

# Two-Link Key System Intercoms



 **MELCO**

# Two talking paths mean added efficiency for key system intercoms.

Melco's line of two-link intercoms provide your 1A1 and 1A2 type key system customers with a total communications package. With two private talking paths your customers can hold up to two intercom conversations simultaneously. And the KL-30 and KL-19A offer many custom calling features — all accessible from just a single pickup key.

From the same key, optional features may be accessed to increase the flexibility and efficiency of either system. A paging option provides for convenient single or multi-area paging. And an outside line access option allows your customers to increase their current line traffic capacity with additional network lines.

Melco's two-link intercoms are designed for easy installation. Connections to the power supply and station telephone instruments are quick and simple, saving you and your customers valuable time and money in installation and equipment costs.

Part of an established line of key system intercoms and intercom enhancements, Melco's reliable two-link intercoms and auxiliary equipment are backed by an extensive warranty service policy.

All Melco intercoms are registered with the F.C.C. The KL-30 is registered under Number AQT9PZ-69527-KN-E. The KL-19A is registered under number AQT9PZ-68231-KX-N.

## Description

### KL-19A

Melco's KL-19A Two-Link Intercom provides for up to 19 stations and is compatible with either tone or rotary dialing telephones. The system is expandable from 19 to 38 stations with the addition of Melco's KX-38 Intercom Expander. Single or multi-area paging may easily be added to the system. The KL-19A is the economical solution for your customers requiring a two-link system without extensive custom calling features.



### KL-30

Melco's KL-30 Two-Link Intercom may be ordered equipped for 8, 16, 24, 32, or 40 stations and is compatible with either tone or rotary dialing telephones. Sophisticated switch-selectable features include dial 9 trunk hunting, specific call pickup, call forwarding, conferencing, message waiting, camp-on busy, and do-not-disturb. The KL-30 offers such optional features as call announcing, four-area paging, paging access, and outside line access. These options may be easily added by inserting circuit cards. No wiring changes are required.



**Paging Access** — provides paging capability to four areas without reducing station capacity. It is designed for use as a pre-amplifier and features background music input, visual busy indicators, call attention tone, and additional paging capability for the attendant on a separate key even if both links are busy.

**Four-Area Pager** — provides paging capability to four areas without reducing station capacity. Each area may be accessed separately or all may be accessed simultaneously. This paging option is intended for use with speakers and is not designed for use as a pre-amplifier. Features include background music input, separate paging and background music volume control, and visual busy indicators.

**Outside Line Access** — adds outgoing call capability to 4 C.O. lines, easily dial-accessed from the KL-30 pick-up key. It provides visual busy indicators, busy tone, and conferencing. This unit does not reduce KL-30 station capacity.

**Call Announcing** — provides call announcing and handsfree answerback capabilities for 6 stations. Two versions are available to enable use with either ATT or ITT handsfree answering station units. Each circuit pack used reduces KL-30 station capacity by two.

## Design Features:

FEATURES	KL-19A	KL-30
Station lamp control	•	•
Bell or buzzer signaling	•	•
Fully selective station signaling	•	•
Two intercom talking paths	•	•
Compatible with tone and/or rotary dialing telephones	•	•
Interrupted ringing	•	•
Flashing lamps	•	•
Ringback tone	•	•
Dial tone	•	•
Busy tone (off-hook on intercom line only)	•	•
Busy tone (off-hook on any line)		•
Permits answering from any station	•	•
Automatic station release (lockout)		•
Private conferencing (up to 5 stations)	•	•*
Private conferencing (1 outside line/up to 3 stations)	•	
Message waiting		•*
Camp-on busy		•*
Call forwarding		•*
Do-not-disturb		•*
C.O. line scan - dial 9 trunk hunting (available only when Outside Line Access Option is used)		•*
Specific call pickup (no call pickup)		•*
Acknowledgment tone		•
Error tone		•
Outside line access option		•
Single-area paging option	•	•
Multi-area paging option	•	•
Call announcing and handsfree answerback on intercom		•
Expandable station capacity	•	
Aluminum housing	•	•

\* Switch selectable feature.



## KL-19A™ TWO-LINK INTERCOM FOR KEY SYSTEM TELEPHONES

### 1. GENERAL

1.01 The KL-19A is a 19-station intercom for key systems. It has two talking paths, one of which is private, and it can be expanded to 38 stations with a Melco KX-38 Intercom Expander. The KL-19A furnishes dial tone, busy tone, ringback tone, interrupted ringing and flashing lamps. Station signaling is fully selective.

1.02 Local and network conferencing are dial accessed. Paging is available with the addition of one or more paging access or paging amplifier circuits. An outgoing network line can be accessible with the addition of a Melco KA-360 Outside Line Access circuit. All stations, both links, conferencing, paging and the network line are available from every telephone through a single pick-up button of the key telephone.

1.03 This device has received Registration Number AQT9PZ-68231-KX-N under Part 68 of FCC Rules and Regulations. Ringer equivalence is 0.0B.

### 2. FEATURES

2.01 The KL-19A:

- selectively signals 19 intercom stations.
- expands easily to 38 stations.
- functions with tone and/or rotary dialing telephones on 1A1 or 1A2 type key systems.
- allows two intercom conversations at the same time.
- requires only one button of a key telephone.
- provides dial tone.
- provides busy tone to the caller when the called station is off-hook on the intercom line.
- provides busy tone when the called station is off-hook on any line when used with a Melco Intercom Busy Unit.
- provides interrupted ringing, flashing lamps and ringback tone without an external interrupter.
- permits answering from any station.

- provides outgoing network line access when a Melco Line Access Circuit is installed with the intercom.
- provides private conferencing for up to five stations initiated by a tone or rotary dialing station.
- provides private conferencing for up to three stations and a network line when initiated by a tone dialing station.

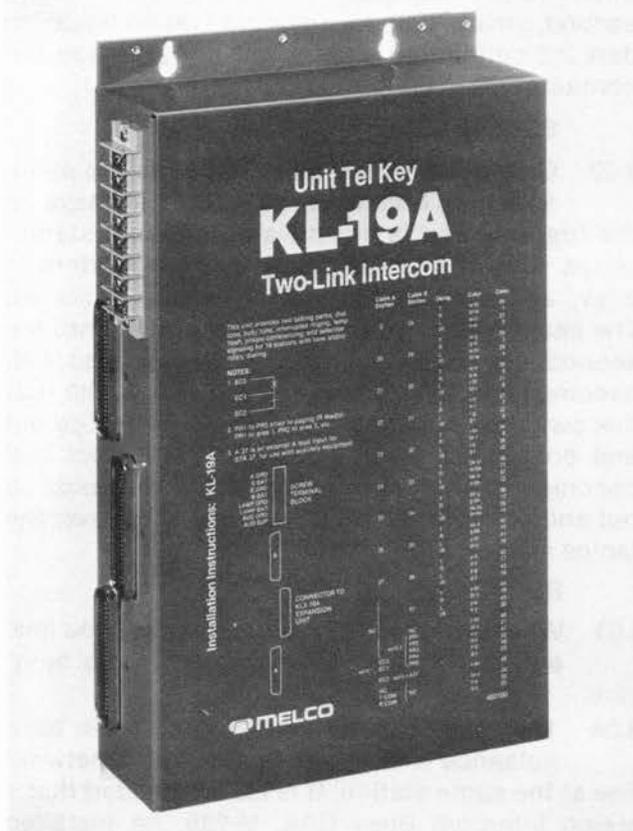


Fig. 1

- can access paging equipment which can provide paging for 1 to 5 areas, or 4 areas and all area paging.
- has extra contacts to control paging or other auxiliary equipment.
- mounts on a backboard or in a relay rack.
- uses two 25-pair connector cables for rapid installation.
- operates from a standard key system power supply.

### 3. OPERATION

#### FIRST CALL

3.01 A call can be placed whenever the intercom pick-up button is not lighted. To place a call, a station user presses the intercom button, comes off-hook and hears dial tone through the first talking link. All station lamps light and auxiliary contacts EC1-EC3 operate. After the station number is dialed, the caller hears ringback tone and the called station receives interrupted ringing and flashing lamp. When the called station or any other station answers, the call is switched to the second, private link. All intercom station lamps go dark indicating that another call can be made and contacts EC1-EC3 restore.

#### SECOND CALL

3.02 Operation for the second call is the same as for the first, except that the call stays on the first link and is not private. Intercom station lamps remain on, indicating that the system is busy, and contacts EC1-EC3 remain operated. The second call remains on the first link until the second link becomes idle. If the second link becomes idle before the first, the call on the first link switches to the second link. All lamps go out and contacts EC1-EC3 restore. If the first link becomes idle before the second link, all lamps go out and contacts EC1-EC3 restore. Whenever the lamps are out, a call can be made.

#### BUSY TONE

3.03 When a station is talking on the second link and is called, the caller will receive busy tone.

3.04 The ringing of an incoming call can be a nuisance when there is a call on a network line at the same station. It is recommended that a Melco Intercom Busy Unit, M-268, be installed with the KL-19A. With this unit an intercom caller will receive a busy signal when the called station is off-hook for any reason and the called station will not ring. See Figure 6 and the Practice for the M-268.

#### ANSWERING

3.05 An intercom call may be answered by any telephone operating on the KL-19A.

#### NETWORK LINE ACCESS

3.06 An outgoing call may be placed through the intercom when a Melco KA-360 Outside

Line Access Unit is installed. To place an outside call, dial 37, listen for central office dial tone, then dial the desired network number. See Figure 8 and the practice for the KA-360.

#### LOCAL CONFERENCE (5 stations max)

3.07 Tone or rotary dialing stations may initiate a local conference with the intercom as follows:

A. Dial 60, the local conference access number.

- Receive dial tone. Proceed with Step B.
- Receive busy tone . . . second link is busy. Try later.

B. Dial each station to be in the conference.

- Receive dial tone after each station is dialed.
- If less than 4 stations are called, dial 60 again.
- Originator will hear three periods of ringback tone.
- Called stations will receive three periods of ringing followed by 20 seconds of flashing lamp.
- If all called stations answer, all will switch to the second link when the last one answers.
- If all called stations do not answer, there will be a 20-second waiting period, then all off-hook stations will switch to the second link.

C. Proceed with the conference.

#### NETWORK/LOCAL CONFERENCE (3 stations max)

3.08 When a Melco KA-360 Outside Line Access Unit is interfaced with the KL-19A, a tone-dialing station may establish a conference with intercom stations and an outside line. The procedure is as follows:

A. Dial the local conference access number, 60.

- Receive dial tone. Proceed with Step B.
- Receive busy tone . . . second link is busy. Try later.

B. Dial the assigned network access number, 37, followed by the number

assigned to network conference (any available station number). See Paragraph 4.05.

- Receive dial tone after each station number is dialed.

C. Dial the other stations to be in the conference.

- Receive three periods of ringback tone after two other stations are dialed.
- If only one other station is dialed, dial 60 again.
- Called stations receive three periods of ringing and 20 seconds of flashing lamp. All off-hook stations then switch to the second (private) link.
- Busy tone after the first ringing period indicates a busy network line.
- Central office dial tone indicates that the network line is ready for dialing.

D. Tone dial the desired outside line number.

E. Begin the conference after the network line answers.

#### PAGING

3.09 To access paging, the originator presses the intercom pickup button, comes off-hook and dials the access code for the paging area desired. The page is made and the originator replaces the handset.

### 4. INSTALLATION

4.01 Mount the KL-19A in a relay rack or on a backboard.

4.02 Connect two single A25B or equivalent 25-pair connector cables to the KL-19A connectors and secure them with the clamps provided. Terminate the cables on two 66 type connecting blocks.

4.03 Make connections from the power supply and the stations to the KL-19A as shown in Figure 7. Connect all grounds common at the power supply.

4.04 If network access is desired, place a Melco KA-360 Outside Line Access Unit near the KL-19A and make the cross-connections shown in Figure 8. Use connections for Station 37. For more information refer to the practice for the KA-360.

4.05 For local/network conference, connect an additional IR lead from the KL-19A to the the CONF RR lead of the KA-360. Refer to Paragraph 3.08 and Figure 8. The station number associated with the additional IR lead becomes the access code number for network conference.

4.06 If paging capability is desired, the Melco KA-380 Single Area or KA-384 Four Area Paging Access Circuits are recommended. Amplifiers and speakers are not furnished. For paging systems complete with access circuitry and amplifiers but not speakers, Melco KT-363 Single Area or KT-364 Four Area systems are recommended. These have self-contained access circuits and amplifiers but are not furnished with speakers. Connect the IR leads of the station numbers selected to access paging and the PR leads of the KL-19A to the paging equipment as shown in Figures 9 through 12, and refer to the practices for those paging circuits.

4.07 The KL-19A will provide a station busy signal to an intercom caller when the station dialed is off-hook on the intercom line. If the customer wishes to receive a busy signal when the called station is off-hook on any line, the Melco M-268 Intercom Busy Unit must be installed. See Figure 6 and the Melco technical practice for the M-268 for more details. Note that the connected R( ) lead and the SB lead of the station telephone connect to leads RR( ) and SB, respectively, of the same number group of the M-268, and the RR( ) of the M-268 is in turn connected to the station associated IR lead of the KL-19A.

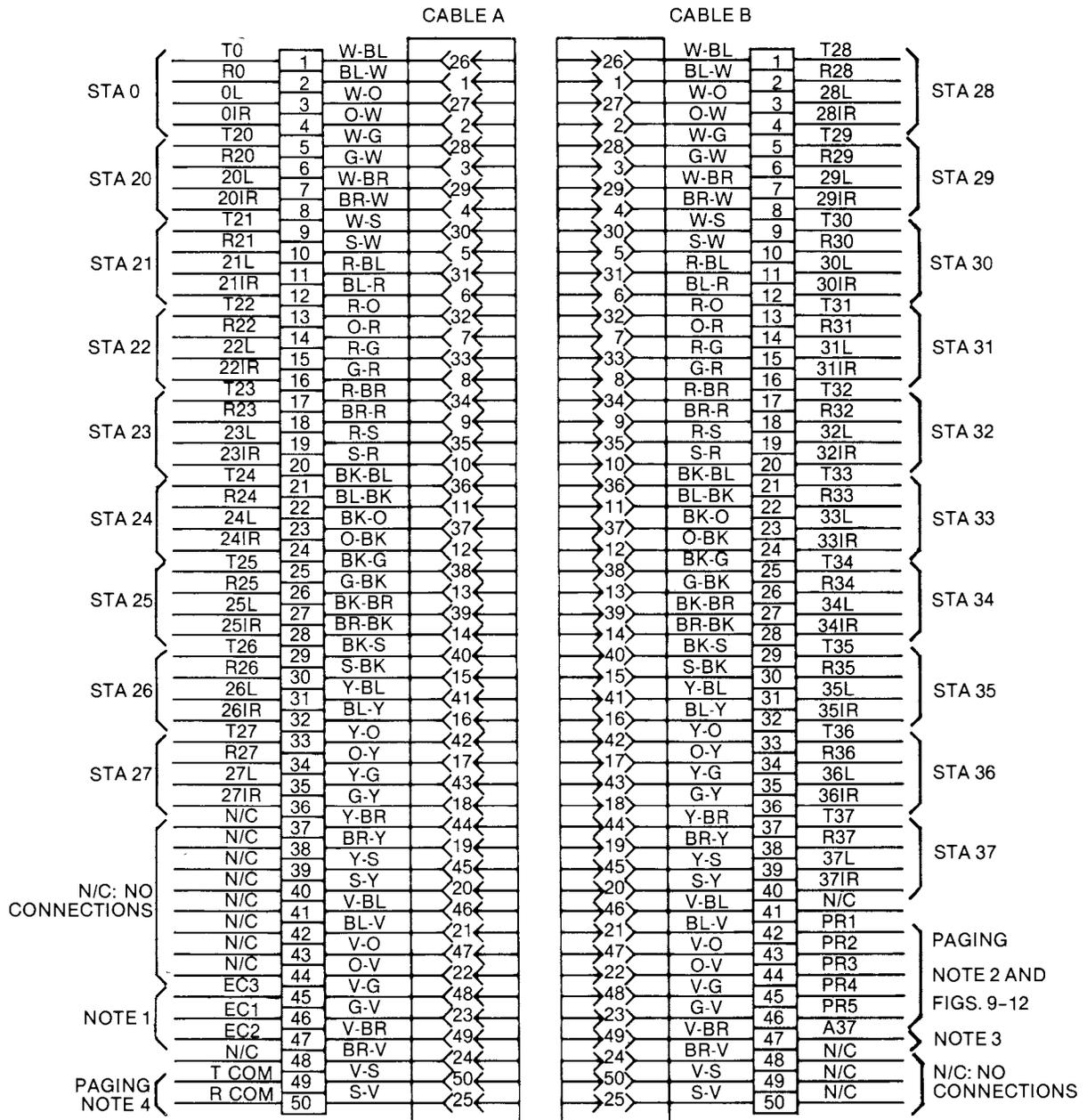
4.08 The KL-19A may be expanded to 38 stations with the addition of a Melco KX-38 Expander. Use a B25A connector cable for connection from the KL-19A plug to the KX-38 connector as an expander cable, and two additional single A25B cables for connection from the KX-38 to the connecting block for the additional 19 stations. Cable length should not exceed 5 feet. Details are shown in Figure 7 and the KX-38 practice.

4.09 Test signaling and transmission to all stations.

### 5. MAINTENANCE

5.01 If the KL-19A does not function properly after installation is completed, verify





NOTES:

1. EC1, EC2 AND EC3 ARE FROM INTERNAL RELAY CONTACTS AND USED TO CONTROL AUXILIARY EQUIPMENT AS REQUIRED. SEE FIGURES 8, 9, 10, AND 12.
2. PR1 THROUGH PR5 - STRAP TO IR LEADS SELECTED FOR PAGING ACCESS. STRAP PR1 TO ( )IR FOR AREA 1, PR2 TO ( )IR FOR AREA 2, ETC.
3. A37 IS AN A LEAD INPUT FOR STATION 37, USED WITH AUXILIARY EQUIPMENT.
4. SEE FIGURES 9 THROUGH 12 FOR PAGING APPLICATIONS AND, WHEN M-268 INTERCOM BUSY UNIT IS USED, SEE M-268 PRACTICE, FIGURES 5 AND 6.

Fig. 2 — KL-19A Cable Connections – Stations, Paging, and Miscellaneous.

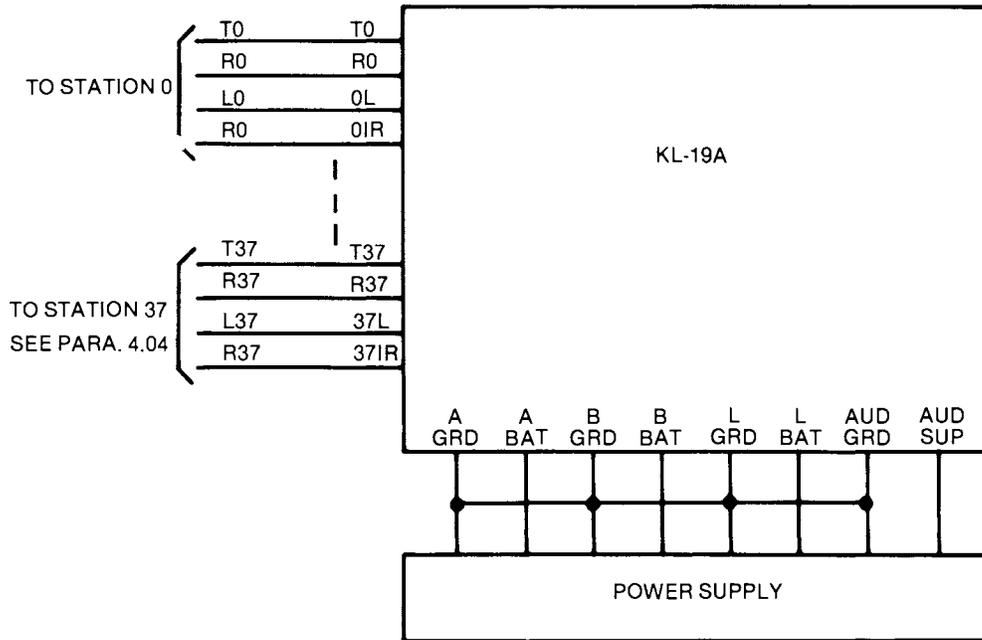


Fig. 3 — KL-19A Station Connections.

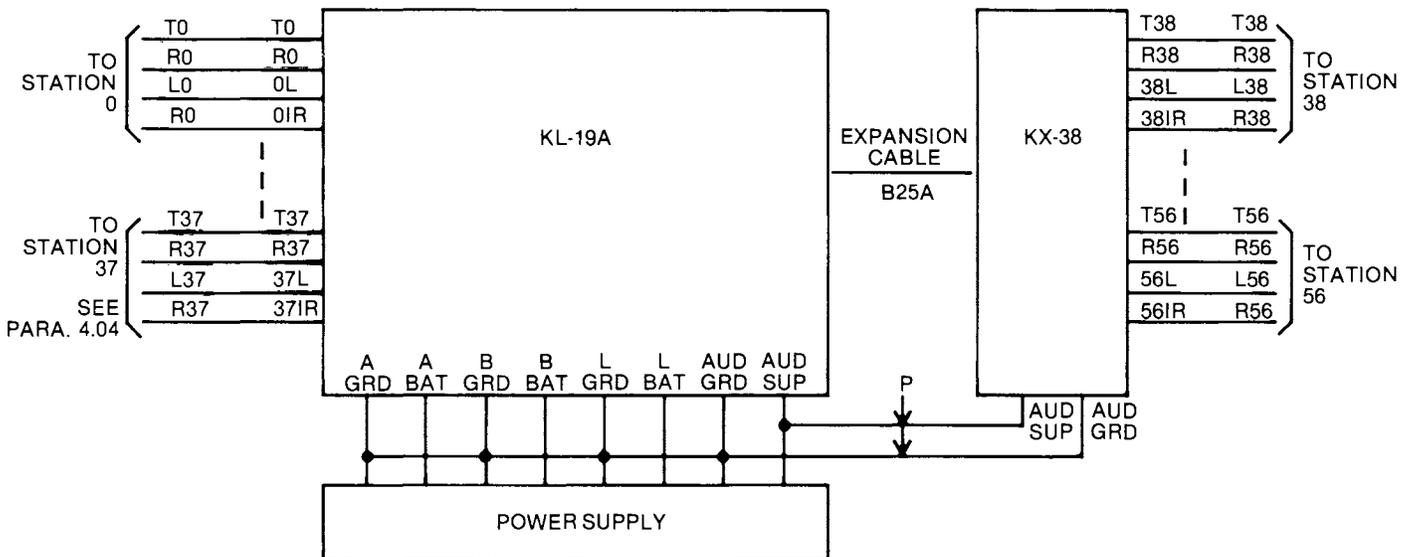


Fig. 4 — KL-19A Connections for KL-19A with Expansion Unit.

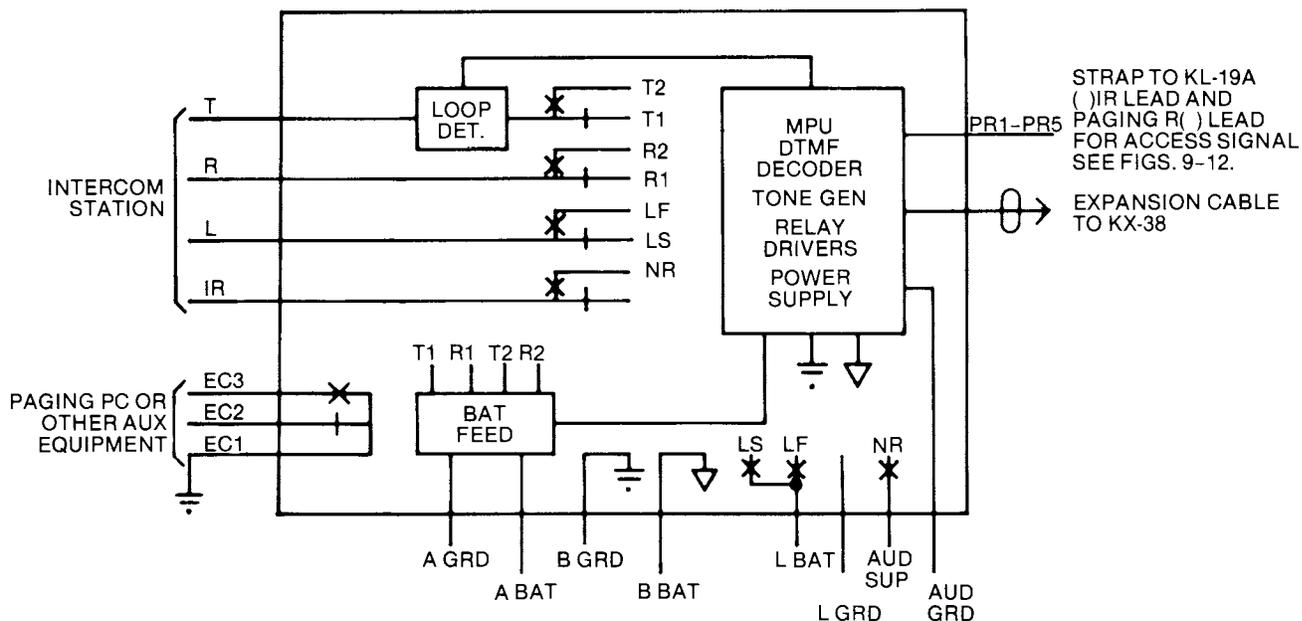
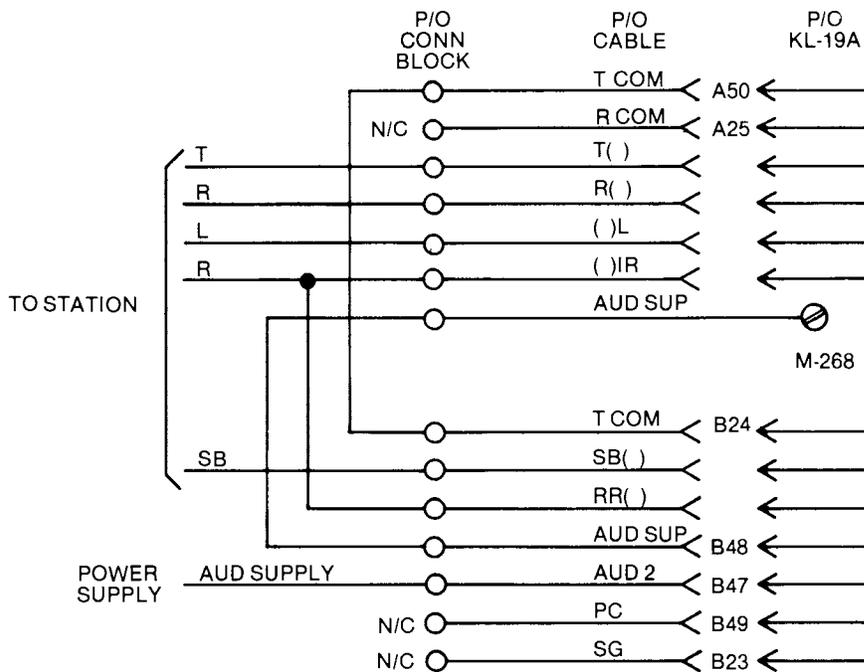


Fig. 5 — Condensed Functional Schematic.



- NOTES:  
1. N/C — NO CONNECTIONS.  
2. P/O — PART OF.

Fig. 6 — Connections, KL-19A and M-268 Intercom Busy Unit (Typical).

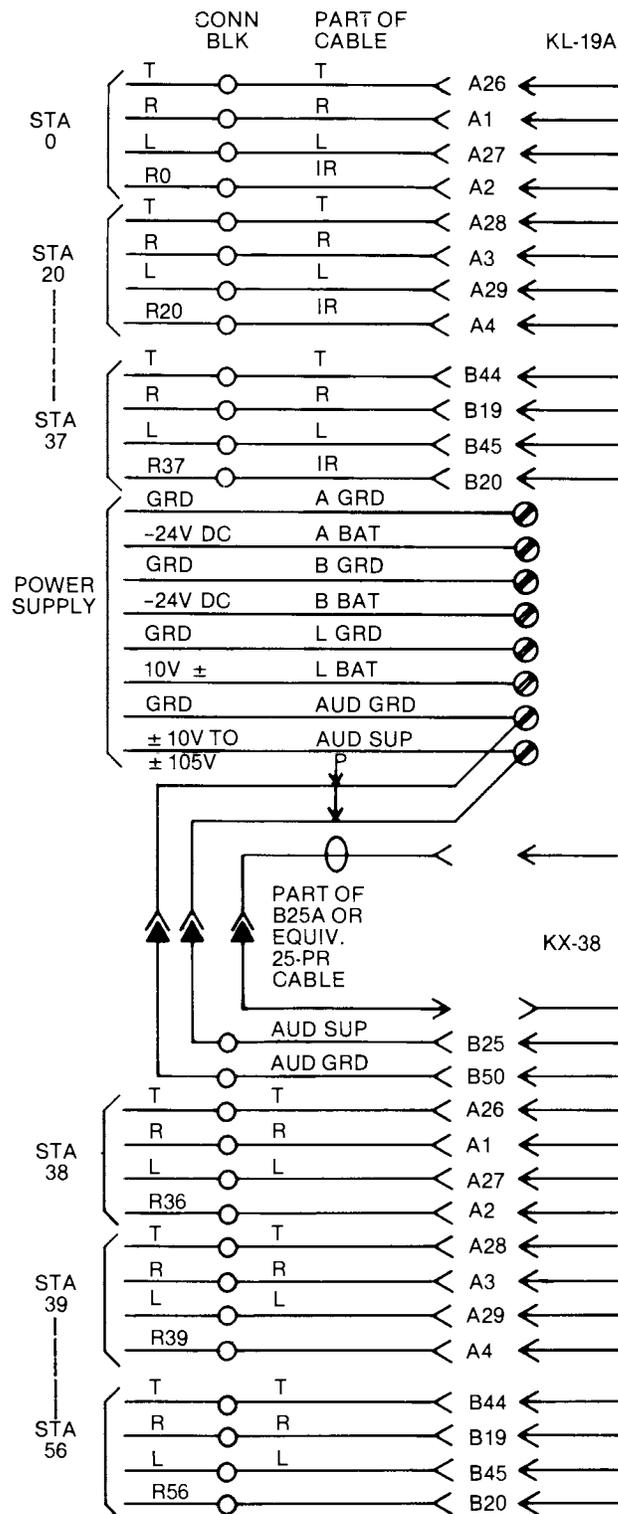
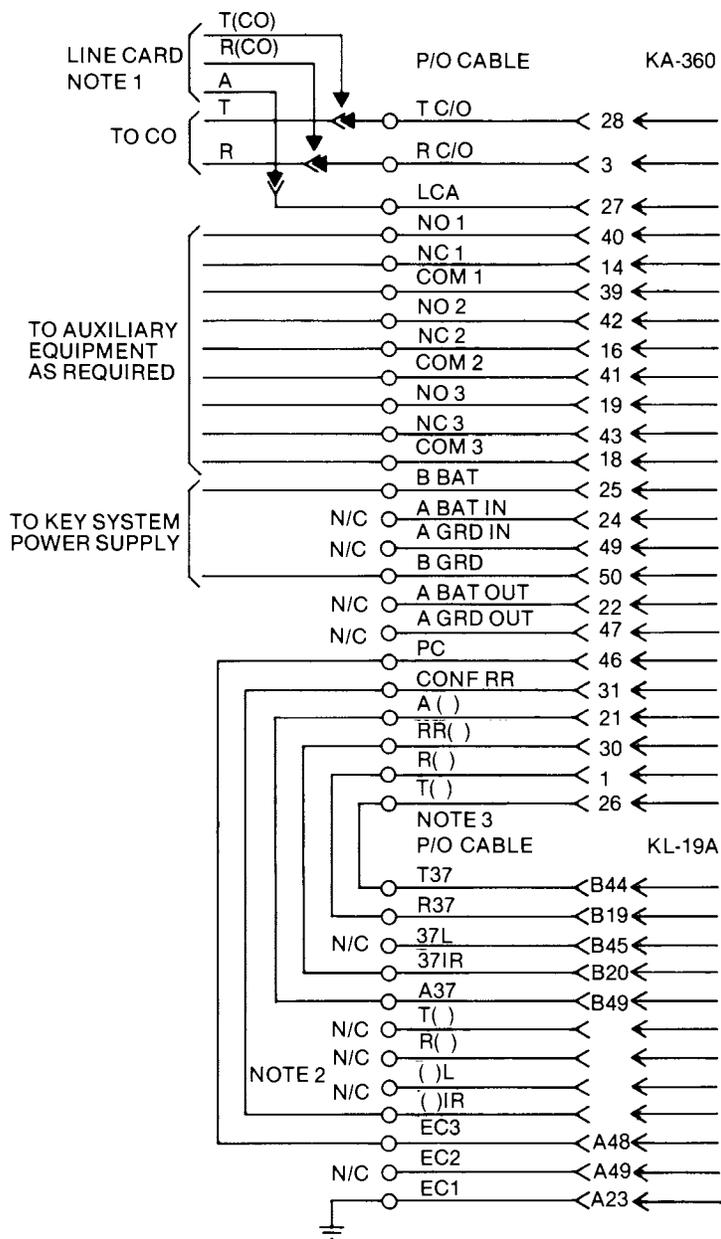


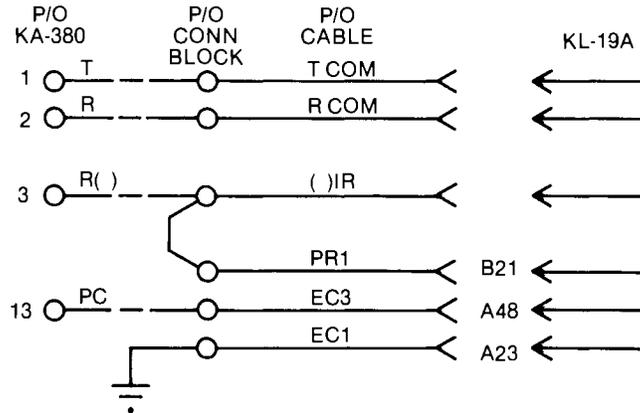
Fig. 7 — Connections, KL-19A Intercom and KX-38 Expander.



NOTES:

1. REFER TO KA-360 PRACTICE IF NETWORK LINE WILL ALSO BE ACCESSED THROUGH PICK-UP KEYS OF MULTI-LINE TELEPHONES.
2. NC: NO CONNECTIONS.
3. P/O: PART OF.

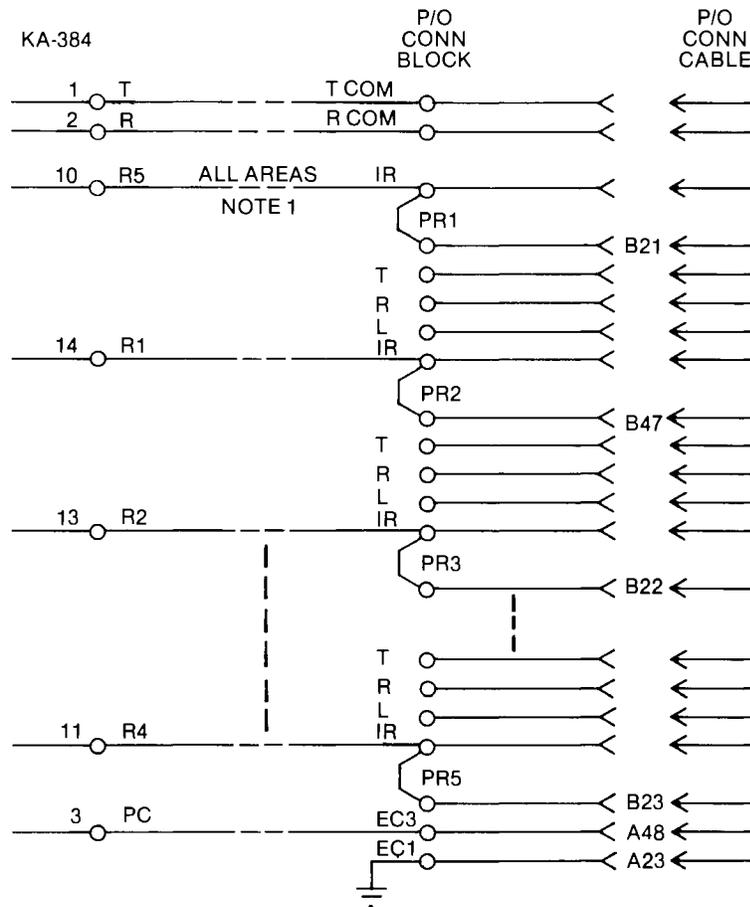
Fig. 8 — Connections, KL-19A and Optional KA-360 Line Access Unit.



NOTES:

1. THE NUMBER OF THE IR LEAD SELECTED DETERMINES THE PAGING ACCESS DIALING CODE NUMBER.

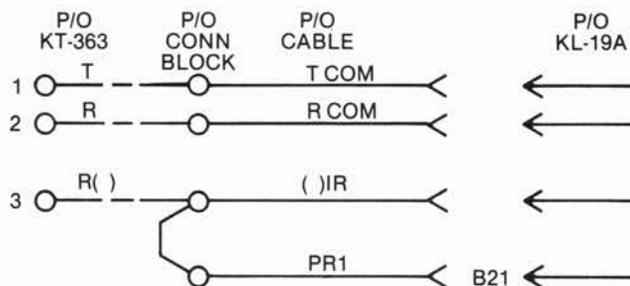
Fig. 9 — Connections, KL-19A and KA-380 Single Area Paging Access Unit.



NOTES:

1. ACCESS NUMBERS ARE ASSIGNED FOR EACH AREA AND FOR ALL AREAS. TWO OR THREE AREAS MAY BE COMBINED UNDER ONE ACCESS NUMBER.

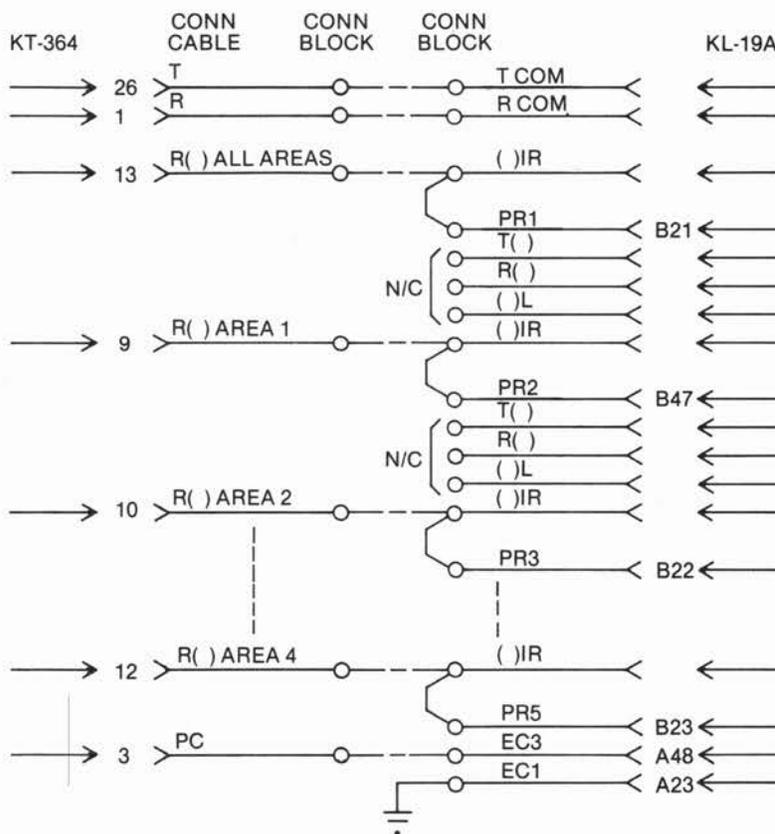
Fig. 10— Condensed Wiring of KL-19A and KA-384 Four Area Paging Access Unit.



NOTES:

1. THE NUMBER OF THE IR LEAD SELECTED IS THE PAGING ACCESS DIALING CODE NUMBER.

Fig. 11 — Connections, KL-19A and KT-363, Single Area Paging Amplifier.



NOTES:

1. THE PAGING ACCESS DIALING IS THE NUMBER OF THE IR LEAD SELECTED FOR EACH AREA OR ALL AREA PAGING.

Fig. 12 — Connections, KL-19A and KT-364 Four Area Pager.

**KL-30™ TWO-LINK INTERCOM****1. GENERAL**

1.01 The KL-30 is a two-link intercom system that provides up to 40 stations with two private talking paths, dial tone, busy tone, ring-back tone, flashing lamps, interrupted ringing and six switch-selectable features. The KL-30 is compatible with 1A1 and 1A2 type key systems and can be used with tone and/or rotary dial telephones.

**2. DESIGN FEATURES**

2.01 The KL-30:

- provides two private talking paths for up to 40 stations.
- requires one telephone pick-up key to access all stations and both links.
- provides dial tone for calling station.
- provides interrupted ringing and flashing lamp to the called station (without an external interrupter) and ringback tone to the calling station.
- provides an option for each station to receive busy tone when the called station is off-hook on any outside line.
- allows private conferencing for up to five stations per link. Either link may conference and both links may have a conference at the same time.
- permits answering from any station.
- is equipped with "punch-down" type connecting blocks for quick connecting to station telephone equipment.
- mounts in a relay rack or on a wall.
- is compatible with tone and/or rotary dial telephones.
- provides for outgoing and incoming call capability on 4 CO lines.\*
- provides for paging to 4 areas.\*

- places a station temporarily out of service if it is left off-hook too long without dialing.
- provides a three-beep acknowledge tone indicating that an attempt to utilize a feature is progressing satisfactorily.
- provides an alternating error tone if the user performs an invalid operation.



Fig. 1

2.02 The KL-30 provides standard switch-selectable features:

- conference
- message waiting
- camp-on busy
- call forwarding
- do not disturb
- CO line scan (dial 9, trunk hunting)\*
- specific call pick-up (no call pick-up)

\*See Section 8.03 on options.

2.03 The KL-30 provides for the addition of option cards for extra features. Please see Section 8.03 for a listing of available option cards. For further information on any of these option cards, see the specific Melco Technical Practice for each.

2.04 An optional seven-conductor power cable assembly, the CA7, is available for convenient plug-in connection to a W.E. Co. 79B1, 90B1 or a similar modular power supply. When the CA7 power cable assembly is used, power connections are made to the screw terminals on the underside of the KL-30 panel as shown in Figures 4 and 5. When the CA7 is not used, power connections can be made either to terminals on the KL-30 connecting block or to the screw terminals on the KL-30 underside.

### 3. INSTALLATION

3.01 Mount the KL-30 in a relay rack or on a wall.

3.02 Cross connect T, R, LG, L, B and R from the KL-30 connecting block to the stations. Connect telephone lead SB to KL-30 lead SB and system ground to KL-30 lead SG when a busy signal is desired for a called telephone off-hook on any line. (See Fig. 2.)

3.03 Connect B BAT, B GRD, AUD SUP, AUD GRD, LAMP SUP and LAMP GRD from the power supply to the KL-30.

**NOTE:** *If B BAT supply results in too much hum on the talk path, connect A BAT supply instead of B BAT supply to the B BAT terminals on the KL-30. (The A BAT terminals are not used).*

### 4. OPERATION

#### FIRST CALL:

4.01 The intercom is available for a call whenever the intercom pick-up key is not illuminated. To place a call, the originating station comes off-hook. Dial tone is heard and all station lamps illuminate. When the desired number is dialed, dial tone is replaced by ringback tone. The called station rings intermittently and the pick-up lamp flashes. When the call is answered ringback tone and ringing stop. Lamps at the two off-hook stations are now on steady and all other station lamps are off. One intercom link is busy and the other is available for a second call.

#### SECOND CALL:

4.02 When a second call is placed, the operation is the same as for the first link except that all intercom pick-up key lamps remain on when both links are busy.

#### BOTH LINKS BUSY:

4.03 When both links are busy, all intercom station lamps will be on and no dial tone or talk battery will be provided to a station coming off-hook.

#### ONE LINK IDLE:

4.04 When one of the two conversations ends and both stations return to on-hook, all lamps of idle stations turn off to indicate that another call may be made. Operation is the same as described in Paragraph 4.01.

#### CALLED STATION BUSY:

4.05 When the called station is off-hook for any reason, busy tone will be heard at the calling station. Also, if a non-existent number is dialed, busy tone is returned.

#### STATION OUT OF SERVICE:

4.06 If a station is left off-hook without dialing for 20 seconds, dial tone is replaced by error tone. If only one digit other than 0 has been dialed and is not followed by another digit within 20 seconds, error tone is also given. In each case error tone is supplied for 10 seconds, after which the station is placed out of service, freeing its link for use by others. The station is out of service until it is returned on-hook. If it is called, the caller receives busy tone.

#### SWITCHABLE FEATURES:

4.07 The features of Do Not Disturb, Call Forwarding, Camp-on Busy, Message Waiting, Conference and Specific Call Pick-up are put in service by operating switches located on the control card of the KL-30. (See Figs. 6, 7 and 8.) Switchable features are as follows:

1. Conference: The conference feature allows private conferencing for up to five stations. Both links allow conferencing and two conferences (one on each link)

may occur simultaneously. To initiate a conference, a station user dials "11", receives dial tone and dials the numbers of the desired stations for conference. After each station number is dialed, the conference initiator will receive dial tone unless the station is busy. (If a called station is busy, the initiator will receive busy tone and must repeat the procedure for conference, omitting the busy station.) If the number of stations dialed for conference is fewer than four, the conference initiator must redial "11".

After four stations have been dialed, or "11" has been redialed, the initiator will receive ringback tone, while each station called will simultaneously receive four periods of ringing (along with flashing lamp). Ringing and flashing lamp will stop at a station that answers. A station that does not answer within the four ringing periods will be omitted from conference. As soon as the number of stations dialed answer, or the time limit is over, conferencing may begin. All other stations are locked out. The conference feature is deactivated when all stations return on hook.

2. Message Waiting: This feature can be activated when the attendant (station "0") has a message for a station that is busy or does not answer. The station is signaled by a flashing intercom key lamp that the attendant called and has a message. To initiate the feature, the attendant returns on-hook after receiving busy tone or no answer, comes off-hook, dials "12," receives dial tone, dials the number of the station for which there is a message, receives busy tone, and returns on hook. If the called station did not answer, the intercom key lamp will begin flashing immediately. If the called station was busy, the lamp will begin flashing as soon as that station becomes idle. The lamp will continue to flash at the called station until the station comes off-hook, deactivating the feature. However, the feature is not

deactivated when the station comes off-hook to answer an incoming call.

3. Camp-on Busy: When a caller finds a station busy and wants his call returned, he can "camp" on the busy station. After he hears busy tone, he returns on-hook, comes off-hook, dials "13", receives dial tone, dials the number of the busy station, receives busy tone and returns on-hook. As soon as the busy station returns on-hook, the originator receives ringing and flashing lamp first and has four ringing periods in which to answer. If the originator does not answer, the camp-on is deactivated. If the originator does answer, then the terminator receives ringing and flashing lamp until he answers or until the originator goes on-hook, deactivating the camp-on. The feature is also deactivated if the calling station comes off-hook before the busy station returns on-hook.

Five camp-on's can be in progress at the same time. When more than one caller is camped on the same station, the calling stations are prioritized on a first come, first served basis.

4. Call Forwarding: This feature provides for automatic transfer of intercom calls to another station. When a station user wants to receive calls at another station, he comes off-hook, dials "14", receives dial tone, dials the number to which his calls are to be forwarded, receives busy tone and returns on-hook. Calls to his station are then transferred to the forwarded station. The feature is deactivated when the initiating station comes off-hook.

This feature cannot be multiplied — for example, if station A has forwarded his calls to station B and station B has forwarded his calls to station C, calls to station A will ring station B, not C.

5. Do Not Disturb (Make Busy): This feature causes a station to appear busy when signaled. When a station user does not wish to receive intercom calls, he comes off-hook, dials "15", receives busy tone

and returns on-hook. A caller dialing that station will receive busy tone. This feature is deactivated when the initiating station comes off-hook.

6. Specific Call Pick-up: This feature allows the system to operate in such a way that only the station being called can answer. Normal operation is to permit answering from any station (universal call pick-up).

## 5. MAINTENANCE

5.01 The KL-30 system, including the cards, is warranted against manufacturing and material defects for two years. If it fails within that time, it will be repaired or replaced at no charge.

**CAUTION:** *When replacing circuit cards, turn the power off to avoid damage to system circuitry.*

5.02 To isolate a problem with a station or group of stations, replace the associated station card with a spare. If the trouble clears, the first card is defective. A problem can also be isolated by trading station cards. The problem will follow the card to different stations. (Refer to the label on the back of the KL-30 cover for station assignments on station cards.)

5.03 If all stations are receiving a persistent busy tone, test by removing all station cards and reinserting them one at a time. The card which makes all stations busy again is defective and must be replaced.

5.04 Voltages at test points should be as follows:

TEST POINT	VOLTAGE
Red	Ground
Black	B Battery
White	-5V
Green	-9V

5.05 A troubleshooting guide, pages 10 through 13, suggests probable causes and solutions for most problems that might be encountered. The most likely cause and its solution is presented first. If a telephone develops trouble not covered in this guide, check connections and wiring to that station. If the problem persists, test the station card by replacing it with a spare card.

**CAUTION:** *Static charges can damage circuit packs. Do not handle unnecessarily. Keep in protective packing when not in use. Be certain that your body is discharged of static charge before handling a circuit pack and then handle only by the plastic ejectors. Do not walk about with un-packaged circuit packs. Do not insert or remove circuit packs with the power on.*

## 6. SPECIFICATIONS\*

Operating voltage

A & B Bat . . . . . -18 to -28V DC  
 -24V DC nom

Current (-24V DC)

w/o option cards . . . . . 250 mA idle nom  
 550 mA operated nom

Lamp supply

voltage . . . . . 10V AC nom  
 freq. . . . . 60 Hz  
 current . . . . . 1.6A max  
 (2A fuse)

Audible supply

voltage . . . . . 10V AC nom, 60 Hz  
 or 105V AC nom, 20 to 30 Hz  
 (ringing generator)  
 current . . . . . 0.5A per station  
 (2A fuse)

Rotary dialing:

loop limit . . . . . 800 ohms  
 pulse ratio . . . . . 60/40% ± 20%  
 dial speed . . . . . 8 to 12 pps  
 interdigital time . . . . . 200 msec min

Tone dialing:

loop limit . . . . . 750 ohms  
 input sig level . . . . . -7.5 to + 4dBm  
 bandwidth . . . . . 2% nom  
 recognition time . . . . . 40 msec min  
 interdigital time . . . . . 40 msec min

Off-hook recognition . . . . . 100 msec nom

On-hook release . . . . . 150 msec ± 10%

Operating temperature . . . . . 0° to 50°C  
 32° to 122° F

Operating humidity . . . . . 0 to 95%

Signaling period:

lamp . . . . . 0.5 sec on, 0.5 sec off  
 ringing . . . . . 1 sec on, 3 sec off  
 ringback . . . . . 1 sec on, 3 sec off  
 busy tone . . . . . 0.5 sec on, 0.5 sec off

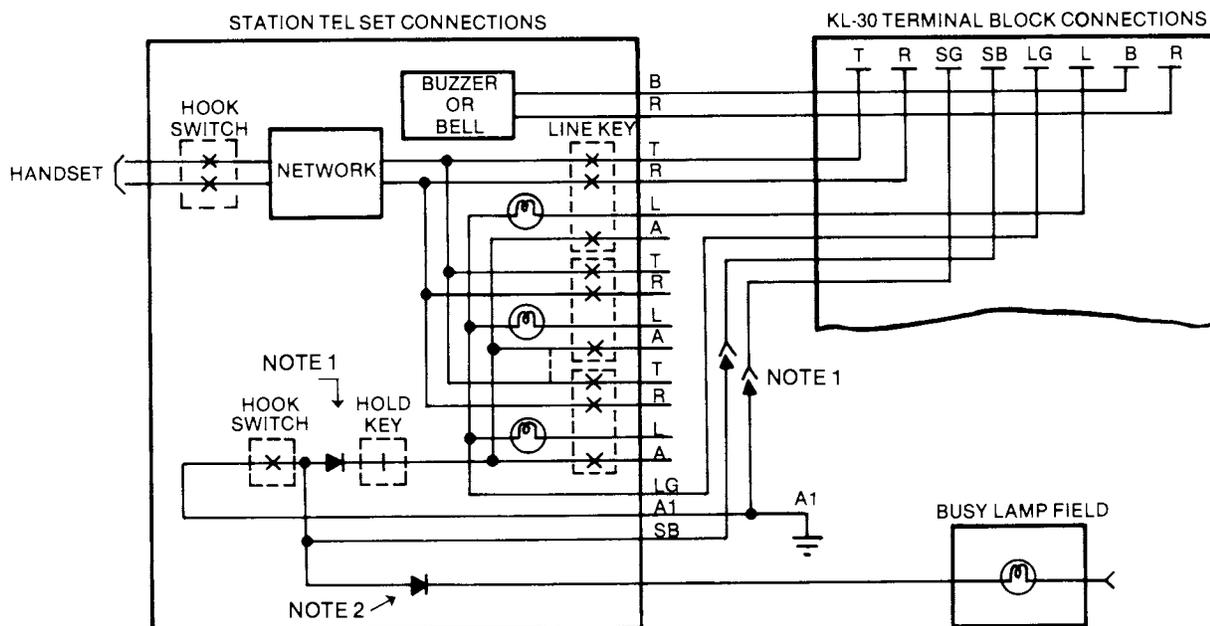


8.02 Order spares for standard items by number as follows:

TO ORDER:	SPECIFY ORDER NUMBER:	NOTES
Control Circuit Pack	120125	
Power Regulator Circuit Pack	120126	
Station Circuit Pack	120127	8 Stations/Pack
Housing and Backplane Assembly	120140	Housing, Cover, Fuse Panel, Connecting Blks, PCB Backplane
User's Guide	470302	Operating Instruction Booklet

8.03 Order optional items by number as follows:  
(For details of option operation see applicable Melco practice listed below).

TO ORDER	SPECIFY ORDER NUMBER	NOTES	APPLICABLE MELCO PRACTICE
CA7	CA7	Seven Conductor Power Cable	—
4-Area Pager Circuit Pack	120128	Use when driving speakers directly	490047
Paging Access Circuit Pack	120185	Use when driving amplifiers. Has four outputs for four areas.	490048
Outside Line Access Circuit Pack	120129	Permits outgoing and incoming CO calls.	490058



NOTES:

1. CONNECT SB, SG AND DIODE FOR TELEPHONE OFF-HOOK BUSY SIGNAL. SEE PARA 3.02
2. INSTALL DIODE WHEN BUSY LAMP FIELD AND SB LEAD ARE BOTH USED.

Fig. 2 — KL 30 Typical Station Equipment Connection for 1 of 40 Stations.

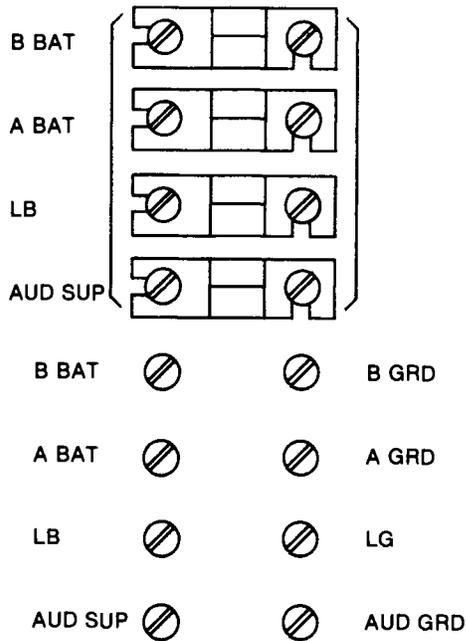


Fig. 3 — KL-30 Fuse Panel and Screw Terminal Designations.

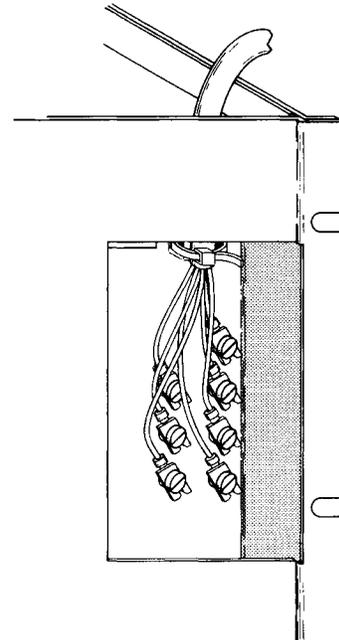


Fig. 4 — Underside of KL-30 Showing Screw Connections for CA7 Power Cable.

CA 7		KL-30	CA 7	
PLUG PIN	WIRE COLOR	SCREW POSITION & DESIGNATION ON UNDERSIDE OF KL-30	WIRE COLOR	PLUG PIN
			BLK	8
20	RED		GRN	12
16	WHT		ORN	4
24	BLU		BRN	9

Fig. 5 — Connections, Wire Colors and Plug Pin Numbers of CA7 Power Cable.

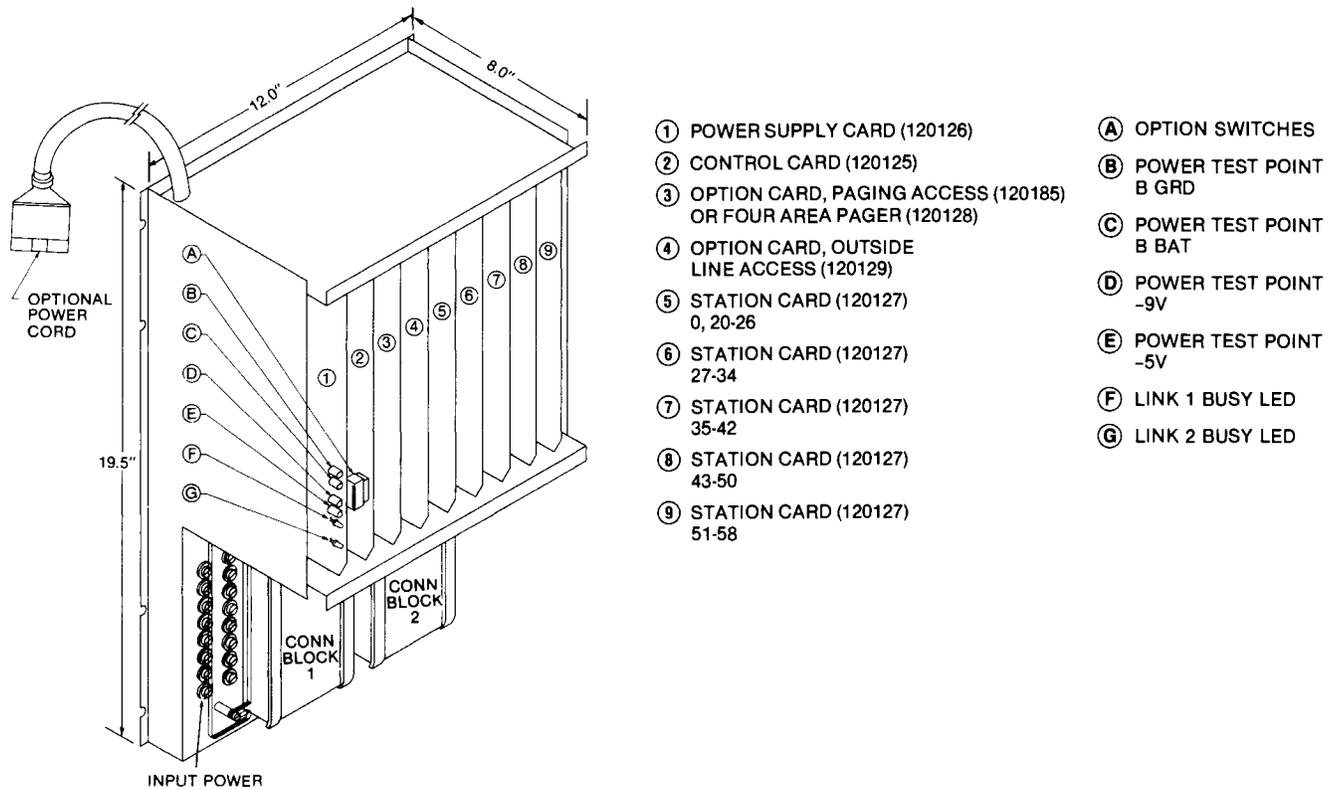


Fig. 6 — Front of KL-30 Showing Card Positions.

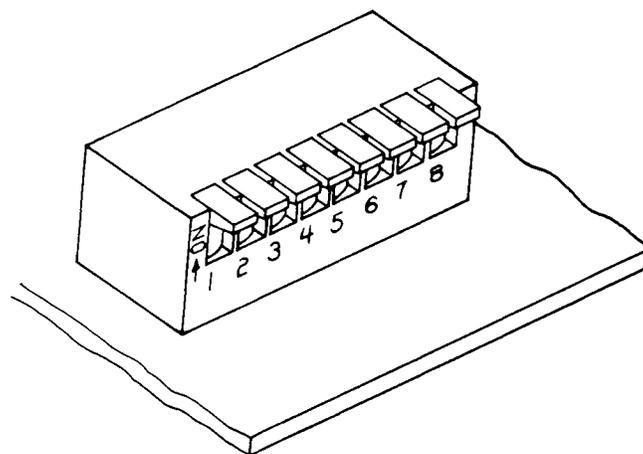


Fig. 7 — Option Switches on Control Card of KL-30.

KL-30 TWO-LINK INTERCOM SYSTEM

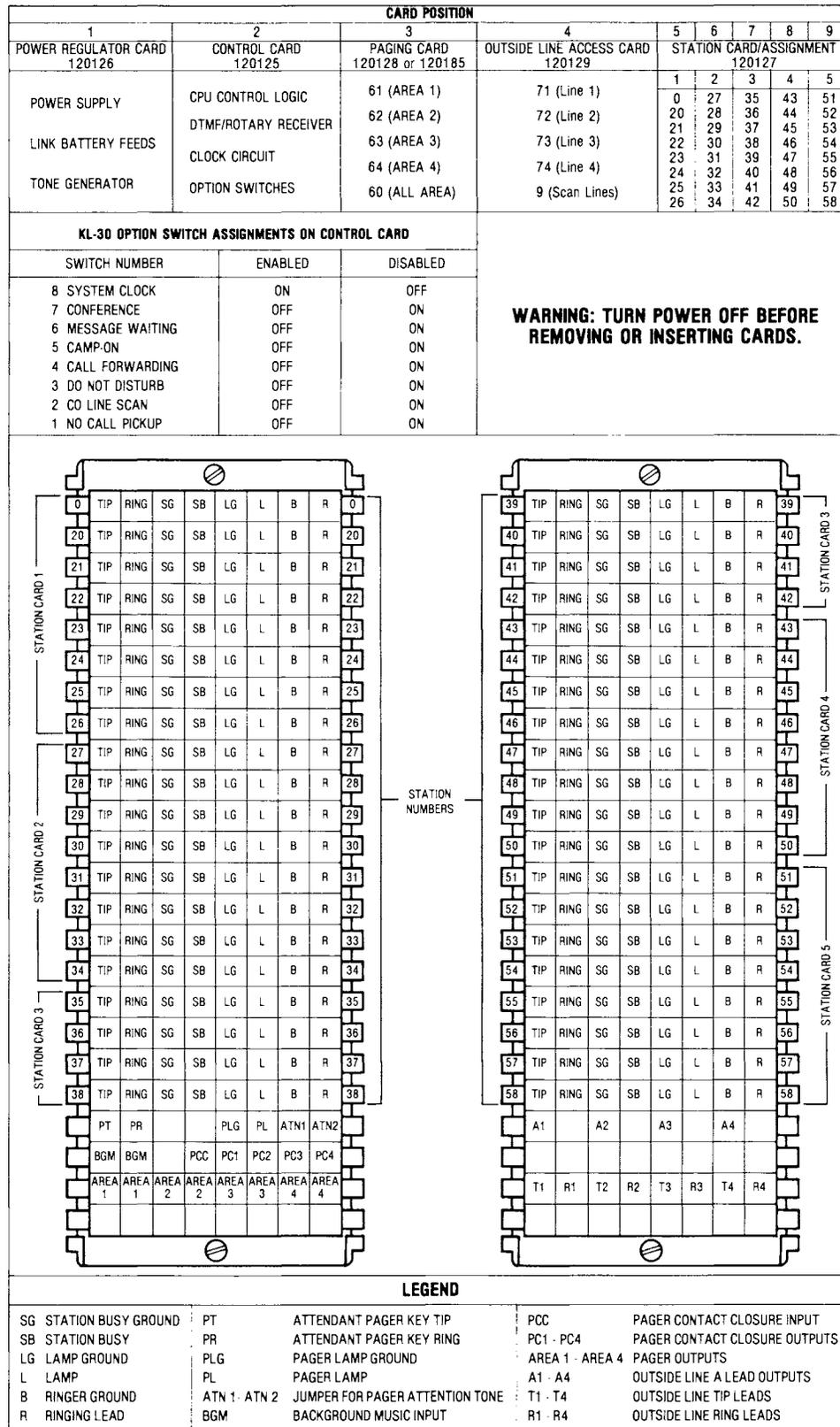


Fig. 8 — Option Switch, Function, Station, and Punch Block Pin Assignments.

TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	SOLUTION
<u>DEAD PHONE</u>		
All stations	Blown fuse(s)	Replace fuse(s)
	Open B bat. supply	Repair open connections
	Wrong voltages from power supply card (Para. 5.04)	Replace power supply card
	Open option switch on control card	Turn #8 switch "on"
Some stations	Defective control card	Replace card
	Defective station card(s) (Para. 5.02)	Replace card(s)
One station (One or both links)	Defective control card	Replace card
	Defective station card	Replace card
<u>NO LAMPS</u>		
All stations	Blown lamp bat. fuse	Replace fuse
	Open lamp supply circuit	Repair open connections
	Defective control card	Replace card
Some stations	Defective station card(s)	Replace card(s)
	Defective control card	Replace card
One station	Open station lamp circuit	Repair open connections
	Defective lamp	Replace lamp
	Defective station card	Replace card
<u>CONSTANT LAMPS</u>		
All stations	Open option switch on control card	Turn #8 switch "on"
	Defective control card	Replace card
Some stations	Defective station card(s)	Replace card(s)
	Defective control card	Replace card
One station	Defective station card	Replace card

TROUBLESHOOTING GUIDE (Continued)

PROBLEM	PROBABLE CAUSE	SOLUTION
<u>ERRATIC LAMPS — ON OR OFF, ON-HOOK OR OFF-HOOK, RANDOM STATION</u>	Defective control card	Replace card
<u>NO RING</u>		
All stations	Blown aud. supply fuse	Replace fuse
	No aud. supply	Repair open aud. supply circuit
	Defective control card	Replace card
Some stations	Defective station card(s)	Replace card(s)
	Defective control card	Replace card
One station	Open ringing ckt.	Repair station connections
	Defective ringer	Repair or replace
	Defective station card	Replace card
<u>CONSTANT RING</u>		
All stations	Open option switch on control card	Turn #8 switch "on"
	Defective control card	Replace card
Some stations	Defective station card(s)	Replace card(s)
	Defective control card	Replace card
One station	Defective station card	Replace card
<u>ERRATIC RINGERS — ON OR OFF, ON-HOOK OR OFF-HOOK, RANDOM STATIONS</u>		
	Defective control card	Replace card
<u>NO DIAL TONE</u>		
All stations	Defective power supply card	Replace card
	Defective control card	Replace card
Some stations or one station	Defective station card(s)	Replace card(s)

TROUBLESHOOTING GUIDE (Continued)

<u>PROBLEM</u>	<u>PROBABLE CAUSE</u>	<u>SOLUTION</u>
<u>CANNOT BREAK DIAL TONE</u>	Defective power supply card	Replace card
	Defective control card	Replace card
<u>NO BUSY TONE</u>	Defective power supply card	Replace card
<u>PERSISTENT BUSY TONE</u>		
All stations	Defective control card	Replace card
	Defective station card	Replace card (Para. 5.04)
One station	Do not disturb feature activated	
	Faulty SB lead	Repair foreign ground or other fault
	Phone off-hook	
	Defective station card	Replace card
<u>STATION BUSY (SB) CIRCUIT DOESN'T FUNCTION*</u>		
All stations	Defective control card	Replace card
Some stations or one station	Wiring errors	Correct wiring
	Defective station card(s)	Replace card(s)
<u>NO RINGBACK TONE, LAMPS LIGHT</u>		
	Defective power supply card	Replace card
	Defective control card	Replace card
<u>NO RINGBACK TONE, LAMPS DO NOT LIGHT</u>		
	Blown lamp battery fuse	Replace fuse
	Open lamp supply circuit	Correct wiring
	Defective control card	Replace card
<u>CONSTANT RINGBACK TONE &amp; DIAL TONE</u>		
	Defective power supply card	Replace card
	Defective control card	Replace card

TROUBLESHOOTING GUIDE (Continued)

<u>PROBLEM</u>	<u>PROBABLE CAUSE</u>	<u>SOLUTION</u>
<u>NO RING CUT-OFF</u>	Defective called station card	Replace card
<u>CANNOT PAGE</u>	Defective pager card	Replace card
<u>CANNOT ACCESS OUTSIDE LINE</u>	Defective outside line access card	Replace card

\*The KL-30 provides busy tone when the called station is off-hook on the intercom or an outside line.

Technical assistance on the KL-30, or any Melco product, is available from:

MELCO LABS  
14408 N.E. 20th St.  
P.O. Box 4026  
Bellevue, WA 98009  
(206) 643-3400

FOUR AREA PAGER FOR KL-30™ INTERCOM  
(CIRCUIT PACK NO. 120128)

## 1. GENERAL

1.01 The KL-30 Four Area Pager is an option for the KL-30 Two Link Intercom for key systems. It provides paging capability to four areas without reducing station capacity. It also provides for background music to the four areas. The pager is intended for use with speakers and is not designed for use as a preamplifier.

## 2. DESIGN FEATURES

## 2.01 The Four Area Pager:

- provides two-digit dial access to any one of four areas or to all four areas simultaneously.
- provides for background music.
- has volume control for paging and background music for each area.
- has visual indicators to show which areas are being paged.

## 3. INSTALLATION

3.01 Disconnect power to the KL-30 intercom and remove the cover.

3.02 Insert the Four Area Pager circuit pack into position 3 of the KL-30 (components to the left). See Figure 2.

3.03 Turn all volume pots all the way counterclockwise.

3.04 Connect the speakers to connecting block terminals above labels AREA 1, AREA 2, AREA 3, and AREA 4. See Figure 3. Use speakers rated at 5 watts or more. Note that two wires are necessary; the return connects to B battery, not ground.

3.05 Connect wires from background music source to terminals above label BGM. See Figure 3.

3.06 Replace the cover.

3.07 Restore power to the KL-30. Adjust volume controls as desired for paging and background music for each area.

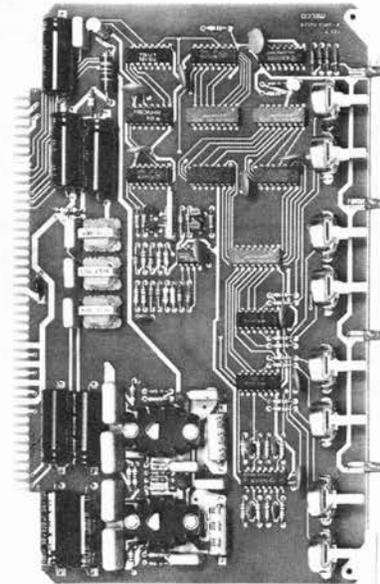


Figure 1

## 4. OPERATION

4.01 To access an area, the station user dials the access number for the desired paging area: 61 for Area 1, 62 for Area 2, 63 for Area 3, 64 for Area 4, and 60 for all areas. Paging in one area does not disrupt background music in other areas. Only one page at a time may be made. The talking link not being used for the page is still available for conversation. When a page to an area is in progress, the lamp for that area is lighted.

## 5. MAINTENANCE

5.01 Provisions are made for field replacement of defective circuit packs. Before removing, turn off the power. Replace the pack with another and restore power.

5.02 The Four Area Pager is warranted against manufacturing and material defects for two years. If it fails within that time, it will be repaired or replaced at no charge.

6. SPECIFICATIONS

6.01 Current at - 24V DC . . . . @ 4 watts/area:  
 w/8 ohm speakers 320ma max  
 @ 1.5 watts/area:  
 215ma max

Power out at . . . . . 4 watts rms  
 - 24V DC max/area

Load . . . . . 8 ohm speakers  
 recommended  
 (see Figs. 5 and 6)

Frequency . . . . . 300 Hz to 3KHz  
 response ± 3 dB

6.02 Maximum loop resistance for half power to speakers: 66 ohms

Maximum cable length for half power to speakers:

18 ga.	500 ft.
22 ga.	200 ft.
24 ga.	125 ft.
26 ga.	75 ft.

6.03 Minimum input level for maximum power output of 4 watts rms: - 13 dBm.

7. ORDERING INFORMATION

7.01 Order from your local supplier or distributor:

(QUAN) 120128 PAGER CIRCUIT PACK.

7.02 Technical assistance on the KL-30 Four Area Pager, or any Melco product, is available from:

MELCO LABS  
 P.O. Box 4026  
 Bellevue, WA 98009  
 206/643-3400

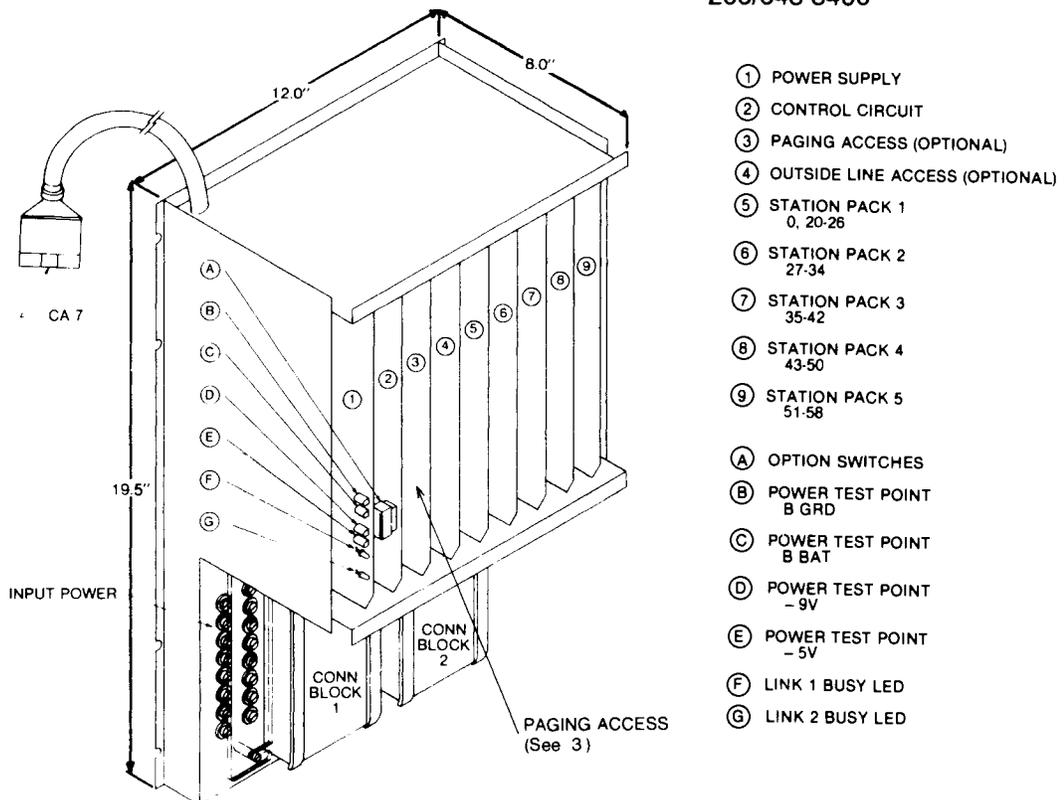


Figure 2—Front of KL-30 Showing Circuit Pack and Miscellaneous Component Locations.

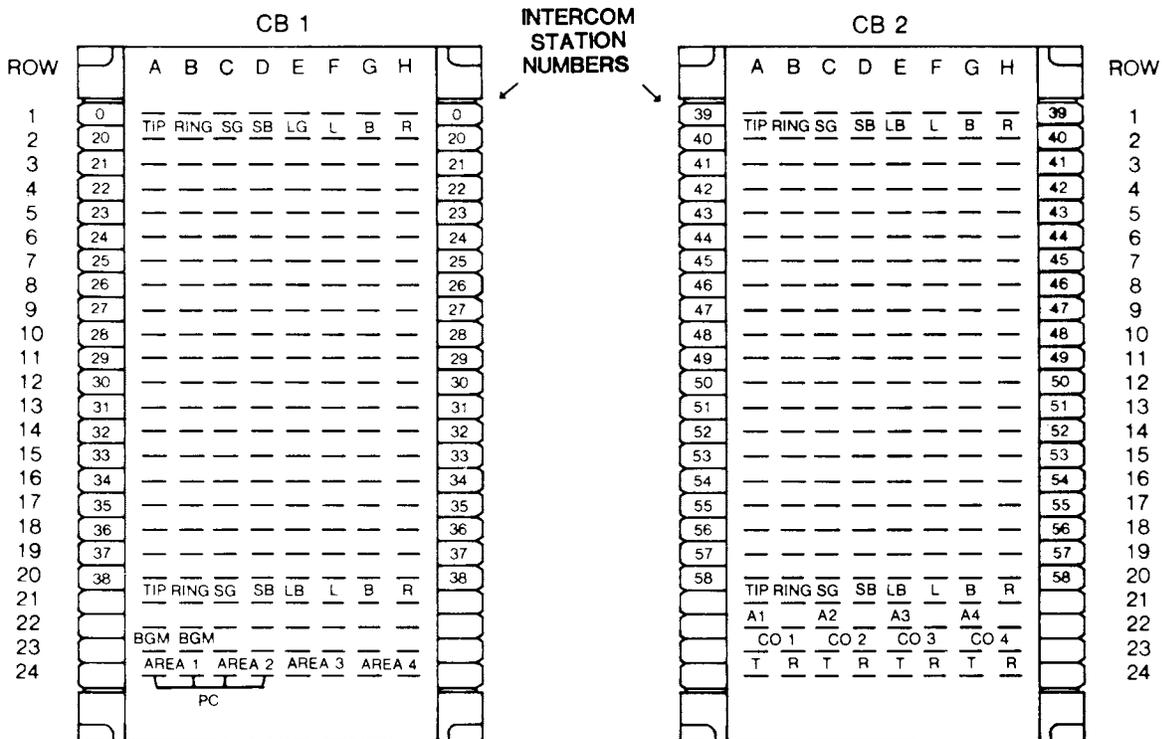


Figure 3—Station and Terminal Assignments of KL-30 Connecting Blocks.

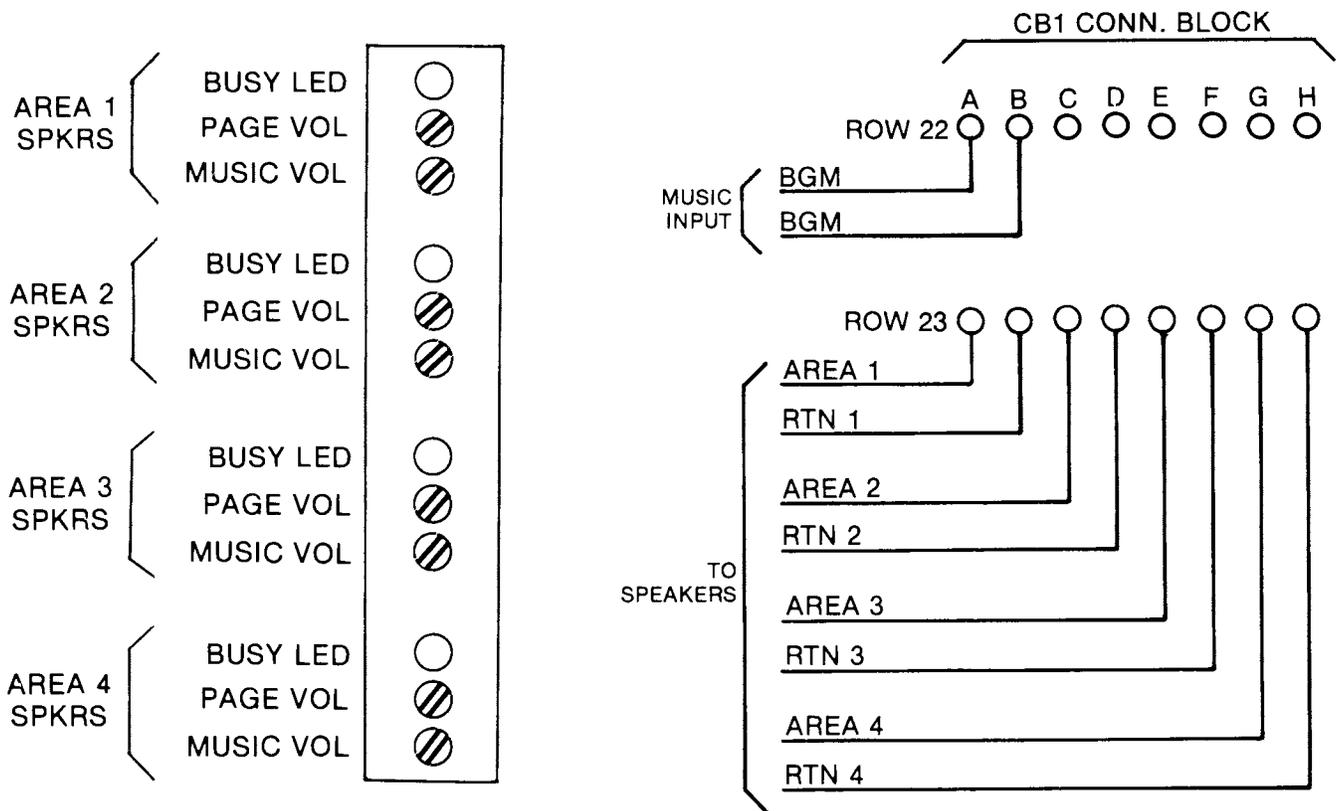


Figure 4 — KL-30 Pager Circuit Pack Card Edge.

Figure 5 — Connecting Block Terminal Assignment. Background Music and Paging.

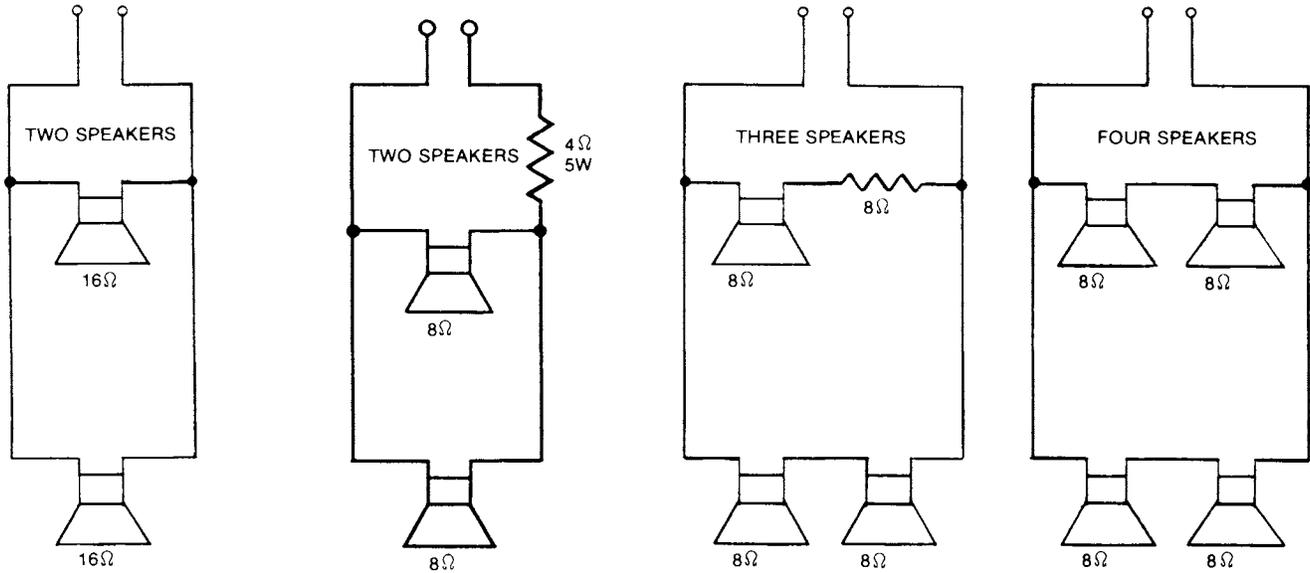


Figure 6 — Optional Speaker Arrangements

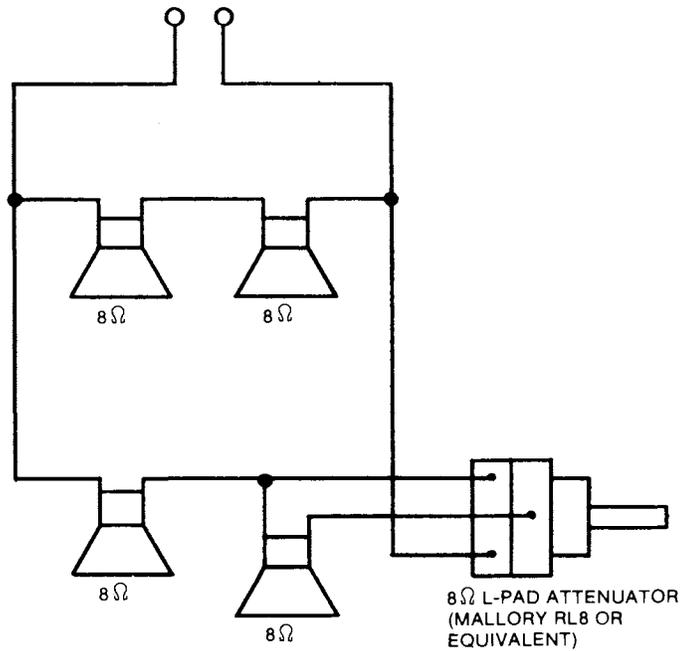


Figure 7 — Independent Volume Control Configuration

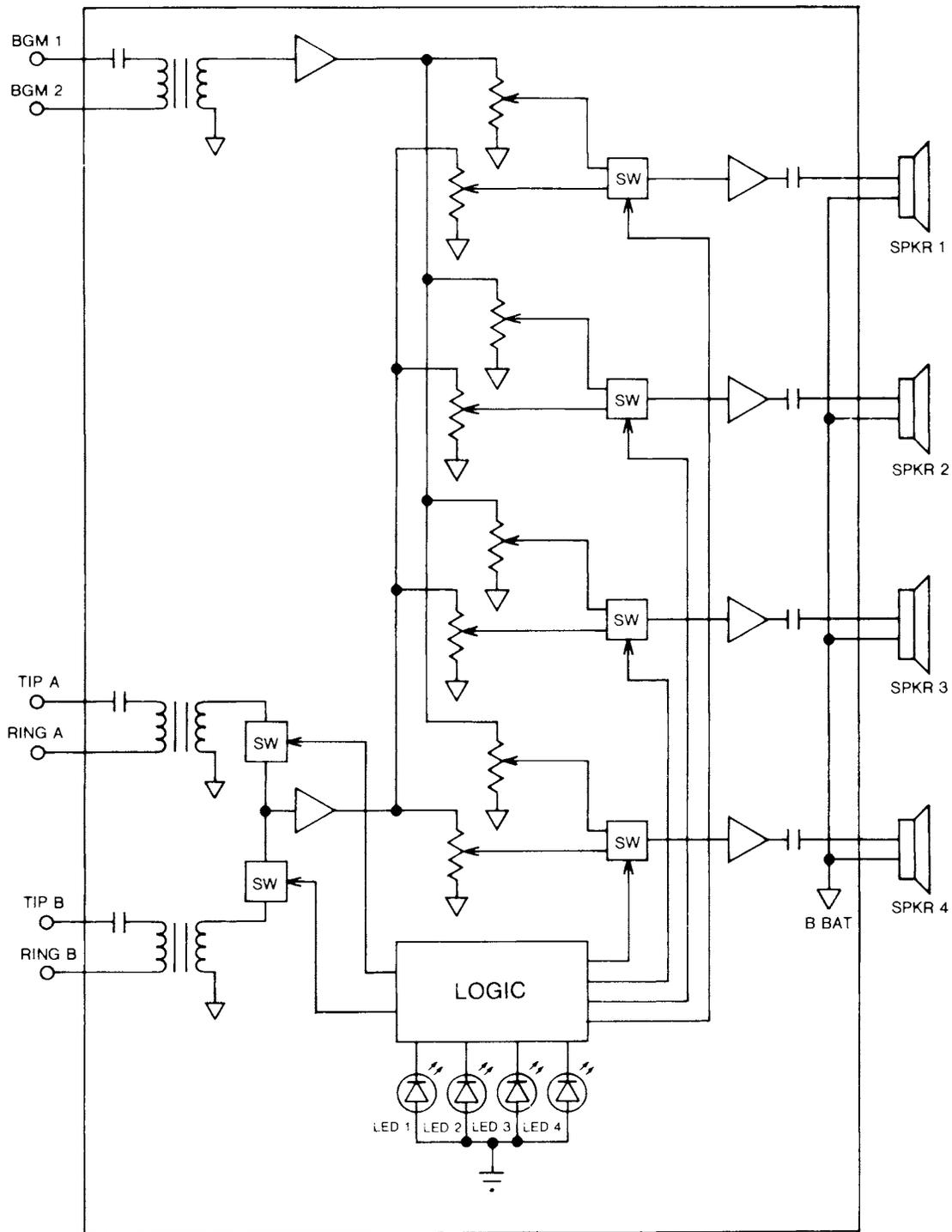


Figure 8 — Functional Schematic of KL-30 Four Area Pager

## OUTSIDE LINE ACCESS FOR KL-30™ INTERCOM (CIRCUIT PACK NO. 120129)

### 1. GENERAL

1.01 The KL-30 Outside Line Access is an option to the KL-30 Two Link Intercom for key systems. It provides outgoing access from the intercom to four outside lines without reducing station capacity. Two CO calls may be in progress at the same time, one on each link.

### 2. DESIGN FEATURES

2.01 The Outside Line Access:

- provides two-digit tone or rotary dialing access to any one of four outside lines from the KL-30 intercom.
- provides busy signal if the outside line dialed is busy, ringing, or on hold.
- has visual indicators on the unit to show which outside lines are accessed.
- provides A leads to line card, if used.
- allows tone dialing telephones to establish a conference with intercom stations and an outside line.
- does not require line cards if associated lines are accessed only through the KL-30.

2.02 The KL-30 provides switch selectable features in conjunction with the Outside Line Access Option:

- conference call on an outside line
- dial 9 to scan for available outside line.

### 3. OPERATION

#### OUTSIDE LINE ACCESS

3.01 Dial the two-digit access code for the desired outside line: 71 for Line 1, 72 for Line 2, 73 for Line 3, and 74 for Line 4. The caller will receive a C.O. dial tone if the outside line is not busy. If the selected outside line is busy, the caller will receive a busy tone; another line may then be selected and accessed. The intercom talking link not being used for the outside line call is still available for an additional call.

3.02 The user may also access an outside line by dialing 9. The KL-30 then scans the outside lines and connects the calling station automatically to an available line. If no lines are available, the caller will receive a busy tone and must try again later.

**NOTE:** *The outside line scan option switch must be enabled to use this feature.*

3.03 When a call to an outside line from an intercom station is in progress, the LED on the circuit pack for that outside line is lit.

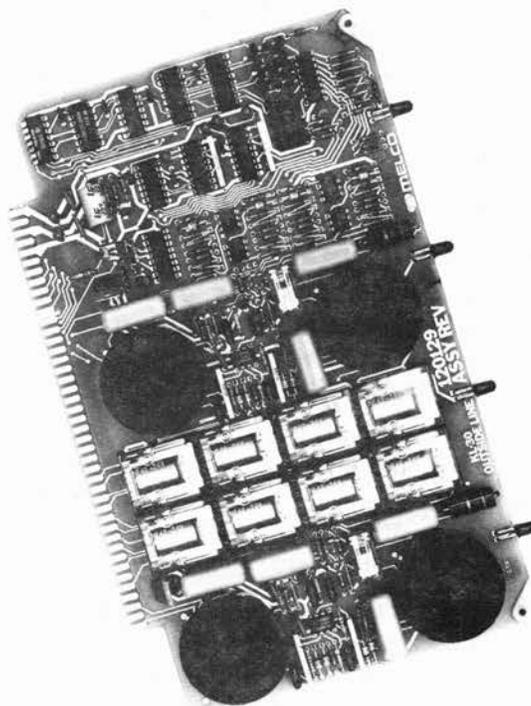


Fig. 1

#### INCOMING OUTSIDE LINE CALL TRANSFER

3.04 Incoming outside line calls may be transferred to an intercom station by the attendant (Station 0). The attendant places the outside line on hold, then, on the intercom key, dials 81 for Line 1, 82 for Line 2, 83 for Line 3, or 84 for

Line 4. Dial tone is reissued to Station 0. The attendant then dials the intercom station to which the outside line call is to be transferred. After the station answers and Station 0 returns on-hook, the station and the outside line are connected. If the station user does not wish to converse with the outside caller, the station user must hang up, and the attendant must press the outside line key without hanging up to keep the outside call alive. If the station does not answer or is busy, the attendant may freely use the intercom key while the outside line is still on hold.

**CONFERENCE CALL ON AN OUTSIDE LINE: TONE ONLY**

3.05 To initiate a private conference with intercom stations and an outside line, a station user dials "11", receives intercom dial tone, then dials the stations to be included in the conference. Intercom dial tone is received after dialing each station.

3.06 If a station is busy, busy tone is heard, and the initiator must repeat the procedure omitting the busy station.

3.07 After up to 3 stations are dialed, the conference initiator may dial either the two-digit access code for one of the outside lines (71, 72, 73, or 74) or the one-digit outside line scan code (9) if the outside line scan feature is enabled.

3.08 The conferencing stations now receive four rings (along with flashing lamp) during which time they must answer or be omitted from conference. Ringing and flashing lamp stop at a station when it answers.

3.09 When all stations answer or the time limit is up, central office dial tone is heard if the line is available. The outside line number may then be tone dialed. All other stations are locked out of the conference.

3.10 If the outside line is in use, busy tone is heard instead of the stations being rung. The initiator must repeat the procedure for conferencing.

3.11 At the conclusion of the conference, the equipment releases when all intercom stations disconnect.

**NOTE:** *The conference option switch must be enabled to use the conference feature.*

**4. INSTALLATION**

4.01 Disconnect power from KL-30 intercom and remove the cover.

4.02 Insert the Outside Line Access Circuit Pack into Position 4 of the KL-30 (components to the left.) See Figure 2.

4.03 Connect Tip and Ring of outside lines to connecting block terminals T1, R1, T2, R2, T3, R3, T4, and R4. See Figure 4. The Tip (T) terminal of unused outside lines should be connected to B battery.

4.04 Connect line card A leads to connecting block terminals A1, A2, A3, and A4 if a line card is used.

4.05 Replace cover and restore power to the KL-30.

4.06 Place conference and outside line scan option switches on Control Card in desired position (see Figs. 2, 3, and 4).

**5. MAINTENANCE**

5.01 Provisions are made for field replacement of circuit packs. Before removing a circuit pack, disconnect the power from the KL-30. Replace the circuit pack with another and restore power.

5.02 The Outside Line Access Circuit Pack is warranted against manufacturing and material defects for two years. If it fails within that time, it will be repaired or replaced at no charge.

**6. SPECIFICATIONS**

Current at -24V DC	
idle . . . . .	20ma typ
2 lines busy . . . . .	175ma typ
Crosstalk . . . . .	less than -90 dBm
(0dBm 1KHz,	(output, 2nd link)
input, 1st link)	
Distortion . . . . .	less than 1%
	(0dBm input)
Longitudinal balance . . . . .	better than -60db
	200 to 1000 Hz
Insertion loss . . . . .	3 dB max
C.O. loop . . . . .	1800 ohms max
Dimensions . . . . .	6.25" x 9.75" x 1.00"
Operating humidity . . . . .	0 to 95%

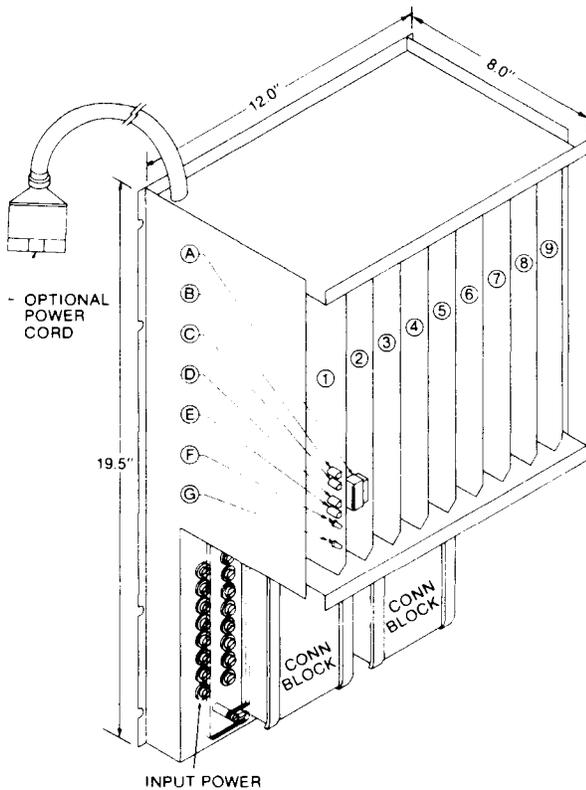
Operating temperature .....0°C to 50°C  
32°F to 122°F  
Weight .....2 lbs.

7.02 Further information and technical assistance on the KL-30 Outside Line Access Circuit Pack, or any Melco product, is available from:

**7. ORDERING INFORMATION**

7.01 Order from your local supplier or distributor:  
(QTY) 120129 OUTSIDE LINE ACCESS CIRCUIT PACK

MELCO LABS  
14408 N.E. 20th St.  
P.O. Box 4026  
Bellevue, WA 98009  
(206) 643-3400



- ① POWER SUPPLY CARD (120126)
- ② CONTROL CARD (120125)
- ③ OPTION CARD PAGING ACCESS (120185) OR FOUR AREA PAGER (120128)
- ④ OPTION CARD, OUTSIDE LINE ACCESS (120129)
- ⑤ STATION CARD (120127) 0, 20-26
- ⑥ STATION CARD (120127) 27-34
- ⑦ STATION CARD (120127) 35-42
- ⑧ STATION CARD (120127) 43-50
- ⑨ STATION CARD (120127) 51-58

- Ⓐ OPTION SWITCHES
- Ⓑ POWER TEST POINT B GRD
- Ⓒ POWER TEST POINT B BAT
- Ⓓ POWER TEST POINT -9V
- Ⓔ POWER TEST POINT -5V
- Ⓕ LINK 1 BUSY LED
- Ⓖ LINK 2 BUSY LED

Fig. 2 — Front of KL-30 Showing Card Positions.

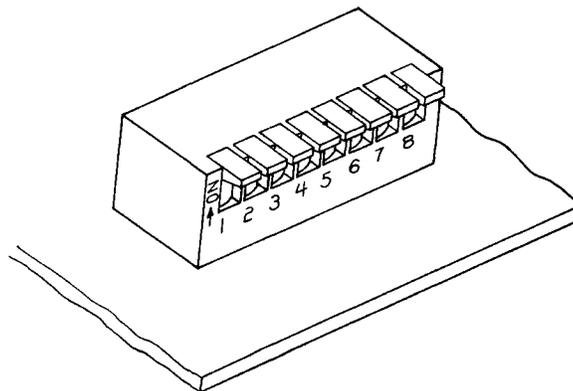


Fig. 3 — Option Switches on Control Card of KL-30.

KL-30 TWO-LINK INTERCOM SYSTEM

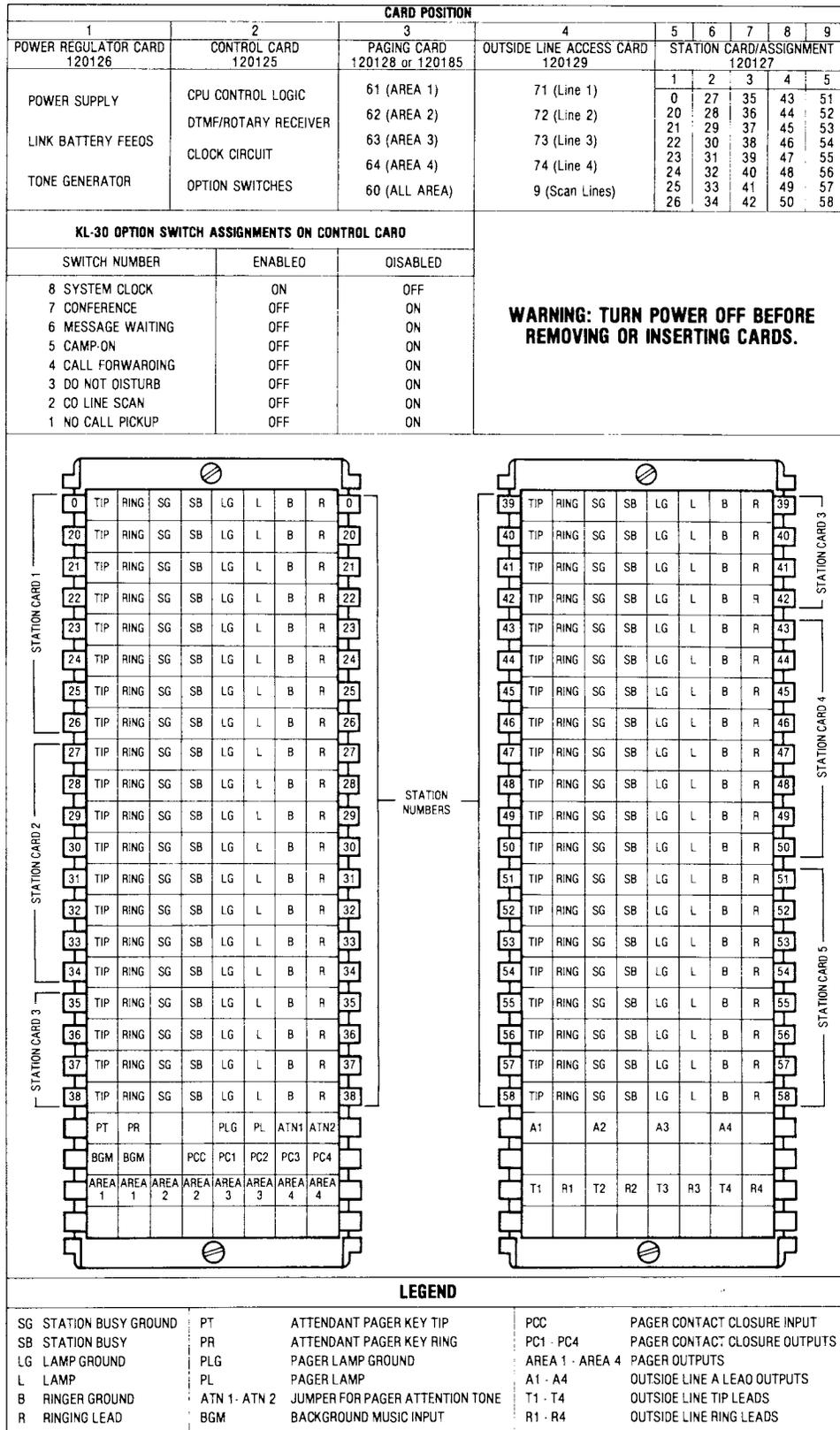


Fig. 4 — Option Switch, Function, Station, and Punch Block Pin Assignment.

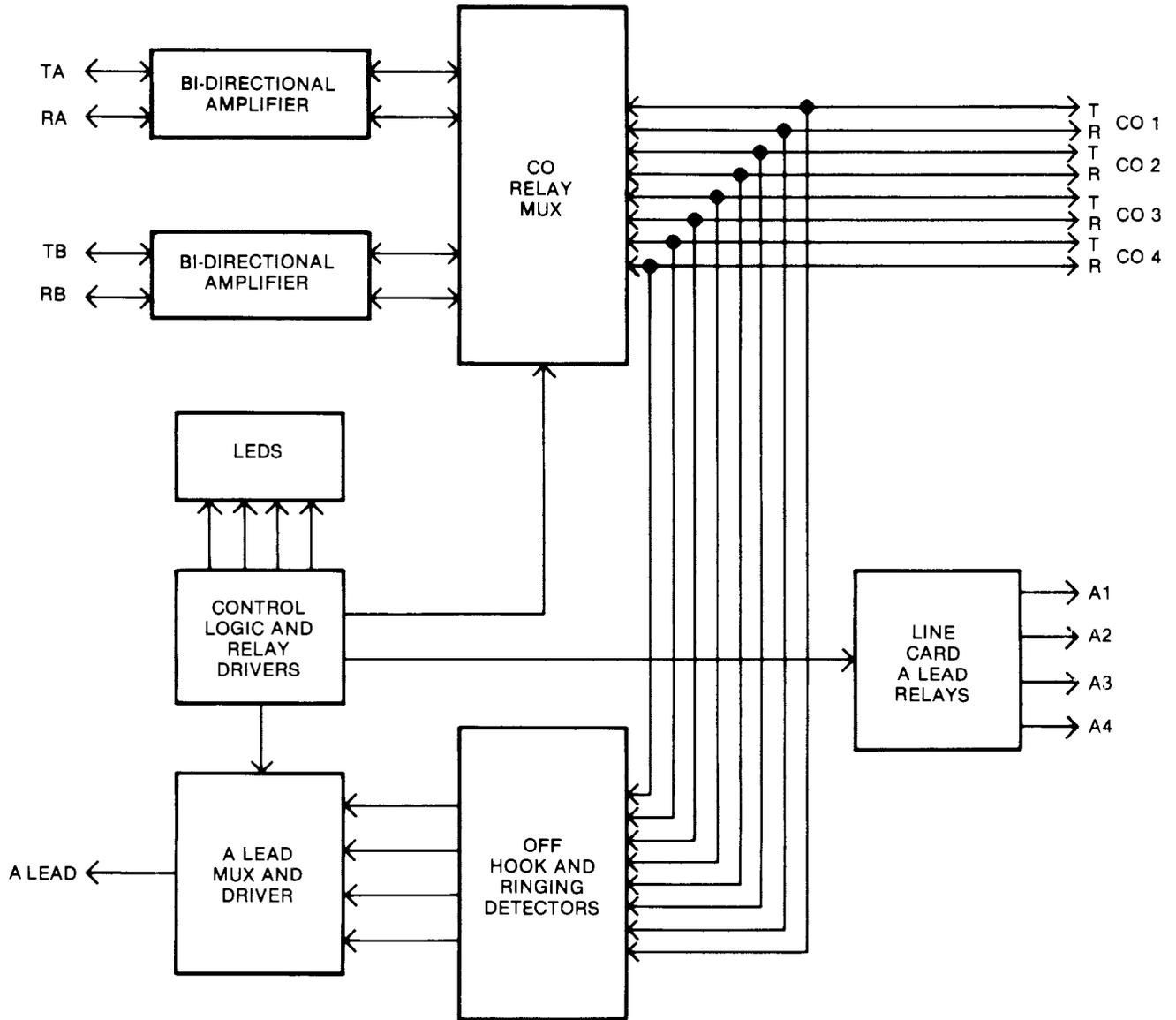


Fig. 5 — KL-30 Outside Line Access Circuit Block Diagram.

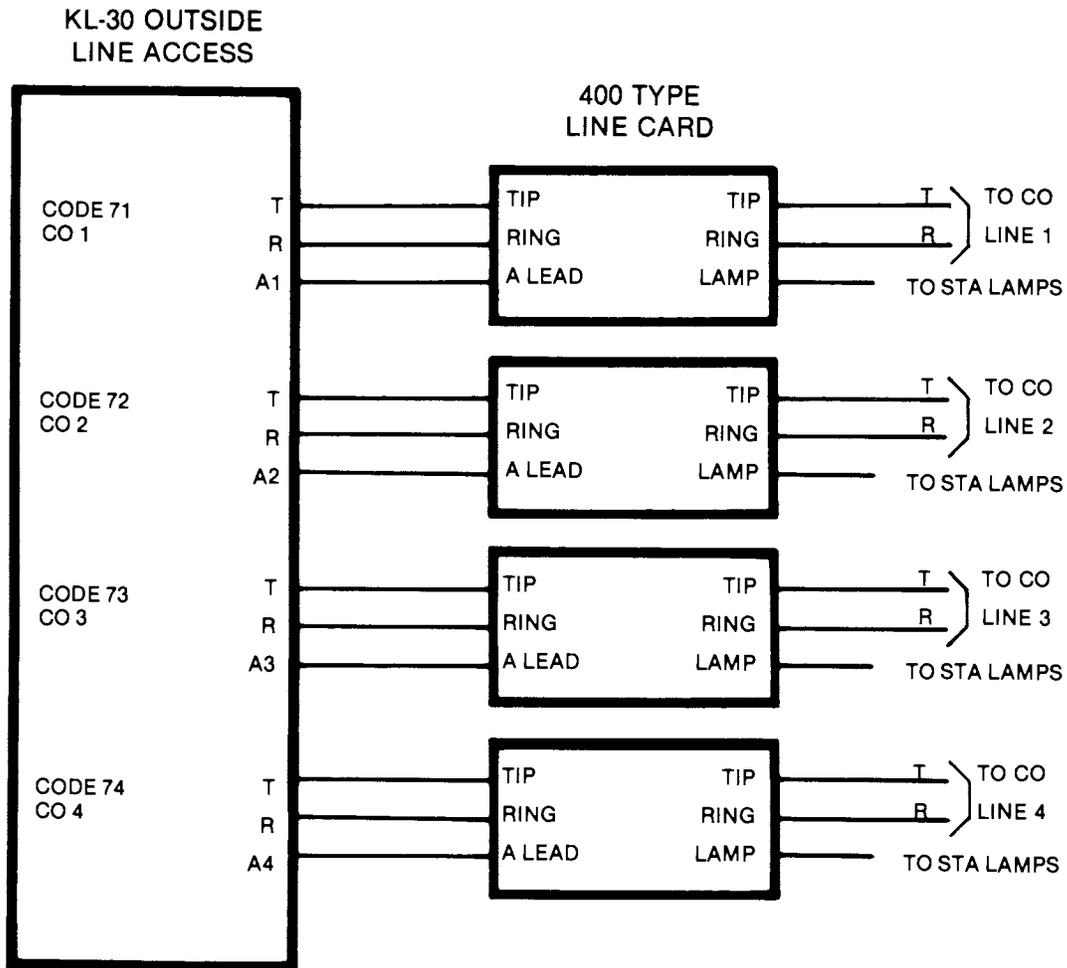


Fig. 6 — KL-30 Outside Line Access Connection to Line Cards.

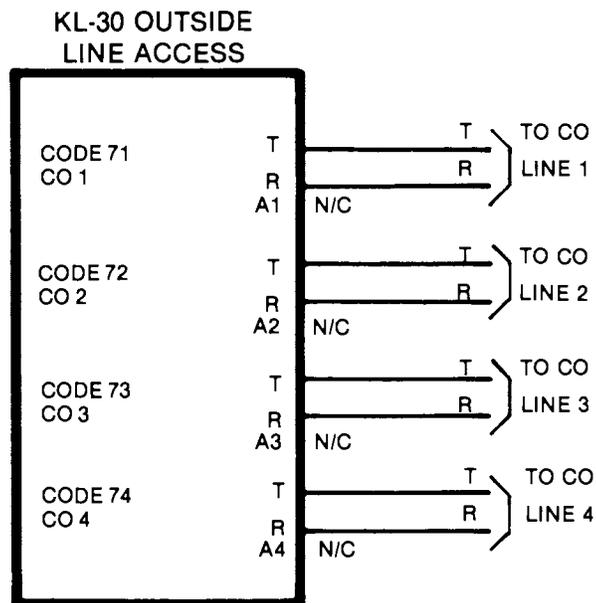


Fig. 7 — KL-30 Outside Line Access Connection without Line Cards.

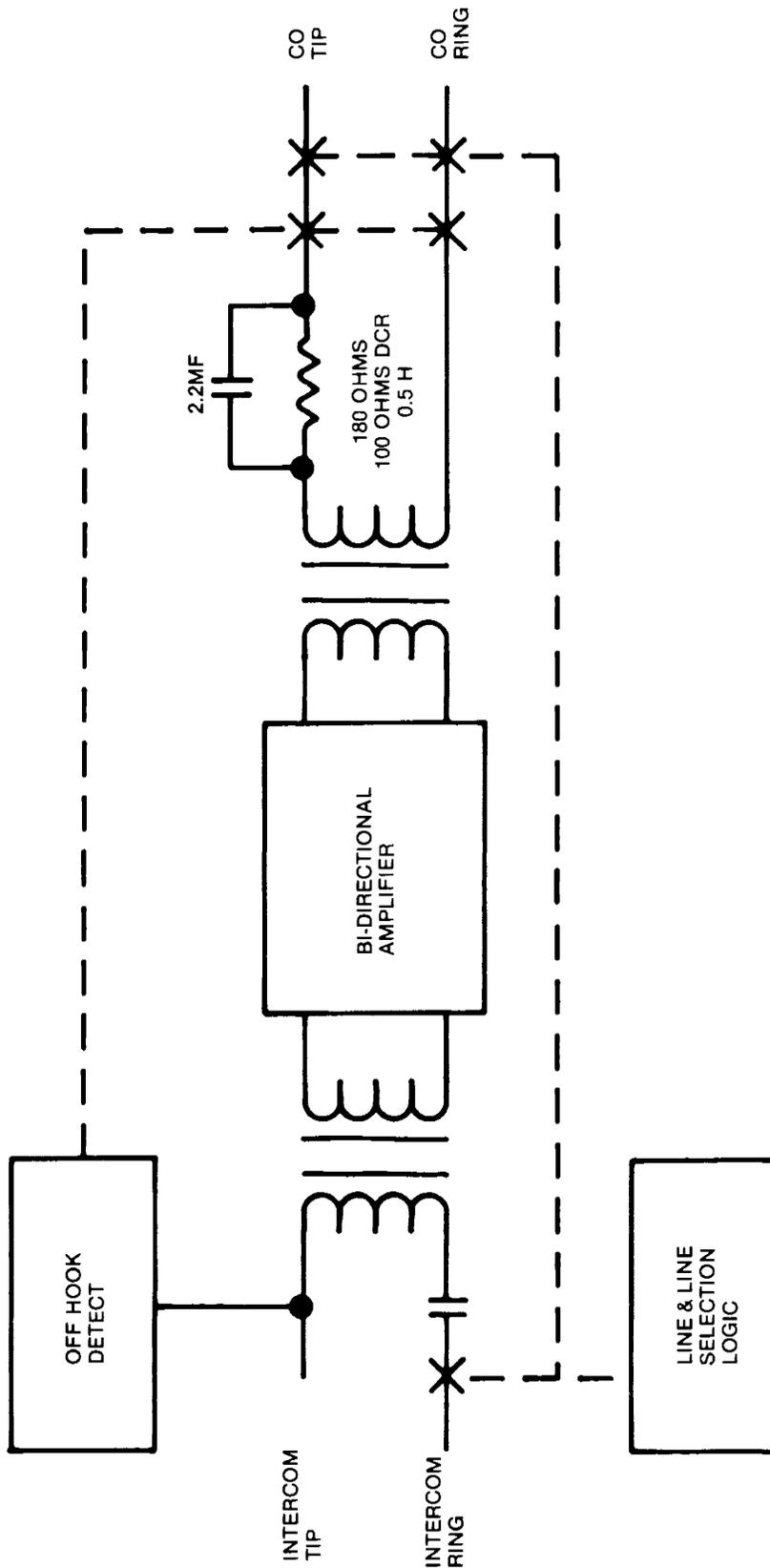


Fig. 8 — KL-30 Outside Line Access Typical Signal Path.

## PAGING ACCESS FOR KL-30™ INTERCOM (CIRCUIT PACK NO. 120185)

### 1. GENERAL

1.01 The KL-30 Paging Access Circuit Pack is an option for the KL-30 Two Link Intercom. It provides paging capability to four areas without reducing station capacity. It also provides for background music to the four areas. The KL-30 Paging Access is for use as a preamplifier only.

### 2. DESIGN FEATURES

2.01 The Paging Access Circuit Pack:

- provides two-digit dial access to any one of four areas or to all four areas simultaneously.
- provides for background music.
- provides additional paging capability for attendant on separate key even if both links are busy.
- has visual indicators to show which areas are being paged.
- provides pager busy lamp lead for attendant and any other station requiring it.
- provides optional attention tone at start of page.
- provides transformer coupled outputs for driving external amplifiers.

### 3. INSTALLATION

3.01 Disconnect power to the KL-30 intercom and remove the cover.

**CAUTION:** *Static charges can damage circuit packs. Do not handle unnecessarily. Keep in protective packing when not in use. Be certain that your body is discharged of static charge before handling a circuit pack and then handle only by the plastic ejectors. Do not walk about with un-packaged circuit packs. Do not insert or remove circuit packs with the power on.*

3.02 Insert the Paging Access Circuit Pack into position 3 of the KL-30 (components to the left). See Fig. 2.

3.03 Connect the external amplifier inputs to connecting block terminals labeled AREA 1,

AREA 2, AREA 3, and AREA 4. Note that two wires are necessary; the outputs are transformer coupled. See Fig. 3.

3.04 Connect wires from background music source to terminals labeled BGM. See Fig. 3.

3.05 Connect special page tip and ring terminals (PT and PR) to attendant's phone using a key other than the intercom key. This allows the attendant to page on another key when both intercom links are busy with conversations.

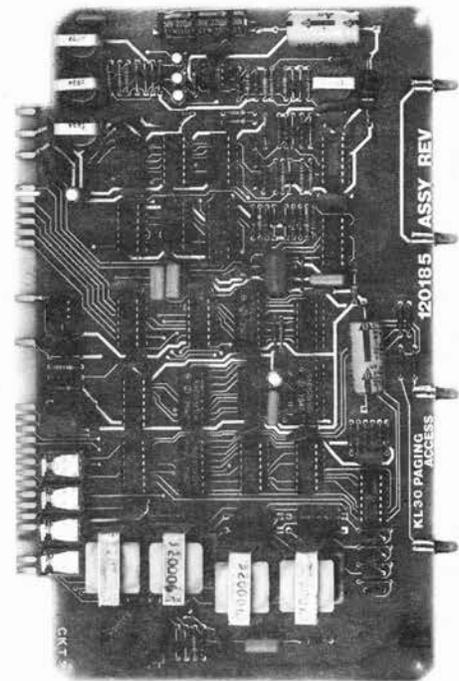


Fig. 1

3.06 Connect attendant's pager key lamp (and any other lamps desired) across pager lamp and pager lamp ground terminals (PL and PLG). This lamp indicates when the pager is in use.

3.07 Connect a strap from terminal ATN 1 to ATN 2 if attention tone before paging is desired.

- 3.08 Connect paging contact closure common (PCC) and paging contact closure outputs (PC1, PC2, PC3, PC4) to auxiliary equipment as required.
- 3.09 Replace the cover and restore power to the KL-30.
- 3.10 Adjust volume controls on external amplifiers as desired for paging and background music for each area.

#### 4. OPERATION

- 4.01 To access an area on the intercom key, a station user dials the access number for the desired paging area: 61 for Area 1, 62 for Area 2, 63 for Area 3, 64 for Area 4, and 60 for all areas. Paging in one area does not disrupt background music in other areas. Only one page at a time may be made. The talking link not being used for the page is still available for conversation. When a page to an area is in progress, the lamp for that area is lighted.
- 4.02 The attendant can page by dialing area numbers in the same manner as station users or, can access all areas by using the special paging key. The purpose for this feature is to allow the attendant to page even when both links on the intercom key are busy with conversations. If the pager busy lamp is not lit, the attendant simply comes off hook on the paging key without dialing and pages.
- 4.03 Table A clarifies what occurs when two people try to page at the same time.

#### 5. MAINTENANCE

- 5.01 Provisions are made for field replacement of defective circuit packs. Before removing turn off the power. Replace the pack with another and restore power.
- 5.02 The Paging Access Circuit Pack is warranted against manufacturing and material defects for two years. If it fails within that time, it will be repaired or replaced at no charge.

#### 6. SPECIFICATIONS

- Current at -24V DC ..... 50 ma  
(with 600 ohm loads, idle or paging)
- Operating temperature range ..... 0° to 50°C  
32° to 122°F
- Operating humidity ..... 0 to 95%
- Paging Area Load ..... 100 ohms min.  
recommended
- Frequency response ..... ± 2 dB  
(station input to pre-amp output  
300 Hz to 3500 Hz)
- Crosstalk between areas ..... -60 dB  
(300 Hz to 3500 Hz)
- Maximum input without clipping ..... + 10 dBm
- Attention tone amplitude  
at output ..... -20 dBm nom.
- Attention tone frequency ..... 583 Hz nom.
- Attention tone duration ..... 0.4 sec. nom.
- Pager lamp voltage ..... 50 V peak max.
- Pager lamp current ..... 4 A max.
- Contact closure voltage ..... 100 V max.
- Contact closure current ..... 1 A max.
- Contact closure power ..... 20 W max.
- Background music  
input impedance ..... 130Kohms nom.
- Output impedance ..... 150 ohms nom.

#### 7. ORDERING GUIDE

- 7.01 Order as follows:  
(QTY) 120185 PAGING ACCESS  
CIRCUIT PACK  
from your supplier or distributor.
- 7.02 For further information or assistance with the KL-30 Paging Access or any Melco product, call or write:  
MELCO LABS  
14408 N.E. 20th St.  
P.O. Box 4026  
Bellevue, WA 98009  
(206) 643-3400

ON INTERCOM KEY		ON PAGING KEY	INDICATION
Station User A	Station User B	Attendant Only	
PAGING	WANTS TO PAGE	—	Station User B gets busy signal after dialing paging access code.
PAGING	—	WANTS TO PAGE	If Attendant ignores pager busy lamp and comes off hook on paging key, the attendant <i>will not</i> get a busy signal and will not be able to page.
WANTS TO PAGE	—	PAGING ALL AREAS	If Station User A cannot hear any paging area and dial accesses the pager, the user <i>will not</i> get a busy signal and will not be able to page.

Table A. Indication when two users try to page at same time.

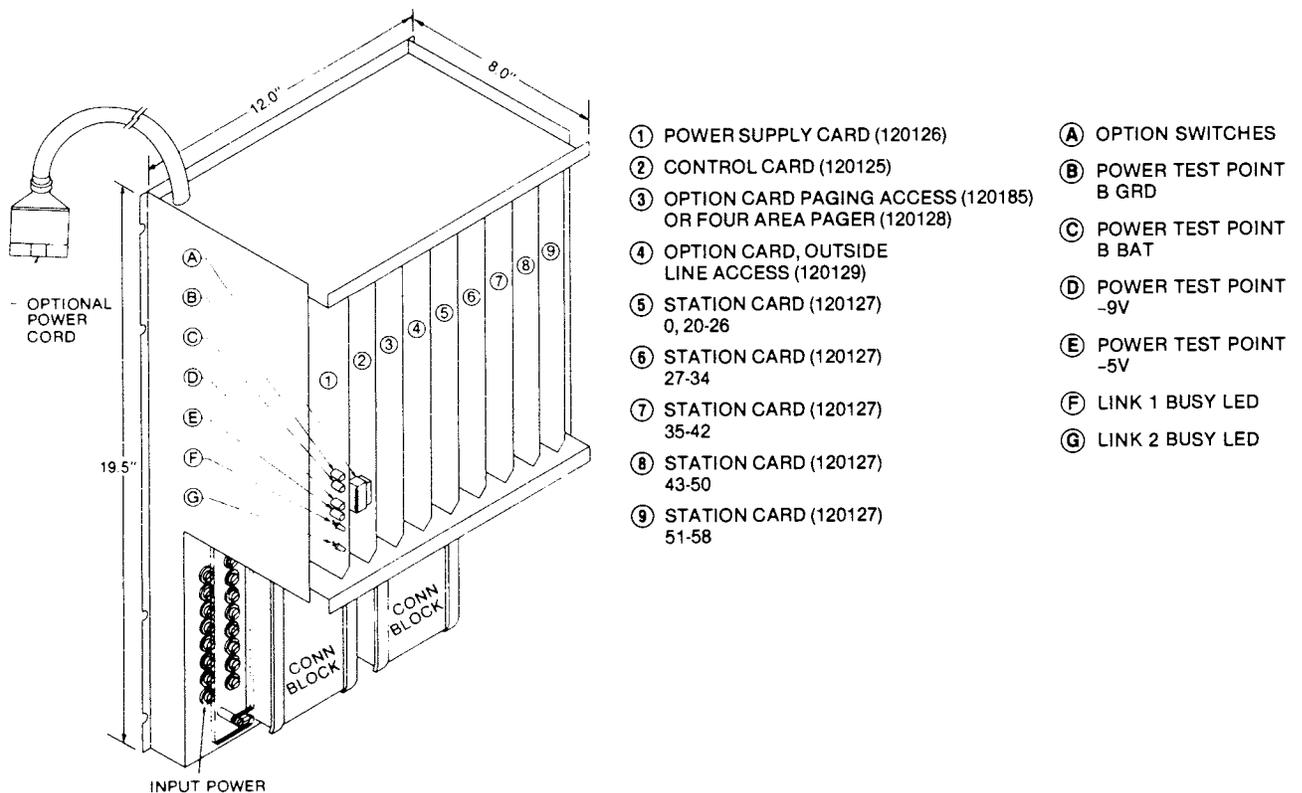


Fig. 2 — Front of KL-30 Showing Circuit Pack and Miscellaneous Component Locations.

KL-30 TWO-LINK INTERCOM SYSTEM

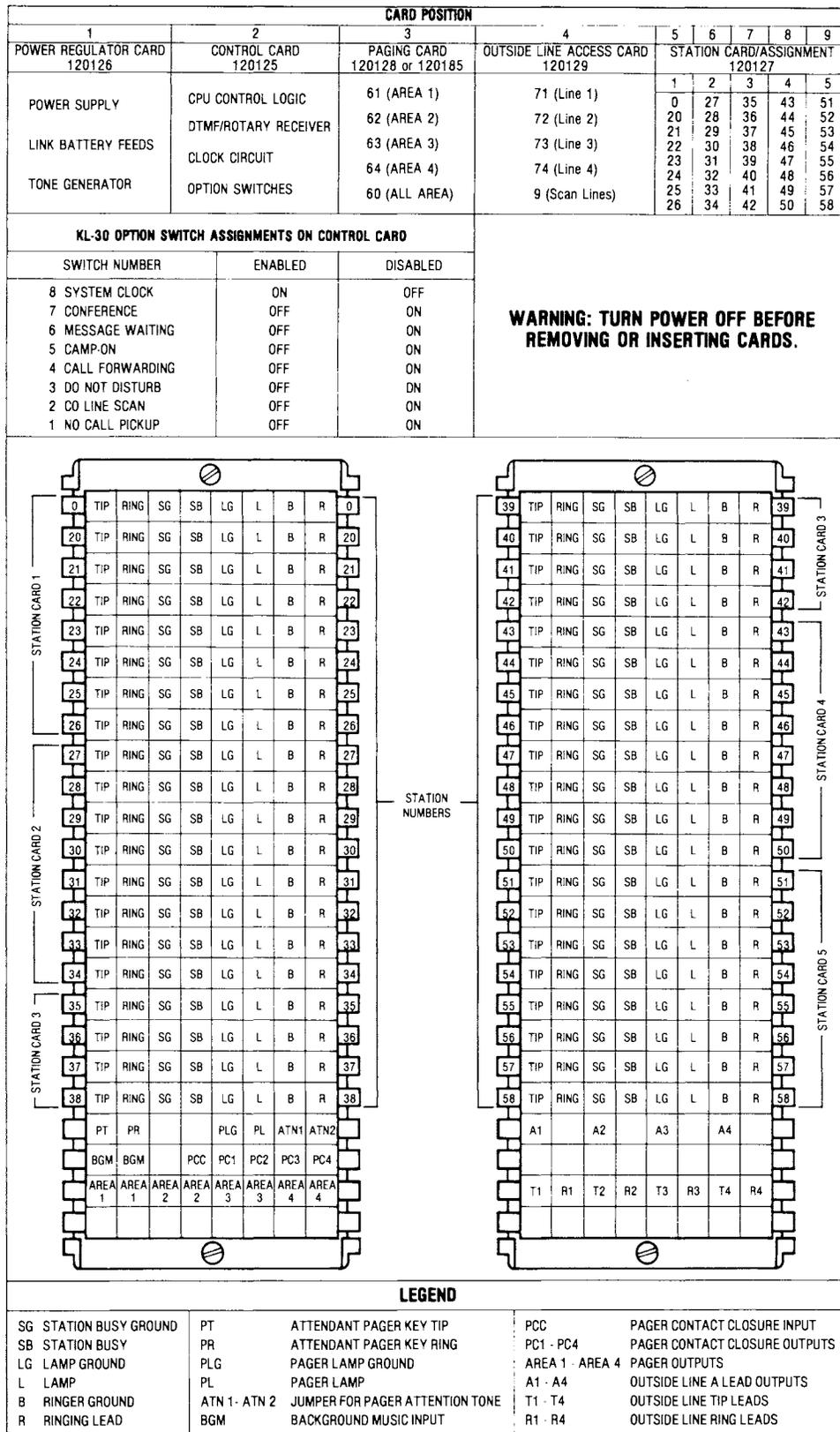


Fig. 3 — Option Switch, Function, Station, and Punch Block Pin Assignments.

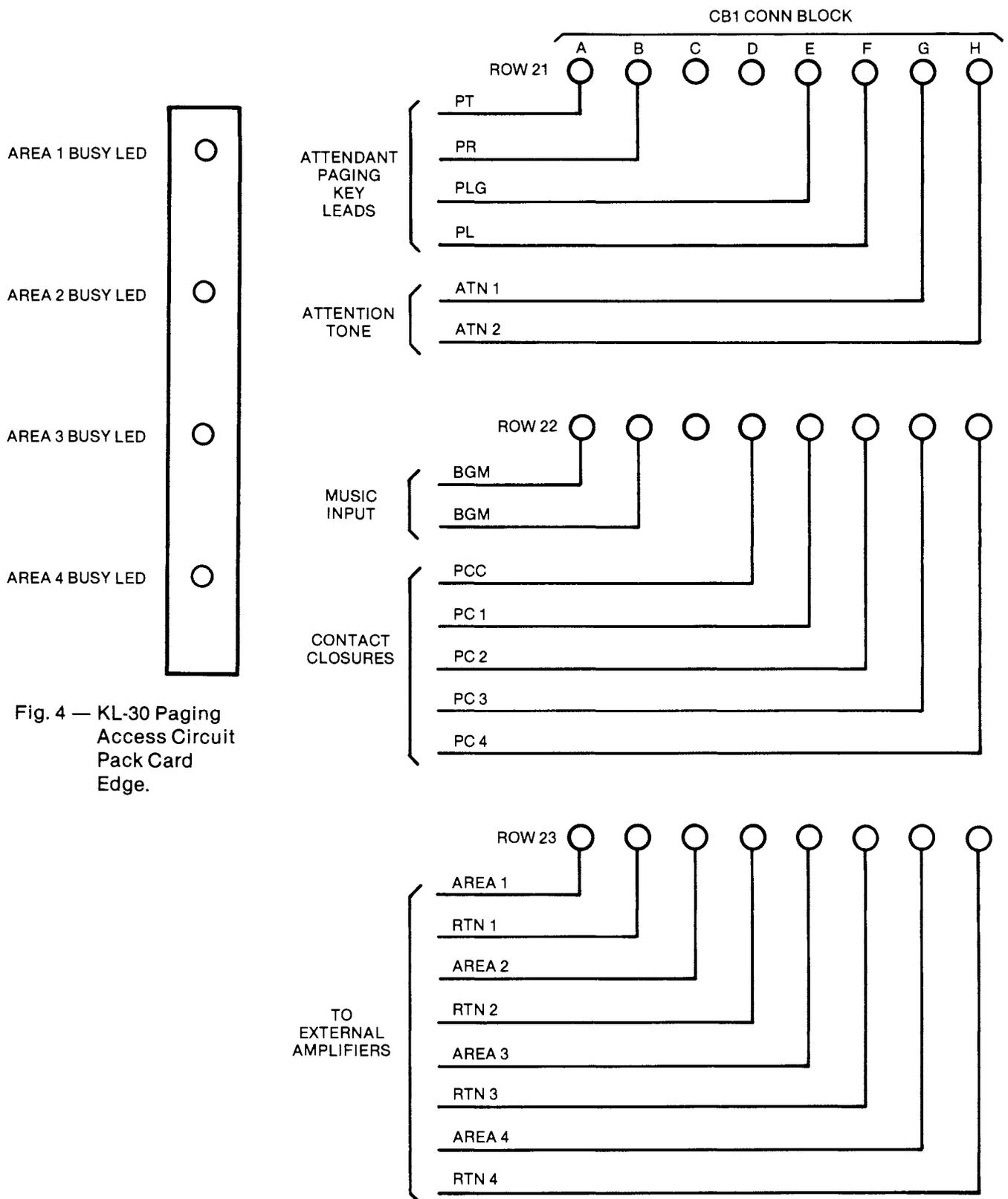


Fig. 4 — KL-30 Paging Access Circuit Pack Card Edge.

Fig. 5 — Connecting Block Terminal Assignments, Background Music and Paging.

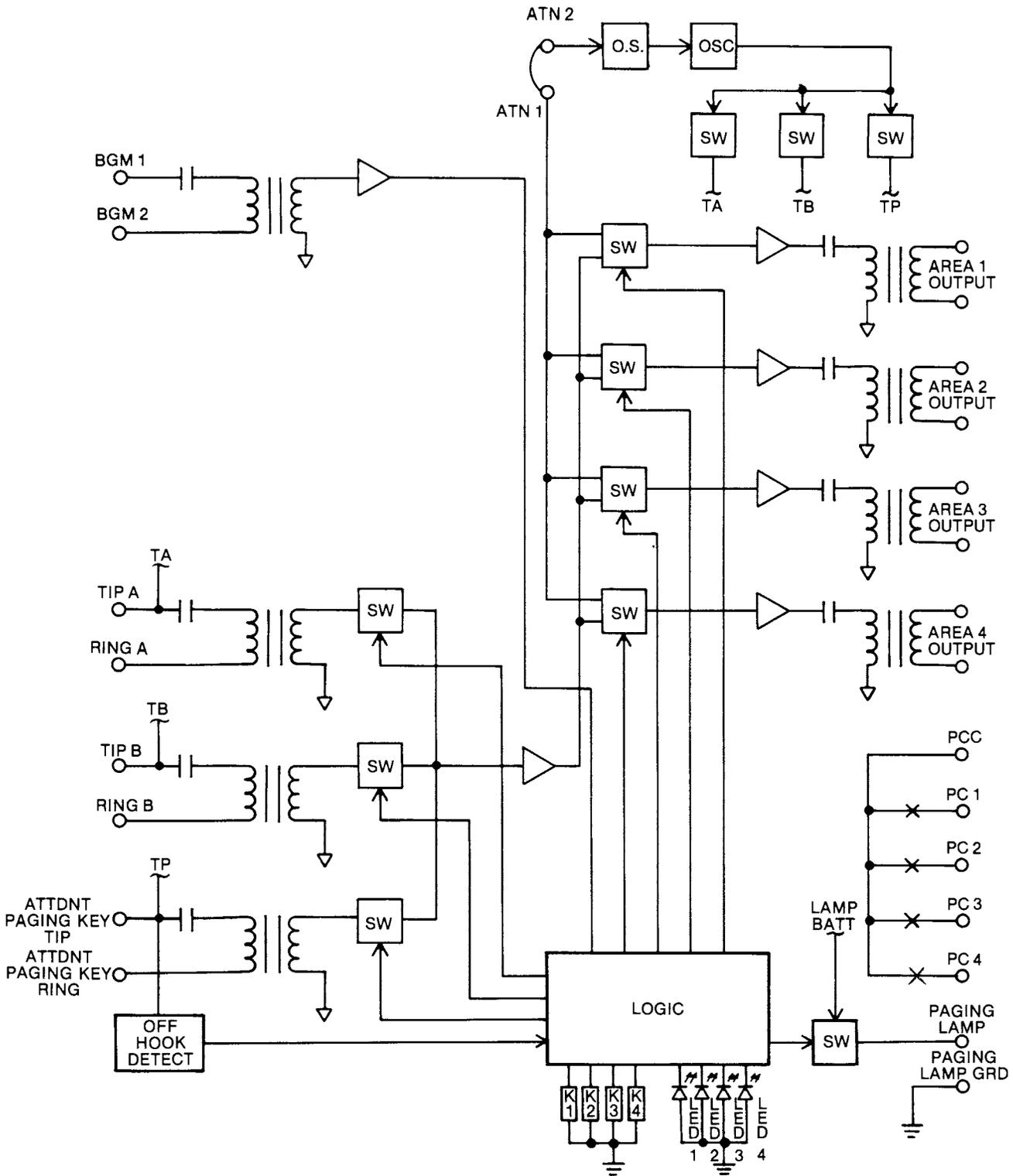


Fig. 6 — Functional Schematic of KL-30 Paging Access.