over the same RLT to the branch location and releases the RLT. The RLT is now available for a new CAS call. Main location attendant-seeking calls are routed to a main location attendant in the same manner as a stand-alone PBX attendant-seeking call. Within a DIMENSION PBX

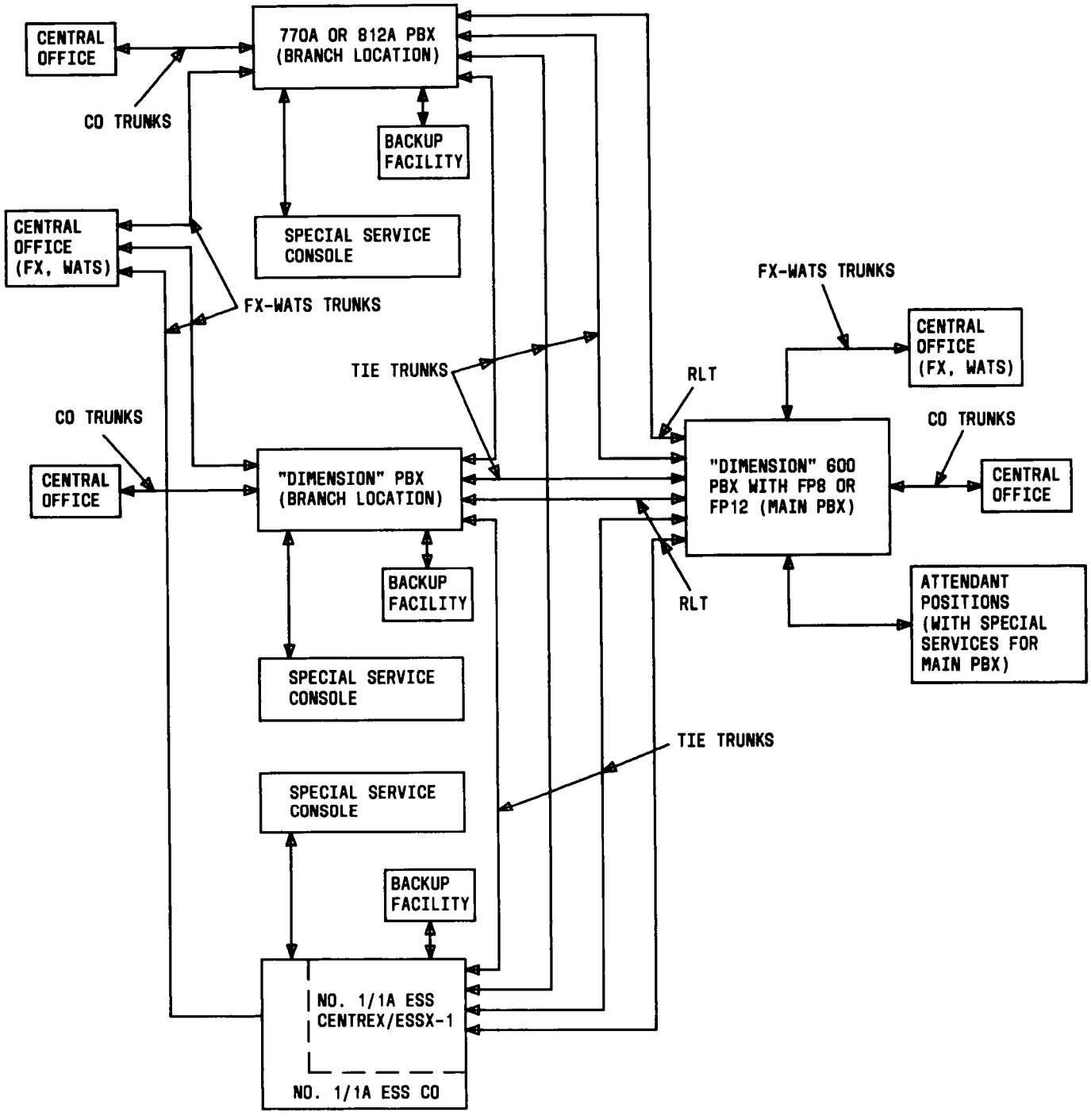
Fig. 15—211A Power Unit

at the main location, main PBX attendant traffic and RLT traffic from the branch PBXs is served by the same attendant incoming call queue.

3.105 This feature eliminates the need for call distribution equipment associated with the DIMENSION PBX CAS with separate attendant concentration feature. For additional descriptive information on CAS, refer to Section 981-012-100.

B. CAS With Separate Attendant Concentrator

3.106 This feature (Fig. 17) permits multilocation PBX customers (branch locations) served by separate switching vehicles to concentrate attendant positions at a single location (main location). Incoming Listed Directory Number (LDN) calls come into each PBX directly from the central office and are switched to the centralized attendant positions over



◗Fig. 16—Centralized Attendant Service With DIMENSION 600 PBX Providing Combined PBX/Attendant Concentration◖

Release Link Trunks (RLTs). These trunks can be viewed as short holding time connections from the unattended PBX locations to the centralized answering point. Incoming LDN calls received over RLTs are always routed back over the same RLT. Once the attendant releases the call, the trunks are made available for other calls.

3.107 ***CAS Backup Options:*** Two backup RLT answering options are available for each branch PBX location. These options are used when a console is placed in the night console mode or when there is a failure at the main location or failure of RLTs.

(a) ***Backup Telephone Option:*** The backup telephone service option may be supplied by the 2514BM nonkey telephone sets (Fig. 18). From 1 to 16 backup nonkey telephones (one for each RLT) may be used. These telephone sets are

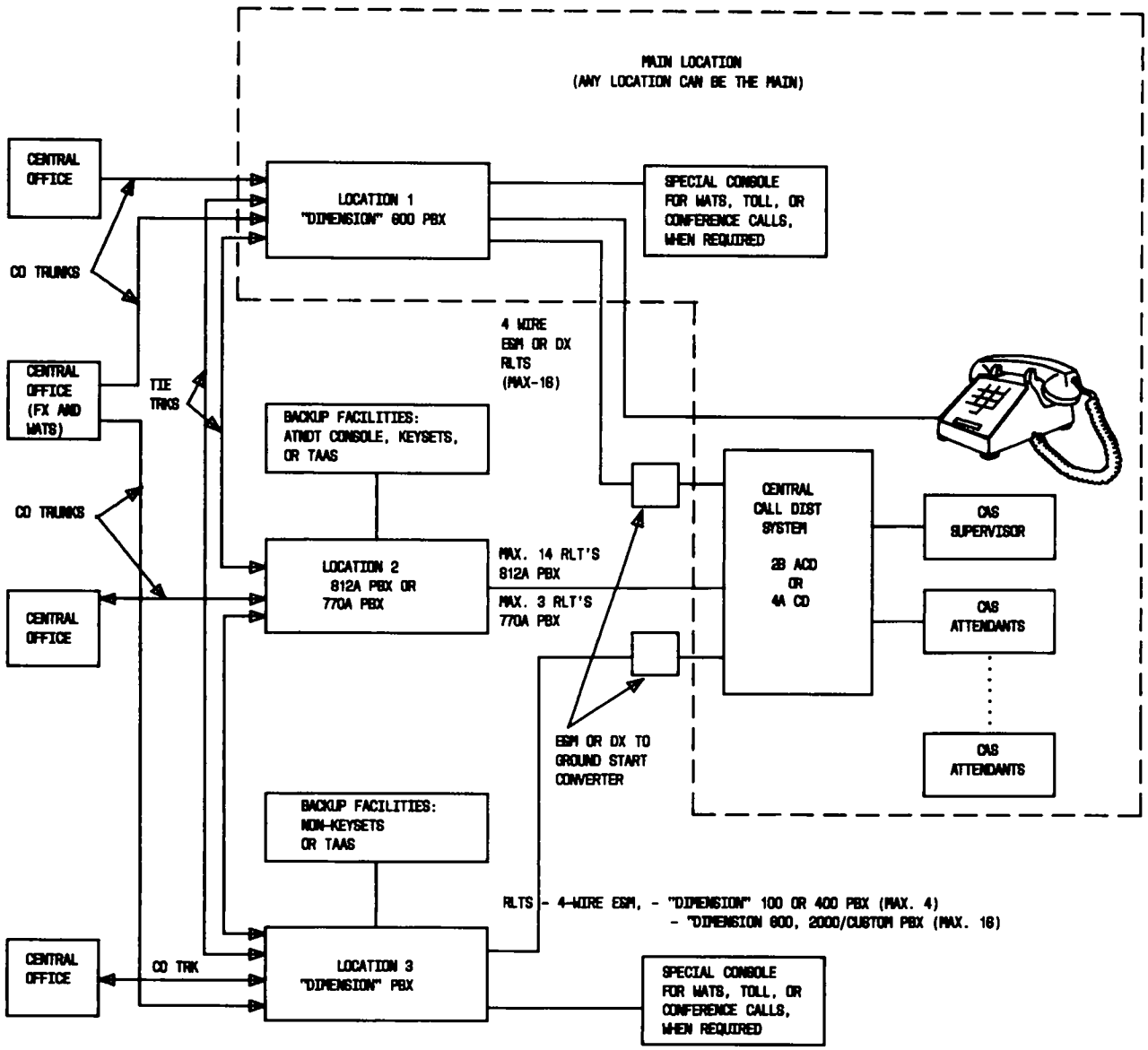


Fig. 17—Centralized Attendant Service (CAS) Arrangement With Separate Attendant Concentrator

equipped with a plug-in handset/headset and a turnkey which controls the on-hook/off-hook status of the telephone set. These arrangements permit the attendant to listen to CAS information tones immediately after going off-hook.

(b) ***Trunk Answer From Any Station (TAAS) Option:*** With TAAS activated, all RLT calls are processed by the TAAS feature. The answering station extends the call to the desired station or trunk by use of Threeway Conference Transfer. Any backup station may be used to transfer the RLTs to CAS or backup mode. If only the TAAS backup mode is required, any station at the PBX may be designated as a CAS mode control set (either a TOUCH-TONE telephone dial or rotary dial).

3.108 ***CAS with Force Administration Data System (FADS):*** The FADS provides for display of attendant-related traffic information at the company location if the company location has CAS which allows you to concentrate attendant positions at a single (main) location. The FADS terminal allows a display of attendant-related traffic items at any time. The information may be used to determine the number of calls handled by each attendant, the length of each call, the average time spent processing each call, and the waiting time for calls in queue. Maximum efficiency can be maintained by using the information to determine if the number of Release Link Trunks (RLTs) is adequate or inadequate. The FADS terminal has a 3-digit and a 4-digit display field and a TOUCH-TONE telephone type keyboard. A printer may be used to obtain hardcopy output.

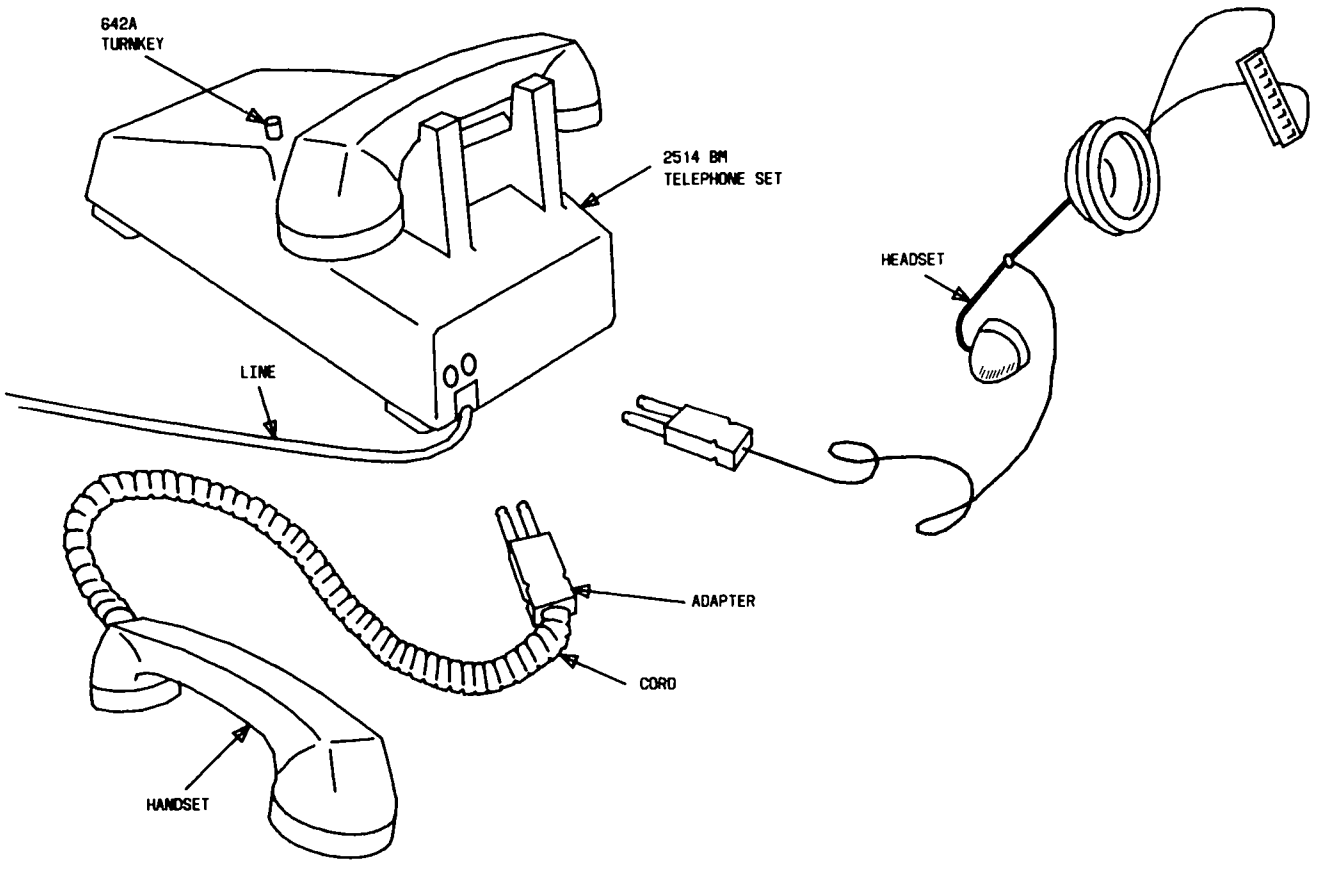


Fig. 18—Centralized Attendant Service Backup Telephone Service Equipment

CENTRALIZED STATION MESSAGE DETAIL RECORDING (CSMDR)

3.109 The CSMDR system provides for the centralized collection of traffic data from remotely located DIMENSION PBXs within a customer's network. Traffic data at each remote location is collected and stored via a 94A local storage unit for later periodic polling by the central polling unit. When the remote locations are polled, the traffic is transmitted to the central polling unit and made available in the form of a magnetic tape output or an interface to a computer port.

CLASS OF SERVICE (COS)

3.110 A COS is a group of features and restrictions assigned to a working station line. Each working station line must be assigned a COS, and more than one station line can be assigned to the same COS. Combinations of features and restrictions in a COS are activated by using the Maintenance and Administration Panel (MAAP), Customer Administration Panel (CAP), Customer Administration Center System (CACS) or the Remote Maintenance, Administration, and Traffic System (RMATS) to provide the customer the flexibility he or she may require from the system. Some features interact and cannot be activated in the same COS. For example, Call Forwarding—Don't Answer and Call Forwarding—Busy and Don't Answer cannot be activated in the same COS. The DIMENSION 600 PBX can have a maximum of 63 different classes of service assigned (COS 31 is reserved for the remote access and ECTS personal CO line pickup features).

CLASS-OF-SERVICE DISPLAY TO ATTENDANT

3.111 This feature provides the attendant with an alphabetic or numeric code display representing the class of service of the calling PBX station connected to the attendant. The information is displayed on the alphanumeric display when the class of service key is pressed.

3.112 ♦With DCS (FP8, Issue 3) the class of service of a station at one of the other PBXs in the DCS can be displayed.♦

CODE CALLING ACCESS

3.113 Attendants, station users, and the tie trunks can dial an access code and a 2- or 3-digit called party code to activate a signal which corresponds to the called party code. The called party, by dialing an answering code from any station within the PBX, may be connected to the calling party.

A. 3A Code Calling Access

3.114 The 3A code call unit is a relay-selector device which permits a PBX station or attendant to reach a party on the premises served by the PBX. A maximum of two incoming ports and two answer ports (LC08s) may be connected.

B. Chime Paging

3.115 Electronic chime paging requires the use of an LC17B tone plant (tone plant C) and the 89A control unit which connects to customer-provided equipment.

CODE RESTRICTION

3.116 This feature denies selected station lines completion of dialed outgoing exchange network calls to selected office and area codes. The restricted calls are routed to intercept tone. Three levels of authorization permit authorized station lines the ability to complete outgoing CO or FX calls to specified area or office codes within an area. The calls allowed are a function of the particular trunk group dialed.

COMMON CONTROL SWITCHING ARRANGEMENT (CCSA) ACCESS

3.117 This feature provides access to the CCSA network for Network Inward Dialing, Direct Outward Dialing to the network, and other features similar to those provided on the exchange network. The Advanced Private Line Termination (APLT) trunks cannot tandem through the system without attendant assistance. If off-net access is provided by the network, selected station lines can be denied off-net access. The CCSA termination is denied to a station when DID restriction is applied.

COMMUNICATION INTERFACE FOR PROPERTY MANAGEMENT SYSTEM (CIPMS)

3.118 The CIPMS feature provides an interface circuit that allows the PBX to function with a customer-owned Property Management System (PMS). The PMS provides the customer with man-

agement control of certain features in either a hospital or hotel/motel type of environment. Information concerning maid-dialed cleaning status changes, control of restrictions, message waiting, local call message units, and calling number display is passed to the PMS, provided the PMS has been designated to handle these functions. The PBX receives check-in/checkout (or admit/discharge) room/bed, change/swap, message waiting, control of restrictions, and calling number display information, as necessary, depending on which functions are performed by the PMS and which are performed by the DIMENSION PBX.

A. Calling Number Display Over CIPMS

3.119 The calling number display function provides calling number display information to a customer-provided PMS computer. The calling number station and the called station number of the calling number display unit or the called attendant console will be transmitted over the CIPMS link to the PMS. The PMS can then access the guest directory and display the caller's name and other information to the called party via a PMS provided CRT, printer, or other suitable device.

B. Room/Bed Change/Swap Over CIPMS

3.120 This function provides a room/bed swap and change message from the PMS to the PBX over the CIPMS data link. This transfers telephone call charges, automatic wakeup information, message waiting details, and telephone restriction information to the new room.

3.121 The PMS consists of customer-selected input/output (I/O) peripheral equipment. This equipment is vendor-supplied. The electrical interface requirement must match those of the Peripheral Interface Circuit (PIC). The CIPMS equipment may consist of a passive terminal or an active terminal. The passive terminal performs I/O only. The active terminal (minicomputer or programmable calculator with an I/O port) receives input data and performs calculations in regard to room charges, telephone charges, etc. Figure 19 depicts a possible CIPMS hospital/lodging interface configuration.

C. With Data Entry By Telphone

3.122 ▶This feature provides the capability to collect data from station consoles or station telephone sets and transmit the data via the Communication Interface for Property Managment System (CIPMS) data link to a customer's property management system computer. A user dials the dial access code for the data entry feature and receives second dial tone. The user then proceeds to dial the appropriate additional data digits, terminating the data input with the TOUCH-TONE dialing button.◀

CONTROLLED OUTWARD RESTRICTION

3.123 An attendant can control the restriction of direct dialed outgoing exchange network calls (local central office and toll calls in hospital/lodging applications) from selected station lines or groups of lines. When activated, the restricted calls are routed to intercept tone.

CONTROLLED STATION-TO-STATION RESTRICTION

3.124 An attendant can prevent selected station lines or groups of lines from receiving station-to-station calls. When activated, the restricted calls are routed to intercept tone.

CONTROLLED TERMINATION RESTRICTION

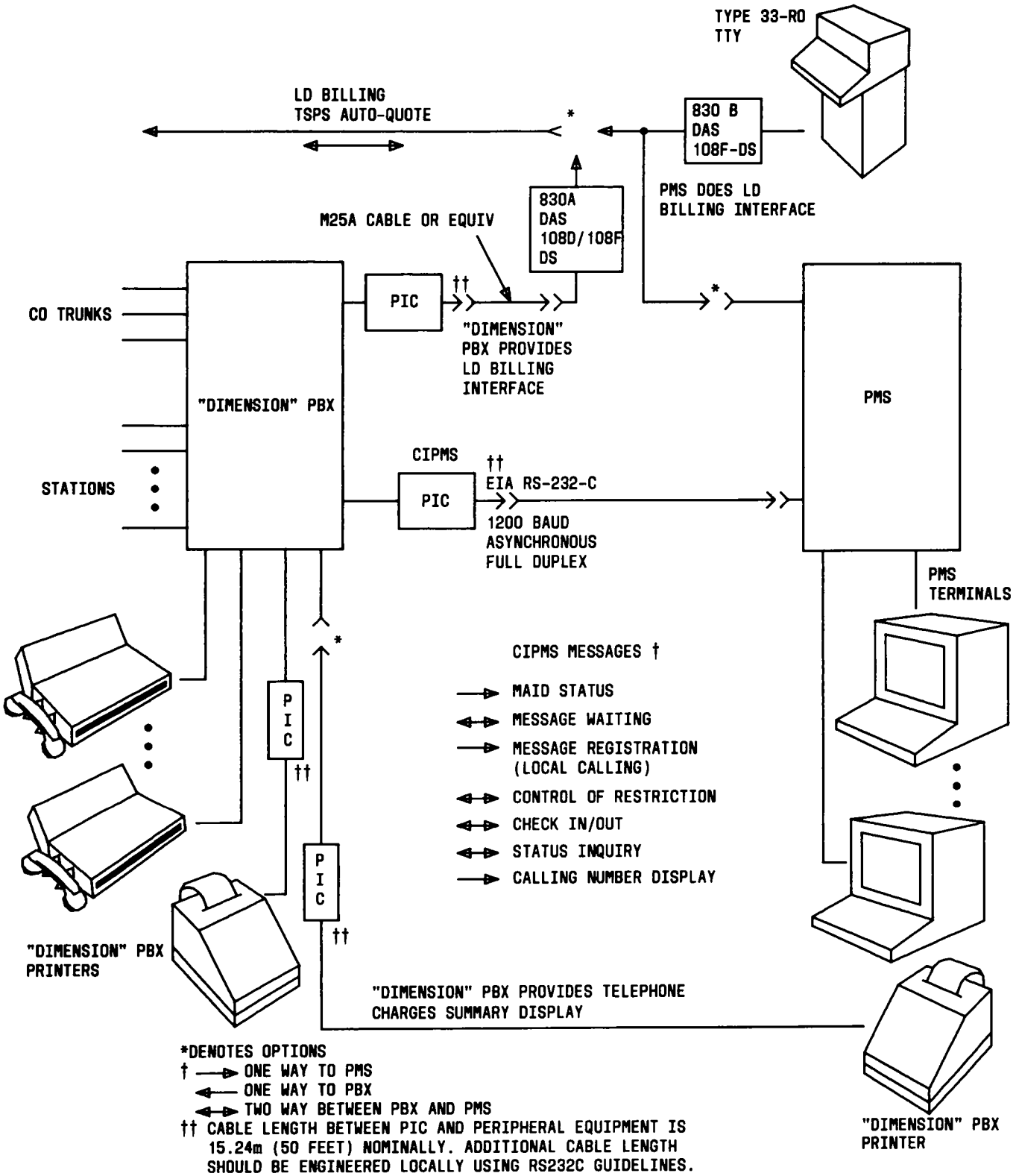
3.125 An attendant can prevent selected station lines or groups of lines from receiving any calls. This feature is a form of "do-not-disturb" service. When activated, restricted Direct Inward Dialing and Common Controlled Switching Arrangement calls are routed to the attendant, an announcement, or to intercept tone, depending on the option selected. All other restricted calls are routed to intercept tone.

CONTROLLED TOTAL RESTRICTION

3.126 An attendant can prevent selected station lines or groups of lines from originating and receiving any calls. This feature is used to temporarily disconnect station lines.

CUSTOM INTERCOM

3.127 This feature allows station users to dial code numbers to reach frequently called PBX stations. Three-burst distinctive ringing is provided to nonbusy called stations and originating call waiting treatment is provided when a busy station is called. The intercom numbers within a custom intercom group are changeable via a designated station line, the MAAP, RMATS, CAP, and CACS.



◆Fig. 19—Typical Hotel/Motel or Hospital Communication Interface for Property Management System (CIPMS) Equipment Layout◆

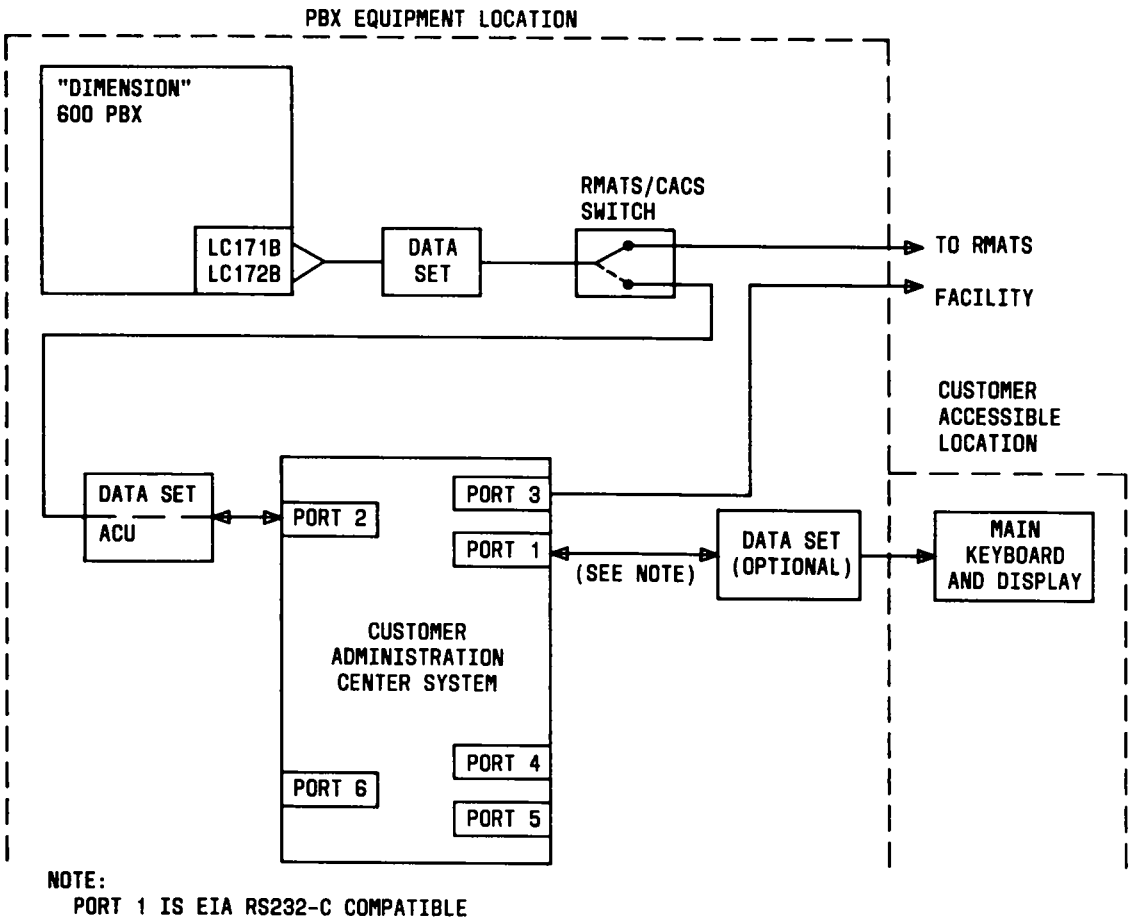
CUSTOMER ADMINISTRATION CENTER SYSTEM (CACS)

3.128 This feature permits the customer to administer station and electronic tandem switching features and to obtain traffic measurements and recent circuit assurance data from one or more FP8 or FP12 switching locations. An interactive user terminal provides inputs/outputs. The following features may optionally be provided: station rearrangement and change, facilities administration and control, traffic data to customer, and facilities assurance reports. Figure 20 depicts the CACS equipment configuration. Refer to Section 554-010-140 for detailed information on CACS.

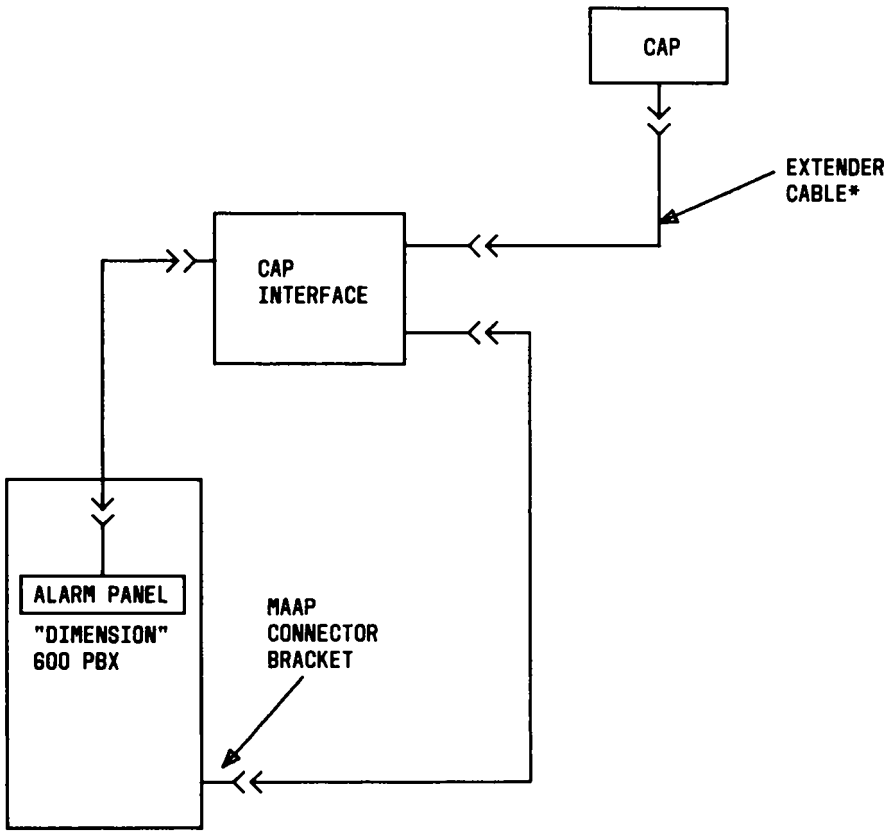
CUSTOMER ADMINISTRATION PANEL (CAP)

3.129 This feature provides the PBX customer the ability to change station user features (ie, line extension number, network class of service, etc) and control tandem switching features (FP8). This panel is a simplified alternative to the CACS.

3.130 The CAP provides an alternate to having craft personnel initiate Maintenance and Administration Panel (MAAP) and Remote Maintenance, Administration and Traffic System (RMATS) changes. The CAP restricts the customer to only those MAAP procedures of customer concern. Input data is by button pushes and output is by light-emitting diode (LED) displays, the same as on the MAAP. The CAP is to be located on customer premises; however, it must be located within a distance of 305 cable meters (1000 cable feet) of the PBX. Figure 21 depicts the CAP to DIMENSION PBX equipment configuration. Refer to Section 554-010-141 for detailed information on CAP.



♦Fig. 20—Typical CACS Equipment Configuration♦



* EXTENDER CABLE LENGTH FROM CAP VIA CAP INTERFACE TO "DIMENSION" PBX SHALL NOT EXCEED 305 METERS (1000 FT)

Fig. 21—Customer Administration Panel (CAP) Configuration

CUSTOMER PREMISES FACILITY TERMINAL (CPFT) EQUIPMENT (MD)

3.131 The CPFT equipment is optional and, when furnished, provides transmission and signaling range extension for the PBX line and trunk circuits. The CPFT equipment consists of Metallic Facility Terminal (MFT) circuit packs, housed in connectorized shelves (carriers), and can be mounted in an auxiliary cabinet or in any available 584-mm (23-inch) mounting space as long as power and alarm considerations are met. (See Section 332-610-100 for details.)

3.132 The MFT family of voice frequency repeater/signal range extension units replaces earlier E6, V4, and dial long line (DLL) units in the central offices. The CPFT/MFT installation furnishes transmission and signaling equalization and gain to lines and trunks as required, ie, CO, foreign exchange (FX), tie trunks, WATS, and private services.

CUSTOMER PREMISES TRAFFIC MEASUREMENTS

3.133 On customer premises (non-RMATS), traffic polling may be performed with an Alston 820-type count monitor scanner, or equivalent. Detailed traffic measurement is accomplished by extracting usage (hundred call seconds [CCS]) and peg count data via software and the count monitor scanner. The scanner can be polled from a remote location, or it can be connected locally to a teletypewriter (TTY) for traffic reports. After the scanner is connected to the high-speed data channel, the MAAP and traffic procedures are used to prepare the study. The PBX may dump summarized or raw traffic data concerning the MAAP selected network upon receipt of a break character. Any terminal (such as TTY) may send the break character and receive the data. Line feed and spacing control is provided by the PBX.

DATA CHANNEL REPEATER

3.134 The data channel repeater (Fig. 22) provides range extension and/or lightning protection

for DIMENSION PBX low-speed data channels and various remote devices required for system operation. It can be used with electronic telephone controllers and calling number displays. The repeater connects in series with the data channel to repeat data pulses.

3.135 The repeater circuit is designed to operate in unexposed environments without additional protection or in exposed environments with standard protection.

3.136 The repeater circuitry is packaged in a modified key service unit, approximately 241 mm (9-1/2 inches) wide by 432 mm (17 inches) long. Each repeater can accommodate two data channel repeater circuits. The unit can be wall-mounted and must be connected to a 120-Vac 60-Hz outlet. A power cord (Lists A through D) is available in lengths from 610 mm (2 feet) to 3658 mm (12 feet).

3.137 Figure 23 depicts a typical application for data channel repeaters. A minimum of one and a maximum of four data channel repeaters may be installed per individual data link. See Section 554-010-101 for detailed information.

DATA COMMUNICATION ACCESS

3.138 ◗This feature provides access to a customer's computer equipment by PBX users via a trunk-type connection to computer ports on the PBX. Computer access is available to station users and attendants at the work facility where the PBX and computer are located, to remote users via the Remote Access to PBX Services and Off-Premises Station features, and to users of the electronic tandem system.

Data Communications Access

3.139 This feature uses the LC361 loop signaling interface circuit which functions as a Data Communications Access Port (DCAP) to provide an interface between the PBX and customer-provided computer equipment. Figure 24 illustrates the use of the DCAPs.

3.140 ***With DID Capability:*** The DID capability is available only when the station number steering feature is provided. Station number steering directs DID to a DCAP group, based on the station number within the DID dialing plan. The office code (NXX) is the same for stations and any DCAP group using station number steering.◖

DATA PRIVACY

3.141 Activation of this feature by a station user prohibits other calls from employing various overriding features to gain access to the station user line and consequently disturbing any data transmission which might be occurring. When the station user goes on-hook, the restriction is automatically canceled.

DATA RESTRICTION

3.142 This feature prohibits other individuals, including the attendant, the ability to employ various overriding or alerting features to gain access to or superimpose tones onto a busy station. Disturbance to any transmission in progress is therefore prevented. Overriding or alerting features include Call Waiting, Executive Override, Busy Verification, Trunk Verification, and Timed Recall on Outgoing Calls. This feature is in effect for all calls once it is assigned to a station or trunk.

DATA SWITCHING

3.143 ◗This feature provided in FP8 allows the switching of synchronous and asynchronous data from and to data terminals and computer-type equipment via a DIMENSION PBX at speeds up to 9600 bps. The data is in a digital format from the terminal, through the PBX and to the computer. Data information can remain digital, end-to-end. Voice conversations remain analog, end-to-end.

3.144 Two versions of Data Switching are available: Data Switching Level 1 and Data Switching Level 2. Level 1 is implemented with only new hardware and requires no new software. Existing software translation changes via the maintenance and administration panel interface are required for Level 1 Data Switching implementation. Two new hardware devices are required to provide Data Switching Level 1. The data interface (DI) (LC566) replaces modems and is attached directly to terminals or computer ports. The data port (DP) circuit pack (LC567) is internal to the PBX and replaces either an LC02 line circuit or an LC361 trunk circuit. Level 2 requires a software modification in addition to hardware including the data interface (DI), and data port (DP).

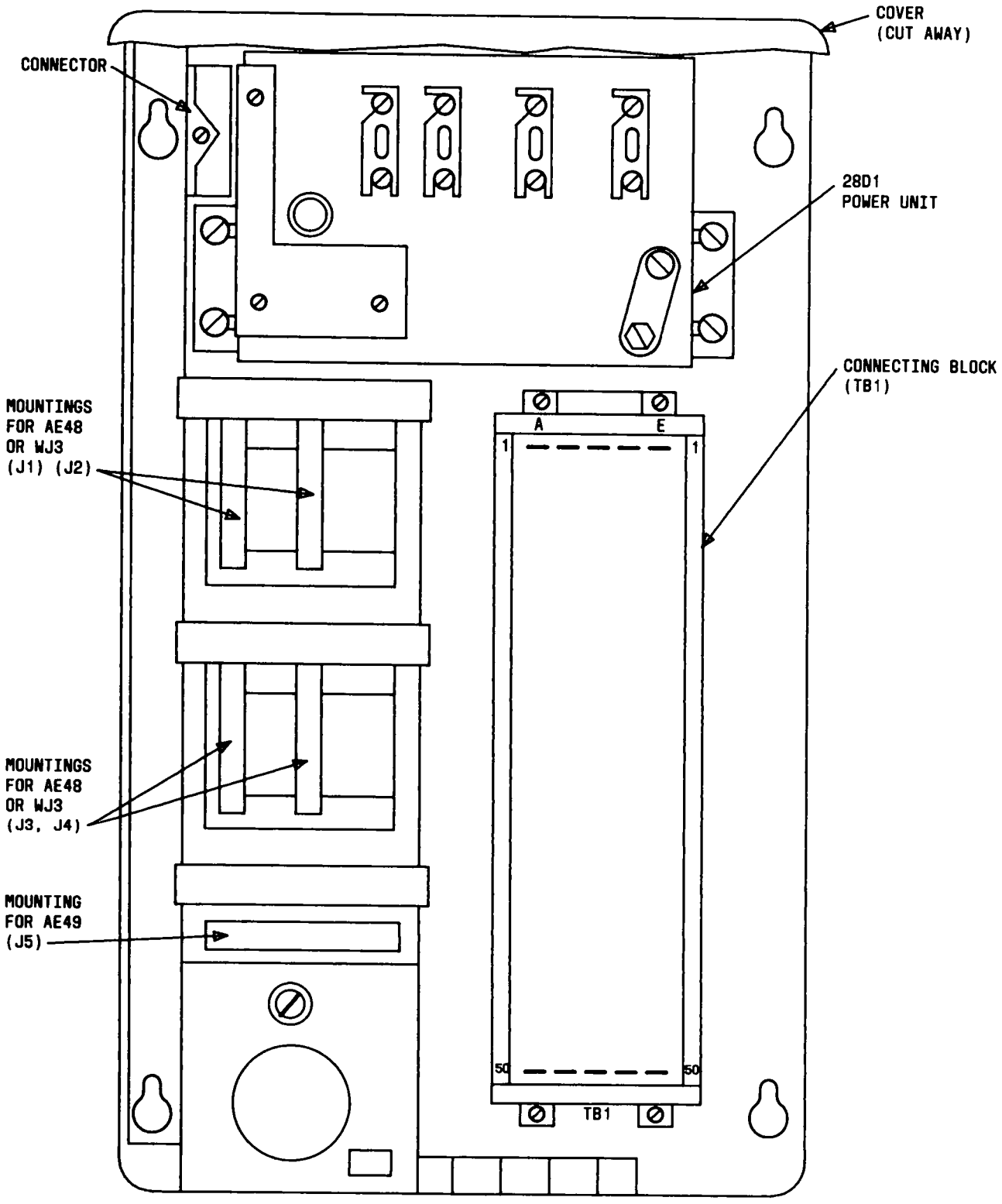
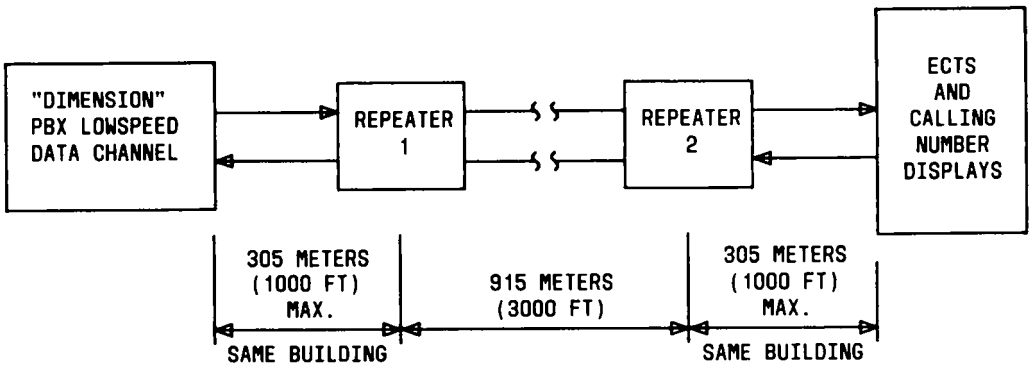


Fig. 22—Data Channel Repeater Unit



NOTE: DISTANCES SHOWN ARE MAXIMUM

Fig. 23—Data Channel Repeater—PBX Application (Two Repeaters)

A. Level 1 Data Switching

3.145 A DIMENSION (400E/600) PBX equipped with Level 1 Data Switching feature provides a customer with the ability to connect computer and/or terminal equipment to either the line or trunk side of the PBX. Level 1 Data Switching provides:

(a) ***On-premises Modemless Data Switching:*** Full or half duplex, either synchronous or asynchronous at speeds up to 9600 bps

(b) ***Terminal Dialing:*** Data "call set-up" to a host computer or other terminal from a data terminal, keyboard on ASCII asynchronous terminals. This capability is called terminal dialing and provides the ability to originate a data call from a terminal, using keyboard key operations to generate on-/off-hooks and digits for dialing. Visual call progress message such as "incoming call", "dialed number is ringing", etc. are displayed or printed at the terminal

(c) ***Computer Port Access:*** Permits the user to access computer ports on either the line or trunk side of the PBX.

(d) ***Call Setup Using A Station Set:*** Data "call set-up" by using a station and the Threeway Conference Transfer feature to connect a terminal to a host computer or another terminal

(e) ***RS-366 Dialing:*** Electronic Industries Association (EIA) RS-366 interface for automatic calling unit dialing. This function provides computer port call origination for host computers and eliminates the need for an automatic calling unit.

(f) ***Off Premises Access Using Private Line Modems:*** This provides a user with access from a terminal that is on the line or trunk side of the PBX to a Digital Data Service (DDS) unit or a private-line modem.

3.146 ***Data Interface (DI):*** The DI is a locally powered unit requiring 120-volt AC input (approximately 15 watts). The DI is designed for three mounting arrangements:

(1) ***J58893A:*** A single stand-alone unit for use at a terminal or modem. The DI can be desk mounted link a data set.

(2) ***J58892A L1, L2:*** A multiple-mount unit that houses up to eight DIs.

(3) ***J58892AA L1, L2:*** A rack-mounted arrangement that houses up to eight DIs. The rack mount is designed for DIMENSION PBX auxiliary cabinets or DATAPHONE* data communications terminal cabinets.

3.147 The DI contains a number of option switches which are used to control data speed and for-

*Trademark of AT&T.

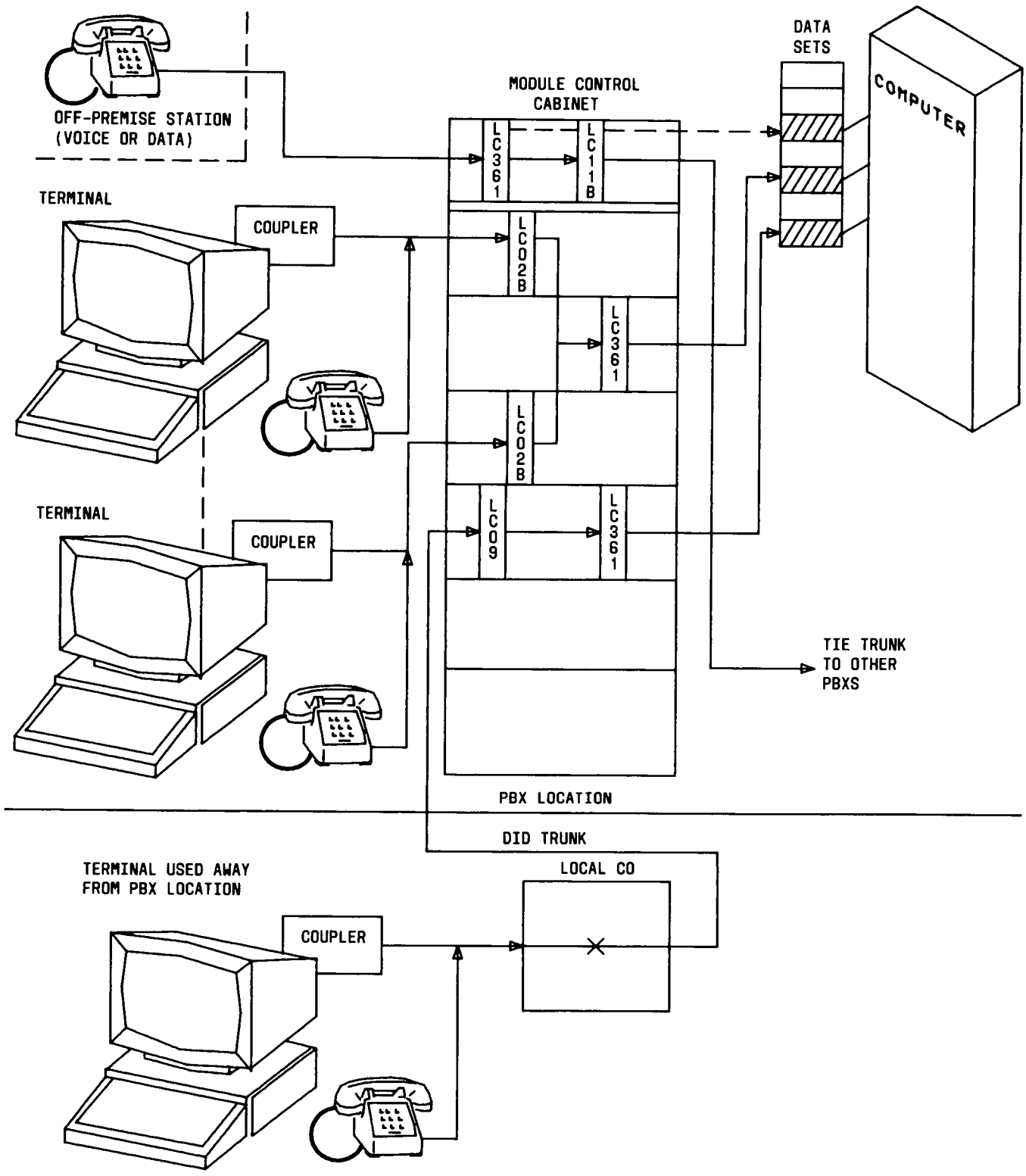


Fig. 24—Loop Signaling Interface (LC361) for Data Communication Access and Off-Premises Stations

mat. It also contains buttons and indicators which are used during call setup and maintenance functions.

3.148 The DI as shown on Fig. 25 provides a standard EIA RS-232C interface to customer-provided data equipment such as terminals, host computers, and voice band modems. The DI interface to the DP in the PBX over a DIMENSION PBX data link (DDL) is a 4-wire bipolar, fully synchronous digital communications link consisting of two tip and ring pairs. The DI provides four major functions:

(1) End-to-end control

(2) Data handling

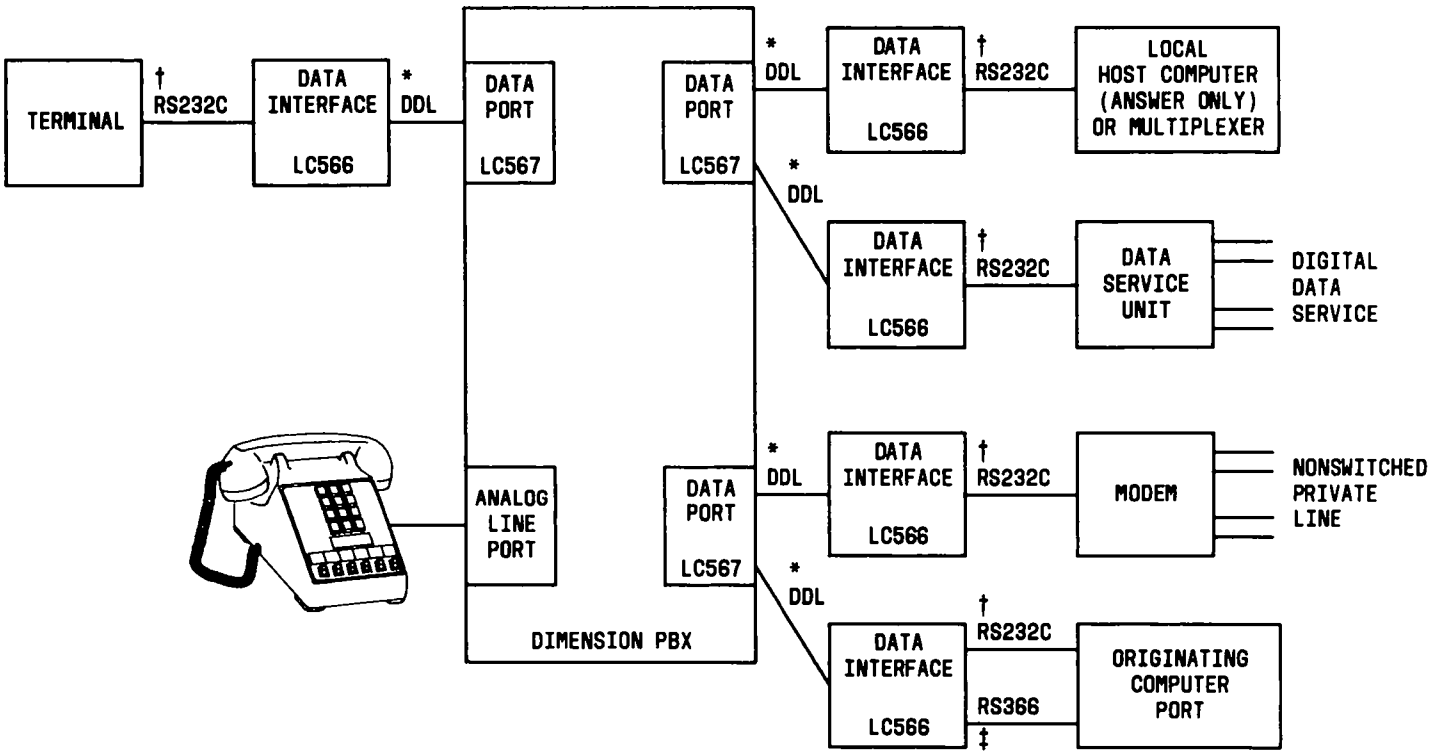
(3) Clocks and timing generation

(4) DIMENSION PBX data link (DDL) interface

3.149 ***Data Port:*** The DP as shown on Fig. 25 is a carrier-mounted circuit pack which provides the interface between the DIMENSION PBX data link to the DI. The DP can be used on either the line or trunk side of the PBX and replaces line or loop signaling trunk circuit packs LC02B and LC361 respectively, as required. The DP appears to the PBX software as the circuit it replaces, thus no software changes are required for single-module PBXs equipped for Level 1 Data Switching.

B. Level 2 Data Switching

3.150 This feature provided for DIMENSION 600 PBXs (excludes 400E PBXs), includes all



* DIMENSION DATA LINK (DDL) - FOUR WIRE FULL DUPLEX DIGITAL COMMUNICATIONS LINK

† ELECTRONIC INDUSTRIES ASSOCIATION (EIA) RS-232C COMPATABLE INTERFACE

‡ EIA RS366 COMPATABLE INTERFACE FOR AUTOMATIC CALLING UNIT DIALING (IE COMPUTER PORT CALL ORGINATION)

Fig. 25—Example DIMENSION PBX Single-Module Level 1 Data Switching Configuration

hardware and functions provided by Level 1 Data Switching, plus the following additional features (Fig. 26):

(a) Associated set dialing, allows a user to make data calls using an analog station set and has two types of data-call setup:

- ***Associated Data Port Mode:*** In this mode, an association between a data port and analog line is assigned in translations. A data call is set up when a user dials a number of a data port, analog line, or trunk (when using modem pooling) and then generates a switchhook flash and hangs up. When the user hangs up, the call is automatically transferred to the associated data port.
- ***Non-Associated Data Port Dialing:*** This mode allows the user of an associated set to make data connections for terminals not assigned in translations to the users telephone. The mode of operation is similar to the Threeway Conference Transfer feature except that answer tone is provided by software following the switchhook flash. In this mode, when the called party (host computer) answers, the user generates a switchhook flash that results in a second dial tone. A second data port may then be dialed. When the second data port answers, the user hangs up to transfer the call.

(b) Modem pooling, allows the selection of a specific type of modem without requiring that modems be dedicated to each terminal. Modems are modulator/demodulator devices which provide an interface with terminals and convert digital signals to audible tones for data transmission over the voice network. Modems also convert received tones to digital signals for use by data processing equipment. For DIMENSION PBXs equipped for Data Switching, the modem is replaced by the DI for all local Data Switching. When DIs are used for local Data Switching, a DI-to-modem connection must be provided before going out over the public network. This is accomplished by switching the call through a modem pool. Significant software additions provided by Issue 3 of FP8 supports the selection of the proper modem pool, the proper "call set-up", and switching in of the modem at the proper time.

(c) Data verification by station provides diagnostic capabilities to verify the status (busy or idle) of modem-pool members. It eliminates the need for service calls to determine the working condition of a modem-pool member.

(d) Enhanced Uniform Call Distribution (EUCD) performs the same functions as Uniform Call Distribution except that the hunting pattern is either sequential or next idle station in the hunting sequence. The EUCD serves to determine which port of an on-premises computer or terminal group is selected on a dial-up basis.

For additional feature information on associated set dialing, modem pooling and data verification by station, refer to Data Switching Level 2 Feature Document 554-191-279. Enhanced Uniform Call Distribution is covered in Feature Document 554-191-121.◀

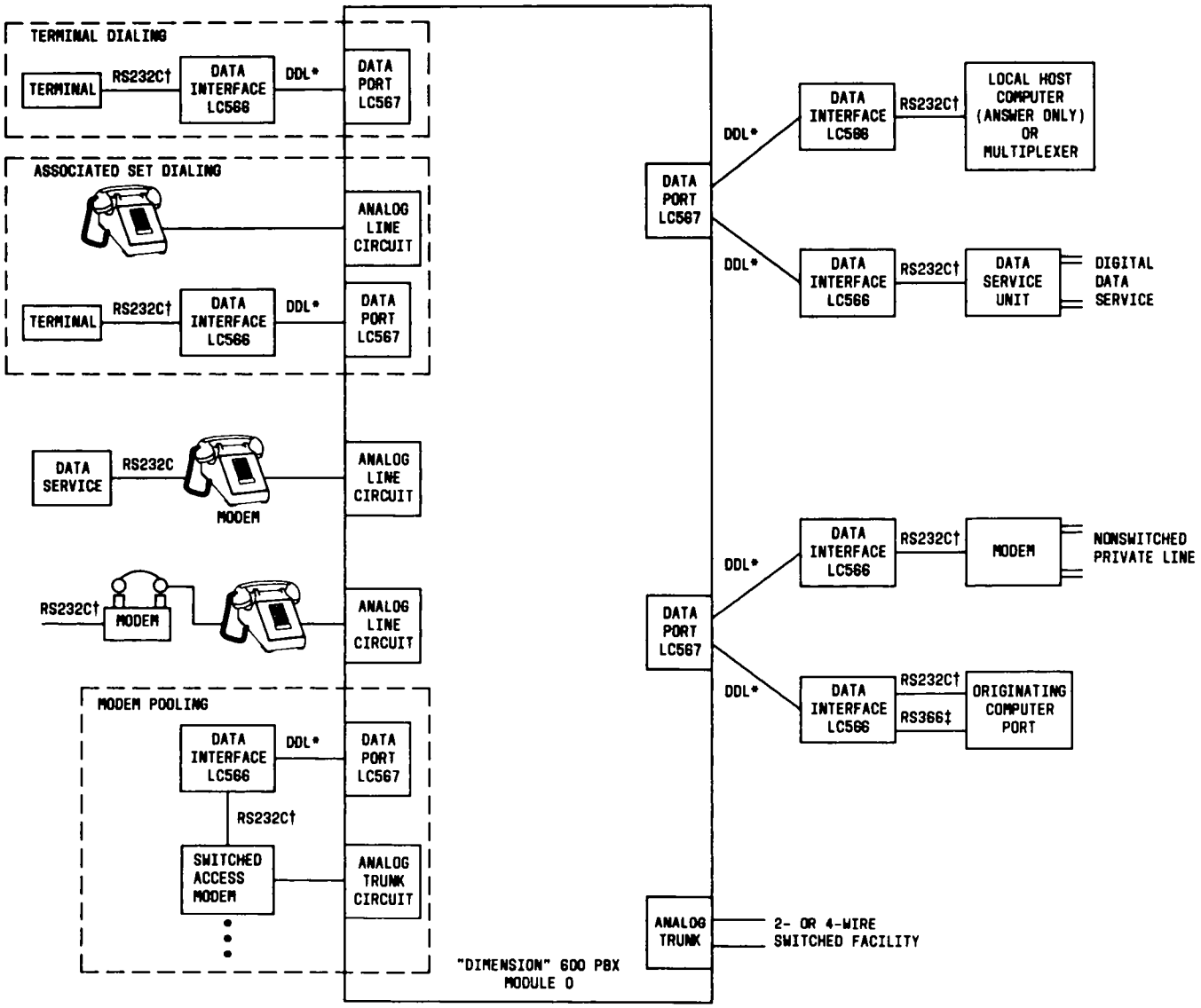
DELUXE QUEUING

3.151 This feature permits station calls, tie trunk calls, remote access calls, Off-Premises Extension (OPX) calls, attendant calls, or attendant-assisted calls to be placed in a queue whenever all trunks for completing a particular call are busy. The queue may be a Ringback Queue (RBQ), in which case the calling party goes on-hook and is called back when a trunk becomes available, or an Off-Hook Queue (OHQ), in which case the calling party remains off-hook and is connected to a trunk when it becomes available. Attendant and attendant waiting calls only use OHQ. In all cases, the nonpriority queue is only served when the priority queue is empty. There are four types of deluxe queuing arrangements. These are various combinations of RBQ and OHQ with one or two queues. The types are designated I through IV and are defined as follows:

(a) ***Type I:*** All OHQ for tandem, main, satellite, and tributary locations. All calls, including remote access and attendant calls, use a single OHQ.

(b) ***Type II:*** Ringback queue for tandem, main, and satellite locations. No queuing for tributary locations. All tandem attendant calls and tandem remote access calls use a priority OHQ. All other calls use a nonpriority RBQ.

(c) ***Type III:*** The same as Type I; however, two OHQs are used. Calls from main, satellite, and tributary locations, as well as remote access, OPX,



* "DIMENSION" DATA LINK (DDL) - FOUR WIRE FULL DUPLEX DIGITAL COMMUNICATIONS LINK.
† ELECTRONIC INDUSTRIES ASSOCIATION (EIA) RS232C COMPATABLE INTERFACE.
‡ EIA RS366 COMPATABLE INTERFACE FOR COMPUTER PORT CALL ORIGINATION.

Fig. 26—Example of a DIMENSION 600 PBX Level 2 Data Switching Configuration

and attendant calls use a priority OHQ. Tandem stations use a nonpriority OHQ.

(d) ***Type IV:*** Mixed queuing with RBQ for tandem stations and OHQ for all other calls. Off-hook queue calls use a priority queue, and RBQ calls use a nonpriority queue.

DIAL ACCESS TO ATTENDANT

3.152 This feature allows station users or dial repeating tie trunks within the switching system to reach the attendant by dialing a code, usually but not necessarily, a single digit 0. The attendant may complete these calls to trunk facilities or station lines.

"DIMENSION" PBX ELECTRONIC CUSTOM TELEPHONE SERVICE (ECTS)

3.153 The ECTS provides improved key telephone features and simplified access to custom calling PBX features (Table E). Some of the main characteristics are:

- A multibutton electronic telephone (MET) set (2990 through 2999 series), which can be used for single or multiline service.
- Nonlocking pushbuttons and light emitting diode (LED) indicators on the MET set to provide line or feature access and status.
- Administration of features and maintenance routines which are controlled by software programs. Interface with the PBX is via the Maintenance and Administration Panel (MAAP). The Customer Administration Center System (CACS) and Customer Administration Panel (CAP) provide the customer with the capability to make station rearrangements and changes.
- All network and bridging connections are accomplished in the PBX under software control.
- No switching functions are required in the telephone set.
- An electronic telephone controller may be optionally located within the PBX cabinets or in a remote position to provide the most economical plan.
- A test line is assigned to a steering port in each controller. Tip and ring assignments for these test lines are given in the customer ordering document.

3.154 A MET set can be arranged for single-line service or multiline (key-type) service. Conventional nonkey telephone sets (500 through 2800 series) can be used to pick up PBX lines which appear on an electronic key telephone set.

3.155 The MET sets are controlled by an electronic telephone controller available in 2-line capacity sizes. A basic controller (J58879KA) serves a maximum of 63 MET sets. A supplemental controller (J58879KB) provides line capacity for 63 additional MET sets or a maximum of 126 per controller group. The maximum number of controllers is feature package and memory configuration dependent (Table A).

3.156 The basic and supplemental controllers are contained in circuit pack carriers which can be mounted in a vacant carrier position in the module control, line, or auxiliary PBX cabinets, or on a separate controller cabinet (Fig. 27). Refer to Part 4, ECTS Basic and Supplemental Carriers for additional hardware information.

3.157 For more detailed information regarding ECTS, refer to Section 554-010-110.

DIRECT DEPARTMENT CALLING (DDC)

3.158 This feature provides an economical alternative to Direct Inward Dialing (DID) service for selected high call volume departments behind a PBX. Each DDC group terminates one or more non-DID Listed Directory Number (LDN) type trunks to a designated station which is normally in a hunting group. Calls to this station are queued if the station and all other members of the hunting group are busy. ▶For systems equipped with Issue 3 of FP8, the function of the DDC feature is replaced by the Enhanced Uniform Call Distribution feature.◀

DIRECT INWARD DIALING (DID)

3.159 An incoming call from the exchange network (not FX or WATS) can reach a specific station line without attendant assistance. The DID service can be provided for some station lines and non-DID (LDN only) service can be provided for other sta-

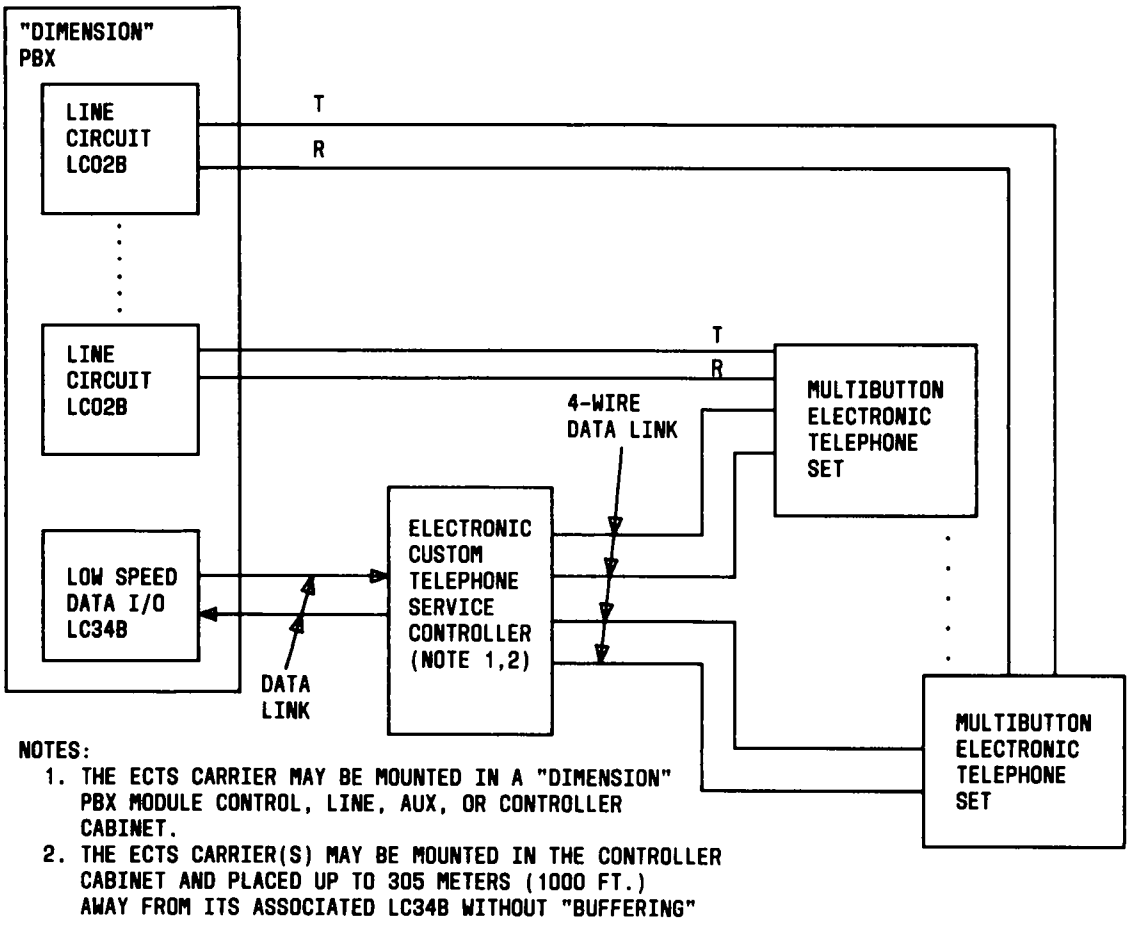


Fig. 27—DIMENSION PBX ECTS Configuration

tion lines on the same PBX. The DID calls to DID-restricted station lines are routed to the attendant or recorded announcement, depending on the option selected. The Listed Directory Number can be dialed to receive attendant assistance.

DIRECT OUTWARD DIALING (DOD)

3.160 A PBX station user can gain access to the exchange network without the assistance of the attendant by dialing an access code and receiving a second dial tone. The user may then proceed to dial the desired exchange network number.

DIRECT TRUNK GROUP SELECTION

3.161 This feature allows the attendant (active on a switched loop) to directly access an idle outgoing trunk in a given trunk group by pressing the key associated with the desired trunk group.

DIRECTORY SERVICE

3.162 This feature, which is provided in Issue 3 of FP8 via the DIMENSION 600 PBX Applications Processor (AP), automates access to information about station users. It is essentially a computerized "white pages" directory. Listings on a video terminal may be accessed or created via an AP terminal interface by an attendant, a message center agent, or a terminal user. Directory output under control of system administration may be sent to a printer or tape. Either the complete directory or only specified sections can be printed in order of name, extension, or organization. Directory searches can be based on an extension, room, location, organization, or a partial or full spelling of the principal's name.

3.163 Directory information includes name of station user (principal), position extension, organization number, location, room number, and immediate supervisor. Other directory items can be defined by the customer within ten additional fields, with up to 55 characters per field.◀

DISTINCTIVE RINGING

3.164 Unique patterns of station ringing (using existing station sets) are provided to permit the station user to distinguish between various types of calls. Three patterns are available as follows:

(a) One-burst (normal) ringing indicates station-to-station call.

(b) Two-burst ringing indicates attendant call or outside call.

(c) Three-burst ringing indicates either Automatic Callback, Originating Call Waiting, Outgoing Trunk Queuing Callback, or Custom Intercom call.

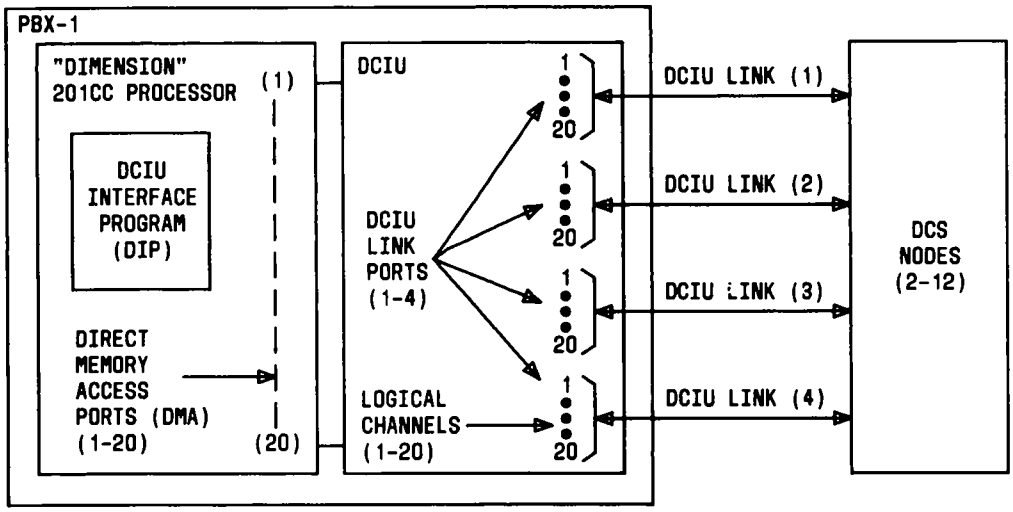
DISTRIBUTED COMMUNICATIONS SYSTEM (DCS)

3.165 ▶The DCS provides new feature capabilities to DIMENSION 600 PBXs equipped with Issue 3 of FP8. The DCS provides customers with the capability to have feature transparency between multiple DIMENSION PBX switches. Feature transparency is the ability to activate, administer and use a feature between two or more PBX switches, and have the feature operate as if it were in the same switch. The switches can be located on the same premises, a campus arrangement, or in different locations distributed throughout a metropolitan area. In addition, customers that require more capacity than can be provided with a single PBX can now be provided with a system comprised of several PBXs that have feature transparency between them. This then enables customers to operate and control their systems, basically, as a single entity.

3.166 ***Transparent Features:*** Each PBX equipped with DCS has available all of the features presently offered with FP8. In addition, DCS provides some degree of feature transparency between the PBXs for the following FP8 features:

- Alphanumeric Display for Attendant Position
- Attendant Control of Trunk Group Access
- Automatic Callback Calling
- Automatic Circuit Assurance
- Busy Verification of Station Lines
- Call Forwarding—All Calls, Busy and Don't Answer
- Call Waiting—Attendant, Originating, Terminating
- Calling Number Display to Attendant
- Centralized Attendant Service W/Combined PBX/Attendant Concentrator
- Class-of-Service Display to Attendant
- Direct Trunk Group Selection
- Distinctive Ringing
- ECTS Direct Station Selection (DSS)
- ECTS Last Extension Called
- Five-Digit Dialing
- Inter-PBX Call Transfer
- Station-to-Station Calling
- Threeway Conference Transfer
- Trunk Group Busy Indicators on Attendant Position
- Trunk Group Warning Indicators on Attendant Position
- Trunk Verification by Customer.

3.167 ***Data Communications Interface Unit (DCIU):*** Feature transparency is made possible between PBXs by the addition of a DCIU and an associated DCIU interface program (DIP) to each PBX. The DCIU makes possible the transfer of information between PBX processors. As shown in Fig. 28 the DCIU interfaces with the local PBX processor via 1 of 20 direct memory access (DMA) ports under control of the DIP. The DIP translates DCIU instructions, generates and formats a DCS message with the appropriate feature or call information, and transmits the message by a DMA port to the DCIU.



NOTE: NO MORE THAN FOUR DCIU LINKS ARE ASSIGNED EACH NODE AND NO MORE THAN TWELVE PBXs MAY BE ASSIGNED A DCS

Fig. 28—Distributed Communications System/DCIU Interface

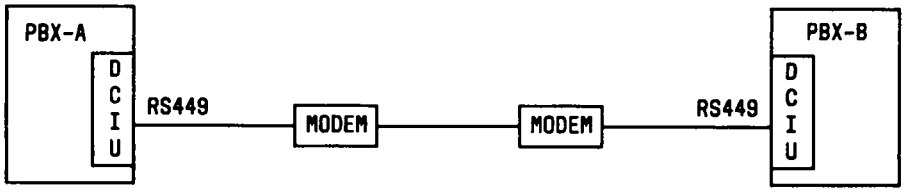
3.168 Once the appropriate call or feature message reaches the DCIU, the DCIU determines which PBX (ie, DCS node) the message is destined for, assigns the proper DCIU link and selects one of 20 logical channels within the link over which the message is to be transmitted. The links connect the various DCS nodes and are capable of handling information at speeds up to 19.2 Kbs, depending on distances involved and traffic on the link.

3.169 Typical connecting arrangements for DCIUs are shown in Fig. 29. A standard data modem or a local area data set (LADS) that supports the required baud rate (ie, 2.4 Kbs to 9.6 Kbs) and provides protection is required at each end of the interface.

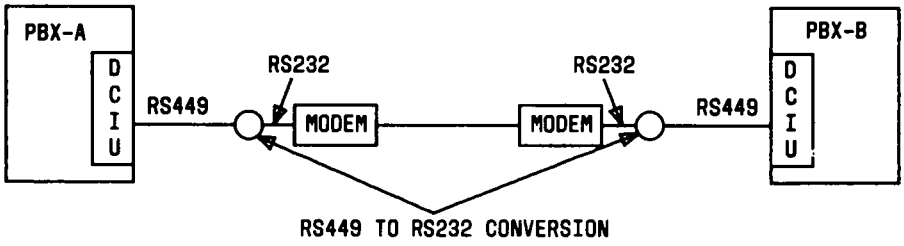
3.170 ***DCS Architecture:*** A DCS is comprised of various PBXs connected via DCIUs and associates links to provide feature transparency between the systems. Systems A, B, C, D (Fig. 30) make up a DCS and are referred to as cluster nodes. Communication between two DCIUs via an intermediate DCIU is referred to as a hop (ie, PBX-A to PBX-C via intermediate DCIU located in PBX-B).

3.171 An example of a DCS electronic tandem network (ETN) configuration is shown in Fig. 31. Systems A, B and C make up a DCS and PBXs F, G and H make up another DCS. Feature transparency ***does not*** exist between the two DCSs. Tie trunks are required between DCS nodes to pass digit, signaling, and voice transmission. In the DCS configuration of DCS nodes F, G and H, tie trunks are not needed between satellite G and H because communication between these locations is routed via main PBX F.

3.172 Assignments of DCIU links at each DCS node are made in such a manner that all nodes can be physically connected with no more than one hop required to reach any combination of nodes. No more than four DCIU links are assigned to each

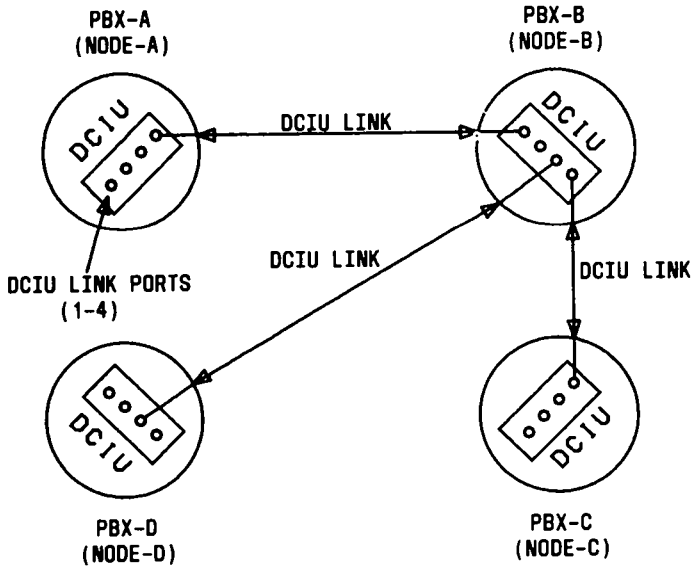


A - CONNECTING ARRANGEMENT WITH EIA RS449 COMPATIBLE MODEMS

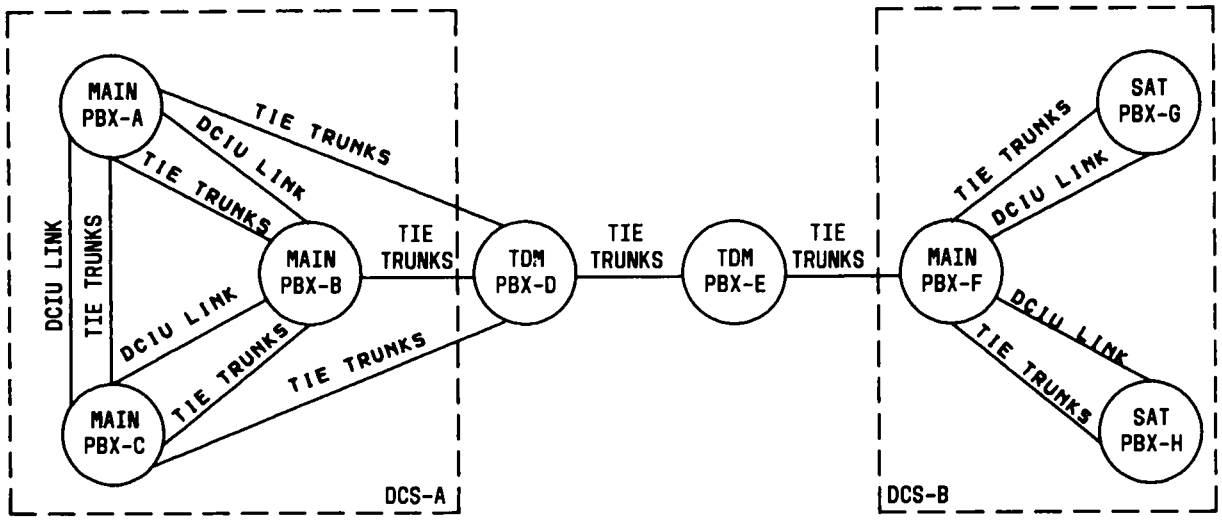


B - CONNECTING ARRANGEMENT WITH EIA RS232 COMPATIBLE MODEMS

♦Fig. 29—Distributed Communications System DCIU Connecting Arrangements♦



♦Fig. 30—Distributed Communications System/DCIU Interface♦



NOTE: FEATURE TRANSPARENCY DOES NOT EXIST BETWEEN DCS-A AND DCS-B

Fig. 31—Distributed Communications System Electronic Tandem Network Configuration

node and no more than 12 PBXs can be assigned a DCS. The PBXs must be within a 30-mile radius. Large DCS multiple PBX switch complexes may require the use of a 5-digit dialing plan. See "Five-Digit Dialing," this Part for a description of the plan.

3.173 There is currently no method for administering or maintaining all DCS cluster nodes using the same connection. All nodes must be administered and maintained as separate PBXs using a separate dial-up connection from RMATS or CACS for each PBX.

3.174 When a feature is accessed to a distant node that requires the passing of the COS assignment, the COS in both the sending and receiving nodes must be the same.

3.175 Like COS assignments, each trunk group (TG) that is associated with a DCIU link must be numbered exactly the same on both ends of the circuit (ie, TG20, trunk 4 must be TG20, trunk 4 on both ends of the circuit.)

ELECTRONIC TANDEM NETWORK (ETN)

3.176 Electronic tandem networks are composed of:

- Tandem switches interconnected by intertandem tie trunks
- Main switches which home on tandem switches via access lines
- Satellite and tributary switches which home on main switches via tie lines.

Figure 32 is an example of a 3-node ETN. DIMENSION PBXs equipped with FP8 may be used as tandem, main, satellite, or tributary switches in an ETN. An ETN configuration provides a means for uniform dialing (ie, Uniform Numbering Plan feature) from any station on the network.

EMERGENCY ACCESS TO ATTENDANT

3.177 This feature provides priority handling of emergency calls from stations to attendants. Emergency access can be effected by dialing a 1- or 2-digit code from any station and/or by assigning emergency access to manual originating lines. A station user is connected to an idle attendant loop. The priority call waiting lamp is lit, a special SOS audible tone is sounded, and EMRG is displayed at the idle console. If all loops are busy, the call is placed in an

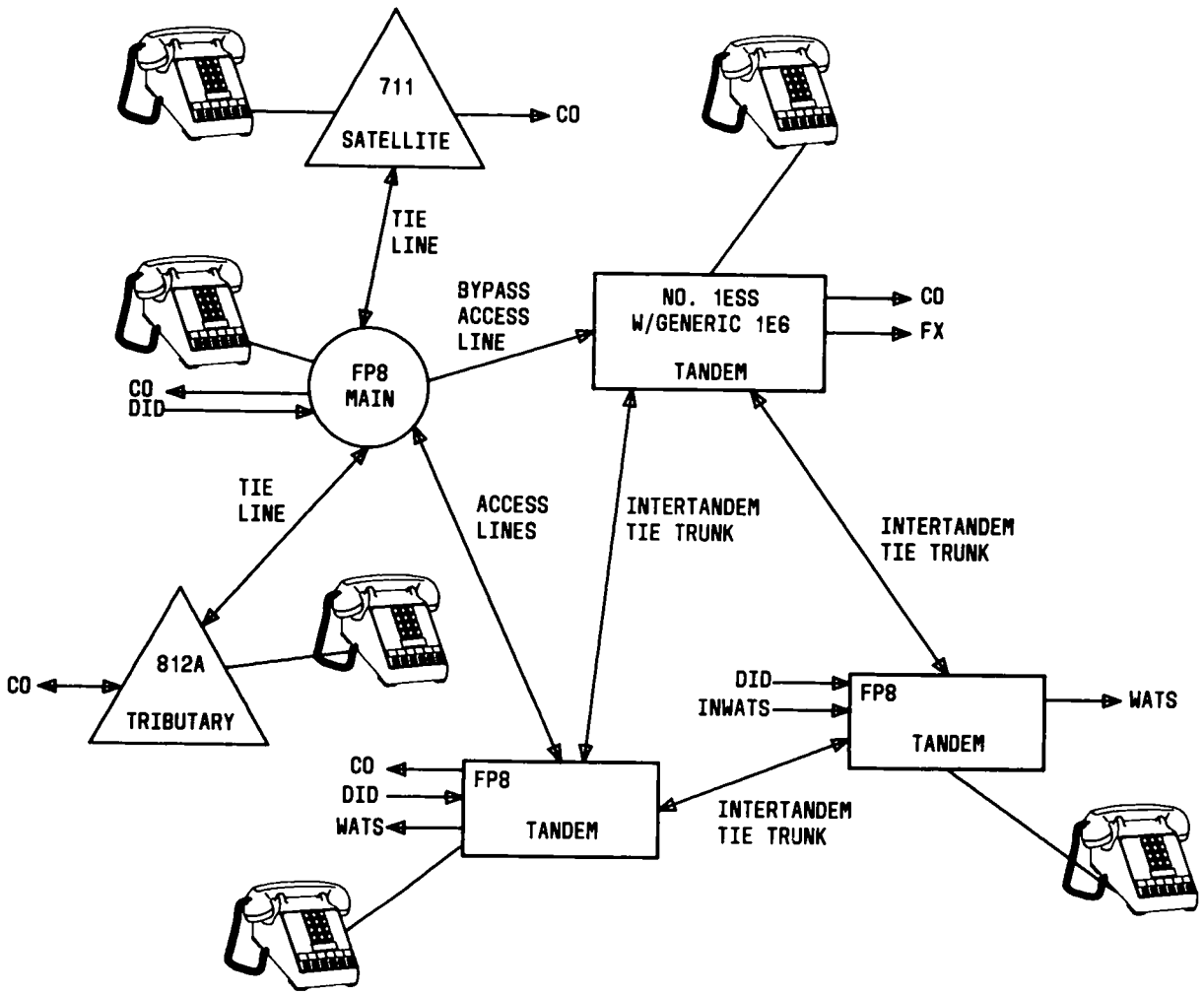


Fig. 32—Example of a 3-Node Electronic Tandem Network

emergency priority queue and the priority lamps and SOS tones are activated at all consoles. When a position becomes idle, the emergency indications continue only at the idle console until the call is answered.

ENERGY COMMUNICATION SERVICE (ECS)

3.178 This feature provides the ability for the DIMENSION PBX to control energy consuming devices throughout a hospital or lodging complex. Audio signals are sent over the telephone wiring to control power unit consumption in the hotel/motel/or hospital facility. This feature is designed to use existing telephone wiring wherever possible. A separate interface unit is required for each power unit controlled. The control modes include:

- Guest room load/vacant room control
- Guest room load/load cycling control
- Individual load/time-of-day control

- Individual load/load cycling control
- Peak demand load shedding
- Energy consumption and demand monitoring.

3.179 The following enhancements have been incorporated into this feature:

(a) ***8-Day Clock:*** Allows the ECS operator to create a schedule for setting up load usage on a daily basis. This enhancement includes an eighth day to be used for scheduling holiday load usage.

(b) ***Generic Wording:*** When the generic wording option is ordered, all occurrences of non-generic nomenclature will be replaced with new terminology. The primary change will be to use the word "station" to replace all occurrences of the words "guest room" (hospitality) or "patient room" (hospital).

(c) ***Individual Power Meter Reporting:*** Individual power meter reporting will give the ECS operator a display of the current demand (updated every minute) for each of the individual meters. This display will be added to the screen for the base procedure.

(d) ***Energy Control Alarm Printing:*** Alarm printing will give the ECS operator the capability of printing a list of the alarms at any time. A total of 42 ECS alarms will be in memory. If the number of alarms in memory ever reaches 35, a list will be printed automatically, and then the printed alarms will be cleared from memory.

3.180 Further technical information and detailed application notes helpful for system implementation are available in Section 554-010-103.

ENERGY COMMUNICATIONS SERVICE ADJUNCT (ECSA)

3.181 The ECSA consists of a DIMENSION PBX cabinet-mounted processor(s), and associated equipment for power, alarms, and program tape. In addition, there is a unique energy carrier and three circuit packs developed for the adjunct. Using this configuration, the adjunct is a dedicated system for monitoring and controlling the energy consumed by customer equipment. Call processing is performed by the host PBX to which the adjunct is connected by way of alarm circuitry.

3.182 Important hardware considerations center around the use of the energy load control circuit LC562. It provides a normally open contact interface at the ECSA thereby eliminating the need for Energy Communications Signaling Units (ECSU) and corresponding hardware previously necessary to generate and pass tones to ECSUs over telephone lines. With the adjunct, it is necessary to provide dedicated wiring (and cross-connect field) from the LC562 contacts to the low-voltage control circuitry for the energy consuming equipment. Due to the number of circuits per LC562 and number of circuit pack positions per energy carrier, the adjunct provides a higher load handling capability per cabinet than was possible using ECSUs and their supporting hardware. Other hardware considerations are that the use of CAP and attendant console are excluded from the adjunct operation. The MAAP procedures are limited to a minimal number and interface to RMATS is separate from that of the host PBX.

3.183 Relative to feature package considerations, the ECSA is equipped with a program tape based on FP11 with generic wording. No call processing is provided.

3.184 Additional information concerning the ECSA can be found in descriptive Section 554-106-100 and preinstallation and planning Section 554-106-101.

ENHANCED PRIVATE SWITCHED COMMUNICATIONS SERVICE (EPSCS)

3.185 This service (EPSCS) provides the private switching network that interfaces with the Advanced Private Line Termination (APLT) feature in the DIMENSION PBX. The APLT trunks may be served by a common control switching arrangement (CCSA); however, APLT would not be provided the enhanced services of EPSCS. Trunks from the EPSCS switching network can tandem through the PBX without assistance from the attendant (if the network has the Tandem Tie Trunk Switching feature). When off-net access is provided by the network, selected station lines can be denied off-net access.

ENHANCED UNIFORM CALL DISTRIBUTION (EUCD)

3.186 ◗This feature, provided in Issue 3 of FP8, replaces the functions of Uniform Call Distribution (UCD) and Direct Department Calling (DDC)

features provided in Issue 1 of FP8/FP12. It is equivalent to the ACD feature in FP8, Issue 2, except that the Performance Reporting Option (PRO) 150/500 is not available. This feature permits incoming Direct Inward Dialed (DID), Central Office (CO), Foreign Exchange (FX), Tie Trunk, and 800 Service calls as well as local station and attendant extended calls to be terminated directly to the next idle of a prearranged group of answering positions (referred to as a split). The answering positions appear as normal stations to the PBX and can function in the normal manner to originate and receive calls directly. The FADS display that was provided with UCD is not compatible with Issue 3, FP8.◀

EXECUTIVE OVERRIDE

3.187 The station user can enter an existing 2-party busy station connection. Before the add-on is established, a nominal 4-second burst of tone will be applied to advise the calling and talking parties.

3.188 An ECTS station user can activate Executive Override by pressing the assigned button upon hearing a busy signal when calling another station. The status lamp remains illuminated until one of the original parties hangs up.

EXTENDED MEMORY HOLDOVER

3.189 This is an optional hardware arrangement provided with FP9/FP11. It replaces the standard 90-second holdover battery associated with each J87432D power supply with a hotel/motel or hospital battery cabinet containing low-maintenance lead-acid batteries and charging units. Eight hours of memory holdover are provided by this arrangement. (System holdover is not provided by this arrangement.) This option is highly desirable in FP9 and FP11 systems using the billing or room status features since a loss of the information stored in the PBX control memory would require significant effort to restore.

FACILITIES ADMINISTRATION AND CONTROL

3.190 This feature is provided in connection with the CACS and CAP. The customer can administer the assignment of parameters which determine user calling privileges, such as Facility Restriction Levels and Authorization Codes. Manual control (override) of time-of-day routing is provided. Activation and deactivation of trunk group queues are also provided.

FACILITIES ASSURANCE REPORTS

3.191 This feature is provided in connection with the CACS. The customer can obtain an audit trail of the referrals generated by the Automatic Circuit Assurance feature. The audit trail indicates the identity of the trunk circuit, time of referral, nature of the referral (ie, short holding time failure or long holding time failure) and whether a test was performed by the PBX attendant in response to the referral.

FACILITY RESTRICTION LEVEL (FRL)

3.192 An FRL is a parameter associated with each authorization code, station line, incoming tie trunk group, remote access trunk, and attendant console positions (as a group). The FRL is used to determine if a call attempt is permitted as well as which routes are to be used or denied in the process of routing calls via Automatic Alternate Routing (AAR), Automatic Route Selection (ARS), or Automatic Route Selection—Deluxe (ARS—Deluxe). There are up to eight levels of calling privileges to be specified by the customer. When the FRL of the calling party is transmitted over an intertandem tie trunk to a distant PBX, it is called Traveling Class Mark (TCM).

FIVE-DIGIT DIALING

3.193 ▶This feature provides a means for stations to call other stations in the same PBX or a different PBX using five digits without dialing an access code or pausing for dial tone between digits. The Five-Digit Dialing plan can be used to accommodate large multiple PBX switch complexes such as a Distributed Communications System (DCS). Small PBX configurations can still use a 4-digit plan; however, 4-digit and 5-digit dialing plans cannot be intermixed. The 5-digit call processing capability in a DCS environment, for example, will allow a station user to access any other station on any switch in the DCS. No dial access codes or intervening dial tones are required. To the station user, the calling procedures are the same as those on a single system.

3.194 When Five-Digit Dialing is used in a DCS, the first two digits of a 5-digit number must uniquely identify a single PBX within the DCS cluster. The digit "0" may not be used as the first or sec-

ond digit for station numbers. In addition, the first digit of a 5-digit number series must be the same for all stations in a given DCS cluster node.

3.195 Attendant consoles capable of displaying the 5-digit dialing codes are required to support configurations using Five-Digit Dialing.◀

FLEXIBLE NUMBERING OF STATIONS

3.196 Station numbers can be assigned to lines at the time of installation in accordance with a customer-desired numbering plan and can be reassigned while in service to permit personnel moves without requiring number changes. Station number assignments can begin with any digit except *, #, and 0 but must be fixed in length to two, three, or four digits in the same installation. The same first digit cannot be used for both station numbers and trunk or feature access codes. However, the same first digit can be used for trunk and feature access codes where all codes starting with that first digit always have the same number of digits (two or three).

FLEXIBLE NUMBERING OF STATIONS—MIXED NUMBERING

3.197 Station numbers can be assigned to lines at the time of installation in accordance with a customer-desired numbering plan and can be reassigned while in service to permit personnel moves without requiring number changes. Station number assignments can begin with any digit except *, #, and 0 and can vary in length from one to four digits within the same installation. Conflicts that result from the use of the same first digit for different length station numbers can be resolved with time-out, an end of dialing code (with TOUCH-TONE dialing), and/or by use of a prefix digit for multidigit station numbers. To avoid time-out, a different prefix code can be used for different length station number series. The same first digit can be used for trunk and feature access codes. Mixed numbering allows mixing of station and trunk feature codes using the same first digit and also the same number of digits (unassigned codes).

3.198 The following improvements have been incorporated in this feature since its introduction in DIMENSION PBX systems:

- Any digit assigned as a single-digit trunk access code may also be used for assignment as the first digit of multidigit room station numbers (eg, digit 8 or 9). Time-out or end-of-dialing code is required after the first digit in order to resolve trunk access codes and station numbers.

- Unassigned 2- or 3-digit numbers in a station numbering series can be used as trunk access or feature access codes. A dial 0 may be assigned as the attendant access code and dial 0X or 0XX as feature or trunk access codes.

- All lines which receive DID calls can be fixed at 3- or 4-digit numbering plans in an installation. These lines may also be accessed by single- or 2-digit numbers for internal dialing.

Note: These additional capabilities are required for hotel/motel installations having more than seven floors to eliminate the need for an access code when using room-to-room dialing.

FORCE ADMINISTRATION DATA SYSTEM (FADS)

3.199 The FADS feature provides for display of Centralized Attendant Service (CAS) and/or Uniform Call Distribution (UCD) traffic data. Access to the data is via one or more FADS display terminals. Each terminal consists of two Light-Emitting Diode (LED) display fields and a TOUCH-TONE telephone pad. Only one terminal is required for CAS traffic studies while a maximum of 12 terminals may be provided for UCD group traffic studies (one terminal per group). Optionally, a printer can be provided with each terminal to obtain a hard-copy printout of the traffic data. ▶FADS is not available in Issue 3 of FP8. It is available in Issue 1.◀

3.200 The FADS hardware arrangement is used to display CAS force administration data for integrated (main PBX) attendant concentration applications. Force administration data is made available at a main location by both visual and printed displays. Each FADS (one per system) requires one dedicated low-speed data channel and consists of four hardware items as follows:

- 211A power unit
- KS-19252, List 7 adapter
- ADDMASTER* 9042-2 printer (optional)

*Registered trademark of Addmaster Corp.

- 102F1-A inquiry display unit (CAS applications only)
- 102G1-A inquiry display unit (UCD applications only).

3.201 Figure 33 depicts the 102F1-A display unit.

FOREIGN EXCHANGE (FX) CENTRAL OFFICE (CO) ACCESS

3.202 This feature which provides access to a distant CO via FX trunks. All incoming calls to the PBX (from the FX CO area) are placed to the listed FX directory number and are answered by the attendant similar to Listed Directory Number (LDN) service. Outgoing calls are made on an attendant-handled basis via direct or dial access and/or on a dial basis by stations (through use of a trunk access code).

3.203 ***With Voice Switched Gain (VSG):*** Voice switched gain provides a means of inserting

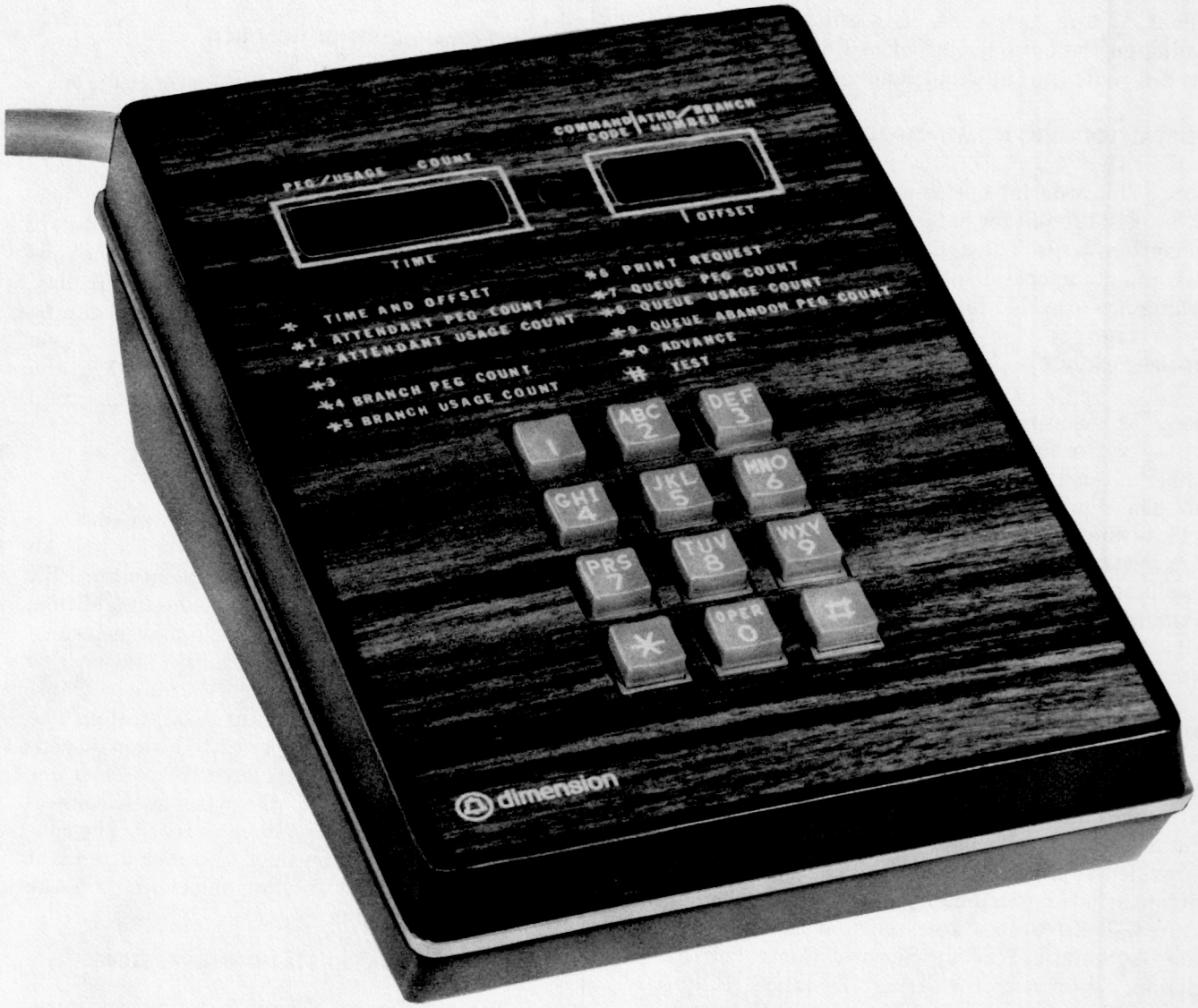


Fig. 33—FADS Display Unit (102F1-A)

gain in the transmission path where end-to-end loss significantly degrades transmission quality. The VSG is provided only on incoming attendant completing non-DID trunks when the incoming call is extended to an outgoing trunk. The activation of VSG is controlled by the PBX program. The VSG is never used on an outgoing call via an FX trunk. Only one VSG trunk is provided per circuit pack. The use of VSG trunks should be carefully traffic engineered.

FULLY RESTRICTED STATION

3.204 Selected station lines are denied the ability to place or receive any but station-to-station calls. The DID calls are routed to the attendant or an announcement. The CCSA calls are routed to the attendant, an announcement, or to intercept tone, depending on the option selected. All other restricted calls are routed to intercept tone.

HOSPITAL/LODGING NOMENCLATURE

3.205 This ordering option allows the use of FP9 or FP11 for either hotel or hospital applications on a system basis. The appropriate console designations, alphanumeric display wording, and printout wording are provided for the intended application.

HOT-LINE SERVICE

3.206 This feature allows a station user on the PBX system to place a call to a preassigned called number automatically when the station user goes off-hook. The Hot-Line Station can receive calls normally. Hot-Line calls can be directed to stations, exchange trunks, APLT trunks, and internal miscellaneous trunks such as Loudspeaker Paging. A maximum of 30 lines can have this service. Up to 14 digits can be automatically dialed. Trunk signaling if required (eg, wink start) is automatically handled.

HOTEL/MOTEL OR HOSPITAL CONSOLE/TERMINAL

3.207 The DIMENSION PBX system attendant console, modified to include an additional 4-digit alphanumeric field and additional feature keys, is provided as input/output terminals to access and control various hotel/motel or hospital management features. The features accessed and controlled include: Automatic Wakeup Service, Controlled Restriction, Interface for Long Distance Billing, Message Waiting, Local Call Billing, and Room Status. The Attendant Console/terminal also provides all of the normal Attendant Console functions. In smaller installations, the Attendant Console/terminal can serve both as the PBX Attendant Console and as the front desk terminal. In larger installations, a separate Attendant Console/terminal for the PBX attendant and a station console/terminal for the front desk (including separate cashier and front office manager) may be provided.

IN-DIALING THROUGH MAIN

3.208 The in-dialing through main feature is a feature of the main/satellite configuration. Calls destined for a satellite PBX on a Direct Inward Dialing (DID) or Network Inward Dialing (NID) basis are automatically switched by the main over a tie trunk to the called satellite PBX.

INCOMING CALL IDENTIFICATION (ICI)

3.209 An attendant at a switched loop console position can visually identify the type of service or trunk group associated with a call directed to that position. The visual indication can be provided via indicator lamps or via the alphanumeric display feature. When provided via indicator lamps, up to six incoming call indicators can be provided on the console. ▶When provided via the alphanumeric display, up to 30 ICI indications (per PBX in a DCS) can be provided in a 4-position field. With a DCS (FP8, Issue 3.0), calls to the attendant from another PPX in the DCS will display the ICI assigned to the trunk group in the other PBX.◀

INTER-PBX CALL TRANSFER

3.210 The Inter-PBX Call Transfer feature is a feature of the main/satellite configuration. An incoming CO call to a main PBX or a satellite PBX may be put in a 3-way conference mode. In addition, an incoming CO call to a main PBX may be transferred over a tie trunk to a satellite PBX station, and an incoming CO call to a satellite PBX may be transferred over a tie trunk to a main PBX station. The transfer of calls to trunks is permitted when disconnect supervision can be guaranteed (ie, at least one incoming call is involved); otherwise, such connections must be limited to 3-way conference. The conference/transfer operation may be under attendant control or station dial control, depending on the main/satellite switching systems.

INTER-PBX COORDINATED STATION NUMBERING

3.211 This is a feature of main/satellite configurations and, in certain instances, may be pro-

vided with main/tributary configurations. Stations at the main and satellite may dial each other without intervening dial tone. The dialing plan for an inter-PBX call is the same as for an intra-PBX (station-to-station) call. In a switching arrangement where the main PBX provides access lines to a private network, such as APLT, stations at the satellite or tributary may access that network by dialing a single access code. This requires that the satellite or tributary be a DIMENSION FP8 PBX.

INTERCEPT TREATMENT

3.212 Calls which cannot be completed are routed to an appropriate audible signal, recorded announcement, or to the attendant, depending on the noncompletion condition. These treatments are as follows:

(a) ***Attendant Intercept:*** Certain calls that cannot be completed are routed to the attendant position for further treatment. Direct inward dialed calls so routed are given normal charging treatment.

(b) ***Intercept Tone:*** This treatment provides a continuous tone alternating between a low pitch (440 Hz) and a high pitch (620 Hz), indicating that a restricted or unassigned code has been dialed or that a special service has been denied.

(c) ***Recorded Announcement Intercept:*** Intercepted calls are routed to a recorded message which indicates the reason the call was intercepted. This intercept treatment is provided as an alternative to attendant intercept for DID, Electronic Tandem Network (ETN), and Advanced Private Line Termination (APLT) calls only as a system option. Only one message can be given. No answer supervision is provided for this type of intercept treatment.

INTERFACE FOR LONG DISTANCE BILLING

3.213 This feature allows selected long distance billing information transmitted to the hotel via Traffic Service Position System (TSPS) Auto-Quote Data Channel to be stored in the PBX memory. This information can be displayed on the console/terminal or printed on demand and on checkout giving up-to-the-minute billing on calls placed by the guests. Taxes (federal, state, and local) are automatically calculated. The TSPS message number and the total calculated dollar amount will be stored and displayed for each guest call to allow posting the charge and to serve as a tracer to the original TSPS message.

3.214 To accumulate system totals of all long distance calls, charges are also stored in memory and can be provided or cleared on demand. One total includes all TSPS/HOBIC (Hotel Billing Information Center) charges; the other total includes all taxes and intrastate surcharges as billed to the guests.

INTERFACE TO NETWORK CONTROL OFFICE SUPPORT SYSTEM — LOCAL STORAGE UNIT (NCOSS — LSU)

3.215 This feature provides the hardware connection to the (optional) LSU which is used by the NCOSS for storing SMDR data. The traffic data is obtained from a high-speed data channel located in the common control carrier, slot 33, circuit 0.

INTERPOSITION CALLING AND TRANSFER

3.216 An attendant at one attendant position of a multiposition attendant team can call an attendant at another position of the same team for purposes of consultation. The attendant can also transfer a call to another attendant position of the same team for special handling. This is used where certain positions are equipped, or at least assigned, to handle certain kinds of calls (such as conference, Wide Area Telecommunications Service [WATS] access, or internal directory assistance). As an option, access codes to allow station dial access to individual positions can be provided.

INWARD RESTRICTION

3.217 Selected station lines are prevented from receiving incoming exchange network calls and APLT calls, either DID or attendant-completed. Attendant-completed calls are routed to intercept tone. The DID calls are routed to the attendant or to a recorded announcement.

JOURNAL PRINTERS

3.218 This feature will provide hard-copy paper printers for audit trail and demand printing functions associated with the hospital/lodging management features. The feature applications utilizing printers are:

(a) Audit Trail

- Long distance billing TSPS message

- Local call billing audit
- Wakeup activity audit
- Maid status
- Needs cleaning audit
- Energy communications restriction

(b) Demand

- Billing for front desk/cashier
- Housekeeper printer
- Room status for front desk/cashier
- Energy communications reports
- Property Management System (PMS) audit.

LEAVE-WORD CALLING (LWC)

3.219 ▸The LWC feature allows a caller to leave a predefined "canned" message for the called party. By using a feature button on a Multibutton Electronic Telephone (MET) set, or by dialing an access code (non-MET set), the LWC feature creates a message containing the calling party identification, date, time, and a message to call the calling party. The message is created and stored in the Message Center data base without the participation of a covering station user. The subscriber for whom the message is intended then retrieves messages by calling the Message Center directly. Leave-Word Calling messages may be canceled by the caller before they are retrieved. Leave-Word Calling requires the Message Center Service feature since both features use the same data base. If more than one message is sent from a given caller, a count will be maintained and only the last message will be stored. These messages are integrated with Message Center messages so that any access to the Message Center will retrieve all the messages, including the LWC messages.

3.220 Whenever a LWC or Message Center message is waiting, the message waiting indicator on the station set lights as a result of the Automatic Message Waiting feature. This indicates messages are available in the Message Center for the subscriber.◂

LINE LOCKOUT WITH WARNING

3.221 This feature provides 10 seconds of warning tone and then holds the line out of service when a station line remains off-hook for longer than 10 seconds without dialing or after the last digit dialed during call origination. The hold out-of-service condition does not tie up switching facilities or call processing time and will be released when the station goes on-hook.

LISTED DIRECTORY NUMBER (LDN) SERVICE

3.222 Incoming exchange network calls to the PBX via the assigned listed local telephone directory number are directed to the attendant. The attendant may complete these calls to station lines within the system or certain trunk facilities. When Direct Inward Dialing is not provided, all incoming exchange network calls must be made on an LDN basis. Listed numbers are provided for CO, trunk (DID and non-DID), Advanced Private Line Termination (APLT), and Tie Trunk Calls.

3.223 ***With Voice Switched Gain (VSG):*** The VSG provides a means of inserting gain in the transmission path when end-to-end loss significantly degrades transmission quality. The VSG may be provided on incoming attendant completing trunks when the incoming call is extended to an outgoing trunk. The VSG is never used on an outgoing call via an FX trunk.

LOCAL CALL BILLING

3.224 This feature computes the dollar amount for local calls placed by guests based on the total message units stored for each guest room/bed telephone via the Local Call Billing rate parameter. This billing information integrated with the long distance charge information can be displayed or printed on demand and on checkout. Accumulative system (house) totals of local call message units, calls, and dollars of posted charges will be provided to facilitate accounting.

3.225 A printout can be obtained from a shared or dedicated journal printer. In either case, if an overload should occur, the load may be shared by a designated alternate printer.

LOUDSPEAKER PAGING

3.226 ▸***Basic:*** This feature allows the attendant direct access and station users dial access to

paging equipment for the purpose of voice paging. The paging amplifiers and speakers may be either customer owned or telephone company provided. Voice paging facilities make use of the telephone transmitter as the microphone. A control signal for cutoff or override of background music is also provided. Optional arrangements are available to provide multizone paging where a separate access code and/or console key (for direct access) is provided for each of up to six zones or all zones within a customer's complex. Dial access to all-zone paging is included when multizone paging is provided. Direct access (console key) to all-zone paging is optional.◀

3.227 ***Deluxe:*** This feature allows the attendant direct access and attendant and station users dial access to paging equipment for the purpose of voice paging. The paging amplifiers and speakers may be either customer owned or telephone company provided. Voice paging facilities make use of the telephone transmitter as the microphone. A control signal for cutoff or override of background music is also provided. Optional arrangements are available to provide multizone paging where a separate access code and/or console key (for direct access) is provided for each of up to six zones and/or all zones within a customer complex. Page answer capability is provided to allow the paged party to be connected to the calling party by dialing an answer code from any station within the PBX. Priority paging is provided to permit attendants and/or designated stations to dial access a paging zone or answer-back channel and preempt any station user connected to that zone or channel. Stations assigned Threeway Conference Transfer may also access paging while on any 2-party call. The second party can be added on or transferred to the page answer party but not to the paging input.

3.228 ***With Tie Trunk Access Allowed:*** Tie trunk access to paging and answer-back equipment is a feature enhancement. The paging party at the remote PBX dials the tie trunk access code to access the PBX. Upon receiving PBX dial tone, the paging party accesses and uses Loudspeaker Paging in exactly the same way as a paging party at the PBX, except that the PBX does not recognize a flash over a tie trunk to release the paging equipment after making the announcement.

MAIN/SATELLITE

3.229 This feature allows multilocation PBX customers to concentrate their attendant positions at one location referred to as the ***main.*** Other unattended locations equipped only with dial switching equipment are referred to as ***satellites.*** A minimum of one and a maximum of three Listed Directory Numbers (LDNs) may be provided per complex and all Central Office (CO) calls are routed through the main (with or without Direct Inward Dialing).

3.230 A DIMENSION PBX FP8 system may function simultaneously as a main and a tandem PBX.

MAIN/TRIBUTARY

3.231 The Main/Tributary function permits a multilocation customer to consolidate Tie Trunk Access facilities (eg, APLT) at a single location designated the ***main.*** A tributary is a PBX which reaches a tandem on an Electronic Tandem Network (ETN) by going through a main (main/tributary). It is attended and may or may not have a coordinated numbering plan with the main. For ETN calls, a separate RNX is assigned to tributaries while satellites share an RNX with the main.

MANUAL ORIGINATING LINE SERVICE

3.232 These station lines are arranged to automatically route to the attendant position for completion when the station user goes off-hook for service. Dial tone is not provided to these lines and all originating connections are made by the attendant. Terminating connections can be dialed directly to a manual line.

MANUAL TERMINATING LINE SERVICE

3.233 Calls to these station lines require completion by the attendant. Nonattendant-handled calls to these lines are routed to intercept tone. Common Control Switching Arrangement (CCSA) calls are routed to the attendant, to an announcement, or to intercept tone, depending on the option selected. The DID calls are routed to the attendant or to a recorded announcement. Originating calls are dialed in the normal manner.

MESSAGE CENTER SERVICE

3.234 ▶This feature, which is provided by Issue 3 of FP8, allows a pool of agents, or operators, at a Message Center to provide a video terminal based

answering service for subscribing station users. All Message Center calls are channeled to the agent pool through a designated Enhanced Uniform Call Distribution (EUCD) queue. When a call is not answered immediately by an agent, the call awaits distribution in the EUCD queue. The caller hears a recorded announcement and optional background music until the agent answers.

3.235 Agents in the Message Center can retrieve messages as well as answer calls. Agents answering calls can identify the subscriber to the caller, inform callers of any messages that subscribers have left for them, and retain messages callers leave for subscribers by entering them at the video terminal, and subsequently saving them on the Message Center data base.

3.236 A message-waiting lamp lights at the subscriber's telephone when there is a message. Subscribers may call the Message Center directly to retrieve the message. The agent can add, delete, or change any message the subscriber designates for incoming callers. The agent can also step through the subscribers messages sequentially and read, retain, or delete them. Each message displayed at the agent's terminal will be one of two types: those activated by callers through the Leave-Word Calling feature, and those entered by message center agents at a terminal.

MESSAGE WAITING SERVICE

3.237 This feature provides the ability to light a lamp remotely (from a central location) on a station set served by the PBX to indicate that a message is waiting for the station user. The lamps can be activated from the hotel/motel or hospital console/terminal via the DSS/busy lamp field.

> ***Note:*** Message Waiting Service is restricted to on-premises application. Off-premises message service is not a standard feature offered with the DIMENSION PBX and is not registered under the Private Line Service provisions of the FCC Rules (Part 68).

MISCELLANEOUS TRUNK RESTRICTION

3.238 Preselected station lines (and dial repeating tie trunks) are denied access to preselected miscellaneous trunk groups that may include FX, WATS, APLT tie trunk, and auxiliary trunks. Restricted call attempts are given intercept tone.

MULTIPLE LISTED DIRECTORY NUMBERS (LDN)

3.239 More than one central office LDN can be associated with an installation. Each LDN can be assigned a unique incoming call indication on the console. With non-DID service, a separate trunk group is required for each LDN on which a unique Incoming Call Identification (ICI) is desired.

MUSIC-ON-HOLD ACCESS

3.240 This feature provides customer-furnished music or other audible indication to the held party during the hold interval. The held call condition can be the result of Attendant Position Hold, Call Hold, or Threeway Conference Transfer Hold, or the hold associated with other similar features.

NIGHT CONSOLE POSITION

3.241 This feature provides an alternate attendant position which can be used at night in lieu of the regular attendant position(s) to answer all calls directed to the attendant. This position provides all of the regular attendant functions.

NIGHT STATION SERVICE—FIXED SERVICE

3.242 Arrangements are provided to route calls, normally directed to the attendant, to a preselected common station line within the system when night service is activated. In addition, incoming calls from specific non-DID exchange network trunks can be arranged to route to specific station lines. The routings are provided on a fixed basis by the telephone company at the time of order or via the Maintenance and Administration Panel (MAAP). Trunk Answer From Any Station, when included in the feature generic, may also be provided for night calls not assigned to, or that cannot be answered by, night stations.

NIGHT STATION SERVICE—FULL SERVICE

3.243 Arrangements are provided to route calls, normally directed to the attendant, to a preselected common station line within the system when night service is activated. In addition, incoming calls from specific non-DID exchange network trunks can be arranged to route to specific station lines. The routings can be assigned on a flexible basis by the attendant and remain in effect night-to-night until changed. A default common night station is assigned

by the telephone company at the time of order or via the MAAP which is used in the event of a power failure that causes loss of memory. Trunk Answer From Any Station answering capability is provided for night calls not assigned to or that cannot be answered by night stations. When in night service, all stations have Threeway Conference Transfer capability for transferring calls to other stations and Call Waiting service (if provided with the feature package) for night calls.

OFF-PREMISES STATIONS

3.244 This feature provides service between the PBX and a PBX station where the station is located some distance from the PBX premises.

OFF-PREMISES STATIONS (OPS) WITH CALL CONTROL

3.245 This feature provides access to the PBX by special off-premises extensions. An off-premises extension (OPX) is a telephone set, under control of the PBX, that has a trunk-type connection (LC361) to the PBX. The OPX is usually located some distance from the PBX, and the OPX user has access to trunk features instead of line features. An OPS is a station connected to the PBX via line circuit LC02B.

3.246 Off-Premises Stations With Call Control may be either the TOUCH-TONE dialing pad or the rotary dial type. Station groups with call control have a unique location code (RNX) where R can be any digit from 2 through 9 less any reserved digits, N can be any digit from 2 through 9, and X can be any digit from 0 through 9. Stations within the unique RNX code are not permitted the usual on-network station features—ie, Call Forwarding, Speed Calling, etc. Each group consumes one AAR pattern and one trunk group. The group(s) may require authorization codes on originating calls as well as terminating calls. The SMDR records may be obtained on both originating and terminating calls. The signal level at the special OPX interface circuit (LC361) is 5 dB greater than that for an OPS interface circuit LC02B, thus allowing longer loop lengths without the application of repeaters (Fig. 24).

ORIGINATION RESTRICTION

3.247 A station line with this restriction cannot be used to originate calls at any time. Attempted origination will be given line lockout with warning tone (10 seconds of intercept tone) treatment. Terminating calls, however, are completed normally to this station line.

OUTGOING TRUNK QUEUING

3.248 This feature provides a means for station users to dial a busy outgoing trunk group, to be automatically placed in a queue, and to be called back when a trunk in the group is available. If the trunk group is part of a route advance group, the route advance sequence is checked before queuing is activated. A particular limit on the number of stations that can be waiting in queue for each group can be set for a particular customer. Any requests received after that limit is reached causes the station user to hear reorder tone.

OUTWARD RESTRICTION

3.249 Preselected station lines within the PBX are denied the ability to access the exchange network without the assistance of the attendant. Restricted calls are routed to intercept tone.

PACKAGED METALLIC FACILITY TERMINAL ASSEMBLY (PMFTA)

3.250 ▶The PMFTA is a circuit pack mounting assembly designed for small groups of Metallic Facility Terminal (MFT) plug-ins. The PMFTA is a self-contained arrangement including an associated power supply and interface terminal connectors. In order to meet FCC requirements, MFT equipment should be physically located separate from the PBX and electrically located on the network side of the RJ21X registration jack. Additional information on the PMFTA is available in Section 332-610-101.◀

PERIPHERAL INTERFACE CIRCUIT (PIC)

3.251 The PIC is a general-purpose programmable interface unit. It may be used in FP9 or FP11 hotel/motel or hospital installations as the Communications Interface for Property Management System (CIPMS). Is is the interface to printers, with the Energy Communications Service cathode-ray tube (CRT), and with Traffic Service Position System (TSPS) data sets.

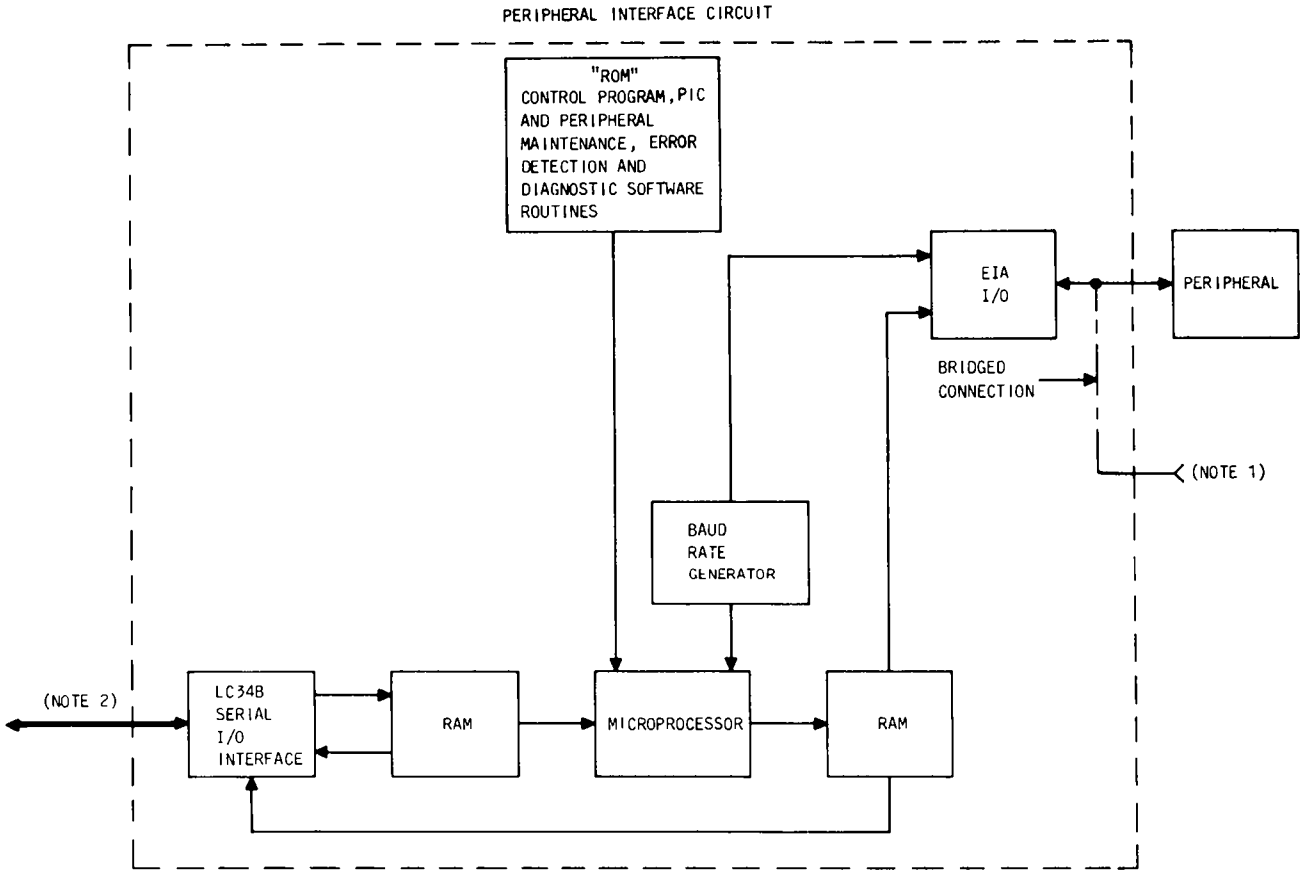
3.252 The PIC is a unit consisting of a controller which converts bipolar signals from the PBX into the Electronic Industries Association (EIA) RS-232C compatible form for use with an I/O peripheral.

Physically, the unit contains an internal regulated power supply, an LC34-/LC366-type 4-wire data channel, two 25-pin EIA serial data connectors (both male and female), and a microprocessor-controlled interface board (Fig. 34). All are mounted in a modified 4800-type data set equipment housing.

3.253 The PIC connects to an LC34-/LC366-type circuit pack which is located in the common control cabinet of the PBX. It receives/transmits serial 17-bit words in bipolar signal format.

3.254 Each PIC has two EIA I/O connectors. The PIC has an internal baud rate generator which controls the rate at which data is transferred between peripheral equipment and the PIC. The transfer of data is in the full-duplex mode, asynchronous, and in American Standard Code for Information Interchange (ASCII) code. The customer may select one of the following baud rates to match his/her peripheral (property management system):

- 9600
- 2400
- 1200



NOTES:
1. ONLY ONE 25-PIN EIA I/O MAY BE CONNECTED TO A PERIPHERAL AT ANY GIVEN TIME.
2. FOUR-WIRE DATA CHANNEL TO THE "DIMENSION" PBX.

Fig. 34—Peripheral Interface Circuit (PIC)—Functional Block Diagram

- 300
- 110.

3.255 For more detailed information regarding the PIC, refer to Section 554-010-102.

POWER FAILURE TRANSFER

3.256 This feature provides service to and/or from the exchange network (non-FX and WATS) for a limited number of prearranged stations during a power failure at a PBX customer location when reserve power is not provided or if battery reserve is provided when the reserve depletes. Incoming service is not available for Direct Inward Dialing. The power failure transfer stations must be equipped with a ground-start button to originate calls when in power failure mode and equipped with a rotary dial when the central office accepts only rotary pulsing.

3.257 The use of one or more 609A emergency transfer panels is required, each of which provides for transfer of ten trunks. When a power failure occurs, each central office trunk is connected directly to a predesignated station line, bypassing the PBX network, and removing all restrictions and system features. This feature is enabled also as an emergency transfer under certain major alarm conditions such as processor failure.

3.258 The Electronic Custom Telephone Service (ECTS) stations can also be arranged to act as power failure transfer stations with the addition of an auxiliary ringer adjunct to the station tip and ring for incoming calls.

PRIVACY AND LOCKOUT

3.259 Privacy automatically splits the connection whenever an attendant would otherwise be bridged on a call with more than one facility (eg, with both a calling and a called party). Attendant Lockout denies an attendant the ability to reenter an established connection held on the console position, unless recalled by a station. When privacy is provided, the Attendant Lockout feature is also provided.

RADIO PAGING ACCESS

3.260 This feature provides the attendant and station user dial access to customer-owned radio paging equipment to selectively tone-alert or voice-page individuals carrying pocket radio receivers.

3.261 Two originating ports and two answer-back ports (two LC08D circuit packs or four dial CO trunk circuits) may be provided per radio paging unit. The maximum number of paging ports is limited by the number of dedicated trunks (LC08D circuits) and the number of alternate paging dial access codes. If the radio paging equipment is found busy, audible reorder tone is returned to the originating party.

RECALL DIAL TONE

3.262 This feature provides a means of indicating to the station user that the switchhook has been successfully used to generate a flash to request a service feature during an established call instead of having caused a reorigination to occur. The result of a successful use of the switchhook flash is three bursts of dial tone followed by steady dial tone. The result of a reorigination is steady dial tone. Dialing is not registered during the interrupted portion of recall dial tone.

RECORDED ANNOUNCEMENT UNIT

3.263 The 13A announcement unit provides 8 announcements (channels) per carrier, and stores digitized speech in a magnetic bubble memory. The unit provides for fixed 12-second announcements or variable announcements which are adjustable in 3-second intervals to maximums of 12 or 24 seconds. The network interface is an LC13 auxiliary trunk, and the announcement unit mounts in an auxiliary cabinet.

RECORDED TELEPHONE DICTATION ACCESS

3.264 This feature permits access to and control of customer-owned dictating equipment by station users within the system. The start and stop functions of customer-owned telephone dictating equipment may be voice-controlled or dial-controlled. The record, playback, etc, functions are dial-controlled.

REMOTE ACCESS TO PBX SERVICES

3.265 This feature allows a user outside the DIMENSION PBX to access the PBX services via an exchange network or leased facilities connection. The user dials a preestablished number which establishes a connection to the PBX via the Message Telecommunications System (MTS), Foreign Ex-

change (FX), or 800-Service (INWATS). The user may then be required to dial a 4-digit barrier code (optional) to access the PBX services. The user can then place any call as if the user were at a PBX station.

3.266 This service can be arranged for Full, Outward, or Toll Restriction and/or can be denied access to miscellaneous trunk groups. All signaling is done using TOUCH-TONE dialing, and the barrier code (if used) is readily changed at the Attendant Console. Dedicated full-time or shared night-service-only trunk facilities can be used for providing this service.

A. With Time-Out to Attendant

3.267 When a call is received on a remote access trunk and dialing does not start within 10 seconds, the call is routed to an attendant or to a night station. This enables callers without a TOUCH-TONE telephone who know the remote access code to use the feature since the attendant or the night station user can perform subsequent dialing (via a TOUCH-TONE telephone).

B. With Authorization Codes

3.268 After the desired destination number is dialed, the PBX may request the user to dial an authorization code (optional). If the user has an authorization code, that code defines the user's calling privileges.

3.269 If the Authorization Code feature is activated and the Remote Access Authorization Code is also enabled, the dialed digits input by the remote access user is an authorization code instead of a barrier code.

3.270 When a need for an Facility Restriction Level (FRL) is determined, the value corresponding to the authorization code will be used without prompting for the code a second time.

3.271 If the authorization code is found to be invalid or if the FRL is not sufficient to complete an Automatic Alternate Routing (AAR) or Automatic Route Selection (ARS) call, intercept tone will be returned to the user.

3.272 The authorization code dialed will be written in the station message detail recording record.

3.273 If the Remote Access Authorization Code is not enabled, the attendant has the capability to modify the barrier code from the console. If authorization codes are used, the attendant loses this control capability.

3.274 When the Remote Access Authorization Code is activated, the authorization code will always be entered regardless of the call destination.

C. With Voice Switched Gain

3.275 On direct-dialed remote access to PBX service calls to outgoing trunks, the voice switched gain amplifier in the PBX will automatically amplify the incoming signal by 15 dB if the incoming signal level is greater than −43 dB and less than −30 dB. Signals above that level are amplified to −15 dBm until a −15 dBm input level is reached, at which time the amplifier will be removed from the circuit (no gain). Signals above −15 dBm should be passed without amplification or loss.

REMOTE MAINTENANCE, ADMINISTRATION, AND TRAFFIC SYSTEM (RMATS)

3.276 The RMATS is a telephone company system which provides the capability to remotely administer most features and restrictions on PBXs equipped with an RMATS interface. Through proper use of RMATS, most trouble conditions can be analyzed, verified, and corrective action taken.

3.277 The RMATS, a software-oriented system, is standard to all feature packages and is primarily used to determine if a detailed traffic study is required. Traffic studies and structures may be flexibly administered in the PBX and automatically polled by the RMATS central facility. The RMATS dials the PBX via the Direct Distance Dialing (DDD) network (Fig. 35) and sends it a unique security access code. Accessed PBXs may be polled daily or at hourly intervals. Data collected from the PBX is summarized and made available in a variety of reports at the central facility. Raw data may be made available for external processing, if desired.

3.278 Section 554-010-130 contains detailed information on RMATS interface operations and PBX wiring arrangements.

RESERVE POWER

3.279 This feature provides an alternate independent source of power to maintain PBX ser-

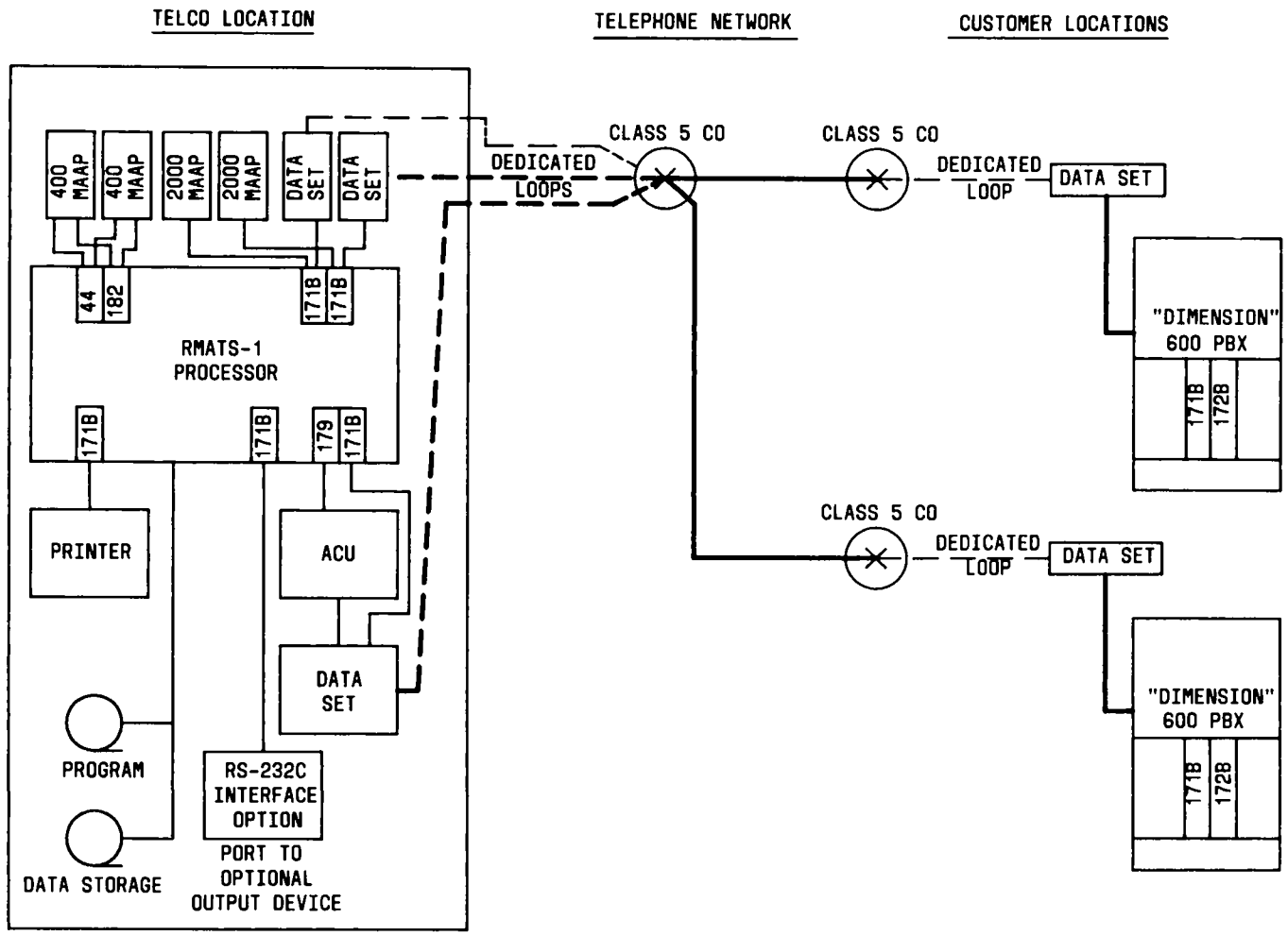


Fig. 35—RMATS—DIMENSION 600 PBX—Hardware Interface

vice for a limited time (normally 8 busy hours) during a power failure at the customer premises.

ROOM STATUS AND SELECTION

3.280 This feature will provide the capability to store and display the occupancy and cleaning status and the type number of each guest room/bed, facilitate housekeeping management, maid locating, and room selection. Also, communication between the front desk and the housekeeper is speeded up via real-time maid activity and checkout audit printouts to indicate which rooms need cleaning next. The occupancy status is changed automatically by changing status of the guest (ie, checking in or checking out of the room) on the console/terminal. Cleaning status is normally changed by the maid or inspector dialing from the room telephone. Capability on an optional basis is provided to detect occupied/vacant status discrepancies via maid dialing separate "clean—looks occupied" and "clean—looks vacant" codes.

A. Room Change/Swap

3.281 This arrangement provides a procedure, which is available from the console/terminal, that allows changing or swapping of rooms with the associated stored data, such as telephone charges, automatic wakeup messages, message waiting information, and assigned controlled restrictions. The room change procedure involves transfer from an occupied room, not in an audit mode, to a vacant room in a ready state. Room swap requires that both rooms be occupied and not in audit before swapping

occurs. Alphanumeric displays on the console provide necessary information to the attendant for performing transfers. Rooms in audit will display "AUDIT" at the console/terminal if transfer of a room under audit is attempted and the change or swap will not be executed.

B. Up/Down Room Search

3.282 The room search to be performed in either an ascending or descending direction when the lodging check-in or hospital admittance function is activated at the console/terminal. The direction of search can be changed at any time by the customer using a console/terminal procedure.

ROTARY DIAL CALLING

3.283 Dialing information from standard rotary dial station equipment is accepted. At a calling station, this feature utilizes a rotary device to generate dc pulses, representing either the address of the called facility or an instruction to a dial-controlled device. TOUCH-TONE dialing signals from station lines with the rotary dial class of service are not accepted.

ROUTE ADVANCE

3.284 This feature routes outgoing calls over alternate facilities when the first choice trunk group is busy. The station user selects the first choice route by dialing the corresponding access code, and the equipment automatically advances to alternate trunk groups. The digits following the access code must be identical for any of the trunk groups selected. The alternate groups may also be accessed by other codes. Up to ten route advance groups may be provided, each containing a maximum of five trunk groups.

SERIAL CALL

3.285 An attendant can complete an incoming trunk call to two or more station lines in succession without requiring the called station user(s) to recall the attendant. This feature is implemented through the use of the Two-Party Hold on Console feature.

SINGLE-DIGIT DIALING

3.286 This feature permits a station user to reach any of a preselected group of stations by dialing single-digit codes. Time-out is available in cases where the single digit used conflicts with the normal numbering plan.

SPEED CALLING

3.287 The station user can dial a 2- or 3-digit code to reach frequently called PBX stations or outside telephone numbers except International Direct Distance Dialing (IDDD) and tie trunk calls. ⧫These frequently called numbers and the associated entry numbers represent a list.⧫ Individual lists can be changed by the station line to which that list is first assigned. Group lists are changeable via a designated station line within each group. Individual or group lists can be changed via the MAAP, CAP, RMATS, or CACS.

3.288 ⧫***Expanded Speed Calling For IDDD Numbers:*** The number of digits that can be entered into a speed call entry list has been increased in Issue 3 of FP8 to accommodate up to 16-digit IDDD numbers. Previously in Issue 1 of FP8 the maximum was 12 digits plus a dial access code (up to 3 digits). As a result, IDDD numbers could not be called using the Speed Calling feature. With Issue 3 of FP8, the dial access code (up to 3 digits), plus the IDDD number (011 + 3-digit country code + 10 digits) may be entered into a Speed Calling list and IDDD numbers can be called using the Speed Calling feature.⧫

SPLIT ACCESS TO OUTGOING TRUNKS

3.289 Two separate trunk groups are provided for Direct Outward Dialing which can be accessed by dialing the same trunk access code. For example, administrative stations could be connected to a flat rate trunk group with guest stations connected to measured rate trunks.

SPLITTING—ONE-WAY AUTO MANUAL

3.290 This feature allows an attendant to consult privately with one party on a call without the other party hearing. The split (allowing private consultation with the called party) goes into effect automatically when the attendant starts to complete a call, but the attendant can take positive action to unsplit or to reinstate a split condition.

STATION HUNTING

3.291 A call is routed to an idle station line in a prearranged group when the called station

line is busy. Station lines cannot be in more than one hunting group; however, more than one station line may hunt to the same line. The number of hunting groups is unlimited. The size of each hunting group is limited to 30 station lines per group. The hunting sequence over the prearranged group can be accomplished as follows:

(a) ***Terminal Hunting:*** The hunt always starts with the called station line and ends with the last station line in the prearranged group, completing the call to the first idle station line encountered. Unless the first station line is called, only a portion of the group is tested. The prearranged hunting sequence can be either ***consecutive*** (station numbers are in ascending numerical sequence) or ***nonconsecutive.***

(b) ***Circular Hunting:*** The hunt starts with the called station line and always proceeds in a prearranged order to test all lines in the group once, completing the call to the first idle station line. The station numbers may be in consecutive or nonconsecutive order.

STATION MESSAGE DETAIL RECORDING (SMDR)

3.292 This feature provides a record of the PBX station (or attendant) identity, call ending time, duration, and the trunk group used for outgoing and/or incoming calls. The call duration is measured from the establishment of the connection in the customer system to the time when the station goes on-hook. There are two types of SMDR equipment; designated ***TYPE I,*** as described above, and ***TYPE II.*** TYPE II provides additional record capability. The customer's Authorization Code, Facility Restriction Level, and ARS pattern in effect may be recorded to verify traffic flow and determine individual customer costs.

3.293 The SMDR feature provides the following service records and data fields:

- All outgoing calls (central office, tie trunks, APLT, and WATS)
- Incoming WATS, APLT, DID, or tie trunks
- Type of call (access code)
- Calling station number
- Called number
- Time the call was completed
- Date (month and day) the call was made
- Duration of the call
- Indication of attendant-handled calls
- Ineffective call attempts (automatic route selection [ARS] and alternate routing [AAR])
- ARS plan switch (plan 1, 2, 3), FP8
- Account code, if dialed
- Time in queue (FP8)
- Authorization Codes (FP8/FP12) if dialed
- Facility Restriction Level (FP8, FP11, and FP12).

3.294 All SMDR machines receive data from the PBX via a high-speed data channel. The SMDR consists of logic circuit packs and a 207B power supply mounted in an LC-type carrier. The number of circuit packs varies depending on which SMDR (direct output or 9-track magnetic tape) is provided.

3.295 The SMDR hardware is provided in the direct output version, the COMM-STOR II version, or the 9-track magnetic tape version. The latter version is the recommended configuration. ♦If SMDR is used with Five-Digit Dialing (FP8, Issue 3) or if the incoming or outgoing trunk circuit number is required for SMDR data, a local storage unit (LSU) which accepts and stores message detail records must be provided. A direct output option on the LSU allows the LSU to interface with COMM-STOR II.♦

A. Direct Output Version

3.296 The direct output version provides Station Message Detail Recording using a printer, paper tape punch, COMM-STOR II, or customer-provided terminal or storage device. The amount of output information from SMDR is proportional to customer traffic, number of stations within the PBX, and number of trunks to be monitored.

Because of the voluminous amount of output information possible from the direct output version of SMDR, exercise care when selecting the type of terminal to be used.

B. COMM-STOR II Version

3.297 The COMM-STOR II unit (Fig. 36), when used with SMDR, is a totally dedicated system, which interfaces with the DIMENSION PBX to record the call records generated by the PBX SMDR direct output system. In addition, the COMM-STOR II unit is capable of generating reports that summarize toll use and toll changes (by station or by department) and trunk usage data.

3.298 The reports may be used by the customer in allocating costs and evaluating toll facilities. They aid in identifying abuse to the customer's network.

3.299 The operator communicates with the COMM-STOR II unit via a terminal (43 teleprinter, DATASPEED* 40/2 terminal or equivalent). The system displays a message on the terminal, to which the operator responds. The operator may be instructed to perform a particular action or enter information in response to a question. Frequently, a list of operations appears from which the operator must choose one to perform. Through the interaction of terminal displays and operator responses, the operator can perform all the necessary procedures.

3.300 Reports are displayed on a cathode-ray tube (CRT) and/or printed for hard copy retention depending on the option chosen by the customer.

*Registered trademark of AT&T.

B. 9-Track Magnetic Tape Version

3.301 For systems requiring a capacity greater than the direct output for storing the recorded calling information, the 9-track magnetic tape version may be used (Fig. 37). The tape may be changed, as required, depending on customer requirements (traffic capacity or monitoring of calls). The 9-track system is equipped with a Kennedy 9217 tape formatter used to write data on a standard 9-track magnetic tape. When output information is required by the customer in the form of a hard copy for visual inspection, the 9-track magnetic tape requires machine processing (software decoding). The output from the magnetic tape may be grouped as required by the customer, ie, grouped by type of calls, account numbers, specific dates, etc. This feature provides a record of trunk calls which may be used to tally costs, allocate charges, analyze calling patterns, and effect implementation of controls and/or restrictions. The 9-track magnetic tape SMDR uses the same receiving circuitry as the direct output version and provides greater record storage capacity. Twelve circuit packs in a large special purpose cabinet comprise the 9-track magnetic tape system.

3.302 For more detailed information regarding SMDR, refer to Section 554-010-122.

STATION NUMBER STEERING

3.303 This feature allows conversion of a station number, which is part of the station numbering plan for the PBX, to a dial access code. When the station number is dialed, it is converted into a trunk or feature dial access code. Station numbers such as these are referred to as station-to-trunk numbers which are accessed by trunks, stations, and attendants. This feature provides the following:

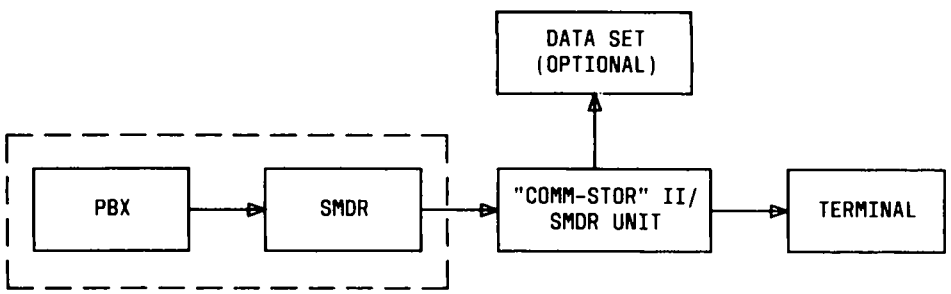


Fig. 36—Block Diagram of SMDR With COMM-STOR II Unit

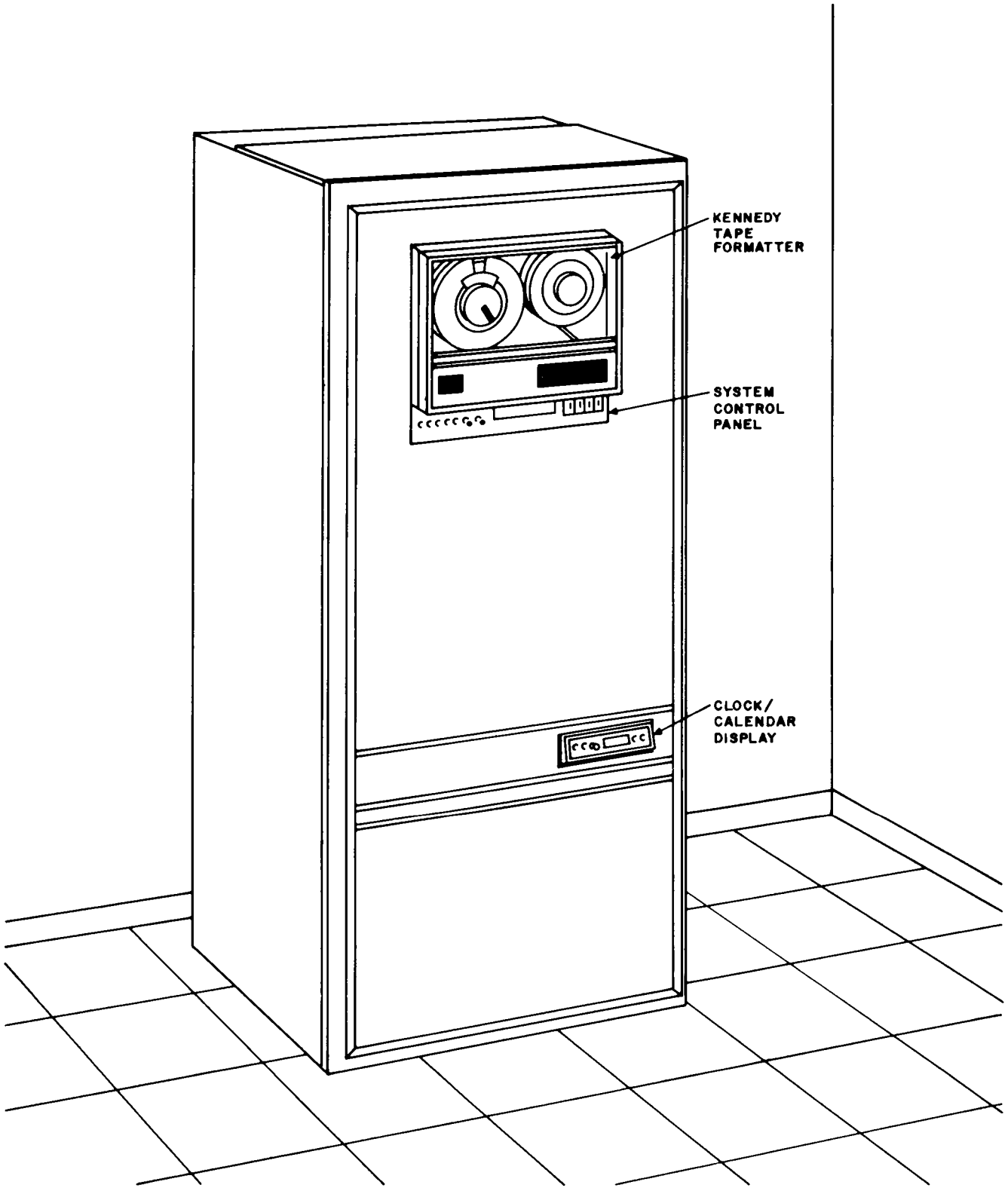


Fig. 37—SMDR—9-Track Magnetic Tape System

(a) Dialed station numbers can yield dial access codes to access main/satellite (M/S) stations on a multidigit steering basis.

(b) Dialed station numbers can yield dial access codes to LC361 circuit packs for Off-Premises Extensions (OPX).

(c) Dialed station numbers can yield dial access codes for the PBX attendants or Centralized Attendant Service (CAS) attendants.

(d) Speed Calling Access is available to OPX, Data Communications Access ports, CAS attendants, PBX attendants, and to M/S stations.

Station features and the station class of service do not apply to the dialed station number because the dialed number is not recognized as a station.

STATION REARRANGEMENT AND CHANGE

3.304 This feature is provided in connection with the CACS and CAP. The customer can administer the class-of-service assignments for individual PBX lines and make changes in the hunting and pickup group assignments. The capability to administer button assignments and signaling options on DIMENSION PBX ECTS sets is also included.

STATION-TO-STATION CALLING

3.305 The station user can directly dial other stations within the same system without the assistance of the attendant. The number of digits required depends on the numbering plan engineered for the customer.

STRAIGHTFORWARD OUTWARD COMPLETION (SFOC)

3.306 An attendant can place an outgoing call for a station user who reached the attendant via dial 0 or intercept or an attendant-originated call without requiring the station user to hang up. The attendant will dial the called number for the station user or, with through dialing, allow the station user to complete the dialing.

SWITCHED LOOP OPERATION

3.307 The attendant position is arranged so that each call requiring attendant assistance is automatically switched to one of a limited number of idle loops (call access points) on an available attendant position. Normally, a call is automatically released from the attendant position when the call is answered by the called station (released loop operation). Incoming calls are queued (retained in a waiting state) in the order of their arrival when all attendant positions are busy. To distribute the call load evenly to each attendant, each queued call is automatically switched to the first available attendant position. A console lamp indication (CW) is given to the attendant when calls are waiting to be served.

SYSTEM STATUS INDICATOR (SSI)

3.308 The system status indicator(s) may be used to monitor the traffic status, queue threshold, and warning thresholds on release link and incoming trunks and Uniform Call Distribution/Direct Department Calling (UCD/DDC) groups. Each SSI contains eight lamps. Lamp indications are controlled from the contact interface B circuit pack, LC15. The quantity of SSI displays used is dependent upon the type of hardware configuration. System status indicators may be used with the centralized attendant service feature (CAS-branch, CAS-main), or the UCD/DDC feature. Figure 38 shows the faceplate labeling for the 30A8 SSIs used with the CAS-branch feature. Table F lists the lamp status functions for CAS branch usage. The lamp status has different meanings for CAS main and UCD/DDC group monitoring. Refer to Section 981-012-100 for further details.

TANDEM TIE TRUNK SWITCHING

3.309 This is a service arrangement that allows tie trunk to tie trunk, tie trunk to CCSA, and tie trunk to exchange network connections through the switching system (dialed directly by the distant PBX station user). Tandem connections can be restricted on a trunk group basis. Restricted calls are routed to intercept tone.

TERMINATION RESTRICTION

3.310 ◗Station lines with this restriction cannot receive calls at any time except when night service is in effect and an incoming trunk is assigned to the restricted station line.◖ Calls can be originated normally from this station. The DID calls are routed to the attendant or to an announcement, depending on the option selected. The CCSA calls are routed to the attendant, to an announcement, or to intercept

NOTE:
"DIMENSION" 600 PBX USES UP TO THREE SSI's, DEPENDING ON THE NUMBER OF RLT CIRCUITS. SSI–3 DOES NOT USE THE LAST FOUR (LOWER) LAMPS.

Fig. 38—CAS 30A8 System Status Indicator

TABLE F

SYSTEM STATUS INDICATOR LAMP FUNCTIONS

LAMP	LAMP CONDITION	SYSTEM STATUS
RLT ( )	Dark	Idle RLT
	Steadily lighted	Busy RLT or associated backup station handling CAS call
	Wink	Maintenance busy
CONTROL	Steady	Normal operation
	Blinking	Backup mode or TAAS mode
OVERLOAD	Dark	No overload
	Steadily lighted	Queue threshold exceeded
MAJOR	Dark	Normal operation
	Steadily lighted	Major alarm
MINOR	Dark	Normal operation
	Steadily lighted	Minor alarm

tone, depending on the option selected. All other terminating calls are routed to intercept tone.

THREEWAY CONFERENCE TRANSFER

3.311 A non-ECTS station user can, by flashing while on any 2-party call, effect a Threeway Conference Transfer. After flashing, the station dials the third party (which can be a trunk) for private consultation while the second party is held in soft hold. By flashing a second time, a Threeway Conference is effected. Subsequently, a transfer is accomplished when the original party goes on-hook. Where two trunks are involved in a conference, all conferees are released from the connection when the controlling station goes on-hook, except with the trunk-to-trunk transfer option which allows transfer to incoming trunk to outgoing trunk calls, when incoming call disconnect supervision can be guaranteed. In addition, the controlling non-ECTS station can drop the third party by flashing during the Threeway Conference.

3.312 An ECTS station user can activate Threeway Conference Transfer via use of the recall button in lieu of using the switchhook.

3.313 ◗***With Trunk-to-Trunk Transfer:*** This option allows a station to transfer an incoming trunk to an outgoing trunk when the incoming trunk disconnect supervision can be guaranteed. The trunk-to-trunk transfer option is basically intended for use on a where-it-will-work basis with CAS to allow station transfer of an incoming CO call over a tie trunk to a station at another PBX in the CAS complex. The option will allow any station with the Threeway Conference Transfer class of service to transfer any incoming trunk call to any outgoing trunk call. Transfer of an outgoing trunk call to another outgoing trunk call will still be denied by dropping both trunk connections when the controlling station hangs up unless the trunks have guaranteed disconnects administered. In a DCS (FP8, Issue 3) configuration, an attempt is made to reconfigure a tie trunk from outgoing to incoming before the call is torn down. At the other DCS PBX, the tie trunk is changed from incoming to outgoing and the call disconnect is then controlled by that PBX.◖

THROUGH DIALING

3.314 At the discretion of the attendant, station users can complete dialing after the attendant selects the trunk facility on attendant-handled outgoing calls.

TIE TRUNK ACCESS

3.315 This feature provides access to dedicated 1-way or 2-way circuits between this PBX and another PBX.

TIME-OF-DAY SYNCHRONIZATION

3.316 This hardware feature provides improved software clock accuracy which is important in FP8 applications for switching alternate routing plans at precise times. The feature is important in FP9 and FP11 applications where Automatic Wakeup Service and billing-related features are utilized. It provides accuracy to within 1 minute per month and the time display appears on the hotel/motel console/terminal (FP9 or FP11). The time-of-day clock has an optional battery backup which keeps the clock running in the event of a power failure. Each common control requires the associated LC144 and a separate battery backup.

TIMED RECALL ON OUTGOING CALLS

3.317 With this feature, outgoing trunk calls from selected stations are automatically transferred to the attendant after a timed interval, between 1 and 31 minutes, assigned for the trunk group. A warning tone is sent to the calling party 30 seconds before the transfer takes place.

TIMED REMINDER

3.318 The attendant is automatically alerted after 30 seconds when a call on the console is waiting on a busy station line (attendant call waiting), or the called party has not answered, or the incoming call is held on the console. This signal is retired when the loop is reseized by the attendant and reactivated 30 seconds after the attendant releases from the connection and the call is still waiting, unanswered, or held.

3.319 ***With Audible Signal:*** The audible signal functions as an attendant altering signal in addition to the console faceplate flashing indicators. The audible signal consists of a 1.95-kHz tone which cycles 400 ms on, 1200 ms off, when activated.

TOLL RESTRICTION

3.320 This is a limited form of Code Restriction which permits station users to access the local central office and to dial local service area calls, but prevents completion of toll calls or calls to the toll operator without the assistance of the attendant. Restricted toll calls are given intercept tone. This feature is provided on a per-station basis and is available in two mutually exclusive forms:

(a) ***Battery Reversal:*** A battery reversal signal from the central office on an outgoing call will route the toll-restricted calling station to intercept tone.

(b) ***0/1 (With Limited 3-Digit):*** This form of toll restriction is based on screening at the PBX rather than at the central office. Toll restricted (0/1) stations are routed to intercept tone if the first or second digit dialed following the trunk access code is a 0 or a 1 and the office or area code is not in the allowed call list (which has a maximum capacity of ten 3-digit codes).

TOLL TERMINAL ACCESS

3.321 A station user or attendant can dial a toll operator directly or access a uniquely identified trunk group to a Traffic Service Position System (TSPS) position with a single digit access code. Toll operator callback over the toll terminal is not provided. The initial digit used for this feature need not be unique (it can also be used for station line numbers in the same installation if time-out is used).

"TOUCH-TONE" CALLING

3.322 Dial information from standard TOUCH-TONE calling station equipment is accepted. At a calling station, this feature utilizes pushbutton-operated audible tones, a series of which represent either the address of a called facility or an instruction to a dial-controlled device. Rotary dialing station instruments can be used on station lines with TOUCH-TONE calling class of service for testing purposes. Address information is accepted from either TOUCH-TONE dialing or rotary dialing instruments during the same call.

"TOUCH-TONE" DIALING TO DIAL PULSE CONVERSION

3.323 TOUCH-TONE dialing signals are converted to dial pulse signals when the distant end associated with outgoing trunk calls is not equipped to receive TOUCH-TONE dialing signals or when transmission loss prevents reliable TOUCH-TONE dialing signals. External dial pulse conversion equipment is not required for this feature.

"TOUCH-TONE" DIALING SENDERIZED OPERATION

3.324 TOUCH-TONE dialing senderized operation can be provided on trunk groups adminis-

tered for TOUCH-TONE dialing outgoing class of service. The TOUCH-TONE dialing sender receives and repeats dialing signals as TOUCH-TONE dialing signals over the selected trunk. TOUCH-TONE dialing senderized operation can be provided on Speed Calling, Automatic Route Selection, Automatic Route Selection—Deluxe, and Automatic Alternate Routing calls.

3.325 When TOUCH-TONE dialing senderized operation is required, TOUCH-TONE dialing sender circuit packs (LC12) must be installed. The quantity of circuit packs required will be determined by traffic load.

TRAFFIC DATA TO CUSTOMER

3.326 This feature is provided in connection with the CACS and CAP. A CAP provides the customer with the capability to read each traffic register. With the CACS, the customer may automatically poll switching locations on a daily or hourly basis to obtain traffic measurements, including peg counts, usage and overflow data. Summary reports, exception reports, and complete traffic register outputs may be obtained. The status of time-of-day routing is included in the traffic data.

3.327 The customer can now reassign traffic registers to collect traffic data required for the maintenance of the system.

3.328 The reassignment of traffic registers by the customer provides flexibility in identifying the originator of calls in the SMDR, improving transmision on calls between the public message network and the customer's private network, and allowing the customer to select traffic data to be collected.

TRAFFIC MEASUREMENT

3.329 Traffic studies and structures may be flexibly administered in the PBX and automatically polled by the Remote Maintenance, Administration, and Traffic System (RMATS) central facility. Optionally, the system can be polled using existing polling equipment such as an Alston scanner. Measurements are accumulated hourly and may be polled hourly or daily.

3.330 ◗Information is stored in registers which are updated hourly as peak values occur. Trunk group activity measurements may be obtained which will be time coincident with certain peak values studied. Time coincident studies of traffic item studies and related peak register may also be flexibly assigned. Trunk group combinations, Outgoing Trunk Queuing (OTQ) activity, and Automatic Route Selection (ARS) studies may be assigned, as required.

3.331 The traffic values, are stored in a dedicated memory area which is outputted to RMATS on a polling schedule prescribed in the RMATS central facility.◖

3.332 The RMATS facility can be arranged to automatically poll on a daily or hourly interval. The RMATS dials the PBX via the DDD network, sends the PBX unique security access code, and receives and records data stored in the PBX. All traffic study values in the PBX are zero after polling. In the case of polling with an Alston scanner, a system MAAP procedure is used to eliminate the requirement for a security code before data transmission.

TRAVELING CLASS MARK (TCM)

3.333 When Automatic Route Selection (ARS)—Deluxe or Uniform Numbering/Automatic Alternate Routing (UN/AAR) chooses a tie trunk to a tandem PBX or centrex, the TCM is sent over the tie trunk. It is then used by the distant tandem to determine the best available facility consistent with the user's calling privileges. The TCM represents the Facility Restriction Level (FRL) to be used based on the station, trunk, or attendant originating the call or the authorization code, if dialed.

TRUNK ANSWER FROM ANY STATION (TAAS)

3.334 Incoming calls, normally directed to the attendant, activate a common alerting signal on the customer premises when night service is activated and night stations are not assigned or are all busy. These calls may then be answered by any station user in the system who dials a special code from any nonrestricted station.

TRUNK GROUP BUSY INDICATORS ON ATTENDANT POSITION

3.335 The attendant(s) is provided with a visual indication when all trunks in a group are busy. Up to 24 busy indicators can be provided.

TRUNK GROUP WARNING INDICATORS ON ATTENDANT POSITION

3.336 The attendant(s) is provided with a visual indication when a preset number of trunks in a group are busy. This number can be specified via the maintenance and administration panel. Up to 12 warning indicators can be provided.

TRUNK IDENTIFICATION BY ATTENDANT

3.337 This feature gives the attendant the ability to identify a specific trunk being used on any incoming or outgoing call. While connected with a trunk, the attendant presses the TRK ID key. This causes the alphanumeric display to show the dial access code of the trunk group in use. A second depression of the TRK ID key causes the index number of the trunk to be displayed. A third depression of the TRK ID key returns the initial display and the entire procedure can be repeated.

TRUNK-TO-TRUNK CONNECTIONS

3.338 This feature allows an incoming or outgoing trunk call to be extended via the attendant to another outgoing trunk. Trunk-to-trunk connections can be effected among the following types of trunks: CO, FX, WATS, APLT Network, and Tie Trunks. Disconnect supervision can be automatic in some cases, but in others, the attendant must monitor the connection and manually disconnect after use.

TRUNK VERIFICATION BY CUSTOMER

3.339 This feature provides attendant access to individual trunks of a particular trunk group for making test calls to verify supervision and transmission. Where a busy trunk is encountered, a bridged connection with a warning tone to the busy parties is provided to verify transmission. The tone is only a warning that bridging is taking place. The attendant dials a test access code followed by the normal trunk group access code (or operation of the direct trunk group select key) followed by the specific number of the trunk to be tested. A dial code must be assigned to incoming trunk groups to allow attendant access for testing. This same dial code is used to establish night connections on incoming trunks. One-way incoming trunks cannot be tested while they are idle.

3.340 Trunk Verification by Customer (attendant) may not be used on the following trunks and miscellaneous circuits:

- Release link trunks
- Loudspeaker paging trunks
- Recorded telephone dictation trunks
- Recorded announcement trunks.

3.341 ▮In a DCS (FP8, Issue 3) configuration, trunks or other PBXs in the DCS can be verified by an attendant not associated with the PBX. A direct trunk group select key must be assigned for transparent operation of this feature.◀

TRUNK VERIFICATION BY STATION (TVS)

3.342 This feature permits a designated station, a remote maintenance station, or a backup control station associated with a Centralized Attendant Service Release Link Trunk (CAS RLT) to access individual trunks terminating on the PBX for the purpose of making test calls to verify supervision and transmission. To test incoming (busy) trunks or where any busy trunk is encountered, an optional bridged connection with a warning tone to the busy parties is provided to inform the users. If a defective trunk is found, a code can be dialed from the designated station line or control station to put the trunk in a maintenance busy state until repaired. Any dial repeating tie trunk can also be used to remotely test trunks on a PBX, but is limited only to those trunks to which it can normally be connected. However, the busy trunk override option is not provided nor can the tie trunk put another trunk in a maintenance busy state. This feature also permits testing of outgoing RLT trunks in a CAS installation.

TWO-PARTY HOLD ON CONSOLE

3.343 This feature allows an attendant to hold a call on the console with both a calling and a called station or trunk facility (or two called facilities) connected. Two-Party Hold is required for the operation of the Attendant Lockout, Serial Call, and Trunk-to-Trunk Connections features.

UNIFORM CALL DISTRIBUTION (UCD)

3.344 This feature permits incoming calls over prearranged facilities (eg, CO, FX, Tie Trunk, 800 Service [INWATS]) to be added to a queue associated with a group of selected stations. These calls are then processed from the queue to the stations via a

circular hunting pattern which starts at the next idle station in the hunting sequence following the last station to receive a call in the group. Each UCD station is typically a nonkey (standard) telephone set which can also be used in a normal manner to make and receive calls directly. ▶The UCD is available with FP8, Issue 1. It is not available with Issue 2 or 3 of FP8.◀

3.345 ▶***With Force Aministration Data System (FADS):*** The FADS information may be used by the customer to determine the number of calls handled by each station, the length of calls, the average time spent processing each call, and the average waiting time for calls placed in the UCD queue. This allows the customer to determine whether more or less stations are needed to adequately handle the traffic load. If a large number of calls are being placed in queue, more member stations may be added. Conversely, if few calls are being queued, the number of stations may be reduced.

3.346 The number of calls handled by each station or trunk group can be analyzed to determine if the telephone system is arranged in the most efficient manner to handle the hourly and/or daily traffic.

3.347 The FADS terminal has a 3-digit and a 4-digit display field and a TOUCH-TONE telephone type keyboard. A printer is used to obtain hard-copy output.◀

UNIFORM NUMBERING

3.348 This feature permits station users at any FP8 PBX or main PBX to place calls over tie trunks using a uniform dialing plan. The user dials an access code, followed by a 7-digit number which uniquely identifies each customer station. The number consists of a 3-digit location code and 4-digit station code. (Reduced plans of four, five, or six digits are also possible.) Station users at tributary PBXs use the same plan with the possible exception of an additional access code. The feature provides the number translation and supervision necessary to route the call. When the same access code(s) is followed by a 10-digit DDD number, the call is automatically routed via the Automatic Route Selection—Deluxe feature.

UNINTERRUPTIBLE POWER SERVICE (UPS)

3.349 This is an optional feature which provides operating power for the PBX during commercial ac power interruptions. When such an interruption occurs, the UPS provides the required power (holdover) from batteries which have been charged during normal commercial power operation. The UPS is available in either a *nominal holdover* configuration in which battery power can be supplied in terms of minutes or in an *extended holdover* configuration in which battery power can be supplied in terms of hours. The following paragraphs give a description of the major UPS categories.

3.350 ***Nominal holdover*** provides power for PBX cabinets and peripherals during relatively short-term commercial power interruptions. This allows all PBX functions to continue without interruption for several minutes. Nominal holdover has been designed primarily for those customers who provide supplemental power sources, such as engine-alternators that can be expected to take over local power loads within seconds or, at most, a few minutes. For customers without such backup arrangements, nominal holdover prevents loss of PBX service for perhaps 95 percent of all power interruptions, depending on local experience. The duration of the power holdover is dependent on the load on the cabinet power supply.

3.351 ***Extended holdover*** provides power holdover up to approximately 8 hours for PBX cabinets by the use of a separately housed battery plant and charging unit, such as a 131A battery reserve power plant. The UPS power supplies contain an inverter, thereby eliminating the need for an external unit as required in other reserve power arrangements. However, a cabinet-mounted dc filter is required in the battery feed to the UPS power supply.

3.352 The hardware for standard UPS is completely self-contained and is installed in PBX cabinets in place of the normal power supply unit. This eliminates the need for extra cabinets holding rectifiers, inverters, and banks of batteries. During a commercial power interruption, the nominal holdover arrangement provides electrical power through a UPS rectifier/converter power supply. The power originates from a UPS battery pack which has been charged from commercial power by a UPS battery charger. A full recharge after a power interruption should occur within 24 hours. The extended holdover arrangement uses the UPS rectifier/converter power supply, but uses a locally engineered battery reserve type power plant and charger such as a 131A or equivalent. A dc line filter is also required in the feeder pairs from the reserve type power plant.

VISUALLY IMPAIRED ATTENDANT SERVICE

3.353 Visually impaired attendant service capability is achieved by augmenting the normal visual signals provided on a standard attendant position with special tactile devices and/or audible signals which enable a visually impaired person to operate the position. This service is provided using a light-sensitive probe (990A light sensor), a grooved console faceplate (6A guide), and additional audible tones which identify the type of call. DIMENSION PBX consoles allow plugging an audible tone adjunct (2A translator) directly into the console. The audible signals identify the type of incoming call, and new tones indicate calls waiting and timed reminders.

3.354 Figure 39 shows the Visually Impaired Attendant Service apparatus. Figure 40 depicts the Visually Impaired Attendant Service coded ring rates.

3.355 The 2A translator performs two functions. ***First,*** it monitors the six incoming call indicator positions on the Attendant Console and produces a logic output that controls audible ringing. In this way, six different audible ring codes are generated that identify which of the six Incoming Call Indicators (ICI) are active. If the console is alphanumeric, the ICI information will also appear in the alphanumeric display field. The six coded call indicators are as follows:

(1) Listed Directory Number call

(2) Internal call to attendant

(3) Attendant recall

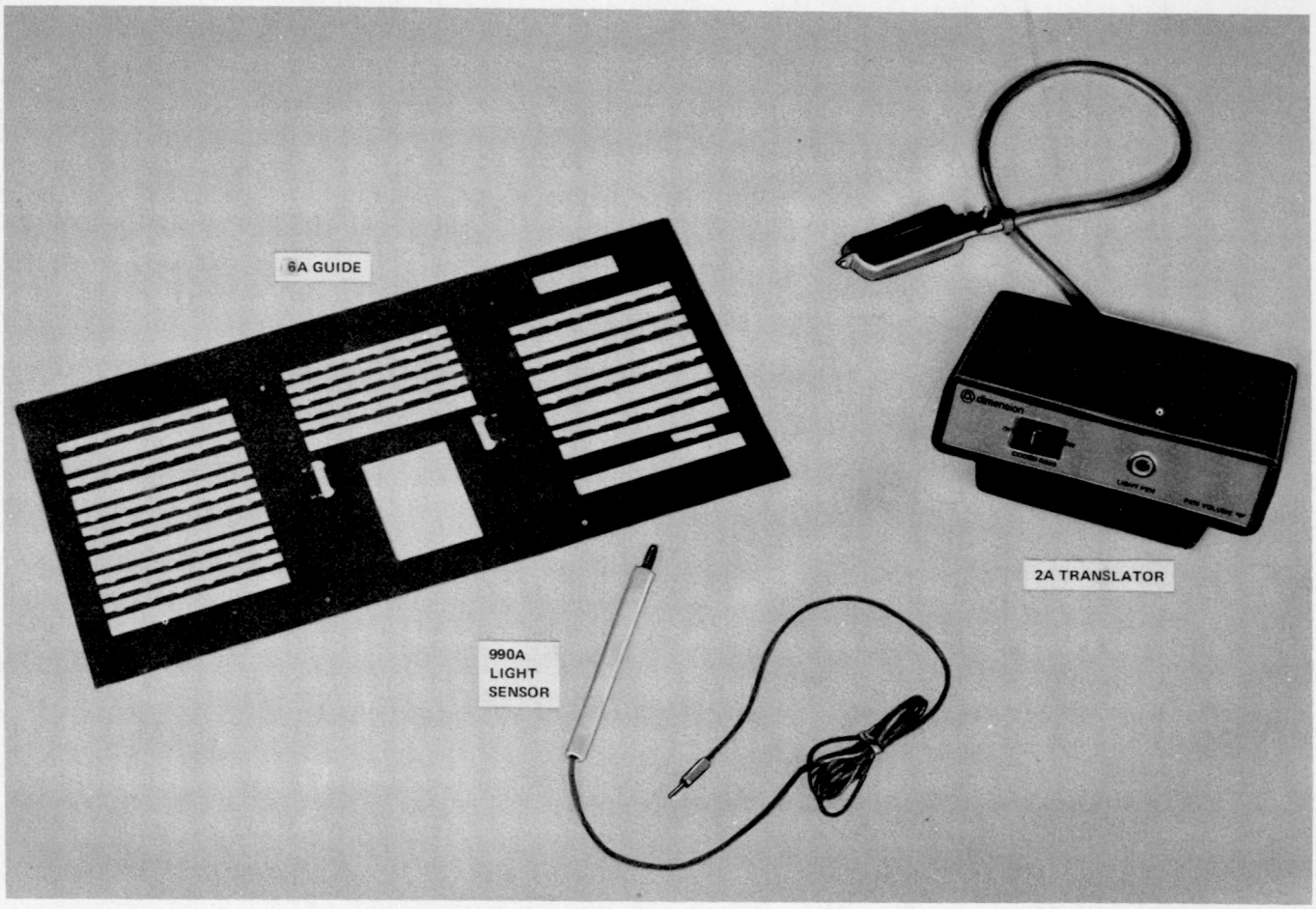


Fig. 39—Visually Impaired Attendant Service—Console Equipment

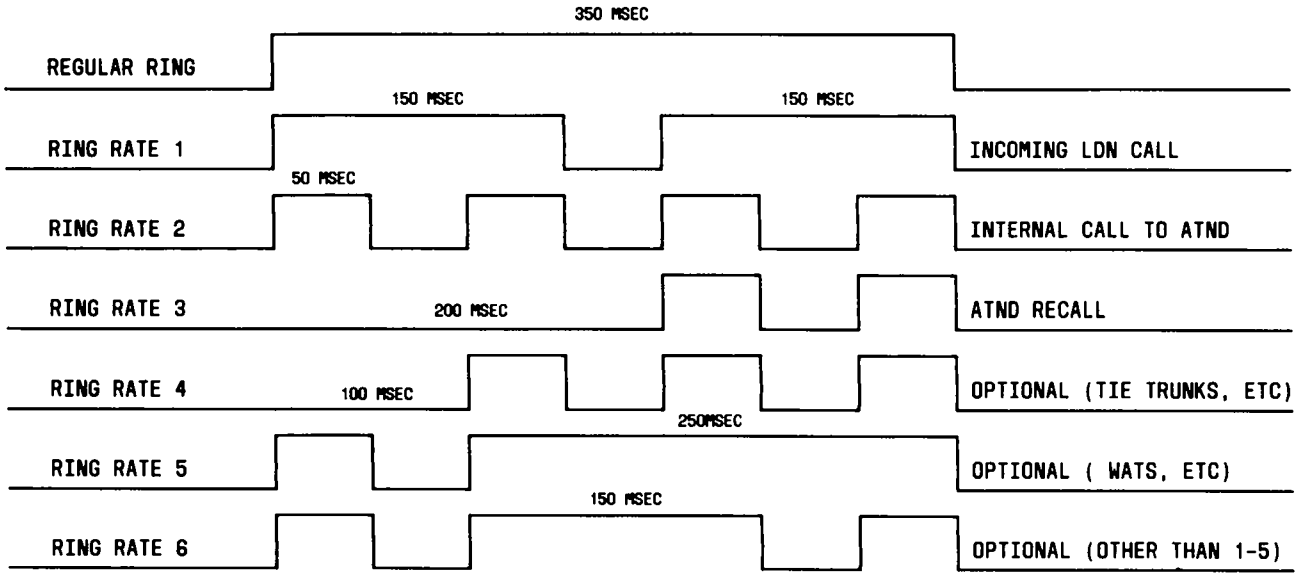


Fig. 40—Visually Impaired Attendant Service—Coded Ring Rates

(4) Customer options (tie trunks, etc)

(5) Customer options (WATS, etc)

(6) Other than 1 through 5.

Second, the 2A translator senses the light-sensitive probe output when the probe is placed over an illuminated console LED and injects a tone onto the console headset.

This feature can only be provided with the 02-system console.

WIDE AREA TELECOMMUNICATIONS SERVICE (WATS) ACCESS

3.356 This service provides access to or from a WATS serving office. All incoming calls to the PBX are placed to the assigned 800 Service number and are answered by the PBX attendant similar to LDN service. OUTWATS calls to the various geographic areas are made on an attendant-handled basis via Direct Trunk Group Selection, when provided, or dial access and/or on a direct dial basis by stations.

WIDE FREQUENCY TOLERANT POWER PLANT

3.357 The DIMENSION PBX power supplies are capable of functioning under conditions of wide input frequency tolerance (57 Hz to 63 Hz) with input voltage variations from a minimum of 105 volts to a maximum of 129 volts. Additionally, if frequency variations are held to 60 ±0.3 Hz, the input voltage can deviate from a minimum of 99 volts to a maximum of 129 volts. This feature permits operation with customer-provided emergency power generating equipment.

3.358 The PBX power plant facilities are provided that operate from ac energy sources which are not as closely regulated as commercial ac power. The wide tolerance power plant will continue to function properly with average frequency deviations of up to ±3 Hz or voltage variations of −15 percent to +10 percent as long as both of the conditions do not occur simultaneously. This feature permits operation with customer-provided emergency power generating equipment.

4. PHYSICAL ARRANGEMENTS

CABINETS

4.01 The DIMENSION 600 PBX equipment is housed in cabinets measuring approximately 610 mm (24 inches) deep by 800 mm (31-1/2) inches wide by 1765 mm (69-1/2 inches) high. The cabinet can accommodate five carriers. The number of carriers and consequently the number of cabinets re-

quired is determined by the line, trunk, and service circuit requirements of the customer. Each cabinet is made up of a basic framework with side and front panels hinged for easy access. Within the cabinet, carriers are mounted on frames in accordance with customer requirements. Location of the carriers, to some extent, varies. Cabinets are shipped from the factory complete with units, wiring, cabling, and circuit packs in place. Front panels are available to blend with office decor. The front panel colors are available in avocado, teak, walnut, gold, orange, red, and blue. In addition, an option is available for the use of a customer-provided panel. An auxiliary cabinet is provided to house standard optional circuits such as customer premises facility terminal (CPFT) equipment and interface trunks.

4.02 The DIMENSION 600 PBX is a 1-, 2-, 3-, or 4-cabinet system that consists of various arrangement of three basic cabinets. A brief description of the three cabinets follows.

A. Control Cabinet (J58884A)

4.03 The control cabinet (Fig. 4) is always required and houses the following equipment:

- Power supply
- Minirecorder
- Basic control carrier (one always required) or control growth carrier (one always required)
- ECTS carrier
- Module control and trunk port carrier (one always required)
- Line group control carrier
- Line port carrier
- Supplemental ECTS carrier
- Tie trunk carrier
- Trunk port carrier.

B. Line Cabinet (J58882C)

4.04 The line cabinet (Fig. 5) houses the following carriers:

- Power supply
- Line group control carrier (one always required)
- Line port carrier
- ECTS carrier
- Supplemental ECTS carrier.

C. Module Control Cabinet (J58882B)

4.05 The module control cabinet (Fig. 6) houses the following carriers:

- Power supply
- Module control and trunk port carrier (one always required)
- ECTS carrier
- Line group control carrier
- Line port carrier
- Supplemental ECTS carrier
- Tie trunk carrier
- Trunk port carrier.

When provided, the module control cabinet must always be cabled as the second cabinet. When added to an existing 2-cabinet system, the line cabinet must be recabled as the third cabinet.

CABINET-MOUNTED EQUIPMENT

A. Carriers

4.06 Carriers of the DIMENSION PBX are small frames, including wiring and apparatus for housing and interconnecting circuit packs. Each carrier is limited to hold only certain types of circuit packs. Within the carriers, some circuit packs may be dedicated to particular positions (slots). The slots are numbered from left to right and the circuit packs are inserted from the front. A total of 20 circuit pack carriers may be provided with a maximum size system (four cabinets). Regardless of system size, a basic control carrier or a control growth carrier, a module

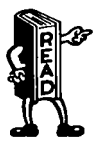
control and trunk port carrier, and a line group control carrier must always be provided. The remaining number and type of carriers to be provided are determined by customer requirements (lines, trunks, service circuits). The carriers measure 660 mm (26 inches) wide by 241 mm (9.5 inches) high by 457 mm (18 inches) deep. The type of carriers and the maximum number of each type which may be provided are indicated in the following paragraphs.

4.07 ***Basic Control Carrier:*** The basic control carrier J58882AC (Table G) houses and provides interconnections for a total of 40 circuit packs. Carrier circuit pack slots are numbered 00 through 41. The number of 16K memory circuit packs (LC128B) required are determined by the number of words provided in the system program. Mounting space is also provided for the Automatic Number Identification (ANI) interface (LC31C), tape transport interface circuit (LC30C), data transfer (LC172B), data control (LC171B), and fast/slow speed input/output data channel (LC34B) circuit packs.

4.08 ***Control-Growth Carrier:*** The control-growth carrier J58882AH (Table H) houses and provides interconnections for a total of 38 circuit packs. The DIMENSION 600 PBX uses only 31 of the circuit pack slots as indicated. Carrier slots are numbered for software compatibility—eg, 00 through 10, 17 through 30, 31/35 through 34/38, then 39 and 40. This completes the first portion of the control-growth carrier. Slots immediately following slot 40 are 19, 20/24 through 23/27, and 34 through 39. This is the growth portion of the control-growth carrier. The 64K-word memory circuit pack (LC346) and the high density (four channels) data channel circuit pack (LC366) are required in the control-growth carrier.

4.09 ***Control Carrier:*** The control carrier J58882AK (Table I) (required for Issue 3 of FP8) houses and provides interconnections for 39 circuit packs. Carrier circuit pack slots are numbered 00 through 39; slot 21 is not used. The carrier replaces the J58882AH control-growth carrier when the Data Communications Interface Unit (DCIU) function is to be provided. The DCIU supports DIMENSION 600 PBXs (FP8, Issue 3), Distributed Communications System (DCS) and/or Applications Processor, Directory/Message Center Service features. The carrier configuration consists of a new common control processor, 256K-word Random Access Memory (RAM) circuit pack (4-maximum), DCIU, and minirecorder tape transport interface circuits. The J58882AK carrier when not equipped with a DCIU (circuit packs LC501 through LC505 and LC507) may be used as the control carrier which replaces the J58882AH control-growth carrier for single-switch customers not requiring a DCS or AP functions.

4.10 ***Module Control and Trunk Port Carrier:*** The module control and trunk port carrier J58882BA (Table J) houses and provides interconnections for 31 circuit packs. Carrier circuit pack slots are numbered 00 through 31. The circuit packs always required are the pulse amplitude modulation (PAM) amplifiers, network circuits, and maintenance circuits. One module control and trunk port carrier is required in each cabinet containing trunk port circuits.



Slot 06 in the first module control and trunk port carrier cannot be used due to software restrictions.

4.11 ***Line Group Control Carrier:*** The line group control carrier J58882BB (Table K) houses and provides interconnections for a total of 22 circuit packs. Carrier circuit pack slots are numbered 00 through 22. One carrier is located in each equipment cabinet that contains line circuits, attendant circuits, or tone circuits. This carrier contains PAM amplifiers and digital buffering for the port circuits in the carrier, as well as the group amplifiers for the line group. In line cabinets, the carrier also contains the network control circuits and network maintenance monitor for the cabinet. One line group control carrier is required in each cabinet containing line port circuits.

4.12 ***Supplemental Line Port Carrier:*** The line port carrier J58879AC (Table L) houses and provides interconnections for 18 circuit packs. Carrier circuit pack slots are numbered 00 through 18. This carrier contains line circuits and the buffering to the network control and PAM amplifier circuitry. This carrier must be placed in a cabinet containing a line group control carrier which provides control to the line port carrier.

4.13 ***Trunk Port Carrier:*** The trunk port carrier J58879BA (Table M) houses and provides interconnections for 18 circuit packs. Carrier circuit pack slots are numbered 01 through 18. This carrier contains the central office, tie, auxiliary trunk, con-

▶TABLE G◀

BASIC CONTROL CARRIER CONFIGURATION—J58882AC

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER (NOTE)																			
TYPE	CODE			00	01-16	17	18	19	20,21	22	23	24	25	26	27	28	29	30	31	32	33-38	39	40	41
RAM Data Buffer A	LC135C	1	1	X																			
RAM (16K Words)	LC128B	1	16		X																		
RAM Data Buffer B	LC136	1	1			X																	
RAM Address and Timing Control	LC138	1	1				X																
Alarm	LC147	1	1					X															
201CC Processor	LC143*	1	1						X														
Extended Microstore	LC142*	1	1							X													
I/O and Memory Decode	LC133B	1	1									X											
I/O Buffer and Test	LC134B	1	1										X										
Cartridge Transport Interface A	LC29C	1	1											X									
Cartridge Transport Interface B	LC30C	1	1												X								
ANI Interface	LC31C	1	1														X						
Data Transfer	LC172B†	1	1															X					
Data Control	LC171B†	1	1																X				
Fast/Slow Speed I/O Data Channel	LC34B	2	9															X	X	X	X		
4-MHz Channel Control	LC130	1	1																			X	
4-MHz Subchannel	LC131	16	1																				X
Time-of-Day Clock	LC144	1	1																	X			
201CC Processor‡	LC455B	1	1						X														

Note: Slot 23 is reserved for manufacturing test.

* The LC142 and LC143 must have the same number (stamped in red ink). The decimal number (stamped in black ink) does not affect compatibility.

† Optional — LC171B and LC172B provided with RMATS.

‡ When LC455B or LC455C is used instead of LC143, circuit pack LC142 must be removed. Systems with memory sizes greater than 512K words require LC455C.

◗TABLE H◖

CONTROL-GROWTH CARRIER CONFIGURATION—J58882AH-1

CIRCUIT PACK		NO OF CKTS PER CP	MAX CP PER CARR	CONTROL SLOT POSITION IN CARRIER (SEE NOTE)																																		GROWTH									
TYPE	CODE			00	01	02	03	04	05	06	07	08	09	10	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	19	20	21	22	23	24	25	26	27	34	35	36	37	38	39
RAM BUS TERMINATIONS	LC135C	1	1	X																																														
RAM 64K-WORD	LC346	1	8		X	X	X	X	X	X	X	X																																					
RAM DATA BUFFER	LC136	1	1												X																																			
RAM ADDRESS AND TIMING CONTROL	LC454	1	1													X																																	
ALARM	LC147	1	1														X																																
201CC PROCESSOR*	LC143/ LC455B/ LC455C	1	1															X																															
EXTENDED MICROSTORE	LC142	1	1																	X																													
I/O AND MEMORY DECODE	LC133B	1	1																			X																										
I/O BUFFER AND TERMINATIONS	LC134B	1	2																				X																X									
MINI-RECORDER INTERFACE A	LC29B	1	1																					X																							
MINI-RECORDER INTERFACE B	LC30C	1	1																						X																						
ANI TRANSMITTER CKT	LC31C	1	1																							X																					
DATA TRANSFER†	LC172B	1	1																								X																				
DATA CONTROL†	LC171B	1	1																									X																			
HIGH DENSITY DUAL SPEED SERIAL DATA CHANNEL‡	LC366B	4	9																								X	X	X	X	X								X	X	X	X					
	LC34B(MD)	2	9																									X		X																
TIME OF DAY CLOCK	LC144	1	1																											X																
4-MHZ CHANNEL CONTROL	LC130	1	3																																	X										
4-MHZ SUBCHANNEL	LC131	16	5																																		X									

NOTE: IN THE CONTROL PORTION OF THIS CARRIER, SLOT POSITIONS 9, 10, AND 28 ARE NOT USED. SLOT POSITION 23 IS RESERVED FOR MANUFACTURING TEST. IN THE GROWTH PORTION OF THIS CARRIER, SLOTS 34 THROUGH 39 ARE NOT USED.

* WHEN LC455B OR LC455C IS USED, LC142 IS NOT REQUIRED AND SLOT 22 SHOULD BE LEFT VACANT. LC455C REQUIRED FOR MEMORY SIZES GREATER THAN 512K WORDS.

† OPTIONAL - LC171B AND LC172B ARE REQUIRED WITH RMATS AND CACS AND/OR SMDR.

‡ WHEN THREE OR MORE CONSOLES ARE BEING USED, THE LC366B REPLACES THE LC366. THE LC34B CAN BE USED AS A SUBSTITUTE FOR THE LC366 DUAL-SPEED DATA CHANNEL, BUT TWO DATA CHANNELS PER SLOT ARE LOST.

TABLE I

CONTROL CARRIER CONFIGURATION—J58882AK

CIRCUIT PACK (NOTES 1-4)		CKTS PER CP	MAX CP PER CARR	SLOT POSITION IN CARRIER																																					
TYPE	CODE			00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
DCIU DEBUG	LC507	1	1	X																																							
DCIU I/O	LC505	1	2		X	X																																				
DCIU MEMORY	LC504	1	1				X																																			
DCIU PROCESSOR	LC503	1	1					X																																		
DCIU CONT. REG.	LC502	1	1						X																																	
DCIU DATA BUFFER	LC501	1	1							X																																
256K RAM	LC500	1	4								X	X	X	X																												
RAM DATA BUFFER	LC136B	1	1												X																											
RAM ADDRESS & TIMING	LC454B	1	1													X																										
ALARM CKT	LC147B	1	1														X																									
PROCESSOR (NOTE)	LC515	1	1															X	X																							
SWAT INTERFACE	LC301	1	1																	X																						
I/O & MEMORY DECODE	LC133B	1	1																		X																					
I/O & BUFFER TERM.	LC134B	1	2																			X														X						
MINIRECORD INT. A	LC509	1	1																				X																			
MINIRECORD INT. B	LC510	1	1																					X																		
ANI DATA REG.	LC31C	1	1																						X																	
DATA TRANSFER	LC172B	1	1																								X															
DATA CONTROL	LC171B	1	1																									X														
TIME OF DAY CLOCK SYNCH	LC144	1	1																										X													
QUAD DATA CHANNEL	LC366	4	4																						X	X	X			X	X	X	X	X								
4-MHZ CHANNEL CONTROL	LC130	1	3																															X			X			X		
4-MHZ SUBCHANNEL	LC131	16	5																																X			X	X		X	X

NOTES:
1. LC171B and LC172B (Slots 24 and 23) optional circuit packs required with CACS, RMATS, and/or SMDR
2. LC515 (Slots 14 and 15) is made up of two circuit packs (LC513 and LC514) wired together
3. LC507 and LC301 (Slots 00 and 16) are for test/maintenance only and are not to be left in the carrier

♦TABLE J◀

MODULE CONTROL AND TRUNK PORT CARRIER CONFIGURATION—J58882BA

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER (NOTE)																													
TYPE	CODE			00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Carrier PAM Amplifier	LC101	1	1						X																								
Group PAM Amplifier	LC102*	1	2				X	X																									
Central L/T PAM Amplifier	LC103/ LC103B*	1	1		X																												
Maintenance	LC105	1	1	X																													
Digital Network Buffer	LC49C	1	1															X															
Network Clock	LC121B	1	1																											X			
Network Control	LC122	1	1																												X		
Network I/O Subchannel Interface	LC123	1	1																													X	
Network I/O Data Converter	LC124	1	1																														X
Scanner/Distributor	LC46	1	1																												X		
CO Trunk	LC08D	2	11							X	X	X		X		X			X		X		X		X		X		X				
DID Trunk	LC09D	2	11							X	X	X		X		X			X		X		X		X		X		X				
Tie Trunk	LC11B	2	8							X	X	X		X		X			X		X		X										
ANI Data Transmitter	LC32B	1	1																						X								
AUX TRK Interface	LC13B	2	8							X	X	X		X		X			X		X		X										
TOUCH-TONE Dialing Register	LC10B†	1	8									X		X		X			X		X		X		X		X						
TOUCH-TONE Dialing Register	LC54B†	1	8										X		X		X			X		X		X		X		X						
ATND Conference	LC06B	1	2							X	X	X		X		X			X		X		X										
Message Register Interface	LC16B	8	8							X	X	X		X		X			X		X		X										
Voice Announcement Circuit	LC190	1	1							X	X	X		X		X			X		X		X		X		X		X				
TOUCH-TONE Dialing Register and Receiver	LC10C/ LC10D†	1	11							X	X	X		X		X			X		X		X		X		X		X				
Loop Sig Interface Trunk	LC361	2	8							X	X	X		X		X			X		X		X										
TOUCH-TONE Dialing Sender Dial Tone Detector	LC12	2	8							X	X	X		X		X			X		X		X										
Contact Interface	LC15	8	11							X	X	X		X		X			X		X		X										

Note: Slots 06, 07, 08, 10, 12, 15, 17, 19, 21, 23, and 25 can contain optional circuit packs. Slot 06 cannot contain a circuit pack in first module control and trunk port carrier.

* Single bus system does not require LC102 in slot 04 or LC103 in second carrier if provided.

† When LC10C or LC10D is used, LC54B is not required.

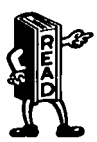
ference, and register circuits. Data port circuit packs (LC567) required to support FP8 Data Switching feature may also be mounted in this carrier.

4.14 ***Central Office and Tie Trunk Port Carrier:*** The tie trunk port carrier J58882BD (Table N) houses and provides interconnections for 18 circuit packs. Carrier slots are numbered 01 through 18. This carrier provides mountings for central office and tie trunk circuits. ⧫Data port circuit packs (LC567) required to support FP8 Data Switching feature may also be mounted in this carrier.⧫

4.15 ⧫***ECTS Basic and Supplemental Carriers:*** The ECTS basic controller carrier J58879KA (Table O) and the ECTS supplemental controller carrier J58879KB (Table P) provide control for multibutton electronic telephone (MET) sets provided with ECTS. The basic carrier provides mountings for the control circuit packs (LC56 through LC60) and 64 steering circuits (8 circuits per LC55). The supplementary carrier provides mountings for an additional 64 steering circuits (8-LC55). The supplementary carrier, when used, is powered from the basic carrier and is always mounted above the basic carrier. Only one ECTS controller (one basic and one supplemental carrier) can be installed in a DIMENSION PBX cabinet. Only two ECTS controllers can be installed in a DIMENSION PBX auxiliary cabinet (J58879F).⧫

B. Circuit Packs

4.16 Circuit packs are 203 mm by 292 mm (8 by 11-1/2 inches). Each pack is equipped with an identification faceplate containing a color-coded label. The circuit packs have been separated according to function to simplify maintenance and repair. In addition, the circuit pack faceplates have test points to allow interrogation of internal circuit states for fault diagnosis.



A circuit pack is always replaced with a circuit pack having either the same or a subsequent suffix as printed on the carrier designation strip. That is, an LC08 cannot be used if the designation strip specifies the LC08B. The LC08B, C, or later alpha-suffixed circuit packs are suitable replacements for an LC08B.

4.17 Circuit packs contain the circuits for the system and plug into connectors on associated carriers. Every circuit can be addressed by a 5-digit number which tells its location by module-carrier-slot-circuit. For example, circuit number 0-2-16-1 indicates the circuit located in module 0, carrier 2, slot 16, circuit number 1. The following is a numerical listing and a brief description of the PBX circuit packs. These circuit packs conform to FCC registration requirements. ⧫Refer to Fig. 41 for a functional block diagram of the DIMENSION 600 PBX common control and network control circuit pack configuration.⧫

- ***LC02B—Line Circuit:*** The LC02B is the interface to stations within the PBX. It receives loop signaling from the station sets to detect on- and off-hook status and dial pulses. It alerts the station by sending 20-Hz ringing. The tip and ring is not cut through the time division switch and, therefore, cannot achieve dc continuity. Each LC02B contains four separate line circuits.

- ***LC03B—Message Waiting Line Circuit (MD):*** The LC03B functions in the same manner as the LC02B but, in addition, can interface with a station message waiting lamp and with an energy communication signaling unit. Each LC03B provides four separate line circuits.

- ***LC03C—Message Waiting Line Circuit:*** The LC03C performs the same function as the LC03B with component changes to eliminate the requirement for the −5V potential.

- ***LC04—Tone Plant A:*** The LC04 provides 350-Hz and 440-Hz tones. Tones from the LC04 and LC05B are used individually and in combination, steady and interrupted, at various rates to provide eight distinct audible tones. One LC04 is required per system when an LC204 is not provided.

- ***LC05B—Tone Plant B:*** The LC05B provides 480-Hz and 620-Hz tones. Tones from the LC04 and LC05B are used individually and in combination, steady and interrupted, at various rates to provide eight distinct audible tones. One LC05B is required per system when an LC204 is not provided.

- ***LC06—Attendant Conference Circuit (MD):*** The LC06 enables the attendant to

◗TABLE K◖

LINE GROUP CONTROL CARRIER CONFIGURATION—J58882BB

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER (NOTE)																				
TYPE	CODE			01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
Carrier PAM AMP	LC101	1	1				X																		
Group PAM AMP	LC102*	1	2		X	X																			
Maintenance	LC105†	1	1	X																					
Digital Network Buffer	LC49C‡	1	1											X											
Scanner/ Distributor	LC46†	1	1																				X		
Network Control	LC122†	1	1																			X			
Network I/O Subchannel Interface	LC123†	1	1																					X	
Network I/O Data Converter	LC124†	1	1																						X
Tone A	LC04§	1	1					X																	
Tone B	LC05B†	1	1						X																
Attendant	LC45	2	2							X	X														
Line Circuit	LC02C	4	12					X		X	X	X	X		X	X	X	X	X	X	X				
Transmission Test Line	LC145	2	1												X	X	X	X	X	X	X				
Message Waiting Line Circuit	LC03C	4	12					X		X	X	X	X		X	X	X	X	X	X	X				
Signal Distribution Circuit	LC41B‡	1	1											X											
Tones Circuit	LC204§	1	1					X																	
Tone Plant C¶	LC17B												X												

Note: Slots 05, 07, and 08 can contain optional circuit packs.

* Single bus system does not require LC102 in slot 03.

† Not required when carrier is located in module control cabinet.

‡ LC41B replaces LC49C with Feature Package 9 or 11.

§ Both LC04 and LC05B circuit packs or one LC204 circuit pack is required to provide tones. LC204 is not a direct replacement for LC04 and LC05B.

¶ FP8, FP11, and FP12 only.

TABLE L

LINE PORT CARRIER CONFIGURATION — J58879AC

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER				
TYPE	CODE			00	01	02-09	10	11-18
Carrier PAM AMP	LC101	1	1		X			
Digital Network Buffer	LC49C*	1	1				X	
Line Circuit	LC02C	4	16			X		X
Message Waiting Line Circuit	LC03C	4	16			X		X
Signal Distribution Circuit	LC41B*	1	1				X	
Data Port	LC567†	2	16			X		X

* LC41B and LC03Cs are used instead of LC49C and LC02Bs when the Message Waiting feature is used.

† The LC567 replaces LC02 as required to support FP8 Data Switching feature. Note that there are only two circuits per LC567 versus four per LC02.

establish a conference of up to six parties. This circuit can accommodate a maximum of six stations or four stations and two trunks. A separate time slot and conference port is required for each conference party. Attendant conference circuits cannot be bridged together. Each LC06 contains one 6-port conference circuit.

- ***LC06B—Attendant Conference Circuit:*** The LC06B performs the same function as the LC06 with component changes to eliminate the requirement for the −5V potential.

- ***LC08C—Dual CO Trunk Circuit (MD):*** The LC08C provides all CO, FX, and WATS ground-start trunk interfaces to a central office. This circuit employs standard ground-start signaling and can be used in 1-way incoming, 1-way outgoing, or 2-way modes. It detects a CO battery reversal for toll diversion purposes. Each LC08C contains two separate trunk circuits.

- ***LC08D—Dual CO Trunk Circuit:*** The LC08D performs the same function as the LC08C with component changes to eliminate the requirement for the −5V potential.

- ***LC09C—Direct Inward Dialing (DID) Trunk Circuit (MD):*** The LC09C provides the DID trunk interface to a central office. It detects a low resistance loop closure (high/low signaling) as an incoming seizure and provides a reversal of battery and ground on the tip and ring leads as an off-hook indication from the PBX. Each LC09C contains two separate trunk circuits.

- ***LC09D—DID Trunk Circuit:*** The LC09D performs the same function as the LC09C with component changes to eliminate the requirement for the −5V potential.

- ***LC10B—TOUCH-TONE Telephone Register:*** The LC10B is paired with an LC54B to process TOUCH-TONE dialing. The register circuit interfaces the receiver to the time division network and recodes the 2-out-of-7 output from the receiver into binary-coded decimal (BCD). Each LC10B provides one register circuit.

♦TABLE M♦

TRUNK PORT CARRIER CONFIGURATION – J58879BA

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER																
TYPE	CODE			01	02*	03*	04*	05*	06*	07*	08*	09*	10	11*	12*	13*	14*	15*	16*	17*	18*
CARRIER BUFFER AMP	LC101	1	1	X																
DIGITAL NETWORK BUFFER	LC49C	1	1										X							
2-WAY CO TRUNK	LC08D	2	16		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
DIRECT-IN-DIAL TRUNK	LC09D	2	16		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
TIE TRUNK	LC11B	2	8		X	X	X	X	X	X	X	X									
LOOP SIGNALING INTERFACE TRUNK	LC361	2	8		X	X	X	X	X	X	X	X									
"TOUCH-TONE" DIALING RCVR AND REG †	LC10C/ LC10D	1	16		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
"TOUCH-TONE" DIALING REGISTER	LC10B	1	4											X		X		X		X	
"TOUCH-TONE" DIALING RECEIVER	LC54B	1	4												X		X		X		X
AUX TRUNK INTERFACE	LC13B	2	8		X	X	X	X	X	X	X	X									
ATTENDANT CONFERENCE	LC06B	1	2		X	X	X	X	X	X	X	X									
REMOTE ACCESS CO TRUNK	LC07	1	16		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
"TOUCH-TONE" DIALING SENDER	LC12	2	8		X	X	X	X	X	X	X	X									
CONTACT INTERFACE	LC15	2	8		X	X	X	X	X	X	X	X									
MESSAGE REGISTER INTERFACE	LC16B	8	8		X	X	X	X	X	X	X	X									
DATA PORT	LC567	2	8		X	X	X	X	X	X	X	X									

* OPTIONAL CIRCUIT PACKS.

† THE NUMBER OF LC10C/LC10D CIRCUIT PACKS NEEDED DEPENDS UPON THE NUMBER OF "TOUCH-TONE" DIALING STATIONS AND TRAFFIC LOAD. AN LC10C/LC10D MAY OCCUPY ANY TRUNK PORT CIRCUIT SLOT POSITION. THE LC10C/LC10D CIRCUIT PACK MAY REPLACE AND EXISTING LC10B; HOWEVER, IT IS RECOMMENDED THAT THE ACCOMPANYING LC54B BE REMOVED.

TABLE N

CENTRAL OFFICE AND TIE TRUNK CARRIER — J58882BD

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER			
TYPE	CODE			01	02 — 09	10	11 — 18
Carrier Buffer AMP	LC101	1	1	X			
Digital Network Buffer	LC49C	1	1			X	
2-Way CO Trunk	LC08D	2	16		X*		X*
Tie Trunk	LC11B	2	16		X*		X*
Loop Signaling Interface Trunk	LC361	2	16		X*		X*
Data Port	LC567	2	16		X*		X*

* Optional circuit packs.

TABLE O

ECTS BASIC CONTROLLER CARRIER CONFIGURATION — J58879KA

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER (NOTE)												
TYPE	CODE			00	01	02	03	04	05	06	07	08	09	10	11	12
Steering Circuits	LC55	8	8	X	X	X	X	X	X	X	X					
Transmitter/Receiver	LC56	1	1									X				
Memory I/O	LC57	1	1										X			
Station Activity Buffer	LC58	1	1											X		
Fault Control	LC59	1	1												X	
Data Interface	LC60	1	1													X

Note: A 207A power supply is provided in left side of carrier.

- ***LC10C—TOUCH-TONE Telephone Register and Receiver:*** The LC10C processes TOUCH-TONE dialing. It converts TOUCH-TONE dialing signals to BCD signals. The LC10C combines the functions of the LC10B and the LC54B into a single circuit pack. When replacing an LC10B with an LC10C, it is recommended that the LC54B be removed to enhance system reliability.

- ***LC10D—TOUCH-TONE Telephone Receiver and Register:*** Performs the same functions as LC10C and has increased

▶TABLE P◀

ECTS SUPPLEMENTAL CONTROLLER CARRIER CONFIGURATION—J58879KB

CIRCUIT PACK		NO. OF CKTS PER CP	MAX. CP PER CARR	SLOT POSITION IN CARRIER							
TYPE	CODE			13	14	15	16	17	18	19	20
Steering Circuits	LC55	8	8	X	X	X	X	X	X	X	X

resistance to noise spikes generated in SMDR applications.◀

- ***LC11B—Tie Trunk Circuit:*** The LC11B provides CCSA access, AUTOVON access, and tie trunk service. It may be used as a DID trunk when duplex (DX) or E and M signaling is required and is used as a Release Link Trunk (RLT) for Centralized Attendant Service (CAS). This circuit is a 4-wire circuit and can be optioned on the circuit pack for DX or E&M signaling. It contains switchable 2-dB transmission pads that are switched in or out via software. Each LC11B contains two independent trunk circuits.

- ▶***LC12—TOUCH-TONE Dialing Sender/Dial Tone Receiver:*** This circuit pack (CP) contains two trunk type circuits which function independently as a TOUCH-TONE calling generator and as a dial tone receiver (ie detector). The TOUCH-TONE telephone senders (2 per CP) are software controlled and, when enabled, generate TOUCH-TONE dialing signals of a 76-millisecond duration for digit outpulsing and maintenance. Dial-tone detection is accomplished by a precision 350-Hz dial tone detector (2 per CP).◀

- ***LC13—Auxiliary Trunk Interface Circuit (MD):*** Each LC13 contains two separate circuits. The LC13 provides a method to connect a talking path to the following voice connecting arrangements: loudspeaker paging coupler, music-on-hold coupler, recorded announcement trunk, interface trunk circuit, recorded telephone dictation trunk, automatic trunk level interconnecting unit, and AUTOVON ATND/LDN trunk.

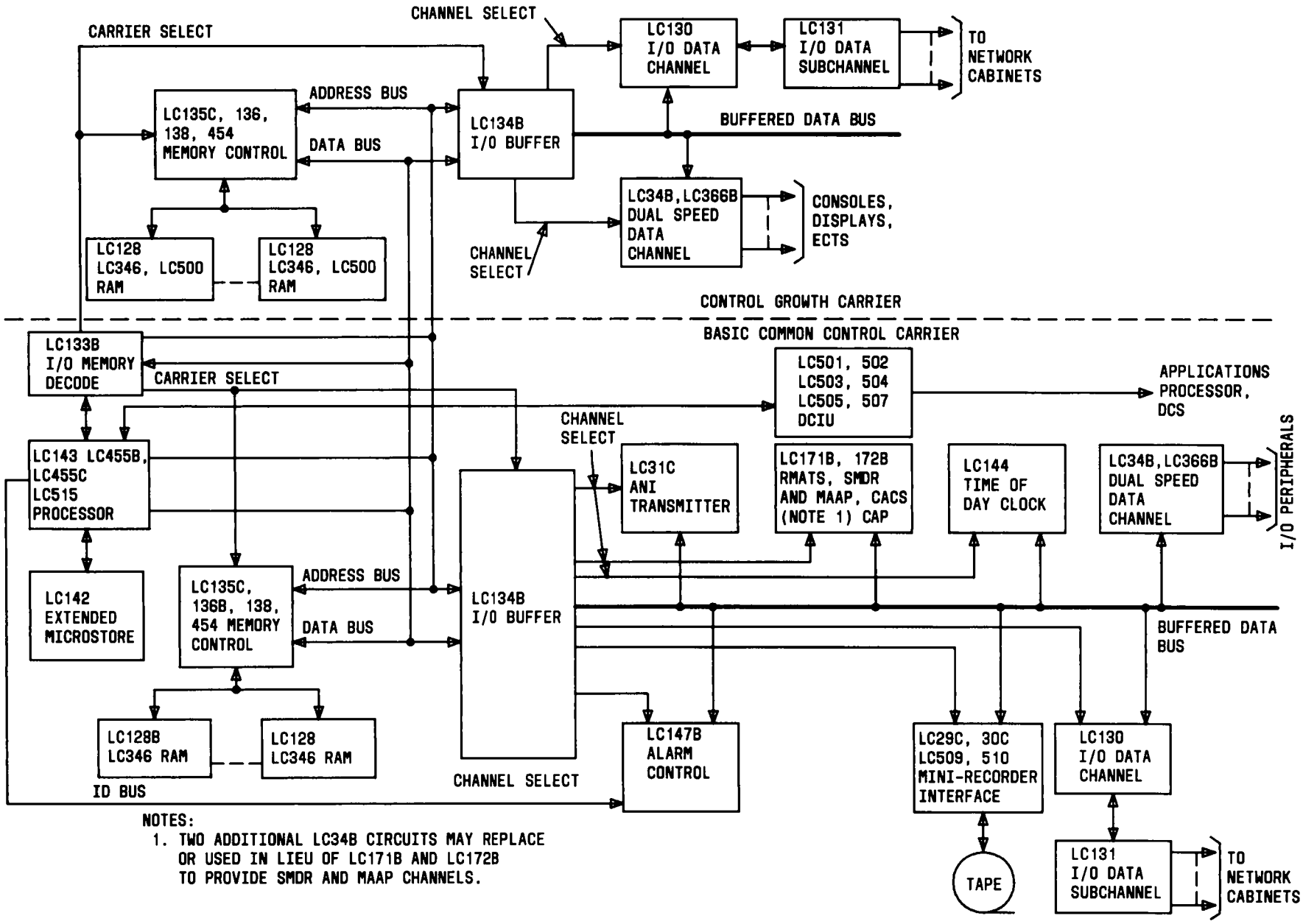
- ***LC13B—Auxiliary Trunk Interface:*** The LC13B performs the same function as the LC13 with component changes to eliminate the requirement for the −5V potential.

- ***LC15—Contact Interface B:*** Each LC15 contains eight circuits. The LC15 is used to drive the CAS system status indicator and trunk status indicator lamps for both CAS and Uniform Call Distribution/Direct Department Calling (UCD/DDC).

- ***LC16B—Message Register Interface:*** The LC16B detects M lead signals from the central office. These signals increment the message unit total for the line which is connected to the associated trunk. Additionally, the LC16B is required for interfacing to the energy usage sensors in implementing the Energy Communications Service feature. Each LC16B contains eight station message register circuits.

- ***LC17B—Tone Plant C:*** This circuit pack generates tones for inter-PBX signaling in CAS applications and Code Calling Access (Chime Paging). Although only one LC17B is required per network module at a branch PBX location containing RLTs or backup stations, two LC17Bs are normally specified for backup purposes. An LC17B provides call-type identification to the CAS attendant(s) on outgoing release link trunk (RLT) calls. An alternate clock source input (25 ms) is provided for use with a dual processor to prevent the Code Calling Access tone from being seized when in use and to change the Code Calling Access tone from 880 Hz to 892 Hz. The following four tones are provided: 440 Hz and 480 Hz—LDN, 800-Service, FX, and CAS; 480 Hz—Immediate Audible Ring—CAS; 440 Hz—CAS; 892 Hz—Code Calling Access.

- ***LC29B—Tape Transport Interface A:*** The LC29B contains the interface circuits



♦Fig. 41—DIMENSION 600 PBX Common Control and Network Control Circuit Pack Configurations (Sheet 1 of 2)♦

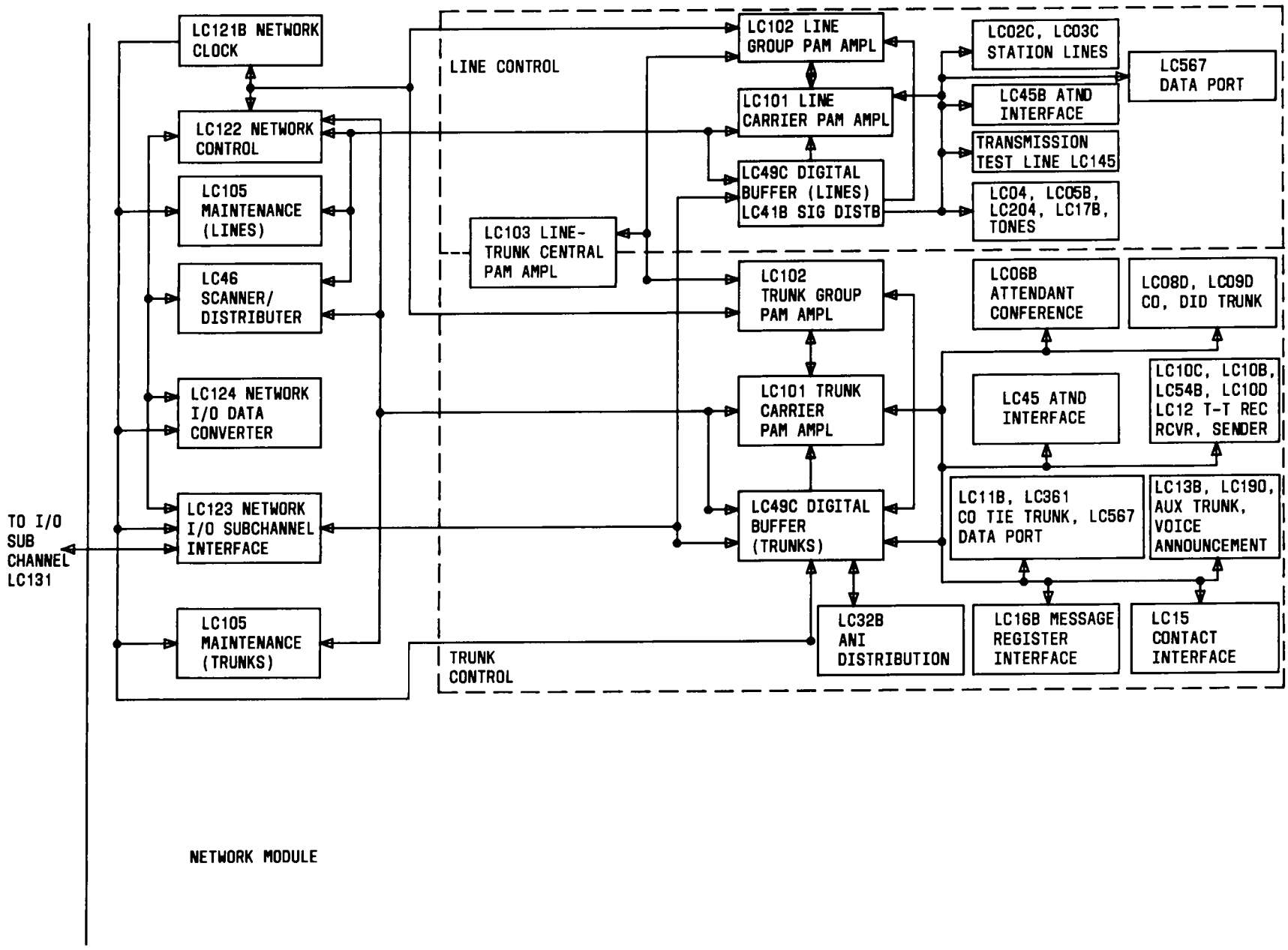


Fig. 41—DIMENSION 600 PBX Common Control and Network Control Circuit Pack Configurations (Sheet 2 of 2)

between the processor, data bus, and tape transport interface B (LC30C). One LC29B is required per system.

- ***LC30C—Tape Transport Interface B:*** The LC30C controls the operation of the tape transport. One LC30C is required per system.
- ***LC31C—ANI Transmitter Circuit:*** The LC31C provides the automatic number identification (ANI) control and register circuits. It stores the identity of the calling station until it is transmitted to the central office. One LC31C is used per system.
- ***LC32B—ANI Signal Distribution Circuit:*** The LC32B controls the transmission of ANI information to the central office. Each LC32B provides two data channels. One LC32B is used per system.
- ***LC34B ▶(MD)◀—Dual Speed Serial Data Channel:*** The LC34B provides two dual speed data channels (slow, 185 kilobits per second; fast, 833 kilobits per second) used to convert and transmit data between the processor and peripheral units (ie, attendant console, SMDR, ECTS controllers, etc). The LC34B can be used as an optional substitution for LC366 dual-speed data channel.
- ***LC41B—Signal Distribution Circuit (Hotel/Motel):*** The LC41B performs the functions of the LC49 and replaces the LC49 in the line carrier when stations are equipped for Message Waiting and/or the Energy Communications feature is implemented. It monitors lamp status. One LC41B is required per line carrier.
- ***LC45—Attendant Interface:*** The LC45 connects the Attendant Console voice path to the time division bus. Each LC45 contains two separate 4-wire transmission circuits.
- ***LC45B—Attendant Interface:*** The LC45B is introduced to reduce transmission noise in the Attendant Console circuit. An LC45B is used when the Attendant Console is equipped with a 478B plug not containing a shunt resistor. An LC45 must be used when the Attendant Console is equipped with a 478A plug containing a shunt resistor.
- ***LC46—Scanner/Distributor:*** The LC46 interrogates the port circuits and reports status to the processor. In addition, it distributes control data to port circuits. This data controls the ring relay in the line ports and various trunk port relays. It is also used in conjunction with the network control during network tasks and decodes carrier addresses, buffer boards, and port address bits to the LC49. One LC46 is required in each module control and trunk port carrier and each line group control carrier (located in a cabinet that does not contain a module control and trunk port carrier).
- ***LC49C—Digital Network Buffer:*** The LC49C provides buffer gating and an audit selector for the network control, board and port selection decoders for the scanner/ distributor, port reset logic, and common ringing application and trip circuits for the line carriers. It also has a power return circuit to hold the shift register off the PAM bus during power-up. One LC49C is required in each module control and trunk port carrier, line group control carrier, line port carrier, and trunk port carrier.
- ***LC54B—TOUCH-TONE Telephone Receiver:*** The LC54B is paired with a TOUCH-TONE telephone register (LC10B) to process TOUCH-TONE dialing signals. It converts the TOUCH-TONE dialing signals to a 2-out-of-7 dc signal.
- ***▶LC55 Through LC60:*** For a description of the ECTS control circuit packs, refer to Section 554-010-110 Electronic Custom Telephone Service, System Description.◀
- ***LC101—Carrier Buffer Amplifier:*** The LC101 serves as a common amplifier for all input and output (I/O) PAM signals for all port circuits in a carrier. It also provides a digital interface for some of the control signals. One LC101 is required in each module control and trunk port carrier, trunk port carrier, line group control carrier, and line port carrier.
- ***LC102—Group PAM Amplifier:*** The LC102 amplifies all input and output signals within a common line or trunk group. One LC102 is required for single bus and two are required for dual bus in each module control

and trunk port carrier and each line group control carrier.

- ***LC103—Central Line/Trunk PAM Amplifier:*** The LC103 sums all PAM signals within a network module. Input signals from all line and trunk groups are amplified and provided as outputs to all line and trunk groups connected to the PAM bus. One LC103 is required per PAM bus.

- ***LC103B—Central Line/Trunk PAM Amplifier:*** The LC103B is used instead of the LC103 to correct a noise problem.

- ***LC104—Link Central PAM Amplifier:*** The LC104 amplifies the PAM signals being transmitted from line or trunk group amplifiers. Input signals from all line and trunk groups connected to the bus are amplified and provided as outputs to link group amplifiers connected to the bus. It also provides a bus termination function. One LC104 is required for each module control and trunk port carrier.

- ***LC105—Network Maintenance:*** The LC105 performs PAM continuity and gain tests. It also monitors power, clock status, fuses, and temperature. One LC105 is required for each module control and trunk port carrier and each line group control carrier located in a cabinet that does not contain a module control and trunk port carrier.

- ***LC121B—Network Clock:*** The LC121B provides all functional timing for the PAM system and a 25-ms clock for the LC05B circuit pack. One LC121B is required per each module control carrier. The LC121B contains a dual-in-line switch package which must be in the required setting for application in the DIMENSION 600 PBX.

- ***LC122—Network Control:*** The LC122 establishes, removes, and audits network connections in response to commands from the processor. One LC122 is required in each module control and trunk port carrier and each line group control carrier located in a cabinet that does not contain a module control and trunk port carrier.

- ***LC123—Network I/O Subchannel Interface:*** The LC123 receives and transmits data in a serial format from the common control subchannels. It provides a dedicated data channel between the processor and each network cabinet. One LC123 is required in each module control and trunk port carrier and in each line group control carrier located in a cabinet that does not contain a module control and trunk port carrier.

- ***LC124—Network I/O Data Circuit:*** The LC124 receives serial data from the LC123 and converts the data to a parallel format to be used by the scanner/distributor and network control. Information is passed through it from the processor, providing instructions to the scanner/distributor and network control. One LC124 is required in each module control and trunk port carrier and in each line group control carrier located in a cabinet that does not contain a module control and trunk port carrier.

- ***LC128B—RAM (16K):*** The LC128B provides storage for 16,384 words and is used as the PBX main memory.

- ***LC130—4-MHz Channel Control:*** The LC130 controls information passed from the processor to the LC131. It passes information from the processor to the network cabinets. One LC130 is required per system.

- ***LC131—4-MHz Subchannel Circuits:*** The LC131 furnishes dedicated data channels to each network cabinet. This data channel allows the processor to execute commands in each network cabinet using the scanner/distributor and network control. Each LC131 provides 16 subchannels. One LC131 is required per system.

- ***LC133—I/O Memory Control:*** The LC133 provides processor control of data passed from the 16K memory to the input/output buffer (LC134). One LC133 or LC133B circuit pack is required in the basic control carrier.

- ***LC133B—I/O Memory Control:*** The LC133B circuit pack provides processor control of data passed from memory to the input/output buffer (LC134). This circuit pack may be used with either the 16K or 64K memory by selecting the proper option. One

LC133B is required in the control-growth carrier.

- ***LC134—I/O Buffer and Terminations (MD):*** The LC134 provides the interface between the main data bus and peripheral control circuits. It also provides terminating resistors on data and address bus leads to reduce oscillations. One LC134 is required in the basic control carrier.

- ***LC134B—I/O Buffer and Terminations:*** The LC134B performs the same functions as the LC134, but with modifications to correct noise problems which may occur during circuit pack testing.

- ***LC135/135C—RAM Bus Termination:*** The LC135 provides terminations for the memory address, data, and control buses. One LC135 is required in the basic control carrier.

- ***LC136—RAM Data Control:*** The LC136 functions as a memory data buffer and a bit-swap circuit. One LC136 is required in the basic control carrier.

- ***LC138—RAM Address and Timing Control:*** The LC138 refreshes memory and provides a timing circuit that controls internal timing of the memory. One LC138 is required in the basic control carrier.

- ***LC142—Extended Microstore:*** The LC142 provides 24 read only memories (ROMs) totaling 3K words of additional microstore memory for the processor. The LC142 is only compatible with an LC143 that has the same issue number (stamped in red ink). The decimal number (stamped in black ink) does not affect compatibility. One LC142 is required in the basic control carrier.

- ***LC143—201CC Processor:*** The LC143 is a microprogrammable processor made up of two separate printed circuit boards (LC140 and LC141) mounted together and electrically connected through two special interboard connectors. It controls data flow between the main memory and I/O devices via a 1-way address bus and a 2-way data bus and performs arithmetic and logic operations on this data. It also provides logic to generate system interrupts and boot-strap loading of the high-level memory. A section of read only memory that stores the microcontrol programs generates signals for the processor and clock generator, and controls decoding circuits for generating timing and control signals for the processor. The LC143 is only compatible with an LC142 that has the same issue number (stamped in red ink). The decimal number (stamped in black ink) does not affect compatibility. One LC143 is required for the basic control carrier.

- ***LC144—Time-of-Day Clock:*** The LC144 provides time-of-day data—seconds, minutes, hours, and days (0-999)—to the PBX software for record-keeping purposes.

- ***LC145—Transmission Test Line Circuit:*** The LC145 provides the circuitry to perform transmission testing of trunks. One LC145 is required when the transmission testing is required and is located in the line group control carrier.

- ***LC147—Alarm Circuit:*** The LC147 interfaces with the processor, alarm panel, fuse and breaker alarm bus, and overtemperature sensors. One LC147 is required in the basic control carrier.

- ***LC147B—Alarm Circuit:*** The initial use of the LC147B is in the J58882AK control carrier. The circuit pack is used to activate the major or minor alarm LEDs on the alarm panel. One LC147B is required for each J58882AK carrier.

- ***LC171B—Data Control:*** The LC171B circuit pack contains two data channels. Channel 0 provides dual speed (serial data channel) operation similar to the LC34B and LC366 circuit packs. The dual speeds are selectable, 833 kilobits per second for fast speed and 185 kilobits per second for slow speed. Channel 1 also has dual speed options (300 baud and 1200 baud). The 300-baud option is for use with RMATS. An LC171B circuit pack is required with the RMATS system. The 1200-baud option is for use with a high-speed printer, and a printer cutoff lead is provided from the LC171B.

- ***LC172B—Data Transfer:*** The LC172B provides an I/O data channel between the

processor and MAAP. One LC172B is required in the basic control carrier when associated with the RMATS system.

- ***LC190—Voice Announcement Circuit:*** The LC190 provides a nonalterable 2-second announcement for use with Automatic Wakeup Service. Only one LC190 is used per system.

- ***LC204—Tones Circuit:*** The LC204 provides 350-Hz, 440-Hz, 480-Hz, and 620-Hz tones. These tones are used individually and in combination, steady and interrupted, at various rates to provide eight distinct audible tones. The LC204 combines the functions of the LC04 and LC05B into a single circuit pack, but is not a direct replacement for these circuit packs.

- ***LC301—SWAT Interface:*** The LC301 is a test circuit pack (CP) and is not part of the list structure. The CP is used for maintenance and test purposes only. It must be removed from its carrier when not in use.

- ***LC346—RAM (64K Word):*** The LC346 circuit pack provides 64K words of main memory per circuit pack.

- ***LC361—Loop Signaling Interface Trunk:*** The LC361 provides two separate ports with loop signaling and trunk features for increased efficiency of access to on-premises computer ports. It also provides off-premises extension capability with call monitoring (SMDR) and transmission level compensation.

- ***LC366/LC366B—Dual-Speed Serial Data Channel:*** The LC366/LC366B provides one dual speed data channel which can be optioned for either slow speed (185 kilobits per second) or fast speed (833 kilobits per second) and three fixed slow-speed data channels. The data channels convert and transmit data bits synchronously between the processor and peripheral unit(s). Each LC366/LC366B must be optioned for the particular PBX.

- ***LC454—RAM Address and Timing Control:*** The LC454 provides refresh and other timing signals required to maintain and control the read/write operations. One LC454 is required for each common control carrier (J58882AH-1).

- ***LC455B—201CC Processor:*** The LC455B is a microprogrammable processor made up of two separate printed circuit boards (LC140 and LC462) mounted together and connected through two special interboard connectors. It controls data flow between the main memory and I/O devices via a 1-way address bus and a 2-way data bus. The LC455B performs arithmetic and logic operations on this data. It also provides logic to generate system interrupts and bootstrap loading of the main memory. The read only memory stores the microcontrol programs, generates signals for the processor and clock generator, and controls decoding circuits for the generation of timing and control signals for the processor. Circuit pack LC455B combines the functions of circuit packs LC142 (extended microstore) and LC143 (processor) into a single circuit pack.

- ***LC455C—201CC Processor:*** The LC455C performs the same functions as a LC455B but with changes to the Programmable Read Only Memory (PROM) microcoding. The LC455C is made up of two printed circuit boards (LC140 and LC462B). The LC462B replaces the LC462 which is one of two circuit packs which make up the LC455B. The LC462B is the same as a LC462 except for PROM microcoding changes. The changes improve microdiagnostic testing and provide the capability to display a 4-digit memory circuit pack number when a failure is found during microdiagnostic testing. The 4-digit display is required in systems with memory sizes greater than 512K words. The LC455C must be used instead of a LC455B where memory size is greater than 512K words. The LC455C can also be used in systems with smaller memory sizes.

- ***LC500—256K RAM:*** Each LC500 contains 256K of RAM. A maximum of four LC500s are used in slots 07 through 10 of the control carrier.

- ***LC501—DCIU Data Buffer:*** The LC501 circuits buffer the data to and from the

201CC memory and perform parity checks on the data. One LC501 is required and it is located in slot 06 of a carrier equipped with DCIU.

- ***LC502—DCIU Control Registers:*** Five registers on the LC502 control the interface between the DCIU and the 201CC processor. One LC502 is required, and it is located in slot 05 of a carrier equipped with DCIU.

- ***LC503—DCIU Processor:*** The LC503 contains the processing logic for the DCIU. One LC503 is required, and it is located in slot 04 of a carrier equipped with DCIU.

- ***LC504—DCIU Memory:*** The LC504 contains memory for the DCIU. It contains 32 kilobits of ROM and 128 kilobits of RAM. Only one LC504 is required, and it is located in slot 03 of a carrier equipped with DCIU.

- ***LC505—DCIU I/O:*** The LC505 contains the physical DCIU links. Each LC505 contains two ports. One or two LC505s are required per carrier. The LC505 is located in slots 01 and 02.

- ***LC507—DCIU Debug:*** The LC507 is used as a hardware test tool for laboratory aid and as a troubleshooting and monitoring tool for DCIU operations in the field. One LC507 is required, and it is located in slot 00 of a carrier equipped with DCIU. This circuit pack is not to be left in the carrier.

- ***LC509—Minirecorder Tape Cartridge Interface:*** The LC509 and LC510 minirecorder interface controls the operation of the minirecorder and transports data between the minirecorder and the 201CC processor. One LC509 and one LC510 are required in a carrier equipped with DCIU. The LC509 is located in slot 19 and the LC510 is located in slot 20.

- ***LC515—Common-Control Processor:*** The LC515 performs all common-control functions for the PBX. It is contained on two separate circuit packs (LC513 and LC514) that are mounted together to form a single unit electrically connected by two interboard connectors. The LC515 is located in slots 14 and 15 of a J58882AK carrier.

- ***LC563—Data Interface (DI):*** The LC566 provides a standard EIA RS232C interface between the PBXs and customer provided computer and data terminal equipment. It also provides an EIA RS366 interface for computer port call originations. The DI is required to support FP8, Issue 3 Data Switching feature Level 1 and Level 2 and is capable of operating at speeds up to 9600 bps. The LC566 contains one circuit per circuit pack.

- ***LC567—Data Port (DP):*** The LC567 provides the PBX interface to the data interface (LC566). Each LC567 contains two data port circuits. The LC567 replaces line circuit packs (CP) (LC02) and loop signaling interface trunk CPs (LC361) where data interfaces to the line and/or trunk side of the PBX is required. The DP is required to support FP8, Issue 3 Data Switching feature Level 1 and Level 2 and is capable of operating at speeds up to 9600 bps. The LC567 contains two circuits per CP.◀

C. Minirecorder and Cartridge

4.18 The KS-21477, List 8 minirecorder assembly houses one of the two 6.35-mm (1/4-inch) 4-track (two tracks read-only and two tracks read/write) program cartridges provided with the system. This cartridge is used to initialize the memory at the time of installation and after subsequent power failures. The second cartridge is used as a backup and contains an identical program and translation. The minirecorder is mounted in the lower right-hand side of the control cabinet (Fig. 4). The unit is completely self-contained and is connected to the system via two KS-type connectors. The minirecorder measures 184 mm (7.25 inches) wide by 188 mm (7.40 inches) high by 292 mm (11.51 inches deep). Weight of the minirecorder is approximately 9 kg (20 pounds).

4.19 ▶A new KS-21447, List 12 minirecorder replaces the List 8 model when the PBX is equipped with an Issue 3 FP8. It performs all List 8 functions and provides an additional 200 feet of tape handling capacity. The additional tape is used primarily for FP8 Application Processor Directory/Message Center Service and/or Distributed Communications Service features.◀

D. Fan Assembly Mounting

4.20 The fan assembly mounting is always provided and is mounted in the lower portion of

the equipment cabinet. The fans are an equipment option. Requirements for fans and associated filters are specified in Part 5.

E. Maintenance and Administration Panel (MAAP)

4.21 The MAAP (Fig. 42) provides the means to alter translations (eg, class of service, line assignments), incorporate patches to the system (customer premises change notices [CPCNs]), initiate traffic measurement, and initiate maintenance programs to isolate faults. The MAAP has a 12-button dial, four rows of control keys, a 25-digit operational display, a 3-digit procedure display, and indicators for alarm and operational status. A 2-digit error code display is provided to indicate an incorrect entry.

4.22 The MAAP operations use a series of procedures to accomplish the designed functions. Each procedure is accessed by dialing an associated 3-digit code from 000 to 999. A request to access a particular procedure causes an associated off-line software program to be read from the tape cartridge into a designated memory block, referred to as the paging buffer. Once this read operation is completed, the WAIT lamp on the MAAP is extinguished, and the procedure is available for use. Operation of the MAAP and tape cartridge will interrupt customer service only in specific cases of system diagnosis, recovery, or rearrangement.

4.23 The MAAP is stored in the control cabinet. The MAAP is connected via a 25-pair, 2438-mm (8-foot) extension cable which plugs into a connector adjacent to the control carrier. The MAAP must be removed from storage and connected each time it is used.

4.24 ***Emergency Central Office (CO) Connection:*** Upon certain PBX failures or commercial power failures, all stations would normally be inoperative. However, in the DIMENSION PBX, automatic operation of transfer relays in a 609-type emergency transfer panel bridges preassigned stations directly across CO trunks (Fig. 43). A ground-start key (551A) is required at each of the assigned

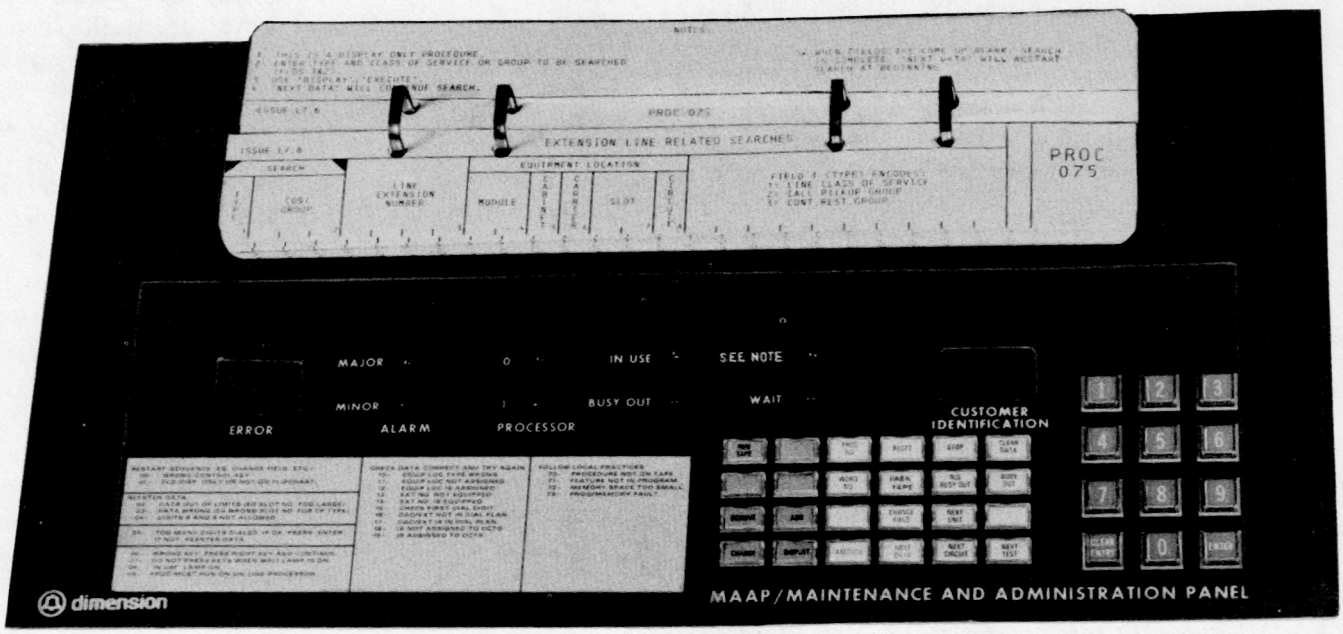


Fig. 42—Maintenance and Administration Panel (MAAP)

stations to enable the caller to obtain CO dial tone. A CO connection is established by going off-hook at any of these stations and pressing the start key momentarily. If listed directory number trunks are used for this transfer service, incoming calls will go to the emergency stations.

HOTEL/MOTEL BATTERY CABINET

4.25 An optional hardware arrangement where an external battery storage supply may be used for long-term memory holdover when a power failure occurs is provided in FP9 and FP11. These low maintenance lead-acid batteries and 251A power units are contained in a J58882D cabinet (Fig. 44) and replace the standard 90-second holdover rechargeable battery pack. The extended memory holdover option is highly desirable in FP9 or FP11 systems where billing and room status information is maintained in main memory.

AUXILIARY CABINET

4.26 System auxiliary equipment (J58879F-2) can be installed in a separate auxiliary cabinet (Fig. 45). The auxiliary cabinet can be equipped with units such as CPFT, telephone dictation, recorded announcement, etc, as shown in Table Q. Panels may be either 584 mm or 660 mm (23 inches or 26 inches) wide. An ac distribution, fan assembly, and frequency generator unit can be provided depending upon local requirements.

FEDERAL COMMUNICATIONS COMMISSION (FCC) REGISTRATION REQUIREMENTS

4.27 The following paragraphs provide planning information concerning the implementation of the FCC registration program for the DIMENSION PBX.

4.28 The Commission has established a PBX register only date and a PBX grandfather date. The PBX register only date is the date by which all newly

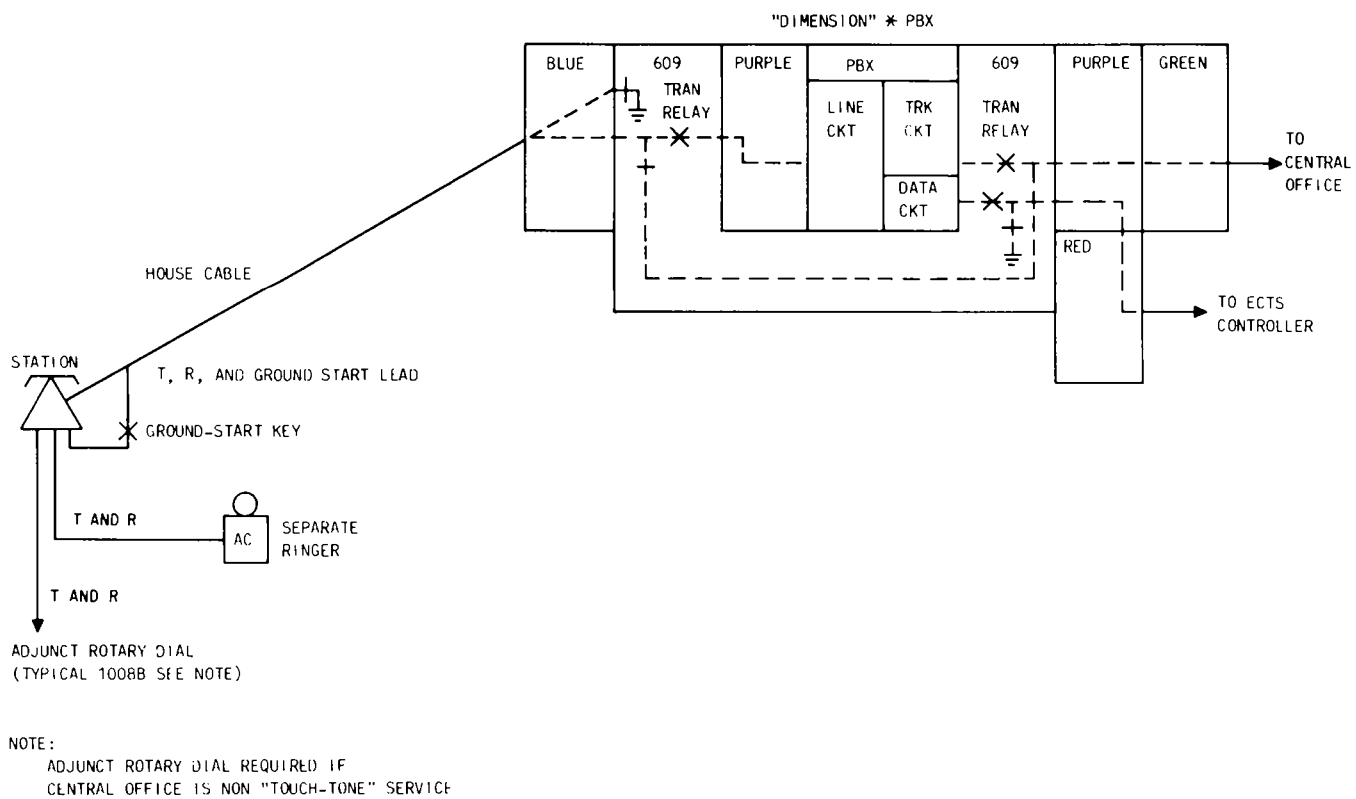
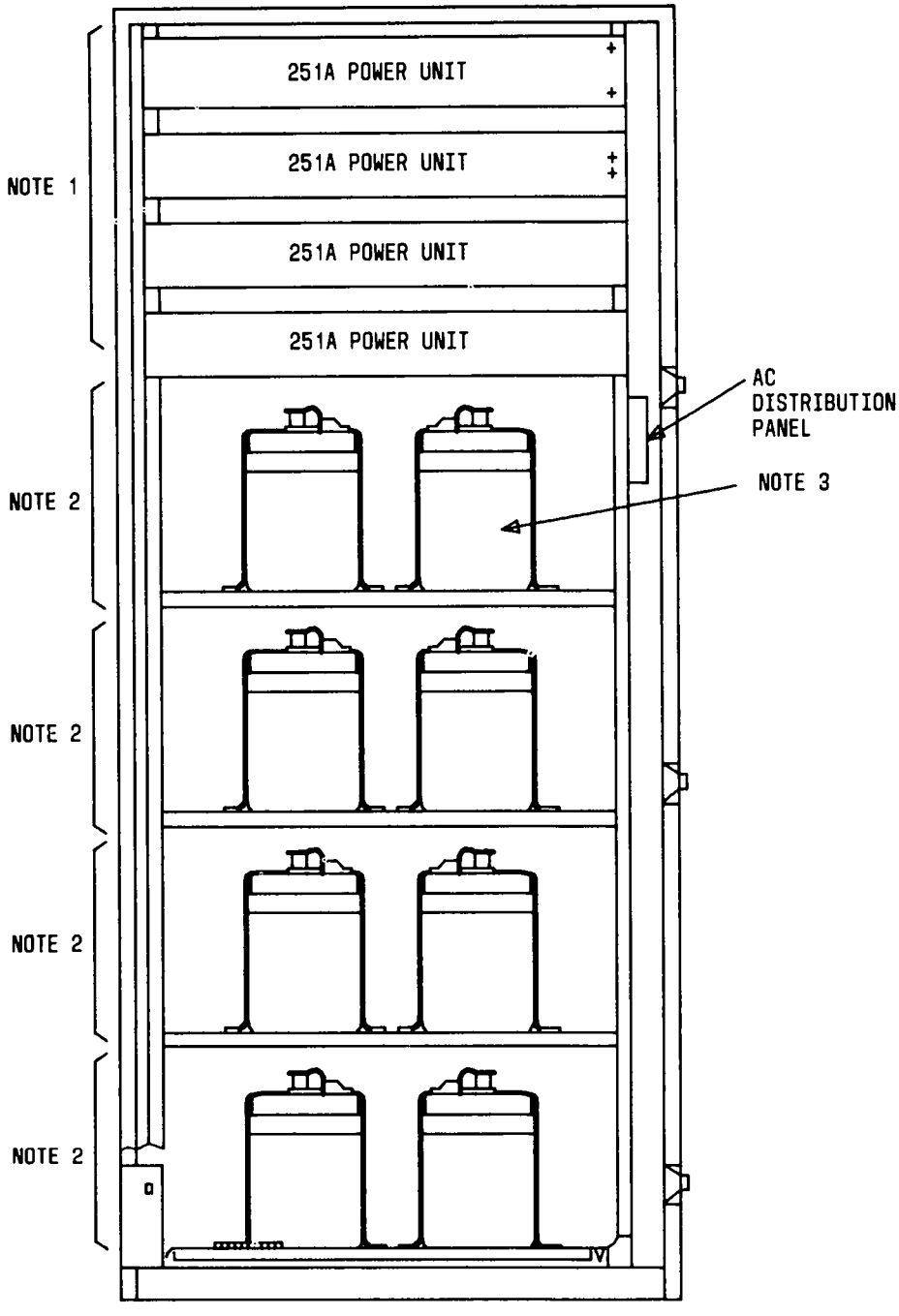


Fig. 43—Typical Emergency Transfer Arrangement



NOTES:
1. ONE 251A POWER UNIT PER J58882D, LIST 2 SHELF
2. J58882D,L2 SHELF
3. "DELCO"-1200 BATTERIES

Fig. 44—Hotel/Motel Battery Cabinet

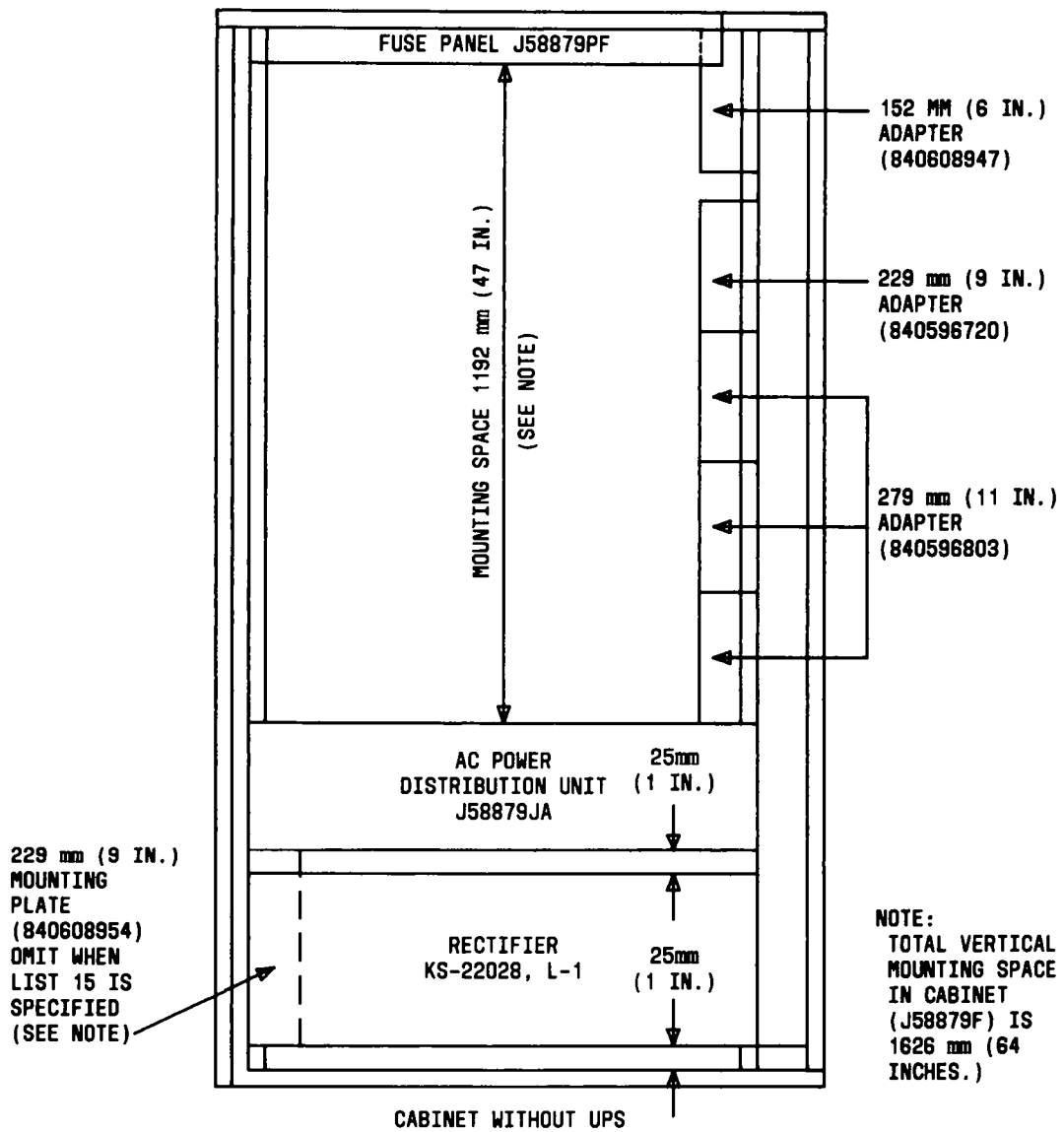


Fig. 45—Auxiliary Cabinet—J58879F

♦TABLE Q♦

AUXILIARY CABINET AND COMMON EQUIPMENT SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
1	Auxiliary Cabinet, J58879F-2, List 1 (MD)	Framework, assembly, wiring, and equipment to provide 1626 mm (64 inches) of vertical mounting space for 584 mm (23-inch) wide auxiliary units.
	Auxiliary Cabinet, J58879F-2, List 2 (MD)	Equipment required in addition to List 1 to provide an ac power distribution unit, arranged for 60-Hz, 117 Vac power.
	Auxiliary Cabinet, J58879F-2, List 3 (MD) (Power Supply)	Equipment required in addition to Lists 1 and 2 to provide a –48 Vdc, 8-amp power supply. 203 mm (8-inch) vertical mounting space.
	Auxiliary Cabinet, J58879F-2, List 4 (MD) (Air Baffle)	Equipment required in addition to Lists 1 and 2 when a filtered air supply is required. 127 mm (5-inch) vertical mounting space.
	Auxiliary Cabinet, J58879F-2, List 5 (MD)	Apparatus and wiring required in addition to List 1 to provide a cable assembly when connectorized cable is used from the auxiliary cabinet to the cross-connect field.
	Auxiliary Cabinet, J58879F-2, List 6 (MD)	Equipment required in addition to Lists 1 and 2 to provide a frequency generator unit.
	Auxiliary Cabinet, J58879F-2, List 7 (Fuse Panel)	Wiring and equipment required in addition to Lists 1, 15, 16, and 25 to provide 23 fuse positions (–48V) and ringing and interrupter terminal strips. 50.8 mm (2-inch) vertical mounting space required.
	Auxiliary Cabinet, J58879F-2, List 8 (MD)	Equipment required in addition to List 6 to provide one frequency interrupter unit.
	Auxiliary Cabinet, J58879F-2, List 10 (MD)	Equipment required in addition to List 1 to provide a standard perforated top.
	Auxiliary Cabinet, J58879F-2, List 11 (MD)	Equipment required in addition to List 1 to provide a liquid spill-resistant top assembly.
	Auxiliary Cabinet, J58879F-2, List 12	Equipment required in addition to List 1 16 and 25 to provide one auxiliary circuit filter unit. 203 mm (8-inch) vertical mounting space.
	Auxiliary Cabinet, J58879F-2, List 13 (MD)	Apparatus to provide a wall outlet and wall plate
	J58879F-2, List 14 (MD)	Apparatus to provide a wall outlet and wall plate
	J58879F-2, List 15	Equipment required in addition to List 1, 16, and 25 to provide a –48 Vdc power supply.
	J58879F-2, List 16 (MD)	Framework, assembly, wiring, and equipment to provide 1626 mm (64 inches) of vertical mounting space for 584 mm (23-inch) wide auxiliary units.
	J58879F-2, List 17 (MD)	Equipment required in addition to List 16 to provide an ac power distribution unit, arranged for 117-volt power source.
	J58879F-2, List 18 (MD)	Equipment required in addition to Lists 1, 16, and 17, and 24 when a filtered air supply is required.

TABLE Q (Contd)

AUXILIARY CABINET AND COMMON EQUIPMENT SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
1 (Contd)	Auxiliary Cabinet, J58879F-2, List 19 (MD)	Equipment required in addition to Lists 1 and 2 to a −48 Vdc power supply. 203 mm (8-inch) vertical mounting space.
	J58879F-2, List 20	Equipment required in addition to List 16, 17 and 25, 24 to provide a frequency generator
	J58879F-2, List 21	Wiring and equipment required in addition to List 20 to provide one Frequency Interrupter Unit
	J58879F-2, List 22	Apparatus to provide a wall outlet and associated mounting hardware.
	J58879F-2, List 23 (MD)	Equipment required in addition to List 16 when this cabinet is used in a multi-cabinet PBX line up.
	J58879F-2, List 24 (MD)	Equipment required in addition to List 16 to provide AC power distribution with EMI filter.
	J58879F-2, List 25	Framework, assembly, wiring and equipment for one basic cabinet with five carrier positions. Provides mounting space for ECTS carriers (J58879KA & J58879KB) and electromechanical equipment where required.
	J58879F-2, List 26	Equipment required in addition to List 25 when this cabinet is used in a multicabinet line up, or to provide an alternate method of providing earthquake bracing in other applications.
2	Recorded Announcement Unit, H-400-107, Lists 1 & 6, KS-16765	Requires J58879F, List 2, for 254 mm (10-inch) vertical mounting space.
	Recorded Announcement Unit, H-400-107, List 1	Same as KS-16765, Lists 2, 7, and 8, to include hardware for connectorization.
3	Recorded Announcement Amplifier, List 4	Required in addition to List 1 when KS-20449, List 1, amplifier is required.
4	Recorded Telephone Dictation Trunk Unit, J58827E-1, Lists 1 & 7	Assembly, wiring, and equipment for one recorded telephone dictation trunk unit. Provides a means of recording announcements and transmitting them to one or more trunks simultaneously.
5	Trunk Level Interconnecting Unit, J53050F-1, Lists 1 & 3	Assembly, wiring, and equipment for one automatic trunk level interconnecting circuit. Provides trunk level access to customer-provided equipment such as radio paging, dial dictation, etc.
6	Interface Unit, J58824CD-1, Lists 7, 9, 12, 15, 16, & 17	Assembly, wiring and equipment for one applique unit. Required when TOUCH-TONE service signals are converted to dc signals on a 2-of-7 lead basis using type G1 receivers or Type A3 TOUCH-TONE telephone receivers.
7*	J99380A-1, Lists 1 & 4, CPFT Assembly Hardware (MD)	Assembly, wiring, and equipment for one shelf assembly equipped to accommodate up to 12 MFT transmission type plug-in units.
	CPFT Mounting Panel, J99380B-1, List 1 (MD)	Assembly, wiring, and common equipment required for one apparatus mounting panel equipped to accept up to twelve 837-type units.
8*	CPFT Shelf Assembly, J99390C-1, List 1 (MD)	Assembly, wiring, and equipment required to install one shelf assembly to accommodate up to 14 KTU-type circuits.
	CPFT Double-Depth Shelf Frame, J99380D-1, List 1 (MD)	Assembly and wiring for one hinged double-depth frame assembly suitable for mounting J99380A, B, C, and E shelf assemblies.

* See footnote at end of table.

◗TABLE Q◖ (Contd)

AUXILIARY CABINET AND COMMON EQUIPMENT SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
8* (Contd)	CPFT Shelf Assembly J99380E-1, Lists 1 & 4 (MD)	Assembly, wiring, and equipment for one double module shelf assembly suitable for mounting up to a maximum of 12 MFT, LSE, or signal type plug in units.
9	Type A3 TOUCH-TONE Calling Receiver Shelf, J99289A-1, 1, 2, 6, G, H	Provides mounting space for two J99289B-1 receiver units.
10	Type A3 TOUCH-TONE Calling Receiver, J99289C-1, List 1, C 5A	Provides a connectorized cable to connect to the TOUCH-TONE calling receiver and interface trunk unit.
11	Type G1 TOUCH-TONE Calling Receiver J59204CA-1, List 1	Provides mounting space for up to two sets of G1 receivers. Each G1 receiver consists of HJ16, HJ17, and AE46 circuits.
12	Input AMP HJ16	Input amplifier and channel detector for the G1 receiver.
	Channel Filter HJ17	Channel filter for G1 receiver.
13	Basic Electronic Telephone Controller Carrier, J58879KA, List 1	Assembly, wiring, and equipment for the basic ECTS carrier.
14	Supplemental Electronic Telephone Controller Carrier, J58879KB, List 1	Assembly, wiring, and equipment for the supplemental ECTS carrier.
15	Auxiliary Cabinet, J58879PH-1, List 12	Equipment required in addition to List 1 to provide one auxiliary circuit filter unit.
16	Radio Paging Dial Pulse Conversion, J58847Y, List 4	Assembly, wiring, and equipment for one link and electronic dial unit with fusing from KS-19642, List 6, rectifier. Required with TOUCH-TONE telephone systems which interconnect to rotary dial paging equipment.
17†	44V4A Repeater, J98615AH, List 2, 2A	Voice repeater equipped for 48-volt operation. Requires 50 mm (2-inch) vertical mounting space.
	44V4B Repeater, J98615AH, List 3, 3B	Data repeater equipped for 48-volt operation. Requires 50 mm (2-inch) vertical mounting space.
18†	24V4C Repeater, J98615BJ, List 2	Two-wire to four-wire repeater requiring 48 volts power.
	24V4D Repeater, J98615BL, List 2	48-Volt operated 2-wire to 4-wire repeater with loop-around repeater in the event of a power failure.
19	H-9040, Group 1	Four-phase recorder announcer for wake-up service.
	H-9040, Group 2	Equipment required in addition to Group 1 for remote record option.
	H-9040, Group 3	Equipment required in addition to Group 1 to provide tape recorder option.
	H-9040, Group 4	Equipment required in addition to Group 1 to provide battery backup for recorder/announcer.
20	13A Recorded Announcement Unit, J1C121A-1, List 1	8-Channel completely electronic digital recorder.

* In order to meet FCC requirments of physical and electrical separation of Network Channel Terminating Equipment (NCTE) from Customer Terminals, all CPFT arrangements which permit mounting and use of Metallic Facility Terminal (MFT) equipment within DIMENSION PBX arrangements are rated "MD". Therefore, MFT equipment should no longer be mounted in an auxiliary cabinet but rather should be physically located separate from the PBX and electrically located on the Network side of the RJ21X registration jack.

† Not to be installed in auxiliary cabinet with items 2 to 6, 9 to 16, 19, and 20.

manufactured PBX systems being connected to the network must be registered. The PBX grandfather date is the date which establishes the sytems that are excluded from the technical compliance regulations of the registration program. The grandfather provision of the registration program means that all PBXs that were legally connected to the network as of the grandfather date are grandfathered for life. These PBXs may remain connected; may be removed and reinstalled; and may be removed, repaired, refurbished, and reinstalled. Reinstallation of a removed PBX is not restricted to the same customer. The system may be installed for any customer.

4.29 Additions may be made to grandfathered systems using only equipment registered in configuration with the DIMENSION 600 PBX system. The grandfathered system does not become registered but does retain its grandfathered status. Specifically, this means that additions to grandfathered systems only be made using units from Class C or Chief Engineers' stock, or new registered units. Grandfathered status is also retained when units and/or cables used for repair and/or refurbishing are of a type that were connected to the network as of the grandfather date. Therefore, orders for new units from Western Electric for grandfathered systems must be restricted to maintenance, repair, or refurbishing.

4.30 ▶To comply with regulations developed to ensure network protection from lightning surges and other induced voltages, a 66M3-50R connecting block(s) or a 25-pair cable(s) with an RJ21X jack(s) provided by outside plant should be mounted in close proximity of the cross-connect field. A connectorized A25D cable shall be terminated on the cross-connect field and connected to the 66M3-50R connecting block. For installations without controlled access, the cable should not be more than 7.6m (25 feet) long, but a registered 7.6-m (25-foot) extender cable may be added to extend the distance between the cross-connect field and connecting block. No length restrictions are imposed on cabling in PBX equipment rooms with controlled access.

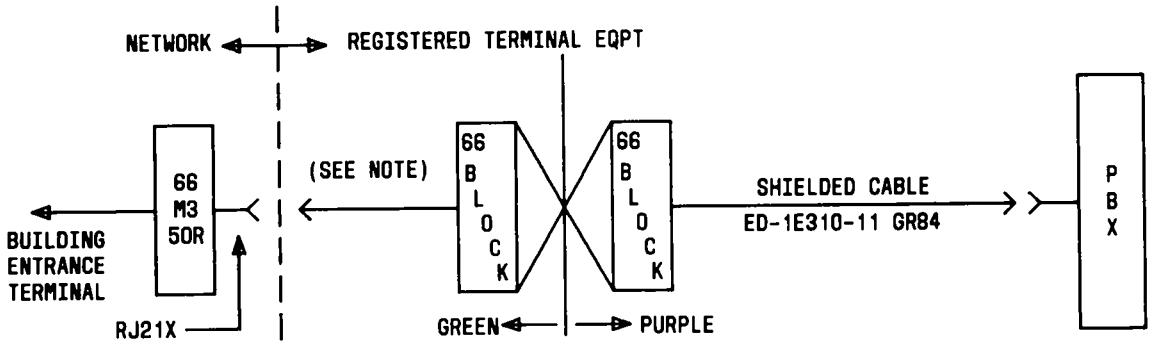
4.31 A functional block diagram of the network interface for FCC registration requirements is illustrated in Fig. 46. The only leads which are to be wired through the connecting block are tip and ring leads for central office type services (ie, CO trunks, FX, and WATS trunks). Therefore, with the DIMENSION 600 PBX, only tip and ring leads from circuit packs LC08-type (dial CO trunk circuit) and LC09-type (DID trunk circuit) are to be wired to the connecting block. All other leads leaving the PBX toward the CO should be cross-connected from the appropriate color-coded field to a connecting block in the green field, other than the connecting block in the green field from which the A25D connector cable originates and plugs into the 66M3-50R connecting block.

Note: After May, 1983, connections to private line network channels require a network interface connector RJ2GX for tie lines (LC11B) and connector RJ21X for off-premise station lines (LC02B).

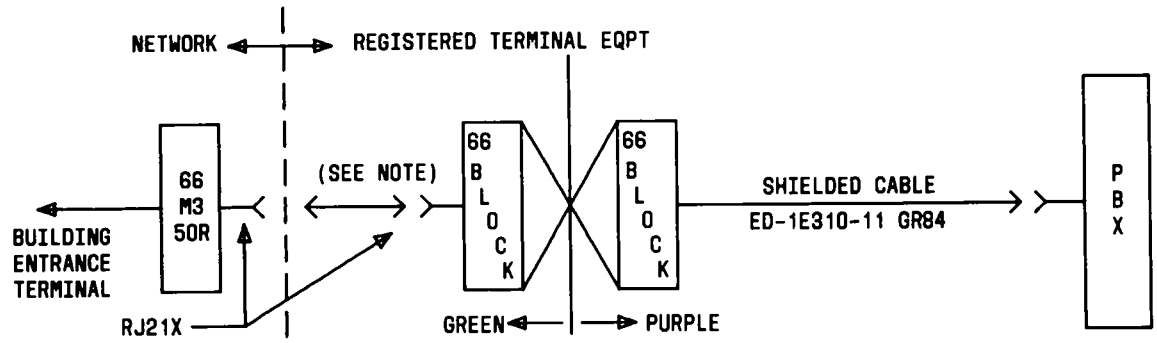
4.32 An alternate connector (KS-16690-L1) can be used in place of the 66M3-50R. The alternate connector also supplies an RJ21X connecting jack. Federal Communications Commission registration also requires that the cross-connect field either be located in a room with controlled access or be provided with a protective cover to assure that adequate insulation is present to isolate the field from commercial power, wiring, and grounding surfaces. If the PBX is in a room with controlled access, there is no cable length restriction and the cross-connect field does not have to be covered. However, the cables must remain exposed for inspection and cannot be concealed or embedded in the building structure.

4.33 To comply with FCC technical requirements, the maximum allowed loop resistance to be used serving LC02-type and LC03-type, excluding terminal equipment, shall be less than 950 ohms. This applies to all FCC registered terminal equipment. It is required that the LC02B, LC03C, LC09D, and LC49C or LC41B vintage circuit packs be used in order to conform to the FCC criteria. Circuit packs with earlier vintage codes, cannot be substituted in registered DIMENSION 600 PBXs. The grandfathered PBXs are not restricted by vintage of circuit pack codes. Only registered station sets, registered terminal equipment, equipment registered in conjunction with the DIMENSION PBX, or private line services may be connected to the LC02B and LC03B.

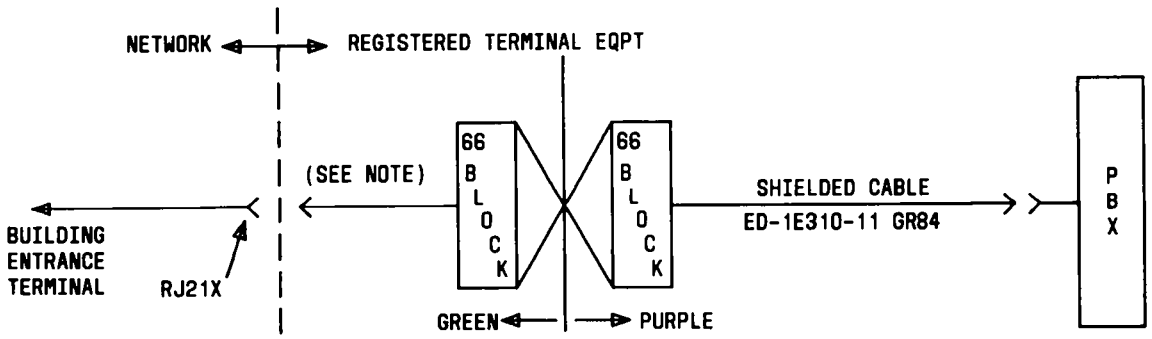
4.34 Systems shipping on or after October 1, 1983, must comply with FCC regulations (Part 15) pertaining to radio frequency interference (RFI). Controlled introduction of compliant system will be made in advance of that date. The compliant systems



A. WITH 66M3-50R ON THE NETWORK SIDE



B. WITH 66M3-50R ON BOTH THE NETWORK AND REGISTERED TERMINAL EQUIPMENT SIDE



C. WITH MINIATURE RIBBON CONNECTOR ENDED CABLE

NOTE:
THE DISTANCE BETWEEN THE REGISTERED TERMINAL EQUIPMENT AND THE RJ21X CONNECTOR SHALL BE A MAXIMUM OF 7620 mm (25 FEET) PLUS ONE 7620 mm (25-FOOT) REGISTERED EXTENDER.

Fig. 46—Typical FCC Registered Equipment Interconnections

will incorporate the following to become more resistant to RFI:

- Shielded cabinets
- Cables having drain wire shields with spade lug connectors which attach to mating connector field on the back of the cabinets
- RFI gasket on mating surfaces of cabinet panels which can be removed
- Conductive paint on cabinet surfaces which permanently mate
- Fasteners which hold the doors in-place
- Triaxial 4 MHz cable between cabinets.◀

In order to meet FCC requirements of physical and electrical separation of network channel terminating equipment (NCTE) from customer terminals, all CPFT arrangements which permit mounting and use of metallic facility terminal (MFT) equipment within DIMENSION PBX arrangements are rated "MD". Therefore, MFT equipment should no longer be mounted in an auxiliary cabinet, but rather should be physically located separately from the PBX and electrically located on the NETWORK side of the RJ21X registration jack.

AUTOMATIC VOICE NETWORK (AUTOVON) ACCESS ARRANGEMENT

4.35 This arrangement allows interconnection of a DIMENSION 600 PBX to a 4-wire AUTOVON switching center via AUTOVON access lines.

4.36 These arrangements require no software changes in the DIMENSION 600 PBX. The interface arrangements have been designed to work with FP7, FP8, FP11, and FP12 which include common control switching arrangment (CCSA) capabilities. The hardware design uses standard DIMENSION PBX circuit pack technology in the J59216BA, BB, and BC circuit pack carriers. These carriers are used in place of existing trunk carriers, thereby reducing total trunk and line capacity in some system configurations. The AUTOVON carriers are limited to one module in a DIMENSION 600 PBX. Use is made of existing power supplies and service circuits.

4.37 The console functions needed for AUTOVON have been incorporated into the DIMENSION PBX console adjunct. This combination permits an attendant to handle both regular and AUTOVON traffic. The selector console adjunct has a capacity of 30, 60, or 90 trunk buttons. Additional buttons on the bottom of the console adjunct provide the four TOUCH-TONE dialing precedence level signals required for outgoing precedence calls. This arrangement permits the retention of the 12-button TOUCH-TONE telephone dial in the standard DIMENSION PBX console. A data link connection between each selector console adjunct and corresponding control circuits in the basic AUTOVON equipment carrier provides the means for completion of all AUTOVON calls requiring attendant handling and for driving the status lamp indicators.

4.38 For more detailed information regarding AUTOVON, refer to Section 554-010-135.

5. ENVIRONMENTAL REQUIREMENTS

5.01 Exposure to extreme temperatures and humidity may degrade telephone service and create a lasting damaging effect on the system equipment.

5.02 The equipment is designed to operate at ambient temperatures from 0° to 49°C (32° to 120°F) and at 10 to 95 percent relative humidity conditions. These limits should not be regarded as desirable working conditions for minimum maintenance. It is recommended that an ambient temperature in the range of 4° to 35°C (40° to 95°F) with relative humidity in the range of 20 to 60 percent be maintained for equipment locations. ▶See ED-1E301-01 (CCS 201 Environmental Requirements) for additional information.◀

5.03 When excessive room temperature and/or high contaminant levels are anticipated, blower fans and a filter assembly are required to be installed in the system cabinets.

5.04 The packing material used for shipping cabinets from Western Electric is adequate for upright or lay-down (on side) shipment. However,

upright shipment is preferred. If cabinets are shipped laying down, installation personnel should carefully raise the cabinets to an upright position before unpacking.

5.05 The minimum floor plan for a system is given in Part 7. In all cases, the minimum requirement specified in commercial floor loading codes must be met. The total weight of one cabinet does not exceed 360 kg (800 pounds) and a free maintenance area of at least 1.4 square meters (15 square feet) must be provided per cabinet.

5.06 All systems must be located in areas where adequate illumination is provided for maintenance and where noise levels do not exceed the levels specified in the Occupational Safety and Health Act (OSHA).

5.07 Electromagnetic interference (EMI) filters per ED-1E403 can be used when the PBX is located in areas subjected to radio frequency interference.

5.08 The DIMENSION 600 PBX cabinets can be ordered with floor rails when required as an optional method for earthquake bracing.

5.09 Refer to Section 554-105-101 for details and additional environmental requirements.

6. POWER

6.01 Commercial power for the system is provided by 120 volts 60 Hz with a 20-ampere circuit per cabinet. Each 20-ampere circuit should be protected by a thermal magnetic circuit breaker (ITE Q120-B020 typical or approved equivalent). It must be capable of withstanding an initial current surge of approximately 150 amperes for a period of 10 milliseconds. A power outlet for each cabinet must be provided.

6.02 Dedicated power lines to the PBX should be provided to prevent the introduction of electrical noise and inadvertent removal of power from the system. In areas where excessive electromagnetic fields exist, special shielding, grounding, trunk line filtering, etc, must be provided.

6.03 Wide-frequency tolerant rectifiers are standard and operate with an input frequency of 60 ±3 Hz. The input ac voltage may vary from 99 Vac to 129 Vac to accommodate brown-out conditions. Both voltage and frequency cannot vary simultaneously without service degradation. One HUBBELL* Twist-lock power receptacle, Catalog No. IG-2310, must be installed by the customer for each cabinet.

6.04 An installation requires a customer-provided load center capable of housing one 20-ampere thermal magnetic circuit breaker per cabinet and two customer-provided equipment ground conductor terminal bars mounted back-to-back on the load center wall. The circuit breaker provides power to a power outlet (wall-mounted) for each cabinet.

6.05 Each cabinet contains an ac distribution unit, a dc power distribution system, temperature sensors, and a fan assembly (optional). The ac distribution unit provides ac power for the rectifier, blowers, frequency generator, and a 60-Hz utility outlet. If the cabinet thermal sensors reach 54° ±2°C (130° ±5°F), the cabinet has reached a critical temperature, and the fans will be activated. A critical temperature indicator will be activated at 63° ±2°C (145° ± 5°F).

6.06 The following rectifiers and power supplies are used in DIMENSION 600 PBX cabinets:

- Rectifier J87432F is installed in the control cabinet with or without reserve power.
- Rectifier J87432B is installed in the line and module control cabinets when reserve power is not required.
- Rectifier J87432BB is installed in the line and module control cabinets when reserve power is required and a dc-to-ac inverter is used.
- Power supply J87460F is installed in the control cabinet to provide uninterruptible power with battery backup.
- Power supply J87460B is installed in the line and module control cabinets to provide uninterruptible power with battery backup.
- Rectifier KS-22028 is installed in the auxiliary cabinet when reserve power is not required.

*Registered trademark of Harvey Hubbell, Inc.

RESERVE POWER

6.07 Reserve power can be provided for the DIMENSION 600 PBX using the following equipment (Fig. 47):

(a) Customer-provided circuit breaker box load center

(b) 100-type power plant

(c) DEPENDAC* inverter

(d) Special type power supplies in equipment cabinets.

*Registered trademark of Reliance Electric Co.

UNINTERRUPTIBLE POWER SERVICE (UPS)

6.08 The DIMENSION 600 PBX UPS is divided into two equipment configurations (Fig. 48). Following is a List of the equipment required for these configurations. (A more detailed description of UPS can be found in Part 3.)

(a) ***Nominal Holdover*** cabinet equipment is listed below.

- Rectifier/converter power supply J87460F is installed in the control cabinet.
- Rectifier/converter power supply J87460B is installed in the line cabinets and module control cabinets.
- Battery charger J87455A, List 1, is installed in the cabinet with the UPS power supply.

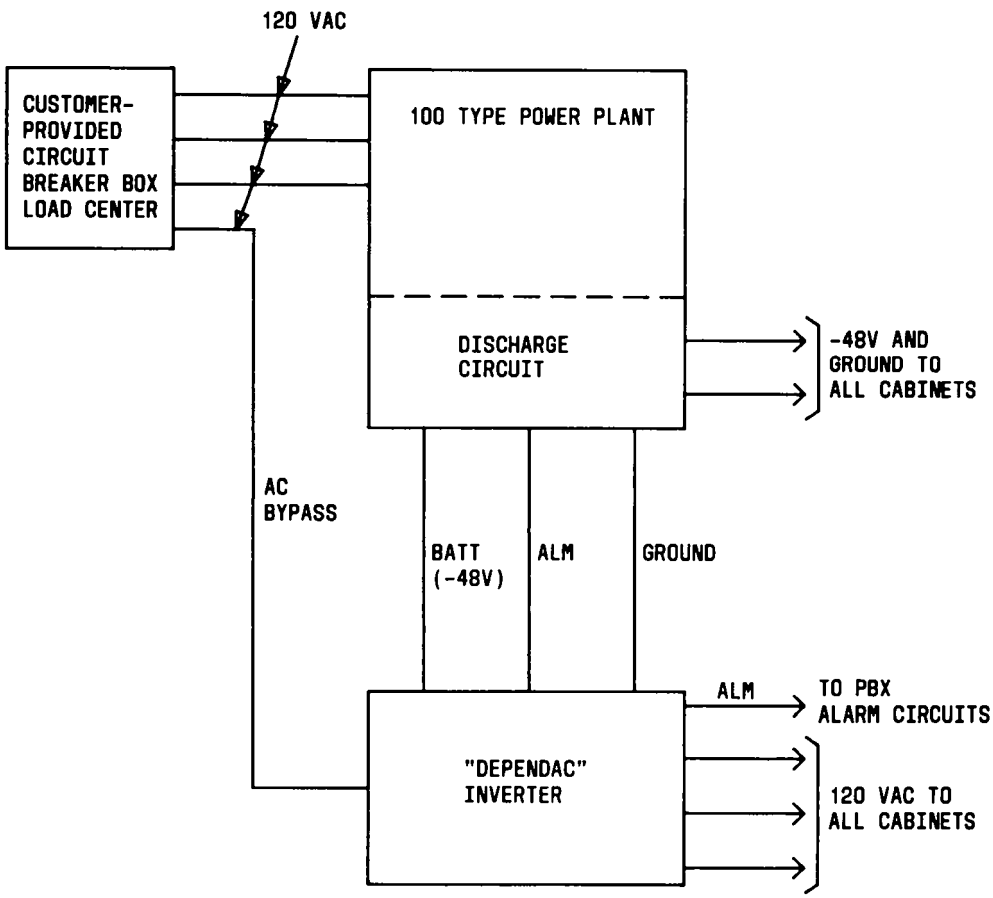


Fig. 47—Reserve Power

- Battery pack KS-21906, List 3, is installed in the cabinet with the UPS power supply.

- Power distribution and fan assembly J58884JA, Lists 26, 27, and 28, equipped with 124A ringing generator is installed in the cabinet with the UPS power supply.

(b) ***Extended Holdover*** is similar to the nominal holdover configuration listed above, except that the battery and battery charger are not in the cabinet with the UPS power supply. They are provided in the form of a locally engineered "100-type" battery reserve type power plant. Information concerning the specific "100-type" power plant can be found in Section 790-100-654. A dc line filter connecting to this power plant is mounted in the cabinet in the space normally occupied by the battery pack. The following is a list of cabinet equipment for the extended holdover configuration.

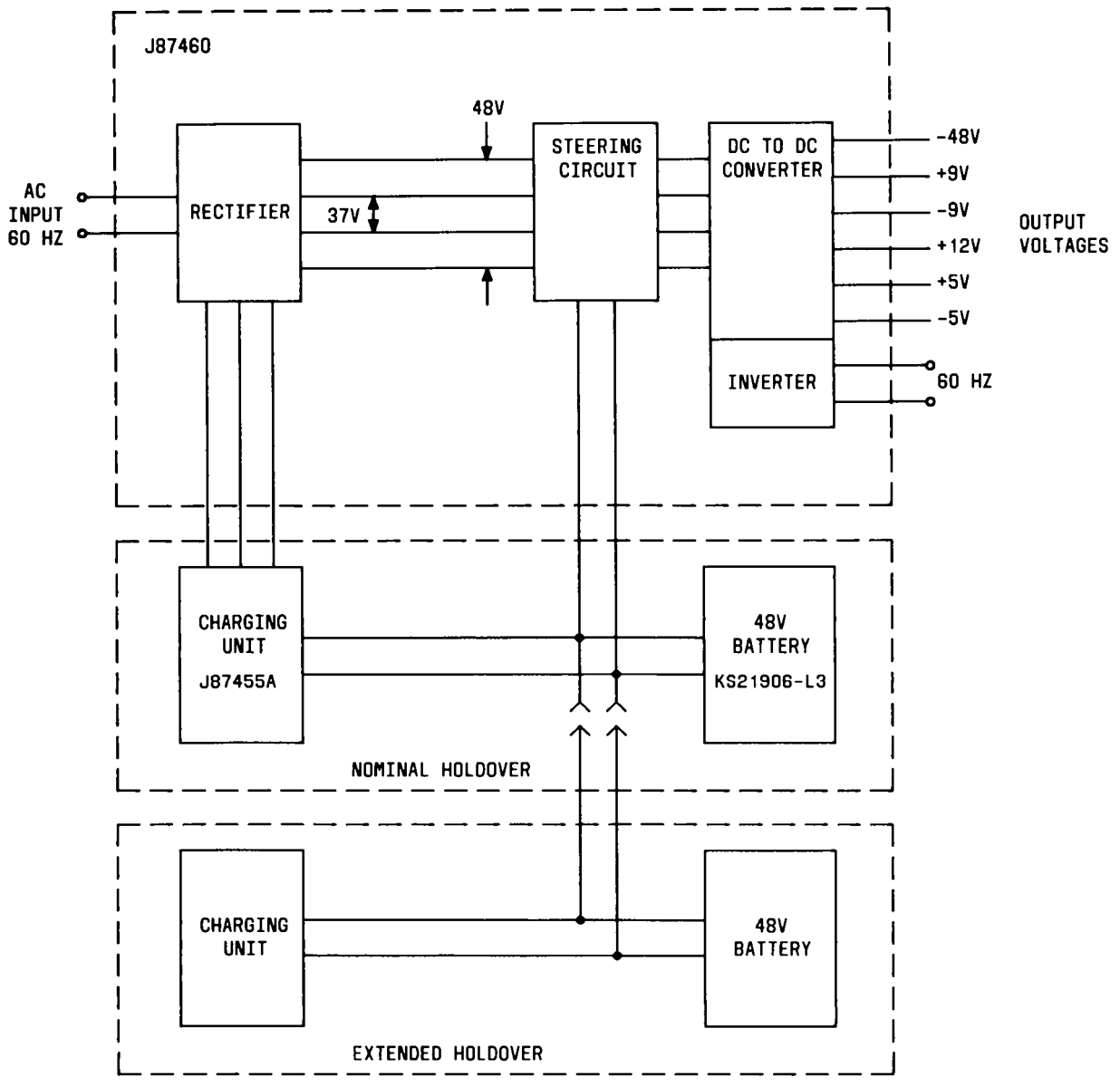
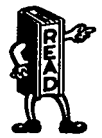


Fig. 48—Block Diagram Showing Nominal and Extended Holdover Configuration

- Rectifier/converter power supply J87460F-1 is installed in the control cabinet.
- Rectifier/converter power supply J87460B-1 is installed in the line cabinets and module control cabinets.
- Direct current line filter J58882A, List 17, is installed in the cabinet with the UPS power supply.
- Power distribution and fan assembly J58884JA, Lists 2, 6, and 13, equipped with 124A ringing generator is installed in the cabinet with the UPS power supply.



Circuit packs LC03, LC06, LC08C, LC09C, and LC13 must be replaced with LC03B, LC06B, LC08D, LC09D, and LC13B, respectively, for application of Uninterruptible Power Service.

7. FLOOR PLANS, CABLING, CROSS-CONNECT FIELD, AND PROTECTION REQUIREMENTS

FLOOR PLANS

7.01 A typical floor plan for a 2-cabinet system is shown in Fig. 49, a 3-cabinet system is shown in Fig. 50, and a 4-cabinet system is shown in Fig. 51. The Extended Memory Holdover cabinet (when used) and the module control cabinet must be adjacent to the control cabinet.

7.02 A great deal of flexibility is available beyond these minimal standards. In all cases, the requirements concerning floor load and thermal environment must be followed.

7.03 A minimum of 160 mm (6 inches) of space should be maintained between the top of the cabinet and any obstruction, such as a shelf or a ceiling, to permit adequate air flow for cooling the system.

CABLING

7.04 A cabling plan requires the following considerations:

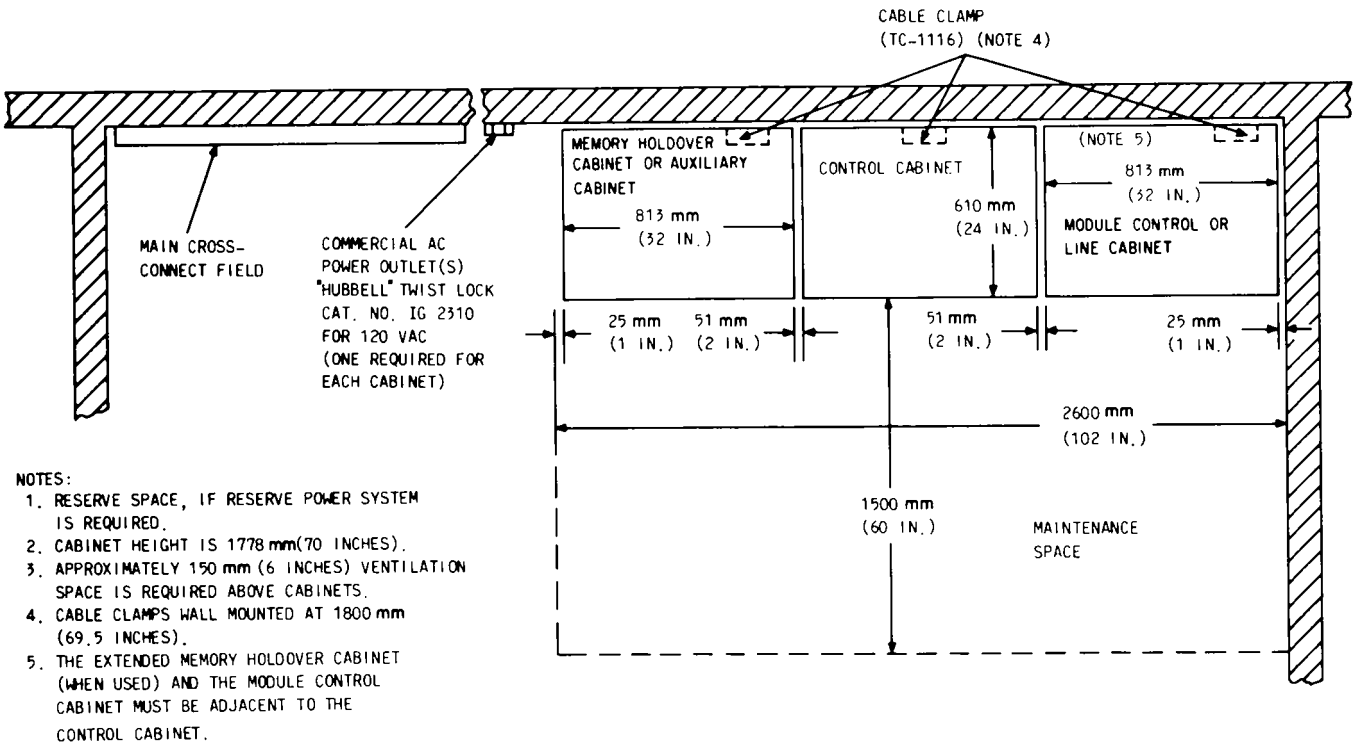
- Maximum cable lengths
- Number of cables required
- Future growth and rearrangements.

7.05 Standard A25-type cables are used for stations, trunks, consoles, etc, terminated at the cross-connect field. Some special flat and shielded cables are used for high frequency data channels and carrier-to-carrier cabling.

CROSS-CONNECT FIELD ENCLOSURE

7.06 The cross-connect field can be contained in three common customer equipment enclosure assemblies which provide protection from dust and water. The enclosures also improve the appearance when the field is located in an office environment. The cross-connect field enclosure assembly (Fig. 52) is available in three sizes. The ***first*** size is 432 mm (17 inches) wide by 1930 mm (76 inches) high and is used to cover three standard 432-mm by 508-mm (17- by 20-inch) backboards and two 187B1 or 196A backboards. The ***second*** size is 432 mm (17 inches) wide by 1371 mm (54 inches) high and is used to cover two standard 432-mm by 508-mm (17- by 20-inch) backboards and two 196A backboards. The enclosures can be mounted above the floor to match the PBX cabinet. The ***third*** size is 432 mm (17 inches) wide by 686 mm (27 inches) high and is used for a smaller installation to cover one standard 432-mm by 508-mm (17- by 20-inch) backboard and one 196A backboard. Colored 183-type backboards are used on the cross-connect field to identify the types of circuits to be terminated at the various positions. The recommended 66-type connecting blocks are identified with the PBX cables which terminate on the blocks. White 187B1 or 196A backboards, having stand-off type distribution rings, are used to separate the fields into upper and lower bands and are intended for use when wiring and cross-connecting the various connecting blocks. Prewired 609-type interface panels may be used to provide connections to emergency transfer facilities. Each 609-type panel contains apparatus for transferring ten PBX stations to ten CO cable pairs during power failure or major alarm conditions. Figure 53 shows a general layout of a typical cross-connect field.

In order to meet FCC registration requirements, a cross-connect field located in an area having nonrestricted access must have a protective cover over the terminal strips terminating the central office cable pairs on the PBX side of the registration jack (RJ21X).



NOTES:
1. RESERVE SPACE, IF RESERVE POWER SYSTEM IS REQUIRED.
2. CABINET HEIGHT IS 1778 mm(70 INCHES).
3. APPROXIMATELY 150 mm (6 INCHES) VENTILATION SPACE IS REQUIRED ABOVE CABINETS.
4. CABLE CLAMPS WALL MOUNTED AT 1800 mm (69.5 INCHES).
5. THE EXTENDED MEMORY HOLDOVER CABINET (WHEN USED) AND THE MODULE CONTROL CABINET MUST BE ADJACENT TO THE CONTROL CABINET.

Fig. 49—DIMENSION 600 PBX—Minimum Floor Space Requirements—2-Cabinet System

PROTECTION REQUIREMENTS

7.07 Station protection is required on all exposed cable pairs. Protectors should be located as near the cable entrance to the building as practicable and the protector ground should be connected to the system single-point ground. In addition, sneak current protection (60D fuse) is required on all trunk pairs exposed to power. Sneak current protection is not required on station pairs. Refer to Section 876-300-100, Issue 8 or later, for detailed protection information, and Section 554-105-101 for detailed grounding and bonding information.

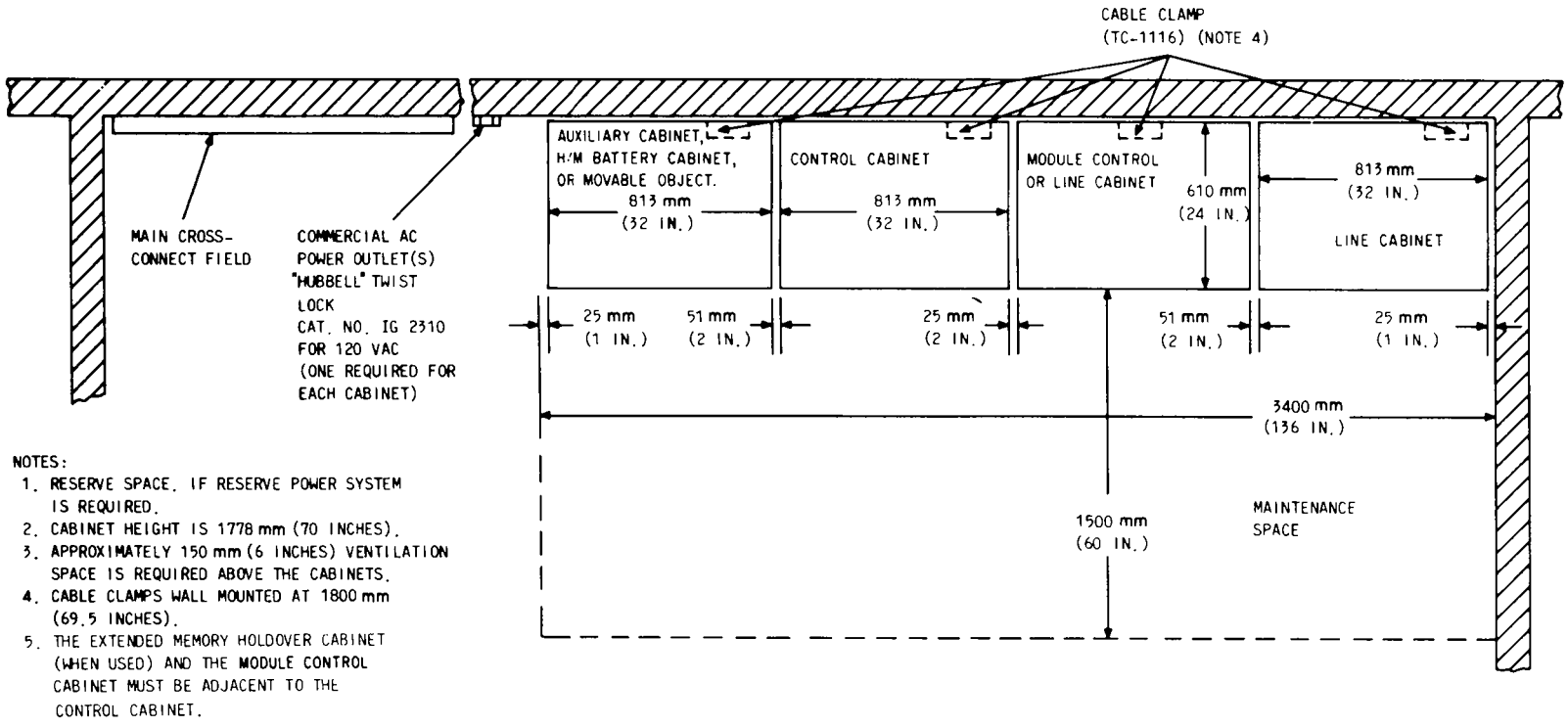
8. TRAFFIC

8.01 To ensure proper levels of service to the customer, detailed traffic engineering is required. Sufficient hardware (TOUCH-TONE telephone originating registers, lines, trunks, etc) and software quantities (dial pulse originating registers, line tables, trunk tables, etc) must be provided and properly assigned.

8.02 Hardware and software quantities that are not required to provide the desired level of service increase customer costs and reduce the processor's throughput.

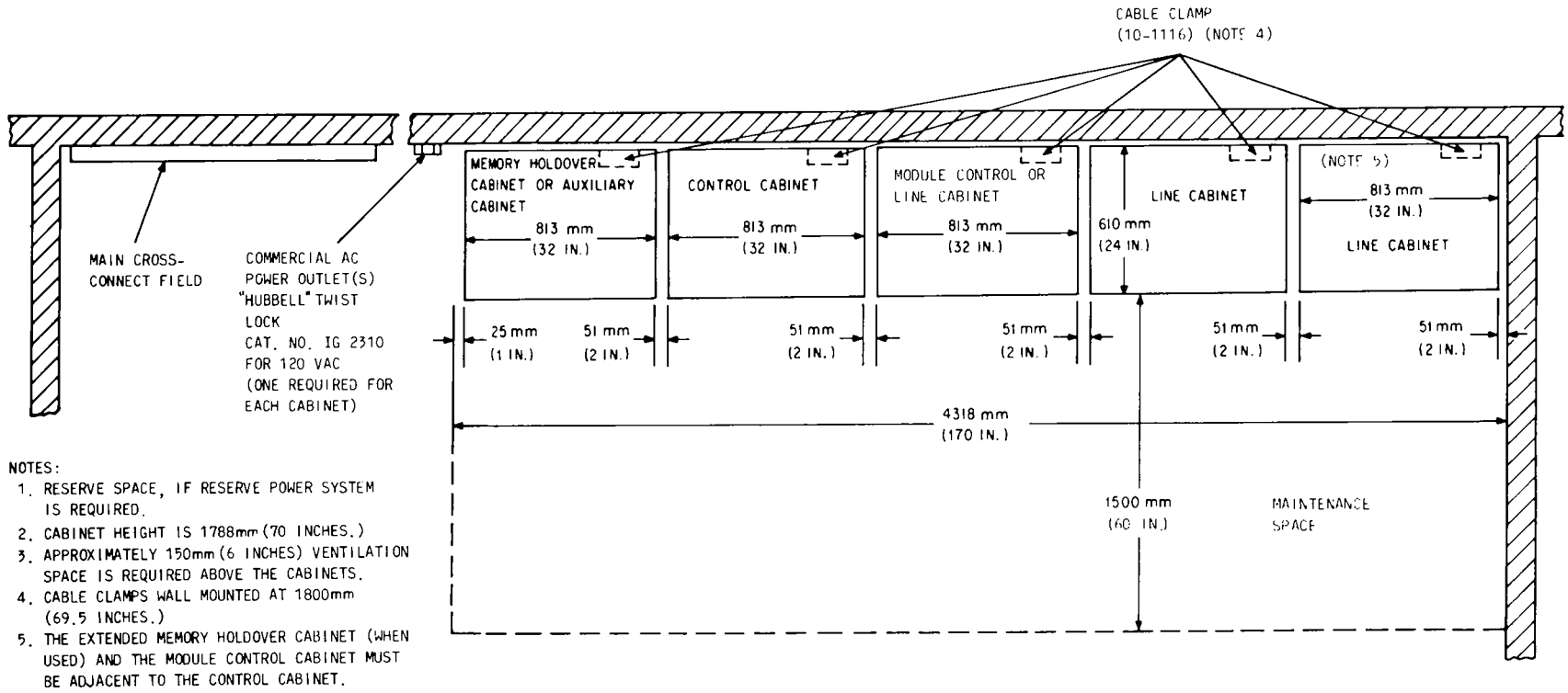
8.03 The PBX provides a group of traffic measurements that are maintained all of the time for system historical and system warning purposes. Additionally, selected off-line traffic algorithms may be paged-in under control of an I/O device (MAAP, RMATS, or CACS). Both raw data and peg counts may be obtained for the selected networks. The following is a list of traffic-sensitive items that should be considered for traffic engineering and traffic measurements:

- Network module linking



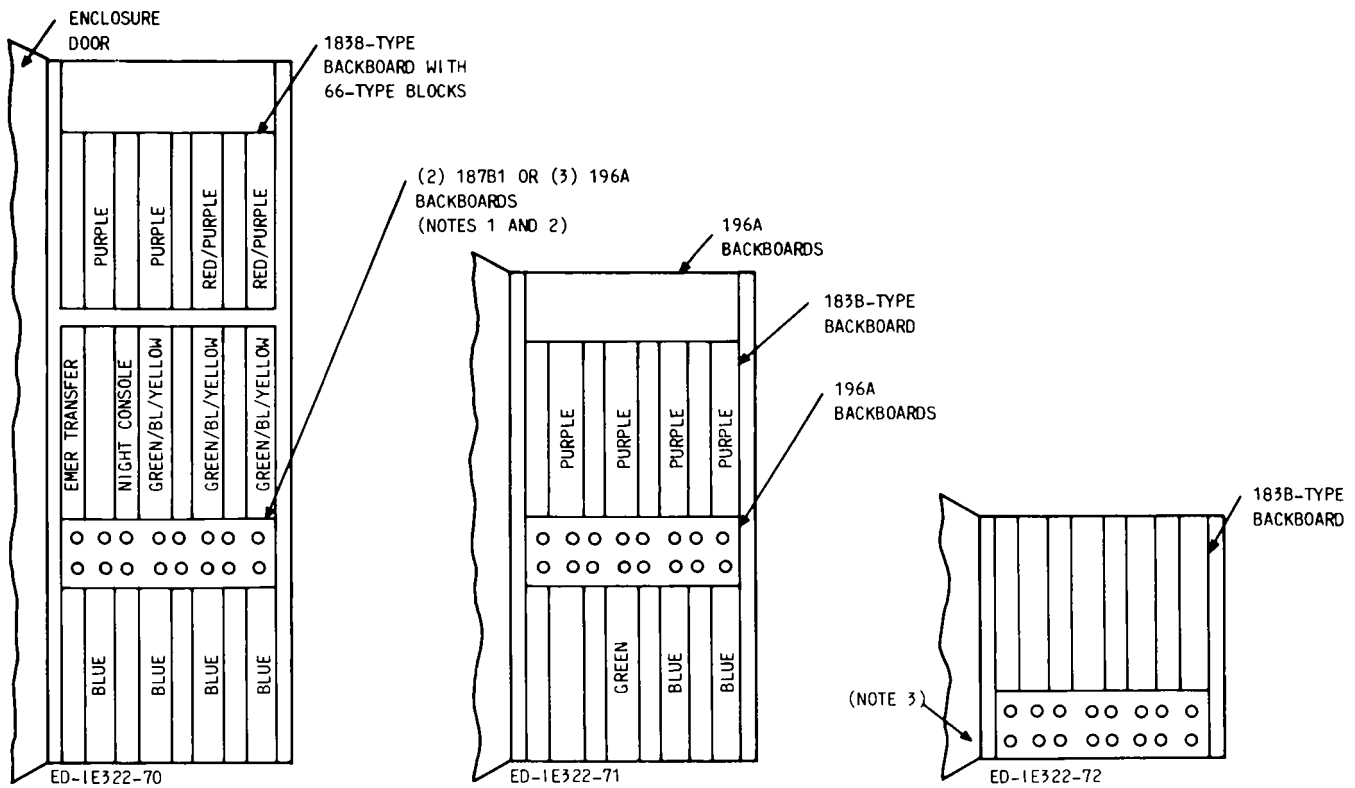
NOTES:
1. RESERVE SPACE, IF RESERVE POWER SYSTEM IS REQUIRED.
2. CABINET HEIGHT IS 1778 mm (70 INCHES).
3. APPROXIMATELY 150 mm (6 INCHES) VENTILATION SPACE IS REQUIRED ABOVE THE CABINETS.
4. CABLE CLAMPS WALL MOUNTED AT 1800 mm (69.5 INCHES).
5. THE EXTENDED MEMORY HOLDOVER CABINET (WHEN USED) AND THE MODULE CONTROL CABINET MUST BE ADJACENT TO THE CONTROL CABINET.

Fig. 50—DIMENSION 600 PBX—Minimum Floor Space Requirements—3-Cabinet System



NOTES:
1. RESERVE SPACE, IF RESERVE POWER SYSTEM IS REQUIRED.
2. CABINET HEIGHT IS 1788mm (70 INCHES.)
3. APPROXIMATELY 150mm (6 INCHES) VENTILATION SPACE IS REQUIRED ABOVE THE CABINETS.
4. CABLE CLAMPS WALL MOUNTED AT 1800mm (69.5 INCHES.)
5. THE EXTENDED MEMORY HOLDOVER CABINET (WHEN USED) AND THE MODULE CONTROL CABINET MUST BE ADJACENT TO THE CONTROL CABINET.

Fig. 51—DIMENSION 600 PBX—Minimum Floor Space Requirements—4-Cabinet System



ED-1E322-70
(432 mm [17 IN.] W
1930 mm [76. IN.] H
229 mm [9 IN.] D)
(432 mm [17 IN.] W
1872 mm [73.8 IN.] H
191 mm [7.5 IN.] D
INSIDE)

ED-1E322-71
(432 mm [17 IN.] W
1372 mm [54 IN.] H
229 mm [9 IN.] D)
(432 mm [17 IN.] W
1314 mm [51.75 IN.] H
191 mm [7.5 IN.] D
INSIDE)

ED-1E322-72
(432 mm [17 IN.] W
686 mm [27 IN.] H
229 mm [9 IN.] D)
(432 mm [17 IN.] W
629 mm [24.75 IN.] H
191 mm [7.5 IN.] D
INSIDE)

CODE (NOTE 4)	BACKBOARD COLOR	CIRCUITS OR EQUIPMENT TERMINATED
B2	GREEN	CENTRAL OFFICE TRUNK CIRCUITS
B1	BLUE	STATION LINE CIRCUITS
B3	RED	KEY AND ECTS EQUIPMENT
A5 OR B5	YELLOW	MISCELLANEOUS CIRCUITS AND EQUIPMENT
A4 OR B4	PURPLE	PBX CIRCUITS AND EQUIPMENT

NOTES:
1. PLYWOOD BACKBOARD MOUNTS FOR ALL SIZES (OPTIONAL).
2. BACKBOARD ARRANGEMENTS ARE FLEXIBLE. REFER TO 518-010-101 TYPICAL LAYOUTS.
3. CABLING IN THROUGH KNOCKOUTS IN SIDE AND BOTTOM.
4. "A" SIZE = 216 mm X 508 mm (8.5" X 20"), "B" SIZE 432 mm X 508 mm (17" X 20").

Fig. 52—Cross-Connect Field Enclosure

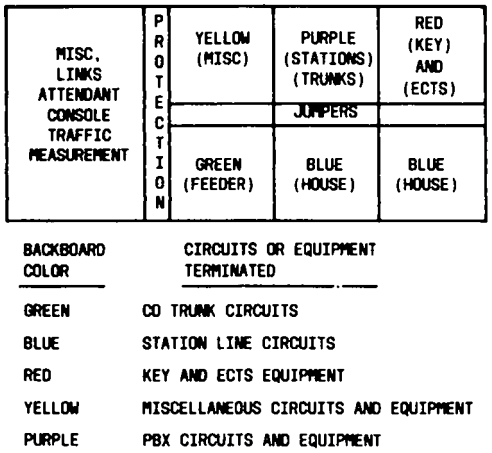


Fig. 53—Cross-Connect Field Backboard Arrangement

- Lines
- Trunks
- Attendant Consoles
- Originating registers
- Ringing blocking
- Processor throughput.

8.04 ⧫Each single time division bus has a traffic capacity of approximately 1608 CCS (hundred call-seconds) (1662 CCS single bus capacity minus 54 CCS for maintenance) or 1536 CCS if Energy Communications Service (ECS) feature is provided. The DIMENSION 600 PBX can have two time division network buses (each provides 64 time slots). The dual-bus system has a traffic capacity of 3564 CCS (3672 CCS total module capacity minus 108 CCS for maintenance) or 3492 CCS if ECS feature is provided.⧫

RINGING BLOCKING

8.05 The system network uses centralized ring-trip detectors for detecting an off-hook condition during line ringing. Station lines are segmented into 32 lines per ring group. Each group can accommodate no more than four lines ringing simultaneously. Reorder tone is returned to the calling party when calls are blocked due to failure to match ringing. Detailed traffic programs are provided to detect when a ring blocking condition arises.

ORIGINATING REGISTERS

8.06 There are two types of digit collection—rotary dialing and TOUCH-TONE dialing. Rotary-dialed digit collection is a function which is performed in software. The number of dial pulse originating registers is a function of stations and memory size.

8.07 The number of TOUCH-TONE telephone registers required is determined on the same basis as the rotary dialed digit registers. However, fewer TOUCH-TONE telephone originating registers (receivers) are required per system because of the shorter holding time for TOUCH-TONE dialing. In order to conserve processor real-time, it is necessary to administer the number of software register records required. The TOUCH-TONE telephone receivers are engineered so that there is a single register pool for the entire system.

PROCESSOR THROUGHPUT

8.08 The processor handles all call stimuli presented to the system network. The average processor occupancy is a measure of the real-time available to handle call stimuli (on-hook, off-hook, etc). Processor occupancy essentially consists of two elements: (1) fixed overhead which is largely determined by the physical quantity of lines and trunks to be scanned, and (2) the amount of call processing which is a function of the total system traffic level.

8.09 For a given processor occupancy, a smaller system has fewer overhead requirements and a greater capacity to process calls (higher calling rate capacity).

9. DESCRIPTION OF OPERATION

9.01 The DIMENSION 600 PBX uses a 16-bit microprogrammed general-purpose processor (LC143/LC455B/LC515). Error detection, diagnostics, and recovery routines (microdiagnostics) are a built-in part of the processor. The processor has a boot-strap loader program which resides in a read-only memory and is used to control loading of the

tape cartridge via a minirecorder. Each PBX system has a program tape which contains call processing routines (generic program) and unique translation information. Translations include flexible assignment entries such as class of service, hunting, and line number-to-equipment location number. Both generic and translation data are loaded into the random access memory (main memory).

9.02 Once a PBX is installed and initialized, the tape remains functionally inactive until called upon due to an actual long-term power failure, periodic translation updates, or until certain off-line maintenance routines are paged in. Certain periodic tasks are performed by the PBX on a timely basis. At approximately 23-hour intervals, the tape is retensioned on the cartridge. When a memory reload is required for any reason, the tape is loaded into main memory and any existing programs and call processing data are overwritten. Loading of the tape takes approximately 2 minutes, depending upon the feature package and physical line requirements.

9.03 The generic and translation portion of main memory can be modified by writing program patches into main memory by using the Maintenance and Administration Panel (MAAP). The modified generic and/or translations, which are contained in main memory, can then be read onto the tape cartridge for a permanent record of the change(s).

MAIN MEMORY AND MEMORY CONTROL

9.04 The main memory and its associated control circuits are contained in the basic control carrier. ♦Main memory consists of 16K-word circuit packs (LC128s), 64K-word circuit packs (LC346s) or 256K-word circuit packs (LC500s). The type of memory control circuits used is determined by whether 8K-word, 16K-word 64K-word, or 256K-word circuit packs are used.♦ Size of the main memory configuration is determined primarily by the feature package and quantity of trunks and lines to be scanned.

9.05 Main memory provides storage capability for generic call processing and translation data, on-line maintenance programs, and status records. The processor communicates with main memory via the address, data, and control buses. A word may be written into memory when the processor places an address on the address bus, the data word to be written on the data bus, and then generates a write command. After the data word has been written into the addressed memory location, the memory control signals the processor that the write function has been completed. After the tape is loaded, both the generic program and equipment translations are contained in a write-protect area of memory. Subsequent write commands to an address within the write-protect area are inhibited.

9.06 The semiconductor integrated circuits which make up the memory are of the dynamic nature and must be periodically refreshed. Memory control contains refresh timing circuitry and a refresh address counter which allocates control of the memory to either the processor request mode or the memory refresh mode (LC454). A rechargeable battery pack is provided as standard equipment, allowing for a minimum of 90-second backup power during power failures. The extended memory holdover allows for up to 8 hours of holdover voltage.

CALL PROCESSING AND NETWORK CONTROL

9.07 A system control program sequences the PBX through call processing and other related feature package requirements. Call processing is under control of the generic program. The generic program is executed by the processor and it determines the status of peripheral circuits and reacts to changes in port status.

9.08 The generic program maintains records of all call states (port connections) in main memory. Communication between the processor and network modules is via dedicated network data channels. These data channels allow the on-line processor to monitor on-hook/off-hook status of each line (or trunk) port by issuing commands to the scanner distributor. On command, the scanner, in conjunction with the Pulse Amplitude Modulation (PAM) network, interrogates each port circuit and returns the current status to the processor. The generic program, in performing call processing, compares the current port status with that obtained from a previous scan command in order to validate changes and check for class-of-service restrictions, etc. If the prior state of an off-hook line was idle (validation confirmed), and, if the station is allowed origination, the processor executes the series of instructions which result in the off-hook line receiving dial tone on condition that all paths are not blocked. The processor (generic program) searches for an idle time slot (64 available talking paths on each of two time division buses per network module) and, if available, marks the time

slot in a memory record associated with the off-hook busy line. The processor (generic program) then searches for an idle originating register. When an originating register is selected, the processor marks the register busy (in memory) and creates a connection between the off-hook line port and the register. A tone supply is added to the time slot and provides dial tone to the station. Once digit reception is initiated, the tone supply is removed.

9.09 The processor (generic program) issues commands to the scanner/distributor within each network module in assigning time slots. The scanner/distributor addresses and enables each port circuit while the network control provides each port circuit with timing signals necessary to define the time slots. In defining a time slot, the network control writes (marks) a bit in the shift register (time slot memory) busy for each active port. The shift register maintains a record of each assigned time slot. The shift register now contains a ***1*** (for each assigned time slot) which is recirculated by a clock and detected at the output stage once each cycle. When detected, the ***1*** causes the time division switch to close for the respective time slot, completing a path between all assigned ports. The switched connections (time slots) are repeated frequently enough to provide quality voice transmission between ports. Sampling rate is approximately 16,000 Hz or once every 64 microseconds (μs) for an interval of 600 nanoseconds (ns).

9.10 The time division buses are the multiplexing or common point for all voice, data (enhanced FP8), and tone communication circuits. When the processor (generic program) issues a scan or distribute command, the addressed scanner/distributor decodes the circuit pack address (port equipment number). For scanning, decoding is done only to the circuit pack level. Therefore, once the carrier and circuit packs have been selected, port status is returned to the processor via the network data channels.

9.11 The system network (Fig. 54) consists of carrier and group amplifiers and a central summing amplifier interconnected by cables. ◗Both line-to-line and line-to-trunk calls within the same module are routed through a line circuit and carrier buffer output amplifier and onto the PAM bus, a group PAM amplifier, a central PAM summing amplifier, a group PAM amplifier, a carrier buffer input amplifier, and a line or trunk port circuit amplifier. Each carrier output amplifier may be switched to one of two group PAM amplifiers (during 1 of 64 time slots) in a system with two time division buses.◖

Note: Each carrier output may appear in 128 time slots, 64 on each bus in a two-bus system.

TONES

9.12 The tone supplies are located in the line group control carrier(s). The LC04 and LC05B circuit packs (always used as a pair) or the LC204 are required to provide the necessary tones.

9.13 Call progress tones are generated from four single-frequency oscillators. These oscillator signals are mixed and modulated, providing the steady or interrupted rates (Fig. 55) necessary to generate the 13 distinct tones:

(a) ***Dial Tone (DT):*** A 350-Hz and 440-Hz steady dial tone.

(b) ***Confirmation Tone (CT):*** A 350-Hz and 440-Hz tone at 300 ipm for three bursts.

(c) ***Recall Dial Tone (RDT):*** A 350-Hz and 440-Hz tone at 300 ipm (interruptions per minute) for three bursts, then steady dial tone.

(d) ***Miscellaneous Tone (MT):*** A 440-Hz steady tone.

(1) Warning tone—On for 1 to 2 seconds repeated every 15 seconds in some applications. Included are:

- Trunk Verification by Customer
- Busy Verification of Station Lines
- Timed Recall on Outgoing Calls
- Executive Override
- Automatic Route Selection, measured rate route-selected.

(2) Call waiting tone—One, two, or three bursts of tone, on for 0.2 second and off for 0.2 second. Included are:

- Attendant Call Waiting
- Originating Call Waiting
- Terminating Call Waiting.

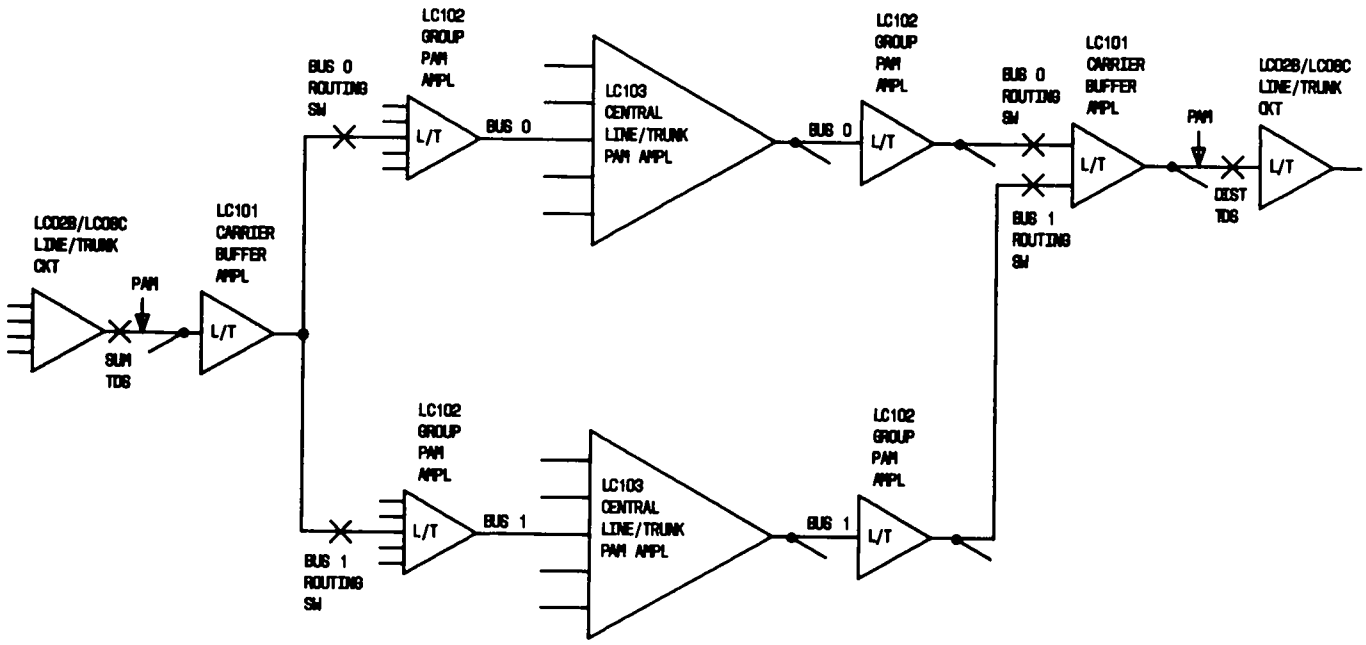


Fig. 54—Network Path for Intramodule Calling—2-Bus System

(e) ***Intercept Tone (ICPT):*** A tone 620 Hz, on for 0.2 second; and 480 Hz, on for 0.2 second. This tone indicates an undefined dial code or an illegal feature activation attempt.

(f) ***Reorder Tone (RT):*** A tone 480 Hz and 620 Hz, on for 0.3 second, off for 0.2 second at 120 ipm. The tone indicates a temporary blockage due to traffic overload.

(g) ***Busy Tone (BT):*** A tone 480 Hz and 620 Hz at 60 ipm. This tone indicates that the designation station or circuit is busy.

(h) ***Audible Ringback Tone (ART):*** A tone 440 Hz and 480 Hz, on for 0.8 second, off for 3.2 seconds. This tone indicates that the destination station is being rung or the call is queued for the attendant.

(i) ***Special Audible Ringback Tone (SART):*** A tone 440 Hz and 480 Hz, on for 0.8 second; followed by 440 Hz, on for 0.2 second, off for 3 seconds. This tone indicates that Call Waiting is active on the called station.

9.14 The following tones shown on Fig. 55 are generated by the LC17B circuit pack for the Centralized Attendant Service (CAS) feature and for Code Calling Access (Chime Paging):

(j) ***Attendant Transfer (AT):*** A 440-Hz tone, on for 0.1 second, off for 0.1 second, on for 0.1 second.

(k) ***Code Calling Tone (CCT):*** A tone 892-Hz—pulse timing, 0.5 second—interpulse intervals, 0.05 second—interdigital, 1.5 seconds—intercycle, 4.5 seconds—for three full cycles.

(l) ***Information Tone (IT):*** A 480-Hz tone, on for 0.1 second; 440 Hz, on for 0.1 second; 480 Hz, on for 0.1 second.

(m) ***Remote Hold (RH):*** Four to six bursts of 440 Hz, on for 0.05 second, off for 0.05 second.

9.15 Time division switching permits the selected tone to be applied to the selected port. Several network ports can be connected to the same tone port in different time slots. Tone samples are placed on the time division bus by similar sampling switches used in other port circuits.

10. MAINTENANCE PLAN

A. General

10.01 The PBXs are designed and manufactured to provide long-term trouble-free service. However, it is the responsibility of the operating company to develop a routine maintenance plan. This maintenance plan should include replacement of the air filters, holdover battery, time-of-day clock backup battery, inspection and cleaning of the minirecorder tape head, etc. The frequency of performing items in the maintenance plan is variable, depending upon the physical environment and amount of dust particles in the PBX equipment room.

10.02 The PBX design and development considerations place high emphasis on the ease of equipment maintainability. The circuits are packaged on replaceable circuit packs. The components on a circuit pack are not replaceable in the field. The long-term maintenance goals (based on full usage of the provided maintenance aids) are as follows:

- Isolation of at least 95 percent of all troubles encountered by craft personnel
- Isolation and repair time—an average of 1 hour or less after arrival on premises
- Correction of at least 90 percent of circuit pack failures with the first circuit pack replacement.

10.03 The ability to isolate faults to a single replaceable circuit pack minimizes trouble-shooting and replacement costs. Automatic fault detection, fault reporting, and fault isolation aids are provided as an integral part of the system. The maintenance plan calls for using these aids in isolating faults in conjunction with circuit pack substitution. It is estimated that less than 5 percent of the problems are either software-associated or of the multifault nature. The isolation and correction of multiple fault alarms may require service personnel who have extensive training or experience.

B. Maintenance Philosophy

10.04 Trouble reports may indicate that an alarm exists, accompanied by a customer complaint. After analyzing the report, maintenance personnel should perform the following routine procedures to restore the system to operational status.

(1) Verify trouble report with attendant.

(2) Observe the fault indicators and follow alarm procedures until all indicators and alarms are cleared.

(3) Make test calls.

(4) Follow nonalarm troubleshooting procedures until all nonalarm troubles are cleared.

10.05 Certain indications may require the use of one of several maintenance displays or programmed diagnostic procedures via the Maintenance and Administration Panel (MAAP). The results of these diagnostic procedures are displayed on the MAAP. Corrective action is usually simple circuit pack replacement. However, circuit pack replacement is never used as a trial-and-error method. Should use of the MAAP fail to isolate the problem, the logic probe provides additional means of locating faults.

C. Alarms

10.06 Both hardware detection and software diagnostic routines function with the built-in maintenance circuitry to monitor critical functions within the PBX. Major and/or minor alarms are generated when a fault condition(s) is detected by software or hardware. Alarms are indicated by Light Emitting Diodes (LEDs) located on the alarm panel (Fig. 56) and on the Attendant Console.

10.07 A major alarm generally indicates a failure which removes a significant number of sta-

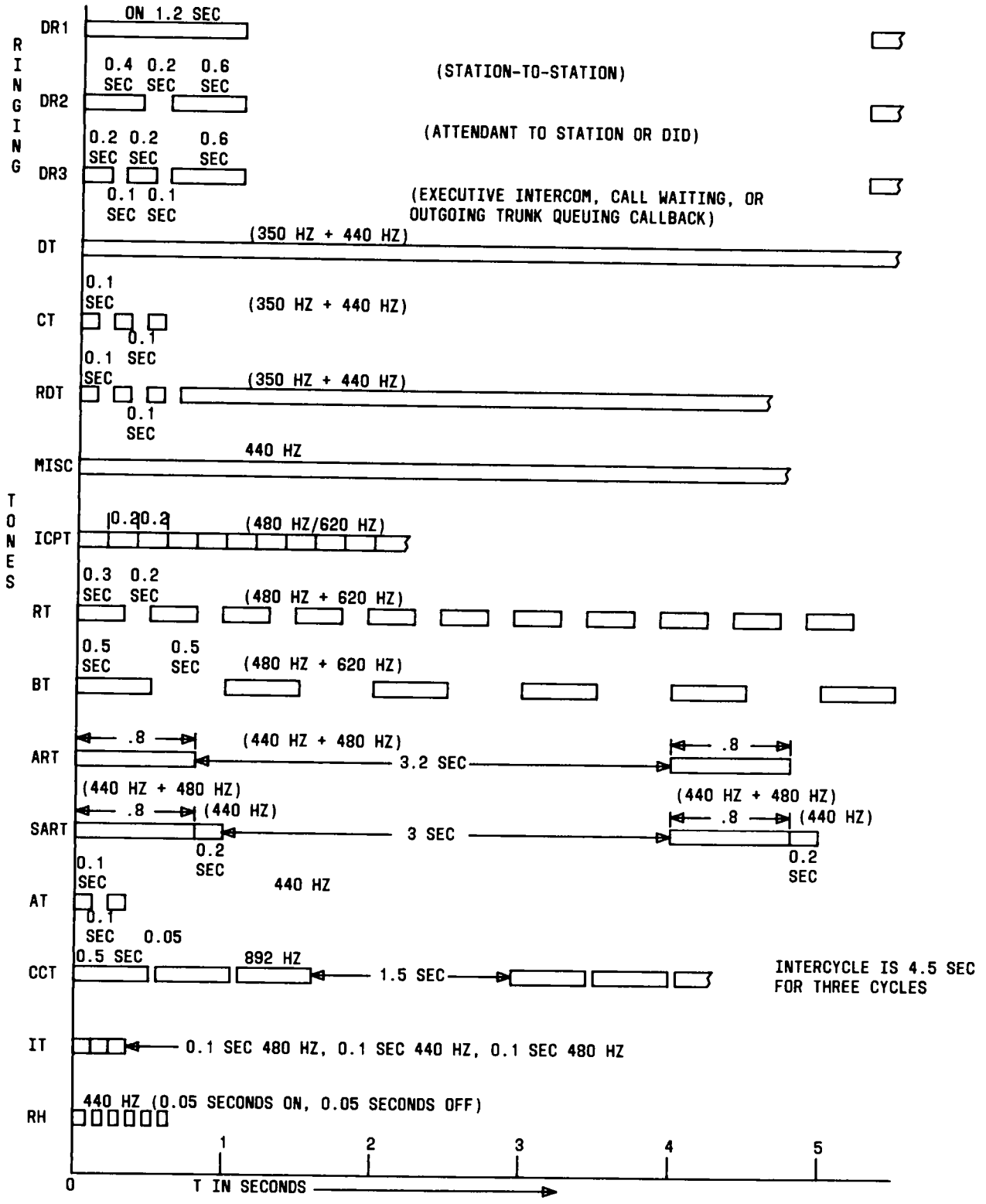


Fig. 55—DIMENSION 600 PBX—Tones and Ringing

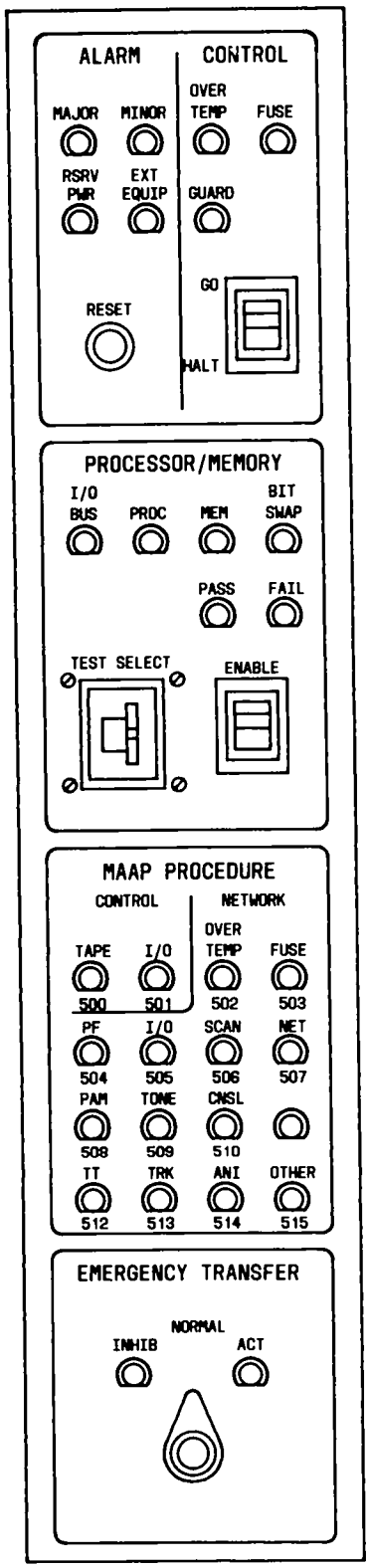


Fig. 56—DIMENSION 600 PBX—Alarm Panel

tions from service or removes a basic feature from several stations. A minor alarm generally indicates a failure which affects a limited number of stations or trunks. Both major and minor alarms are normally indicated by one or more fault indicator lights which help to isolate a particular fault. The alarms are designated and grouped to provide a quick reference (index) to specific MAAP procedures used in evaluating faults and restoring the system to an operating condition.

D. Maintenance Aids, Tools, and Test Sets

10.08 Certain maintenance aids are built into the system. A listing of these items and a description of each follows:

(a) ***Maintenance and Administration Panel (MAAP):*** The MAAP is used for maintenance, diagnostic troubleshooting, and the administration of system and station feature requirements.

(b) ***Alarm Panel:*** This panel contains both major and minor, network, and common control alarms. System initialization can also be accomplished from this panel. The fault indicators are grouped into subsections as follows:

- ALARM
- CONTROL
- PROCESSOR/MEMORY
- MAAP PROCEDURE.

(c) ***Troubleshooting Aids:*** These aids include the following:

- AC and dc power fusing
- Test point on circuit packs
- Busy/idle indicators—LEDs on-line and trunk circuit packs
- Other circuit pack LEDs
- Diagnostic tapes (X-ray program packages) used to check out the system.

10.09 The following tools and test sets are recommended for maintenance:

(a) ***Digital Multimeter (KS-20599, List 4):*** This tool is used for measurement of system voltages requiring greater accuracy than the standard VOM (KS-14510) can provide. Equivalent digital multimeter is Data Precision Model 175.

(b) ***Automatic Number Identification (ANI) Test Set J59204AJ:*** This test set is used to troubleshoot the ANI circuitry. The test set verifies the proper signal being sent to the serving central office.

(c) ***Carrying Case:*** Carrying cases are used for protection and shipment of magnetic tapes and circuit packs.

(d) ***Transmission Test Set (Type 4AN):*** This test set is used to provide the interface between the standard hand test set and the tip and ring access points on circuit packs in order to test the transmission capabilities of the line circuits.

(e) ***Hewlett Packard Model 10525T Logic Probe Equipped With Option H05 or Equivalent:*** The logic probe used to detect absence or presence of system timing pulses. The logic probe can be ordered with the system.

E. X-Ray Program Package

10.10 The X-ray tape consists of a series of diagnostic programs used to exercise the system. Programs are run at the time of installation prior to any other system tests. The X-ray tape is loaded into the system in place of the system feature package tape. After initialization, the X-ray tape runs continuously unless a system failure is detected. If this occurs, a fault code is displayed on the alarm panel or MAAP. No special hardware or test equipment is required. For further information regarding X-ray, refer to Section 554-105-115.

F. Auxiliary Circuits

10.11 Interface circuits enable the processor to maintain communication with the network and peripherals. The minirecorder interface provides the connection to the minirecorder, allowing off-line maintenance procedures to be called up via the MAAP. The MAAP interfaces with the PBX via a dual-speed data channel (low-speed option). A data channel located in slot 30 (circuit 0) of the basic control carrier is dedicated for MAAP use.

10.12 Dual-speed data channels also interface with Attendant Consoles, both Attendant Console and data channel repeaters, displays, ECTS controllers, RMATS, SMDR, CAP, CACS equipment, etc. The data channel located in slot 31 (circuit 1) of the basic control carrier is dedicated to SMDR use.

10.13 When the RMATS/CACS is provided, the data channels for basic carrier slots 30 and 31 are provided by circuit packs LC172B and LC171B, respectively. Circuit pack LC172B provides the control for selecting the system processor and the data channel for MAAP/CAP operations. Circuit pack LC171B provides the data channels for SMDR and RMATS operation.

10.14 The automatic number identification (ANI) circuit packs, LC31C and LC32B, are located in the control carrier and module control and trunk carrier, respectively. The two circuit packs are designated ***ANI transmitter circuit*** and ***ANI signal distribution circuit*** and are furnished only when the customer requires identification, translation, and transmission of calling party numbers to the associated central office. This station and trunk number identification occurs during each outgoing call.

▶11. SYSTEM CONVERSION AND EXPANSION

11.01 Conversion of a DIMENSION 600 PBX from one feature package to another feature package or expanding an existing system requires careful and detailed planning. This planning usually includes both software and hardware considerations. Additionally, depending on the type memory (low-speed) and memory configuration, the existing memory and memory control circuit packs may require replacing with circuit packs for high-speed memory. Refer to Section 554-105-101 (Preinstallation and Planning Information), the Administration and Maintenance Manual, and the DIMENSION PBX System Expansion and Conversion Manual (See 555-000-100 Index) for additional detailed information.◀

12. REFERENCES

12.01 The following sections are associated with the DIMENSION 400E and 600 PBX systems and, when available, may be used for additional information:

SECTION	TITLE
034-362-301	Minirecorder—KS-21447, L1 and L2—Description, Operation, and Trouble-Locating Procedures

SECTION	TITLE
332-610-100	Customer Premises Facility Terminal Equipment—General Description
463-210-101	24A-Type Line Status Indicator—Identification and Installation
463-332-130	89A Control Unit
518-010-101	Centralized Key Telephone Installations
809-002-100	PBX Equipment Space

12.02 The following ***DIMENSION PBX*** sections are associated with the DIMENSION 400E and 600 PBX systems:

SECTION	TITLE
554-000-000	Numerical Index (Refer to this index for TOP documents)
554-000-100	Miscellaneous Documentation Index (List of documents that support DIMENSION PBX systems)
554-010-100	Attendant Console—General Description
554-010-101	Input/Output, Interface and Auxiliary Circuits—Maintenance Support Information
554-010-102	Peripheral Interface Circuit
554-010-103	Energy Communication Signaling Unit
554-010-104	Attendant Console—Maintenance Support Information
554-010-110	Electronic Custom Telephone Service — System Description
554-010-122	Station Message Detail Recording
554-010-123	Station Message Detail Recording — Maintenance Support
554-010-130	Remote Maintenance, Administration, and Traffic System (RMATS-1) — Description and Operation
554-010-135	AUTOVON Service
554-010-140	Customer Administration Center System — Description
554-010-141	Customer Administration Panel—General Description
◗554-010-155	DIMENSION PBX Data Switching
554-010-160	DIMENSION PBX Application Processor Administration◖
554-105-101	Preinstallation and Planning Information
554-105-106	Scanner/Distributor and Network Control — Description
554-105-107	PAM Network and Port Circuits—Description
554-105-108	Central Processor — Description
554-105-115	X-Ray Program Package—Operating Procedure
554-191-100	Feature Document Reference Guide

12.03 ◗The following schematic diagrams (SDs) and associated circuit descriptions (CDs) are applicable and may be referred to when required.

DRAWING	TITLE
SD-1C586-01	TOUCH-TONE Calling Receiving Circuit Type G1 (Issue 1)
SD-1E290-01	609-Type Emergency Transfer Circuit (Issue 8B)
SD-1E449-01	Station Message Detail Recording (SMDR) (Issue 17D)
SD-1E450-01	Electronic Telephone Controller (Issue 10D)
SD-1E451-01	102C and 102D Display Circuits (Issue 4D)

DRAWING	TITLE
SD-1E460-01	Data Channel Repeater (Issue 3D)
SD-1E464-01	DIMENSION 600 PBX— System Circuit (Issue 12D)
SD-1E466-01	Attendant Electronic Console Repeater Circuit (Issue 3D)
SD-1E467-01	Peripheral Interface Circuit (Issue 6D)
SD-1E469-01	DIMENSION 600 PBX—Power and Ground Distribution Circuit (Issue 9B)
SD-1E483-01	DIMENSION 600 PBX—AC Distribution, Fan Assembly, and Frequency Generator (Issue 18B)
SD-1E490-01	Remote Maintenance, Administration, and Traffic System (RMATS-1) (Issue 9)
SD-1E493-01	30A8 System Status Indicator (Issue 1)
SD-5E038-01	Recorded Telephone Dictation Trunk (Issue 11B)
SD-66926-01	Interface Trunk Unit (Issue 16D)
SD-69910-01	Attendant Electronic Console (Issue 10B)
SD-7C010-01	Specification for CPFT (Issue 14B)
SD-82396-01	Power Supply (J87432B) (Issue 2)
SD-82489-01	Power Supply (J87432F) (Issue 1)
SD-82543-01	Power Systems—Triport Circuit J87460F (Issue 1)
SD-95283-01	Recorded Announcement Unit (Issue 9B)
SD-97736-01	KS-21447 Minirecorder Circuit (Issue 2B)◀