

PREINSTALLATION AND PLANNING INFORMATION

"DIMENSION®" "PRELUDE*" PBX

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	4	A. Protectors	18
2. ENVIRONMENTAL REQUIREMENTS	5	B. Sneak Current Protection	18
ATMOSPHERIC REQUIREMENTS	5	C. Coupled Bonding Conductor	18
A. Temperature and Humidity	5	D. Uninterruptible Power Service (UPS)	19
B. Air Contamination	6	4. FEDERAL COMMUNICATIONS COMMISSION (FCC) REGISTRATION REQUIREMENTS	19
FLOOR PLANNING	7	5. CABLING AND CROSS-CONNECT FIELD	19
A. Floor Loading	7	CABLING	19
B. Floor Space Requirements	7	CROSS-CONNECT FIELD	21
C. Stability and Movement	7	A. Description	21
ELECTRICAL FIELDS	7	B. Emergency Transfer	21
ACOUSTICS	12	C. Cross-Connect Field Enclosures	23
LIGHTING	12	D. Cross-Connect Tables	25
3. POWER REQUIREMENTS	12	E. Attendant Console Cross-Connections	25
POWER	12	F. Night Console Cross-Connections	25
A. General	12	6. FEATURE HARDWARE	26
B. Load Center	13	OPTIONAL CIRCUIT PACKS (CPs)	26
C. Power Receptacles	15	AUXILIARY EQUIPMENT ASSOCIATED WITH FEATURES AND SERVICES	26
GROUNDING	16	A. Attendant Console Repeater	32
A. Single-Cabinet and Multiple-Cabinet Grounding Arrangement	16	B. Calling Number Display to Station	37
B. Emergency Transfer Panel	16	C. Code Calling Access	37
ELECTRICAL PROTECTION	16		

* Trademark of AT&T

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

CONTENTS	PAGE
D. Customer Administration Panel (CAP)	37
E. Customer Premises Facility Terminal (CPFT)	38
F. Data Channel Repeater	41
G. Line Status Indicator—24B-Type	45
H. Loudspeaker Paging (Basic and Deluxe)	47
I. Music-on-Hold	48
J. Off-Premises Stations (OPS)	48
K. Radio Paging Access	50
L. Recorded Announcement Intercept Con- nection	55
M. Recorded Telephone Dictation Access	58
N. 44V4 Repeater	58
O. 24V4 Repeater	60
P. Station Message Detail Recording (SMDR)	60
Q. Trunk Answer From Any Station (TAAS)	61
R. Uniform Call Distribution/Traffic Over- flow Indicator	62
S. Visually Impaired Attendant Service	62
TRUNK CIRCUIT-TYPE SELECTION	62
A. Central Office (CO) Trunk Circuit (LC08D)	63
B. Direct Inward Dialing (DID) Trunk Cir- cuit (LC09D)	66
C. Tie Trunk Circuits (LC11B)	67
D. Auxiliary Trunk Interface Circuit (LC13B)	68

CONTENTS	PAGE
E. Loop Signaling Interface Trunk Circuit (LC361)	68
7. FEATURE SOFTWARE	70
8. PROCUREMENT OF SYSTEM	72
ORDERING	72
TRANSPORTATION	72
9. REFERENCES	73
Figures	
1. Minimum Floor Space Requirements (Single Cabinet)	8
2. Multiple-Cabinet DIMENSION PRELUDE PBX Minimum Floor Space Requirements	9
3. Earthquake Environment (USA)	10
4. Electromagnetic Interference (EMI) Filter Assemblies Mounted on Rear Panel of DIMENSION PRELUDE PBX Cabinets	11
5. Load Center and Receptacles for DIMENSION PRELUDE PBXs	13
6. Mounting Arrangement for Ground Bars	14
7. Grounding and Bonding Requirements for DIMENSION PRELUDE PBX	17
8. Typical FCC Registered Equipment Intercon- nections	20
9. Cross-Connect Field	22
10. Cross-Connect Field Enclosures	24
11. Console Connected to the PBX via the Cross- Connect Field	26
12. Night Console Interconnection	27
13. Auxiliary Cabinet—J58891B-1	29
14. Repeater	33

CONTENTS	PAGE	CONTENTS	PAGE
15. Attendant Console Repeater With Range Extension	35	32. Loudspeaker Paging With Chime Paging and Music Background	52
16. Attendant Console Repeater Without Range Extension	36	33. Music-on-Hold Interface	53
17. Equipment Arrangement for Calling Number Display to Station	38	34. LC588—OPS Signaling Range	53
18. Code Calling Access (Chime Paging) Equipment—Block Diagram	39	35. Loop Signal Extender (LSE) at CO in OPS Line	54
19. General Connection Diagram for 3A Code Call Access	41	36. Loop Start Only (LSO) at CO in OPS Line	54
20. CAP Interface	42	37. LSO and LSE at CO in OPS Line	55
21. Single-Module Shelf (J99380A) or Double-Module Shelf (J99380E)	43	38. PBX-OPS Line With Repeater	56
22. Single-Module Metallic Facility Terminal (MFT) Shelf Assembly—DIMENSION PRELUDE PBX Interconnection	43	39. Functional Diagram of Radio Paging Access Connections	57
23. Double-Module MFT Shelf Assembly—DIMENSION PRELUDE PBX Interconnection	44	40. Recorded Announcement Unit	58
24. Shelf and Assembly for 837-Type Networks (J99380B)	45	41. Block Diagram of Recorded Telephone Dictation Trunk Connections	60
25. Network Mounting Panel to DIMENSION PRELUDE PBX—Interconnection (J99380B)	45	42. 44V4 or 24V4 Repeater Connections	61
26. Shelf Assembly for 837-Type Networks on Printed Circuit (PC) Boards (J99380C)	46	43. CO Trunk Connected to Trunk Carrier via Auxiliary Equipment and Cross-Connect Field	62
27. KTU-Type Shelf Assembly for Impedance Matching Network (J99380C)	46	44. Wiring Schemes for SMDR Connections	63
28. Double-Depth Shelf Frame (J99380D) With a Double-Module Shelf (J99380E) in Front and a Network Plug-in Shelf (J99380C) in the Rear	47	45. SMDR Connections at the 724A Panel	64
29. Test Extender (J99380TA)	48	46. Centralized Station Message Detail Recording (CSMDR) Arrangement Interface to the DIMENSION PBX	65
30. 24A8-50 Line Status Indicator	49	47. TAAS Arrangement	65
31. Loudspeaker Paging Connections	51	48. UCD/DDC Traffic Overload Indicator	66
		49. PBX-CO Trunk Combinations	68
		50. PBX-CO Trunks	69
		51. 2-Wire PBX-CO Trunk With Impedance Compensator	69
		52. DID Trunk Range	70

	CONTENTS	PAGE
53.	LSE at DIMENSION PBX in DID Trunk	70
54.	2-Wire PBX Tie Trunks	71
55.	4-Wire PBX Tie Trunks	71
56.	Interconnections for E&M to DX Converter	72
57.	Audible Tone Connections for LC361 Circuit Pack	73
Tables		
A.	Environmental Requirements	5
B.	Backboard Designations	25
C.	Optional Circuit Packs for Features	28
D.	J58891B Auxiliary Cabinet and Common Equipment Summary	30
E.	Display and Power Unit Codes	39
F.	3A Code Call Equipment Summary	40
G.	24B-Type Indicator Ordering Guide	50
H.	Radio Paging Equipment Summary	56
I.	Recorded Telephone Dictation (RTD) Equipment—Summary	59
J.	Value of Resistor R2 per Loop Range	67
K.	Equipment Required per Loop for UCD/DDC Traffic Overload Indicator	67
L.	LC11B Switch Settings for Various Loop Lengths	72
M.	DIMENSION PRELUDE PBX Tapes	74

1. GENERAL

1.01 This section provides information for use in planning a new DIMENSION PRELUDE PBX installation. Power, hardware, software, and cabling requirements are given, along with references to associated documents.

1.02 This section is reissued to include the following information:

- Revision of power dissipation to 432 watts
- LC11B options
- LC361
- Capability of up to four attendants
- 30-Hz ringing current
- Addition of supplemental cabinet (J58891C) which provides for multiple-cabinet system
- Change to RS232 SH compatible tape drive unit
- ED-1E310-11, Shielded cable groups 77 through 79, 87 through 91, and 93 through 97.

Revision arrows are used to denote significant changes.

1.03 The DIMENSION PRELUDE PBX comes in a multiplicity of models. See Sales Order Form for specifics on system parameters (ie, number of trunks, lines, and attendant consoles). A maximum of 440 station lines and 110 trunks (see Note) can be provided in the DIMENSION PRELUDE PBX.

Note: A maximum of 122 trunks can be equipped per system if the J58891CA carrier is provided in the system.

1.04 The DIMENSION PRELUDE PBX has three standard cabinets; a basic cabinet (J58891A), a supplementary cabinet (J58891C), and an auxiliary cabinet (J58891B). There is a maximum of one basic and two supplementary cabinets per system. The basic cabinet houses control, trunk, and line circuits; the supplementary cabinet houses trunk and line cir-

cuits; and the auxiliary cabinet houses any auxiliary hardware necessary for features (see paragraphs 6.03 through 6.78). The cabinet dimensions are 1270 millimeters (mm) (50 inches) high, 789 mm (31 inches) wide, and 584 mm (23 inches) deep. For a more detailed description, including available features and cabinet layouts, see Section 554-102-100.♦

1.05 Before installing the DIMENSION PRELUDE PBX, the following items should be available at the customer location:

- System cabinet(s) and attendant console(s)
- Auxiliary equipment
- Connector cables
- Termination field materials
- Power receptacle(s)
- Load center (power panel)
- Working trunks
- Tools
- Test equipment
- Factory computer-generated lists (shipped with system).

1.06 This section is based on the drawings listed in Part 9. If this section is to be used with equip-

ment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the schematic drawings (SDs) and circuit descriptions (CDs) to determine the extent of the changes and the manner in which the section may be affected.

2. ENVIRONMENTAL REQUIREMENTS

ATMOSPHERIC REQUIREMENTS

A. Temperature and Humidity

2.01 Extreme conditions of temperature and humidity may have damaging effects on system equipment. Exposure to extreme temperature and humidity may degrade telephone service, not only at the time of exposure but also when a normal environment is restored. Table A outlines the equipment room environmental requirements for the system.

2.02 The requirements presented in Table A represent the extreme limits of the equipment operating ranges. These requirements should not be construed as being desirable working conditions for minimum maintenance. Installations in nondesirable areas (ie, outside the temperature range of 18°C [65°F] to 35°C [95°F] with relative humidity range of 20 to 60 percent) will cause degradation to the extent of reducing system life. For storage and transportation environments, the permissible extremes are 68°C (150°F) (15 percent RH) and -40°C (-40°F) (humidity uncontrolled).

Note: Temperature as indicated by an ordinary thermometer is measured at a location

TABLE A

ENVIRONMENTAL REQUIREMENTS

SYSTEM	ROOM AMBIENT (DRY BULB) TEMPERATURE °C (°F)		PERMISSIBLE RANGE HUMIDITY (%)	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
Without Fans	0 (32)	26.7 (80)	10	95
	0 (32)	29.4 (85)	8	95
	0 (32)	32.2 (90)	7	95
With Fans	0 (32)	35.0 (95)	6	80
	0 (32)	37.8 (100)	5	70
	0 (32)	40.6 (105)	4	60
	0 (32)	43.3 (110)	4	55
	0 (32)	46.1 (115)	3	45
	0 (32)	48.9 (120)	3	40

1524 mm (5 feet) above the floor and 381 mm (15 inches) in front of the cabinet.

2.03 The following site selection guidelines should be followed.

(a) The equipment should be installed in an air-conditioned space whenever possible. Fans are ordered nonstandard and will be required in each cabinet whenever:

(1) The equipment space is not air-conditioned and the ambient temperature can exceed 32°C (90°F).

(2) Filters are used.

(b) Environments which are not recommended for installation because of potential temperature problems include:

(1) Rooms in which a major heat source (ie, boiler room, furnace room, manufacturing areas using hot processes) can affect the room ambient temperature significantly.

(2) Areas in which the ambient temperature can attain excessive levels. These areas could include:

(a) Nonventilated rooms with less than 50 square feet of floor space

(b) Nonventilated rooms with two or more exterior walls that are frequently exposed to high ambient temperatures.

2.04 To aid in determining air-conditioning requirements when space is allocated, total power dissipation of the PBX cabinet is 432 watts (1474 BTU/HR).

2.05 The power dissipation rate in paragraph 2.04 is sufficient to heat small rooms above the maximum operating temperature of equipment if proper air-conditioning or ventilation is not provided. The equipment engineer should analyze the room ventilation and/or air-conditioning systems to ensure that requirements for each installation are met.

B. Air Contamination

2.06 The use of filters in the equipment will be determined by the environment. The environ-

ment can be divided into the following air contamination classifications:

(a) **Heavy Industrial:** Space in which industrial processes or construction work act as sources of excessive dust or lint. This environment is not recommended as an installation site. However, if it is necessary to install a system in this environment, filters will be required on each cabinet.

(b) **Average Industrial:** Nonmanufacturing space in industrial areas. Filters must be used on each cabinet installed in this environment.

(c) **Average Residential:** Storage or office space which has heavy traffic or which is adjacent to building exits and entrances. In this environment, if the system is equipped with fans (for reasons of temperature), filters are required on each cabinet.

(d) **Relatively Clean Room:** Interior rooms in office space with little or no traffic. Filters are never required in this environment.

2.07 The basic PBX equipment is primarily solid-state devices. Certain features require the use of open contact relays which are mounted in auxiliary cabinets or on the wall. This equipment is susceptible to the same adverse effects from contaminants as previous electromechanical equipment. Copy machines have been identified as a potential source of contaminants which can erode and insulate open contact relays. It is recommended that relay equipment be located away from equipment which exhibits this type of contaminant emission. If it is found necessary to locate relay equipment in such an environment, then a special filtration system should be utilized. The special filtration system in Section 534-367-201 should only be used in auxiliary equipment containing open contact relays. If fans are installed in this auxiliary equipment, they should not be operational when using the special filtration system.

2.08 In severely contaminated industrial environments, other equipment may be affected. Gold fingers and connector interfaces could chemically deteriorate through the corrosive effects of gases on particle surfaces. Environments containing high concentrations of corrosive gases such as sulfur or chlorine should not be used as installation sites.

Industrial areas suitable for prolonged human activity (without safety protection) are not considered to be severely contaminated, and can be used as installation locations.

2.09 Filters will require replacement periodically as they become laden with contaminants. The replacement interval will vary from a few weeks to a year or more, depending on local conditions. Under average conditions, filter life can be expected to be longer than 6 months. It is the responsibility of the telephone company to conduct periodic filter inspections and ensure replacement when deemed necessary. Filters should be inspected at intervals determined by nature of the environment.

FLOOR PLANNING

A. Floor Loading

2.10 The minimum requirement found in any commercial floor loading codes is 244 kg per square meter (50 pounds per square foot). The maximum weight of the PBX carrier cabinet is about 272 kg (600 pounds). Thus, a free maintenance area of at least 1 square meter (12 square feet) per cabinet must be provided on a floor which is rated at 244 kg per square meter (50 pounds per square foot).

2.11 Concentrated floor loads under the casters of the system are 135 psi (pounds per square inch) for the 3-carrier PBX cabinet. Some surfaces such as soft tile or linoleum may incur indentations over a period of time from the casters. If this is of concern to the customer, the tolerable pressure rating of the customer floor surface should be compared to the appropriate 135 psi loading. If it is less, the floorplate should be used. In most cases, this will not be necessary since the cabinet will probably occupy the same position throughout its service, and such indentations will not be any more severe than those of a large desk.

B. Floor Space Requirements

2.12 A floor space layout of a single-cabinet installation is shown in Fig. 1. Figure 2 shows a floor space layout for a multiple-cabinet installation. A nylon cable clamp is wall-mounted 12.7 mm ($\frac{1}{2}$ inch) from the top of each cabinet. The maximum distance between load center and HUBBELL† receptacle is 6

meters (20 feet). The main cross-connect field should be located near the cabinets, if possible, to simplify testing and maintenance. A minimum of 152 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 airflow for cooling the system.

2.13 Maintenance space is required in front of and on the side of the equipment cabinets to permit access to the interior components.

C. Stability and Movement

2.14 When earthquake or disaster bracing is required by law or when the engineers feel that it is necessary, such bracing shall be installed. The areas in the United States in which earthquake bracing may be desirable are shown in Fig. 3. The PBX cabinet may be bolted directly to the floor. Four insulating bolts, four insulating washers, and four spacer assemblies are used in holes provided in the baseplate of the cabinet for this purpose. When the cabinet is bolted to the floor, maintenance access space of 610 mm (24 inches) should be provided behind the cabinet.

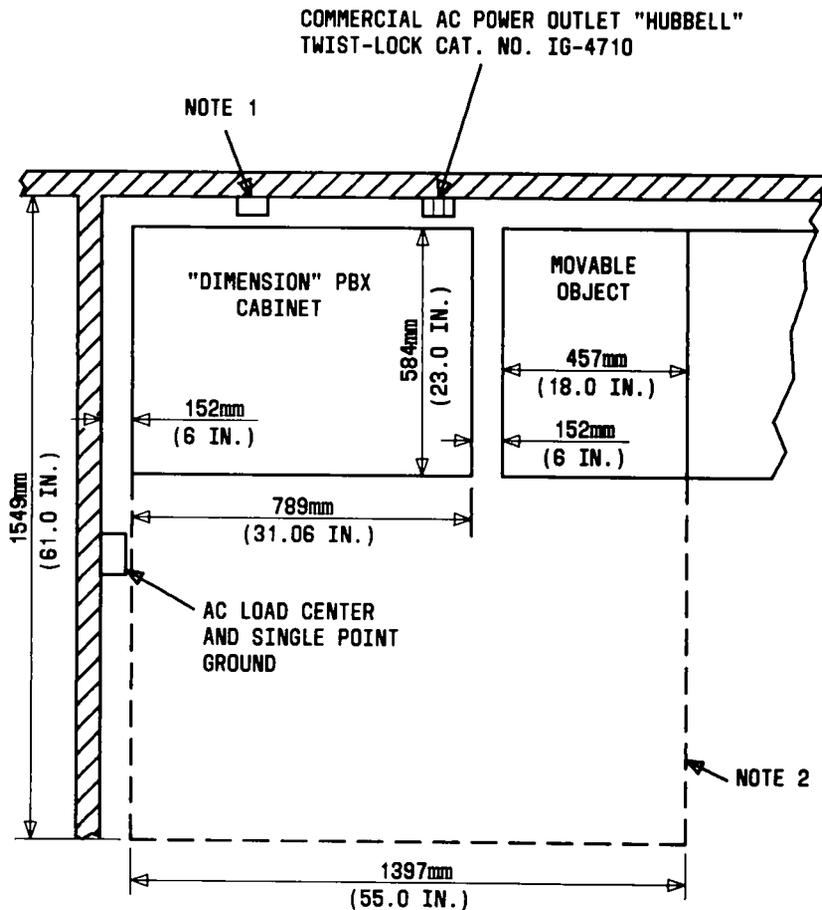
2.15 Care should be taken in moving the cabinet across deep pile carpets in order to prevent tipping. The casters have been placed to allow adequate force (about 36 kg or about 80 pounds) to get the cabinet moving on thick carpeting. Also, the placement of the casters allows a moderately rapid movement (about 610 mm per second or about 2 feet per second) of the cabinet without risk of tipping when a bump or irregularity in the floor is encountered. Movement faster than 610 mm per second (2 feet per second), however, should be considered dangerous with regard to cabinet tipping.

ELECTRICAL FIELDS

2.16 In order to prevent the introduction of noise into the system, power lines that are dedicated to the PBX should be used. Separate branch circuits are sufficient to serve this purpose.

2.17 Electromagnetic fields may cause noise to be induced into the PBX. Care should be taken to avoid placing the PBX cabinets and/or cable runs in areas where high field strengths from sources such as AM radio transmitters, induction heaters, elevator motors, and similar equipment may be present. If

†Registered trademark of Harvey Hubbell, Inc.



NOTES:

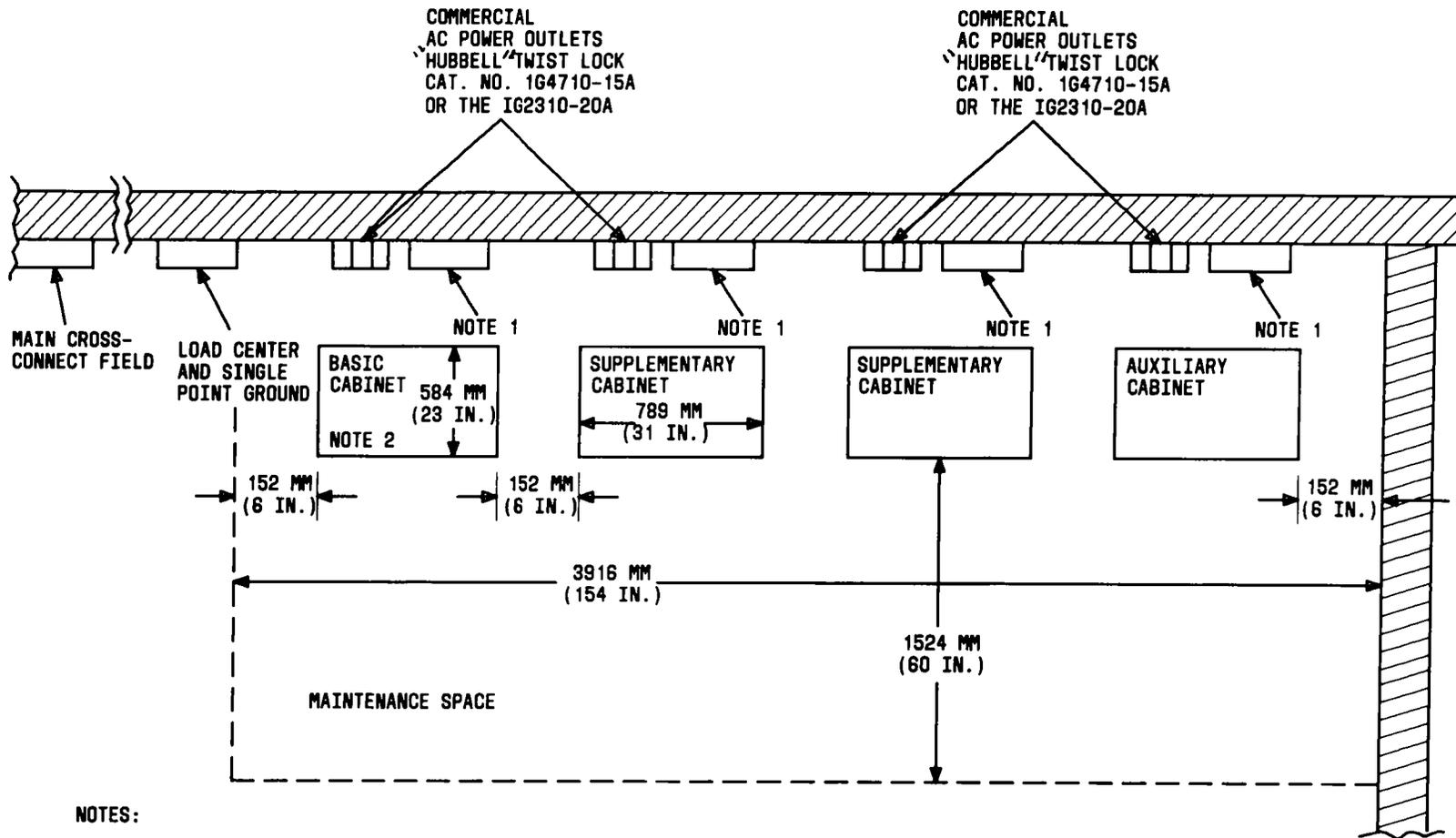
1. NYLON CABLE CLAMP MOUNTED 13mm (1/2 IN.) FROM TOP OF CABINET.
2. DASHED LINES INDICATE MINIMUM MAINTENANCE AREA.

Fig. 1—Minimum Floor Space Requirements (Single Cabinet)

the field strength is less than 0.05 volt per meter, interference is not likely. Between 0.05 and 1.0 volt per meter, interference may or may not occur. In systems where the field strength is greater than 1.0 volt per meter, interference is likely. This interference can result in a demodulated tone or garbled tone being present in the audio band during telephone conversations. It should be noted that in addition to the field strength in the PBX cabinet site, the field strength in the vicinity of cable runs (both in the building and surrounding area) is important and should also be considered. Not all AM radio stations, even those with moderately high field strengths, can be expected to cause interference in the audio band. The resultant demodulated tone should be calculated to determine the action to be taken. In most cases, the interference

is introduced into the system via trunk or station cables or both.

2.18 Standard treatment for noise in cable pairs may be obtained by installing an electromagnetic interference (EMI) filter assembly per ED-1E403. Mounting holes for the filter assembly are predrilled (Fig. 4). The mounting assembly is capable of containing ten 1513A filter assemblies. A Group 3 assembly consists of one EMI filter mounting panel and one filter cover. The EMI filter assemblies (Group 2) must be added to the Group 3 assembly. Each Group 2 filter assembly consists of one EMI filter assembly and one connecting cable (ED-1E367, Group 935).



NOTES:

1. NYLON CABLE CLAMP MOUNTED 13 MM (0.5 IN.) FROM TOP OF EACH CABINET.
2. APPROXIMATELY 152 MM (6 IN.) VENTILATION SPACE IS REQUIRED ABOVE EACH CABINET.

Fig. 2—Multiple-Cabinet DIMENSION PRELUDE PBX Minimum Floor Space Requirements

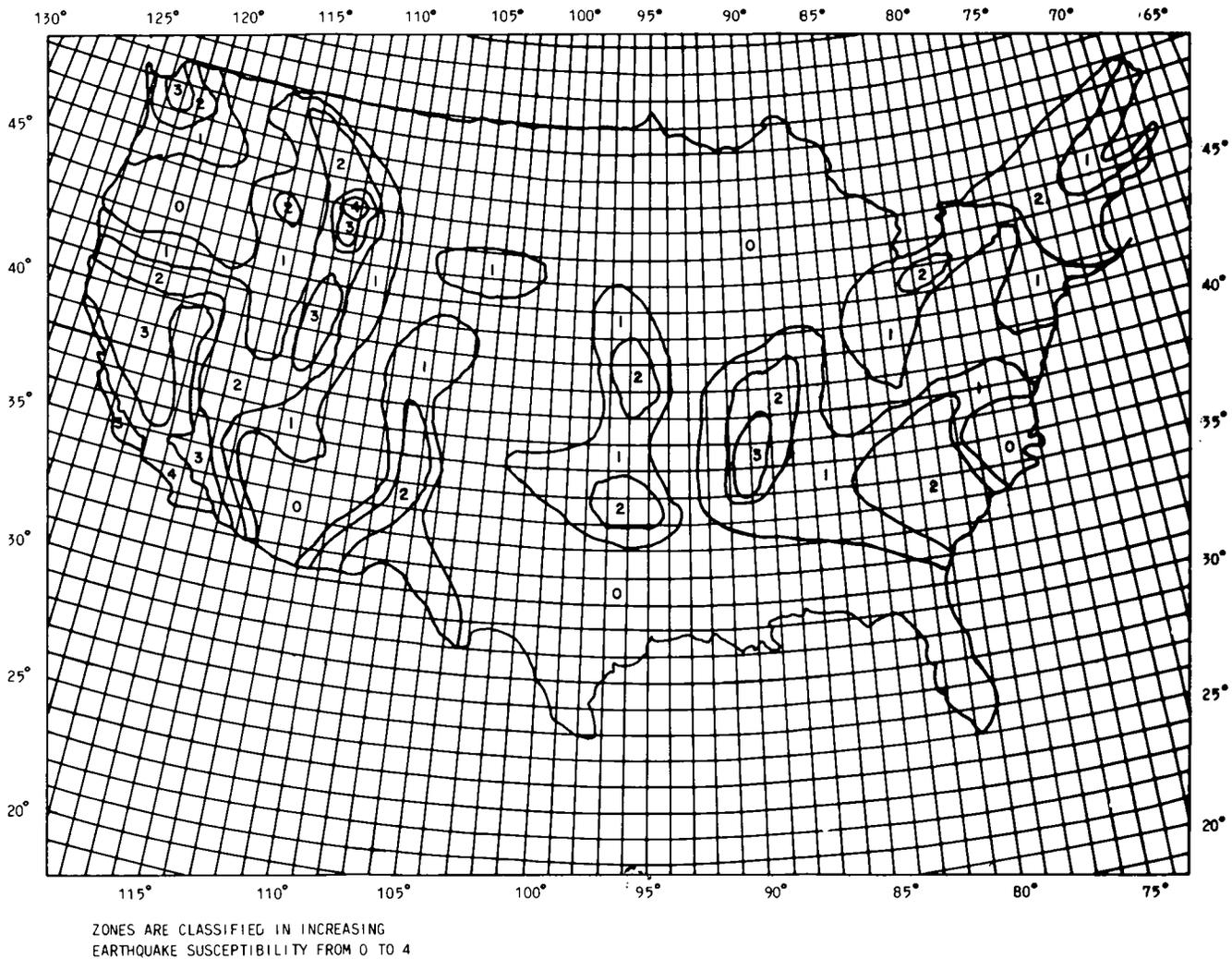


Fig. 3—Earthquake Environment (USA)

2.19 One filter assembly and connecting cable accommodate one 25-pair trunk or line cable. The connecting cable connects from the J1 connector on the filter assembly to the cross-connect field. There are no power requirements, but a ground lead must be connected from the unit to the main ground block.

2.20 Since cable pairs leaving the premises [such as trunk and off-premises station (OPS) pairs] are most susceptible, these pairs should be treated first. If the treatment does not eliminate the problem, treatment of station cable pairs may be required. Examination of the PBX grounding runs (for coupling) and ground loops may also be required,

depending upon local conditions. Typically, AM radio stations have been the cause of most interference problems due to the fact that the electrical characteristics of the PBX usually limit demodulation to frequencies ranging from 500 kHz to 10 MHz.

2.21 Should the attendant console cables be the coupling mechanism, standard 1542AM inductors should be used to filter the console audio pairs. The 1513A filter is not suitable for filtering the console cable since it inhibits data transmission on the data pairs.

2.22 Field strength can be measured using a standard field strength meter such as the Holaday

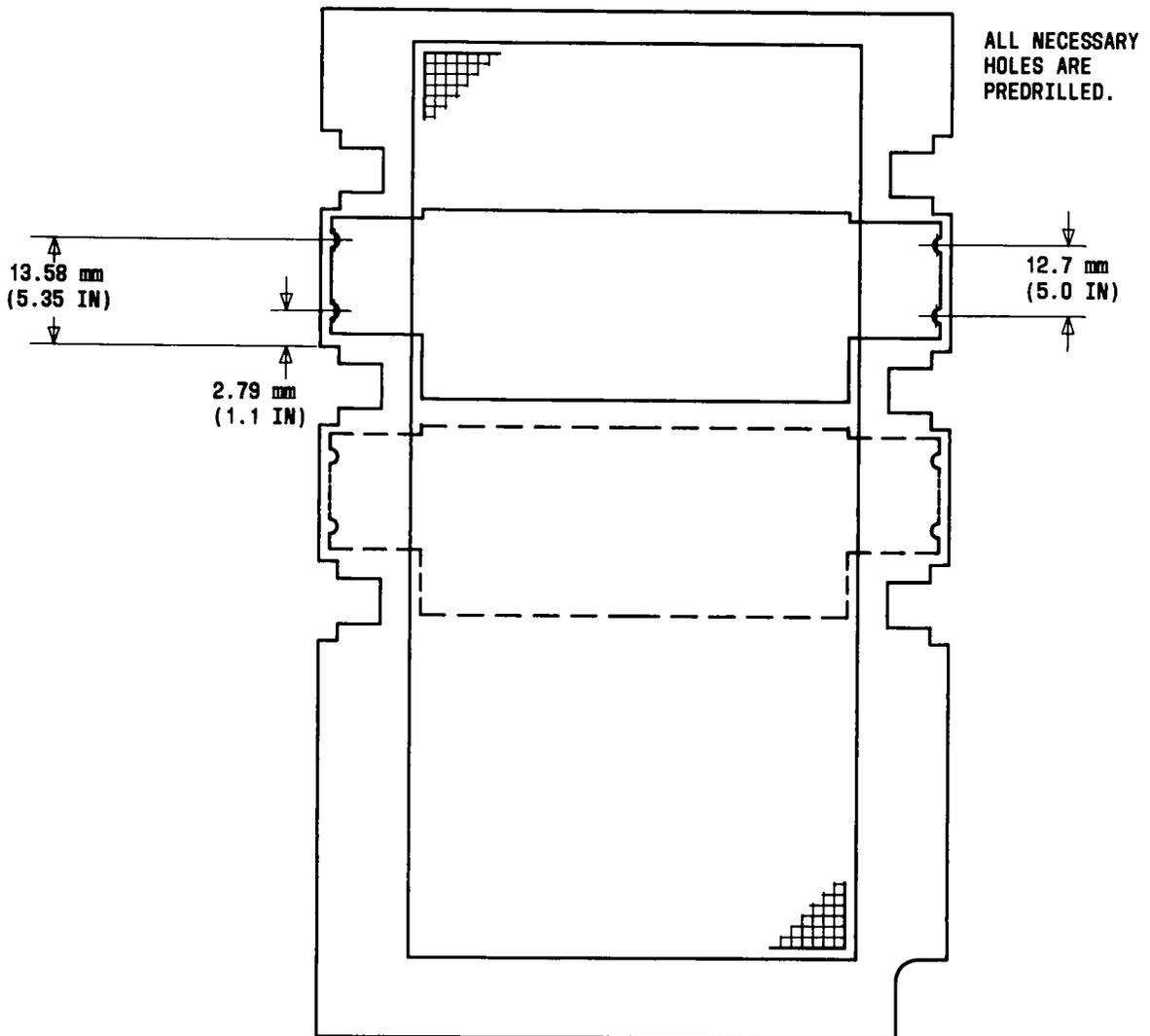


Fig. 4—Electromagnetic Interference (EMI) Filter Assemblies Mounted on Rear Panel of DIMENSION PRELUDE PBX Cabinets

Industries HI-3001 field strength meter, the Electric Field Sensor Model EFS1, manufactured by Instruments for Industry Incorporated, or a tuneable R70B meter from Electrometrics. If the field strength from a broadcast station cannot be measured, the field strength can be approximated by dividing the square root of emitted power in kilowatts by the distance from the antenna in kilofeet. This approximation yields the field strength in volts per meter and is relatively accurate except when very close to the antenna. In those cases, the field strength must be measured.

2.23 The PBX may be subjected to noise interference from motors of more than 186 watts (1/4 horsepower) having commutators, if the PBX and commutators are situated in the same or an adjacent room. Small tools and appliances with universal motors are generally not a problem if operated on separate power lines. Motors without commutators, whether synchronous or asynchronous, generally do not cause interference into the PBX. Experience has shown that in most cases where interference was considered a major area of concern, unshielded PBXs were not affected. It is recommended that in ques-

tionable installation sites, the systems be installed and tested prior to any treatment or shielding attempts.



In order to preclude electrostatic noise in the system, the frame shall be well grounded as specified in Part 3, Power Requirements. Maintenance personnel should wear an authorized wrist grounding strap which is connected to the frame before working on the system to remove electrostatic charge from themselves and avoid charging the circuit board.

ACOUSTICS

2.24 The system should be located in an acoustic environment which allows maintenance personnel to hear tones through a standard headset while performing necessary tests.

2.25 The noise levels which do not permit sound to be heard over the standard headset are about the same or greater than those specified in the Occupational Safety and Health Act (OSHA). This is normally 90 dB. Therefore, the OSHA requirements for sound satisfy the environmental requirements for the system, and these must be met wherever the machine is placed. Refer to current OSHA requirements for acceptable levels.

LIGHTING

2.26 The light intensity level around the system cabinet should be adequate to conform with OSHA standards to provide a comfortable amount of light for maintenance personnel to do the repair tasks required. To obtain accurate footcandle measurement, measure level in center aisle, 1524 mm (5 feet) above the floor, aiming meter upward. Light measurement can be made with a WESTON‡ Footcandle Meter, Model 614.

‡Registered trademark of Weston Instruments, Inc.

2.27 The lighting configuration in the area of the system should allow maintenance personnel to perform their tasks. The light intensity level should be adequate from any of the directions necessary, ie, from the front or back of the cabinet.

3. POWER REQUIREMENTS

POWER

A. General

3.01 Commercial power provided to the system should be capable of providing each cabinet with a 120-Vac 15-ampere circuit. This is adequate for any fully equipped system cabinet and is required to avoid false circuit breaker tripping as a result of momentary inrush currents caused by PBX ferroresonant rectifiers. Each 15-ampere circuit should be protected by a 15-ampere thermal magnetic circuit breaker ITE QPI-BO15 typical, or approved equivalent) which must be capable of withstanding an initial current surge of 150 amperes for a period of 10 ms.

3.02 A 4-cabinet installation (see Fig. 2) could be typically powered from a 3-wire, single-phase, 120-Vac 60-ampere feeder. Since there is no phase restriction between cabinets, the 120-Vac 15-ampere circuit required for each cabinet could be derived from either 1-, 2-, or 3-phase mains.



In order to maintain system integrity, dedicated power feeder lines should be used. Separate feeder circuits from a dedicated service panel are sufficient to serve this purpose. The feeders should not be used to power other equipment.

3.03 DIMENSION PRELUDE PBX rectifiers are capable of operating under a wide range of frequency or input voltage conditions, provided that both conditions do not occur simultaneously. The operating ranges are 99V to 129V if the variation from 60 Hz is ± 0.3 Hz, or 105V to 129V if the variation from 60 Hz is ± 3 Hz.

3.04 The ac distribution required for a 2-cabinet DIMENSION PRELUDE PBX system is shown in Fig. 5. The installers must arrange with the customer or an electrical contractor for the installation and wiring of an approved load center equipped

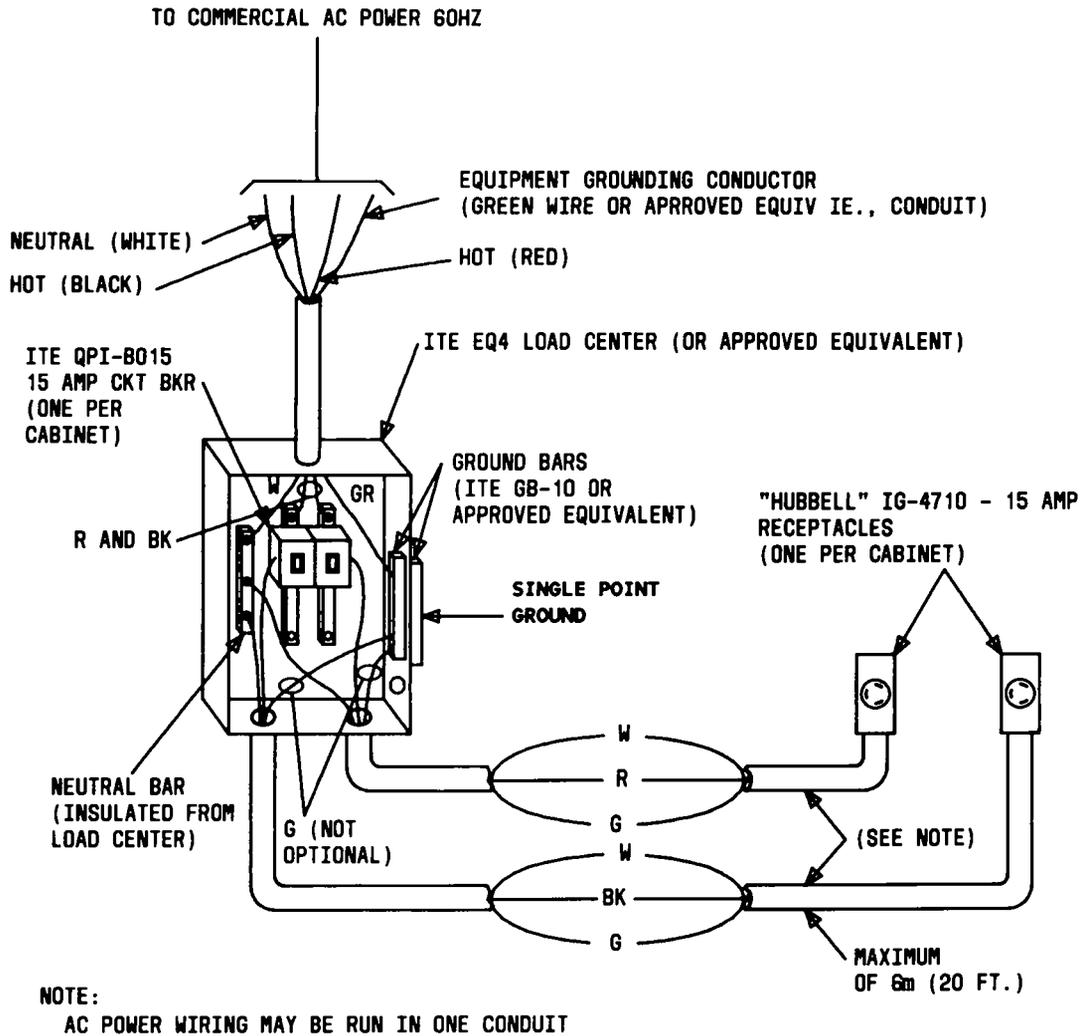


Fig. 5—Load Center and Receptacles for DIMENSION PRELUDE PBXs

with thermal magnetic circuit breakers, branch circuit wiring, and a wall-mounted receptacle for each cabinet. Complete cost of providing the electrical service should be borne by the customer. One circuit breaker and one receptacle are required per cabinet. In all cases, ac wiring and equipment must comply with local codes.



For both single- and multiple-cabinet system installations, the HUBBELL IG-4710 receptacles, the load center, and the ground bars should be installed by the customer prior to starting the PBX installation.

B. Load Center

3.05 The circuit breaker shall provide power to a 15-ampere nonswitchable receptacle (wall-mounted) located behind each cabinet (HUBBELL IG-4710 typical, or approved equivalent). Early installations required 20-ampere nonswitchable receptacle [HUBBELL 2310(MD)].

3.06 A load center (panelboard) of appropriate current rating (ITE EQ4 typical, or approved equivalent) shall be equipped with 15-ampere single-pole thermal magnetic circuit breakers (ITE QPI-BO15 typical, or approved equivalent). Each circuit breaker is to protect one associated wall-mounted

receptacle. Sufficient number of circuit breakers and receptacles shall be provided to accommodate all cabinets. (See Fig. 5.)

3.07 Two ground bars (ITE GB-10 typical, or approved equivalent) will be provided locally.

3.08 The electrician shall mount the two ground bars back-to-back on the side of the load center. They are to be held together in a "sandwich" arrangement such that one is inside the load center and the other on the outside. Star washers shall be used between the screwhead and ground bar, between nut and ground bar, and between each ground bar and load center wall to ensure a permanent, reliable electrical bond between ground bars and load center wall (Fig. 6). The electrician shall use the inside ground

bar to terminate all green wire grounds but not the neutral wire.

3.09 The ground bar located on the load center external wall is the PBX single-point ground and shall be used as such by the installer for grounding the PBX.

Caution: *This ground bar shall be tagged with a form which requests that the installer's Repair Service be notified if connections are loose or if they must be moved.*

3.10 The National Electrical Code (NEC) and most local codes require that the load center be grounded through an "equipment grounding conduc-

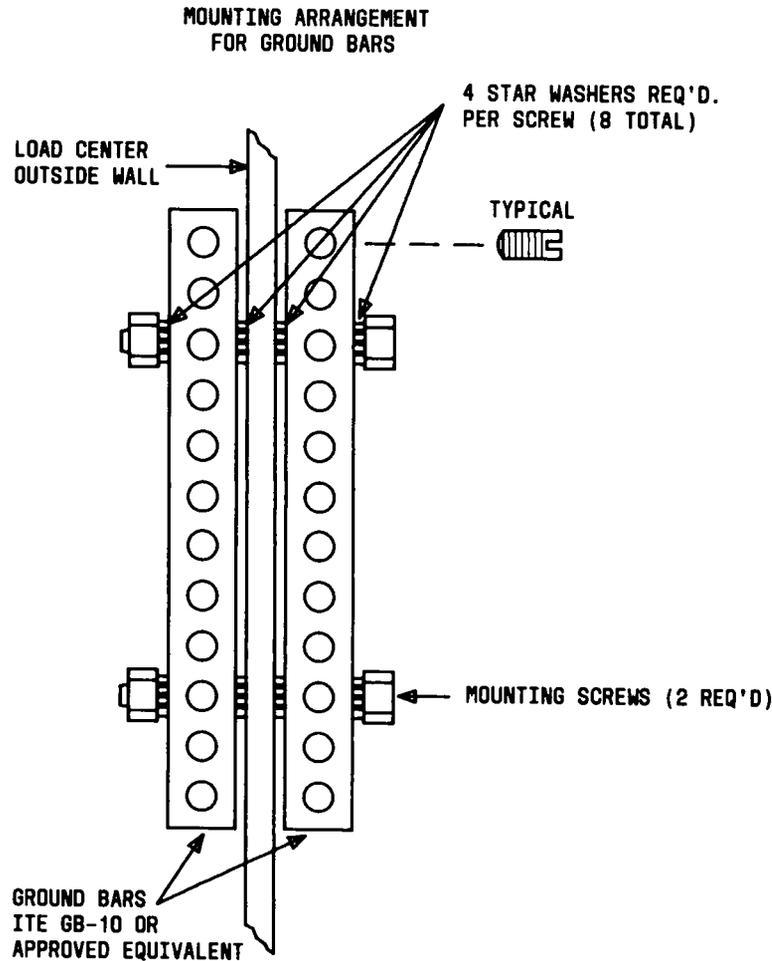


Fig. 6—Mounting Arrangement for Ground Bars

tor" which can be one, or a combination, of the following: (1) a separate corrosion-resistant conductor (green wire), (2) rigid metal conduit, (3) electrical metallic tubing, (4) intermediate metal conduit.

3.11 The presence of a separate green wire between the load center and the ac service entrance, when provided in addition to the approved metallic conduit, contributes negligibly to the protection of the PBX against lightning exposure. A separate green wire conductor is not specified as an installation requirement, but is recommended, if practical, in order to provide a more reliable equipment grounding conductor (protection against exposure).

C. Power Receptacles

3.12 One HUBBELL twist-lock power receptacle, Catalog No. IG-4710, is always shipped with each cabinet for the power receptacle installation. A power receptacle must be provided behind each cabinet.

3.13 The ac wiring between the load center and wall-mounted receptacle should be kept as short as practicable and should not exceed 6.1 meters (20 feet) in length. This requirement limits the length of the ground wire from the PBX to the single-point ground. A separate neutral wire (white) shall be run from the load center neutral bar to each receptacle. The cabinets shall be distributed evenly over the branch circuit.



A separate ground wire (green) is required between the load center and each receptacle, although the wiring is run in conduit, armored cable, or raceway.

3.14 Since the equipment ground (equipment grounding conductor) for the wall-mounted ac receptacles is derived through the green wire conductor only, power receptacles which are designed to derive the protective ground from conduit, when mounted in a metallic junction box, shall not be used in the PBX installation. The HUBBELL IG-4710 receptacle has its ground terminal insulated from its mounting hardware and has been specified for this purpose. A green wire conductor must be used from the load center to the grounding terminals of the receptacles, in order to provide the equipment grounding conductor required by the NEC.

PBX AC Current Drain

3.15 The ac current drain for a PBX should include all cabinets, including any auxiliary equipment such as Station Message Detail Recording (SMDR), Customer Premises Facility Terminal (CPFT), etc. The values calculated from the information that follows are typical current drains (in amperes) at 120 Vac 60 Hz, and should not be used either for design purposes or for specifying the electrical service required for the PBX.

Cabinet 00 AC Drain

- No traffic drain = $1.7 + [0.3 \times (\text{line} + \text{trunk carrier quantity})]$
- Medium traffic drain = no traffic drain + $[0.4 \times (\text{line} + \text{trunk carrier quantity})]$ (6 CCS/line)
- Heavy traffic drain = no traffic drain + $[0.6 \times (\text{line} + \text{trunk carrier quantity})]$ (9 CCS/line).

◆Cabinet 01 AC Drain (no control carrier)

- No traffic drain = $0.7 + [0.3 \times (\text{line} + \text{trunk carrier quantity})]$
- Medium (6 CCS/line) traffic drain = no traffic drain + $[0.4 \times (\text{line} + \text{trunk carrier quantity})]$
- Heavy (9 CCS/line) traffic drain = no traffic drain + $[0.6 \times (\text{line} + \text{trunk carrier quantity})]$.◆

Auxiliary Cabinet

- One frequency generator = 0.7A
- One interrupter = 0.2A
- Fans (when running) = 0.3A
- -48V rectifier at no load = 0.8A
- To find the ac current drain for circuits powered by the -48V rectifier (KS-22028), multiply the -48 current drain by 0.5, which is a factor that accounts for the rectifier efficiency.

Auxiliary Cabinet Example:

If the cabinet is equipped with three CPFT carriers and one -48V rectifier, the ac drain is calculated as follows:

- -48V current drain is $3 \times 0.8 = 2.4$ amperes
- 120 Vac current drain is $2.4 \times 0.5 = 1.2$ amperes
- -48V rectifier (no load) drain = 0.8 ampere
- Total ac current drain for the auxiliary cabinet is $1.2 + 0.8 = 2.0$ amperes.

GROUNDING

3.16 Proper grounding of the PBX is particularly important to ensure personnel safety and to protect the equipment against lightning surges. Grounding within the PBX cabinet is provided by a copper block (designated as ground block) which serves as the single connecting junction for the ac ground wire in the power cord (green wire), the circuit ground, and the frame ground.

A. Single-Cabinet and Multiple-Cabinet Grounding Arrangement

3.17 Grounding for both the single-cabinet and multiple-cabinet systems is provided by a No. 6 AWG ground wire connected from one of the following approved ground sources to the PBX single-point ground. The single-point ground is the ground bar mounted by the electrician on a side wall of the load center. (See Fig. 7.) The auxiliary cabinet must be grounded only from the basic (00) cabinet. The coupled bonding conductor must also connect to the PBX single-point ground.

- (a) "Water pipe" ground is a metallic water pipe system not less than 12.7 mm (1/2 inch) in diameter that is electrically continuous through the water meter and extends at least 3 meters (10 feet) into earth.
- (b) "Building steel" is the building structural steel which is electrically connected to both the metallic water pipe system and the power ground.
- (c) Power ground is the electrode to which the power service entering the building is grounded. This may be the metallic water pipe, a ground

rod, building steel, footing, ring ground, or the metallic conduit supplying panelboards on the floor.

(d) The grounding conductor for the secondary side of the power transformer feeding the floor. (If this option is selected, the connection to the grounding conductor should be made by a licensed electrician.)

3.18 For information on how to select an approved ground, refer to Sections 876-300-100 and 631-400-102.



Ground Isolation: Care should be exercised when implementing the grounding scheme. To preserve the integrity of the single-point ground arrangement, verify that neither cabinet nor any framework (on the PBX side of the customer-provided load center) is connected to or may be moved to inadvertently come in contact with ground at a place other than at the single-point ground (ground window).

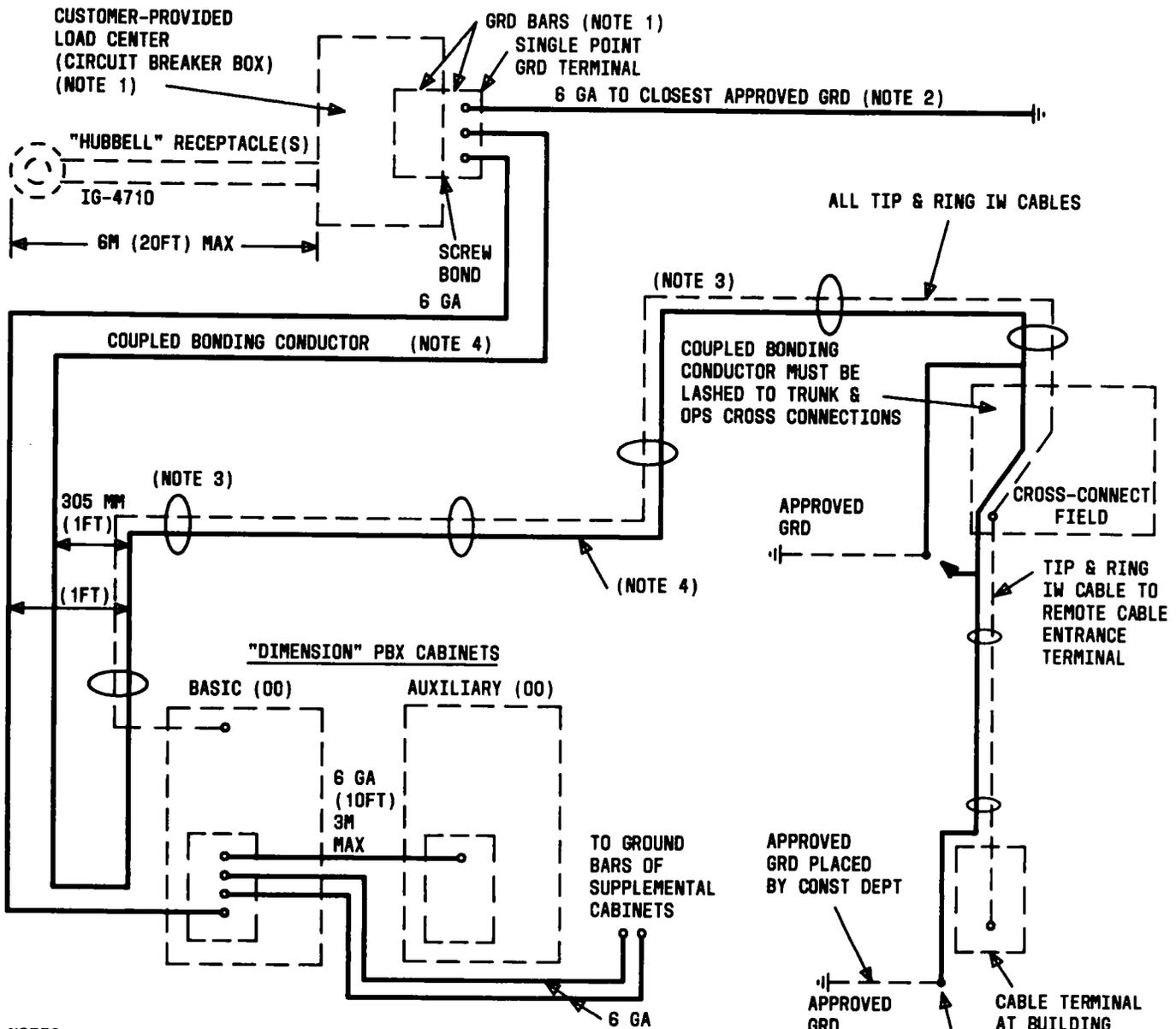
3.19 When a data set is used with the DIMENSION PRELUDE PBX, its circuit ground must always be isolated from its frame ground by opening the appropriate (screw) switch. For example, when the 113DR data set is used for the Remote Maintenance, Administration, and Traffic System (RMATS) feature, apply option P (no common grounds). This opens screw switch S1 in the data set. This isolation is necessary to ensure that lightning surges on the data set green wire ground are not transmitted to the PBX.

B. Emergency Transfer Panel

3.20 A ground conductor (No. 6 AWG) must be provided from an approved ground source (eg, water pipe, building steel frame, ac power ground, or single-point ground) to the emergency transfer panel (609-type). A No. 14 AWG conductor may be used if sufficient mechanical protection of the conductor is provided. This ground conductor provides ground start for each station set having power failure transfer service, and is not used for equipment protection.

ELECTRICAL PROTECTION

3.21 To determine the exposure status of PBX installation and detailed protection requirements, refer to Section 876-300-100.



NOTES:

1. LOAD CENTER AND TWO (2) GROUND BARS (ITE GB-10 OR APPROVED EQUIVALENT) MUST ALWAYS BE INSTALLED BY THE CUSTOMER BEFORE STARTING PBX INSTALLATION.
2. ALL HEAVY LINES (—) ARE GROUNDING AND BONDING CONDUCTORS TO BE RUN BY PERSONNEL INSTALLING THE PBX. THESE LINES MUST BE RUN AS SHOWN WITHOUT DEVIATION.
3. CABLE TIES LASH ALL TIP & RING IW CABLES (FROM THE PBX TO THE CROSS-CONNECT FIELD) TO THE 10 GA COUPLED BONDING CONDUCTOR. THE COUPLED BONDING CONDUCTOR SHOULD NOT ENTER THE PBX CABINET.
4. THE COUPLED BONDING CONDUCTOR MAY CONSIST OF THE FOLLOWING:
 - CONTINUOUS CABLE SHEATH
 - 6 GOOD CABLE PAIRS
 - 10 GA WIRE
 - COMBINATION OF THE ABOVE, THAT IS, 10 GA WIRE FROM SINGLE POINT GROUND TO CROSS-CONNECT FIELD, AND CABLE SHIELD FROM CROSS-CONNECT FIELD TO THE GROUND SHOWN NEXT TO THE CABLE TERMINAL.

Fig. 7—Grounding and Bonding Requirements for DIMENSION PRELUDE PBX

A. Protectors

3.22 The PBX is exposed to lightning surges if either its associated outside plant (or the building in which it is installed) or the ac power lines serving the premises are exposed to lightning surges. If exposed to lightning, station protectors must be installed to protect tip and ring leads associated with trunks. If off-premises stations are run on exposed plant, their tip and ring leads must also be protected by station protectors. In either case, the ground terminal of the building entrance protectors must be bonded to the PBX single-point ground terminal through a conductor that is closely coupled to the protected tip and ring leads. (See **C. Coupled Bonding Conductor.**)



TO MINIMIZE LIGHTNING SURGES AT THE PBX:

- **Verify that all exposed tip and ring leads are protected.**
- **If trunks or off-premises lines are added, check their exposure status and, if needed, add protection.**
- **Provide protection if outside plant or ac lines are exposed. No protection is required if only the building is exposed.**
- **Always ground and bond PBX in the prescribed manner.**
- **Verify that the cold water pipe system is bonded to the ac power entrance ground.**
- **Verify that the metallic shield of the building entrance cable is grounded and also bonded to the protector ground terminal.**

B. Sneak Current Protection

3.23 Heat coils or 60-type fuses must be installed in all CO trunks or tie trunks that are or may be exposed to power. Exposed off-premises extensions are not required to have sneak current protection. For more detailed information on where to

install, how to maintain, etc, see Section 876-300-100 and Section 460-100-400.

C. Coupled Bonding Conductor

3.24 An electrical connection is necessary between the PBX single-point ground and the protector ground terminal. (If protectors are not provided, the coupled bonding conductor is connected to the building entrance cable ground.) This connection is needed to reduce the difference in potential that can appear between tip and ring leads and the system ground as a result of lightning surges. To minimize this electrical potential difference, it is further required that this conductor be closely coupled (to establish transformer action) to the tip and ring leads associated with each PBX. This conductor is designated "coupled bonding conductor."

3.25 The coupled bonding conductor must always be connected from the single-point ground terminal and be lashed (cable tied) to the tip and ring cables from the PBX cabinets to the nearest protector or cable sheath associated with pairs serving the PBX. If a No. 10 AWG conductor is used, it must be installed from the single-point ground terminal to the basic (00) PBX cabinet, and at that point be lashed to the inside wiring (IW) cables containing the tip and ring pairs from all PBX cabinets to the cross-connect field, and connected to the protector or continuous metallic cable sheath ground lug. If this ground lug does not appear at the cross-connect field, then the coupled bonding conductor must be extended to the remote ground lug and lashed to the tip and ring cable to this remote terminal location. Six spare cable pairs in this tip and ring cable may be tied together and used in lieu of the No. 10 AWG conductor. These cable pairs must be tagged with Form E-3013B. The remote ground lug is located at the building entrance. In a 3-story or higher level building of structural steel or reenforced concrete, the shield on a riser cable can be used as remote ground. If no shielded riser cables are found, a No. 6 AWG copper cable should be run, next to the riser cable, to ground at the building entrance.

3.26 The coupled bonding conductor from the protector ground to the green cross-connect field would preferably consist of the continuous metallic cable sheath, if such a sheath is provided. If the sheath extends only to the cross-connect field, then a No. 10 AWG copper wire or six No. 24 AWG cable pairs may be used to extend the conductor to the PBX.

3.27 For methods of providing the coupled bonding conductor in high-rise and low-wide buildings, see Section 876-300-100.

D. Uninterruptible Power Service (UPS)

3.28 The UPS can be provided for the DIMENSION PRELUDE PBX, but must be ordered non-standard.

4. FEDERAL COMMUNICATIONS COMMISSION (FCC) REGISTRATION REQUIREMENTS

4.01 In order to comply with FCC registration requirements, a 66M3-50R connecting block(s) or a 25-pair cable(s) with an RJ21X jack 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 7.6 meters (25 feet) long, but a registered 7.6 meters (25-foot) extender cable may be added to extend the distance between the cross-connect field and connecting block. A functional block diagram of the network interface for FCC registration requirements is illustrated in Fig. 8. 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, foreign exchange (FX), and wide area telecommunications service (WATS) trunks]. Therefore, with the PBX, only tip and ring leads from circuit packs LC08D (dial CO trunk circuit) and LC09D (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. An alternate connector (KS-16690-L1) can be used in place of the 66M3-50R. The alternate connector also supplies an RJ21X connecting jack. The FCC registration also requires that the cross-connect field be either 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.

4.02 To comply with FCC requirement Part 15, Subpart J, the cables interconnecting the PBX cabinet with other PBX cabinets in the system (daisy chain, home run, and control bus assembly cables only), with the cross-connect field, with the RMATS data set, or attendant console must be shielded. The ED-1E310-11 cable groups 77 through 79, 87 through 91, and 93 through 97 provide for shielded cable between PBX cabinets. These groups are provided in predetermined lengths. Groups 82, 84, and 85 of ED-1E310-11 provide for shielded cables between the PBX cabinet and the RMATS data set, the cross-connect field, and the attendant console, respectively. These cable groups can vary in length, but must be at least 9.2 meters (30 feet) long.

4.03 To comply with FCC technical requirements, the maximum allowed loop resistance to be used serving LC588, excluding terminal equipment, shall be less than 950 ohms. This applies to all FCC registered terminal equipment. Only registered station sets, registered terminal equipment, equipment registered in conjunction with the PBX, or private line services may be connected to the LC588 circuit packs.

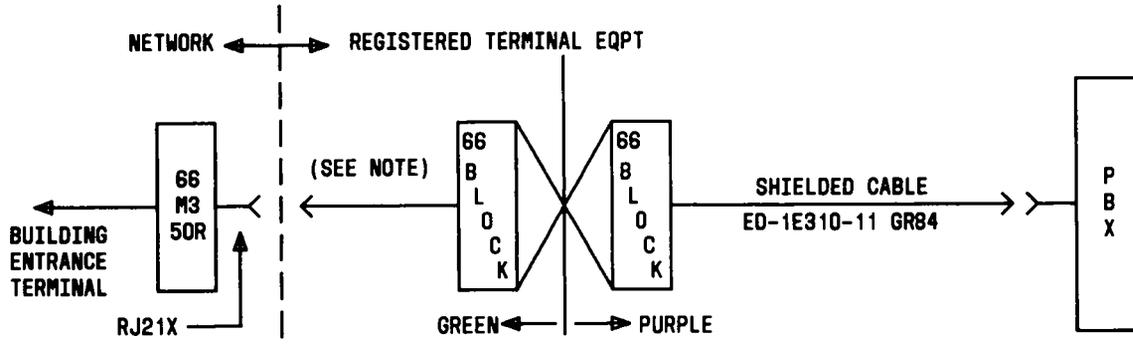
4.04 The DIMENSION PRELUDE PBX cabinets have a permanently lettered registration label that is centrally located at the top of the rear cover.

5. CABLING AND CROSS-CONNECT FIELD

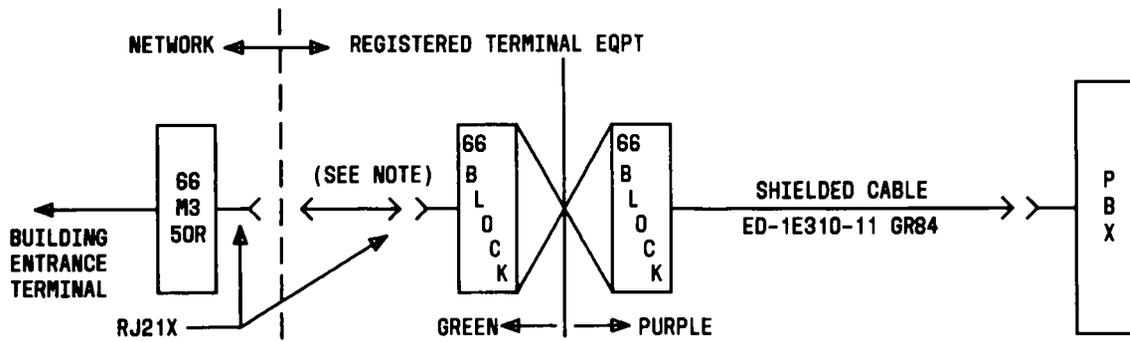
CABLING

5.01 The circuits in the PBX cabinets are connected to the lines, trunks, and consoles by connector cables using KS-type plugs. These cables must be shielded (ED-1E310-11 GR82, GR84, GR85). The shield must be connected to the terminal grounding blocks located on the rear cabinet uprights. These cables are then cut down on the cross-connect field.

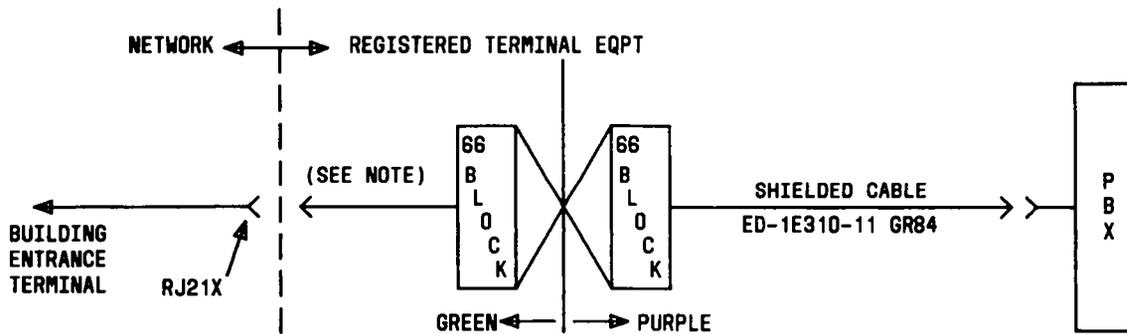
5.02 The cables and carrier connectors are designated by carrier number, cable function, and cable number as follows.



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



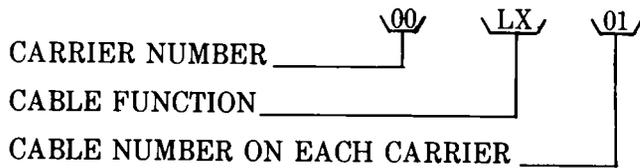
B. WITH 66M3-50R ON BOTH THE NETWORK AND REGISTERED TERMINAL EQUIPMENT SIDE



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. 8—Typical FCC Registered Equipment Interconnections



(a) **Carrier Number:** Assigned sequentially for each type of carrier in the system. There may be a maximum of seven line carriers numbered 00 through 06, three trunk carriers numbered 01 through 03, and one trunk/control carrier numbered 00. The trunk/control carrier and the cables from this carrier do not have the carrier number specified.

(b) **Cable Function:** Circuit designations associated with the cables and connectors are as follows:

- AX—Basic line carrier
- LX—Line carrier
- CA—Attendant interface circuit in a control carrier
- TX—Trunk carrier
- TCX—Trunk/control carrier
- CX—Control carrier.

(c) **Cable Number on Each Carrier:** Number of the cable on the particular carrier is as follows:

- AX—From 01 through 03
- LX—From 01 through 03
- CA—01 and 02
- TX—From 01 through 04
- TCX—From 01 through 03
- CX—From 01 through 06.

CROSS-CONNECT FIELD

A. Description

5.03 Figure 9 shows a typical cross-connect field layout for a DIMENSION PRELUDE PBX

(three carriers and an auxiliary cabinet). The size of the cross-connect field will vary depending on the size and options used (ie, the number of lines or if key or auxiliary equipment is used).

5.04 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 system cables which terminate on the blocks. **Backboard colors and type of circuits terminated are as follows:**

COLOR	TERMINATED
Green	CO trunk sets
Blue	Station line sets
Red	Key equipment
Yellow	Miscellaneous circuits and equipment
Purple	PBX circuits and equipment (line/trunk)

5.05 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.

B. Emergency Transfer

5.06 Prewired 609-type interface panels may be used to provide connections to emergency transfer facilities. Each 609A-type panel contains apparatus for transferring ten stations to ten CO cable pairs during power failure or alarm conditions. The panels should be mounted in the cross-connect field, as shown in Fig. 9, for ease of cross-connecting to the circuits. Trunks with terminal balancing treatment and power failure transfer service shall be cross-connected to allow the terminal balancing networks to remain in the circuit after power failure transfer.

5.07 A second 609-type transfer panel can also be used for transferring an attendant console position for night console operation.

5.08 Ground start for emergency transfer stations is furnished by a ground conductor (No. 6

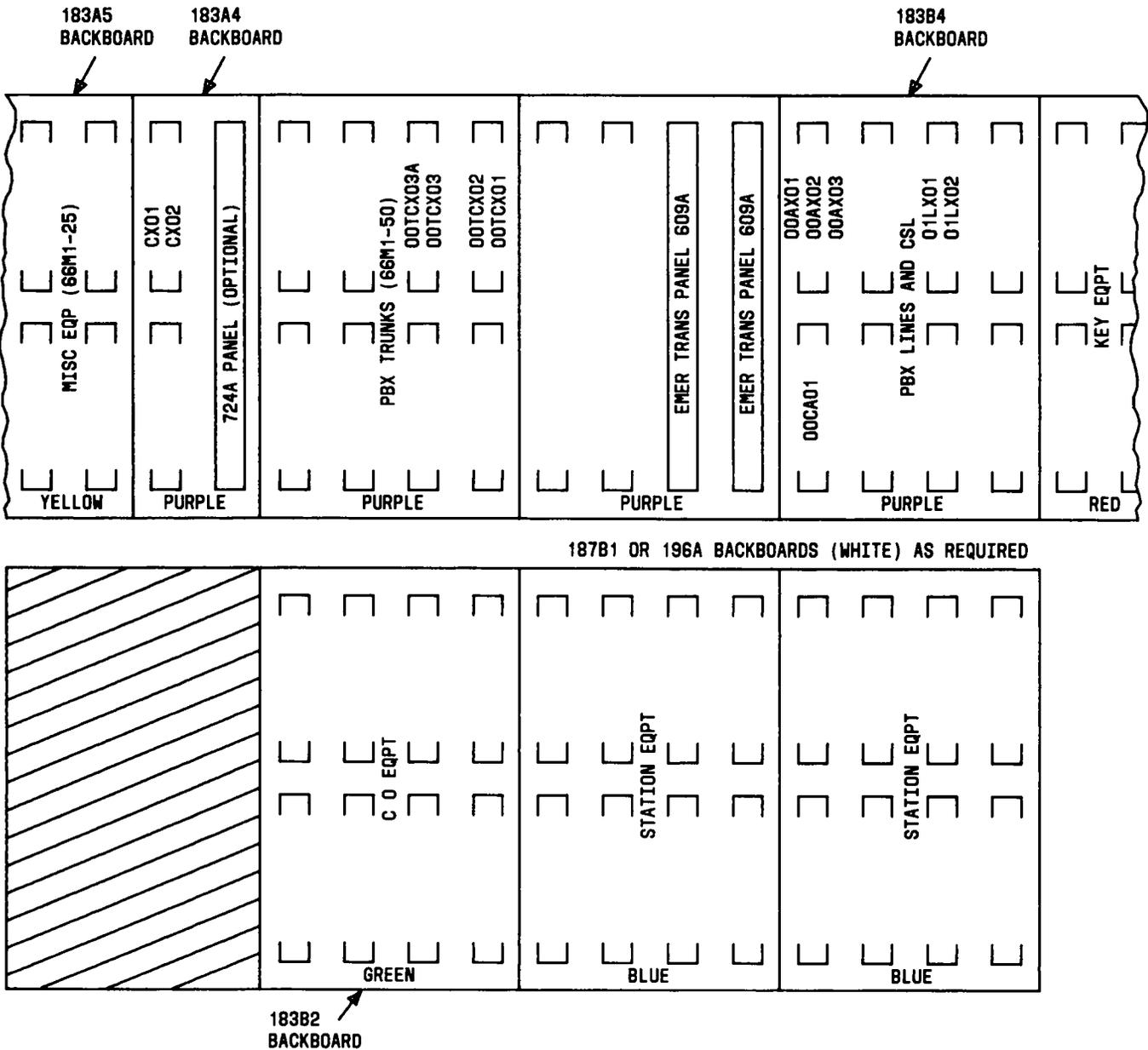


Fig. 9—Cross-Connect Field

AWG maximum) from an approved ground source (eg, water pipe, building steel frame, or ac power ground) to the 609-type emergency transfer panel. An AWG No. 14 conductor may be used if sufficient mechanical protection is provided for the conductor. This ground start conductor runs through a relay contact in the 609-type panel to the ground start key. Ground start is provided for each PBX station set assigned for emergency transfer service and is not intended for equipment protection.

Note: A Thomas & Betts Co. lug ("LUG-IT" No. 3531) is shipped loose with the 609-type panel to be used for termination of the ground wire (AWG No. 14 through AWG No. 6).



The 48-volt and ground leads to the 609A panel should be insulated to protect accidental shorting and inadvertent transfer. These leads

should not be diverted for any other reason.

5.09 Refer to Section 518-010-101 for detailed information on cross-connect fields installed on customer premises.

C. Cross-Connect Field Enclosures

5.10 The cross-connect field enclosure assembly (Fig. 10) is available in three sizes as follows:

(1) One assembly is 686 mm (27 inches) high, 432 mm (17 inches) wide, and 229 mm (9 inches) deep. The 686-mm (27-inch) high assembly is used to cover one standard 432 mm by 508 mm (17- by 20-inch) backboard and one 196A distribution ring backboard. This size can be expanded horizontally and vertically as required.

(2) One assembly is 1372 mm (54 inches) high, 432 mm (17 inches) wide, and 229 mm (9 inches) deep. The 1372-mm (54-inch) high assembly is used to cover two standard 432 mm by 508 mm (17- by 20-inch) backboards and two 196A distribution ring backboards. This size can be expanded horizontally as required. A 609-type emergency transfer panel can be located in the vacant part of the field.

(3) One assembly is 1930 mm (76 inches) high, 432 mm (17 inches) wide, and 229 mm (9 inches) deep. The 1930 mm (76-inch) high assembly is used to cover three standard 432 mm by 508 mm (17- by 20-inch) backboards and two 187B1 or three 196A distribution ring backboards.

5.11 These enclosures may be multiplied horizontally as needed. The top and side panels will accommodate the additional depth of the 19-mm (3/4-inch) backboard on which the frame assembly is mounted. The door panel is provided in two different groups. Group 1 is used when the field enclosure assembly is mounted on the wooden backboard and Group 4 is used when the field enclosure assembly is mounted flush on the wall (without wooden backboard).

5.12 The 1930-mm (76-inch) high enclosure assembly would normally be used where the cabinets are located some distance from the backboard enclosure assembly.

5.13 The installation of one **1930-mm (76-inch)** high cross-connect field enclosure (ED-1E322-70) requires the following:

- One GR1/GR4, consisting of the basic enclosure with door, brackets, and hardware
- Two GR2s, each consisting of one side panel and hardware
- Two GR3s, each consisting of one top/bottom panel and hardware.

When more than one enclosure is used (joined), GR2 side panels are required only at the ends.

5.14 The installation of a **1372-mm (54-inch)** high cross-connect field enclosure (ED-1E322-71) requires the following:

- One GR1/GR4, consisting of basic enclosure with door, brackets, and hardware
- Two GR2s, each consisting of one side panel and hardware
- Two GR3s, each consisting of one top/bottom panel and hardware.

When more than one enclosure is used (joined), GR2 side panels are required only at the ends.

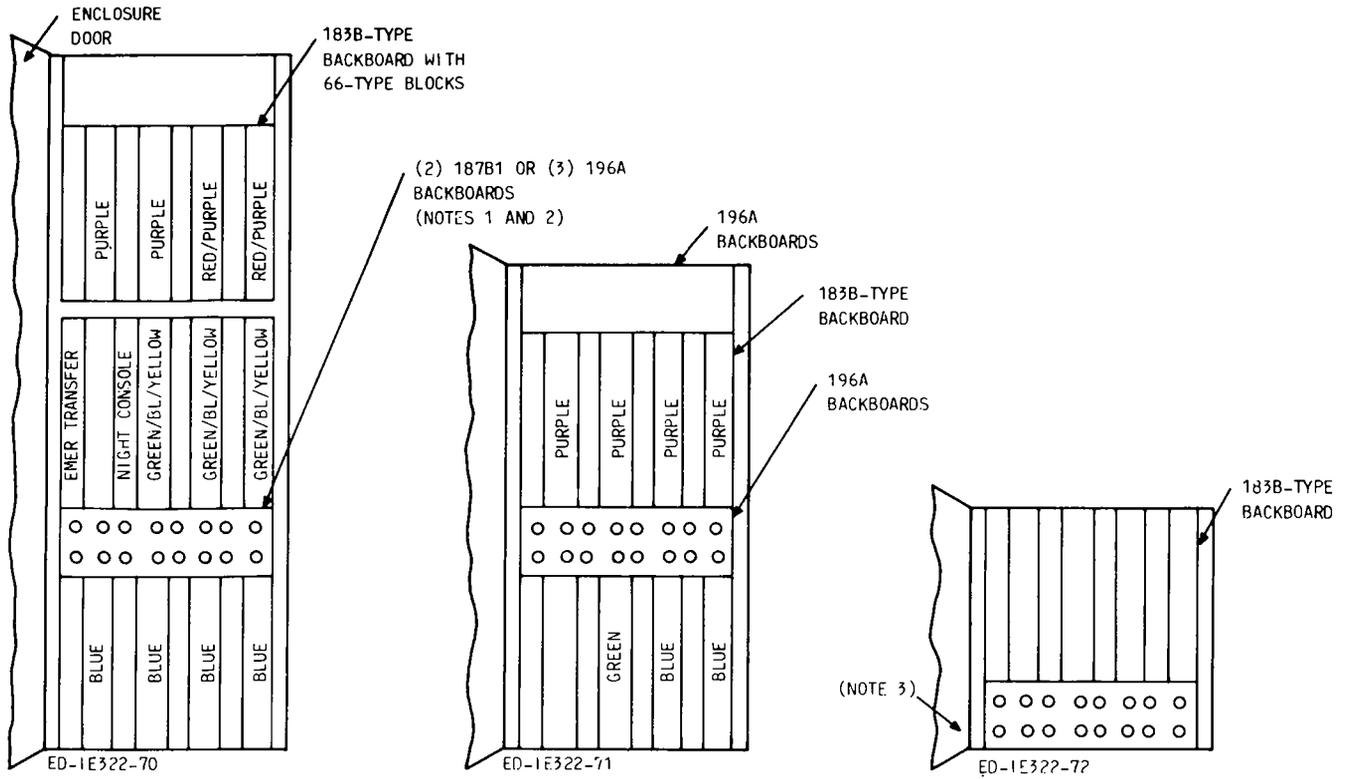
5.15 The installation of a **686-mm (27-inch)** high cross-connect field enclosure (ED-1E322-72) requires the following:

- One GR1/GR4, consisting of the basic enclosure with door, brackets, and hardware
- Two GR2s, each consisting of one side panel and hardware
- Two GR3s, each consisting of a top/bottom panel with hardware.

When more than one enclosure is used (joined), GR2 side panels are required only at the ends.

5.16 The cross-connect field enclosures are designed to be located on customer premises and may house the following apparatus:

- 183 (Type) backboards
- 184 (Type) backboards
- 187B1 backboards
- 196A backboards



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 SECTION 518-010-101 FOR TYPICAL LAYOUTS.
3. CABLING IN THROUGH KNOCKOUTS IN SIDE AND BOTTOM.
4. "A" SIZE - 21.5 cm X 50.8 cm (8.5 IN. X 20 IN.) "B" SIZE - 43.2 cm X 50.8 cm (17 IN. X 20 IN.)

Fig. 10—Cross-Connect Field Enclosures

- 609 (Type) emergency transfer panels
- 620A (modular) key panels
- 624A (modular) key panels
- 641A (modular) key panels
- 642A (modular) key panels
- 720A panel
- 722A panel
- 724A panel.

Backboard ordering information is shown in Table B.

D. Cross-Connect Tables

5.17 Computer-generated cross-connect tables are delivered from the factory prior to the delivery of the system. These tables should be completed and provided for installer use at the time of installation.

E. Attendant Console Cross-Connections

5.18 The attendant console may be connected directly to the CA01 connector on the trunk/control carrier using an ED-1E310-11 GR85 cable or via a connector block in the cross-connect field using an ED-1E310-11 GR84 cable (Fig. 11). Second, third, and fourth attendant consoles may be connected to the CA02, CA03, and CA04 connectors, respectively, on the J58891AA-1 trunk/control carrier.

F. Night Console Cross-Connections

5.19 The night attendant console option provides an alternate console for use after normal working hours. To activate night console, the attendant places the 6017B night transfer switch, located near the daytime console, in the night position and disconnects the unused handset or headset from the daytime console. The night console can be switched in and out of service by the 609-type transfer panel located in the cross-connect field. (See Fig. 12.) When a night console is provided, the day attendant console must be connected via a connector block in the cross-connect field.

TABLE B

BACKBOARD DESIGNATIONS

TYPE	COLOR	SIZE IN MILLIMETERS (INCHES)	ORDERING CODE
183A4	Purple	216 (8.5) × 508 (20)	101937902
183A5	Yellow	216 (8.5) × 508 (20)	101986446
183B1	Blue	432 (17) × 508 (20)	101412989
183B2	Green	432 (17) × 508 (20)	101564631
183B3	Red	432 (17) × 508 (20)	101937910
183B4	Purple	432 (17) × 508 (20)	101937928
183B5	Yellow	432 (17) × 508 (20)	101986453
196A	White	432 (17) × 117 (4.6)	102581089
187B1	White	432 (17) × 168 (6.6)	101937944

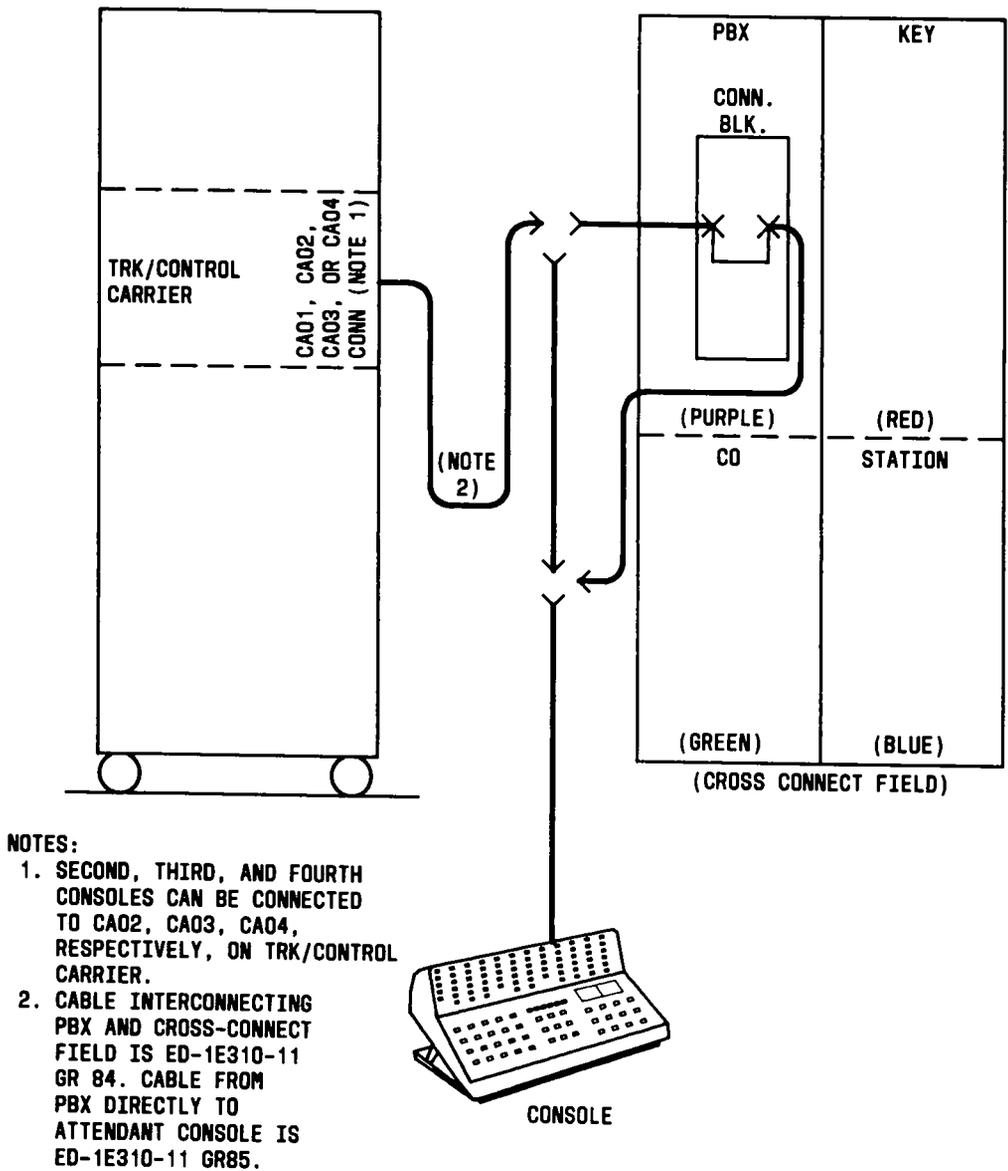


Fig. 11—Console Connected to the PBX via the Cross-Connect Field

6. FEATURE HARDWARE

OPTIONAL CIRCUIT PACKS (CPs)

6.01 The DIMENSION PRELUDE PBX may be ordered in a few different models. Each model comes with a set of predetermined CPs. If alternate or additional CPs are needed to provide a feature, the engineer must determine the need for them. For example, all trunk CPs shipped with the DIMENSION PRELUDE PBX will be LC08s. If DID is desired, the appropriate number of LC09s must be ordered. Alter-

nate or additional CPs can be ordered using the Mechanized Ordering Form E-8194.

6.02 Table C correlates optional CPs that would need to be ordered separately for the applicable features. For circuit pack descriptions, see Section 554-102-100.

AUXILIARY EQUIPMENT ASSOCIATED WITH FEATURES AND SERVICES

6.03 Auxiliary equipment for the DIMENSION PRELUDE PBX will usually be installed in

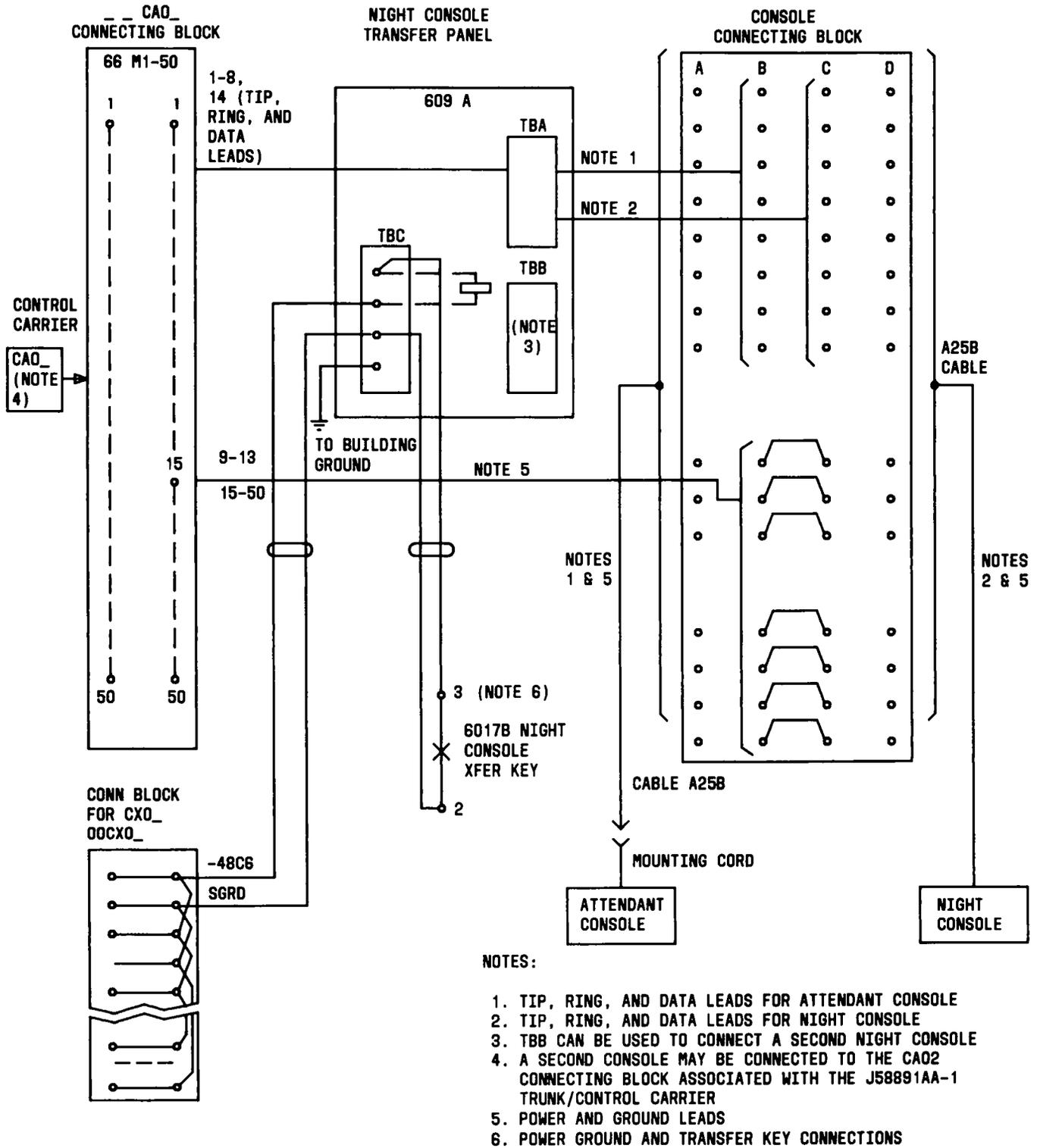


Fig. 12—Night Console Interconnection

TABLE C
OPTIONAL CPs FOR FEATURES

CIRCUIT PACK	FEATURE
LC06B	Attendant Conference, Six-Way Station Conference, Meet-Me Conference
LC09D	DID
LC10C*	—
LC11B	Advanced Private Line Termination, CCSA, Tandem Tie Trunk Switching, Tie Trunk Access
LC12	Tandem Tie Trunk Switching
LC13B	Call Park, Intercept Treatment, Loudspeaker Paging (Basic and Deluxe), Music-On-Hold, Recorded Telephone Dictation Access, UCD/DDC Recorded Announcement
LC15†	—
LC17	Code Call Access (Chime Paging)
LC145‡	—
LC361	Data Communications Access, OPS

* Not required for a particular feature, but may be ordered to provide additional TOUCH-TONE® dialing registers/receivers.

† Provides interface for 24B-Type LSIs and “behive” lamps.

‡ Enables remote 1-way and loop-around transmission tests for routine maintenance. Only one is necessary per system.

the J58891B-1 auxiliary cabinet (Fig. 13). Some equipment may be installed in dedicated cabinets, whereas other equipment is installed elsewhere (ie, inside building that houses the PBX). The list structure for the auxiliary cabinet is given in Table D. When this option is selected, care should be exercised to ensure isolation of the frame from external ground sources. The single-point ground scheme must be maintained.

6.04 The equipment associated with features and/or services is listed below and described in the following paragraphs.

- Attendant console repeater
- Calling number display to station
- Code calling access
- CAP
- Customer premises facility terminal
- Data channel repeater
- Line status indicator (24A-type)
- Loudspeaker paging

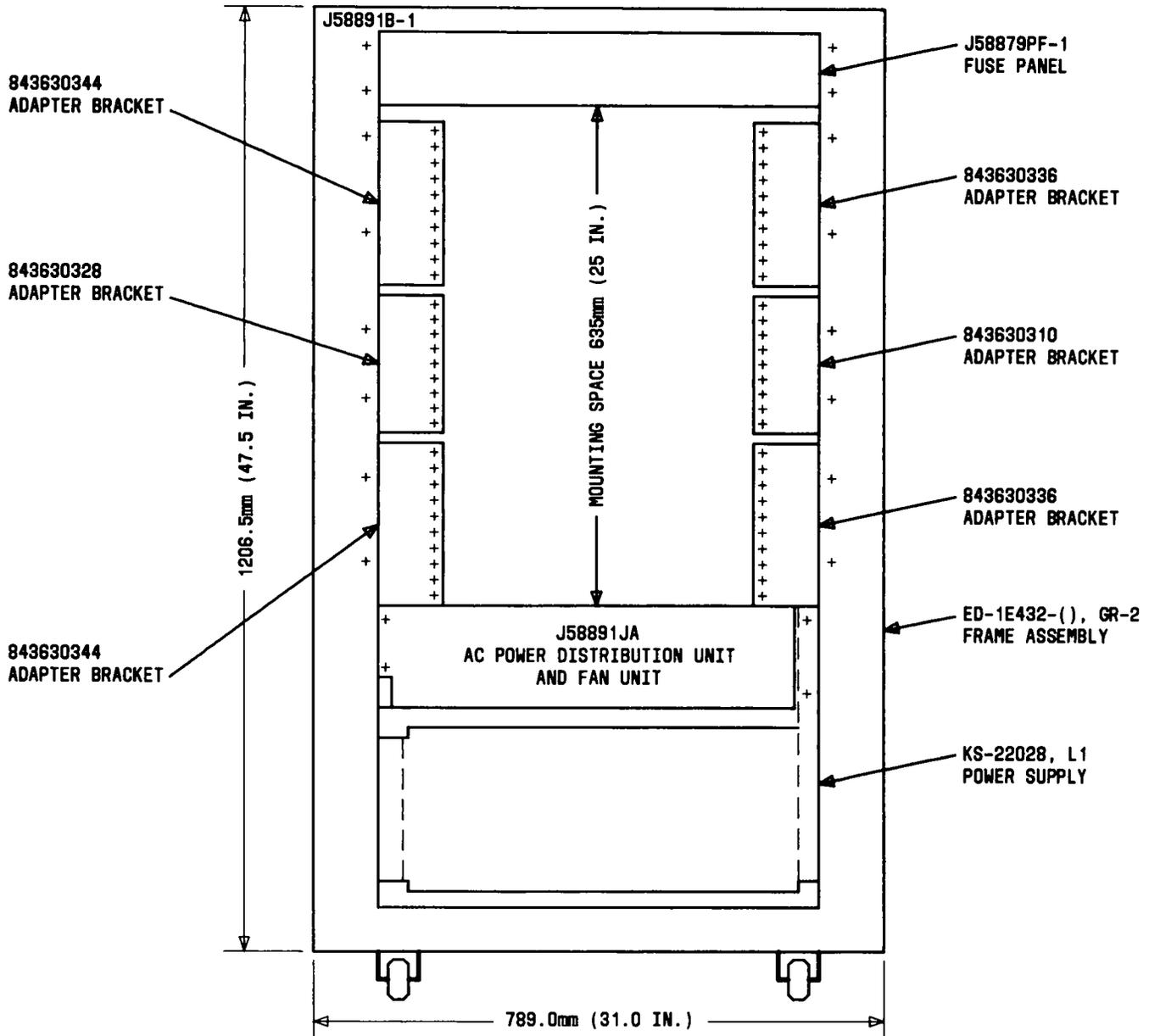


Fig. 13—Auxiliary Cabinet—J58891B-1

- Music-on-hold
- Radio paging access
- Recorded announcement intercept connection
- Recorded telephone dictation access
- 44V4 repeater
- 24V4 repeater
- SMDR
- TAAS
- UCD/traffic overflow indicator

TABLE D

J58891B AUXILIARY CABINET AND COMMON EQUIPMENT SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
1	Auxiliary Cabinet, J58891B, List 1	Framework, assembly, and equipment to provide 1143mm (45 inches) of vertical mounting space for 584mm (23 inch) wide and 483mm (19 inch) deep auxiliary equipment units.
	Auxiliary Cabinet, J58891B, List 2	Equipment required in addition to List 1 to provide an ac power distribution unit, arranged for a 117-volt power source (J58881JA-1, L-7).
	Auxiliary Cabinet, J58891B, List 3	Equipment required in addition to Lists 1 and 2 to provide a forced air cooling system (J58881JA-1, L-5).
	Auxiliary Cabinet, J58891B, List 4	Equipment required in addition to Lists 1 and 2 to provide a frequency generator (J58879PC-2, L-6).
	Auxiliary Cabinet, J58891B, List 5	Wiring and equipment required in addition to Lists 1, 2, and 7 to provide 23 fuse positions (-48V) and ringing and interrupter terminal strips.
	Auxiliary Cabinet, J58891B, List 6	Wiring and equipment required in addition to List 4 to provide one frequency interrupter unit (J58879PC-2, L-7).
	Auxiliary Cabinet, J58891B, List 7	Equipment required in addition to List 2 to provide -48V, 8-ampere power supply (KS22028, L-1).
2	Recorded Telephone Dictation Trunk J58827E, List 1	Applies to J58879F, Lists 2, 3, 6, 7, and 8 recorded telephone dictation trunk 102mm (4-inch) vertical mounting space required.
	Recorded Telephone Dictation Trunk J58827E, Lists 1 and 2	Cable assembly required in addition to List 1 when TOUCH-TONE service receiver is required per CAD-21, [Each J99289 A-1 mounting assembly required 152mm (6-inch) vertical space and houses two J99289B-1 TOUCH-TONE service receivers.]
3	44V4A Repeater J98615AH, List 2, 2A	Voice repeater for 48-volt operation. Requires 51mm (2 inches) of vertical mounting space.
	44V4B Repeater J98615AH, List 3, 3B	Data repeater for 48-volt operation. 51mm (2-inch) vertical mounting space required.

TABLE D (Contd)

J58891B AUXILIARY CABINET AND COMMON EQUIPMENT SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
4	24V4C Repeater J98615BJ, List 2	Two-wire to four-wire repeater for 48-volt operation.
	24V4D Repeater J98615BL, List 2	Two-wire to four-wire repeater for 48-volt operation with loop-around repeater in the event of a power failure.
5	Type G1 TTC RCVR Unit, J59204, List 1	TOUCH-TONE service receiver to be used with (HJ16), input AMP and channel detector, (HJ17) channel filter CP, and AE46, relay driver CP.
6 7	Type A3, TOUCH-TONE service Receiver, J99289A and J99289B	Used with J58827E, Lists 1 and 2. Each J99289A-1 houses two J99289B-11 receivers. 152mm (6-inch) vertical mounting space.
	J99380A-1, List 1, 4 CPFT Assembly Hardware	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	Assembly, wiring, and common equipment required for on apparatus mounting panel equipped to accept up to twelve 837 type units.
8	CPFT Shelf Assembly J99390C-1, List 1	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	Assembly and wiring, for one hinged double-depth frame assembly suitable for mounting J99380A, B, C, and E shelf assemblies.
	CPFT Shelf Assembly J99380E-1, List 1, 4	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	CPFT Double-Depth Shelf Assembly J99380, List 1 Only	Provides an assembly for mounting CPFT shelves in a double-depth arrangement, ie, one front shelf and one back shelf on the same level (for mounting KTU and 837-type CKT pack). 229mm (9-inch) vertical space.
	J58822B, List 5	Code term and jack (SD-66610) for 3A code call. 102mm (4-inch) mounting space.
10	J58822B, List 5 —Optional—	Code term (optional) for 3A code call. 51mm (2-inch) mounting space.
	J58822B, Lists 1, 8, 9, or 10	3A code spend unit. 254mm (10-inch) mounting space.

TABLE D (Contd)

J58891B AUXILIARY CABINET AND COMMON EQUIPMENT SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
11	J58824CD, List 7, 16	Interface unit for radio paging without answerback. 254mm (10-inch) vertical mounting space.
	J58824CD, Lists 7, 12, 16, 17	Interface unit for radio paging with answerback. 254mm (10-inch) vertical mounting space.
	J58824CD, List 9	Interface unit for one applique unit when TOUCH-TONE calling signals are converted to dial pulses. 51mm (2-inch) vertical mounting space.
	J58824CD, List 15	Assembly, wiring, and equipment for one applique unit required in addition to List 7 or 13 when TOUCH-TONE calling signals are converted to DC signals on a 2-out-of-7 lead basis using type GI receivers.
12	Radio Paging J58204CA	Required for attendant access. Requires 51mm (2-inch) vertical mounting space in the auxiliary equipment cabinet.
13	Radio Paging Dial Pulse Conversion J588474, L3, L4	Required with TOUCH-TONE calling systems and with rotary dial radio paging equipment.

- Visually impaired attendant service.

A. Attendant Console Repeater

6.05 The attendant console repeater unit (Fig. 14) provides range extension and/or lightning protection for the PBX low-speed data channels, as well as the alarm, ground, and -48 volt leads. The console power is furnished by an external supply located at the console end repeater. The power supply (284B1 power unit) must be ordered and mounted separately from the repeater unit. The repeater may be used in one of two configurations as follows:

- The repeater may be used when a console is located in a different building than the PBX, and range extension is not required because the distance between the PBX and console is 300 meters (1,000 feet) or less.
- The repeater may be used when range extension is required because the distance between the PBX and console is more than 300 meters

(1,000 feet) but equal to or less than 3350 meters (11,000 feet) (four cascaded repeaters can be used allowing up to 910 meters [3,000 feet] between each repeater).

6.06 The repeater circuit is designed to operate in unexposed environments without additional protection. It will operate in exposed environments with standard protection.

Housing and Mounting

6.07 The repeater circuitry is housed in a modified key service unit with a capacity for one repeater circuit. The unit can be configured for use at either the PBX end or the console end.

6.08 The unit is designed to be wall-mounted near a 120-Vac 60-Hz outlet. Power cords are available in four lengths of 610, 1220, 1830, or 3658 mm (2, 4, 6, or 12 feet)—J58879KC, Lists A, B, C, or D, respectively.

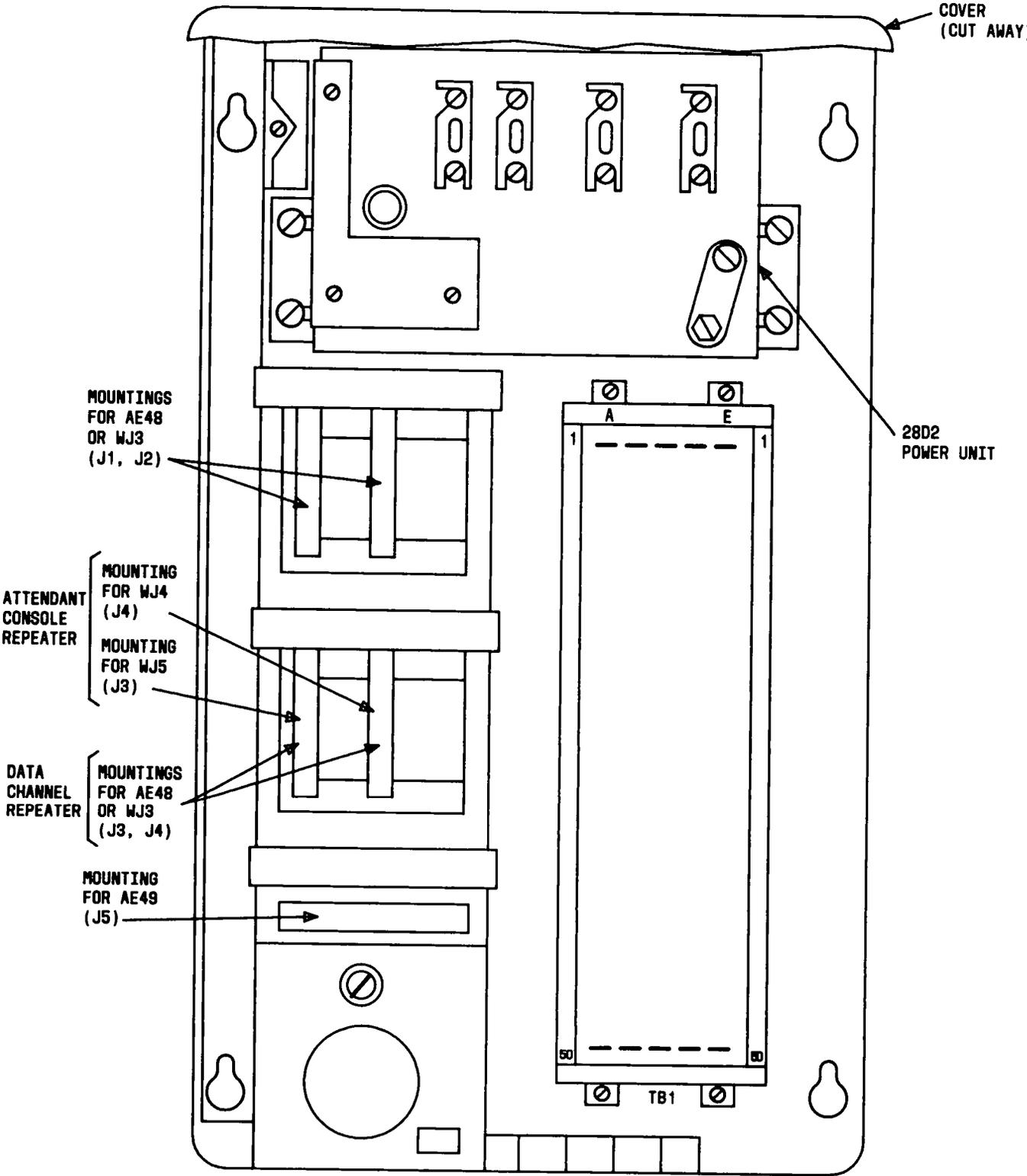


Fig. 14—Repeater

Range Extension Configuration

6.09 When used for range extension (Fig. 15), the attendant console repeater is equipped as follows:

- Two J58879KD, List 1 (repeater assemblies)
- Two J58879KD, List 2 (28D2 power unit and AE-49 circuit packs)
- Four J58879KD, List 3 (AE-48 circuit packs)
- One J58879KD, List 5 (WJ4 circuit pack)—required at console end repeater only
- One J58879KD, List 6 (WJ5 circuit pack)—required at PBX end repeater only
- One J58879KD, List 7 (console power unit 284B1)
- Three J58879KD, power input cords for power units (lengths of power cords are specified in paragraph 6.08).

6.10 The 28D2 power unit and AE-49 circuit packs are required in both the PBX end and console end repeaters when range extension is provided. The power unit for the attendant console end (284B1) is also required with or without range extension.



If the attendant console is located in a building separate from the PBX, attendant console repeaters must be used. If range extension is not required, the repeater units provide isolation between PBX and console.

Intermediate Repeaters

6.11 When intermediate console repeaters are used, they should be equipped as follows:

- One J58879KD, List 1 (repeater assembly with wiring option Z)
- One J58879KD, List 2 (28D2 power unit and AE-49 circuit pack)
- Two J58879KD, List 3 (AE-48 circuit packs).

Repeaters Without Range Extension

6.12 When repeaters are used without range extension (Fig. 16), they should be equipped as follows.

- Two J58879KD, List 1 (repeater assemblies)
- Four J58879KD, List 4 (WJ3 circuit packs).

Required at PBX end repeater only:

- One J58879KD, List 6 (WJ5 circuit pack)

Required at console end repeater only:

- One J58879KD, List 5 (WJ4 circuit pack)
- One J58879KD, List 7 console power unit 284B1.

Cable Runs

6.13 The console repeater circuit is designed to be used in unexposed environments without additional protection and in exposed environments with standard 0.08 mm (3-mil) carbon block protection. No special treatment is required for repeater cable runs.

6.14 Cable runs from the repeater to the console or PBX must not be installed in an exposed environment. This restriction is determined by the PBX and console connecting circuitry which cannot tolerate exposed environments and cannot be adequately protected. All cabling used in conjunction with the console repeater circuits should be AWG 24, 25-pair, regardless of the length of the cable run.

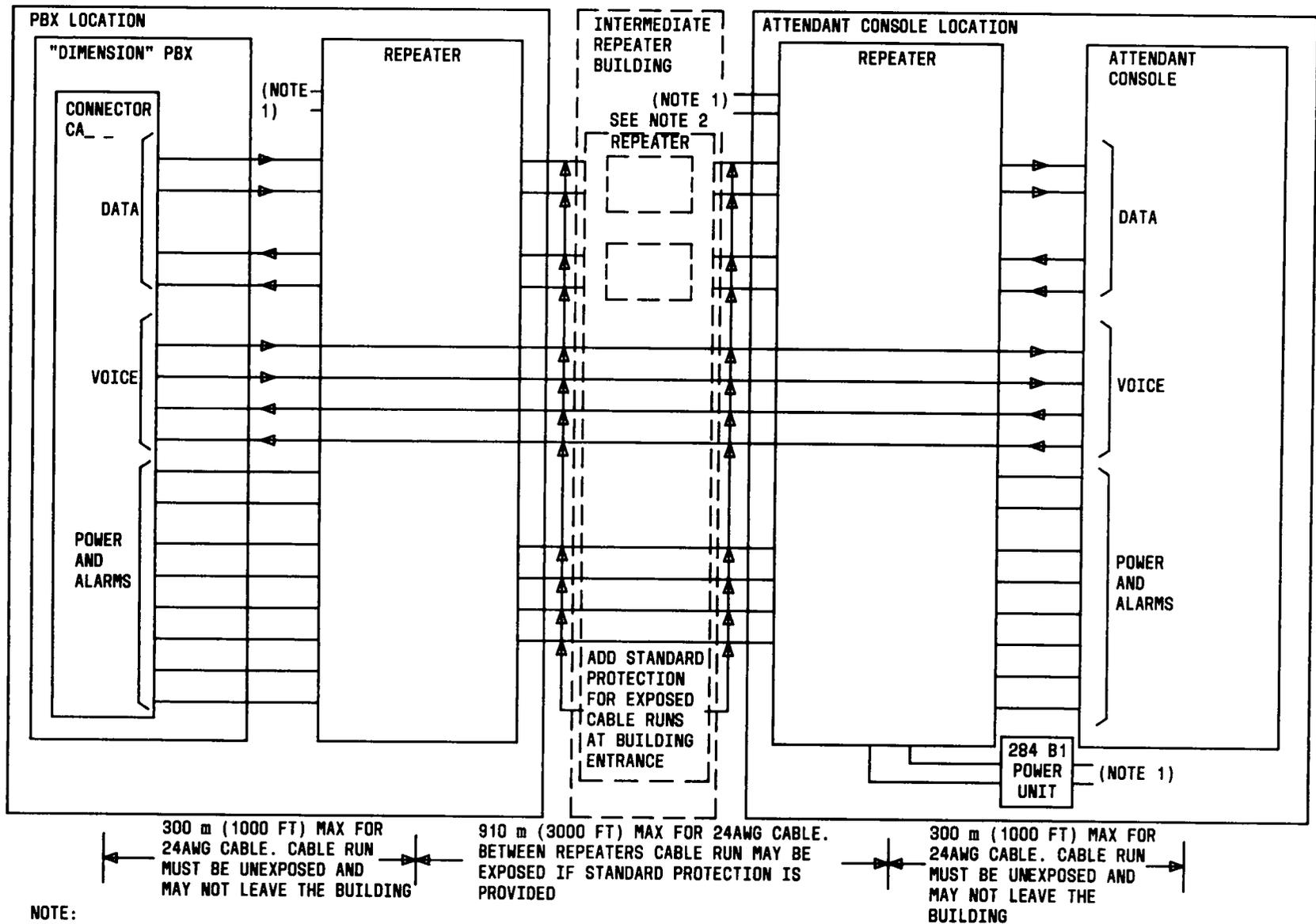


At the console-end repeater, both power supplies must connect to the same 120-Vac source. The ground lug of the console-end repeater must connect to an approved ground.

Repeater Location

6.15 The physical characteristics of the repeater circuit require that it be installed inside a building. The repeater locations should also satisfy the following requirements:

- Same building and less than 300 meters (1000 feet) cable distance from the PBX or attendant console.
- Equal to or less than 910 meters (3000 feet) cable distance between each repeater circuit.
- Close to a 3-prong ac outlet. (If range extension is provided, two outlets on the same cir-



NOTE:

1. THE UNIT PLUGS INTO A COMMERCIAL 120VAC POWER SOURCE.
2. TWO INTERMEDIATE REPEATERS CAN BE CASCADED BETWEEN THE PBX REPEATER AND THE CONSOLE REPEATER ALLOWING A TOTAL DISTANCE OF 3350 m (11,000 FEET) BETWEEN CONSOLE AND PBX. STRAPPING OPTION Z MUST BE WIRED ON THE INTERMEDIATE REPEATERS WHENEVER CASCADED REPEATERS ARE USED.

Fig. 15—Attendant Console Repeater With Range Extension

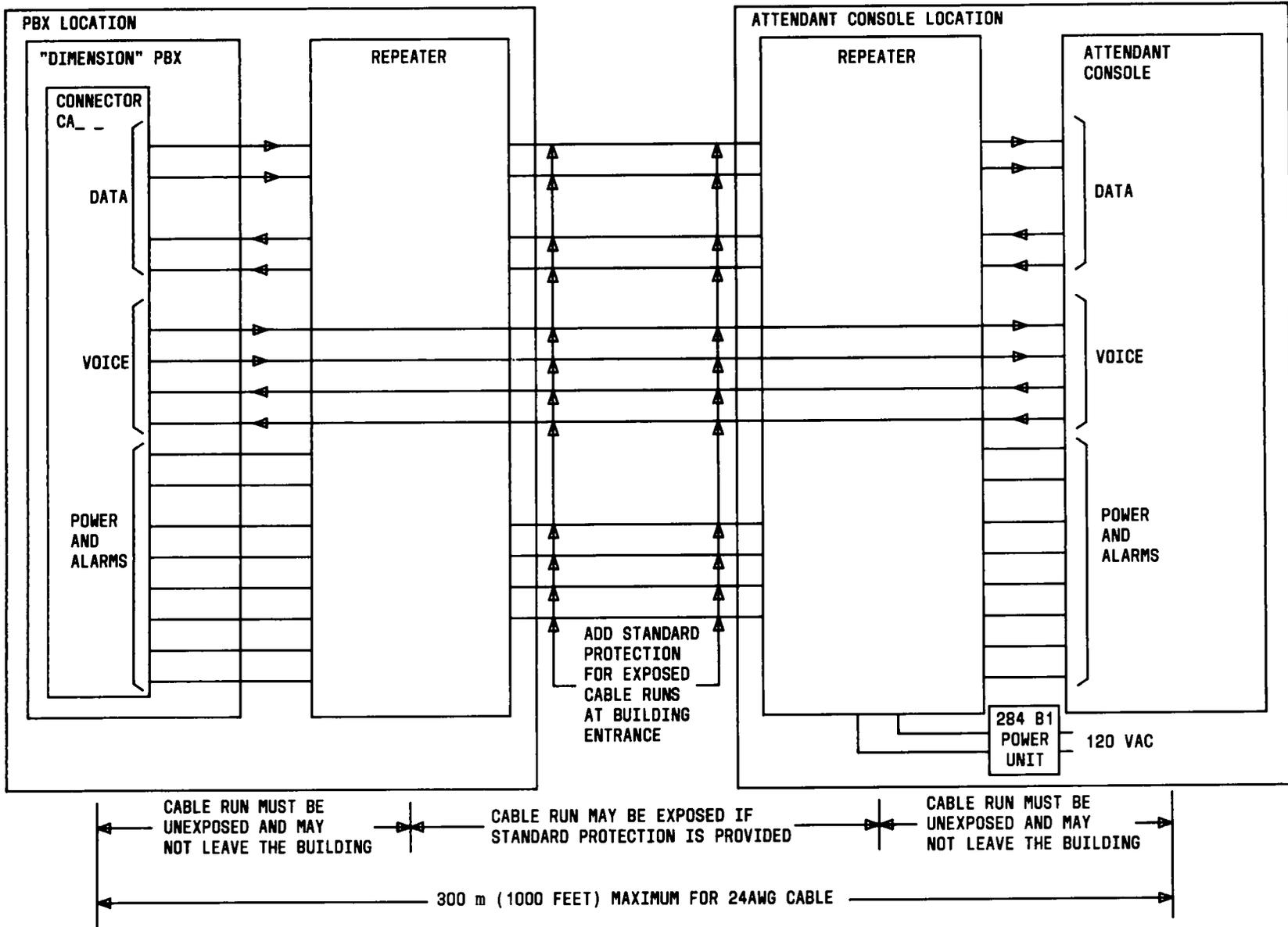


Fig. 16—Attendant Console Repeater Without Range Extension

cuit must be provided for the console-end repeater.)

- The console-end repeater must be located close to an approved ground.

AC Power

6.16 Provision is made for the use of either 123-, 117-, or 111-volt ac power. The power supplies are designed to tolerate line surges.

Tip and Ring Protection

6.17 The console repeater circuit provides no protection for the 4-wire console talk path. Where exposed cable runs exist, standard carbon block protection is adequate for these leads.

6.18 Figures 15 and 16 illustrate the console repeater installations, providing lightning protection only (without range extension) and lightning protection (with range extension).

B. Calling Number Display to Station

6.19 Each line of the PBX equipped for the Calling Number Display to Station feature will require the following:

- One 102D (calling number) display unit
- One 211A power unit
- One KS-19252, List 7 adapter
- One low-speed data channel (one circuit of an LC554 circuit pack).

The equipment arrangement for Calling Number Display to Station is shown in Fig. 17. Ordering code information for various equipment styles and colors is given in Table E. The 102-type display terminal derives its power from a 211A power unit that requires a 120-Vac 60-Hz source.

C. Code Calling Access

Chime Paging

6.20 The Code Calling Access (Chime Paging) feature enables attendants, station users, and tie trunks to dial an access code and a 2- or 3-digit called

party code to activate an electronic chime corresponding to the called party code. The called party can then be connected to the calling party by dialing an answering code from any station within the PBX. When chime paging is required, the following hardware must be installed (refer to Fig. 18 for a block diagram of hardware connections):

- LC17B tone board
- 89A control unit
- 2012B power transformer.

6.21 The 89A control unit should be located as close as possible to the cross-connect field and the paging amplifier to minimize lead lengths. The customer should provide a 120-Vac outlet for the 2012B transformer. One transformer is capable of serving up to three 89A control units. Both voice and chime paging can be provided in the system if two 89A control units are used. Only one amplifier is required to furnish amplification for both 89A control units. Refer to Loudspeaker Paging Equipment in this Part 6 for required equipment and connections for voice and chime paging.

3A Code Call

6.22 The 3A Code Call Access is a standard feature provided in the DIMENSION PRELUDE PBX. This feature is an alternate method of providing chime paging. An equipment summary for 3A code calling is shown in Table F.

6.23 The 3A code call unit may have two incoming ports and two answer ports. These four ports are connected to CO trunk circuits (LC08D) via the cross-connect field (Fig. 19). In a PBX with light traffic, only one incoming port and one answer port may be required. The second incoming port and answer port are optional and can be used in PBX systems where heavy traffic is anticipated.

D. Customer Administration Panel (CAP)

6.24 The CAP (J58879DC-1) and the CAP interface unit (J58879DD-1, List 2) is the necessary equipment to provide the CAP feature.

6.25 The CAP can be located up to 229 meters (750 feet) from the PBX. An ON/OFF switch on the side of the CAP activates the customer's unit, and by

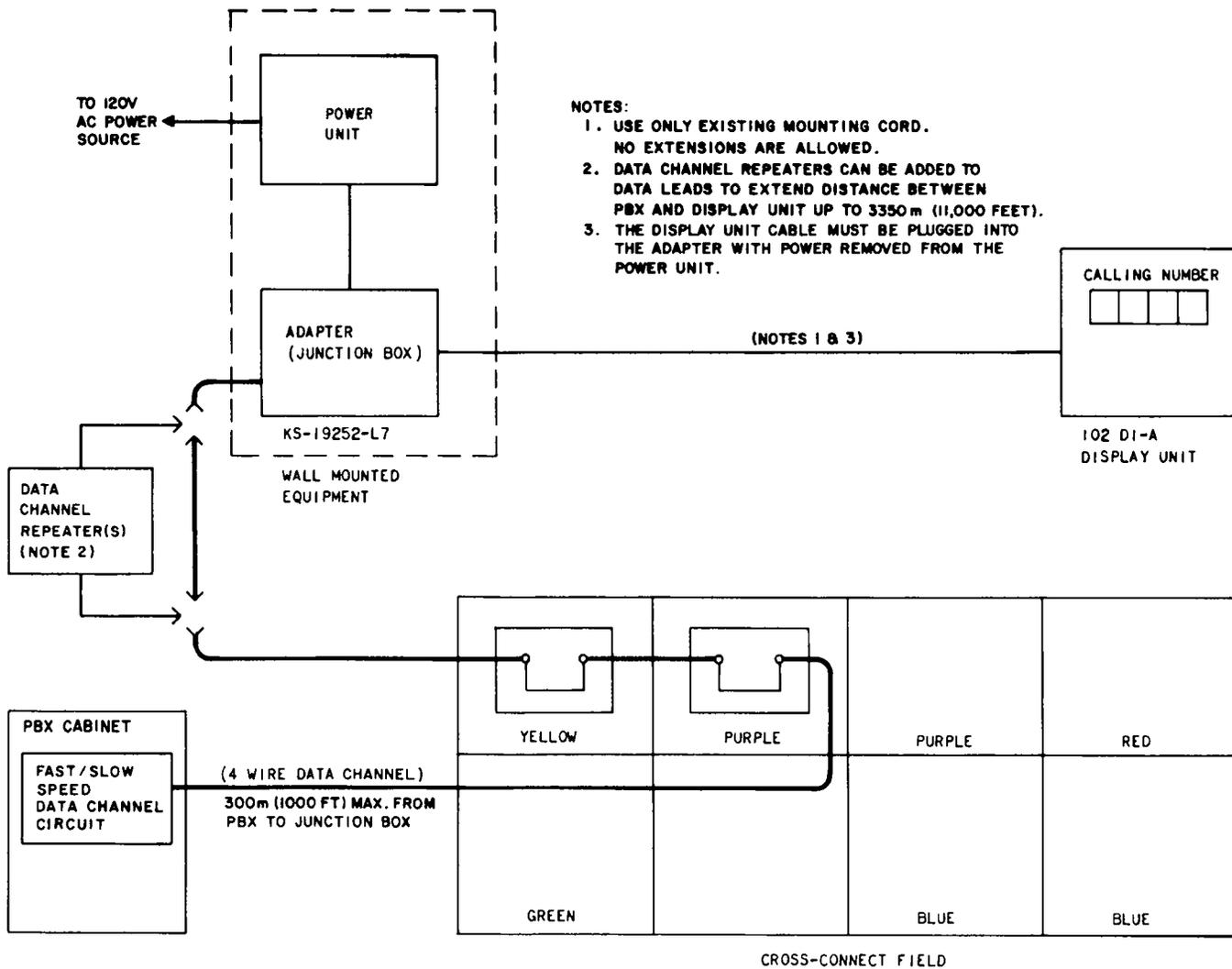


Fig. 17—Equipment Arrangement for Calling Number Display to Station

means of logic in the CAP interface unit disables the Maintenance and Administration Panel (MAAP). The CAP functional block diagram is illustrated in Fig. 20. The interface unit (ABC-1) is mounted within the PBX cabinet. All cabling is provided.

E. Customer Premises Facility Terminal (CPFT)

6.26 Customer premises facility terminal equipment is available to provide transmission and signaling range extension for the system line and trunk circuits. The CPFT equipment consists of MFT circuit packs and terminal balancing networks housed in connectorized shelves (carriers). The CPFT is a standard arrangement which will supply all of

the transmission and signaling functions required to terminate either 2-wire or 4-wire metallic facilities. Customer premises facility terminal equipment may be installed in the auxiliary cabinet (Fig. 13) or any suitable 584 mm (23-inch) mounting frames. Detailed list information on CPFT equipment is contained in the following sections:

- Sections 332-610-100, -180, -200, -500
- Section 332-910-180
- Sections 332-912-161, -131, -231, -232, -261.

6.27 The CPFT family of equipment-coded J99380() is presently divided into *eight* basic

TABLE E
DISPLAY AND POWER UNIT CODES

102D1-A DISPLAY UNITS: CALLING NUMBER DISPLAY		
CODE	HOUSING COLOR	FACEPLATE COLOR
102D1-A-3T	BLACK	TEAK
102D1-A-3W	BLACK	WALNUT
102D1-A-50T	IVORY	TEAK
102D1-A-50W	IVORY	WALNUT
102D1-A-58T	WHITE	TEAK
102D1-A-58W	WHITE	WALNUT
211A-TYPE POWER UNIT		
CODE	HOUSING COLOR	FACEPLATE COLOR
211A-100	BLACK & SILVER	AVOCADO
211A-108	BLACK & SILVER	TEAK
211A-109	BLACK & SILVER	WALNUT
211A-111	BLACK & SILVER	GOLD
211A-112	BLACK & SILVER	ORANGE
211A0114	BLACK & SILVER	RED
211A-115	BLACK & SILVER	BLUE

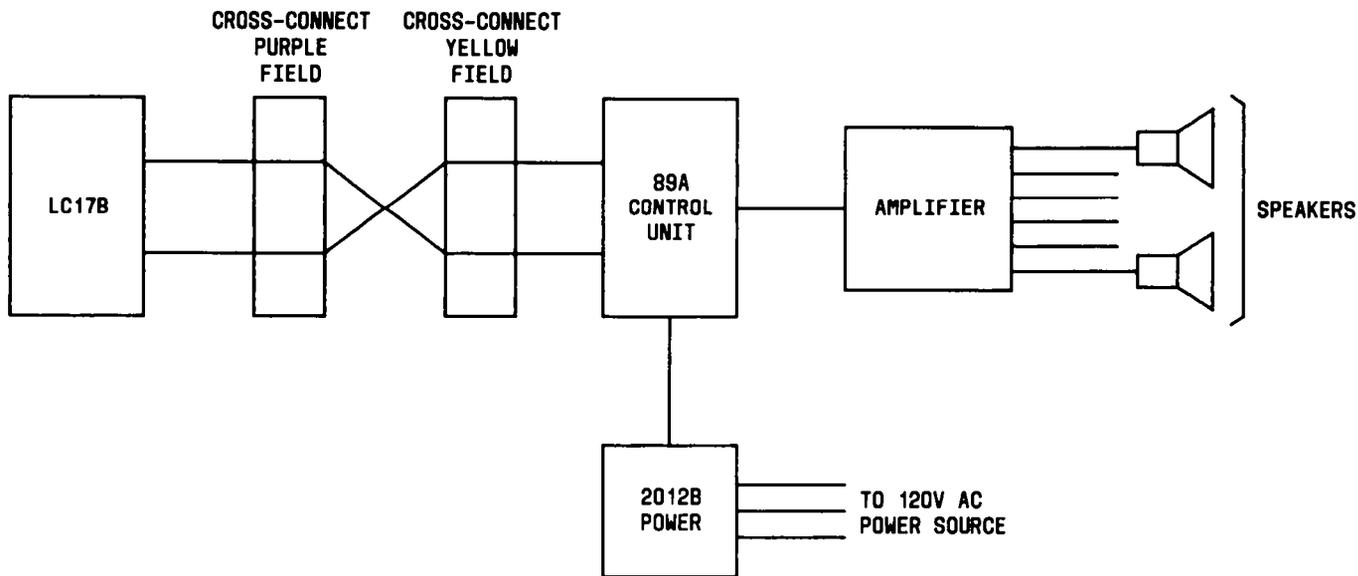


Fig. 18—Code Calling Access (Chime Paging) Equipment—Block Diagram

TABLE F

3A CODE CALL EQUIPMENT SUMMARY

EQUIPMENT LIST			
PART NO.	DESIGNATION	LIST NO.	DESCRIPTION
J58822B	3A code send unit	1	5 cycle signal — 3-digit code
		8	5 cycle signal — 2-digit code
		9	3 cycle signal — 3-digit code
		10	3 cycle signal — 2-digit code
	Code terminal and jack	—	1st circuit access
	Code terminal	5	2nd circuit access
	TOUCH-TONE calling converter	14	Translation for 3-digit code only
15		Translation for 2-digit code only	
J59204	G1 TOUCH-TONE calling receiver	1	Receives TOUCH-TONE calling signals for translation
LC08D	CO trunk	—	—

components. These are further broken down by list numbers to provide the flexibility needed for various mounting arrangements that will be encountered. The following CPFT units are described:

- J99380A or E—Single module shelf or double module shelf, respectively
- J99380B or C—Terminal balancing network
- J99380D—Double-depth shelf assembly
- J99380TB—Test extender
- J99380J—Power distribution and feature panel
- J99380F or G—Shelf assembly for voice frequency circuits
- J99380H—Power distribution and feature panel
- J99380K or L—Circuit pack carrier (CPC) for small CPFT installations.



When loop signaling repeater (LSR) units J99343AC and J99343AD are provided, the KS-19642, List 6 rectifier must be replaced by the KS-22028 rectifier.

6.28 The single-module shelf (J99380A) is used when transmission only is required. A shelf which may be wired for use as a single-module or double-module shelf (J99380E) is shown in Fig. 21. Interconnection information for the single-module shelf and DIMENSION PBX is shown in Fig. 22.

6.29 When both transmission and signaling treatment are required, the double shelf is used. The shelf in Fig. 21 can be used for the double arrangement when it is wired for this purpose. Interconnection information for the double-module shelf and DIMENSION PBX is shown in Fig. 23.

6.30 The terminal balancing network panel (J99380B) is shown on Fig. 24. Interconnection information for the terminal balancing network panel (J99380B) and DIMENSION PBX is shown in Fig. 25.

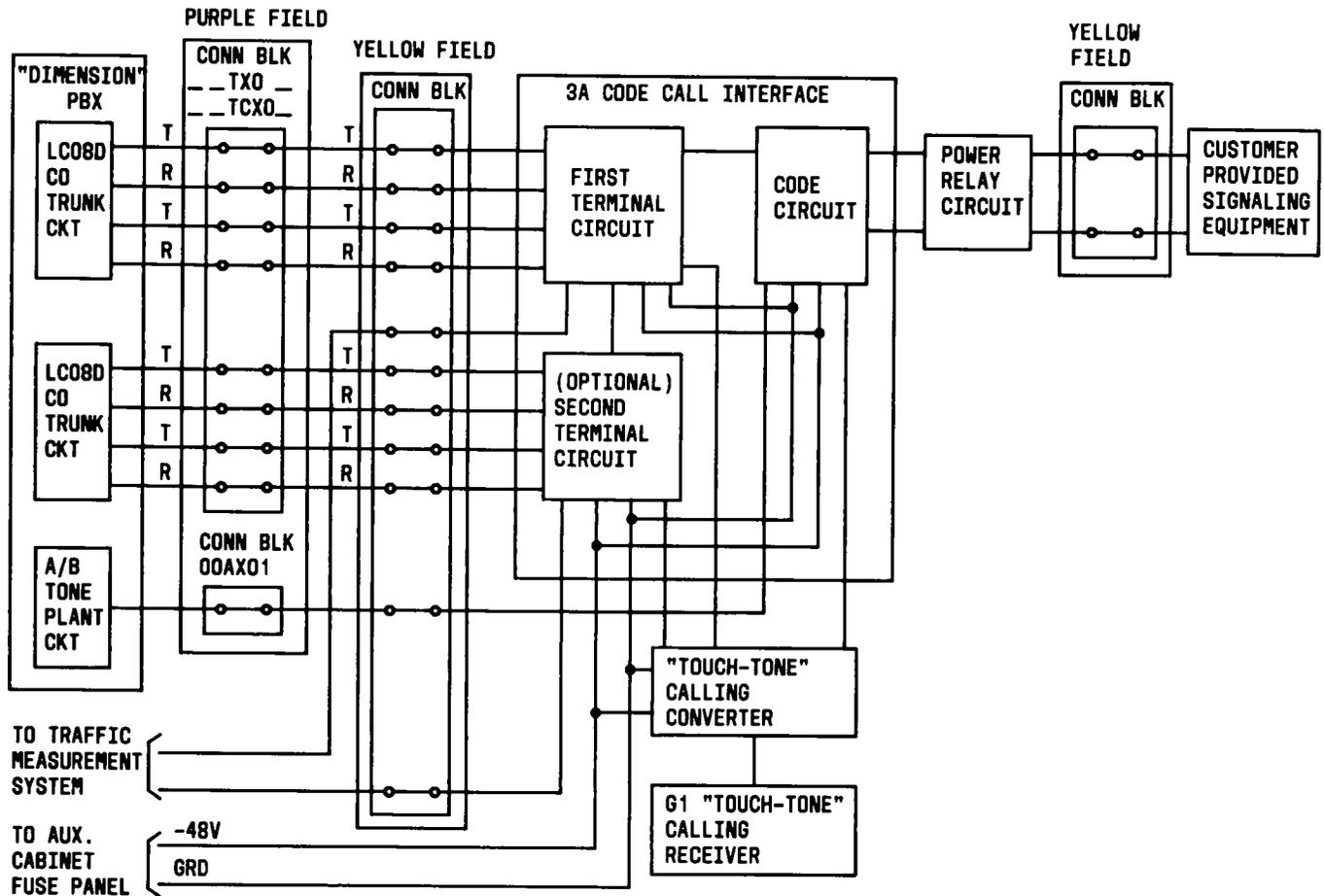


Fig. 19—General Connection Diagram for 3A Code Call Access

- 6.31 The shelf assembly for 837-type networks on PC boards is shown on Fig. 26. Interconnection information for the KTU-type shelf assembly for terminal balancing is shown in Fig. 27.
- 6.32 An illustration of the double-depth shelf assembly (J99380D) is shown in Fig. 28.
- 6.33 The test extender J99380TA (Fig. 29) or J99380TB may be required to allow access to the adjustments and test points when aligning and testing the MFT circuit packs in the CPFT installation.
- 6.34 The power distribution and feature panel (J99380J), voice frequency circuits (J99380F or G), and the power distribution panel (J99380H) are used for supplemental power distribution.

- 6.35 Customer premises facility terminal arrangements for small installations (J99380K or J99380L) provide one to eight MFT circuits and a power unit. A universal circuit pack carrier for two MFT plug-ins is provided. The carrier handles either two independent single MFT module circuits or one double MFT (TU-SU) module circuit. Up to four carriers can be multiplied.

F. Data Channel Repeater

- 6.36 The data channel repeater is a self-contained unit that provides range extension and/or lightning protection for DIMENSION PRELUDE PBX low-speed data channels. It is connected in series with the data channel to repeat data pulses and to provide isolation between input and output pairs.
- 6.37 The repeater circuit is designed to operate in unexposed environments without additional

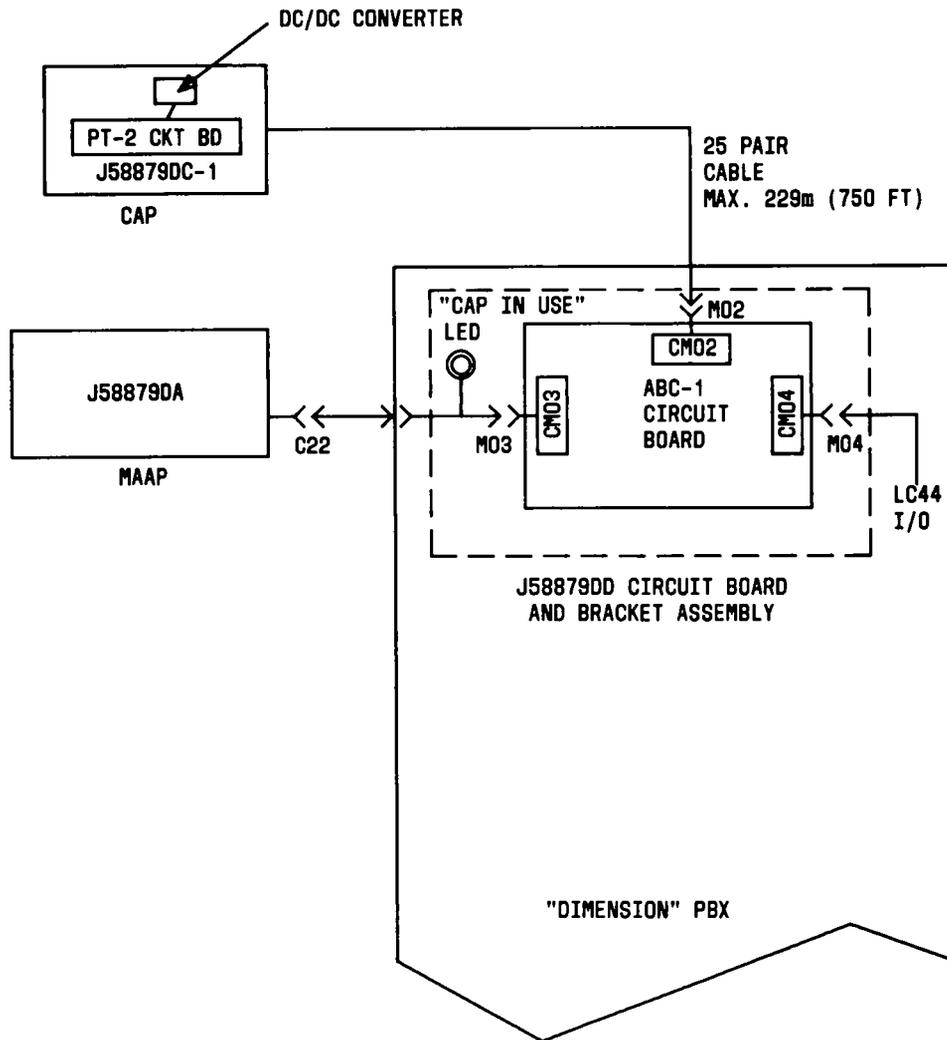


Fig. 20—CAP Interface

protection and in exposed environments with standard 3-mil carbon block protection.

6.38 An application of the data channel repeater is for calling number display.

Housing and Mounting

6.39 The repeater circuitry is housed in a modified key service unit (Fig. 14) with a capacity for two data channel repeater circuits.

6.40 The data channel repeater unit is designed to be wall-mounted near a 120-Vac 60-Hz outlet. Power cords are available in 610-, 1220-, 1830-, and

3660-millimeter (2-, 4-, 6-, and 12-foot) lengths—J58879KC, Lists A, B, C, and D, respectively.

Range Extension and Lightning Protection

6.41 A single-channel repeater with range extension consists of the following equipment:

- One J58879KC, List 1—Assembly, wiring, and equipment including a 28D2 power supply unit
- One J58879KC, List 2—Rectifier and timing reference circuit card (AE-49)

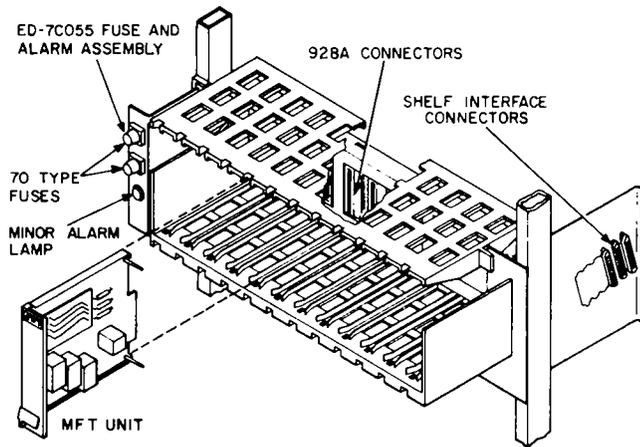


Fig. 21—Single-Module Shelf (J99380A) or Double-Module Shelf (J99380E)

- Two J58879KC, List 3—Unidirectional repeater circuit card (AE-48) for each repeater.

6.42 A dual-channel repeater with range extension consists of the following equipment:

- One J58879KC, List 1—Assembly, wiring, and equipment including a 28D2 power supply unit
- One J58879KC, List 2—Rectifier and timing reference card (AE-49)
- Four J58879KC, List 3—Unidirectional repeater circuit card (AE-48) for each repeater.

6.43 A single-channel repeater used for lightning protection only requires the following equipment.

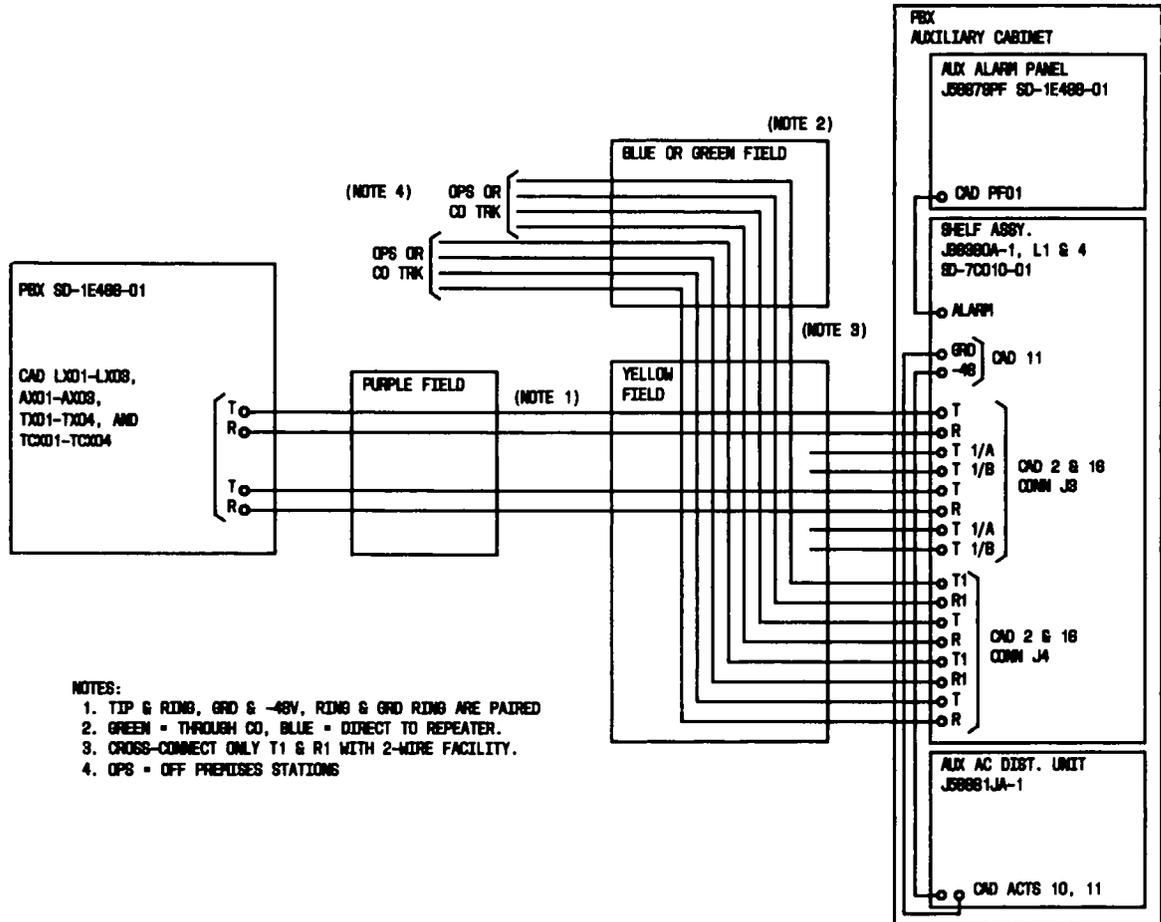
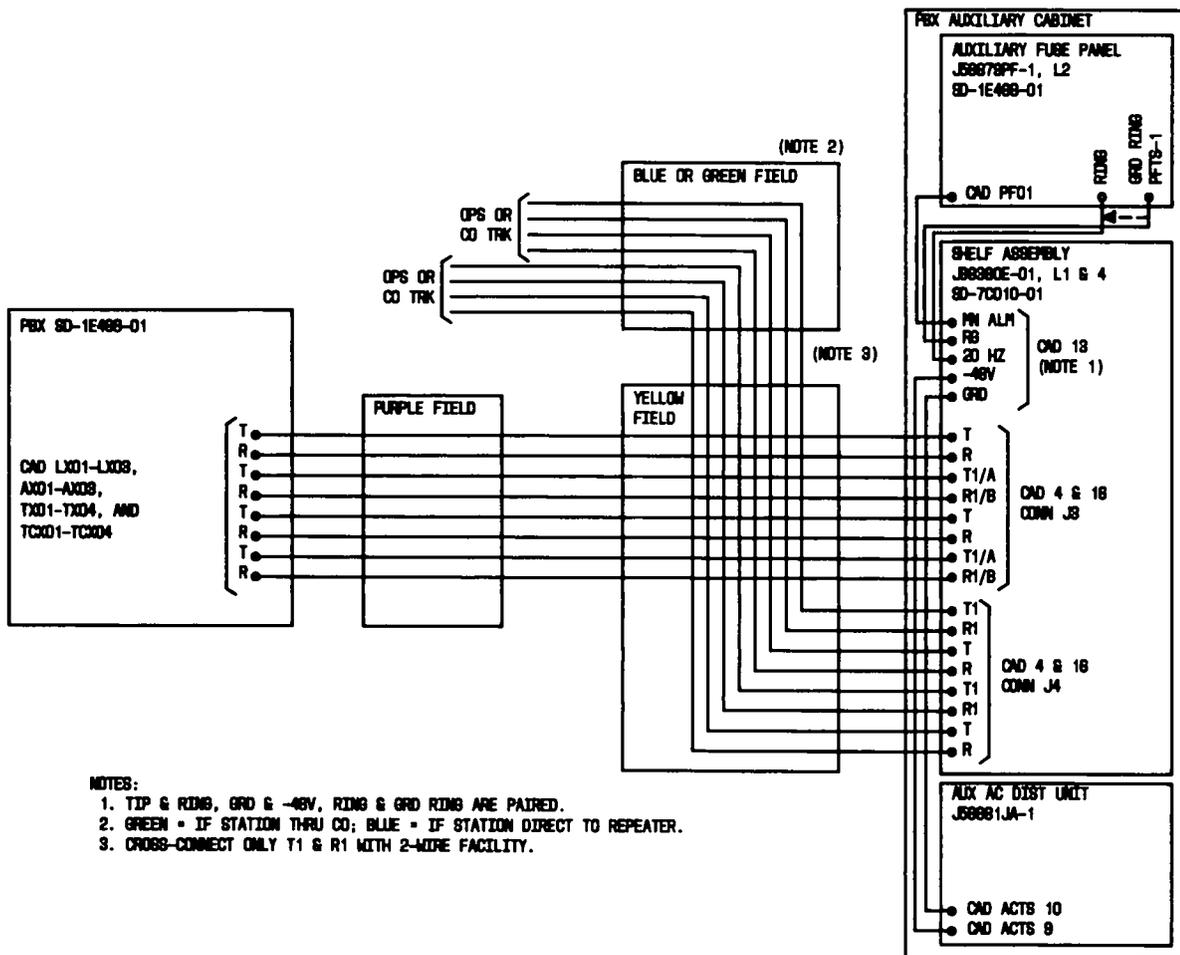


Fig. 22—Single-Module Metallic Facility Terminal (MFT) Shelf Assembly—DIMENSION PRELUDE PBX Interconnection



- NOTES:
1. TIP & RING, GRD & -48V, RING & GRD RING ARE PAIRED.
 2. GREEN = IF STATION THRU CO; BLUE = IF STATION DIRECT TO REPEATER.
 3. CROSS-CONNECT ONLY T1 & R1 WITH 2-WIRE FACILITY.

Fig. 23—Double-Module MFT Shelf Assembly—DIMENSION PRELUDE PBX Interconnection

- Two J58879KC, List 4—Data link, buffer circuit card (WJ3)
- J58879KC, List 5—Assembly, wiring, and equipment, excluding the 28D2 power supply unit.

6.44 A dual-channel repeater used for lightning protection only requires the following equipment:

- Four J58879KC, List 4—Data link, buffer circuit card (WJ3)
- One J58879KC, List 5—Assembly, wiring, and equipment, excluding the 28D2 power supply unit.

Data Range

6.45 The use of data channel repeaters and the standalone unit can extend the maximum distance between the PBX and the peripheral unit as follows:

- 300 meters (1000 feet) between the PBX and one repeater
- 910 meters (3000 feet) between the first and second repeater
- 910 meters (3000 feet) between the second and third repeater
- 910 meters (3000 feet) between the third and fourth repeater

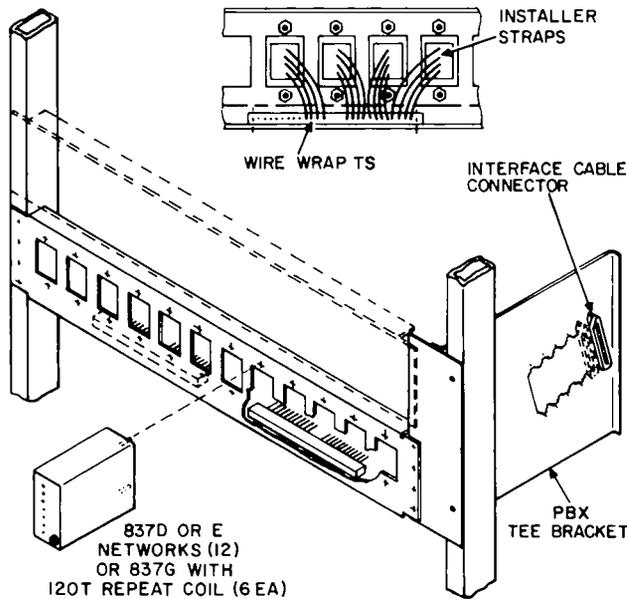


Fig. 24—Shelf and Assembly for 837-Type Networks (J99380B)

- 300 meters (1000 feet) between the fourth repeater and the peripheral unit.

G. Line Status Indicator—24B-Type

6.46 The 24B-type line status indicator (LSI) is used to provide a visual status and audible indication of specific station lines (off-hook, on-hook, and ringing). The status of each line is displayed by a corresponding light emitting diode (LED) on the LSI panel. The LSI is available with capacities for monitoring 8, 16, or 32 lines and can be mounted at a desk or on a wall. The LSI is bridged across the T and R leads of the stations to be monitored. A maximum of four 24B-type LSIs can be bridged across the same station line. Figure 30 illustrates the mounting cord terminations for the LSI. The LSI is plugged into a 120-volt 60-Hz ac commercial power source. The A25B connector cable to connect T and R leads of monitored lines must be ordered separately. The following equipment is necessary to supply the 24B-type LSI:

- Indicator, 24BX - YY
- Faceplate—Order one per 24B-type LSI (see Table G)
- Rear panel—Order one per 24B-type LSI (see Table G)

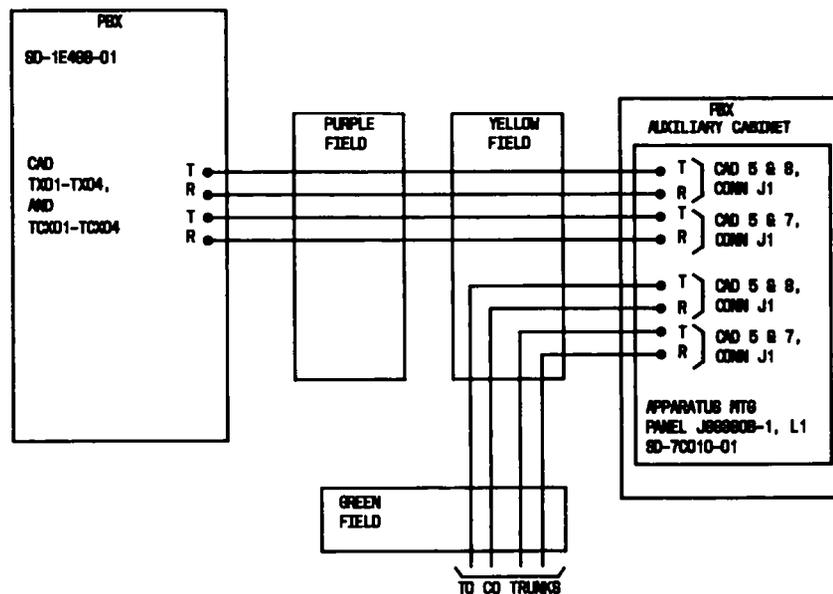


Fig. 25—Network Mounting Panel to DIMENSION PRELUDE PBX—Interconnection (J99380B)

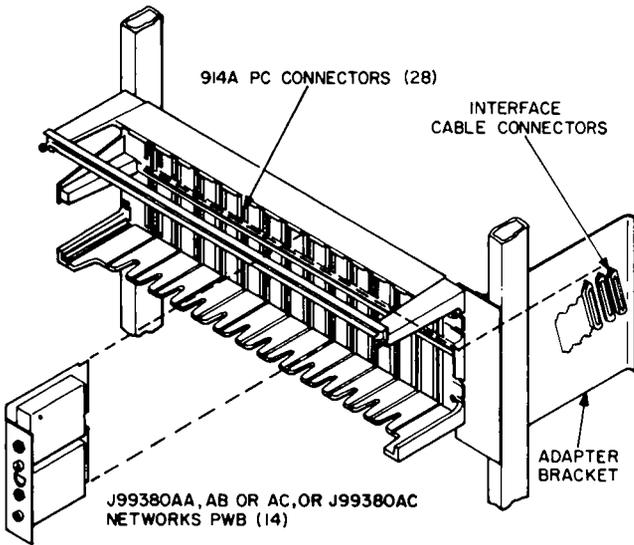


Fig. 26—Shelf Assembly for 837-Type Networks on Printed Circuit (PC) Boards (J99380C)

- Bracket, 115A-YY—Order one per 24B-type LSI.

Note 1: The 24B-type LSI includes a KS-21239, L6 transformer shipped loose with equipment.

Note 2: X indicates the line capacity of the 24B-type LSI. Valid entries for X are 8, 16, or 32. YY indicates the color of the LSI. Valid entries for YY are 03 (black) and 50 (ivory).

6.47 For more detailed information on identification and installation, refer to Section 463-210-101.

Warning: A possible shock hazard is present when securing the transformer power plug of the 24B-type LSI to ac wall outlets equipped with metal receptacle covers. Do not plug the 24B-type LSI into ac wall outlets equipped with metal covers. Use only ac outlets having plastic receptacle covers or replace metal covers with plastic covers.

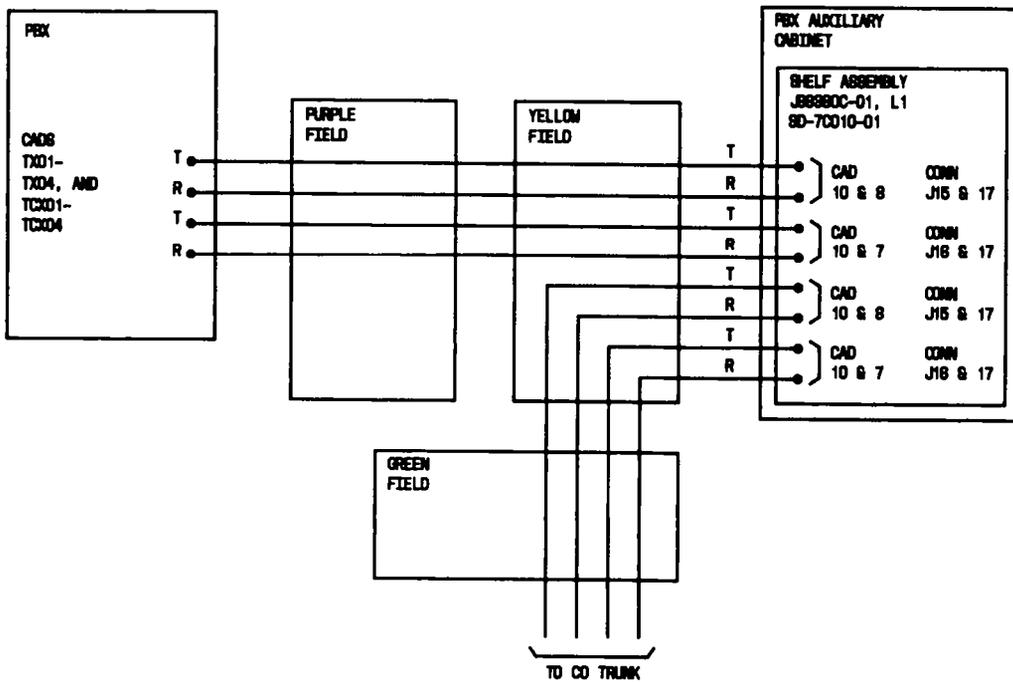


Fig. 27—KTU-Type Shelf Assembly for Impedance Matching Network (J99380C)

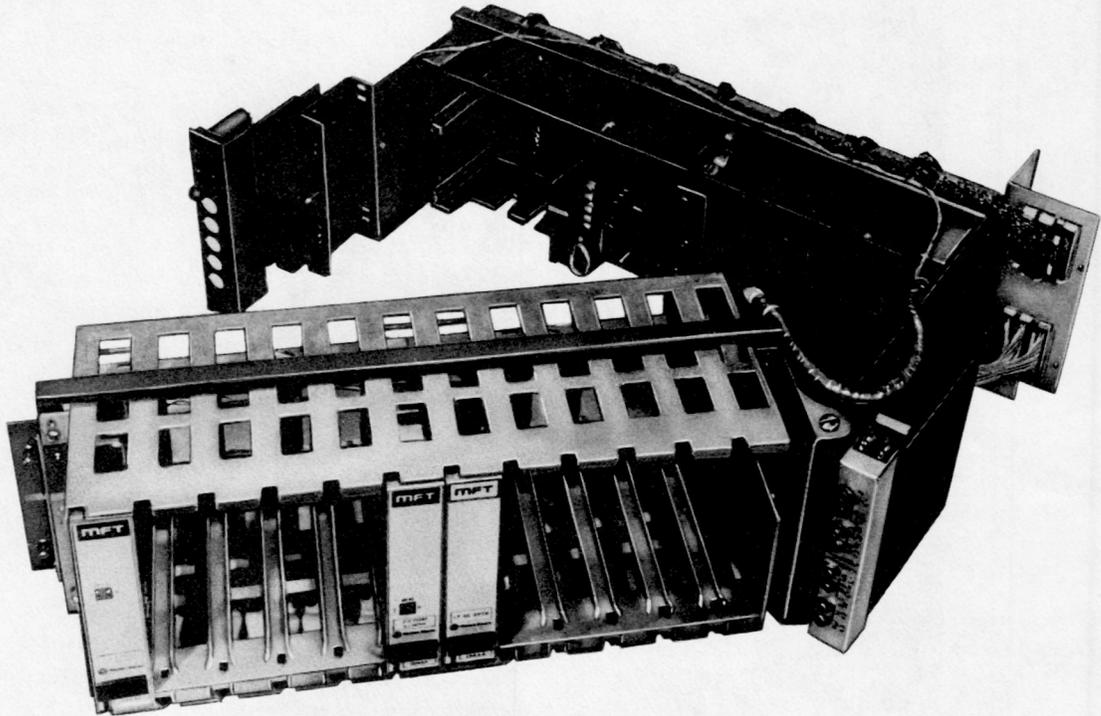


Fig. 28—Double-Depth Shelf Frame (J99380D) With a Double-Module Shelf (J99380E) in Front and a Network Plug-in Shelf (J99380C) in the Rear

H. Loudspeaker Paging (Basic and Deluxe)

6.48 The paging amplifiers and speakers may be either customer-owned or telephone-company provided. All voice paging facilities make use of the telephone transmitter as the microphone.

6.49 The equipment required for loudspeaker paging is listed as follows:

- LC13B auxiliary trunk interface circuit pack (two circuits per circuit pack; one circuit per paging zone)
 - 89A control unit (one per paging zone)
 - 2012B power transformer (one per three 89A control units)
 - Paging amplifiers and speakers (either customer or telephone company provided).
- 6.50 The LC13B circuit pack furnishes an interface from the PBX to the 89A control unit. The

2012B power transformer furnishes the 89A control unit with 16-volt alternating current (converted to ± 12 Vdc by the 89A). The functions of the 89A control unit are as follows:

- Presents a balanced input to the paging trunk circuit (LC13B) and a balanced output to a paging system power amplifier
- Provides the user with circuitry for seizing the paging system or code call system (chime paging)
- Provides circuits for adding music and tones into a paging system.

6.51 Up to three LC13B auxiliary circuit packs can be cross-connected to paging equipment which allows for the maximum of six paging zones. Connections for loudspeaker paging are illustrated in Fig. 31.

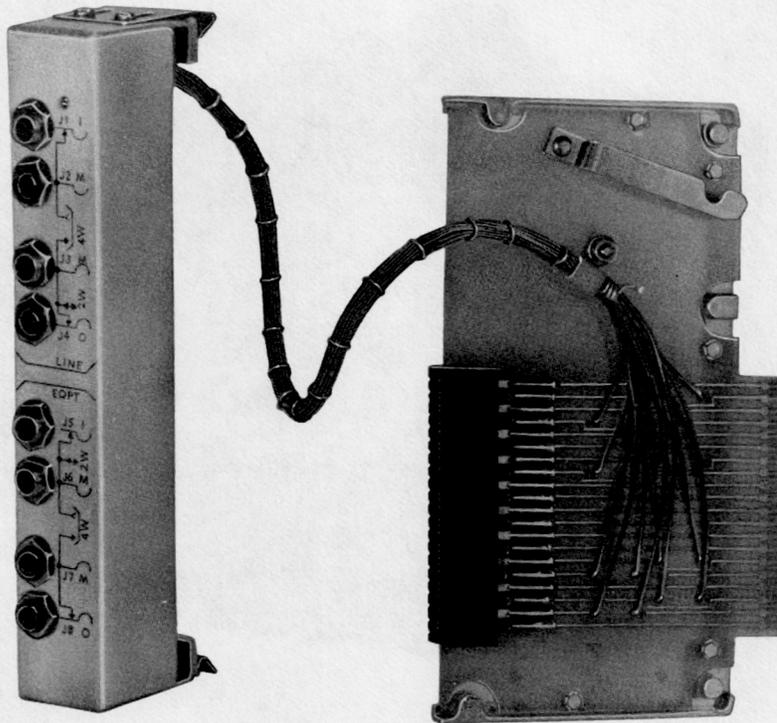


Fig. 29—Test Extender (J99380TA)

Loudspeaker Paging With Chime Paging and Music Background

6.52 Loudspeaker paging can also be provided with chime paging and music background. The required equipment, in addition to the loudspeaker paging equipment for this arrangement is an LC17B tone board and an 89A control unit. The customer-provided equipment must be turned on at all times for the loudspeaker paging with chime paging and music background.

6.53 Connections for loudspeaker paging with chime paging and music background are illustrated in Fig. 32.

I. Music-on-Hold

6.54 A 31D voice coupler is used for coupling customer-provided music to an auxiliary trunk circuit pack (LC13B), which provides 1-way-in reception of the music. The coupler also provides protection of the tip and ring by limiting excessive voice power levels from the held party receiver. In addition, isolation is provided to the customer-provided

equipment. Maximum dc line current is 150 mA. The 31D voice coupler should be wall-mounted near the termination field. For a more detailed description on the 31D voice coupler, refer to SD- and CD-69613-01. The music-on-hold interconnection is shown in Fig. 33. The 31B voice coupler is grandfathered per FCC rules and may be used if available.

J. Off-Premises Stations (OPS)

6.55 The OPS feature is provided for by connection arrangements as illustrated in Fig. 34 through 38.

6.56 The LC588 line circuit (Fig. 34) transmits the 30-Hz ringing to stations associated with the PBX, and it detects loop signaling. Range to a station is limited to no more than 950 ohms. Range is reduced to 500 ohms if four ringers are required and 300 ohms for five ringers (Fig. 35). When an LSE is added, the external circuit resistance is extended to 1610 ohms for up to two ringers and 1500 ohms for three ringers. The LSE is limited for use with three ringers. Signaling ranges are based on a dc voltage level of -45 volts at the PBX, because the nominal -48 Vdc supply var-

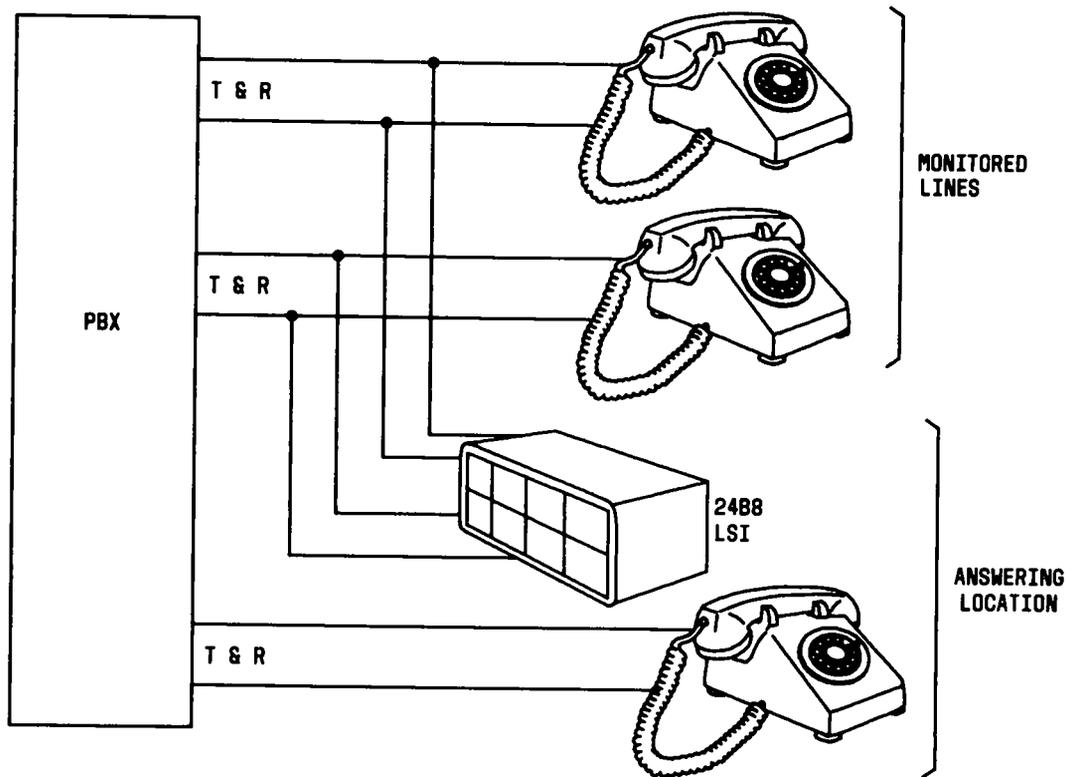


Fig. 30—24A8-50 Line Status Indicator

ies with loading at the other dc outputs. A method for determining the range when an LSE is used is provided in Section 332-910-180. Additional information on MTF plug-in units is provided in Section 851-300-130.

6.57 The dc signaling range of the station loops can also be increased by the installation of a loop signaling repeater/loop start only (LSR/LSO). Where only one repeater is necessary, it is recommended that a 2-to-2 intermediate repeater be used at the serving office or intermediate CO for a 2-wire off-premises station installation (Fig. 36 and 37). Use of the 2-to-2 terminal repeater at either the PBX or station is not advisable in one repeater application. If more than one repeater is needed between the station and its CO, 4-wire facilities should be used. Typical 2- and 4-wire metallic facility installations are shown on Fig. 38. Different combinations of 2-to-4-wire units can also be used by specifying the appropriate 2-4 wire or 4-2 wire intermediate or terminal repeater at the 2-wire to 4-wire range from the LSR to station is defined in SD-1C359-01.

6.58 Among the features offered by the PBX are distinctive ringing and the “ring ping” signal of the Call Forwarding—All Calls feature. This is a reminder that the feature is in effect. It consists of a single 100-ms burst of 30-Hz ringing sent to the station each time a call is forwarded. The three distinctive ringing signals are periodic:

Pattern 1

1.2 seconds on; 4 seconds off.

Pattern 2

0.4 second on

0.2 second off

0.6 second on

4.0 seconds off.

Pattern 3

0.2 second on

TABLE G
24B-TYPE INDICATOR ORDERING GUIDE

COLOR	COMCODE			
	FACEPLATE			REAR PANEL
	24B8	24B16	24B32	24B8/16/32
Avocado	840597660	840597736	840597801	840597579
Gold	840597678	840597744	840597819	840597587
Orange	840597686	840597751	840597827	840597595
Brown	840597694	840597769	840597835	840597603
Red	840597702	840597777	840597843	840597611
Blue	840597710	840597785	840597850	840597629
Black	840597652	840597728	840597793	—
Teak	—	—	—	840597637
Walnut	—	—	—	840597645

0.1 second off

0.2 second on

0.1 second off

0.6 second on

4.0 seconds off.

Distinctive ringing can be transmitted over OPS line with one LSR; however, each burst of ringing will be shortened by 100 ms, and each silent interval will be increased by 100 ms. The "ring ping" will be blocked by the LSR. The LSE is transparent to both features. Single frequency (SF) type FS signaling unit or T-carrier with D-type FX channel units will pass pattern 1 distinctive ringing, but blocks patterns 2 and 3 and "ring ping."

6.59 The following CPFT units are applicable to the OPS configurations.

- J99343FD—DX or E&M to Ground Start (STA)—CPS20

- J99343FC—Ground Start to DX or E&M (CO)—CPS19

- J99343FB—DX or E&M to Loop Start (STA)—CPS18

- J99343FP—Line Start to DX or E&M (CO)—CPS17

- J99345CD—Loop Signaling Extender II—CPS16

- J99343AD—Loop Signaling Repeater, Loop-Start Only—CPS9

- J99343AC—Loop Signaling Repeater Unit—CPS8.

K. Radio Paging Access

6.60 The equipment required to furnish radio paging access is summarized in Table H and is listed as follows:

- Two LC08D dual CO trunk circuit packs

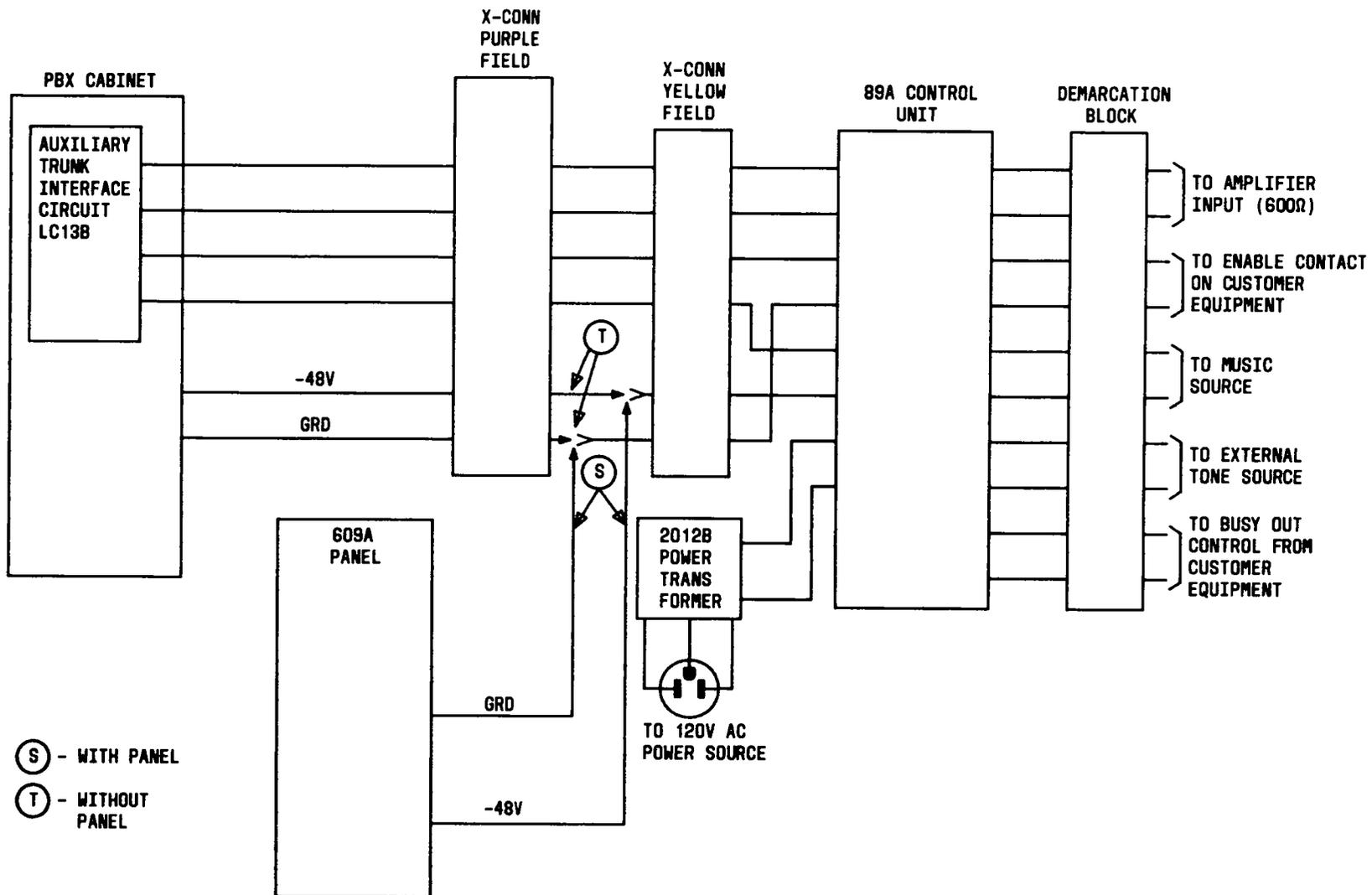


Fig. 31 — Loudspeaker Paging Connections

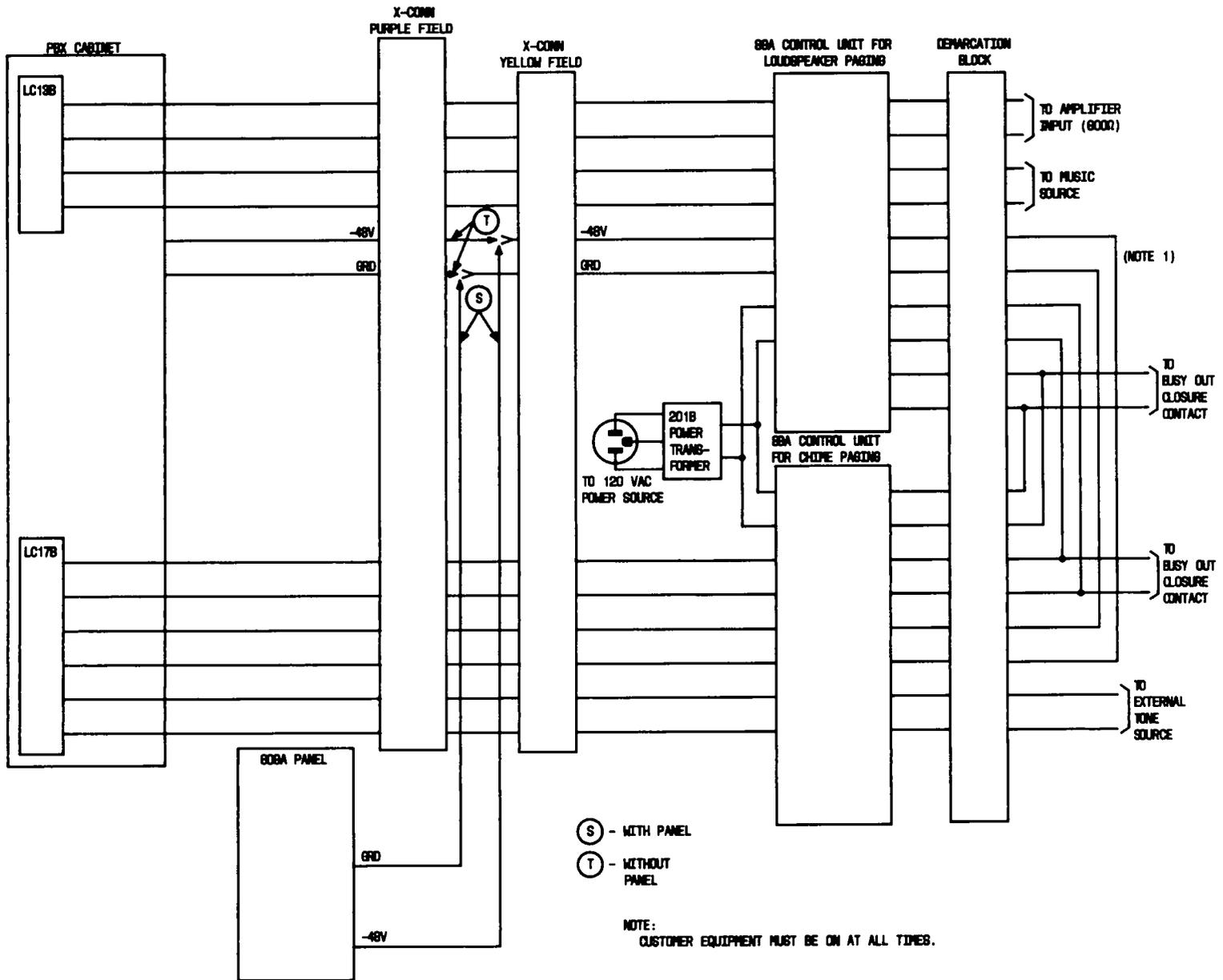


Fig. 32—Loudspeaker Paging With Chime Paging and Music Background

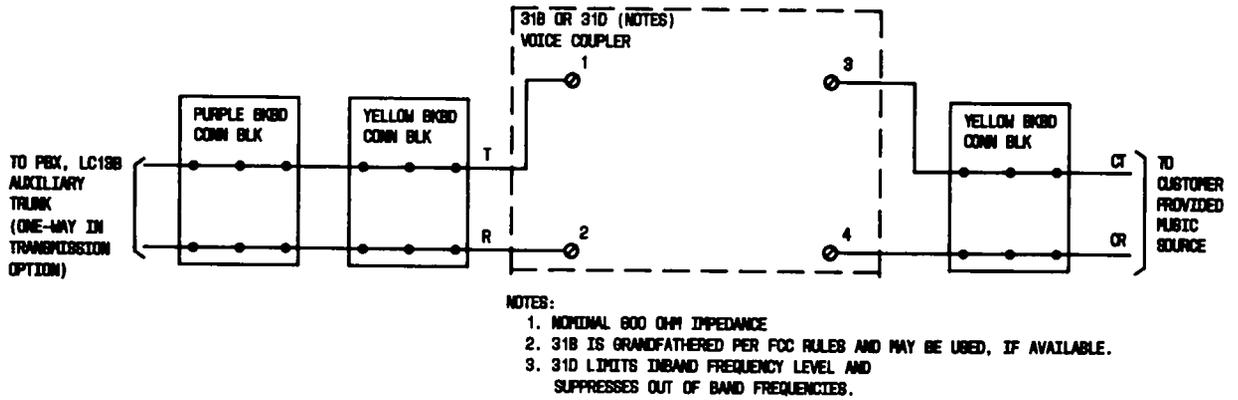
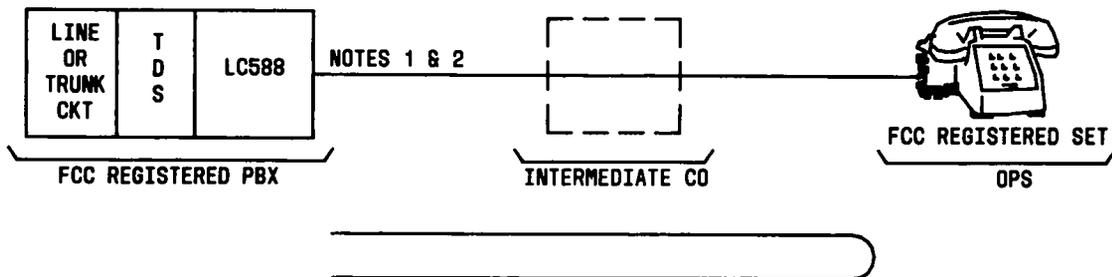


Fig. 33—Music-on-Hold Interface



NOTES:

1. MAXIMUM LOOP RESISTANCE = 950Ω PLUS REGISTERED STATION SET RESISTANCE
2. THE MAXIMUM NUMBER OF C4A TYPE RINGERS PER LINE AND THE ASSOCIATED MAXIMUM ALLOWABLE LOOP RESISTANCE (EXCLUDING STATION SET) IS AS FOLLOWS:

RINGERS	ALLOWABLE LOOP RESISTANCE
1-3	950Ω
4	500Ω
5	300Ω

Fig. 34—LC588—OPS Signaling Range

- J58824CD interface trunk unit, Lists 7, 9, 12, 15, 16, and 17
- J59204CA-L1 TOUCH-TONE calling receiver (G1)
- J58847Y, Lists 3 and 4 assembly, wiring, and equipment for one link and electronic dial unit
- 31D voice coupler (if option Z or ZZ is used)

- Customer-owned radio paging transmitter and loudspeaker equipment



The radio paging equipment units may be several combinations of J codes, depending on PBX service.

6.61 A functional diagram of the radio paging access connections is shown in Fig. 39.

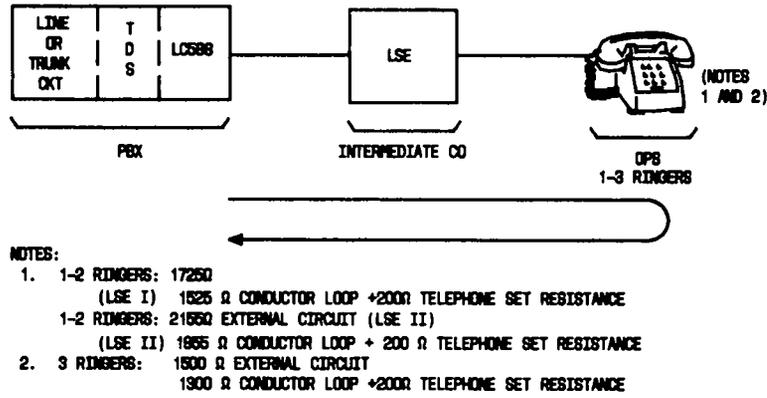


Fig. 35—Loop Signal Extender (LSE) at CO in OPS Line

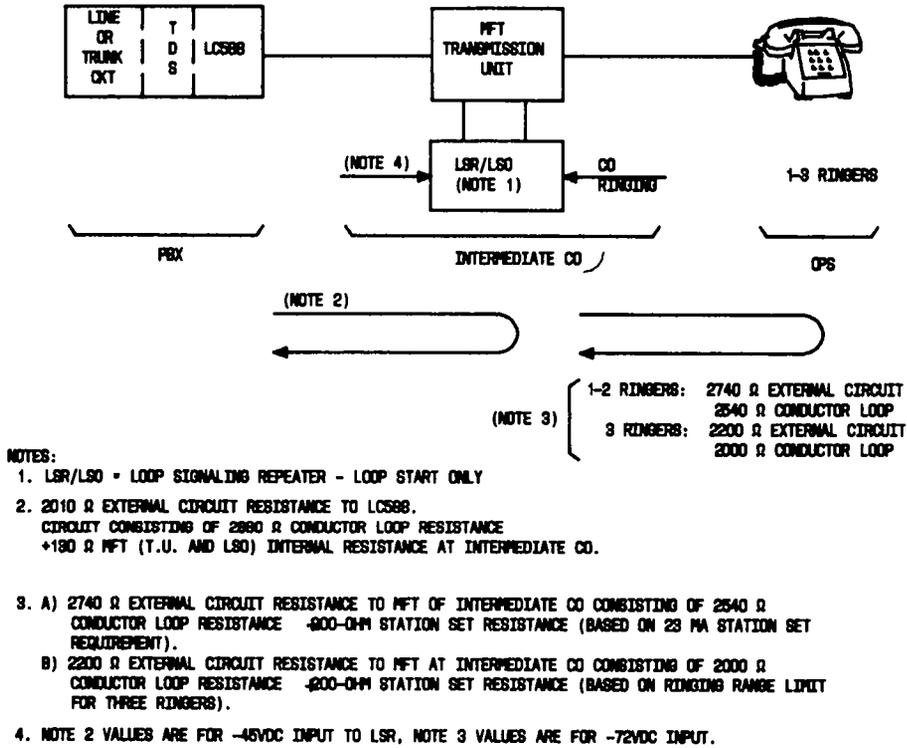


Fig. 36—Loop Start Only (LSO) at CO in OPS Line

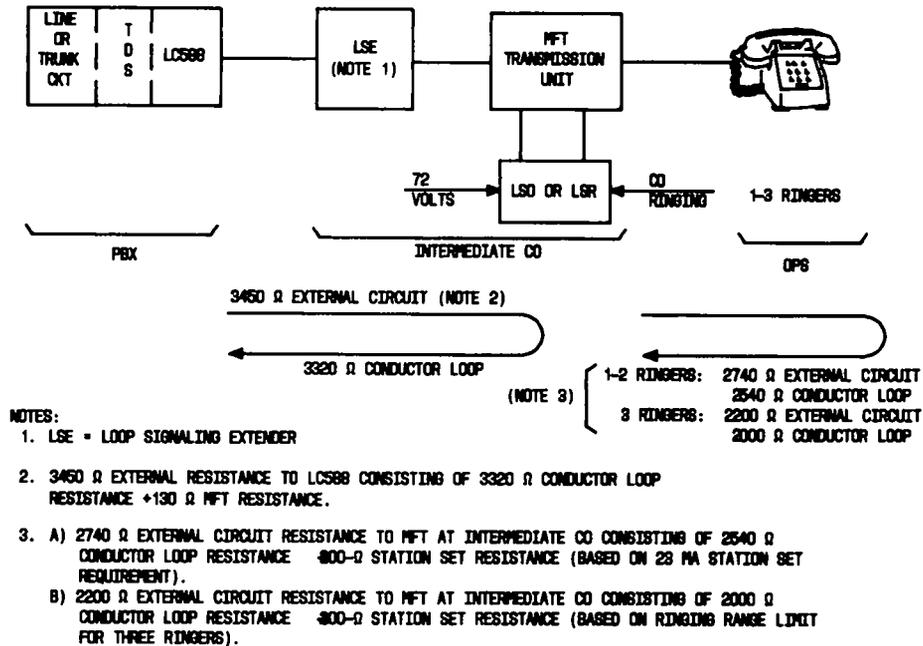


Fig. 37—LSO and LSE at CO in OPS Line



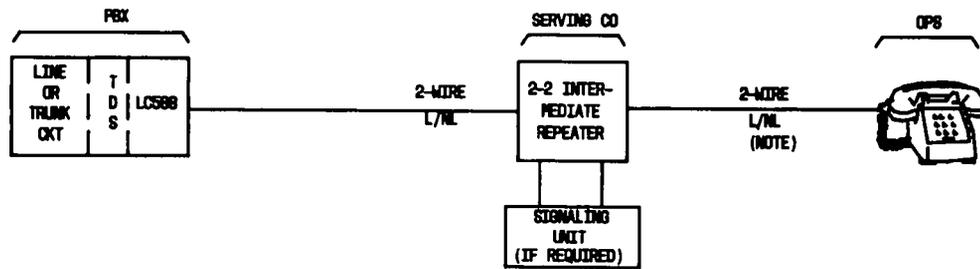
When the Z or ZZ option is used on the trunk interface unit, the 31D voice coupler must be connected to T-R between the interface trunk and the demarcation block. The Z option provides for receiving only from the customer-owned and maintained equipment. The ZZ option provides for 2-way transmission. Option Y provides for transmission only through the customer-owned and maintained equipment. The 31D voice coupler is not required to be connected to the T and R leads when option Y is used.

L. Recorded Announcement Intercept Connection

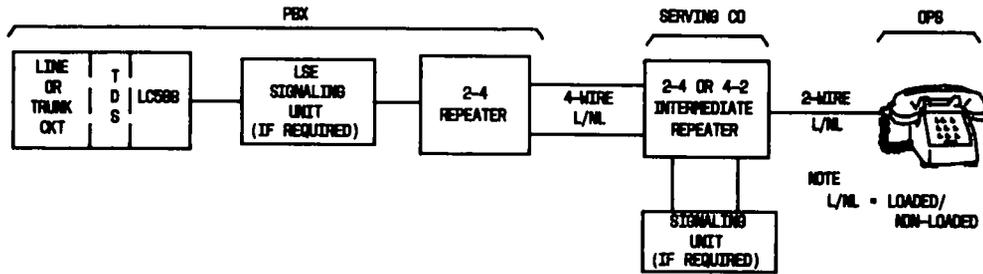
6.62 The recorded announcement equipment consists of the following:

- LC13B—Auxiliary trunk interface circuit pack
- 31D voice coupler (31B voice coupler is grandfathered and may be used if available)
- H400-107, List 1—Assembly, equipment, and cords for one announcement set (KS-16765).

An H400-107, List 4, is required in addition to List 1 when a KS-20449, List 1 amplifier is needed for the announcement set. The KS-16765-L12 announcement sets manufactured prior to January 1, 1980, are grandfathered and do not require a voice coupler.



A - 2-WIRE PBX-OPS LINE WITH 2-2 INTERMEDIATE REPEATER



B - COMBINED 2-WIRE/4-WIRE PBX-OPS LINE

Fig. 38—PBX-OPS Line With Repeater

TABLE H

RADIO PAGING EQUIPMENT SUMMARY

STATION EQUIPMENT	RADIO PAGING EQUIPMENT REQUIRED	VERTICAL MOUNTING SPACE
TOUCH-TONE calling	J58824CD-1, L16, & 17 J58824CD-1, L7 & 12 J58824CD-1, L9	51mm (2 in.) 203mm (8 in.) 51mm (2 in.)
Convert TOUCH-TONE calling eqpt to dial pulse	J58824CD-1, L16 J58824CD-1, L7 & 12 J58824CD-1, L9 J58847Y-1, L3 & 4	51mm (2 in.) 203mm (8 in.) 51mm (2 in.) 254mm (10 in.)
Convert TOUCH-TONE calling eqpt to 2-out-of-7	J58824CD-1, L15 J58824CD-1, L16 J58824CD-1, L7 & 12 J58824CD-1, L17	152mm (6 in.) 51mm (2 in.) 203mm (8 in.) 51mm (2 in.)

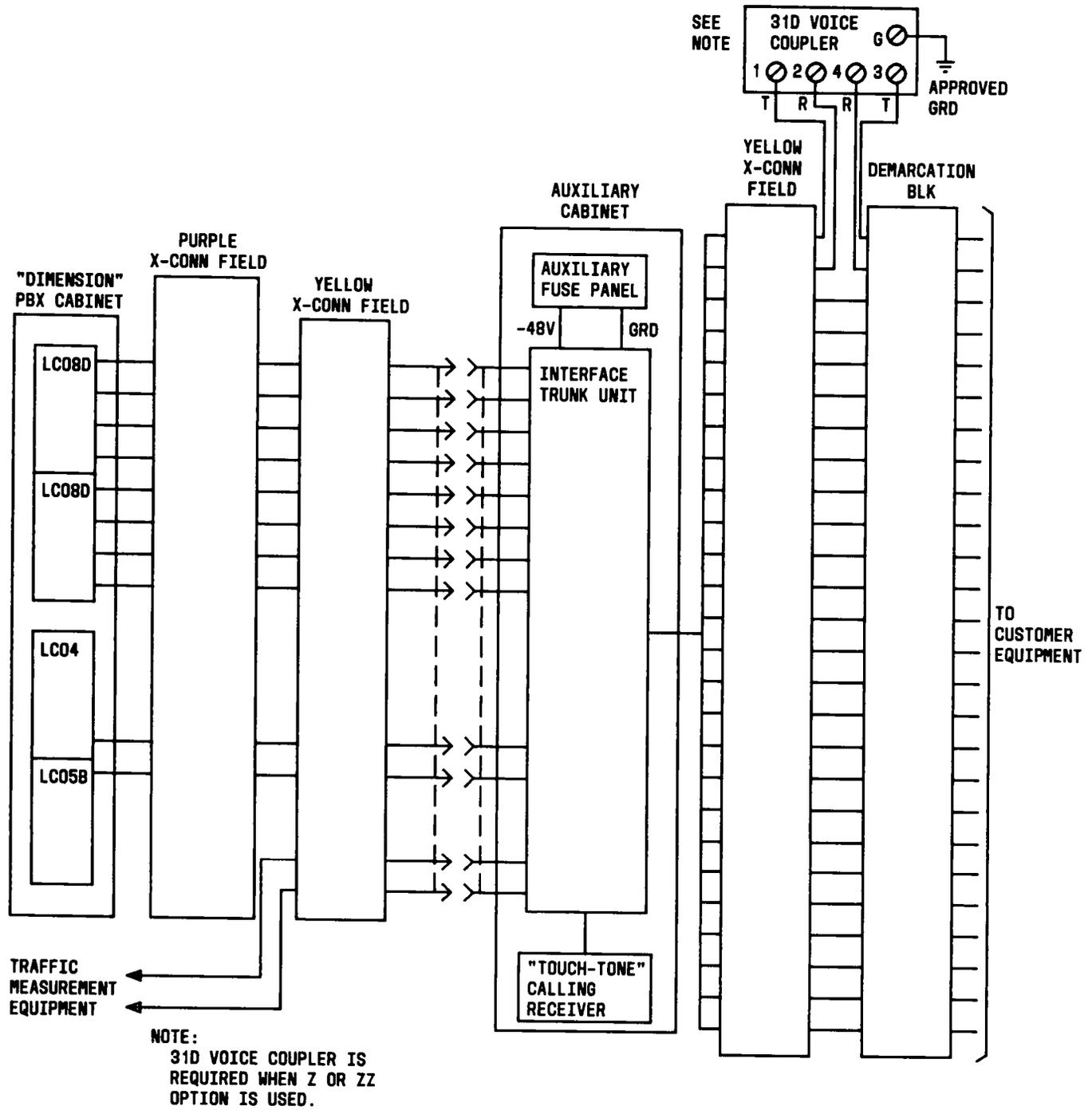


Fig. 39—Functional Diagram of Radio Paging Access Connections

TABLE I

RECORDED TELEPHONE DICTATION (RTD) EQUIPMENT—SUMMARY

ITEM NO.	EQUIPMENT	DESCRIPTION
1	RTD units (dial dictation machine)	Customer-provided equipment.
2	J58827E, L1, and 7 trunk	Required for supervisory control of each customer-provided unit and must be mounted in 584mm (23 in.) wide space in auxiliary cabinet. List A, 2, and 8 are required with "TOUCH TONE" calling operation.
3	J58879PC-2, L4 (120A) frequency generator	Is provided as a separate ringing source for the attendant telephone set(s). If CPFT equipment is being provided, a separate 120A generator used for continuous ringing may be shared with the feature.
4	J58879PG, L1 interrupter for audible ringing	Required for the attendant telephone sets whenever auxiliary cabinet is ordered via E-8194 questionnaire.
5	Fuse Panel	Fuses provided separately if the auxiliary cabinet is not specified.
6	Telephone set (for RTD attendant)	Provides dictation telephone set — as required per dictation unit.
7	<p>"TOUCH-TONE" calling circuit</p> <p>A. LC553, 10C, (MD), or LC10D</p> <p>B. Senior receiver:</p> <p>(1) J99289B-1, List 1, SA and D (A3)</p> <p>(2) J59204CA-1, L1 A, and B (G1)</p>	<p>If access to the dictation unit from a "TOUCH-TONE" calling set is required, both traffic and cost considerations should be considered. The system will be traffic engineered for the appropriate number of "TOUCH-TONE" calling circuits without dial dictation requirements. Since a "TOUCH-TONE" calling register must be dedicated to each dictation connection for the duration of the connection, where the dictation units are busy frequently, it may be necessary to dedicate a "TOUCH-TONE" calling circuit to each dictation trunk to prevent call blockage and dial tone delays. These dedicated circuits must be provided in addition to those specified for normal call processing. Since there may not be room for LC553, LC10C (MD), or LC10D circuit packs in existing carrier slots, it may be economical to order a separate senior receiver per dictation unit, rather than ordering carrier/cabinets; as well as other auxiliary equipment. The number of senior receivers should be considered when ordering an auxiliary cabinet versus other apparatus mounting units.</p>
8	LC13 auxiliary trunk circuit	One LC13 provides two interface circuits for RTD or other auxiliary circuits. The LC13 provides the necessary isolation option, eliminating the need to order the isolation amplifier with the J58827E, L1 trunk.
9	31D voice coupler	One 31D voice coupler for coupling tip and ring leads per dictation machine provided. This coupler provides filtering and limiting required by the FCC registration rules, Part 68. The 31B voice coupler is grandfathered and may be used, if available.

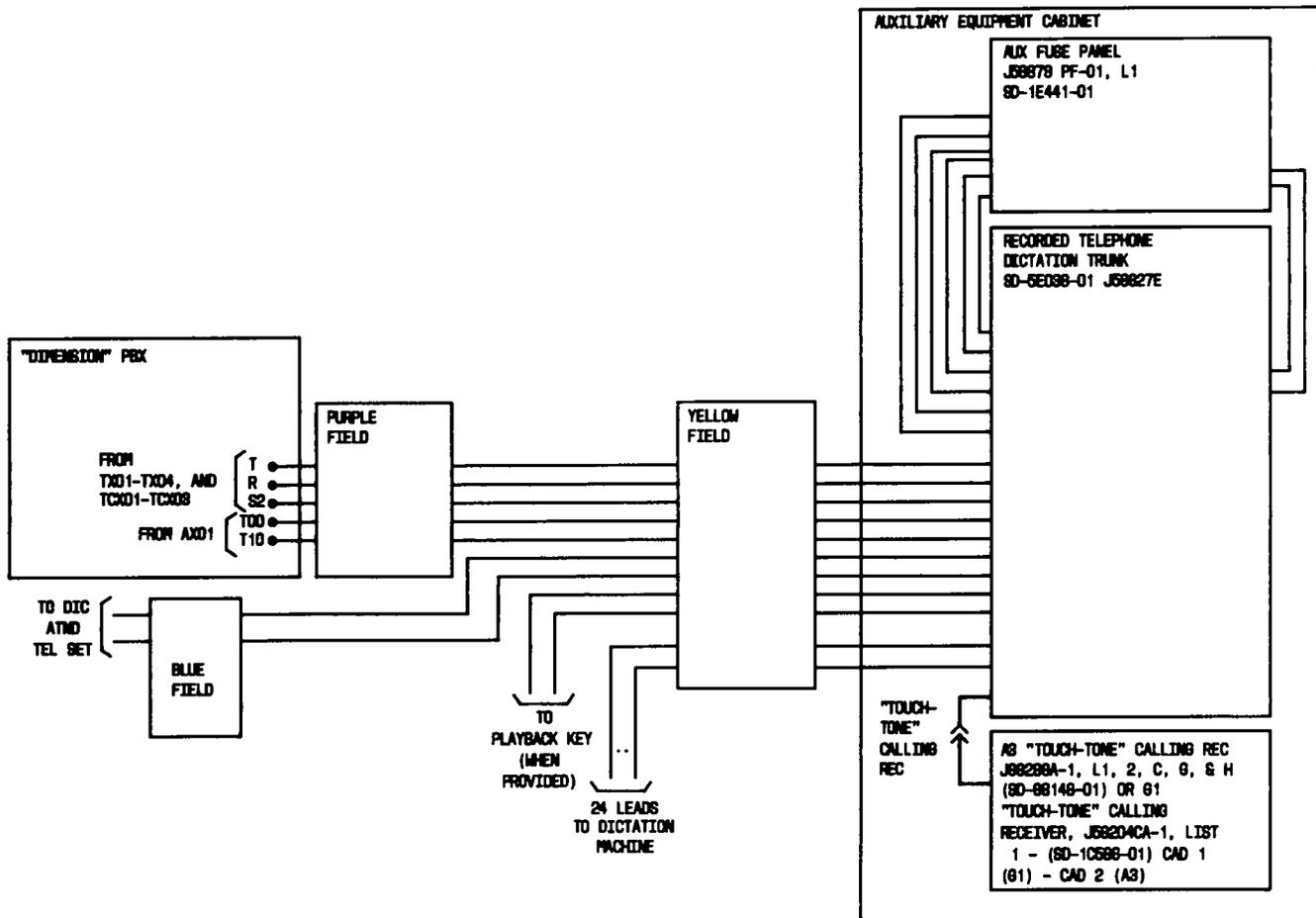


Fig. 41—Block Diagram of Recorded Telephone Dictation Trunk Connections

the repeater, a 1400-ohm resistor (228A) should be used between each -48V source and battery connection on the repeater. An example of 44V4 repeater connections is shown in Fig. 42.

O. 24V4 Repeater

6.67 The 24V4 repeater is designed to interface 900-ohm or 600-ohm 2-wire CO equipment using loaded or nonloaded cable. It consists of a mounting shelf which holds plug-in components and test jacks. If there is no MFT 2-wire repeater available, the telephone company may wish to use the 24V4 repeater for voice and data transmission. An example of the 24V4 repeater connections is shown in Fig. 42.

6.68 Figure 43 shows a typical trunk connected to the trunk carrier via the auxiliary equipment

(eg, 24V4 repeater). The auxiliary equipment may be the CPFT equipment.

P. Station Message Detail Recording (SMDR)

6.69 The SMDR data port is a dedicated channel that is provided by circuit 0, slot 32/37, in the trunk/control carrier. Refer to Section 554-010-122 for detailed SMDR information. Optional wiring connections are shown in Fig. 44. Connections to the 724A panel are illustrated in Fig. 45.

6.70 Power for the SMDR (9-track and direct output) is provided by a commercial 120-Vac 60-Hz source.

6.71 *Centralized Station Message Detail Recording (CSMDR) Interface:* The

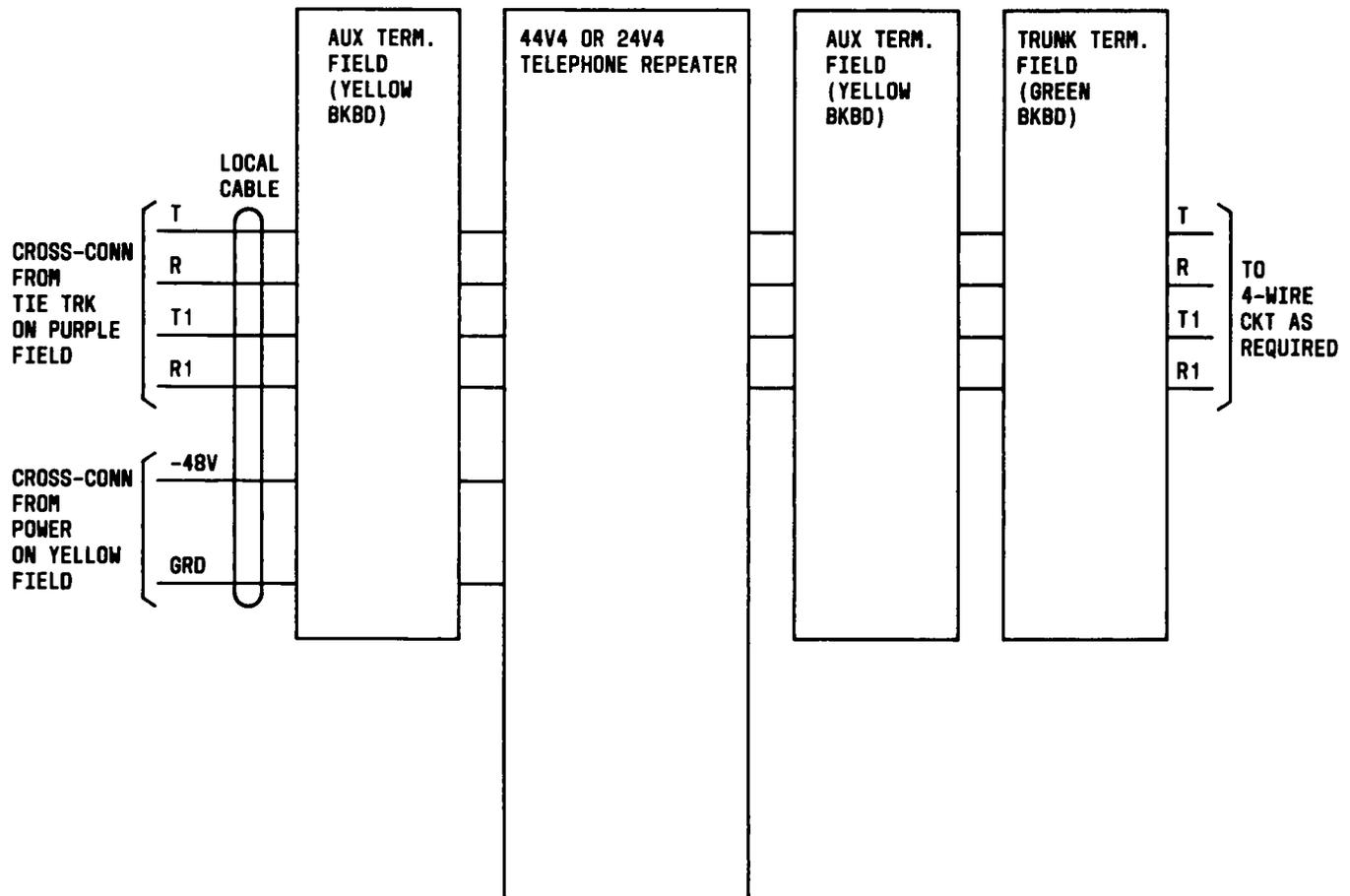


Fig. 42—44V4 or 24V4 Repeater Connections

SMDR data port also provides an interface to a CSMDR system that collects data from each remote customer premises location and provides the data at a central location. Figure 46 illustrates a block diagram of the interface to the PBX via a 212A data set and a 94A local storage unit (LSU). For detailed information on preinstallation and description, refer to Sections 190-402-100/-200 and 190-403-200.

Q. Trunk Answer From Any Station (TAAS)

6.72 The TAAS feature routes all incoming calls, normally directed to the PBX attendant, to activate a common alerting signal (bell, chime, horn, lamp, or station line ringer) on customer premises when night station is activated. These calls can then

be answered by any station user in the system who dials a special code from a nonrestricted station.

6.73 A single line port on an LC588 circuit pack must be designated for the feature. The signal may be connected directly to the line circuit (option T), or if the line circuit capacity is exceeded, an isolating circuit must be provided (option V) (Fig. 47).

6.74 When other than a high impedance ac coupled night ringer such as C4A2 is used or the limits below are exceeded, the 413A KTU slave relay configuration should be used. Line circuit LC588 working limits determine the use of the V option using the 413A KTU isolation.

MAXIMUM NUMBER OF C4A TYPE HIGH-Z RINGERS PER LINE	MAXIMUM LOOP RESISTANCE EXCLUDING STA APPARATUS
5	300 OHMS
4	500 OHMS
3	950 OHMS
2	950 OHMS
1	950 OHMS



Adding audible signals to the T and R leads after initial installation may cause the ringing limitations to be exceeded.

6.75 Refer to Section 463-110-100 for information on signals, Section 518-215-403 for information on the 413A KTU, and Section 518-215-419 for information on the 642A panel.

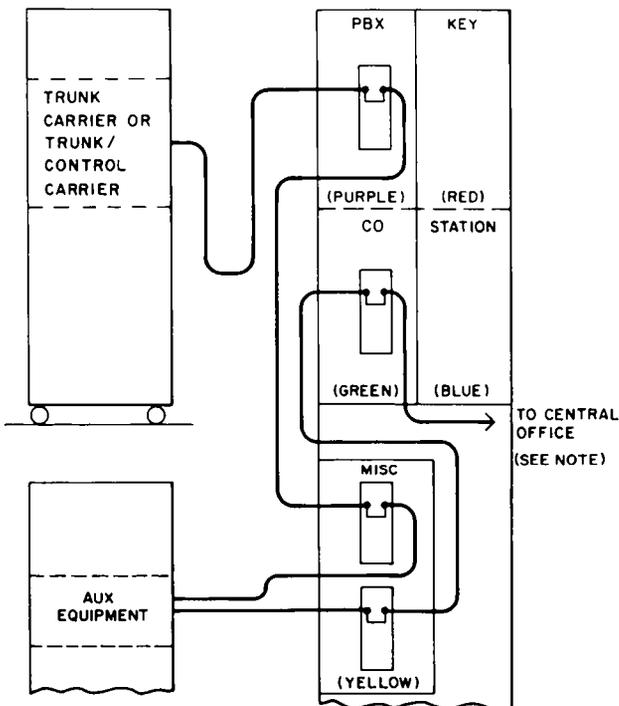


Fig. 43—CO Trunk Connected to Trunk Carrier via Auxiliary Equipment and Cross-Connect Field

R. Uniform Call Distribution/Traffic Overflow Indicator

6.76 When the UCD feature is provided, an indication of traffic overflow must be transmitted to the attendant. A convenient method is through a contact closure applied to a "beehive" lamp (Fig. 48). One circuit is required for UCD traffic overflow. Selection of the lamp type and value of resistor R2 must be engineered based on loop range requirements. The M1 lamp type is for short-loop (25 ohm) range, and the J1 lamp type is for long-loop (1500 ohm) range. Both M1 and J1 lamp types mount in 15-, 17-, or 18-type indicators. In Fig. 48, R1 is an optional surge resistor of 511 ohms used for long-range loops, and the value of R2 is determined by loop-range impedance. Refer to Table J for R2 values. The diode to be added with R2 is a 533F diode. A 185A contact protection network can be added in place of the 533F diode. Required equipment per loop is listed in Table K.

6.77 The recorded announcement feature cannot be used for incoming station calls to the UCD or DDC group stations. When recorded announcement is active for CO-type trunks, the CO trunk calls to a UCD or DDC group are answered immediately. Each UCD or DDC group has the option of being provided with delayed recorded announcement.

S. Visually Impaired Attendant Service

6.78 The visually impaired attendant equipment consists of the following:

- XXX-02XX-XX-XXX
- 6A grooved faceplate
- 990A light sensitive probe
- 2A translator.

Refer to Section 554-010-100 for more information.



This service can only be used with the XXX-02XX-XX-XXX console.

TRUNK CIRCUIT-TYPE SELECTION

6.79 The basic trunk circuit types used in the DIMENSION PRELUDE PBX are as follows:

- LC08D—Dual CO trunk circuit

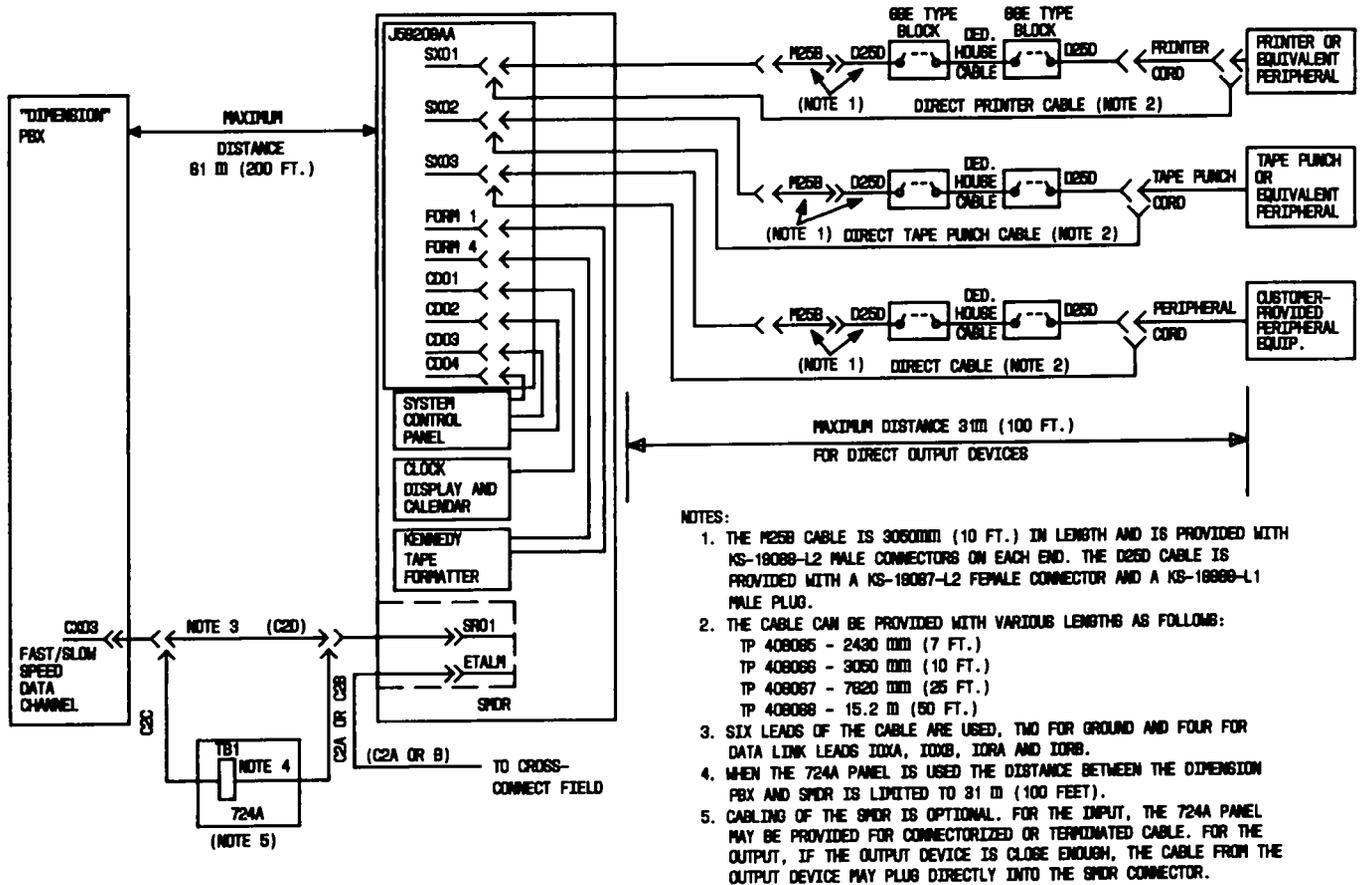


Fig. 44—Wiring Schemes for SMDR Connections

- LC09D—DID trunk circuit
- LC11B—Tie trunk circuits
- LC13B—Auxiliary trunk circuit.



The DIMENSION PBX is compatible with all CO except panel.

A. Central Office (CO) Trunk Circuit (LC08D)

6.80 The LC08D is a dual 2-wire CO trunk circuit pack. The circuit pack may be used as an interface for other trunks and trunk-related features.

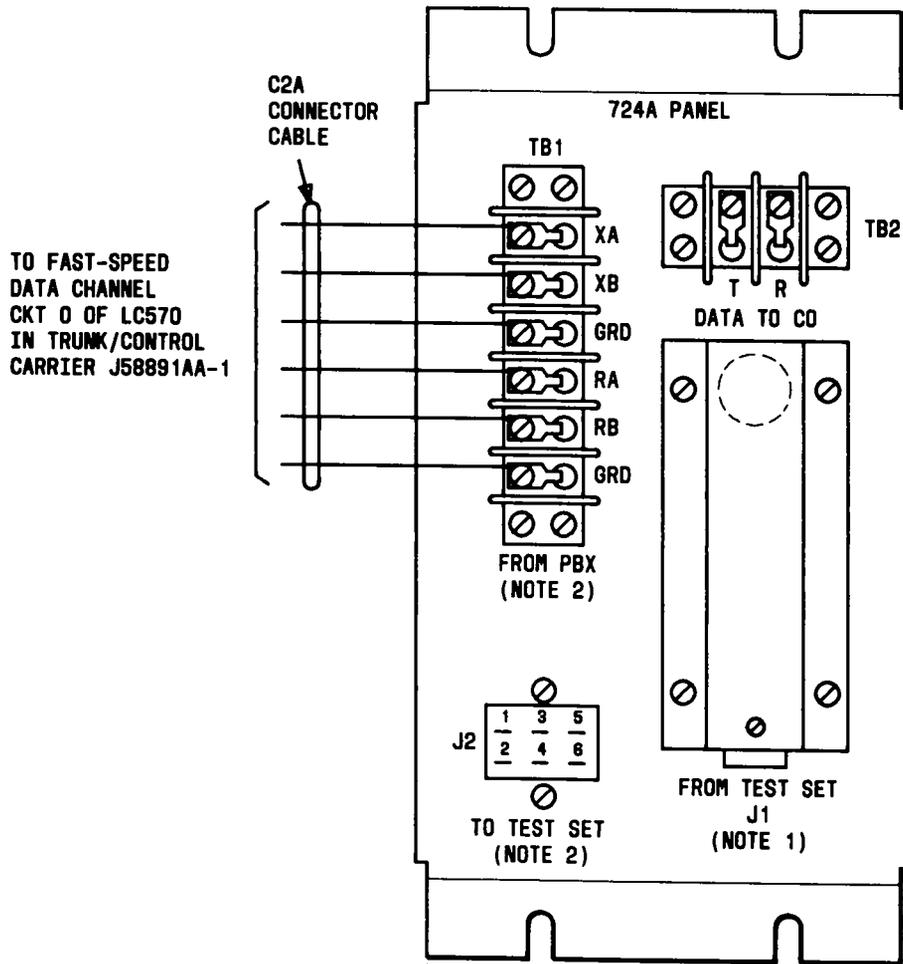
6.81 No wiring options are required for the following operating modes.

LOCAL LDN/FX

- 1-Way automatic in
- 1-Way out direct outward dialing (DOD), dial tone, and ground start
- 1-Way out DOD with party test, dial tone, and ground start
- 2-Way automatic in/dial tone and ground start out
- 2-Way automatic in/dial tone and ground start out with party test.

WATS

- 1-Way automatic in
- 1-Way out DOD or toll terminal access for TSPS, ground start, and dial tone



NOTES:

1. NOT USED FOR SMDR APPLICATION
2. J2 OR TB1 TO SMDR CABINET

Fig. 45—SMDR Connections at the 724A Panel

- 1-Way out DOD with party test, ground start, and dial tone.
- 6.82** The “party test” mode is required with the Speed Calling feature. Party test is required only when outpulsing must be delayed until a positive indication is received, signifying that trunk seizure at the CO has occurred and the CO is returning dial tone.
- 6.83** The LC08D trunk circuit employs a standard ground-start signal and transmission path from the CO to the PBX. Various configurations of the CO trunks are shown on Fig. 49. Two separate

trunk circuits are provided on each physical circuit pack.

- 6.84** Figure 50 shows the CO trunk circuit interfacing with 2-wire or 2-to-4-wire repeaters and depicts the use of 2-wire repeaters to terminate 2-wire cable on a 2-wire switch. The repeater is on the CO side and provides a 900-ohm termination, facing the 600-ohm output of the PBX. Figure 50(A) can also be applied to FX/WATS installations. For 4-wire PBX-CO trunks, a 2- or 4-wire repeater is necessary at the PBX, Fig. 50(B). The 2-wire side has impedance set to 600 ohms. The 4-wire impedance can be 600 or 1200 ohms.

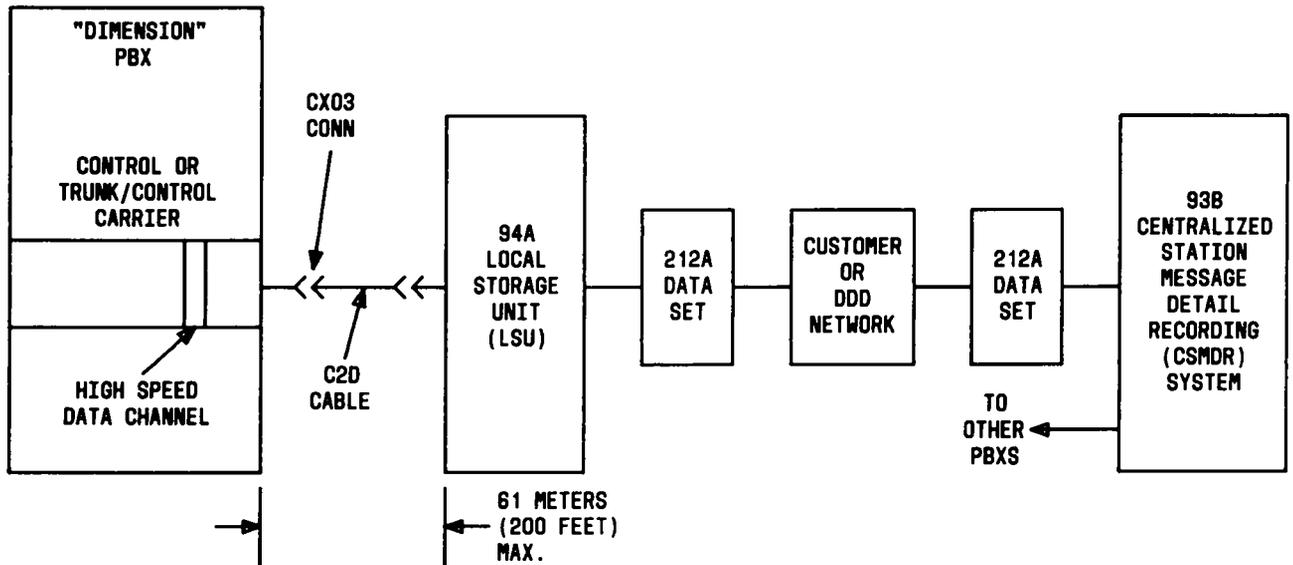
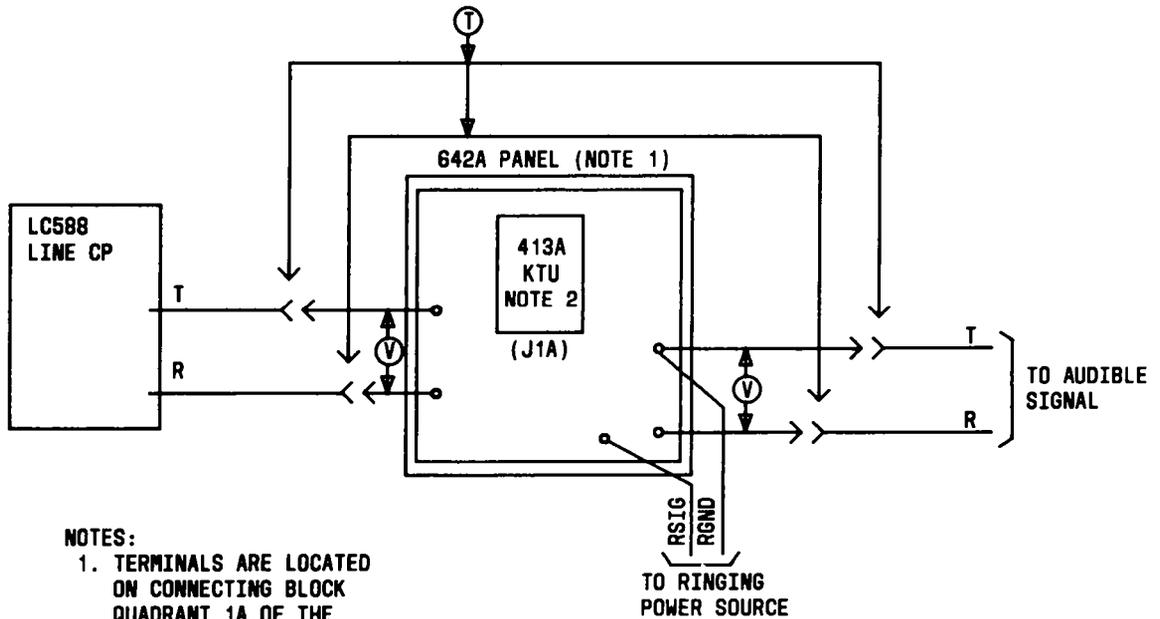
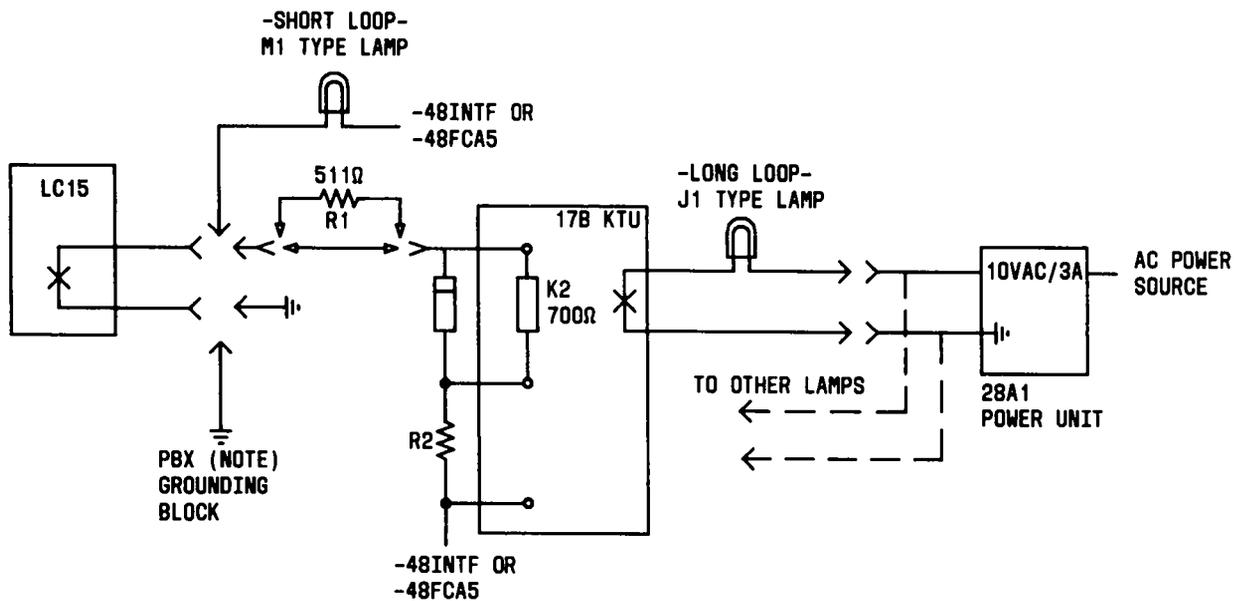


Fig. 46—Centralized Station Message Detail Recording (CSMDR) Arrangement Interface to the DIMENSION PBX



- NOTES:
1. TERMINALS ARE LOCATED ON CONNECTING BLOCK QUADRANT 1A OF THE 642A PANEL. (SEE SECTION 518-215-419)
 2. PROVIDE (X) OPTION ON THE 413A KTU PER SECTION 518-215-403

Fig. 47—TAAS Arrangement



NOTE:
USE PBX GROUNDING BLOCK WHEN OPTIONAL RESISTORS ARE USED

Fig. 48—UCD/DDC Traffic Overload Indicator

6.85 Terminal balance (Fig. 51) is required when PBX-CO trunks can be switched through to via net loss (VNL) tie trunks or CCSA lines.

6.86 Layout patterns for 2-wire FX/WATS are the same as for PBX CO trunks. However, the choice of using either intermediate or terminal repeaters is available, as determined by design loss and crosstalk requirements.

B. Direct Inward Dialing (DID) Trunk Circuit (LC09D)

6.87 The DID trunk circuit pack LC09D is used as high-low reverse battery interface for other trunks and trunk-related features.

6.88 The DID trunk circuit operates in both immediate-start and wink-start modes to provide 1-way DID service or 2-way service on an automatic-out/dial repeating or automatic-in basis. It cannot be used as a 2-way DID/DOD interface or as a loop signaling CCSA interface, because dial pulses cannot be sent outgoing. All modes are software-controlled and do not involve wiring changes. Dial pulsing information is sent back to the PBX as loop pulsing with a maximum external circuit resistance range of 1500

ohms (Fig. 52[A]) or as battery and ground pulsing with maximum resistance of 2450 ohms (Fig. 52[B]). Answer supervision is sent to the CO as battery and ground reversal.

6.89 The signaling range for loop pulsing can be increased by the installation of an LSE at the PBX (Fig. 53). All connections to a trunk circuit are via a single tip and ring pair (2-wire). No transmission pad switching is provided and the nominal transmission loss is zero.



When LC09D is used as an outgoing automatic tie trunk, it will not connect to the DIMENSION PBX time division bus until a closed loop is recognized from the opposite end. This is in the form of a seizure from the DID-equipped CO and will not cut through on a tie trunk call to a manual switching system until the distant switching system attendant returns answer supervision. Therefore, after the PBX dial tone is heard and the access digits are dialed, the

TABLE J

VALUE OF RESISTOR R2 PER LOOP RANGE

LOOP RANGE	R2/OHMS
0 ohms	2.37K
500 ohms	1.62K
1000 ohms	1K
1500 ohms	5 11
2000 ohms	0

TABLE K

EQUIPMENT REQUIRED PER LOOP FOR UCD/DDC TRAFFIC OVERLOAD INDICATOR

ARRANGEMENT	EQUIPMENT REQUIRED
Short Loop (0-25 ohms)	M1-type lamp and 15-, 17-, or 18-type indicator*, LC15
Long Loop Nonexposed Cabling (26-2500 ohms)	J1-type lamp and 15-, 17-, or 18-type indicator*, LC15, 17B KTU*, 28A-1 power unit, 533F diode, or 185A contact protection network or equivalent*, KS-20810-L1A type resistor*
Long Loop Exposed Cabling (26-1600 ohms)	Same as long-loop nonexposed cabling plus J58879BA-L15 interface surge protection network (one per each four UCD/DDC groups)

* One each required per UCD/DDC group.

calling party does not hear audible ring prior to attendant pickup.

C. Tie Trunk Circuits (LC11B)

6.90 The LC11B tie trunk operates in automatic or dial repeating modes, with E&M leads as well as a 4-wire voice transmission path. The following arrangements are available.

- 1-Way in/dial tone in
- 1-Way automatic out
- 1-Way dial tone out
- 1-Way automatic in
- 2-Way dial tone in/dial tone out
- 2-Way automatic in/dial tone out
- 2-Way automatic in/automatic out
- 1-Way in, dial tone and delay dial
- 2-Way delay dial or dial tone in/dial tone out

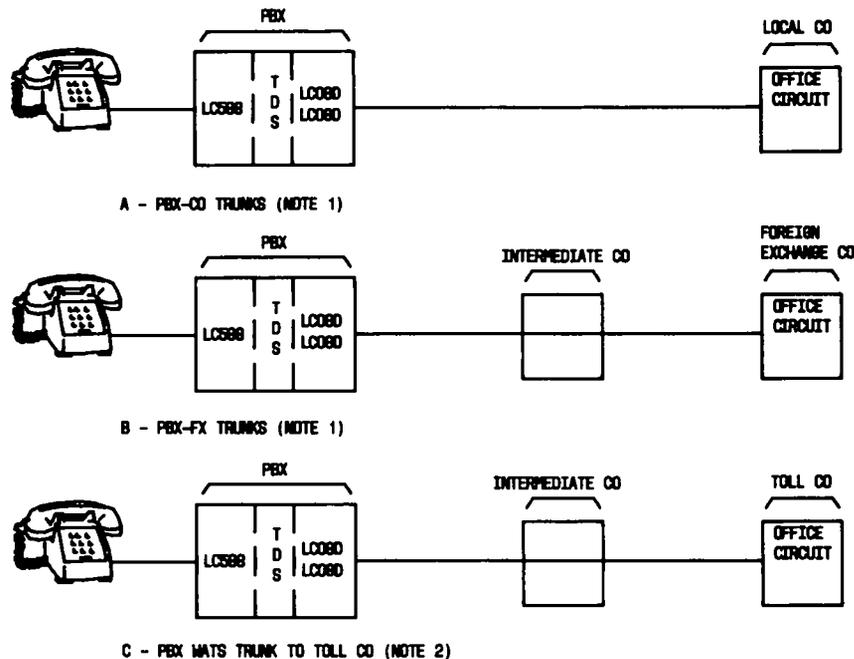
6.91 The CCSA Access is available with the following operational characteristics:

- 2-Way dial delay in/(wink start or delay dial) and dial tone out
- 2-Way wink start in/(wink start or delay dial) and dial tone out
- 2-Way delay dial in/dial tone out
- 2-Way wink start in/dial tone out.

6.92 Various combinations are shown on Fig. 54 and 55. When the tie trunks are used between two PBXs as shown, repeaters may not be required. Long tie trunks may require a 4-wire intermediate repeater in central offices through which the trunk passes. A 2-dB transmission pad switching function on the LC11B is controlled by the DIMENSION PRELUDE PBX software.

6.93 For proper transmission via the LC11B, the circuit pack impedance should be matched to the loop impedance to which it is connected. Switch 2 (SW2) on the LC11B is provided for this purpose. See Table L for the appropriate switch settings for various loop lengths in ohms.

6.94 The LC11B uses E&M signaling. For E&M signaling, a separate pair of wires carry the E&M signals, and the 4-wire transmission path does not



NOTES:

1. PBX-CO AND PBX-FX TRUNKS CAN HAVE THE FOLLOWING MODES OF OPERATION:

- ONE-WAY AUTOMATIC IN
- ONE-WAY OUT DOD DIAL TONE AND GROUND START
- ONE-WAY OUT DOD WITH PARTY TEST DIAL TONE AND GROUND START
- TWO-WAY AUTOMATIC IN/DIAL TONE AND GROUND START OUT
- TWO-WAY AUTOMATIC IN/DIAL TONE AND GROUND START OUT WITH PARTY TEST

2. WATS TRUNKS CAN HAVE THE FOLLOWING MODES OF OPERATION:

- ONE-WAY AUTOMATIC IN
- ONE-WAY OUT DOD OR TOLL TERMINAL ACCESS FOR TSPS, GROUND START, AND DIAL TONE
- ONE-WAY OUT DOD WITH PARTY TEST, GROUND START, AND DIAL TONE

Fig. 49—PBX-CO Trunk Combinations

carry direct current. Two independent trunk interfaces are provided on one circuit pack, and the signaling method of one does not limit the signaling method of the other.

6.95 Due to Part 68 of the FCC regulations, the LC11B cannot be used for DX signaling. If DX signaling is desired for use with an LC11B, an E&M to DX converter is required. The LC11B is connected to the converter via the cross-connect field (see Fig. 56).

6.96 The LC11B circuit pack can also be used to provide DID service for Centrex operation when E&M signaling capabilities are required. In the DID application, the transmission pads will be permanently switched out via DID software. When it is optioned for E&M signaling, connections to the trunk are via six wires; two tip and ring transmission pairs

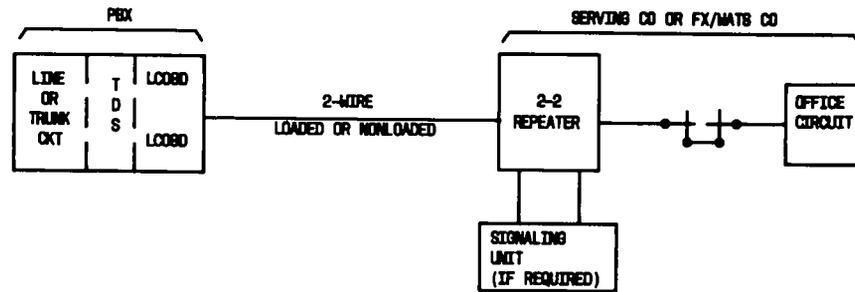
(4-wire) and a signaling pair—the E&M leads. The LC11B furnishes either the appropriate M-lead wink or no signal, as in the case of step-by-step CO immediate start, and the DIMENSION PBX call progress tones will be returned to the calling party.

D. Auxiliary Trunk Interface Circuit (LC13B)

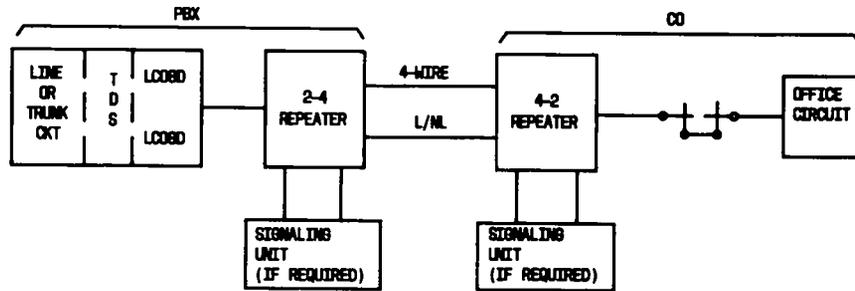
6.97 Transmission to customer-owned peripheral equipment is accomplished by dry-loop seizure or by sleeve ground-start seizure from the auxiliary trunk. A ground on the sleeve lead which has been returned by the peripheral equipment will be detected by LC13B.

E. Loop Signaling Interface Trunk Circuit (LC361)

6.98 The LC361 contains two circuits which provide interface to customer-provided computer



A - 2-WIRE PBX-CO OR FX/WATS TRUNK WITH 2-2 REPEATER AT CO.



B - 4-WIRE PBX-CO TRUNK

Fig. 50—PBX-CO Trunks

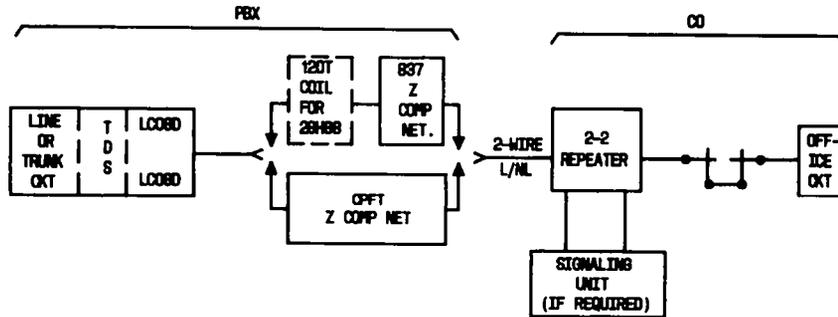


Fig. 51—2-Wire PBX-CO Trunk With Impedance Compensator

equipment (Data Communications Access feature) or to off-premises extensions (Off-Premises Station With Call Control feature). Loop signaling is generated by loop closures for incoming seizures and interrupted 30-Hz ringing for outgoing seizures.

6.99 Ringing and ringback control circuitry is provided on the LC361. Ringing is obtained from the ringing generator via carrier backplane wiring. Ringback tone is obtained from the LC204 tone circuit via the cross-connect field (Fig. 57).

Warning: After connection between LC361 and LC204 is made via the cross-connect field, no other circuit packs should be inserted in the slot used by the LC361 unless the connection is torn down. This is because other circuit packs will apply hazardous voltages to the LC204.

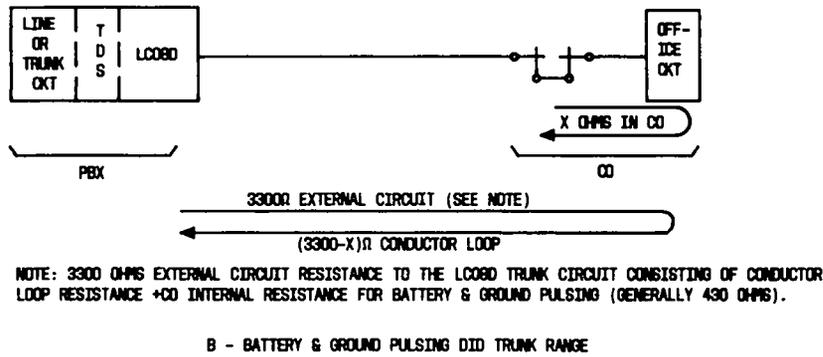
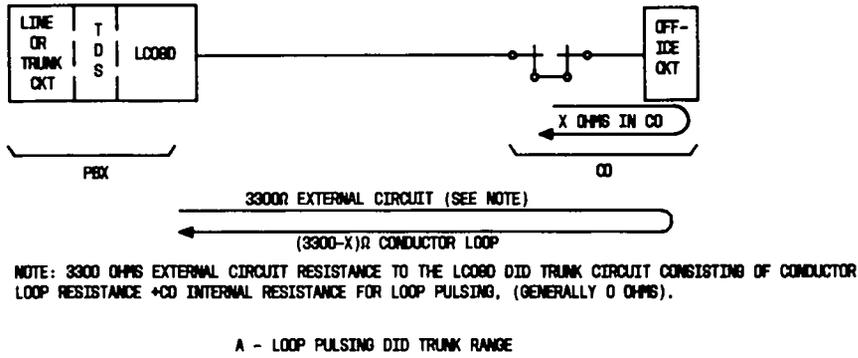


Fig. 52—DID Trunk Range

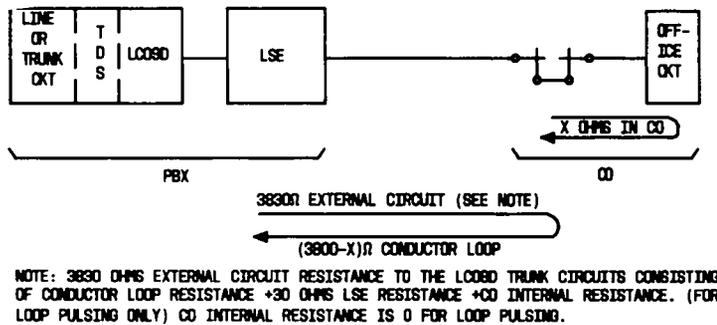


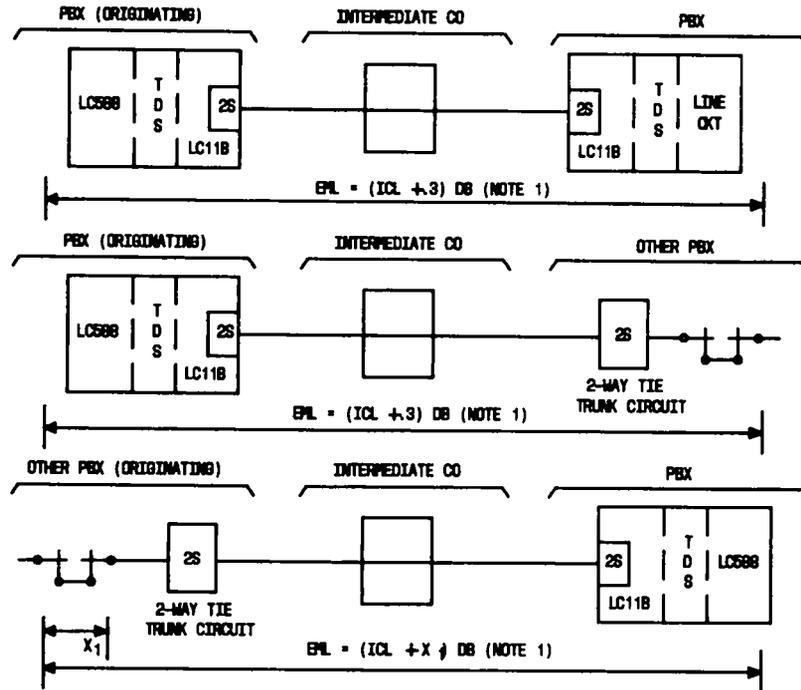
Fig. 53—LSE at DIMENSION PBX in DID Trunk

7. FEATURE SOFTWARE

7.01 The available tapes for the DIMENSION PRELUDE PBX are listed in Table M along with the parameters available with each tape. If tapes for system are ordered that do not contain the necessary translations for the quantity of lines and trunks equipped per system, the additional translations will have to be entered via the MAAP on location. The feature translations, after being entered, should be stored on the tape wafer by performing a RUN TAPE.

7.02 The equipment necessary to provide the DIMENSION PRELUDE PBX with feature translations is as follows:

- MAAP (J58879DA-1)
- RS232 SH compatible tape drive unit
- Tape wafer (one supplied per system).



NOTES:

1. EPL = ESTIMATED MEASURED LOSS

1000 HZ ICL DESIGN OBJ 1

TYPE	
SHORT HAUL	VNL 2+2S+2S
LONG HAUL	

- IF PAD SWITCHING IS NOT REQUIRED AT A PBX FOR ANY REASON AND IT HAS BEEN ASCERTAINED THAT THE PBX WILL NOT BECOME A TIE TRUNK TANDEM SWITCH IN FORSEEABLE FUTURE, THEN THE TIE TRUNK CIRCUIT CAN BE CLASSIFIED AS "WITHOUT PAD" AND THE 2DB LOSS IT REPRESENTS ALLOCATED TO FACILITY LOSS.
- ECHO SUPPRESSORS SHOULD BE USED WHEN THE VNL OF AN INDIVIDUAL TRUNK EXCEEDS 3.5DB, WHERE $VNL = VMLF \times LENGTH + 0.4 - 0$ WHERE $D = 0.10 \times$ (SUM OF ALL 1000 HZ. ROUND TRIP DELAYS OF DELAY EQUALIZERS).

Fig. 54—2-Wire PBX Tie Trunks

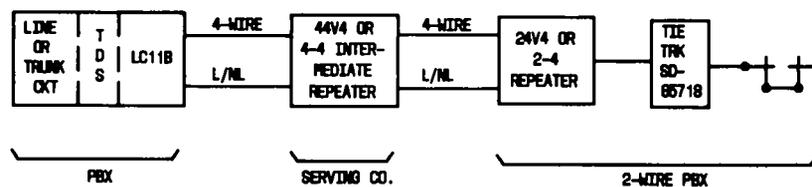


Fig. 55—4-Wire PBX Tie Trunks

TABLE L

LC11B SWITCH SETTINGS FOR VARIOUS LOOP LENGTHS

SWITCH 2 (SW2) SECTIONS	FUNC	LOOP LENGTH IN OHMS							
		0- 350	351- 950-	951- 1550-	1551- 2150-	2151- 2750-	2751- 3350-	3351- 3950-	3951- 4550-
1	Bal 1.1	C	O	C	O	C	O	C	O
2	Bal 2.1	C	C	O	O	C	C	O	O
3	Bal 3.1	C	C	C	C	O	O	O	O
4	Bal 3.0	C	C	C	C	O	O	O	O
5	Bal 2.0	C	C	O	O	C	C	O	O
6	Bal 1.0	C	O	C	O	C	O	C	O

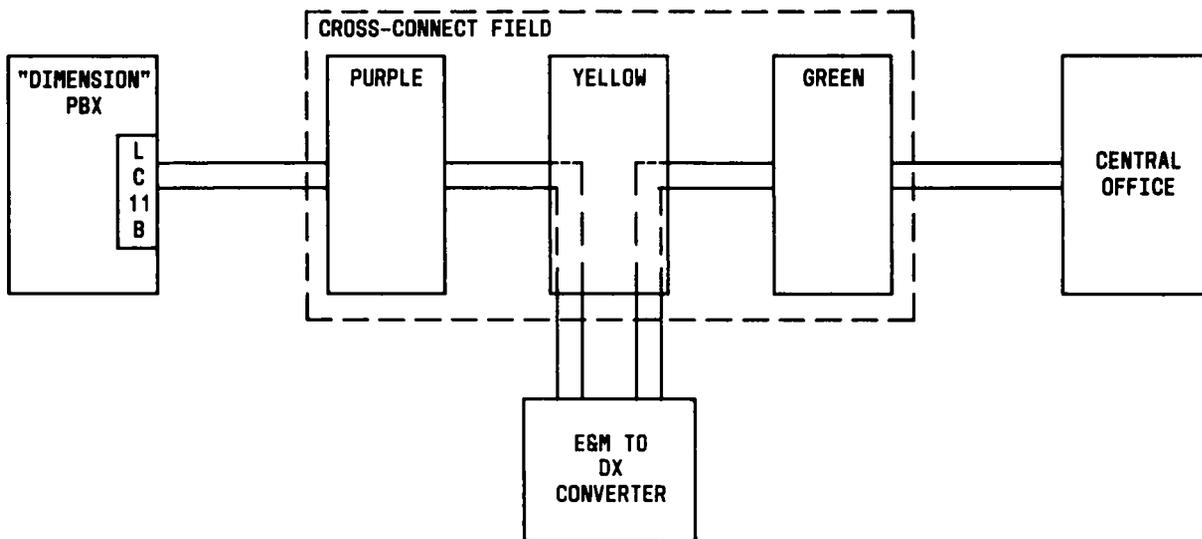


Fig. 56—Interconnections for E&M to DX Converter

Section 554-101-332 provides information for administering feature translations for the DIMENSION PRELUDE PBX.

8. PROCUREMENT OF SYSTEM

ORDERING

8.01 The DIMENSION PRELUDE PBX can be ordered using the Mechanized Ordering Form E-

8194. Alternate and additional circuit packs can be ordered via the E-8194 form, but most auxiliary equipment will have to be ordered nonstandard.

TRANSPORTATION

8.02 The system should always be shipped packaged in the Western Electric Company pro-

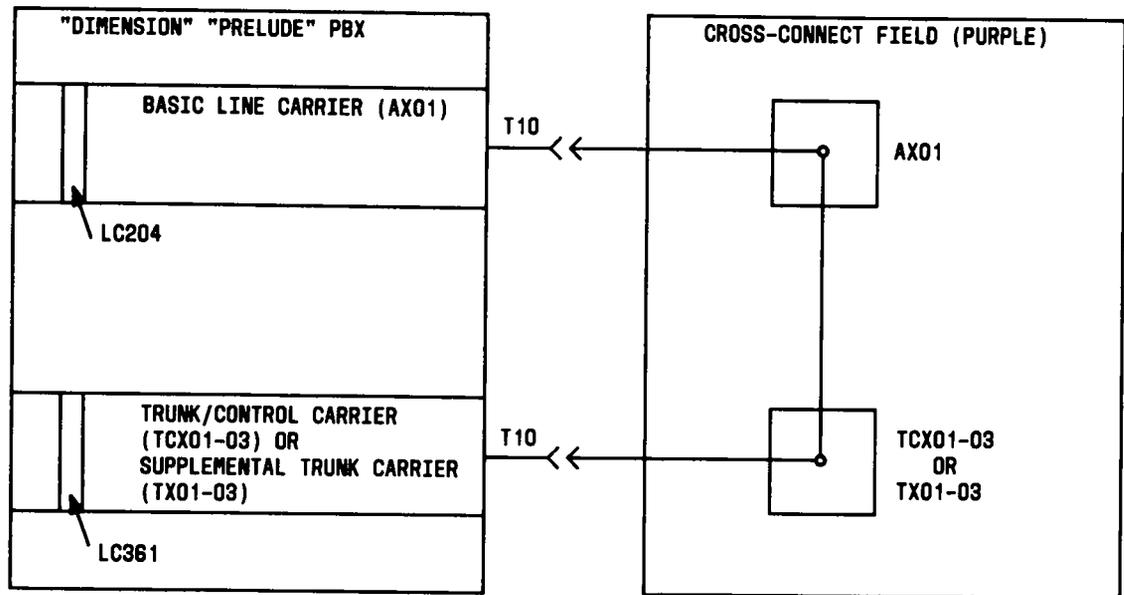


Fig. 57—Audible Tone Connections for LC361 Circuit Pack

vided crates.

8.03 The packing material used for shipping cabinets from Western Electric Company, Inc, is adequate for upright or lay-down (on-side) shipment. However, upright shipment is preferred. If on-side shipment of cabinets is used, installation personnel should carefully raise the cabinets to upright position before unpacking.

8.04 The preferred modes of transportation are in order of preference: truck, rail, and air. Air transportation is known to subject equipment to severe handling shocks. Rail transportation is less severe, but railroad car coupling shocks can be severely stressing on the system.

Handling on Site

8.05 It is preferred that the system remain packaged in its crate until it is in the room in which it is to be located.

8.06 A forklift and dolly are acceptable means of handling the crated system on customer premises. The pallet portion of the crate has been designed for these methods of handling.

8.07 Care should be taken to avoid dropping the system (either crated or uncrated) from any

height. Under no circumstances should the system be allowed to drop from a height greater than 203 mm (8 inches) packaged or 25 mm (1 inch) unpackaged.

9. REFERENCES

9.01 The following sections are associated with DIMENSION PRELUDE PBX and, when available, may be used for additional information.

SECTION	TITLE
190-402-100	94A Customer Premises System—Description Information
190-402-200	94A Customer Premises System—Identification and Preinstallation Information
190-403-200	93B Customer Premises System—Identification and Preinstallation Information
332-610-100	Customer Premises Facility Terminal Equipment—General Description
332-610-200	Customer Premises Facility Terminal Equipment—Installation

TABLE M
"DIMENSION" "PRELUDE"
PBX TAPES

TAPE	TRANSLATION PARAMETERS	
	STATION LINES	CO TRUNKS
E	1	1
F	54	4
G	120	4
H	180	4

SECTION	TITLE
332-610-500	Customer Premises Facility Equipment — Maintenance and Testing
332-910-180	Metallic Facility Termination—General Applications
460-100-400	Station Protection and Grounds
463-110-100	Auxiliary Signals—Identification, Installation, Operation, Maintenance, and Connections
463-210-101	24A- and 24B-Type Indicators, Identification and Installation
518-010-101	Centralized Key Telephone Installation
518-215-403	Control Services
518-215-419	620A-Type, 641A, and 642A Modular Panels—Identification, Installation, Connections, and Maintenance
554-000-000	DIMENSION PBX Numerical Index (Refer to this index for TOP Documents)
554-000-100	DIMENSION PBX (Refer to this index for Maintenance and Administration Manuals)

SECTION	TITLE
554-010-100	DIMENSION PBX Attendant Console — Maintenance Support Information
554-010-101	DIMENSION 100 and 400 PBX—Input/Output, MAAAP, and Auxiliary Circuits—Maintenance Support Information
554-010-122	DIMENSION PBX—Station Message Detail Recording
554-102-100	DIMENSION PRELUDE PBX—System Description
554-191-100	DIMENSION PBX Feature Documents Reference Guide
631-400-102	Cable and Terminal Board in the Subscriber's Building
809-002-100	PBX Equipment Space
851-300-130	Standard Design of Switched Special Services Circuits—Application of Metallic Facility Terminal Circuits
876-300-100	Electrical Protection
9.02 The following SDs and associated CDs are applicable and may be referred to when required.	
DRAWING	TITLE
SD-1C586-01	TOUCH-TONE Calling Receiving Circuit Type G1 (Iss 2)
SD-1E290-01	609-Type Emergency Transfer Circuit (Iss 4)
SD-1E498-01	Power Distribution (Iss 1)
SD-1E460-01	Data Channel Repeater (Iss 1)
SD-1E466-01	Attendant Console Repeater (Iss 1)
SD-5E038-01	Recorded Telephone Dictation Trunk Circuit — Common Systems (Iss 10)

DRAWING	TITLE	DRAWING	TITLE
SD-65747-01	Loudspeaker Paging Trunk (Iss 1)	ED-1E300-01	System Equipment Information
SD-66942-01	PBX Systems TOUCH-TONE Calling Receiver Circuit Type G2 (Iss 4)	ED-1E301-01	Environmental Requirements
SD-69613-01	31-Type Voice Coupler	ED-1E310-11	DIMENSION PRELUDE PBX Cabling Plan and Assemblies
SD-69910-01	Attendant Electronic Console (Iss 7)	ED-1E364-70	DIMENSION PRELUDE PBX Thermal Assembly
SD-7C010-01	CPFT for Voice Frequency Circuits (Iss 5)	ED-1E432-70	DIMENSION PRELUDE PBX Three Carrier Capacity Cabinet Assembly
NS-01511-01	Power Systems — Regulated Ferroresonant Rectifier (Iss 1)	ED-1E433-70	DIMENSION PRELUDE PBX Three Carrier Capacity Front Cover Assembly

9.03 The *equipment drawings (EDs)* are associated with the DIMENSION PRELUDE PBX and may be referred to for additional information.

