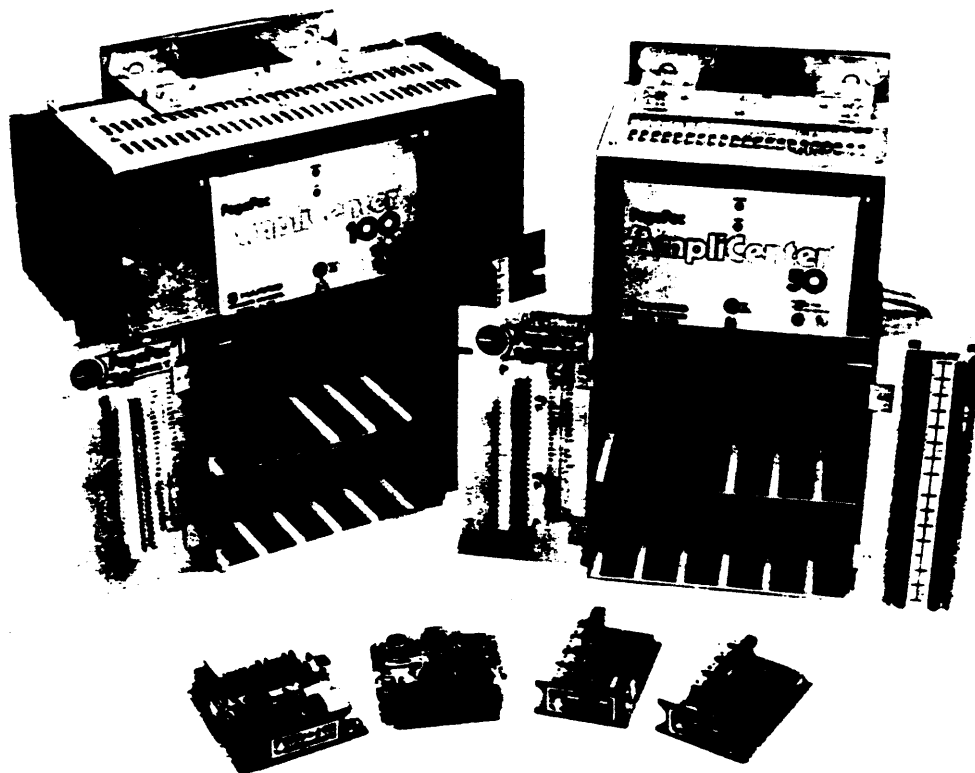


PAGEPAC® TELEPHONE VOICE PAGING SYSTEM
IDENTIFICATION, INSTALLATION, OPERATION AND MAINTENANCE



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PAGEPAC® TELEPHONE VOICE PAGING SYSTEM

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1. GENERAL

1.01 This section provides identification, description of apparatus, installation, operation, maintenance and connection information for the PagePac® Telephone Paging System manufactured by the Dracon Division of the Harris Corporation, Camarillo, California 93010.

1.02 This section is reissued to revise Table N to reflect the actual features available with each zone of Auxiliary Zone Card Type 3.

1.03 This section includes information for the Type C Applique Rev A circuit card and information formerly contained in Section DRCN-46-100 and Section DRCN-46-101, which are hereby cancelled. It does not include information on the 16-zone version of the PagePac® Telephone Paging System, which is no longer being manufactured.

1.04 The Dracon PagePac® (Fig. 1) is a powerful, self-contained paging unit. Available in 50-, 100- and 200-watt capacities, it provides up to 24 separate paging zones plus all-call paging into all 24 zones at once. Talk-back is optional as is an FM tuner for background music and music-on-hold. The basic system comes in a cabinet suitable for wall or rack mounting. Circuit cards are ordered separately and the only other materials required are the loudspeakers, speaker mounting hardware and speaker wire.

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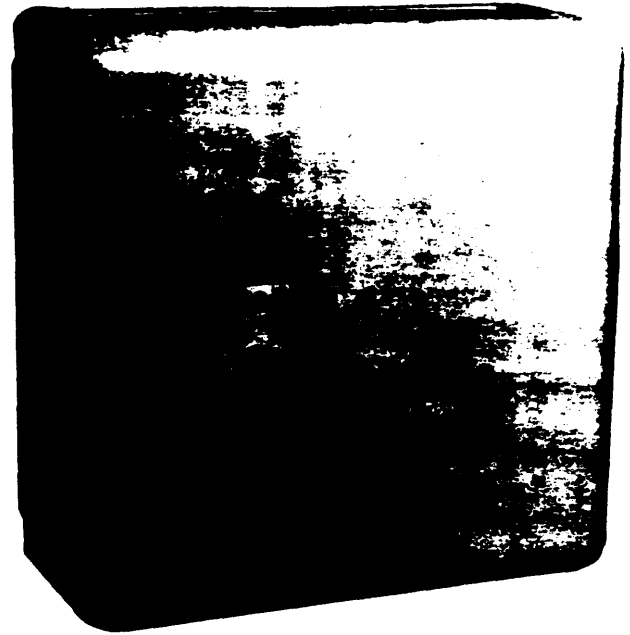


Fig. 1—PagePac® Telephone Paging System

1.05 The PagePac® provides a PABX or key telephone system with all the controls and features necessary for zone paging. Intended for medium and large business customers, it is the full-featured version of the PagePac® family of paging systems.

2. IDENTIFICATION

PURPOSE

- To provide business customers with a large-capacity multi-zone paging system.
- To provide a unique paging system offering a complete range of sophisticated features.

APPLICATION

- 1A2 and 10A2 Key Telephone Systems.
- PABXs and Centrex exchanges.
- As a stand-alone paging system.

DESIGN FEATURES

- Compact and flexible single-unit design.
- Up to 24 paging zones plus all-call paging.
- 25 or 70.7V switch-selectable speaker outputs.
- 600-ohm output for off-premise amplifier.
- Self-contained in rack- or wall-mounted cabinet.
- Compression circuit for uniform paging output level over wide range of inputs.
- Paging preamplifier provides improved frequency response of voice signals.
- Separate preamplifier channel for background music.
- Music automatically muted during paging.
- Music gain can be independently adjusted.

OPTIONAL FEATURES

- Access from key or non-key telephone sets.
- Access via a key system dial intercom or direct from station sets.
- Access from a PABX or Centrex trunk.
- Access from a PABX, Centrex or CO line circuit.
- Decoding of rotary- and tone-dial signals for zone selection.
- Supervisory tones including dial tone, busy tone and reorder tone.
- Zones with special features such as music only or page only.
- Dial access of a preprogrammed group of zones.
- Talk-back; handsfree reply from speaker locations.
- FM music source for background music and key system music-on-hold.

POWER REQUIREMENTS

- 105-129V ac, 57-63 Hz.
- Refer to Table A for the power consumption of the three PagePac models.
- Unit comes equipped with a 6-foot, heavy-duty power cord with 3-prong plug.

TABLE A
POWER CONSUMPTION

MODEL	CONSUMPTION
50-Watt PagePac Idle Full Output	13 Watts 175 Watts
100-Watt PagePac® Idle Full Output	20 Watts 205 Watts
200-Watt PagePac® Idle Full Output	25 Watts 385 Watts

ELECTRICAL CHARACTERISTICS

- Refer to Table B for the PagePac® electrical and performance specifications.
- Refer to Table C for the Talk-Back Control Card performance specifications.
- Refer to Table D for the electrical specifications of the Type C Applique circuit.

NUMBERING PLAN

- The dialing codes to access zones and special features are shown in Table E.
- If the code of an unequipped zone or feature is dialed, reorder tone is heard.

DIMENSIONS AND WEIGHT

- The unit with cover is 17¾" (45.1 cm) wide, 19¾" (50.2 cm) high and 8¾" (22.2 cm) deep.
- It is designed to mount on the wall or on a 19" rack without adapters.
- The 200-watt system weighs 59 lbs. (22.7 kg).

TABLE B

PAGEPAC® ELECTRICAL SPECIFICATIONS

PARAMETER	WORKING LIMITS
ZONE SELECTION Zones Enable Leads* Enable Signals*	24 + All Call 25 (24 Zones + All Call) ±18V, -24V or Ground (selectable)
MAXIMUM SPEAKER LOAD (AmpliCenter® Rating) Per Zone or All Zones Combined	50, 100 or 200 watts rms (depending on model)
MUSIC AMPLIFICATION Frequency Response Distortion Input Impedance Hum and Noise	±1 dB 100 Hz to 17 kHz Less than 1% 600 ohms balanced Min. 60 dB below rated output
PAGE AMPLIFICATION Frequency Response Input Impedance Hum and Noise	-3 dB at 330 Hz and 5.7 kHz 600 ohms balanced Min. 60 dB below rated output
PAGE COMPRESSOR Compression Ratio Attack Time	15:1 Less than 3 ms
SPEAKER LINE	25V or 70.7V (selectable)

TABLE C

TALK-BACK CONTROL CARD SPECIFICATIONS

PARAMETER	WORKING LIMITS
VOICE ACTIVATED SWITCH Switching Level at Telephone Line: high sensitivity low sensitivity Attack Time (Listen to Page) Release Time (Page to Listen) Insertion Loss in Page Mode (Tel. Line to PA Amp Output)	-21 dBm nominal -18 dBm nominal 20 ms nominal 500 ms nominal 0.5 dBm
STANDARD TALK-BACK PRE-AMPLIFIER Sensitivity Average Output to Tel. Line Available Compression	-50 dBm -10 dBm 50 dBm
ADJUSTABLE-GAIN TALK-BACK PRE-AMPLIFIER Sensitivity Limited Output to Tel. Line Available Compression	-50 dBm -5 dBm None
TALK-BACK ALERTING TONES Frequency Output Level Burst Length Repetitive Tone Silent Interval	440 Hz -10 dBm Approx. 1 second Approx. 15 or 30 sec. (selectable)
MAX. SPEAKER LOAD Into 70.7V Line	200 watts rms relay contact rating

*Not required with Type C Applique.

SECTION DRCN-46-201

TABLE D
TYPE C APPLIQUE SPECIFICATIONS

PARAMETER	WORKING LIMITS
LOOP RESISTANCE	
24V Battery Feed	600 ohms max.
48V Battery Feed	1500 ohms max.
LOOP CURRENT	20 mA min.
TELEPHONE LINE IMPEDANCE	600 ohms
RINGTRIP VOLTAGE	75 to 110V ac
DIAL PULSES	9 to 11 pps 60-40 Break Ratio $\pm 10\%$
TONE DIAL SIGNALS	
Digit 1	697 Hz + 1209 Hz
Digit 2	697 Hz + 1336 Hz
Digit 3	697 Hz + 1477 Hz
Digit 4	770 Hz + 1209 Hz
Digit 5	770 Hz + 1336 Hz
Digit 6	770 Hz + 1477 Hz
Digit 7	852 Hz + 1209 Hz
Digit 8	852 Hz + 1336 Hz
Digit 9	852 Hz + 1447 Hz
Digit 0	941 Hz + 1336 Hz
Frequency Bandwidth	$\pm 2.5\%$ About Center Frequency
Amplitude Difference	10 dB max.
Signal Duration	40 ms min.
Interdigital Interval	50 ms min.
Interdigital Time-Out	10 Seconds
AUDIBLE TONES	
Dial Tone	440 Hz — Steady
Busy Tone	440 Hz at 52 IPM
Reorder Tone	440 Hz at 104 IPM
SYSTEM TIME-OUT	8, 45 or 600 Seconds or Unlimited (selectable)
DELAY ON RELEASE	100 or 450 ms (selectable)
TEMPERATURE RANGE	0° to 50° C Operating

TABLE E
TYPE C APPLIQUE NUMBERING PLAN

ACCESS CODE	ZONE OR FEATURE
4	1
5	2
6	3
7	4
8	5
9	6
0	7
21	All-Call
22	8
23	9
24	10
25	11
26	12
27	13
28	14
29	15
20	16
31	17
32	18
33	19
34	20
35	21
36	22
37	23
38	24
39	Zone Group Programming
301	Zone Group 1
302	Zone Group 2
303	Zone Group 3
304	Zone Group 4
300	Scratch Pad Programming
30	Scratch Pad Zone Group

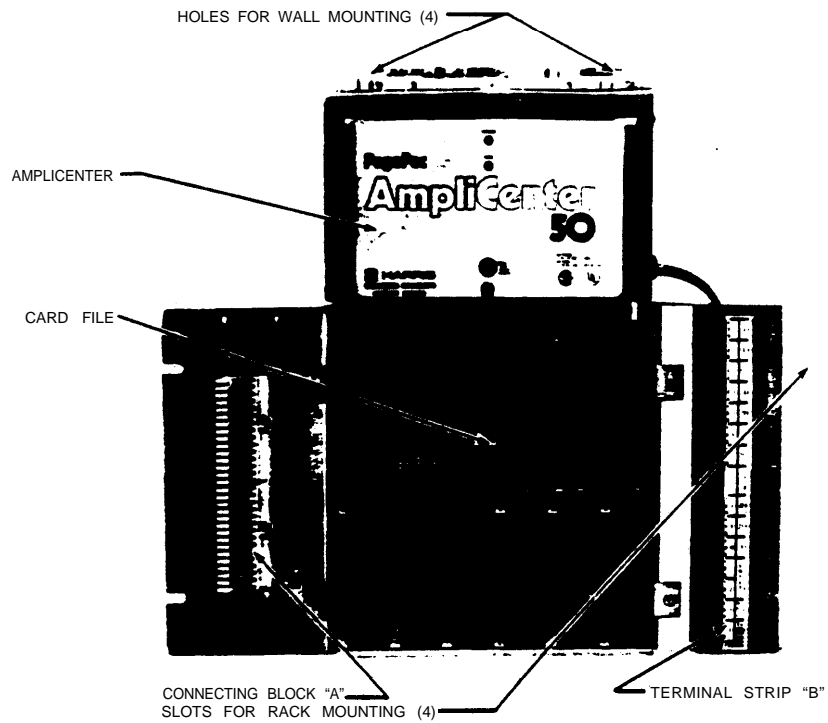


Fig. 2—50-Watt PagePac® Telephone Voice Paging System

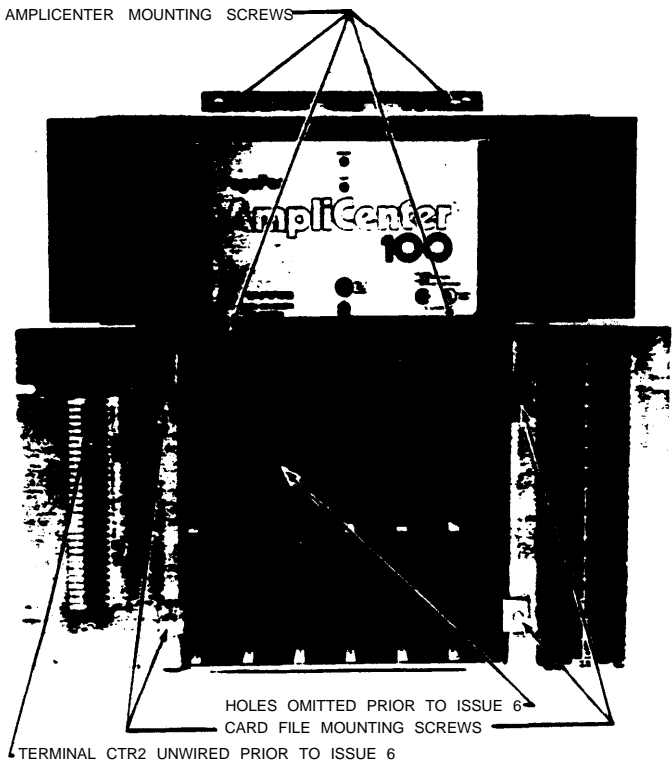


Fig. 3—100-Watt PagePac® Telephone Voice Paging System

ORDERING GUIDE

- Refer to Table F to determine the model number of the desired PagePac assembly, as well as the option cards required for a particular application.
- Select the PagePac assembly with the desired wattage. The PagePac assembly includes an AmpliCenter power amplifier of the corresponding capacity.
- Refer to Table F and select an AmpliCenter® if one is required for replacement purposes or for stand-alone operation as a remote amplifier. Otherwise, the appropriate AmpliCenter is provided as part of the main assembly.
- It is recommended that a Type C Applique be provided in all cases. While it may be omitted where access is via a paging adaptor and zone paging will not be utilized, for reasons of convenience, flexibility and standardization it is desirable that the Applique be used on all new installations.
- A Master Zone Card must be ordered to provide zone paging. The Master Zone Card provides for the first four paging zones as well as all-call.
- Each Auxiliary Zone Card serves four additional zones and up to five such cards may be ordered in any combination. Select the appropriate types from Table F.
- If talk-back is desired, specify the Adjustable-Gain Talk-Back Control Card if high ambient noise is encountered at the speaker locations. Otherwise the Standard Talk-Back Control Card may be specified.
- If the talk-back feature is not desired, the Talk-Back Continuity Card provided with the unit must remain in the connector position designated **TALK-BACK**.

AmpliCenter is a registered trademark of the Harris Corporation.

3. DESCRIPTION OF APPARATUS

PAGEPAC SYSTEM ASSEMBLY

3.01 The PagePac Telephone Paging System is available in a 50-watt, 100-watt and 200-watt version. The four models are electrically and physically identical except for the wattage and size of the AmpliCenter power amplifier. Two of the models are shown in Fig. 2 and 3. Each system consists of an AmpliCenter, card file, plug-in circuit cards (ordered separately) and terminal blocks mounted in an aluminum cabinet with protective cover. Each PagePac is prewired, assembled, and tested at the factory. The equipment mounts directly onto a 19" relay rack or on a wall without the use of adapters. For wall mounting, a template is provided as an aid in positioning the mounting screws.

3.02 The card file (see Fig. 2) is mounted just below the AmpliCenter. It consists of two rows of six positions each and will hold up to 12 printed circuit cards. The card file provides a flexible means of equipping any or all of the service features without the necessity of performing wiring changes in the field. All positions are prewired and tested. Each position is dedicated to a specific type of card. Master and auxiliary zone circuits utilize 3½" x 5½" cards which install in the lower section of the card file. All other circuit cards measure 4¾" x 5½" and are installed in the upper section. The position designated **DTMF** on the upper section is not used with the Type C Applique REV A Card, as DTMF decoding is built into the Type C card.

3.03 All external connections to the system are performed at the connecting block on the left side of the assembly or at the terminal strip on the right side. In general, input connections from the telephone system are made at the connecting block, while output connections to the speakers are performed at the terminal strip. Fig. 4 is a system block diagram of a fully-equipped PagePac Telephone Paging System.

TABLE F
ORDERING GUIDE

DESIGNATION	FEATURES	MODEL NO.
PagePac Telephone Voice Paging System	50-Watt Output	22073-001
	100-Watt Output	22074-000
	200-Watt Output	22075-000
AmpliCenter (Provided with the Above Assemblies)	50-Watt Output	22150-000
	100-Watt Output	22100-000
	200-Watt Output	22120-000
Type C Applique Rev A	Basic Features Only	22082-007
	Basic Features and Zone Group Programming	22082-008
	Basic Features and Confirmation Tone	22082-009
	Basic Features, Zone Group Programming and Confirmation Tone	22082-010
Master Zone Card	First Four Standard Zones (Paging and Background Music)	22081-000
Auxiliary Zone Card Type 1	Additional Four Standard Zones (Paging and Background Music)	22081-001
Auxiliary Zone Card Type 2	Additional Four Special Zones (Low-Level Outputs for Driving Auxiliary or Remote Amplifiers)	22081-002
Auxiliary Zone Card Type 3	Three Standard Zones and one Music-Only Zone	22081-003
Auxiliary Zone Card Type 4	Two Standard Zones and Two Page-Only Zones	22081-005
FM Tuner	Provides Source of Background Music	22083-001
Talk-Back Control Card	Standard	22080-000
	Adjustable Gain	22080-003
	Continuity Card*	22080-002

*Continuity Card is provided with each PagePac® assembly.

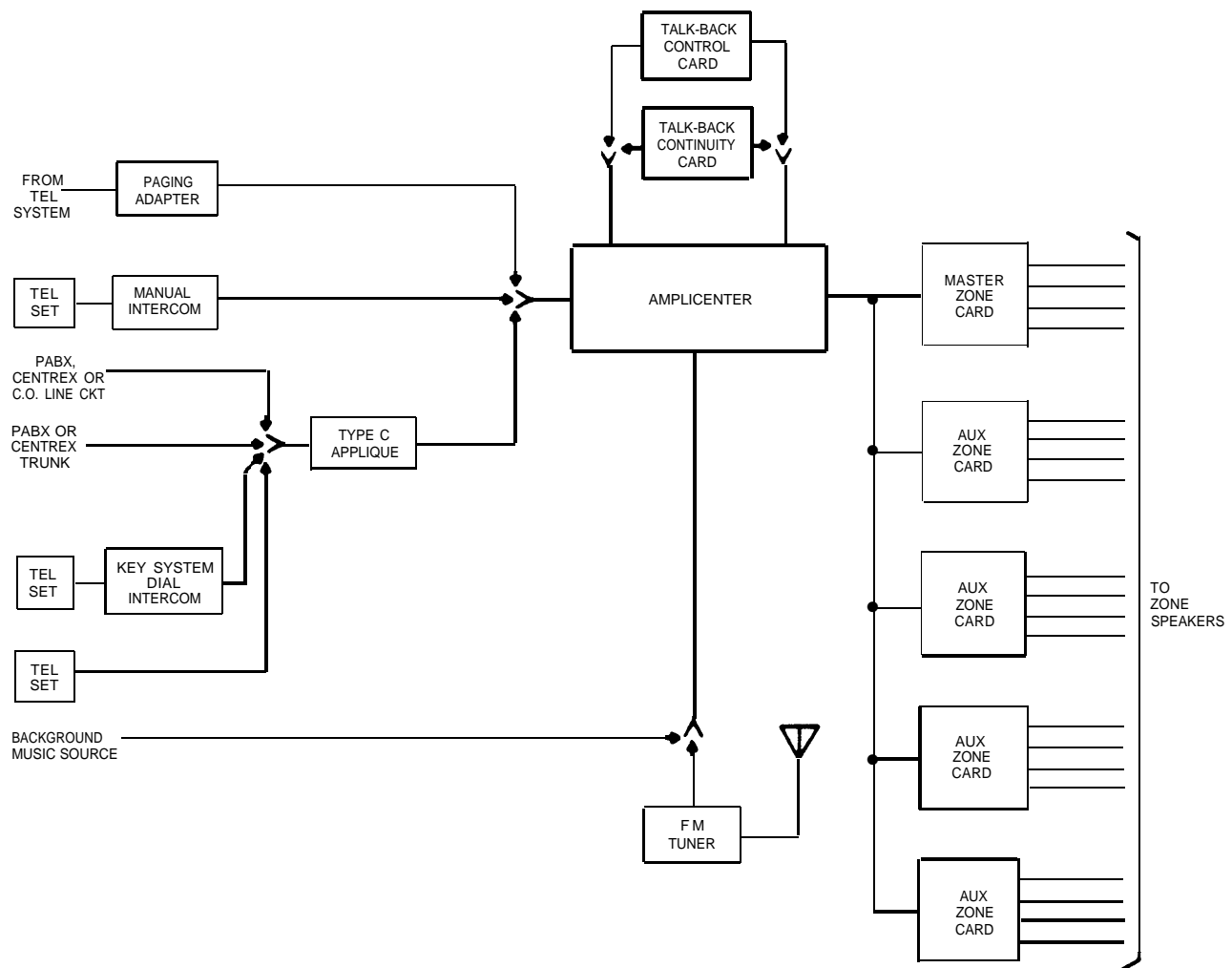


Fig. 4—System Block Diagram

AMPLICENTER®**A. Design Features**

3.04 The AmpliCenter (Fig. 2 and 3) boosts the low-level music and page signals to high levels capable of driving the loudspeakers. The paging preamplifier incorporates limiting and compression circuits so that persons with either loud or soft voices will be heard at the same level. The gain of the paging preamplifier and the compression circuits is preset to provide a paging output level of 70.7V \pm 1 dBm over a paging input level range of -15 dBm to 0 dBm. No field adjustment is required.

3.05 Background music is silenced during paging by operation of a solid-state switch. A potentiometer permits adjusting the music level. Either the 25-volt or the 70.7-volt output can be selected by operation of a slide switch. A low-level, 600-ohm, dry, balanced output is available for driving additional amplifiers. A built-in power supply provides filtered and regulated -24 volts to power all circuit cards.

3.06 The AmpliCenter's terminals are prewired to the card file of the PagePac assembly. No external terminations are made on the AmpliCenter when the latter is provided as part of the PagePac assembly. When an AmpliCenter is used as a stand-alone remote amplifier, refer to Installation Instruction II-720000-609 (included with each AmpliCenter) for detailed information on the external connections.

B. Switches and Controls

3.07 *Power On/Off Switch:* This rocker switch controls the ac power to the AmpliCenter .

3.08 *PowerLED:* This green LED lights when the **POWER** switch is in the **ON** position and ac line voltage is being applied to the AmpliCenter

3.09 *Circuit Breaker Reset Button:* Should the circuit breaker trip due to an ac power overload, pressing the **PWR BRKR** button will reset the breaker and restore power to the amplifier.

3.10 *Overload LED:* An automatic overload detector circuit lights the red **OVLD** LED and instantly removes power from the output stages when the AmpliCenter output exceeds its power rating. This can occur when the total speaker load is greater than the amplifier rating or when the speaker wiring is shorted. In either case, the AmpliCenter should be turned off and the trouble cleared. Protective circuitry in the amplifier may also cause the AmpliCenter's output to cycle on and off during these conditions.

Note: In normal operation the **OVLD** LED will illuminate momentarily when the AmpliCenter **POWER** switch is set to **ON**.

3.11 *Music Gain Control:* Background music level is adjusted with the **MUSIC GAIN** control.

3.12 *LF Cutoff Switch:* This control reduces the AmpliCenter's low frequency response by 3 dB at 200 Hz. It is placed in the **HORN** position when horn-type speakers are connected to the PagePac and in the **NORM** position when all speakers are of the cone type.

TYPE C APPLIQUE REV A CARD**A. General Description**

3.13 The Type C Applique REV A Card (Fig. 5 and 6) is required in a majority of the PagePac applications. The applique is a plug-in circuit card which mounts in the **APPLIQUE** position of the card file and provides the interface to a variety of telephone access arrangements. It also provides rotary-dial or DTMF selection of up to 24 zones and access to special features.

3.14 The Type C Applique is required when the PagePac system will be accessed from any of the following types of circuits:

- (1) The dial intercom of a 1A2 Key System.
- (2) A ground-start or loop-start PABX or Centrex trunk.
- (3) A PABX, Centrex or central office line circuit.
- (4) Direct from single-line instruments or the pickup key of a key telephone set.

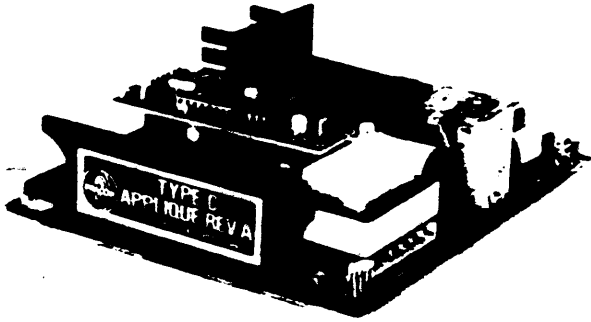


Fig. 5—Type C Applique—Issue 1

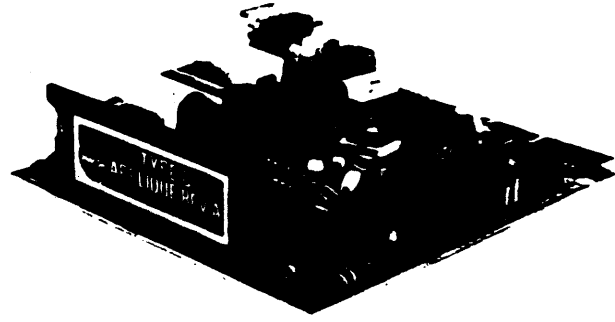


Fig. 6—Type C Applique—Issue 2

3.15 The Type C Applique is available in four versions. The basic version is model number 22082-007 and contains only the basic features described below. The three other versions also contain all of the basic features, but in addition, offer several additional features as described in subsequent paragraphs.

3.16 The Type C Applique offers a variety of options which are programmed using push-on option straps. The latter are packed in a separate plastic bag and shipped with the applique unit.

Note: Two versions of the Type C Applique REV A are currently in service, Issue 1 and Issue 2; the only difference between the two issues being the locations of the option pins.

B. Basic Features

3.17 Zone Decoding: The Type C Applique decodes rotary-dial or DTMF signals for selection of up to 24 individual paging zones and all-call.

3.18 Call Progress Tones: The applique returns dial tone, busy tone and reorder tone to the paging party as appropriate. All three audible signals consist of a 440 Hz tone coupled to the tip and ring. The dial tone is a steady uninterrupted tone, the busy tone is interrupted 52 times a minute and the reorder tone is interrupted 104 times a minute.

3.19 Forced Disconnect: The applique disconnects the caller from the paging system or connects him to reorder tone when continuous access is maintained beyond a preset time limit. The available time limits are 8 seconds, 45 seconds and 600 seconds. This feature may be defeated, allowing unlimited access. The disconnect timer starts when the page originator initially accesses the PagePac® but is reset each time a digit is dialed or an operator override occurs. However, should the applique at any time transmit reorder tone to the calling party, the timer cannot be reset, and the applique will disconnect the caller when the preset time period has expired. The applique can only forcibly disconnect calls incoming from a PABX station line circuit and from ground start trunks of certain PABXs. It returns reorder tone in all other cases.

3.20 Interdigital Time-Out: To ensure maximum availability, the applique will time-out and return reorder tone if the caller fails to dial within 10 seconds after receiving dial tone or fails to dial succeeding digits within 10 seconds. However, if the forced disconnect feature is set for 8 seconds, it overrides the interdigital time-out after the first digit is dialed and disconnects the page originator after a pause in dialing in excess of 8 seconds.

3.21 Vacant Code Intercept: The applique returns reorder tone if a zone is dialed that is *not* equipped with a zone card.

3.22 Direct Attendant Access: The Type C Applique allows the attendant to access the paging system directly for all-call paging.

3.23 Attendant Override: The applique circuit contains a priority override option for use with the direct attendant access feature. It allows the attendant to access a busy PagePac® and interrupt a page for emergency announcements. This feature is enabled by means of an option strap.

3.24 Delayed Release: After the applique receives an on-hook signal, release can be delayed for either 100 ms or 450 ms by means of an option strap.

C. Supplemental Features

3.25 Zone Group Selection: This feature is only available on Type C Applique models 22082-008 and -010. It provides the ability to access a preselected group of zones called a zone group. The applique may be programmed for up to four individual zone groups and a scratch pad group. Zone groups 1 through 4 retain their selected zones until reprogrammed or until power is removed from the applique. The scratch pad group is a one-time-only zone group that is programmed prior to each use. Each group may contain up to eight zones and has its own access code. Any zone may be assigned to more than one group. A special audible signal, stutter tone, is used in conjunction with zone group programming, and consists of two short pulses of tone followed by steady dial tone.

3.26 Confirmation Tone: As soon as a caller gains access to an equipped paging zone, this feature returns nine short bursts of tone to the calling instrument prior to connecting the caller to the paging system. The feature is available on Type C Applique models 22082-009 and -010 only.

D. Visual Indicators

3.27 The operational status of the Type C Applique is indicated by two LEDs, one green and one red, located adjacent to the applique handle. The green LED will flash at a steady rate when the applique is operating normally. The red LED lights while the applique is seized, indicating that the paging system has been accessed. The red LED does not light for direct attendant access.

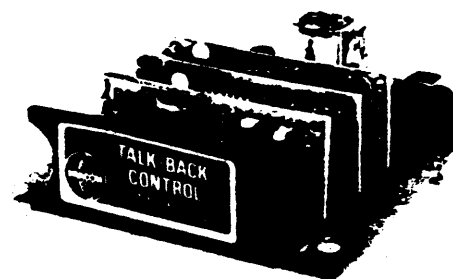


Fig. 7—Standard Talk-Back Control Card

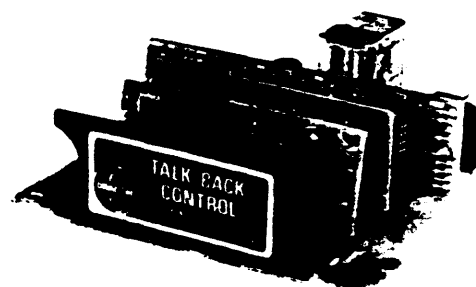


Fig. 8—Adjustable-Gain Talk-Back Card

TALK-BACK CONTROL CARD

3.28 The Talk-Back Control Card mounts in the TALK-BACK position of the card file and allows the paging originator, at the telephone instrument, to carry on a two-way conversation with a called party who is near the paging system speakers. The talk-back unit contains a voice-activated switch controlled by the originator's voice. When the originator is speaking, the paging system functions in the normal manner, but when the caller is silent the loudspeakers are converted to sensitive microphones. When the paged party replies, the voice signals are amplified within the talk-back unit and transmitted to the originator. A service option provides a single, one-second burst of 440 Hz alerting tone to the called speaker whenever a talk-back zone is dialed. An additional service option provides repetitive one-second bursts of alerting tone to the called speakers if the originator remains in the listen mode for a period of either 15 or 30 seconds (optional). This tone will be repeated every 15 or 30 seconds until either the originator speaks into the handset, which causes the circuit to switch into the paging mode, or the caller abandons the page and replaces the handset.

3.29 The Talk-Back Control Card is available in two versions: the standard model (Fig. 7) providing the features just described, and the adjustable-gain model. The Adjustable-Gain Talk-Back Control Card (Fig. 8), in addition to providing all of the standard features, also allows adjustment of the talk-back gain, eliminating the automatic level-compression feature. It is specified if there are any paging zones where ambient noise or other acoustic conditions might cause poor talk-back operation, and its use would improve talk-back performance. For example, in a paging zone with a higher than normal level of equipment noise, talk-back operation could be poor because the loudspeaker(s) pick up the noise as well as the voice of the person trying to respond to the page. The adjustable-gain card allows the speaker gain (sensitivity when acting as a microphone) to be controlled. The paged party has to be closer to the speaker to use talk-back, but the effect of background noise is decreased. If the talk-back feature is not provided, the Talk-Back Continuity Card (Fig. 9) installed at the factory must remain plugged into the TALK-BACK position of the card file.

Caution: *The Talk-Back Control Card, if provided, should be used with speakers and speaker wiring that is comparable in quality with that of Dracon products. Use of poor quality components or unshielded wiring may result in inferior talk-back performance.*

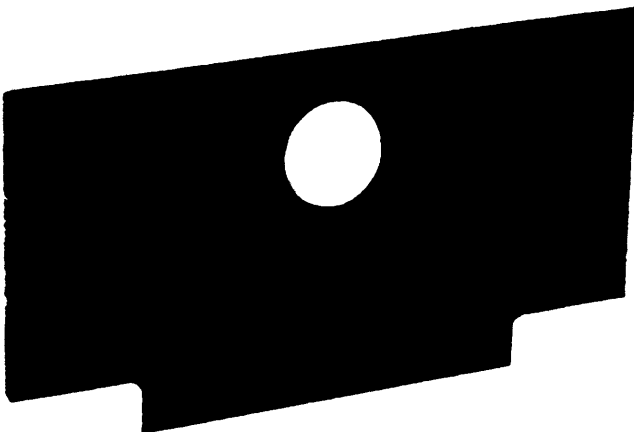


Fig. 9—Talk-Back Continuity Card

FM TUNER CARD

A. Description

3.30 The FM Tuner card (Fig. 10) mounts in the TUNER position of the card file and provides a source of FM background music to the system. It will also supply the music for the music-on-hold feature of a collocated telephone system, when required. To accomplish this, the tuner card provides two outputs: the first is a 600-ohm, low-level music source and the second is a high-level 8-ohm signal providing one watt of power. The tuner incorporates a built-in speaker for monitoring purposes, automatic frequency control and a visual tuning indicator.

Note: Under the U.S. copyright laws, use of the FM tuner may require the user to obtain a copyright license.

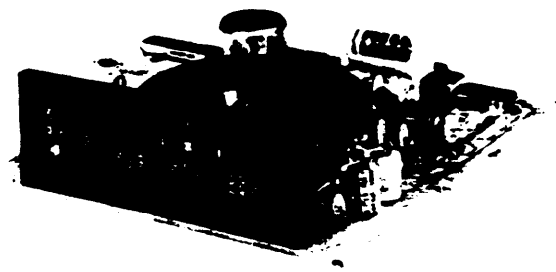


Fig. 10—FM Tuner Card

B. Switches and Controls

3.31 Tuning Dial: This dial permits tuning commercial broadcasts over the FM band of 88 to 108 MHz.

3.32 Tune LED: This LED will light when a station is exactly tuned to its center frequency.

3.33 AFC Switch: In the **ON** position, automatic frequency control is enabled. In the **OFF** position, AFC is switched out to facilitate tuning.

3.34 Speaker Switch: With the **SPK** switch in the **ON** position, the music outputs from the tuner card are disconnected and the built-in monitor speaker is enabled. In this mode, the card is supplying a signal only to the monitor speaker. In the **OFF** position, the built-in monitor speaker is disconnected and both music outputs are enabled. The **OFF** position is the normal operating mode.

3.35 *Monitor Volume Control:* The **MON VOL** control adjusts the sound level of both the monitor speaker and the two music outputs and should be set at mid-range, unless adjustment is required for music-on-hold. In the latter application, failure to set the control for an adequate level may generate trouble reports from telephone system customers.

3.36 *Antenna Switch:* When the **ANT** switch is placed in the **INT** position, an antenna incorporated into the PagePac® assembly is connected to the tuner. This antenna will suffice for most areas where the signal strength is normal. For weak signal areas, the simple external indoor antenna of Fig. 27 can easily be connected to the tuner via the terminal strip on the PagePac®. The **ANT** switch must then be set to the **EXT** position. An outdoor antenna system may also be used if necessary.

ZONE CARDS

A. Basic Features

3.37 *Zone Paging:* The zone paging feature provides the ability to page into one specific physical area such as the front office, showroom or assembly area, utilizing one or more loudspeakers. Each zone is enabled internally from the Type C Applique card. The amplifier output is switched to the proper speakers by relay operation within the zone cards. The talk-back feature, if provided, is enabled on a per zone basis by means of option straps located on the card handles.

3.38 *All CallPage:* The all-call paging feature provides the ability to page into all areas, utilizing all loudspeakers. All-call paging is enabled internally by a signal from the Type C Applique card. All-call talk-back can also be provided by strapping the option block of the Master Zone Card. However, it is not recommended, since the number of connected speakers usually results in excessive noise conditions which drown out the called party's reply.

3.39 *Capacity:* The maximum capacity of the PagePac® is 24 zones plus all-call. The dialing codes to access these zones are listed in Table E. The zones are implemented in increments of four by plugging in up to six zone cards in the card file. Five types of zone cards are available, each offering variations of the basic features. The Master Zone Card must always be installed to provide the first four zones, and thereafter any combination of auxiliary zone cards may be employed.

B. Master Zone Card

3.40 The Master Zone Card (Fig. 11) provides the basic zone paging for zones 1 to 4. It also provides the all-call and the common control for zones 1 through 24. If background music is provided, it will be silenced throughout the entire system whenever any individual zone or all-call is accessed for paging. The Master Zone Card mounts in the **MASTER** position in the card file.

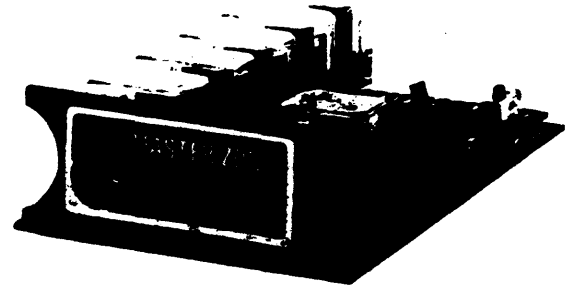


Fig. 11—Master Zone Card

C. Auxiliary Zone Cards

3.41 A maximum of any five auxiliary zone cards can be installed in a system to equip zones 5 to 24 and achieve a total of 24 zones per system. The auxiliary zone cards mount in any of the five card file positions designated **AUX 1** to **AUX 5** and in any order.

3.42 The Type 1 Auxiliary Zone Card (Fig. 12) provides the basic paging for four additional zones. It also permits background music and talk-back in the zones if the corresponding optional cards are provided.

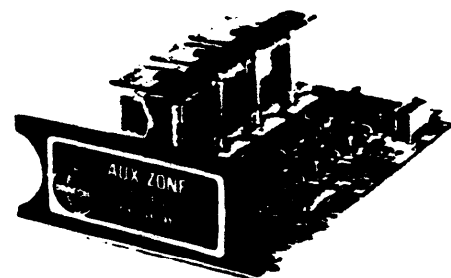


Fig. 12—Type 1 Auxiliary Zone Card

3.43 The Type 2 Auxiliary Zone Card (Fig. 13) provides four zones which have outputs capable of directly driving amplifiers with low-level inputs. The card's 600-ohm low-level balanced outputs are used to drive off-premise amplifiers over standard telephone cable facilities. They may also be used to feed locally-installed amplifiers when additional speaker power is required in a zone. An option switch permits simplexing a ground over the tip and ring to the distant locations to operate a relay or other device controlling the distant amplifiers. Talk-back cannot be provided in zones served by this card.

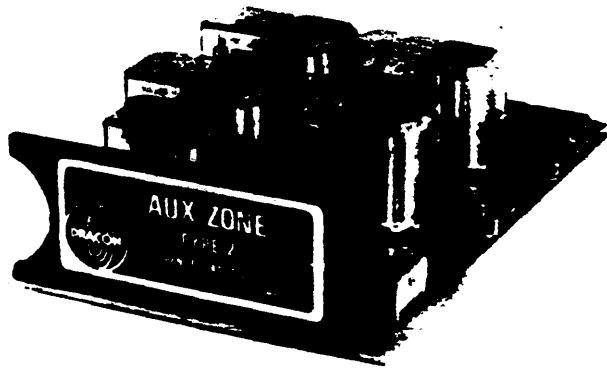


Fig. 13—Type 2 Auxiliary Zone Card

3.44 The Type 3 Auxiliary Zone Card (Fig. 14) provides one *music-only* and three standard zones. Loudspeakers connected to the music-only zone will be excluded from all paging. Uninterrupted music to this zone can be provided if the system is equipped with an external music amplifier.

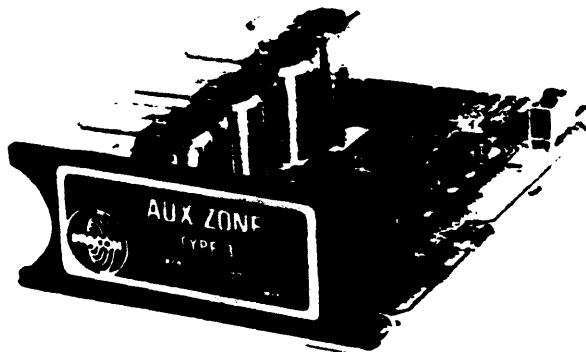


Fig. 14—Type 3 Auxiliary Zone Card

3.45 The Type 4 Auxiliary Zone Card (Fig. 15) provides two *page-only* and two standard zones. The page-only zones can be accessed in the normal manner and can provide talk-back but will be excluded from all system-provided background music.

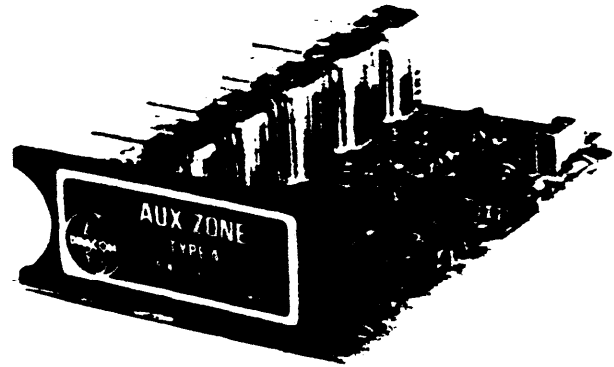


Fig. 15—Type 4 Auxiliary Zone Card

4. FUNCTIONAL DESCRIPTION

IDLE CONDITION

4.01 In the idle state, background music from either the FM Tuner card, if provided, or from an external source is applied to the AmpliCenter® via terminals **MT** and **MR** on connecting block A. Within the AmpliCenter, it passes via the music preamplifier and music page switch to the input of the power amplifier. The music is amplified and applied to the speakers of all the zones via the Master and Auxiliary Zone Card. See the system block diagram of Fig. 4.

DIRECT STATION ACCESS

4.02 When the PagePac is accessed directly from single-line station instruments or from the pickup key of key sets, the Type C Applique must be provided. The applique contains a transmission bridge, providing ground on the tip and battery on the ring conductors to the key system or dedicated instrument.

4.03 When a telephone station goes off-hook, a loop is closed across tip and ring, energizing the battery feed relay in the applique. The latter signals the microprocessor of the off-hook condition. If the dial tone option has been strapped, dial tone is returned to the caller.

4.04 The applique starts a timing period after receipt of the off-hook signal. If a time-out occurs before the first digit is received, reorder tone is returned and no digits will be recognized. If the first digit is received within the allotted time and a two-digit code is being dialed, the applique resets timing after receipt of the first digit. If the circuit times out before the second digit is received, reorder tone is returned and no further digits will be recognized.

4.05 If the zone code has been dialed within the prescribed time period, the applique decodes the dialed number. The applique contains software for decoding both dial pulses and tone-dial signals. The number is decoded as a ground on one of 24 leads to the master and auxiliary zone cards corresponding to the desired zone. Relays energize in the zone card to disconnect all but the selected zone. The applique also grounds the music/page lead to the AmpliCenter®, cutting off background music. As soon as the caller is cut through to the AmpliCenter®, the applique begins timing the page.

4.06 The caller broadcasts his page by speaking into his handset. His voice signals appear across the **PAGE IN** terminals of the AmpliCenter where they pass to the input of the paging preamplifier. See the AmpliCenter block diagram shown in Fig. 16. They are amplified in the preamplifier and pass through the compressor which controls the level of the signal so that persons with soft or loud voices are heard at the same level. Since the music/page switch has been enabled, the voice signals are applied to the power amplifier, amplified and appear at the **AMP OUT** terminals. The voice signal is connected to the desired speakers via relay contacts in the corresponding zone card.

4.07 The connection releases when the caller goes on-hook, or when the applique times out and causes a forced disconnect, whichever occurs first. The forced disconnect is optional. Ground is removed from the music/page switch, and music is again heard in all zones equipped for music.

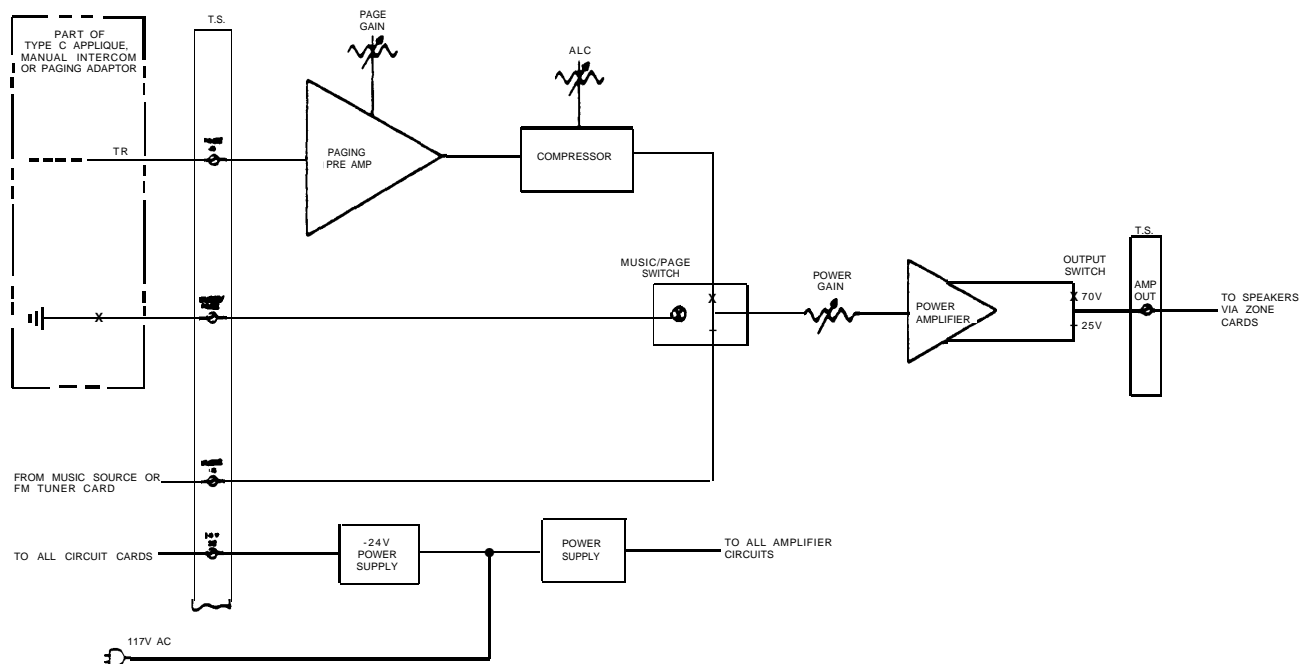


Fig. 16—AmpliCenter® Block Diagram

DIAL INTERCOM ACCESS

4.08 For access from a key system dial intercom, the Type C Applique is provided. However, in this mode, the applique's transmission bridge does not provide a battery feed to the station sets, as the intercom fulfills this function. When the calling party goes off hook, he seizes the key system intercom in the normal manner.

4.09 To access the PagePac the caller dials the assigned intercom code. A momentary ground or $\pm 18V$ buzzer voltage is applied via the intercom signaling lead to the applique's **CTR1** lead, to indicate a seizure. The applique then locks up to the intercom's holding ground via the **CTR2** lead. Dial tone, if optioned, is returned to the caller.

4.10 The caller proceeds to key the DTMF code of the desired zone or all-call and the digits are received in the applique. The operation which follows is identical to that described in paragraphs 4.04 to 4.06. When the caller replaces his handset, intercom holding ground is removed from the **CTR2** lead, releasing the PagePac .

LOOP-START TRUNK ACCESS

4.11 When the caller in a PABX or Centrex lifts his handset and dials the paging code, he is connected to a trunk assigned for paging. The trunk closes a loop across tip and ring to the paging system.

4.12 The caller pages and disconnects in the same manner as with direct access, as described in paragraphs 4.02 to 4.07. When he replaces his handset, the PABX releases the connection to the trunk and the trunk opens the loop to the paging system.

4.13 If the call times out because of the forced disconnect feature, the PagePac cannot release the connection through the PABX, and instead, returns reorder tone until the caller replaces the handset and the PABX releases.

GROUND-START TRUNK ACCESS

4.14 If access from the PABX or Centrex is via a ground-start trunk, then the applique only extends battery on the ring side of the trunk to the switch. When the calling party goes off-hook and dials the paging code, he seizes the ground-start trunk. The latter applies a ground to the ring conductor operating relay K1 in the applique. The applique then returns ground on the tip conductor. The ground-start trunk then removes the ground from the ring wire and closes a loop across tip and ring. The trunk now looks like a loop-start trunk and the operation which follows is identical to that of paragraphs 4.11 to 4.13.

4.15 The connection is released when the calling party replaces his handset. The loop is opened in the trunk circuit and the applique removes ground from the tip conductor. If the call times out and a forced disconnect is initiated, the ground start trunk may detect the opening of the loop in the applique and break down the connection in the PABX. Otherwise, the caller receives reorder tone from the applique as described in 4.13.

STATION ACCESS

4.16 When the caller in a PABX, Centrex or C.O. dials the station code assigned for paging, ringing current is applied across tip and ring to the applique card. The ring detector circuit in the applique is enabled and energizes relay K4. Contacts of K4 disconnect the ring detector from the line and switch the calling party through to a repeat coil. A loop is closed to the PABX via the repeat coil and the windings of relay K1 in series, tripping the ring signal and holding the connection through the switch. Relay K1 is energized by the current flowing in the loop, and in turn provides an off-hook signal to the microprocessor. Dial tone is returned if the dial tone option is selected.

4.17 The calling party may now dial the code of the desired zone or of all-call. The calling instrument must be equipped with a tone dial. The applique starts a timing period after the ringing is tripped. If a time-out occurs before the first digit is received, reorder tone is returned and no further digits will be recognized. If a two-digit zone code is being used, the applique will again begin timing after receipt of the first digit. If a time-out occurs before the second digit is received, reorder tone is returned and no further digits will be recognized. After receiving the required digit information, the applique decodes the zone and connects the caller through. A momentary open or reverse battery from the switching system or a forced disconnect time-out will cause the applique to release and return to an idle state.

ATTENDANT ACCESS

4.18 The attendant can access the system by either of two methods. To page to a specific zone, the attendant must dial the paging code through the switching system in the same manner as a station user. For a general page to all zones (all-call), the attendant can operate a **PAGE** key on the console or switchboard and access the PagePac® directly. There is no time limit on direct attendant-access. Depending upon the switching system, a standard paging trunk employing a 600-ohm dry balanced pair and a control ground may be required to provide direct attendant access.

4.19 To make a page using direct access, the attendant operates the **PAGE** key. The attendant's telephone circuit is disconnected from the switching equipment and its tip and ring wires connect to terminals **OT** and **OR** of the PagePac . The key also grounds terminal **OC**, signaling the microprocessor that the attendant wishes to make a paging call.

4.20 If the paging system is free, relay K3 is energized, connecting the attendant directly to the page input of the AmpliCenter . The AmpliCenter discontinues background music and all zones are enabled. The attendant may now broadcast the page. There will be no time-out. When finished, the attendant restores the **PAGE** key.

4.21 If the paging system was in use and the applique was not optioned for override, the attendant would have to wait until the system became free. If the override feature was optioned, the attendant would cut in and the paging party would be cut off and would receive the busy tone, but would be reconnected when the attendant withdraws.

TALK-BACK

4.22 If the Talk-Back Control Card is provided, a two-way conversation may take place during paging. In this mode, the called speaker will act as both a loudspeaker and a microphone. The Talk-Back Control Card is activated for handsfree reply only if the talk-back option strap is in place on the zone card for the called zone. When a zone selection is made, the zone logic transmits an enable signal to the talk-back circuit via the strap. If there is no strap, the circuit only works in one direction.

ALL-CALL ONLY

4.23 If the all-call-only strap on the Type C Applique is provided, a party originating a page is immediately connected to all zones without the need for making a zone selection.

REMOTE AMPLIFIERS

4.24 Auxiliary Zone Card Type 2 provides four separate paging outputs for connection to off-premise or auxiliary amplifiers. Resistors in the type 2 card drop the output level to 0 dB and provide a 600-ohm output impedance for connection to a telephone line to an off-premise location. The amplifier music inputs are connected to the zone outputs, and the amplifiers are in the music mode at all times. Both the background music and the paging message are transmitted over the telephone line to the remote AmpliCenter . See Fig. 25.

4.25 If a simplex signaling option is employed, then the telephone line is connected through a telephone company-provided center-tapped 600-ohm matching transformer to the remote amplifier's paging input. Locally-furnished background music is connected to the music input. When the zone is seized, the zone card transmits a simplex ground over the tip and ring conductors to enable the music/page switch. See Fig. 26.

5. INSTALLATION

PAGEPAC® MOUNTING

5.01 The PagePac® Telephone Paging System will mount on either a 19" relay rack or directly on the wall. It will also mount on a 23" rack if the appropriate adapters are provided. To mount the PagePac® assembly, excluding the plug-in circuit boards, proceed as follows:

- (1) For wall mounting, select a location which allows at least 12 inches (30.5 cm) of wall space at the top and bottom of the cabinet and 2" at each side (Fig. 17) to allow adequate air flow through the unit and prevent possible amplifier overheating and failure.
- (2) Mount a plywood backboard, if required, on the wall in the selected location.
- (3) For rack mounting, select a position in the frame with at least 28" of vertical rack space available so as to allow 4" above and below the unit for airflow.
- (4) Make sure that a 115V ac power outlet is located within 6 feet of the selected location. The outlet should not be controlled by a switch.

Caution: Do not select a location where the unit will be exposed to weather or ambient temperatures in excess of 122° F (50° C).

- (5) Carefully unpack the unit from the carton and inspect for damage.
- (6) Find the hole-locating template which is included as part of the packing material. **Do not** discard any packing material until you have located the template.
- (7) Remove the cover from the assembly.
- (8) For rack mounting, secure the assembly to the relay rack uprights utilizing the two slotted mounting holes on each side of the assembly and 12-24 binder-head machine screws. See Fig. 2. Dispose of the cover according to local instructions, as it cannot be used with rack mounting.
- (9) If the unit is to be wall mounted, mark the location of the four mounting screws using the template, and fasten the screws to the backboard in the marked locations.

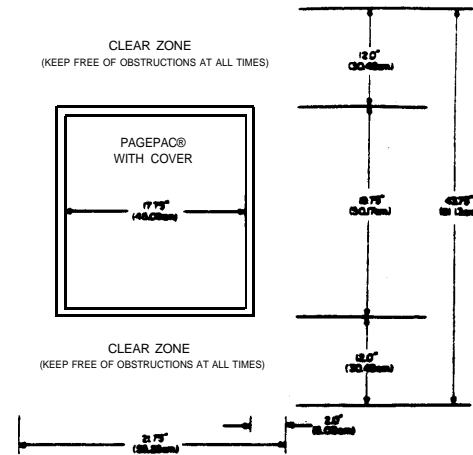


Fig. 17—Clearances for Wall Mounting

- (10) Mount the unit on the wall by passing the screws through the keyhole cutouts. See Fig. 2. Then tighten the screws down on the backplate.

INSTALLING SPEAKERS

5.02 For speaker installation instructions, see Dracon Practices DRCN-46-310, Cone Type Loudspeakers and Baffles; and DRCN-46-300, Horn Type Loudspeakers and Attenuators. All speaker power taps are set at the lowest setting before shipment. It is recommended that the power taps not be changed until after the PagePac® is operating and actual sound levels can be tested.

CONNECTIONS

5.03 General: Before installing any plug-in cards, perform the wiring for the basic assembly as follows:

- (1) Set the **POWER** switch on the AmpliCenter® to **OFF** and do not plug in the ac power cord at this time.
- (2) Perform all voice and music connections and all lamp and lamp ground connections using twisted pair wire.
- (3) All telephone system connections terminate on connecting block A located on the left-hand side of the assembly. Refer to Table G to determine the function of each lead and to connect telephone equipment not covered by the following figures.
- (4) All speaker and remote amplifier connections are performed on terminal block B located on the right-hand side of the assembly. Refer to Table H to determine the function of each lead.

TABLE G
LEAD TABLE—CONNECTING BLOCK A

LEAD DESIG.	FEATURE
T and R	Telephone system input – used when Type C Applique provided.
CTR1	Control 1 – when applique accessed from key system dial intercom, momentary ground applied to this lead seizes applique.
CTR2	Control 2 – when applique accessed from key system dial intercom, continuous ground applied to this lead holds applique after CTR1 signal disappears. Alternately, CTR2 may be used to provide a holding ground to external equipment.
LG and L	Lamp – supplies lamp ground and battery to light an auxiliary busy lamp when the PagePac is in use.
PT and PR	Page tip and ring – telephone system input when Type C Applique not provided. Input must be dry, balanced and 600 ohms impedance.
MT and MR	Music tip and ring – background music input when FM Tuner card not provided. 600-ohm music output for music-on-hold feature when FM Tuner card provided.
ZHG	Zone holding ground – off-hook ground from telephone system applied here locks up relays in zone cards when Type C Applique not provided.
MPS	Music/page switch – off-hook ground from the telephone system applied here switches the amplifier mode from music to page when the Type C Applique not provided.
TBE	Talk-back enable – off-hook ground from the telephone system applied here enables the Talk-Back Control Card when the Type C Applique not provided.
OCT	Operate cut-thru relay – off-hook ground from the telephone system applied here with earlier types of appliques. Not used with Type C Applique.
T2 and R2	Auxiliary output – a 600-ohm, dry balanced output used to drive additional amplifiers.
OT and OR	Operator tip and ring – a 600-ohm dry, balanced input from a PABX console or switchboard used for direct attendant access when the Type C Applique is provided.
OC	Operator control – off-hook control ground from the attendant's console required with the above.
E1 to E24	Zone enable – a momentary ground, 18V ac or -24V dc on one of these leads will select the corresponding zone when the Type C Applique not provided.
E-ALL	All-call enable – a momentary ground, 18V ac or -24V dc will select all-call when the Type C Applique not provided.
LG and LB	Lamp ground and lamp battery – 10V ac from key system power supply is connected here to power auxiliary busy lamps, if provided.
G and -48V	Ground and -48V battery – a 48-volt power supply is connected here when the trunk circuit requires a 48-volt battery feed.
ANT1 and ANT2	Antenna 1 and 2 – an external antenna is connected here if the FM Tuner Card is provided and the signal level of the built-in antenna is not adequate.

TABLE H
LEAD TABLE—TERMINAL BLOCK B

LEAD DESIG	FUNCTION
1, 2, S ZONES 1 TO 24	Speaker pair and shield – when corresponding zone is selected, amplifier output appears across leads 1 and 2. Shield of speaker wiring must be connected to terminal S.
1, 2, S AMP OUT	Amplifier output pair and shield – amplifier output appears across leads 1 and 2 at all times whether or not zone cards are provided and regardless of which zone selected. Shield connects to S.
1, 2, S MUSIC IN	Auxiliary music input – output of external music amplifier connected to these leads when Auxiliary Zone Cards Type 3 provided and an uninterrupted source of music is required.
1, 2 8Ω OUT	8-ohm FM Tuner output – 1 watt music output for connection to external equipment.
GND	Water-pipe ground – must be connected to the same cold water pipe ground as other telephone equipment.

5.04 *Paging Adapter Access:* If the paging system is to be connected to a PABX or key system paging adapter and the Type C Applique will not be provided, perform the connections of Fig. 18. This arrangement does not offer zone paging.

5.05 *Dial Intercom Access:* If access to the paging system is via a key system dial intercom, provide a Type C Applique and perform the connections of Fig. 19.

5.06 *Pickup Key or Station Instrument Access:* If the paging system is to be accessed directly from single-line telephone instruments or directly from a spare pickup key on key telephone sets, provide a Type C Applique and perform the connections of Fig. 20.

5.07 *Trunk Access:* If the paging system will be accessed via a ground-start or loop-start trunk of a PABX or Centrex system, provide a Type C Applique and perform the connections of Fig. 21.

5.08 *Station Line Access:* If the paging system will be accessed via a spare line circuit of a PABX, Centrex or central office, provide a Type C Applique and perform the connections of Fig. 22.

5.09 *Direct Attendant Access:* If the PABX or Centrex attendant's console or operator's position is equipped with a **PAGE** key, the attendant can be provided with direct access to the paging system by performing the connections of Fig. 23.

5.10 *Speaker Connections:* Connect the speakers in accordance with Fig. 24. Shielded wire must be used if talk-back is provided. Otherwise it is optional. Connect the shield to terminal S on the terminal block. Do not ground the shield at the speaker location.

5.11 *Off-Premise or Remote Amplifiers:* If off-premise or remote amplifiers are provided, perform the necessary connections per Fig. 25 or 26 using twisted-pair wire.

5.12 *Cold Water Pipe Ground:* On terminal strip B located on the right-hand side of the unit, connect terminal **GND** to a cold water pipe ground using 18-gauge wire or heavier. Connect to the same point as the telephone system ground.

5.13 *Use of External -48 Volt Power:* If the Type C Applique is provided access is from a PABX or Centrex trunk outlet, and the PABX trunk will not function properly when working into a 24-volt exchange, connect an external source of -48 volts and ground to terminals **-48V** and **G**, respectively, on connecting block A as shown in Fig. 21.

5.14 *Auxiliary Busy Lamps Provided:* If auxiliary busy lamps are required, provide a source of lamp battery and connect it and the lamps as shown in the applicable connection diagram.

5.15 *Auxiliary Busy Lamps Not Provided:* If auxiliary busy lamps are not provided, terminals **L** and **LB** can be used to obtain a contact closure when the PagePac is seized.

TYPICAL TELEPHONE PAGING ADAPTER

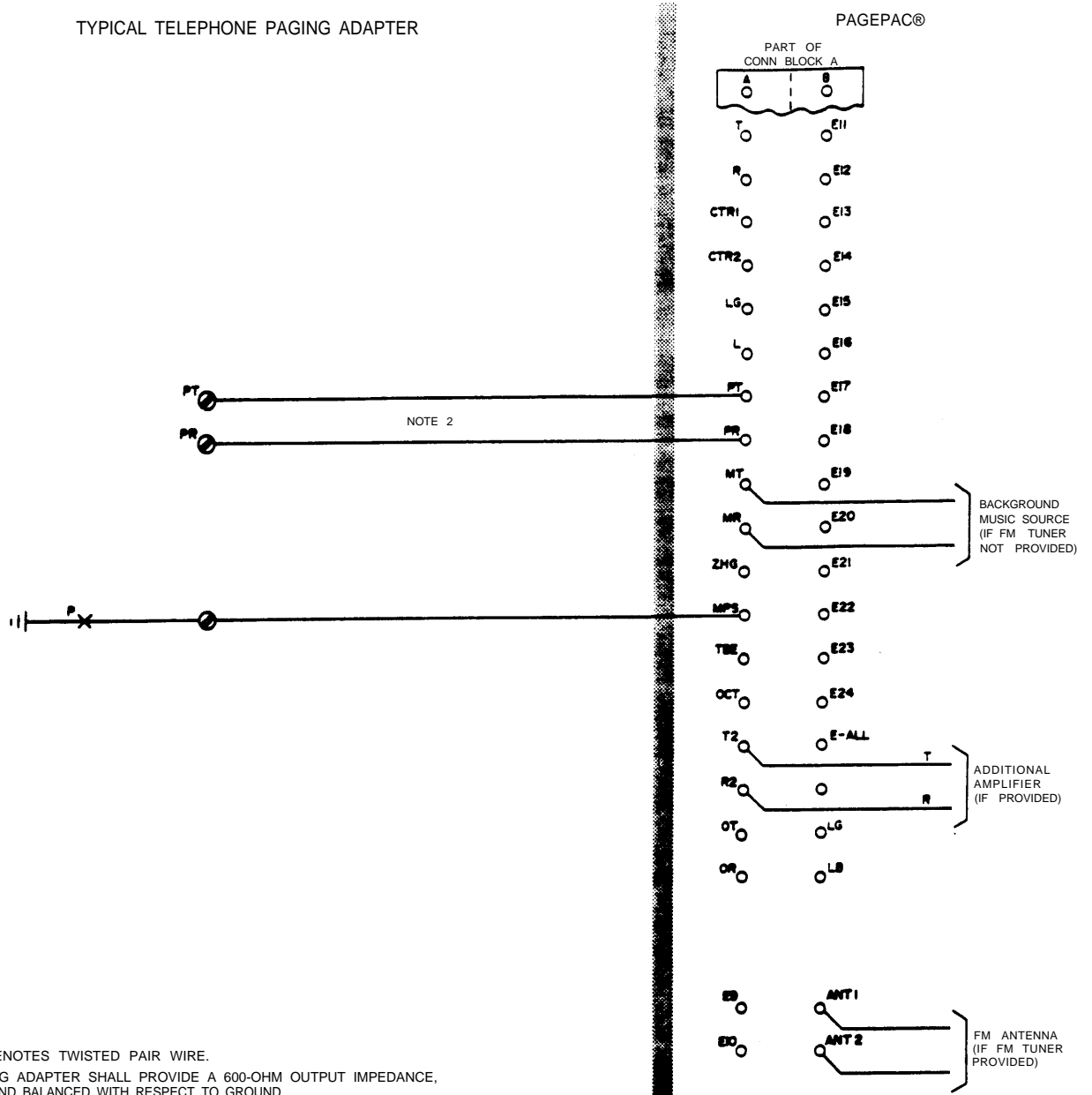


Fig. 18—Connections for Paging Adapter Access

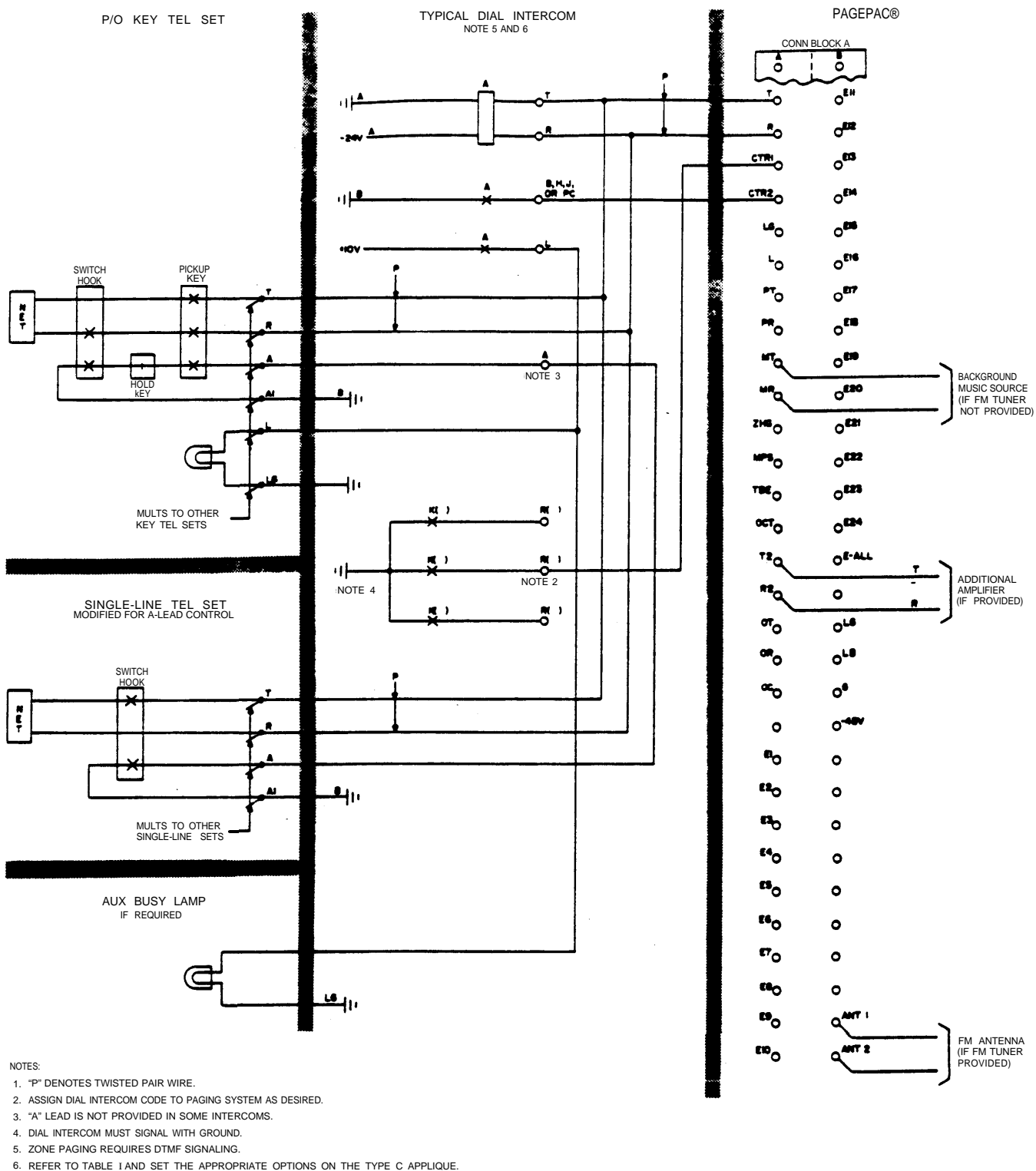
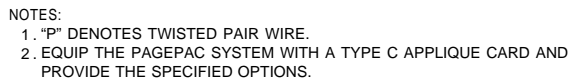


Fig. 19—Connections for Key System Dial Intercom



Page 23

TYPICAL PABX OR CENTREX ONE-WAY OUTGOING
OR TWO-WAY CENTRAL OFFICE TRUNK
NOTE 3

PAGEPAC®

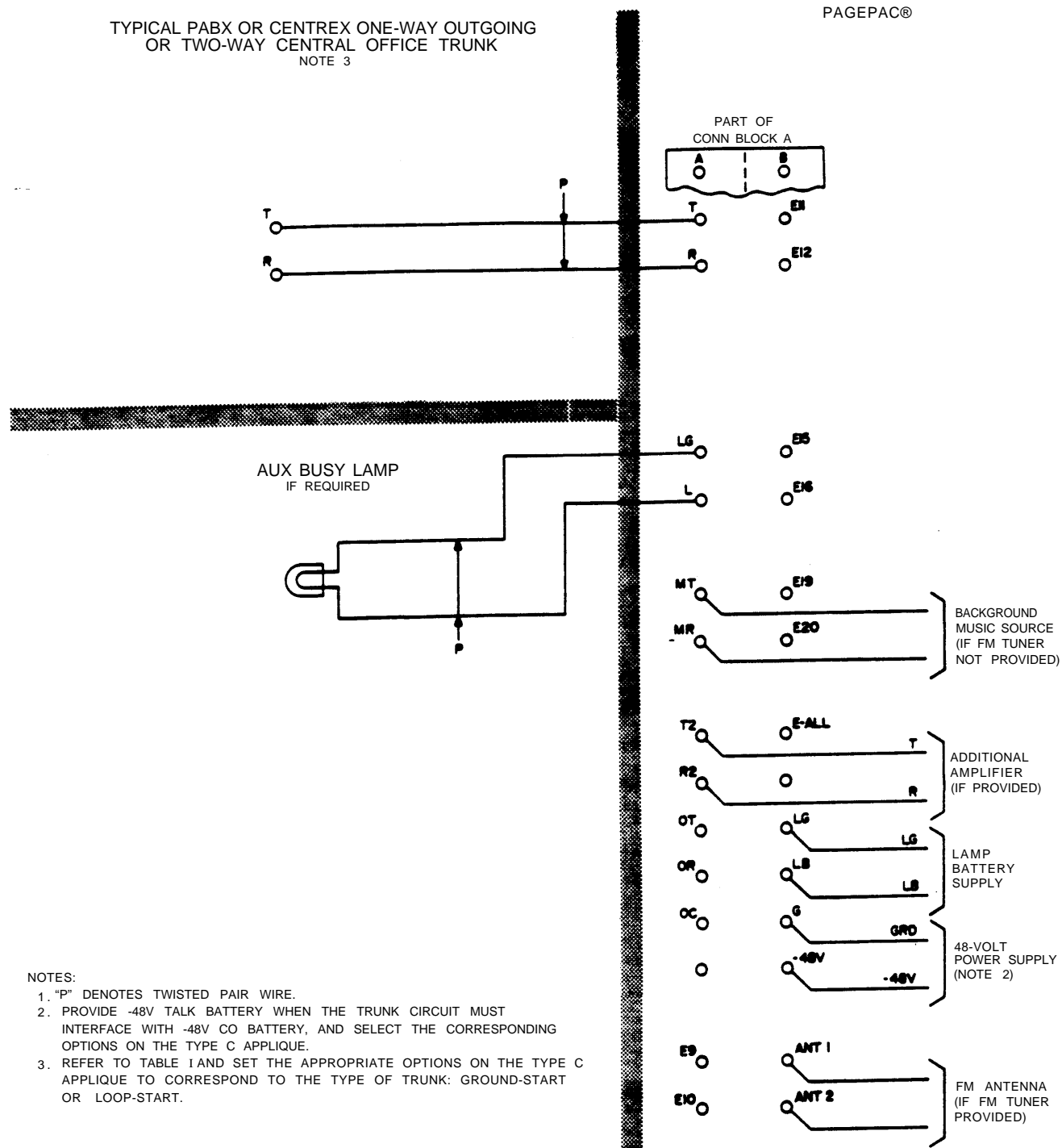


Fig. 21—Connections for PABX or Centrex Trunk Access

PAGEPAC®

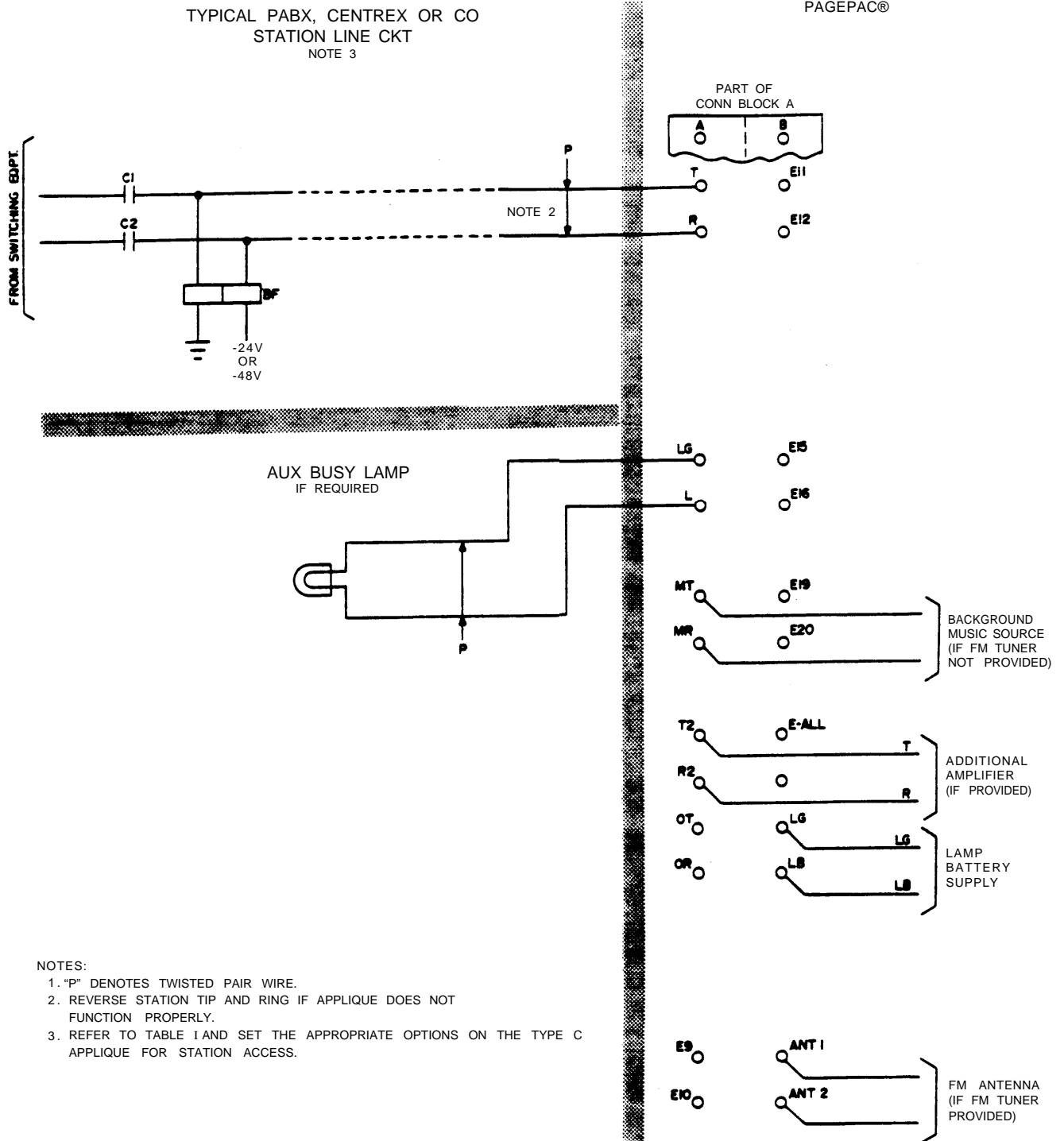
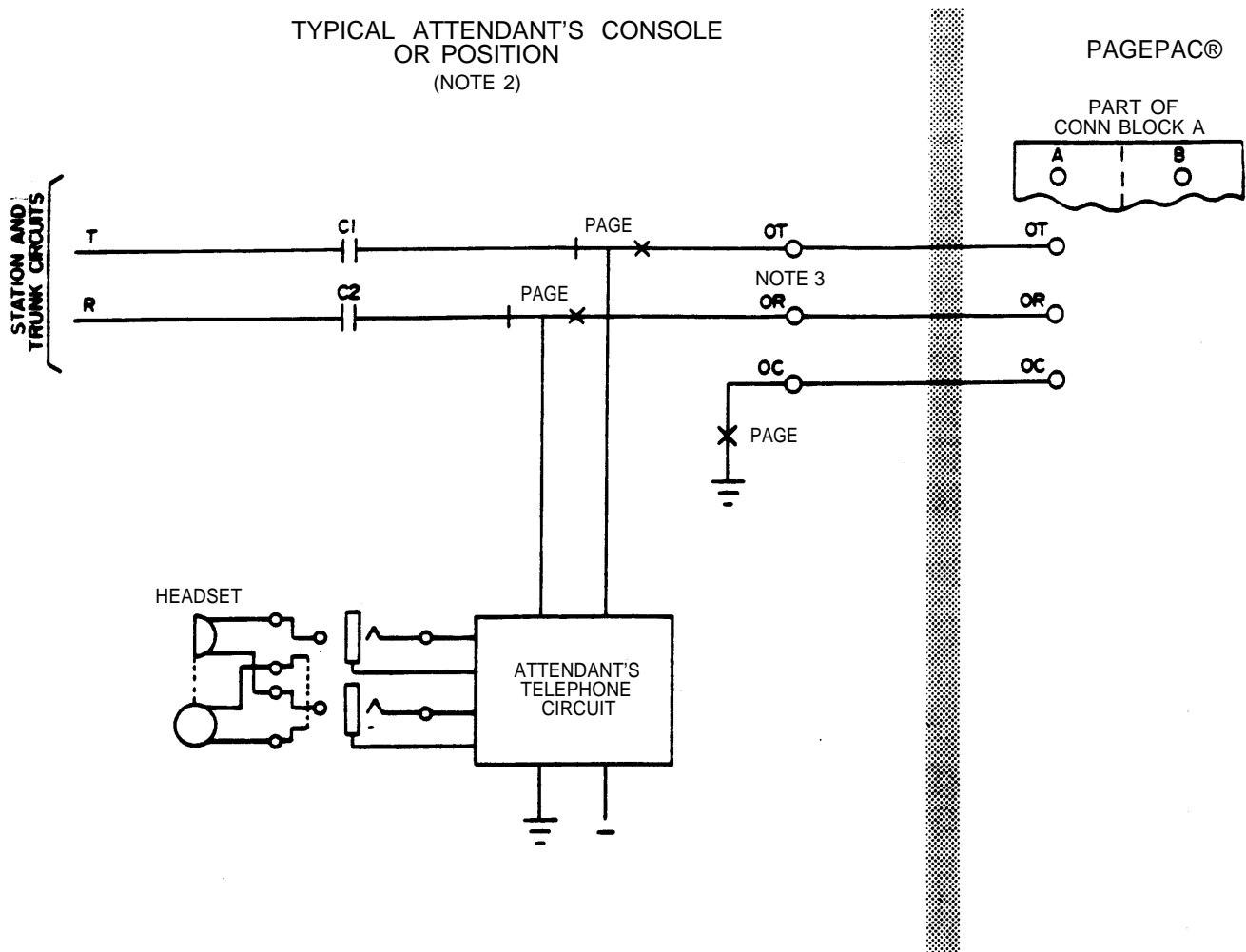


Fig. 22—Connections for PABX, Centrex or CO Station Line Access



NOTES:

1. "P" DENOTES TWISTED PAIR WIRE.
2. ATTENDANT'S CONSOLE MUST BE EQUIPPED WITH A PAGE KEY PERFORMING THE FUNCTIONS SHOWN.
3. ATTENDANT'S TELEPHONE CIRCUIT SHALL PROVIDE A 600-OHM IMPEDANCE, DRY AND BALANCED WITH RESPECT TO GROUND.
4. FOR DIRECT ATTENDANT ACCESS, PAGEPAC SHALL BE EQUIPPED WITH TYPE C APPLIQUE.
5. IF THE PABX ATTENDANT IS TO AUTOMATICALLY OVERRIDE A PAGING CALL IN PROGRESS, STRAP OPTION TERMINALS J15 ON THE TYPE C APPLIQUE.

Fig. 23—Connections for Direct Attendant Access

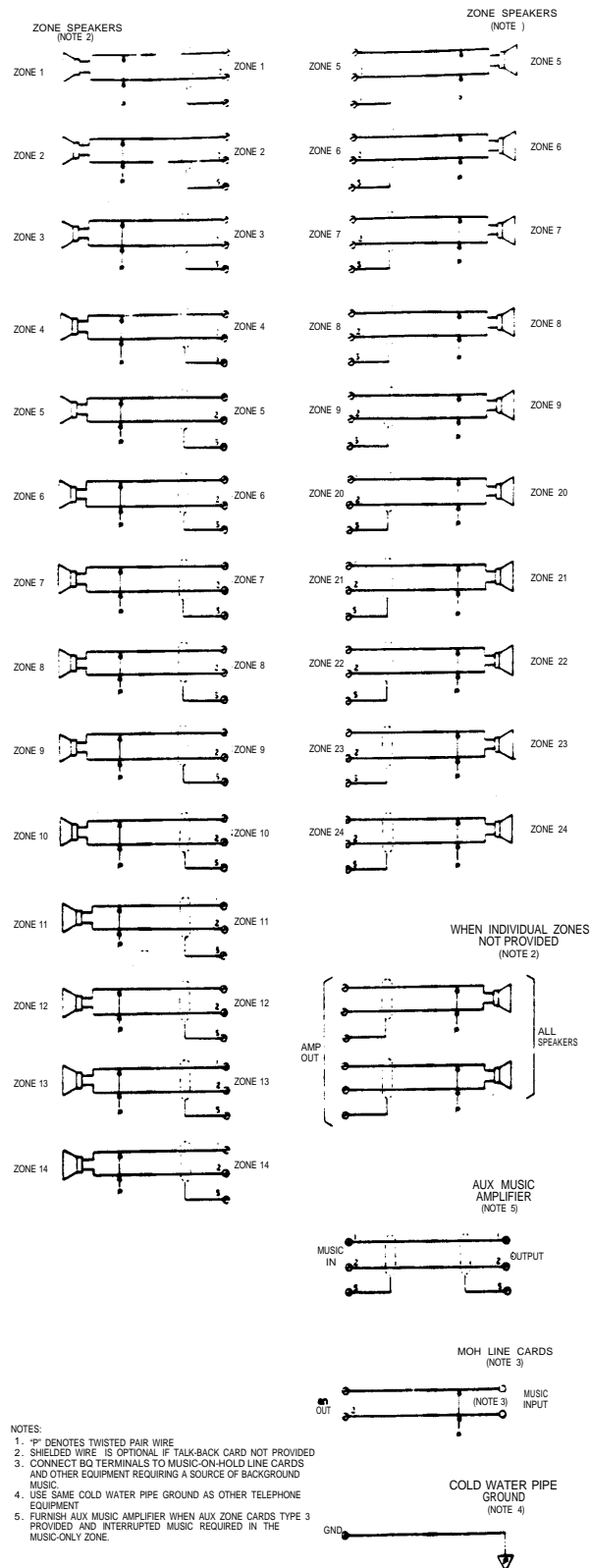


Fig. 24—Speaker Connections

SECTION DRCN-46-201

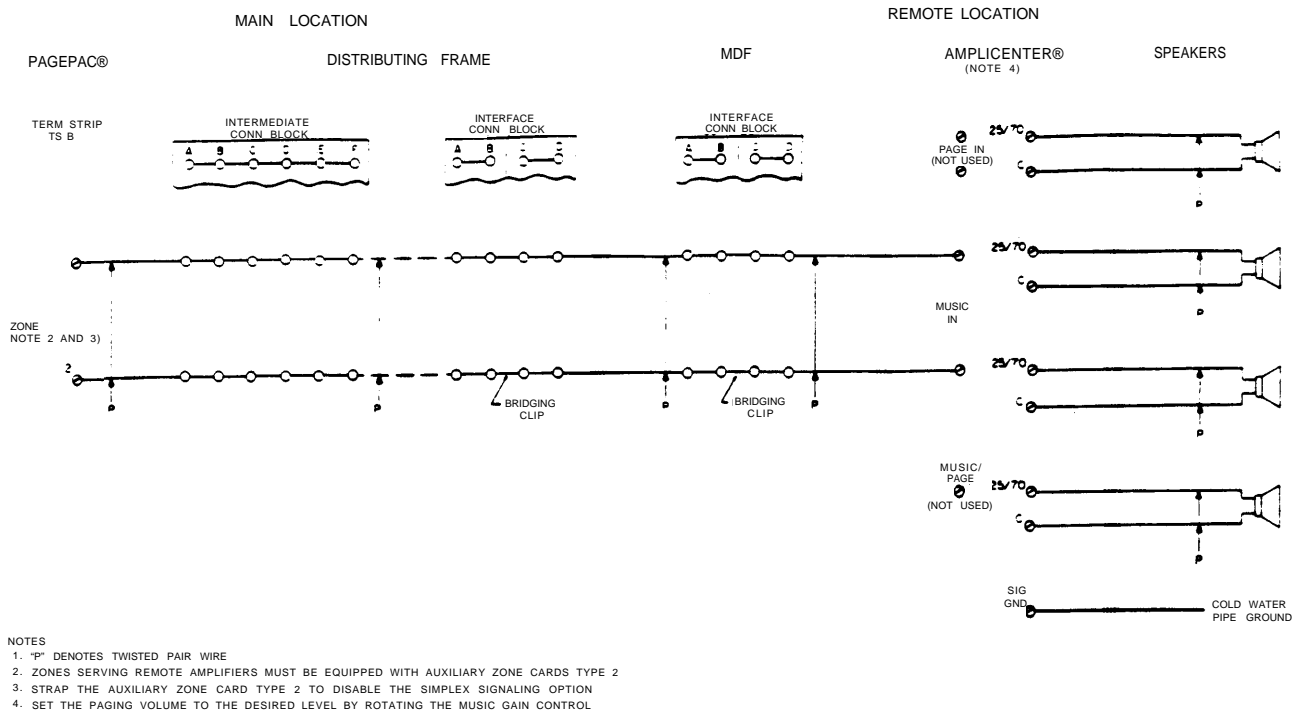


Fig. 25—Off-Premise Amplifier Connections without Simplex Signaling

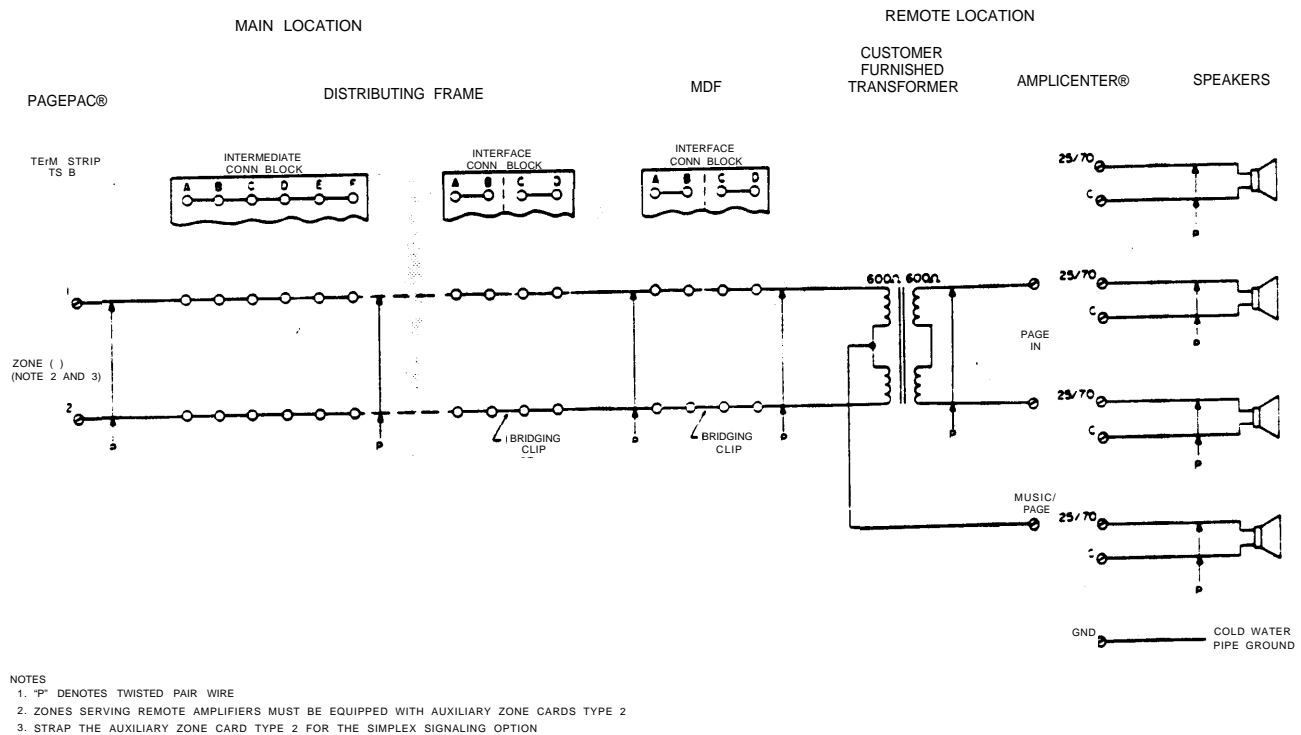


Fig. 26—Off-Premise Amplifier Connections with Simplex Signaling

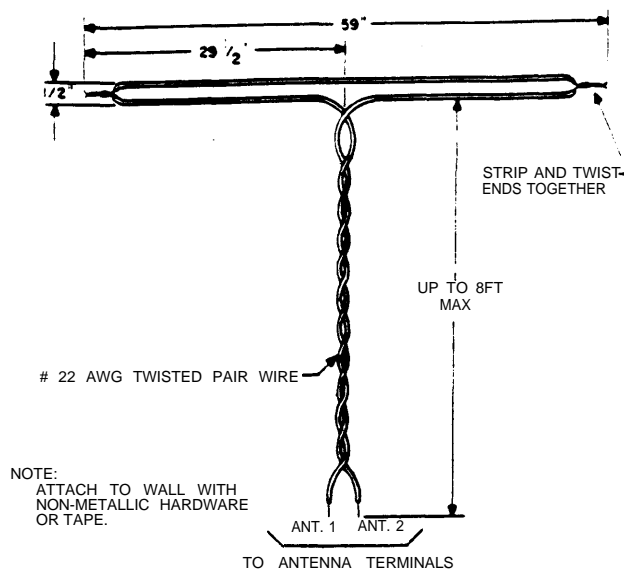


Fig. 27—Suggested Indoor FM Antenna

5.16 FM Tuner Card Antenna Connections: If the FM Tuner card is provided and an outdoor antenna is available, connect it across terminals **ANT1** and **ANT2** of connecting block A. Otherwise provide the indoor antenna arrangement shown in Fig. 27 unless the built-in FM antenna will be adequate. Some locations may require a more extensive antenna system.

Caution: *If an outside antenna is connected to the antenna terminals, the antenna system must be grounded in accordance with Articles 810 and 820 Of the National Electrical Code ANSI/NFPA No. 60-1968.*

5.17 FM Tuner Card Not Provided: If the FM Tuner card is not provided and an external source is available for background music, connect the music source output across terminals **MT** and **MR** of connecting block A.

5.18 Continuous Music With Aux. Zone Card Type 3: If the Auxiliary Zone Card Type 3 is installed to provide a music-only zone, the music will go off every time any other zone is paged. To provide continuous music in the music only zone, set option switch **S2** to **POS A** and provide a separate music amplifier. Terminals **MT** and **MR** on connecting block A are connected to the amplifier's input, and **MUSIC IN** terminals 1, 2 and **S** on terminal strip B are connected to the amplifier's output.

5.19 Music On Hold: If the associated key system features music-on-hold and requires an 8-ohm music source, connect terminals **8Ω OUT** on terminal block B to the key system's music-on-hold line cards. For 600-ohm line cards use terminal **MT** and **MR** on left-hand connecting block A.

5.20 CTR2 Connection: On earlier versions of the PagePac assembly, terminal **CTR2** is not wired to the backplane. If connection is required to **CTR2**, as for example when access is via a key system dial intercom, refer to the following paragraph to ensure that the necessary wiring will be in place.

UPGRADING EARLIER ASSEMBLIES

5.21 Earlier versions of the PagePac assembly, those prior to issue 6, do not have the **CTR2** lead wired from connecting block A to the backplane. It is desirable to upgrade the assembly while it is being installed; it is essential if the **CTR2** lead is being used in this application.

5.22 To determine whether your PagePac® assembly predates issue 6, look at the rear of connecting block A. If there are no wires on the fourth wire-wrap terminal from the top on the right-hand column, terminal **CTR2**, the assembly is an earlier version. Also if the backplane does not contain the 22 terminals shown in the circle in the photo of Fig. 3, it is an earlier version.

5.23 To upgrade the assembly, a jumper wire, part number 087-722170-001, is required. Alternately, a 22-gauge wire can be wire-wrapped to both terminals. To perform the modification, proceed as follows:

- (1) Make sure the AmpliCenter power is turned off.
- (2) Remove all the circuit cards from the card file.
- (3) Refer to Fig. 3 and remove the four screws that fasten the card file to the cabinet.
- (4) On the rear of the connecting block, connect the end of the jumper wire with the white plastic connector to terminal **CTR2**, which is the fourth terminal down on the outside row.

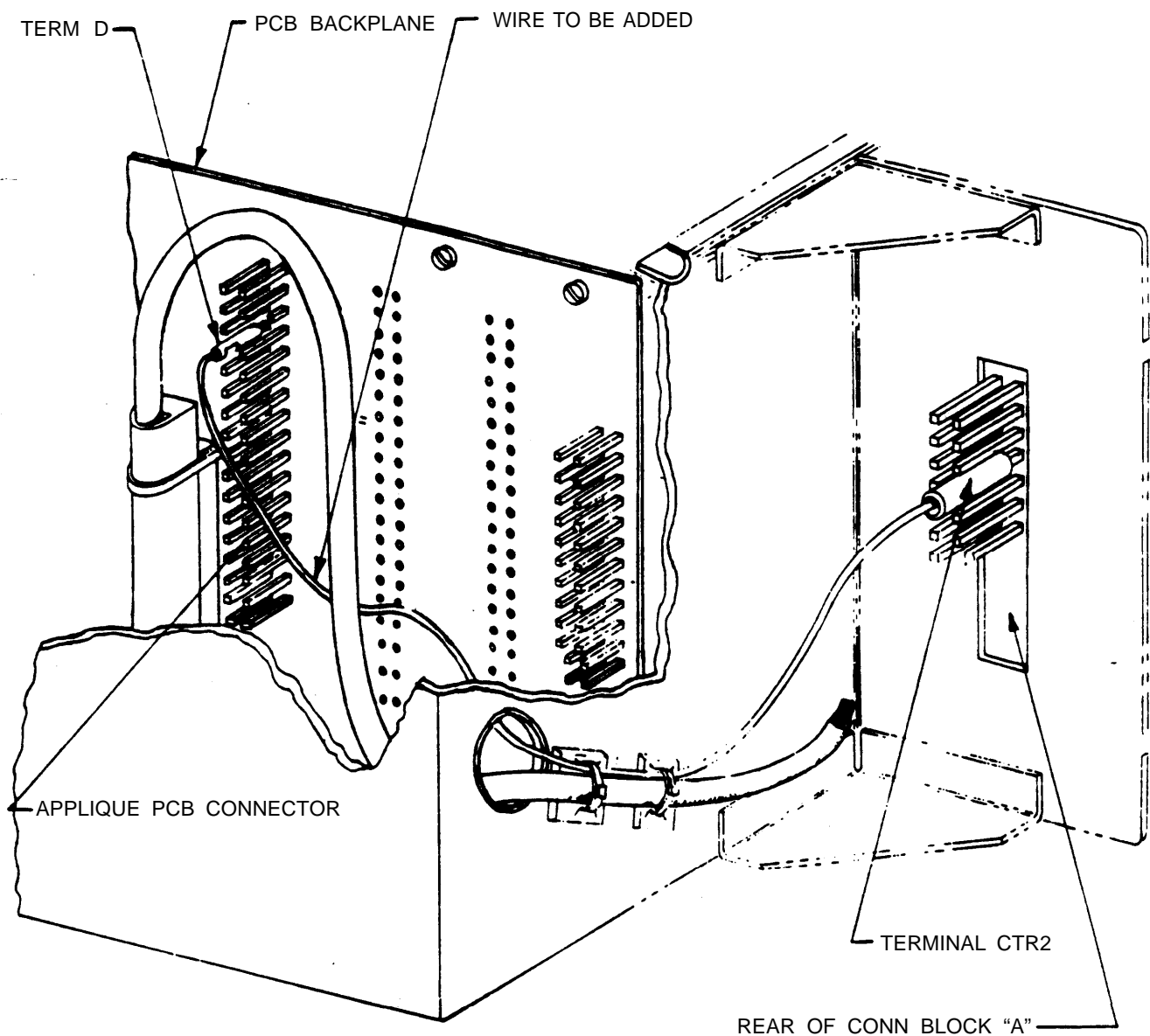


Fig. 28—Cutaway Rear View Showing Wiring Modification

- (5) Run the jumper wire through the cable ties and through the hole in the side of the cabinet as shown in Fig. 28.
- (6) Pull the card file straight out until it clears the cabinet. Support it with one hand while working with the other.
- (7) Connect the free end of the jumper wire to the back of the PCB connector at terminal D, in accordance with Fig. 28.
- (8) Place the card file back into the cabinet and replace the screws.

Caution: When replacing the card file, do not pinch any wires between the top of the card file and the bottom of the AmpliCenter®. These wires must be moved out of the way.

- (9) Replace the circuit cards in their original positions.

SELECTING OPTIONS

5.24 AmpliCenter®: The AmpliCenter® terminal strip (Fig. 29) contains two slide switches for selecting options. They are programmed as follows:

- (1) If the paging system will employ any horn-type speakers, set the **LF CUTOFF** switch to **HORN**. For cone-type speakers, it should be set to **NORM**.
- (2) Set the **OUTPUT** switch to either the **25V** or **70V** position, depending on the type of speaker wiring employed.

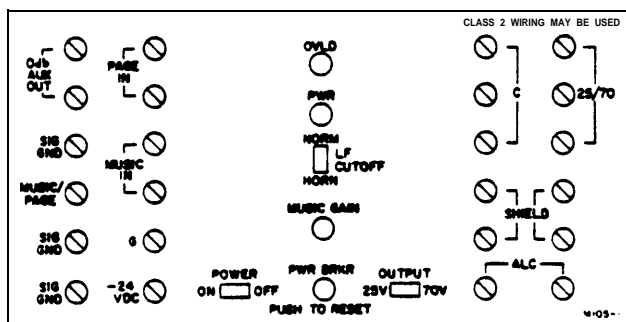


Fig. 29—AmpliCenter® Terminal Strip

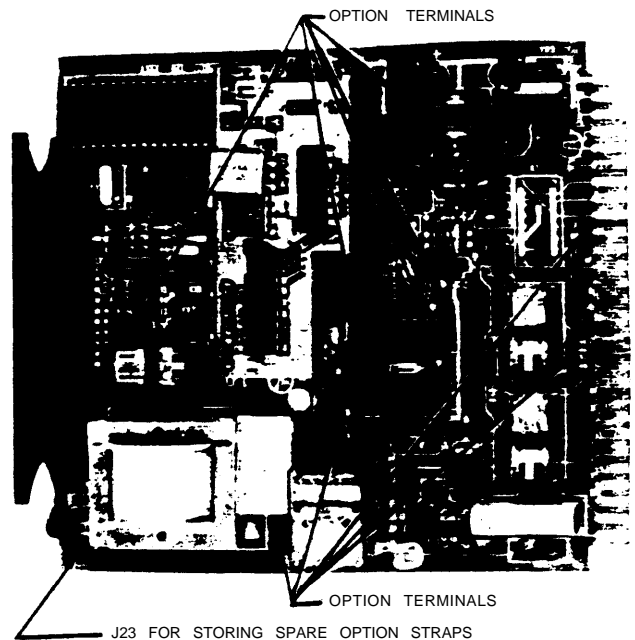


Fig. 30—Option Terminals on Issue 1 Applique

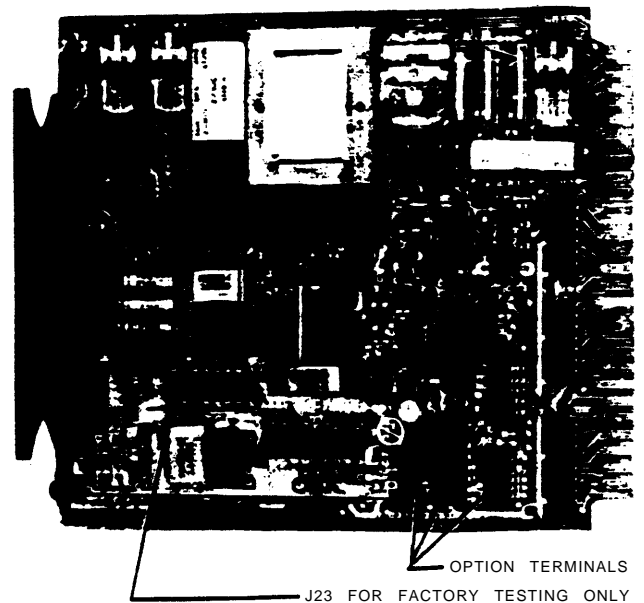


Fig. 31—Option Terminals on Issue 2 Applique

5.25 Type C Applique: Before this card is plugged in, the options should be selected using the push-on straps furnished in a separate plastic bag. Option terminals are located per Fig. 30 if the card is Issue 1, and per Fig. 31 if the card is Issue 2. Install the option straps in accordance with Fig. 32. Select the options as follows:

TABLE I
TYPE C APPLIQUE ACCESS OPTIONS

FEATURE			OPTION TERMINALS	
			DESIG	POSITION
Paging Access	Via Key System Dial Intercom		J1 J2 J6* J7 J8 J9* J10 J14 J16	Out Out A Out Out B B In Out
	Direct From Pickup Keys of Key Sets and/or Single-Line Sets or via Loop-Start PABX or Centrex Trunks	-24V Battery Feed	J1 J2 J6* J7 J8 J9* J10 J16	B B A B B B A Out
		-48V Battery Feed	J1 J2 J6* J7 J8 J9* J10 J16	A A A B B B A Out
	Via Ground-Start PABX or Centrex Trunks	-24V Battery Feed	J1 J2 J6* J7 J8 J9* J10 J16	B B A B B B B Out
		-48V Battery Feed	J1 J2 J6* J7 J8 J9* J10 J16	A A A B B B B Out
	Via PABX, Centrex or Central Office Station Circuit		J1 J2 J6* J7 J8 J9* J10 J16	Out Out A A B B B In
	Dial Tone	Required		J18
Not Required		In		
Paging Selection	Individual Zones		J17 J5*	In Out
	All Call Only	Without Talkback	J17 J5*	Out Out
		With Talkback	J17 J5*	Out In
Operator Override	Required		J15	In
	Not Required			Out
On-Hook Release Delay	100 ms		J20	In
	450 ms			Out
Forced Disconnect Time-Out	8 seconds		J11 J12	Out Out
	45 seconds		J11 J12	Out In
	600 seconds		J11 J12	In Out
	Not Required		J11 J12	In In
External Circuits Require Holding Ground† (Supplied by CTR2)	Upon Accessing PagePac		J14 J19	Out In
	Upon Accessing Called Zone		J14 J19	Out Out

*J5, J6 and J9 options are applicable to *Issue 1* applique cards only.

†May not be used when access is via a key system dial intercom.

- (1) Refer to Table I and to the notes on the applicable connection diagram and strap the card for the desired access arrangement.

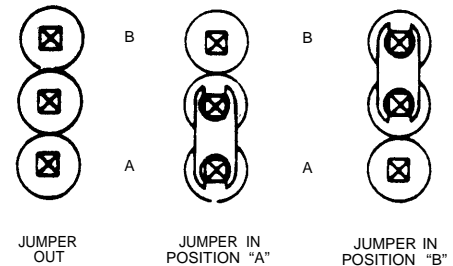
Warning: *The Type C Applique contains components sensitive to static electricity. Always store and transport these cards in conductive plastic bags. Units are shipped from the manufacturer in such bags which should be saved for reuse. Always touch a grounded object such as the PagePac's frame before handling cards.*

- (2) If either ground-start or loop-start trunk access is utilized and if the trunk circuit of the connecting PABX or Centrex will not operate properly when connected to a 24-volt central office, provide the 48-volt talk battery option and an external source of 48 volts.
- (3) If direct attendant access is provided, determine whether the attendant is to automatically override a page in progress, and strap the applique accordingly.
- (4) Strap the card for either zone paging or all-call-only paging per Table I.
- (5) Determine if the customer desires that dial tone be returned when the paging system is accessed and strap the card accordingly per Table I.
- (6) Refer to Table I and strap the card for the desired release time after the caller goes on-hook, and for the desired forced disconnect time-out period.
- (7) If the **CTR2** lead is not being used as an input to the applique and the telephone system or external equipment needs a holding ground when the PagePac® is in use, the **CTR2** lead can be used as an output for this purpose. To program the **CTR2** lead to output an off-hook ground, remove the strap from option pins J14. If the holding ground is to appear when the PagePac® is accessed, strap terminals J19; if it is to appear when the caller is connected to the called zone, omit the strap from J19.

5.26 FM Tuner: In addition to the operating controls, the FM Tuner Card (Fig. 10) contains an option switch for the antenna. Set the **ANT** switch to **INT** if the tuner will utilize the PagePac's built-in antenna. Otherwise set the switch to **EXT** and connect either an outdoor antenna or the antenna of Fig. 27 to terminals **ANT1** and **ANT2** of connecting block A.



(a) TWO-TERMINAL OPTIONS



(b) THREE-TERMINAL OPTIONS

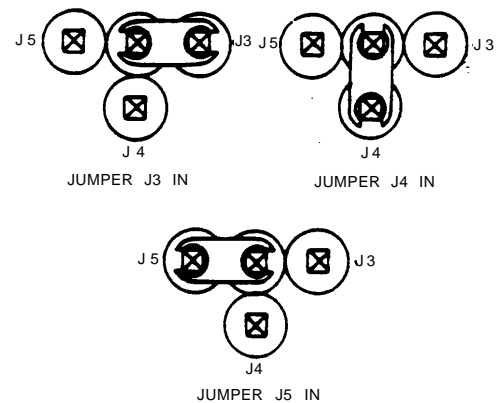
(c) FOUR-TERMINAL OPTIONS
(ISSUE 1 CARDS ONLY)

Fig. 32—Installation of Option Straps

5.27 Talk-Back Control Card: Refer to Table J and strap the Talk-Back Control Card for four possible options as desired. The option terminals are molded into the handle. Also, when talk-back is provided, the zone cards have to be strapped for those zones in which talk-back will be employed.

5.28 Master Zone Card: Refer to Table K and Fig. 33. Strap the card to select the zones which will have talk-back capability.

5.29 Auxiliary Zone Cards: Refer to Fig. 34 through 37 and Table L through O as applicable, and select the options on the various types of zone cards employed in the system.

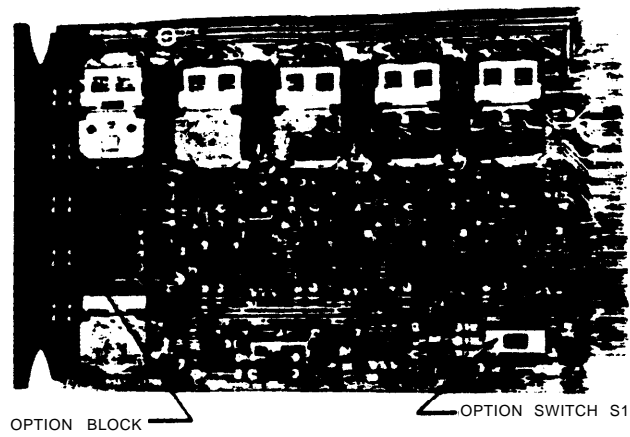


Fig. 33—Master Zone Card—Location of Option Switches

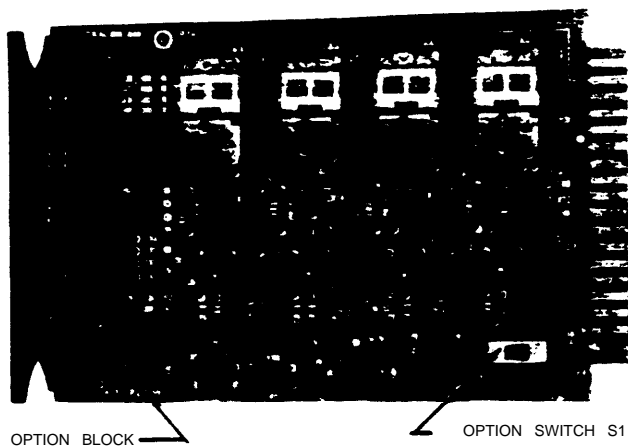


Fig. 34—Aux. Zone Card Type 1—
Location of Option Switches

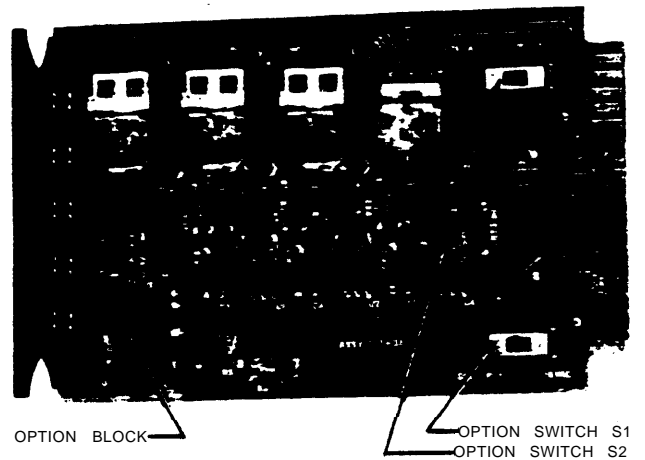


Fig. 36—Aux. Zone Card Type 3—
Location of Option Switches

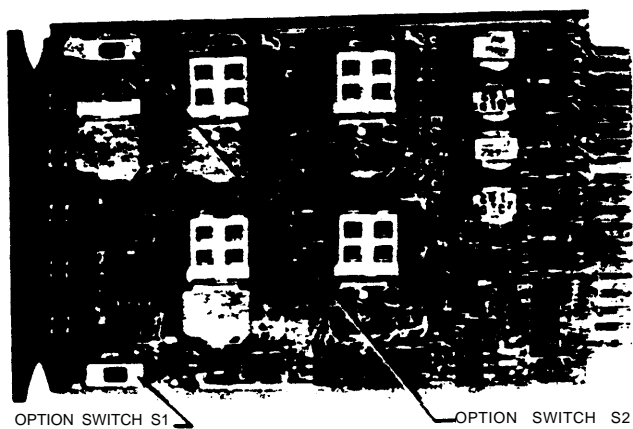


Fig. 35—AUX. Zone Card Type 2—
Location of Option Switches

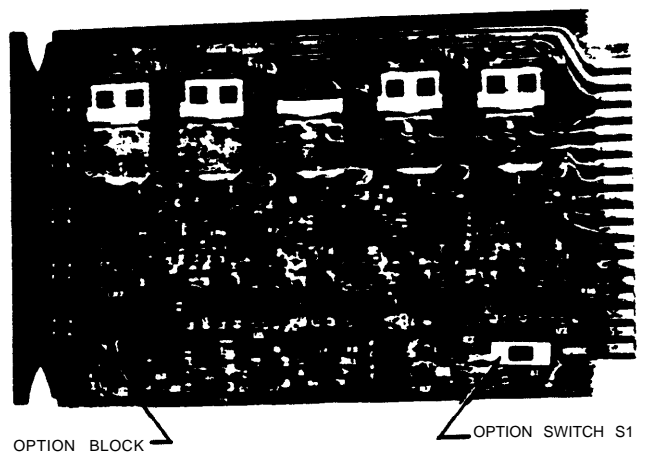


Fig. 37—Aux. Zone Card Type 4—
Location of Option Switches

TABLE J
OPTION SELECTION ON TALK-BACK CONTROL CARD

FEATURE		OPTION TERMINALS	OPTION STRAP
Initial Alerting Tone	Required	1-2	In
	Not Required		Out
Repetitive Alerting Tone	Required	3-4	Out
	Not Required		In
Silent Interval of Repetitive Alerting Tone	15 seconds	5-6	In
	30 seconds		Out
Sound Level from Telephone Necessary to Switch Direction of Talk-Back Circuit	High	7-8	Out
	Low		In

TABLE K
OPTION SELECTION ON MASTER ZONE CARD

FEATURE		OPTION TERMINALS OR SWITCH	POSITION
Zone 1 Arranged for	One-Way Page	9-10	Out
	Talk-Back		In
Zone 2 Arranged for	One-Way Page	7-8	Out
	Talk-Back		In
Zone 3 Arranged for	One-Way Page	5-6	Out
	Talk-Back		In
Zone 4 Arranged for	One-Way Page	3-4	Out
	Talk-Back		In
All-Call Arranged for	One-Way Page	1-2	Out
	Talk-Back		In
Voltage of Zone Selection Leads	Ground	S1*	GND
	± 18V or -24V dc		18 VAC

*S1 may be in either position when Type C Applique is installed.

TABLE L
OPTION SELECTION ON AUXILIARY ZONE CARDTYPE 1

FEATURE		OPTION TERMINALS OR SWITCH	POSITION
Zone 5, 9, 13, 17 or 21 Arranged for	One-Way Page	9-10	Out
	Talk-Back		In
Zone 6, 10, 14, 18 or 22 Arranged for	One-Way Page	7-8	Out
	Talk-Back		In
Zone 7, 11, 15, 19 or 23 Arranged for	One-Way Page	5-6	Out
	Talk-Back		In
Zone 8, 12, 16, 20 or 24 Arranged for	One-Way Page	3-4	Out
	Talk-Back		In
Voltage of Zone Selection Leads	Ground	S1*	GND
	$\pm 18V$ or $-24V$ dc		18 VAC

*S1 may be in either position when Type C Applique is installed.

TABLE M
OPTION SELECTION ON AUXILIARY ZONE CARD TYPE 2

FEATURE		OPTION TERMINALS OR SWITCH	POSITION
Speaker Line Voltage	25-Volt	E1-E1 E2-E2 E3-E3 E4-E4	In†
	70.7 Volt		Out‡
Voltage of Zone Selection Leads	Ground or Type C Applique	S1*	GND
	$\pm 18V$ or $-24V$ dc		18 VAC
Simplex Signaling to Distant End	Required	S2	GND
	Not Required		TBC

*S1 may be in either position when Type C Applique is installed.

†Bridge each pair of terminals with a drop of solder.

‡Remove the solder bridges, if provided.

TABLE N
OPTION SELECTION ON AUXILIARY ZONE CARD TYPE 3

FEATURE		OPTION TERMINALS OR SWITCH	POSITION
Zone 5, 9, 13, 17 or 21 Arranged for	Background Music Only Without One-Way Page or Talk-Back	NA	Standard— Not an Option
Zone 6, 10, 14, 18 or 22 Arranged for	One-Way Page	7-8	Out
	Talk-Back		In
Zone 7, 11, 15, 19 or 23 Arranged for	One-Way Page	5-6	Out
	Talk-Back		In
Zone 8, 12, 16, 20 or 24 Arranged for	One-Way Page	3-4	Out
	Talk-Back		In
Voltage of Zone Selection Leads	Ground or Type C Applique	S1*	GND
	± 18V or -24V dc		18 VAC
Music Source for Music-Only Zone	External Amplifier—Continuous	S2	Pos A
	Internal from PagePac —Interrupted		Pos B

*S1 may be in either position when Type C Applique is installed.

TABLE O
OPTION SELECTION ON AUXILIARY ZONE CARD TYPE 4

FEATURE		OPTION TERMINALS OR SWITCH	POSITION
Zone 5, 9, 13, 17 or 21 Arranged for	One-Way Page and No Background Music	9-10	Out
	Talk-Back and No Background Music		In
Zone 6, 10, 14, 18 or 22 Arranged for	One-Way Page and No Background Music	7-8	Out
	Talk-Back and No Background Music		In
Zone 7, 11, 15, 19 or 23 Arranged for	One-Way Page and Background Music	5-6	Out
	Talk-Back and Background Music		In
Zone 8, 12, 16, 20 or 24 Arranged for	One-way Page and Background Music	3-4	Out
	Talk-Back and Background Music		In
Voltage of Zone Selection Leads	Ground or Type C Applique	S1*	GND
	± 18V or -24V dc		18 VAC

*S1 may be in either position when Type C Applique is installed.

CONNECTING POWER

5.30 The following steps should be followed when powering the PagePac Telephone Paging System.

- (1) Plug the printed circuit boards into the designated slots in the card file. See Fig. 2. Note that the **DTMF** slot is no longer used. Make certain the circuit card is fully seated in the connector. A keying arrangement prevents a circuit card from being installed in an incorrect card file position. However, mechanical damage to the card or card file may occur if circuit cards are forced into incorrect positions.

Warning: *AC power must be turned off before removing or inserting any circuit cards. Failure to do so may result in damaged cards.*

- (2) When plugging in a Talk-Back Control Card, remove and save the Talk-Back Continuity Card for use to restore one-way paging in the event of a talk-back failure or if talk-back is removed in the future.
- (3) If the talkback feature is not provided, the factory-provided Talk-Back Continuity Card **must** remain in the **TALK-BACK** position of the card file.
- (4) Plug the power cord into the 117v ac outlet.

Caution: *In no case should this unit be connected to any sources of direct current (dc) or any ac voltage exceeding 130 volts rms.*

- (5) Set the AmpliCenter **PWR** switch (Fig. 29) to **ON**. The **PWR** LED should illuminate.

Note: It is normal for the **OVLD** LED to light for several seconds after the ac power is turned on. It should not be considered as a trouble indication unless the overload LED remains on.

ADJUSTING MUSIC GAIN

5.31 Without FM Tuner Card: If background music is supplied by an external source connected to terminals **MT** and **MR**, adjust the **MUSIC GAIN** control on the AmpliCenter front panel to provide an acceptable music level in the paging zones.

5.32 With FM Tuner Card Equipped: If background music for the paging zones is supplied by the FM Tuner card, set the level of the music as follows:

- (1) Turn the music gain down by rotating the AmpliCenter's **MUSIC GAIN** control (Fig. 29) fully counterclockwise.
 - (2) Set the FM Tuner Card's **ANT** switch to **EXT** if an external indoor or outdoor antenna has been provided; otherwise set it to **INT**. See Fig. 10.
 - (3) Set the **SPK** switch to **ON** to disconnect both the 8-ohm and 600-ohm outputs and to listen to the monitor speaker.
 - (4) Set the **AFC** switch to **OFF**.
 - (5) Set the FM Tuner Card's **MON VOL** control to mid range.
 - (6) Tune to the desired station. The red **TUNE** LED should light when the station is precisely tuned.
- Note:** If a station cannot be adequately tuned, as indicated by the lamp not illuminating properly, an external antenna may be required.
- (7) Set the **AFC** switch to **ON**.
 - (8) Set the **SPK** switch to **OFF** to reconnect the audio output and disconnect the monitor speaker.

Caution: *Failure to restore the **SPK** switch to the **ON** position will cause a service interruption to the background music in both the paging zones and in the music-on-hold capability of the associated telephone system.*

- (9) If the FM Tuner card supplies the music for the telephone system's music-on-hold feature, adjust the music level by rotating the **MON VOL** control on the FM Tuner card until the music heard by a caller on hold is set at a comfortable level.
- (10) Set the background music level in the paging zones by rotating the **MUSIC GAIN** control on the AmpliCenter .
- (11) Check that background music is heard in each paging zone designated for music and is not heard in non-music zones.

TESTING THE SYSTEM

5.33 After all the printed circuit cards are plugged into the card file and all the foregoing procedures have been performed, proceed to test the system as follows:

- (1) From any station instrument that has access to the system, initiate a paging call to each zone and to all zones at once (all-call).
- (2) When a zone or all-call is accessed, background music should be muted in all zones.
- (3) Speak into the handset. The message should be heard in all the speakers connected to the selected zone or zones.
- (4) Replace the handset. The paging connection should be terminated and background music should again be heard from all the speakers.
- (5) With PABX station access, the connection should release automatically after the allotted time period has elapsed.

Note: During station line access, some types of switching equipment will provide a momentary open to the PagePac® tip and ring after the initial access and ring trip. Should this open interval exceed 450 ms, as in the case of certain ESS central offices, the Type C Applique may disconnect. A Type C Applique software modification is required to provide Open Interval Protection (OIP) and prevent inadvertent disconnection. OIP Field Modification Kits P/N 22082-100 (Issue 1 card) and 22082-200 (Issue 2 card) contain OIP-modified software with installation instructions and should be ordered separately, if required. In such situations it is recommended that the station line be configured for ground-start operation. Once modified, the Type C Applique should not be used for any other type of access unless the standard micro-processor is reinstalled.

- (6) Test the interdigital time-out and forced disconnect features by allowing the call to time-out at different stages when making a page.

5.34 If the Talk-Back Control Card is provided, test this feature in the following manner:

- (1) From any instrument, initiate a call to each zone optioned for talk-back.

- (2) When those zones are called that are optioned for talk-back, either a single-burst or a repetitive alerting tone should be heard, or no tone may be provided, depending on the options selected from Table J.

- (3) When the caller pages into a talk-back zone, instead of a one-way page, a two-way conversation should take place with the party at the speaker location.

COMPLETING THE INSTALLATION

5.35 After all the foregoing tests have been performed, complete the installation as follows:

- (1) Check that each speaker is working and is connected to the proper zone.
- (2) Check that music-only zones do not receive a page and that page-only zones do not receive music.
- (3) Set the paging sound level of each individual speaker in the system by adjusting the speaker's power tap. Refer to Dracon practices DRCN-46-310, Cone Type Loudspeakers and Baffles, and DRCN-46-300, Horn Type Loudspeakers and Attenuators.
- (4) Check the operation of off-premise and remote amplifiers, if provided. A page should only be heard when the assigned zone or all-call is selected. At all other times, background music should be heard, the same as at the main location.
- (5) Check that each station that is not restricted can access the paging system and that restricted phones, if any, cannot reach the paging system.
- (6) Check that all the desired options have been provided.
- (7) Check that the various time-out periods are set for the correct intervals.
- (8) Test the zone group features of the applique card, if provided.
- (9) Test the Type C Applique in both the tone-dial and rotary-dial modes.
- (10) Dress the wiring neatly to the connecting blocks and terminal strips.
- (11) Replace the cover of the PagePac® unit, if wall-mounted.

SECTION DRCN-46-201

6. METHOD OF OPERATION

DIAL INTERCOM ACCESS

6.01 If the paging system is accessed via a key system dial intercom, place a paging call as follows:

- (1) Lift the handset of your station instrument.
- (2) Observe that the intercom path is idle and depress the associated button.
- (3) Dial the intercom code assigned for access to the paging system.
- (4) Listen for the paging system dial tone, if the system is so arranged.
- (5) Dial the one- or two-digit code to access the desired zone or dial "21" for all-call. If the system is arranged for only one zone, no digits need be dialed.
- (6) If the system is arranged for confirmation tone, wait until you hear the nine short bursts of tone.
- (7) Immediately broadcast your message into the handset.
- (8) When you have completed the page, gently replace the handset or depress the hookswitch to avoid a loud "thump".

DIRECT STATION ACCESS

6.02 If your telephone system is arranged for direct access to the paging system, initiate a page as follows:

- (1) Lift the handset of your station instrument.
- (2) If you are calling from a key telephone instrument, observe that the lamp in the **PAGE** button is extinguished indicating the paging system is free. Then depress the button assigned for paging access.
- (3) Then perform steps (4) to (8) of paragraph 6.01.

PABX AND CENTREX ACCESS

6.03 To make a paging call from a station instrument associated with a PABX or Centrex, proceed as follows:

- (1) Lift the handset of your PABX extension.
- (2) Dial the number assigned for paging access.
- (3) If busy tone is received, the paging system is in use. Replace the handset and try again in a few minutes.
- (4) If the paging system is free, perform steps (4) to (8) of paragraph 6.01. If access is via a PABX station circuit rather than a trunk, the calling instrument must be equipped with a tone dial.

PAGING ADAPTER ACCESS

6.04 If access is via a key system or PABX paging adapter, zone paging is not provided. To make a paging call, proceed as follows:

- (1) Lift the handset of your station instrument.
- (2) Dial the number assigned for paging access.
- (3) If busy tone is received, the paging system is in use. Replace the handset and try again in a few minutes.
- (4) If the paging system is free, immediately broadcast your message into the handset.
- (5) When you have completed the page, replace the handset.

DIRECT ATTENDANT ACCESS

6.05 To make a zone page from an attendant's console, access the attendant's station line and perform the steps of paragraph 6.03. If the position is equipped with a **PAGE** key, the paging system can be accessed directly, but only for all-call, as follows:

- (1) Operate the **PAGE** key to the **PAGE** position.
- (2) Immediately speak the message into the operator's headset or handset.
- (3) When the page is completed, restore the **PAGE** key.

TALK-BACK PAGE

6.06 If the paging system is equipped with the talk-back feature, proceed as follows:

- (1) If the called paging zone is arranged for talk-back, you will hear background noise and conversation from the called area.
- (2) If your system is arranged to provide a single burst or an intermittent alerting tone, wait until the initial tone burst is terminated.
- (3) Speak your message into the handset and listen for the reply. The intermittent alerting tone, if provided, will be discontinued when you begin to speak.
- (4) You may continue to converse with the paged party.
- (5) When the conversation is terminated, replace the handset.

ZONE GROUP PROGRAMMING

6.07 Two versions of the Type C Applique, models -008 and -010, offer an optional feature called zone group programming. With this feature up to eight zones can be combined into a group; thereafter all the zones in that group can be accessed by dialing a single three-digit code. Up to four such zone groups can be set up. Once programmed, the applique will remember the zones assigned to each group until the group is reprogrammed or until power is removed from the applique. During programming, the attendant override feature is temporarily disabled to prevent any interruption and the attendant is locked out. To program zone groups 1 through 4, proceed as follows:

- (1) Access the PagePac® in the normal manner. When dial tone is received dial "39" followed by the number of the group to be programmed, "1", "2", "3" or "4". For example, if group 3 is being programmed, dial "393".
- (2) After the three-digit code is dialed, listen for stutter tone consisting of two short bursts of tone followed by steady dial tone. Then dial the one- or two-digit access code of each zone to be included in the group, one after the other, up to a maximum of eight zones. Stutter tone will be heard after each zone code is dialed. For example, if zones 10 through 17 are to be included in group 3, then stutter tone will be heard after the code "24" is dialed for zone 10. Next the two-digit code "25" is dialed for zone 11 and again stutter tone follows. This procedure is continued until all eight zones have been programmed.

Note: Code "21", all-call, must not be used as one of the zones when programming a zone group.

- (3) If during programming, a dialing error is made, or if a time-out occurs and reorder tone is received or if disconnect occurs, replace the handset briefly and reprogram the group. Reorder tone will also be returned if an unequipped zone, a zone for which there is no corresponding zone card, is selected, or if access code "21" all-call is selected, or if an attempt is made to program a ninth zone. Should this occur, go on-hook momentarily and reprogram the group.
- (4) After the last zone code has been dialed, dial "39", whereupon dial tone will be heard. The group is now programmed and may be accessed as explained below.

ACCESSING ZONE GROUPS 1 TO 4

6.08 To access one of the zone groups programmed previously, proceed as follows:

- (1) Access the PagePac® in the usual manner. Dial tone will be received. (If the group has just been programmed and dial tone is present, it is not necessary to reaccess the system).
- (2) Dial "30" and the number of the group to be paged, "1", "2", "3" or "4". For example, dial "301" to access zone group 1. If a model -010 applique has been provided, confirmation tone is returned after all the selected zones are seized.
- (3) Make the page in the normal manner by speaking into the handset. When the page is completed, replace the telephone handset on the cradle.
- (4) If an error is made in dialing, if reorder tone is received, or if a disconnect occurs, replace the telephone handset and repeat steps (1) to (3).

Note: If any zone in the group is strapped for talk-back, all zones in the group will feature talk-back when the group is enabled.

SCRATCH PAD ZONE GROUP PROGRAMMING

6.09 The same two versions of the Type C Applique that feature zone groups also contain a scratch pad zone group. The scratch pad zone group is a one-time-only group that is programmed or assigned zones prior to each use. There is no separate procedure for accessing the scratch pad zone group after it is programmed. Access is automatic upon completion of the programming. As soon as the group is accessed, the memory containing the desired zones is erased. Another page to the same zones requires repeating the programming procedure. To program and access the scratch pad zone group, proceed as follows:

- (1) Access the paging system in the usual manner. When dial tone is received, dial "300".
- (2) When stutter tone is received, dial the access code of each zone to be included in the group, one after the other, up to a maximum of eight. Stutter tone will be received after each zone access code is dialed.
- (3) If during programming, an error is made in dialing, the equipment times out returning reorder tone, or the call is disconnected, replace the handset and initiate a new call.
- (4) If the code of an unequipped zone is dialed, if code "21" all-call is dialed, or if an attempt is made to program a ninth zone, reorder tone will be returned. Go on-hook and reprogram the group.
- (5) After the last zone has been selected, dial "30" to make the page. If your system is equipped with a model -010 applique, you will hear confirmation tone after a connection to all the desired zones has been established.
- (6) Broadcast your page in the normal manner. When the page is completed, replace the telephone handset on the cradle.

Note: If any zone in the group is optioned for talk-back, all zones in the group will feature talk-back when the group is enabled.

7. MAINTENANCE

7.01 General: When trouble is reported, verify that:

- Power is being supplied to the PagePac .
- There are no broken connections at the connecting block or terminal strips.
- The AmpliCenter overload circuit breaker has not tripped.
- The paging system and the telephone system are both properly grounded.

7.02 Test Apparatus Required: If trouble still exists, the test equipment listed below shall be provided. Test lamps must not be used to check voltages. They can damage electronic circuits. A hand testset shall not be used to check voltages as the results will be misleading.

- Volt-ohm-milliammeter,
- Dracon TS21 Hand Test Telephone or equivalent, and
- Test leads with alligator clips.

7.03 Voltage Check: Before proceeding further, check that the voltage at the input to the PagePac is not less than 105 volts nor more than 129 volts ac. Then check that the voltage across terminals **-24 VDC** and **SIG GND** on the AmpliCenter® terminal strip are not less than 22 volts nor more than 26 volts dc. Also check the voltages of the associated telephone system. An undetected blown fuse or low voltage will cause improper operation. DC voltage measurements are made with respect to (+) ground.

7.04 The AmpliCenter 24-volt power supply has protective circuitry that will reduce the voltage to zero if the -24V lead becomes grounded or shorted. Therefore, if zero voltage is measured at the AmpliCenter's **-24VDC** terminal, it does not necessarily indicate a defective AmpliCenter . A second measurement must be taken with the wires removed from this terminal. If the voltage across terminals **-24VDC** and **SIG GND** reads between 22 and 26 volts, it indicates shorted or grounded wiring between the AmpliCenter and the card file or a defective circuit card.

TABLE P
TROUBLE ANALYSIS TABLE

TROUBLE	POSSIBLE CAUSE	POSSIBLE SOLUTION
Background music okay, music silenced when seized, can't page.	a. Defective applique card. b. Defective Talk-Back Control Card. c. Defective AmpliCenter .	Isolate defective unit by substituting Talk-Back Continuity Card, and also by monitoring along paging path with test handset. Replace defective unit.
Background music okay, music not silenced when seized, can't page.	a. Defective applique card. b. Defective AmpliCenter .	Ground MUSIC/PAGE terminal to isolate fault. Replace defective unit.
Page and music okay but unable to use talk-back, or music okay, music silenced when seized, but talk-back locked in listen mode.	a. Signal at T and R below -15 dBm. b. Defective Talk-Back Control Card.	Replace Talk-Back Control Card.
Background music and page dead in all zones.	a. Defective Talk-Back Control Card. b. Defective Master Zone Card. c. Defective AmpliCenter . d. Defective applique card. e. Paging system power off.	Isolate faulty unit by monitoring path with test handset and by substituting Talk-Back Card. Replace defective unit.
Page okay but music dead or distorted.	a. Defective FM Tuner Card. b. MON VOL on FM Tuner set too high. c. Defective AmpliCenter .	Isolate fault by monitoring MUSIC IN terminals. Adjust volume. Replace faulty unit.
Music okay but unable to page in any of the zones 1 to 24 or two zones page at the same time in zones 1 to 4.	a. Defective Master Zone Card. b. Defective Auxiliary Zone Card. c. Defective applique card.	Isolate fault by monitoring AmpliCenter and Master Zone Card output terminals. Replace defective unit
Music okay but unable to page in zones 5 to 24.	a. Defective Auxiliary Zone Card b. Defective applique card.	Isolate fault with test handset and by moving suspect Auxiliary Zone Card to another position. Replace defective card.
Music okay but unable to access any or all of the zones with DTMF dialing while rotary-dialing okay, or vice versa.	Defective applique card.	Replace Type C Applique Card.
Talk-back is inoperative in some or all zones.	a. Option straps missing on zone cards b. Defective Talk-Back Control Card.	Check zone cards and verify strapping. Replace Talk-Back Control Card.

7.05 Troubleshooting: Trouble conditions originating outside of the paging system, such as shorted wires or ac power failure, should be located and cleared using normal telephone repair procedures. A Dracon TS21 Lineman's Test Set or equivalent, in the **MONITOR** mode, is an ideal tool to use for checking continuity of input and speaker wiring.

7.06 Repairs: The PagePac assembly, the AmpliCenter and the circuit cards do not require periodic maintenance and are not field repairable. If a unit fails to function properly, it should be returned to Dracon for repair.

Note: A return authorization number must be received before returning any equipment. This number may be obtained by calling the Dracon Customer Service Department at (805) 487-5307.

7.07 Talk-Back Malfunction: Should a Talk-Back Control Card malfunction, the card may be removed and a Talk-Back Continuity Card placed in the connector to restore one-way paging. The Talk-Back Control Card should then be returned to Dracon for repair.

7.08 Trouble Analysis Table: If the trouble has not been located, refer to Table P. Identify the symptoms and perform the actions indicated.

Danger: Do not hold the test set to your ear when monitoring the 25V/70V AmpliCenter output. Excessive volume may be present.

7.09 Unit Substitution: If spare PagePac® units are available, continue to troubleshoot by substituting a spare unit for the one that is not working.

7.10 AmpliCenter Removal: To remove an AmpliCenter for inspection or replacement, proceed as follows:

- (1) Set the AmpliCenter **PWR** switch to **OFF**.
- (2) Lift the front flap and disconnect all wiring from the front panel of the AmpliCenter .
- (3) Refer to Fig. 3 and remove the four screws located at the top and bottom flanges of the AmpliCenter .

- (4) Remove the AmpliCenter by pulling it straight out until it clears the framework.
- (5) Reinstall the AmpliCenter in the reverse order. Refer to Table Q and reconnect the wires to the AmpliCenter terminal strip.

7.11 Card File Removal: To remove the PagePac® card shelf for repair, replacement or inspection, proceed as follows:

- (1) Set the AmpliCenter **PWR** switch to **OFF**.
- (2) Remove all the circuit cards.
- (3) Refer to Fig. 3 and remove the four screws located on the brackets on both sides of the card file.
- (4) Refer to Fig. 38 and pull the card file straight out until it clears the assembly.
- (5) Disconnect all the plugs located on the card file's backplane.
- (6) Reinstall the card file by performing the foregoing steps in the reverse order.

TABLE Q
AMPLICENTER CONNECTIONS

TERMINAL DESIGNATION	WIRE COLOR	WIRE TYPE
0 dB AUX OUT	Blue	Twisted Pair
	Blue	
MUSIC/PAGE	Blue	Single
PAGE IN	Green	Twisted Pair
	Green	
MUSIC IN	White	Twisted Pair
	White	
G	Black	Single
-24 VDC	Red	Single
C	Red	Shielded Pair
25/70	Black	
SHIELD	Shield	
SHIELD	Green	Single

8. FCC COMPLIANCE**FCC REGISTRATION**

8.01 In compliance with Part 68 of the FCC Rules and Regulations, the customer is advised as follows:

8.02 *Standard Plugs and Jacks:* Direct connection to the network must be through a USOC type jack to be supplied by the telephone company. Registered terminal equipment or protective circuitry may not be used with party lines or coin telephone lines.

8.03 *Notification to Telephone Company:* Customers connecting terminal equipment to the Telephone network shall, before such connection is made, give notice to the telephone company of the particular line(s) to which such connection is to be made and shall provide to the telephone company the FCC registration number and the ringer equivalence of the registered protective circuitry. Notice of final disconnect shall also be given.

8.04 *Separate Wiring:* Compliance with FCC Registration requires that wiring between PagePac and the loudspeakers be in a cable harness separate from all other leads. It is also a requirement that the PagePac be installed by a trained and authorized agent of the manufacturer or under the supervision of a licensed professional engineer, as provided for in section 68.215 of the FCC Rules and Regulations.

8.05 *Separate Housing:* The PagePac has its own housing and mounts externally to the associated telephone system.

8.06 *Incident of Harm:* Should terminal equipment cause harm to the telephone network, the telephone company shall, where practicable, notify the customer that temporary discontinuance of service may be required. However, where prior notice is not practicable, the telephone company may temporarily disconnect service forthwith, if such action is reasonable in the circumstances. In case of temporary discontinuance, the telephone company shall (1) promptly notify the customer of such temporary discontinuance, (2) afford the customer the opportunity to correct the situation which gave rise to the temporary discontinuance, and (3) inform the customer of his right to bring a complaint to the Commission pursuant to the procedure set out in Subpart E of Part 68.

8.07 *Changes in Telephone Company Facilities, Equipment, Operations or Procedures:*

The telephone company may make changes in its communications facilities, equipment, operations or procedures, when such action is reasonably required in the operation of its business and is not inconsistent with the rules and regulations of Part 68. If such changes can be reasonably expected to render any customer's terminal equipment incompatible with the telephone company communications facilities, or require modification or alteration of such terminal equipment, or otherwise materially affect its use or performance, the customer shall be given adequate notice in writing, to allow the customer an opportunity to maintain uninterrupted service.

8.08 *Repairs:* Repair of registered terminal equipment and registered protective circuitry shall be accomplished only by the manufacturer or by its authorized agent. *This applies at any time during and after the warranty period.*

8.09 *Equipment Malfunction:* When trouble is experienced, the customer shall disconnect the registered equipment from the telephone line to determine if the registered equipment is malfunctioning, and that, if the registered equipment is malfunctioning, the use of such equipment shall be discontinued until the problem has been corrected.

8.10 *Restrictive Conditions:* The customer will be advised by written instructions of any restrictive conditions under which the apparatus must be used. Such restrictions to include information such as only with registered apparatus, or only with specific model numbers.

8.11 *Registration Number:* The type of connecting arrangement (jack) to be ordered from the telephone company is indicated below as typical. Other standard jacks may be used for specific applications.

USOC RJ-11C

COMPLIES WITH PART 68, FCC RULES	
FCC REGISTRATION NUMBERS	<u>APF9Q9-69761-PX-N</u>
	<u>APF9Q9-67991-KX-N and APF9Q9-68766-OT-N</u>
RINGER EQUIVALENCE	<u>0.88</u>

RADIO FREQUENCY INTERFERENCE

8.12 The Type C Applique and FM Tuner Card generate and use radio frequency energy and if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. Both have been type tested and found to comply with the limits for a Class B device in accordance with the specifications in Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the PagePac off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- (a) Reorient the radio or TV receiving antenna.
- (b) Relocate the PagePac with respect to the radio or TV receiver.
- (c) Move the PagePac away from the radio or TV receiver.
- (d) Plug the PagePac into a different outlet so that it and the radio or TV receiver are on different branch circuits.

8.13 If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

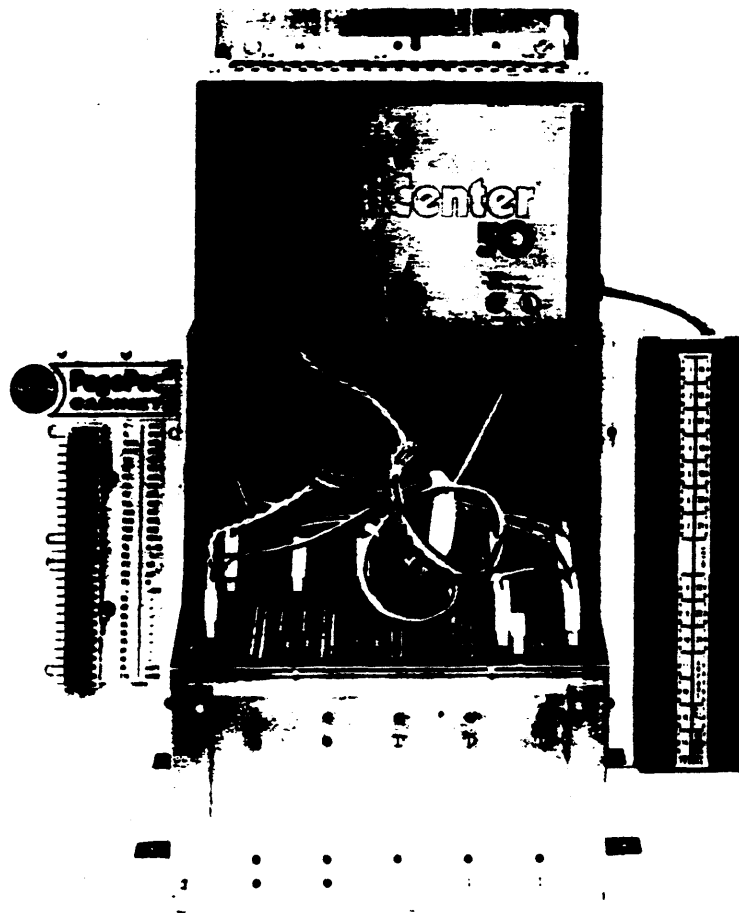


Fig. 38—Removing the Card File