Cohort™

Installation Practice

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Cohort™

EKS-616

INSTALLATION PRACTICE

General Description, Installation and Maintenance

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COHORT EKS-616
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1. INTRODUCTION

1.01 This practice provides basic information about the GAI-Tronics Cohort 6X16 Electronic Key System, including a description of the system, the features, the programming, the installation methods, and the maintenance procedures.

1.02 This practice supercedes all previous documents covering a general description of the installation and maintenance of the Cohort 6X16 Electronic Key System.

1.03 This practice should remain with the KSU at all times.

2. SYSTEM DESCRIPTION

2.01 The Cohort is an electronic key system which uses microprocessor technology in the Key Service Unit (KSU) and in the telephone set. The system uses two-pair cable to provide power, voice, and data links between the KSU and the telephone set. This controlled transmission path is used for line speech path, intercom speech path, page path, line indication and many other functions.

2.02 The Cohort has a maximum of six Central Office (C.O) lines, sixteen extensions, and two intercom paths. All C.O. lines appear at all stations.

2.03 The stored program memory in the KSU is an EPROM (Erasable and Programmable Read Only Memory). Circuits are contained on printed circuit boards (PCBs) for easy installation, replacement, and maintenance. The subset memory is a ROM (Read Only Memory).

2.04 The KSU is a self-contained, wall-mountable unit designed for easy installation. The power supply is mounted separately from the KSU and connected to the KSU by a three-wire power cable.

2.05 The telephone sets are desk sets which can also be wall mounted (every Cohort telephone set has a wall mounting kit taped inside the base). Each has six C.O. Line Keys, one Hold Button, one Speaker Key, one Mute Key, and one Shift Key. All sets are equipped with a built-in speakerphone. Figure 2-1 illustrates the wall mounting procedure.

2.06 An attendant-station telephone set is available with a sixteen light, busy lamp field. Otherwise, the attendant set is identical to the standard Cohort set.

3. SPECIFICATIONS

3.01 Technical specifications for the Cohort system are provided in Figure 3-1.

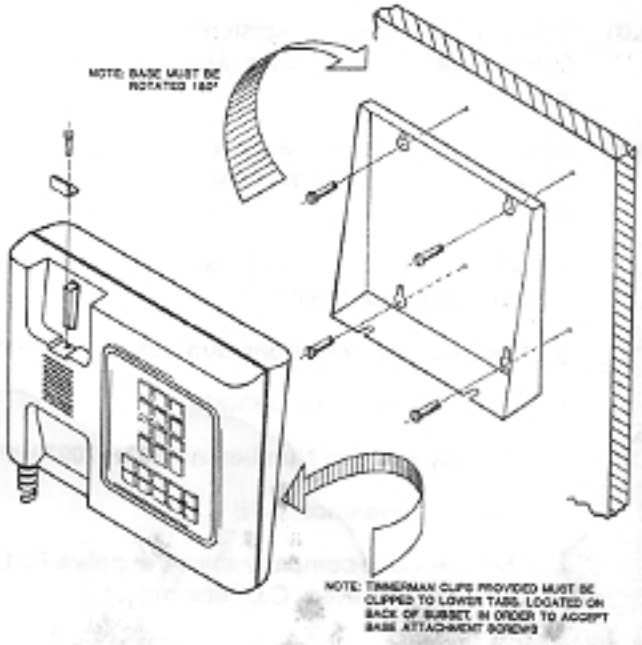

Figure 2-1
SUBSET WALL MOUNTING DETAIL

Figure 3-1
SPECIFICATIONS

System Capacity:

CO Lines	6
Intercom Paths	2
Stations	16

Cable Requirements:

Station cable, 2 twisted pair 24 AWG
Maximum cable length, 500 ft.
Loop Limit, 1000 ft.

Power Requirements:

Input 120V AC at 2.0 Amps, 60 Hz, single phase

Environmental Operating Conditions:

32° to 122°F (0° to 50°C)
with 0% to 90% relative humidity non-condensing

4. FCC REQUIREMENTS

4.01 The Cohort has been registered with the Federal Communications Commission as a fully-protected key system.

4.02 As owner of this telephone system, you must give the following information to the operating telephone company before connecting or disconnecting it:

1. Notice of your intent to use privately-owned telephone equipment.
2. The particular telephone numbers to be used.
3. Model: GAI-Tronics Cohort™

   FCC Registration Number: ADG9ZP-70970-KF-E

   Ringer Equivalence: 0.4B
4. The telephone company should supply a RJ11C connector for every C.O. line required.

5. FEATURES

5.01 In this section Cohort features are described, their use defined, and the access methods given.

5.02 Volume Control
Each Cohort Telephone Set is equipped with a volume control which adjusts the volume of the voice announcements and tone signals. The control is located on the right side of the telephone set.

5.03 Flash Rates and Tone Signals
The Cohort has unique flash rates and 12 tone signals to assist in the feature operation.

5.04 Speakerphone
Each telephone set of the Cohort system is equipped with a built-in speakerphone which allows you to operate the system without lifting the handset. To activate the speakerphone, press Speaker Key, then place or receive a call. The handset may be lifted at any time and the station will revert to normal operation. To return to Speakerphone, press Speaker Key before replacing the handset. Depressing a C.O. Line Key also activates the speakerphone.

5.05 Outside Calls
To make an outside call, lift the handset or press Speaker Key, select and press an unlit C.O. Key, and dial the desired telephone number.

5.06 Incoming calls can be answered on any station. When a call comes in, a ringing tone will be heard. To answer, press the flashing C.O. Key and then lift the handset. If a C.O. line is being used, no other station can access the line.

5.07 Place Call on Hold
If you desire to place the call on hold, press the Hold Key. The C.O. Line Key you are using will flash at a fast flash rate. Inside dial tone will be heard, then you can replace the handset or use the telephone for some other function. (All page, intercom . . . etc.)

5.08 Automatic Hold Recall
The Cohort has automatic hold recall for the attendant station. At installation, the attendant station can be programmed to receive a signal that a call has been on hold longer than 60 or 120 seconds. If desired, the entire system may be programmed so each subset receives a signal after a call has been on hold longer than 60 or 120 seconds. (See Section 8.05 and 8.06)

5.09 Answer Call On Hold
To answer a call on hold, lift the handset and depress the flashing C.O. Line Key.

5.10 Place Intercom Call
To place an intercom call within the system, lift handset and dial the intercom extension number (11 thru 26). A single tone will be heard, after which you make your announcement. (The attendant station (#ll) can be reached by dialing "0".)

5.11 Ringing Intercom Call
A ringing intercom can be used instead of a voice announcement. Lift the handset, dial "*" and the intercom extension number. The called party will hear a ringing tone and must lift the handset to respond.

NOTE: The dialing sequence for intercom calls and ringing intercom calls can be reversed (i.e. by dialing the intercom extension number, the called extension rings, and by dialing "*" and the intercom extension number, the called station receives a single tone, and may operate his intercom hands-free.) See Section 8.08 to reverse these features.

5.12 Receive Intercom Call
To receive an intercom call, you will hear a single tone. The Hold Light will flash, and you speak in the direction of the phone. (See Microphone Mute Section about disconnecting the microphone.) A ringing tone intercom call must be answered with the handset or by pressing the Speaker Key.

5.13 Program Intercom Rings

Each telephone set can be programmed to ring on all intercom calls. Lift the handset, press the Shift Key, dial "1", and then hang up. The handset must be used to answer intercom calls in this mode. To return to voice intercom, lift the handset, press the Shift Key, and dial "4".

5.14 All Page

All telephone sets may be paged simultaneously by lifting the handset, dialing "33", hearing a double tone, and making the announcement.

5.15 Transfer Outside Call

To transfer an outside call, place the call on hold, dial the intercom extension number, announce call and C.O. line number, and replace handset. If the called intercom extension number is on an outside C.O. line, you will hear synthesized music, and the busy extension will hear a single tone. If the station does not answer, hang up.

5.16 Call Waiting Signal

If your busy extension is signalled that a call is waiting, a single tone will be heard, and the Hold Key will light. By pressing the Hold Key, your call is placed on hold and you are connected to the inside party who is signalling you. This feature is operative only when the busy extension is on a C.O. line.

Figure 5-1
PROGRAM SYSTEM SPEED NUMBERS
(Operator Only)

Slots 20 through 49 (31 digits each)

Basic Procedure

1. Take handset off hook
2. Press SHIFT — "7" — "1"
3. Press "#" — and the 2-digit slot address wishing to program (20 thru 49)
   (After pressing "#", CO 1 LED should come on)
   (After pressing the 2-digit slot address, CO 2 and CO 3 LEDs should come on respectively)
4. Enter speed number digits (enter phone number)
   (While entering speed number digits, CO 4 LED should blink on and off momentarily)
5. Press HOLD key
   (After pressing HOLD (the enter key) CO 1, CO 2 and CO 3 LEDs should go out)
6. Go to Step 3
7. When finished — HANG UP, wait 2 seconds before normal operation.

Special Notes and Tips on Programming

1. If a manual pause is desired in the speed number, press **MUTE** key at the desired spot in Step 4. A pause counts as one digit.
2. Each of the 30 slots (20 to 49) contain 31 digit positions. If more than 31 digits are desired, you may do so with slots 20 to 48. However, you may not program the next slot after the one you entered more than 31 digits. Doing so will cut off the tail end of the previous slot (the one with more than 31 digits). 45 digits absolute maximum can be programmed.
3. If a speed number printout is desired, HOOKFLASH using hookswitch and dial "55". This will print out the system numbers only if an SMDR is connected.
4. If CO 1, CO 2 and CO 3 LEDs are not on at any time after executing Step 2, this means you must start again at the beginning of Step 3. This is possible if there was a mistake in programming, i.e. entering wrong slot address code (#90) or entering too many speed numbers in slot 49,etc.

Figure 5-2
PROGRAM PERSONAL SPEED NUMBERS
(Any Phone)

Slot 10 to 19 — 15 digits each

Bacis Procedure

1. Take handset off hook
2. Press SHIFT — "7" — "7" (or SHIFT — "P" — "P" for program personal)
   (After pressing SHIFT 77, CO 6 LED should come on)
3. Press "#" — and the 2-digit slot address wishing to program (10 thru 19)
   (After pressing "#", CO 1 LED should come on)
   (After pressing the 2-digit slot address, CO 2 and CO 3 LEDs should come on respectively)
4. Enter Speed Number Digits (enter phone number)
   (While entering speed number digits, CO 4 LED should blink on and off momentarily)
5. Press HOLD Key
   (After pressing HOLD (the enter key), CO 1, CO 2 and CO 3 LEDs should go out)
6. Go to Step 3
7. When finished — hang up, wait 2 seconds before normal operation

Special Notes and Tips on Programming

1. If a manual pause is desired in the speed number, press **MUTE** key at the desired spot in Step 4. A pause counts as one digit.
2. Each of the 10 slots (10 to 19) contain 15 digit positions. If more than 15 digits are desired, you may do so with slots 10 to 18. However, you may not program the next slot after the one you entered more than 15 digits. Doing so will cut off the tail end of the previous slot (the one with more than 15 digits). 45 digits absolute maximum can be programmed.
3. If a speed number printout is desired, HOOKFLASH using hookswitch and dial "55". This will print out **your** personal numbers only if an SMDR is connected.
4. If CO 1, CO 2 and CO 3 LEDs are not on at any time after executing Step 2, this means you must start again at the beginning of Step 3. This is possible if there was a mistake in programming, i.e. entering wrong slot address code (#90) or entering too many speed numbers in slot 19, etc.
5. When finished programming simply HANG UP and wait for CO 6 LED to go out (about 2 sec.). If at any time during programming the CO 6 LED is not on, you must start again at Step 2.

5.17 Automatic Redial — Intercom

To automatically redial the last person who called you on intercom, lift the handset, press the Shift Key, press "#" key, and voice announce.

5.18 Conferencing — Inside

An inside extension may be added to an outside call by placing the outside call on hold and dialing the intercom extension number of the party to be added. Announce the call and line number, then press and hold the Line Key until the third party joins the call by pressing the announced Line Key.

5.19 Conferencing — Outside

Two outside lines may be added to an inside extension by placing the first call on hold, answer or make the second call, press the Shift Key, and then press the Li Key on hold. The conference is then established. To disconnect one call, press the Line Key for the party you wish to keep, disconnecting the other party.

5.20 All Station Conference

One or all of the intercom stations may be directed to a conference by making an all page call, directing the parties to dial "55". Relift the handset and dial "55". To end the conference, all parties hang up.

5.21 Microphone Mute

The Cohort microphone can be muted by pressing the Mute Key. The Mute Key will display a steady light, signalling that the telephone set is not available for hands-free operation. To release the Microphone Mute, press the Mute Key again, extinguishing the Mute Key Light.

Figure 5-3

PROGRAM CO AUDIO RINGS (Operator Only)

Night and/or Day Modes

Basic Procedure

1. Take handset off hook
2. Press SHIFT — "7" — "3" (for DAY RING) or SHIFT — "7" — "6" (for NIGHT RING)
3. HOOKFLASH — using hookswitch not "shift 0" (about 1/2 second)
4. Enter 2-digit Phone Number wishing to program rings to (11 thru 26).
5. Press the CO Line Keys you wish to ring on that phone.
6. Press HOLD Key.
7. Go to Step 4.
8. When finished — HANG UP, wait 2 seconds before normal operation.

Optional Operations In Place of Steps 4 and 5

1. Dial "33" to Disable Audio Ring to all Phones.
2. Dial "44" to Enable Audio Ring to all Phones.
3. Dial "55" to receive a printout of what phones are enabled to ring on each CO Line, if an SMDR printer is hooked up.

NOTE: In Step 5 the corresponding CO Line Key LEDs should come on and stay on until you HOOKFLASH.

5.22 Do Not Disturb

Each Cohort telephone set may be programmed for "Do Not Disturb" by pressing the Shift Key and the Mute Key. The Mute Key will flash as a reminder the phone is in "Do Not Disturb". No calls will ring at a station in "Do Not Disturb". Anyone calling a station in "Do Not Disturb" will hear a fast busy tone.

5.23 Do Not Disturb Release

To release "Do Not Disturb", press Shift Key, then Mute Key. The Mute Key light will go off.

5.24 System Speed Number

The Cohort System may be programmed for thirty system-wide speed numbers. To program system Speed Dialing see Figure 5-1. The system numbers will be in slots 20 thru 49 with 31 digits available in each slot. To dial a system speed number, press an unlit C.O. Line Key, press shift and then the appropriate two-digit speed number (20 thru 49).

5.25 Station Speed Numbers

Each Cohort Telephone Set may be programmed for ten speed numbers unique to that set. To program station speed numbers see Figure 5-2. The station numbers will be in slots 10 thru 19, with 15 digits available in each slot. To dial a station speed number, press an unlit C.O. Line Key, press shift, and then the appropriate two-digit speed number (10 thru 19).

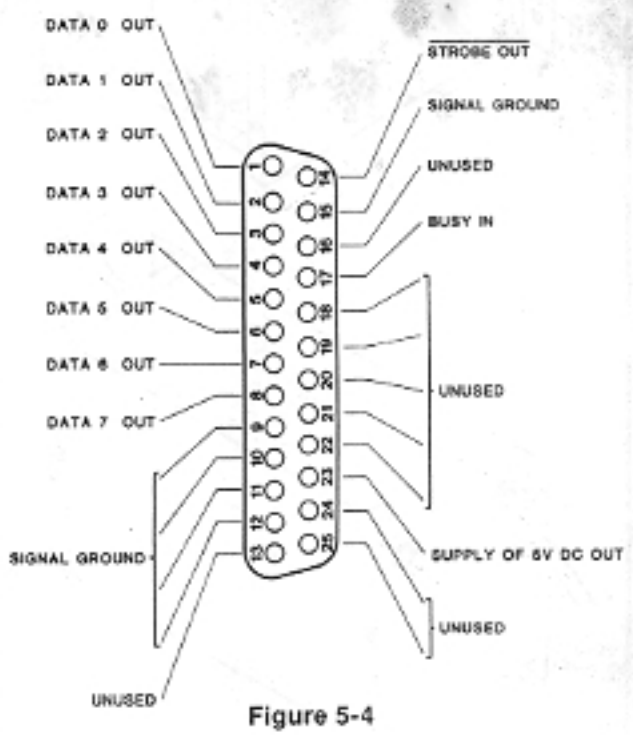

Figure 5-4

SMDR CONNECTOR CONTACT I.D.

Figure 5-5
PROGRAM CLOCK/CALENDAR (Operator Only)
Month — Day — Year — Hour — Minute — Second

Basic Procedure

1. Press SHIFT — "7" — "2" (SHIFT — "P" — "C" for SHIFT Program Clock)
2. Press CO 1 Key for month.
   a) Enter 2-digit code for month (01 through 12)
3. Press CO 2 Key for day.
   a) Enter 2-digit code for day (01 through 31)
4. Press CO 3 Key for year.
   a) Enter 2-digit code for year (i.e. 84)
5. Press CO 4 Key for hour.
   a) Enter 2-digit code for a 24 hour clock (00 through 23) 00 = 12 midnight.
6. Press CO 5 Key for minutes.
   a) Enter 2-digit code for minutes (00 through 59)
7. Press CO 6 Key for seconds.
   a) Enter 2-digit code for seconds (00 through 59)

NOTE: To obtain a printout of what you programmed HOOKFLASH using the hookswitch and dial "55".

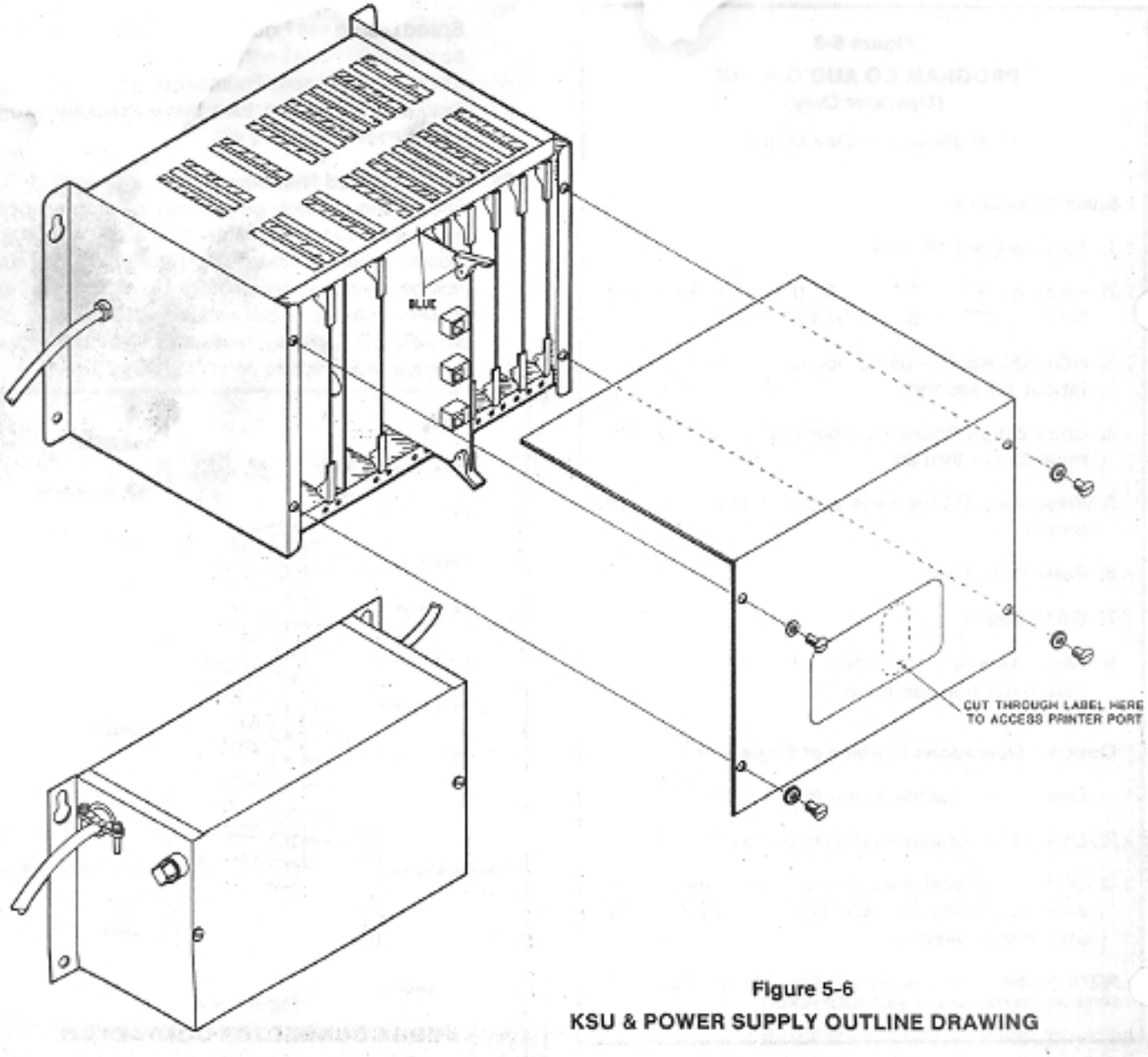

Figure 5-6
KSU & POWER SUPPLY OUTLINE DRAWING

5.26 Flexible C.O. Ring

The Cohort System can be programmed for flexible C.O. ring. Anyone can answer an incoming call since all C.O. lines appear on all phones, but the system allows you to program which telephone set receives which C.O. ring. See Figure 5-3 to program C.O. rings.

5.27 SMDR

The Cohort System has Station Message Detail Recording(SMDR) capability. SMDR is accessed by a 25 pin connector on the CPU line card (See Figures 5-4 and 7-2). A user-supplied on-line printer may be connected for call records. This printer must be a parallel Centronics-compatible device. To program the SMDR clock see Figure 5-5. The Cohort label covers the hole in the KSU cover for the SMDR connector. Use a pen knife to cut a hole through the label (See Figure 5-6).

5.28 Toll Restriction

Each Cohort station may be programmed to restrict the dialing of long distance telephone calls on each C.O. Line. See Figure 5-7 to program toll restrictions.

5.29 Background Music

If a user-supplied external tuner is connected to the Power Regulator PCB (white lever) in the KSU (see Figures 5-8 and 7-3), each Cohort station may receive Background Music by lifting the handset, pressing the Shift Key, and dialing "2". When the handset is replaced, music will be heard through the speakerphone. To cancel the Background Music, lift the handset, press the Shift Key, and dial "2". When the handset is replaced, the music will no longer be heard.

NOTE: Contact #8 on DIP switch (S2) on CPU card must be "on" before Background Music will work. If contact #8 is "off" External Page Output will work.

5.30 Day/Night Mode

Day and Night Ringing Modes can be programmed into the Cohort from the attendant station (#11). In Day Mode only the programmed phones will ring. To program, lift the handset or press the Speaker Key. Then press the Shift Key and dial "3". In Night Mode, only phones programmed will ring. Lift the handset or press the Speaker Key. Then press the Shift Key and dial "6".

5.31 Message Waiting

Any Cohort station may leave a "Message Waiting" signal on any other Cohort station. Dial the intercom extension number of the station you wish to signal (ringing intercom or tone intercom). Press the Shift Key and then hang up. The station you signalled will have its Hold Key lit, notifying the user a message is waiting.

Figure 5-7

TOLL RESTRICTION

Class of Service	Definitions	Class of Service Code
A	No restrictions — can dial anywhere	1
B	Can only dial 911, 411, 611, 1-911, 1-411, 1-611. Can not dial "O" for Operator.	2
C	Can dial local 7-digit numbers and 800 numbers. Can not dial "O" for Operator.	3
D	Can dial local 7-digit number, calls within local area, one additional area code, 800-, 555- and 1-555- numbers. Can not dial "O" for Operator.	4

BASIC PROCEDURES (FROM EXTENSION NO. 11 ONLY)

To program all lines and telephones for Class A:

1. Press Speaker Key or lift handset.
2. Press Shift Key.
3. Press "7", then press "8", then "#", then "0".
4. Hang up.

To program lines and telephones for Class A, B, C, and D:

1. Press Speaker Key or lift handset.
2. Press Shift Key.
3. Press "7", then press "8", then "#".
4. Press telephone number you wish to program (11-26).
5. Press C.O. Line Key you wish to program.
6. Press Class of Service code (1-4).
7. Press next C.O. Line Key and Class of Service until telephone extension is programmed.
8. To continue with another telephone, press "#" and the next extension number you wish to program (11-26).
9. Repeat steps 4-6 until all telephones are programmed.
10. When programming is complete, hang up.

To program Class D with one additional area code:

1. Press Speaker Key or lift handset.
2. Press Shift Key.
3. Press "7", then press "8", then "*".
4. Then dial 3-digit area code.
5. Hang up.

To clear the additional area code permitted in Class D:

1. Press Speaker Key or lift handset.
2. Press Shift.
3. Press "7", then press "8", then "*".
4. Hang up.

If you have an optional external printer attached to the Cohort, you can receive a printout on the toll restriction programming:

1. Press Speaker Key or lift handset.
2. Press Shift Key.
3. Press "7", then press "8", then "#".
4. Hang up.

Special programming notes:

1. Each line can be classed unique to each telephone.
2. Class D's additional area code can be loaded without exiting and re-entering programming mode. Press "*" and 3-digit area code.
3. C.O. Line Key will light when ready for class number (1-4). The light goes out when the class number is pressed.

5.32 Return a Message Waiting Call

If your Hold Key is lit, signalling a message is waiting, lift handset, or press Speaker Key, and dial Shift plus "*". This will ring the intercom extension who left the "Message Waiting" signal. Only the last station who signalled "Message Waiting" will be redialed.

5.33 Automatic Redial — C.O. Calls

If you have placed an outside call from a Cohort telephone set and have received a busy signal, you can hang up and then redial that number later by pressing an unlit C.O. Line Key and pressing Shift and then "#". The number will be automatically redialed.

5.34 External Paging

External speaker amplifiers may be added to the Cohort for paging in areas not accessed by a Coh telephone set (see Figures 5-9 and 7-3). To access the External Paging feature, lift handset or press Speaker Key, dial "44", and make announcement.

NOTE: Contact #8 on DIP switch (S2) on CPU card must be "off" if External Page Output is used. If contact #8 is "on" the Aux. 1 terminals can only be used for Background Music input.

5.35 Figure 5-10 is a summary sheet of all the Cohort feature keys.

NOTE: While a Cohort subset with a busy lamp field is available for use as Station 11 (the attendant subset), any Cohort telephone may be used as Station 11 and can program all system features.

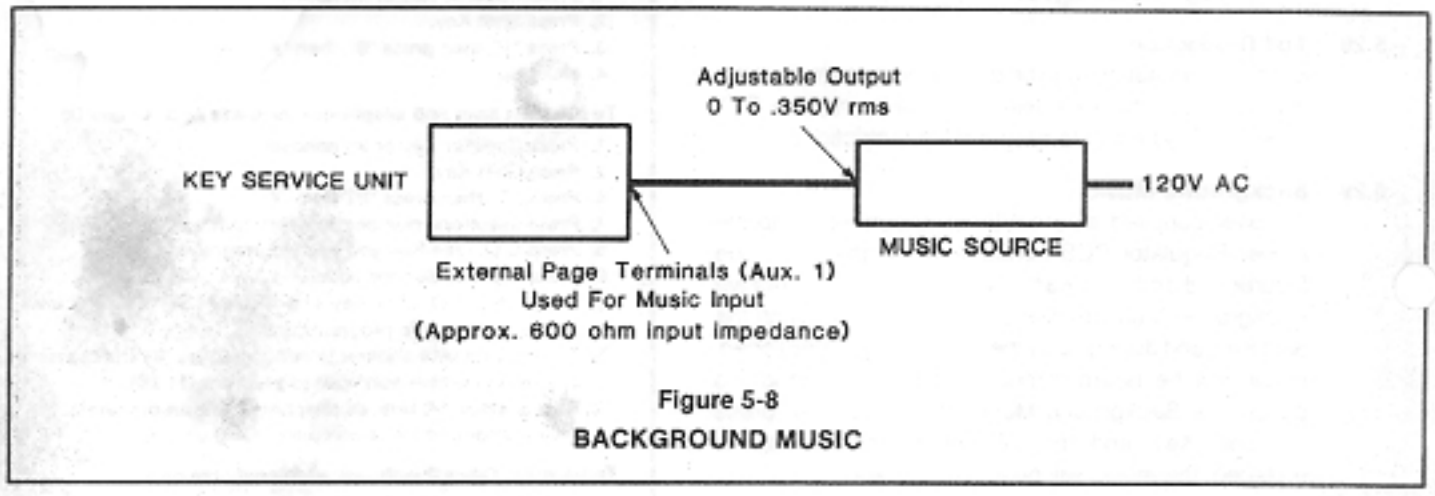

Figure 5-8
BACKGROUND MUSIC

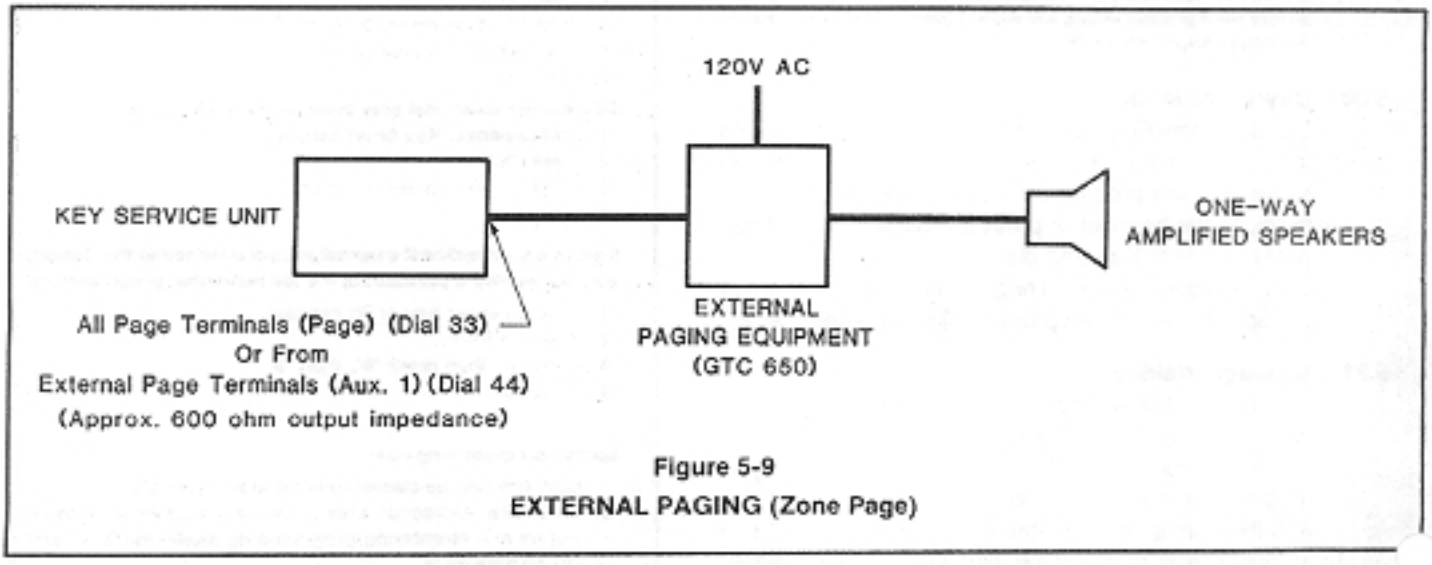

Figure 5-9
EXTERNAL PAGING (Zone Page)

Figure 5-10
FEATURE KEYS OF COHORT

FEATURE	SPECIAL FUNCTION KEYS	DIAL PAD KEYS
Pick Up CO Lines	CO Key	
Place CO Call on Hold	HOLD	
Privacy Release of CO Line	Press and hold CO key down	
Speed Dialing on CO Line	SHIFT	+ 10-19 (10 Station Numbers) or 20-49 (30 System Numbers)
Do Not Disturb on or off (Can be either on or off hook)	SHIFT + MUTE	
Microphone Mute on or off (Can be either on or off hook)	MUTE	
On Hook Dialing	SPEAKER	+ Any off hook function
Conference Two CO Lines	SHIFT	+ 2nd CO Line, which must be on hold
Intercom		11-26
Tone Call on Intercom	*	+ 11-26
Transfer to Intercom when on CO Line	HOLD	
All Page		33
External Page		44
Meet Me Conference		55
Call Back Intercom Number which called you	SHIFT	+ #
Last Number Redial of dialed "#" when on CO Line	SHIFT	+ #
Flash (.510 seconds) (when on CO Line)	SHIFT	+ 0
Message Waiting Recall	SHIFT	+ *
Pulse to Tone (when on CO Line and in D.P.)	SHIFT	+ *
Intercom Ring Only at your extension	SHIFT	+ 1
Intercom Ring Off Only at your extension	SHIFT	+ 4
Background Music on or off	SHIFT	+ 2
Change from Alarm Tone or Door Bell Tone	SHIFT	+ 5
Program Day Mode (Operator Only) (Ext. 11) (Must be off hook)	SHIFT	+ 3
Program Night Mode (Operator Only) (Ext. 11) (Must be off hook)	SHIFT	+ 6
To Enter Program Mode	SHIFT	+ 7 + N

(N + 1, 2, 3, 4, 5, 6, 7, 8, 9, 0)

N = 1 — *Program System Speed Numbers*
N = 2 — *Program Clock*
N = 3 — *Program Day CO Line Rings*
N = 6 — *Program Night CO Line Rings*
N = 7 — *Program Personal Speed Numbers*
N = 4, 5, 8, 9,0 — *Not used at this time*

NOTE: When using SHIFT function, you must be off hook, except Do Not Disturb.

7.17 Normally-open or normally-closed contact alarms are connected to TB1 alarm on power regulator PCB terminal strip (see Figure 7-3).

7.18 External paging amplifier equipment can be connected to either Aux. 1, Aux. 2 or Page on the power regulator P C B terminal strip. (Refer to Section 5.34).

7.19 To change the music-on-hold tune, move plug P1 and/or P2 to different pins on J1 and/or J2 (see figure 7-3).

7.20 To eliminate music-on-hold, remove music chip from power regulator board (see Figure 7-3).

7.21 To attach external ringers and paging systems which can be accessed from a Cohort subset, see Figure 7-4.

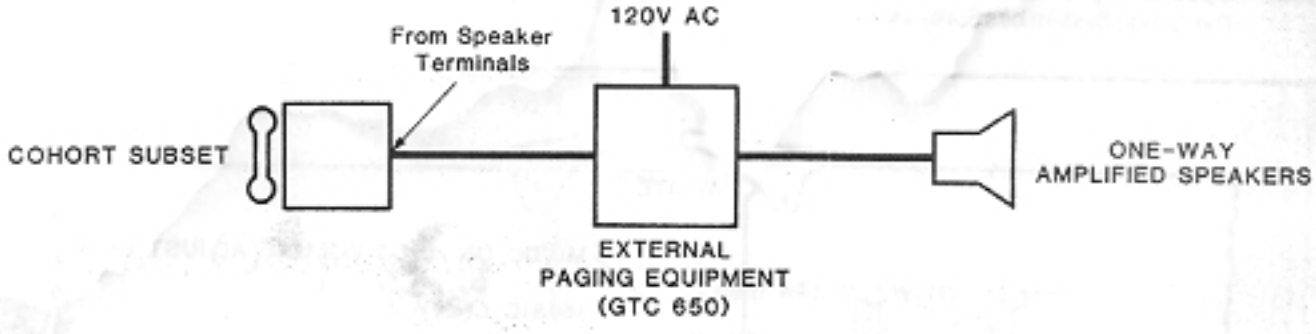

Figure 7-4
EXTERNAL RINGING/PAGING FROM SUBSET

8. PROGRAMMING

8.01 This section describes on-site programming done at the time of installation or later by the customer. The Cohort is a full-featured electronic key system and requires little user programming.

8.02 **IMPORTANT:** The Cohort system should be cleared of all unwanted memory when first starting-up. After the jumper connector has been properly placed into the correct position for battery backup on the CPU board (Refer to Section 7.05), the installer should do the following from the attendant's subset (station #11). Lift the handset, press Shift key, then press "7", "9", "1" and then return the handset and wait 2 seconds. The system is now cleared and ready for programming and use.

8.03 The following options should be done by a qualified serviceman. The CPU card (red lever) has a DIP switch (S2, blue in color) with eight switches. The eight switches are in the "off" position when a CPU line card is shipped.

8.04 Switch S2-1 in the "off" position places the system in the DTMF (tone) mode. Placing the switch in the "on" position will convert the system to dial pulse.

8.05 Switch S2-2 is the alarm switch. In the "off" position the alarm feature must be activated by a normally-open contact type alarm circuit. The switch placed in the "on" position allows the use of a normally-closed circuit alarm.

8.06 Switch S2-3 allows the automatic hold recall to be set for only the attendant station (#11) or to be set for all telephone sets in the system. When the S2-3 switch is in the "off" position, only the attendant station will receive hold recall. By setting the switch in the "on" position, all telephone sets will receive hold recall.

8.07 The Cohort hold recall tone can be changed from 60 seconds to 120 seconds. When Switch S2-4 is in the "off" position, hold recall will occur after 60 seconds. Placing the switch in the "on" position will change the recall time to 120 seconds.

8.08 Switch S2-5 is for inter-digit pause length when in the dial pulse mode. When in the "off" position, the pause is 420 milliseconds. When in the "on" position, the pause is 840 milliseconds.

8.09 The switch S2-6 is used to change the ringing/tone intercom call sequence. When the switch is in the "off" position, tone intercom calls are made by dialing the intercom extension number, and ringing intercom calls are made by pressing "*" and then dialing the intercom extension number. By placing the switch in the "on" position, the access to these functions is reversed

Figure 5-10

FEATURE KEYS OF COHORT

FEATURE	SPECIAL FUNCTION KEYS	DIAL PAD KEYS
Pick Up CO Lines	CO Key	
Place CO Call on Hold	HOLD	
Privacy Release of CO Line	Press and hold CO key down	
Speed Dialing on CO Line	SHIFT	+ 10-19 (10 Station Numbers) or 20-49 (30 System Numbers)
Do Not Disturb on or off (Can be either on or off hook)	SHIFT + MUTE	
Microphone Mute on or off (Can be either on or off hook)	MUTE	
On Hook Dialing	SPEAKER	+ Any off hook function
Conference Two CO Lines	SHIFT	+ 2nd CO Line, which must be on hold
Intercom		11-26
Tone Call on Intercom	*	+ 11-26
Transfer to Intercom when on CO Line	HOLD	
All Page		33
External Page		44
Meet Me Conference		55
Call Back Intercom Number which called you	SHIFT	+ #
Last Number Redial of dialed "#" when on CO Line	SHIFT	+ #
Flash (.510 seconds) (when on CO Line)	SHIFT	+ 0
Message Waiting Recall	SHIFT	+ *
Pulse to Tone (when on CO Line and in D.P.)	SHIFT	+ *
Intercom Ring Only at your extension	SHIFT	+ 1
Intercom Ring Off Only at your extension	SHIFT	+ 4
Background Music on or off	SHIFT	+ 2
Change from Alarm Tone or Door Bell Tone	SHIFT	+ 5
Program Day Mode (Operator Only) (Ext. 11) (Must be off hook)	SHIFT	+ 3
Program Night Mode (Operator Only) (Ext. 11) (Must be off hook)	SHIFT	+ 6
To Enter Program Mode	SHIFT	+ 7 + N

(N + 1, 2, 3, 4, 5, 6, 7, 8, 9, 0)

N = 1 — *Program System Speed Numbers*
N = 2 — *Program Clock*
N = 3 — *Program Day CO Line Rings*
N = 6 — *Program Night CO Line Rings*
N = 7 — *Program Personal Speed Numbers*
N = 4, 5, 8, 9,0 — *Not used at this time*

NOTE: When using SHIFT function, you must be off hook, except Do Not Disturb.

6. SITE REQUIREMENTS

6.01 This section details additional items which must be considered before installation of the Cohort System.

6.02 The power supply should be placed within reach of a 120V AC wall service outlet. The outlet should not be controlled by an external switch which could accidentally be turned off. The AC circuit should be on a separate circuit from all other equipment.

6.03 The power supply and KSU should be mounted on a backboard. Appropriate wall space should be provided for the units.

6.04 A good earth ground, such as a metal cold water pipe or ground rod, must be accessible.

6.05 Determine the quantity and location of the telephone sets, and plan for wiring and modular block requirements.

6.06 Allow for expansion of the system in all plans.

6.07 Easy access for service should be provided.

6.08 The following location should be avoided as KSU installation sites:

1. Near heat- or steam-producing equipment.
2. In extremely dusty atmospheres.
3. Areas with extreme temperatures and humidity.
4. In a passageway where vehicles or equipment are moved.
5. Near a copy or reproducing machine, or in the vicinity of RF (Radio-Frequency) fields.

6.09 The temperature of the equipment room should be maintained between 0°C (32°F) and 50°C (122°F).

7. INSTALLATION

7.01 Cabinet Installation

Remove the KSU from the shipping carton. Remove the four screws holding the cover on the KSU and remove cover. Remove any packing material in the KSU. Printed circuit boards (PCBs) will be shipped separately from the cabinet. Figure 5-6 is an exploded view of the Cohort KSU, associated PCBs and Power Supply.

CAUTION: The cabinet contains static-sensitive components. Personnel handling PCBs or wiring must have knowledge of proper handling techniques, and the necessary safeguard equipment for protection of the static-sensitive devices.

7.02 Mount the power supply within reach of a 120V AC outlet not controlled by an external switch. The screw holes are provided for mounting the power supply. A two-wire adapter may be used if system is grounded separately through a ground rod or a cold water pipe ground.

WARNING: Hazardous voltages may be present and exposed on the power supply. Exercise caution to avoid the possibility of shock.

7.03 Mount the KSU on a backboard using four bolts or screws in the holes provided.

7.04 Connect the KSU and power supply using the cord provided. Plug in power supply and check for any blown fuses. Plug in power line card (white lever) by using guides in KSU frame. Press firmly to insure PCB is in the backplane connector.

NOTE: All Cohort PCBs levers are color coded to match designation strips on KSU frame. Always align matching colors to insure proper operation of system.

CAUTION: The power supply should be unplugged whenever a printed circuit board is to be removed or installed, whenever new station connections are made, and whenever work is performed on existing connections. Failure to disconnect the power supply could result in a blown fuse or damage to a PCB.

7.05 Unplug the power supply and insert the remaining PCBs into the KSU. Plug in the power supply and recheck for any blown fuses. Unplug the power supply.

NOTE: The GAI-Tronics 69078-001 CPU PCB is equipped w battery back-up for program storage during periods when power is disrupted.

This PCB has a three point post head located at the side of the battery in position J2.

GAI-Tronics has shipped the black jumper connector on pins 2 and 3 of the post head. To activate the battery back-up, simply remove the black jumper and place on pins 1 and 2.

7.06 Station Cabling

A 66-type connecting block with RJ11C modular jacks should be mounted near the right side of the KSU. The connecting block will be used to cross-connect each station to the KSU.

7.07 Use two-pair twisted cable for connection between the KSU and the modular connecting blocks for each station. All station cables must be home run. The maximum cable length is 500' from the KSU.

7.08 The station cable is terminated at the station location in a standard four-conductor modular jack. Modular jack assemblies should have screw terminals. Connect the red, green, yellow, and black conductors on the station cable to the corresponding screw.

7.09 At the KSU, punch down each conductor on the block as follows:

Color	Function
Red	Audio
Green	Audio
Yellow	+24V DC
Black	COM

Refer to Table 7-1 for complete cable color codes.

Figure 7-1
STATION BLOCK CONNECTIONS

Color Codes: Wh = White, Bl = Blue, Or = Orange, Gn = Green, Bn = Brown, Sl = Slate, Vio = Violet, Yw = Yellow, Rd = Red, Bk = Black

25 Pair Cable	Twisted Station Cable	Flat Station Cable
Wh/Bl	Wh/Bl	Rd
Bl/Wh	Bl/Wh	Gn
Wh/Or	Wh/Or	Yw
Or/Wh	Or/Wh	Bk
Wh/Gn	Wh/Bl	Rd
Gn/Wh	Bl/Wh	Gn
Wh/Bn	Wh/Or	Yw
Bn/Wh	Or/Wh	Bk
Wh/Sl	Wh/Bl	Rd
Sl/Wh	Bl/Wh	Gn
Rd/Bl	Wh/Or	Yw
Bl/Rd	Or/Wh	Bk
Rd/Or	Wh/Bl	Rd
Or/Rd	Bl/Wh	Gn
Rd/Gn	Wh/Or	Yw
Gn/Rd	Or/Wh	Bk
Rd/Bn	Wh/Bl	Rd
Bn/Rd	Bl/Wh	Gn
Rd/Sl	Wh/Or	Yw
Sl/Rd	Or/Wh	Bk
Bk/Bl	Wh/Bl	Rd
Bl/Bk	Bl/Wh	Gn
Bk/Or	Wh/Or	Yw
Or/Bk	Or/Wh	Bk

25 Pair Cable	Twisted Station Cable	Flat Station Cable
Bk/Gn	Wh/Bl	Rd
Gn/Bk	Bl/Wh	Gn
Bk/Bn	Wh/Or	Yw
Bn/Bk	Or/Wh	Bk
Bk/Sl	Wh/Bl	Rd
Sl/Bk	Bl/Wh	Gn
Yw/Bl	Wh/Or	Yw
Bl/Yw	Or/Wh	Bk
Yw/Or	Wh/Bl	Rd
Or/Yw	Bl/Wh	Gn
Yw/Gn	Wh/Or	Yw
Gn/Yw	Or/Wh	Bk
Yw/Bn	Wh/Bl	Rd
Bn/Yw	Bl/Wh	Gn
Yw/Sl	Wh/Or	Yw
Sl/Yw	Or/Wh	Bk
Vio/Bl	Wh/Bl	Rd
Bl/Vio	Bl/Wh	Gn
Vio/Or	Wh/Or	Yw
Or/Vio	Or/Wh	Bk
Vio/Gn	Wh/Bl	Rd
Gn/Vio	Bl/Wh	Gn
Vio/Bn	Wh/Or	Yw
Bn/Vio	Or/Wh	Bk
Vio/Sl	Wh/Bl	Rd
Sl/Vio	Bl/Wh	Gn

7.10 To install the telephone sets, plug the mounting cord from the set into the modular jack.

7.11 At the KSU, plug a four-wire modular cord into the 66-type connecting block mounted near the KSU. Start with the location which terminates Station 11. Each station line card (black lever) has four modular receptacles. The first station line card has receptacles for Stations 11-14. Plug modular cord into receptacle for Station 11. Follow this sequence until all stations have been connected to the connecting block and the KSU station line cards.

7.12 The attendant station (Number 11) has a busy lamp field for monitoring busy stations. An additional home run two-pair cable and modular jack must be insta. at that station location for the busy lamp field. At the KSU, cross connect a two-pair modular cord between the connecting block location where Station 11's busy lamp cable appears, and the modular receptacle on the CPU line card (red lever).

7.13 The attendant station must be disassembled for installation of the busy lamp cord. Remove the screws holding the base of the station and remove base. Insert one end of modular cord into the modular receptacle in the set housing. A plastic knockout is provided in the base for dressing the modular cord out of the telephone set. Replace base, plug the cord into the additional modular jack at the station location.

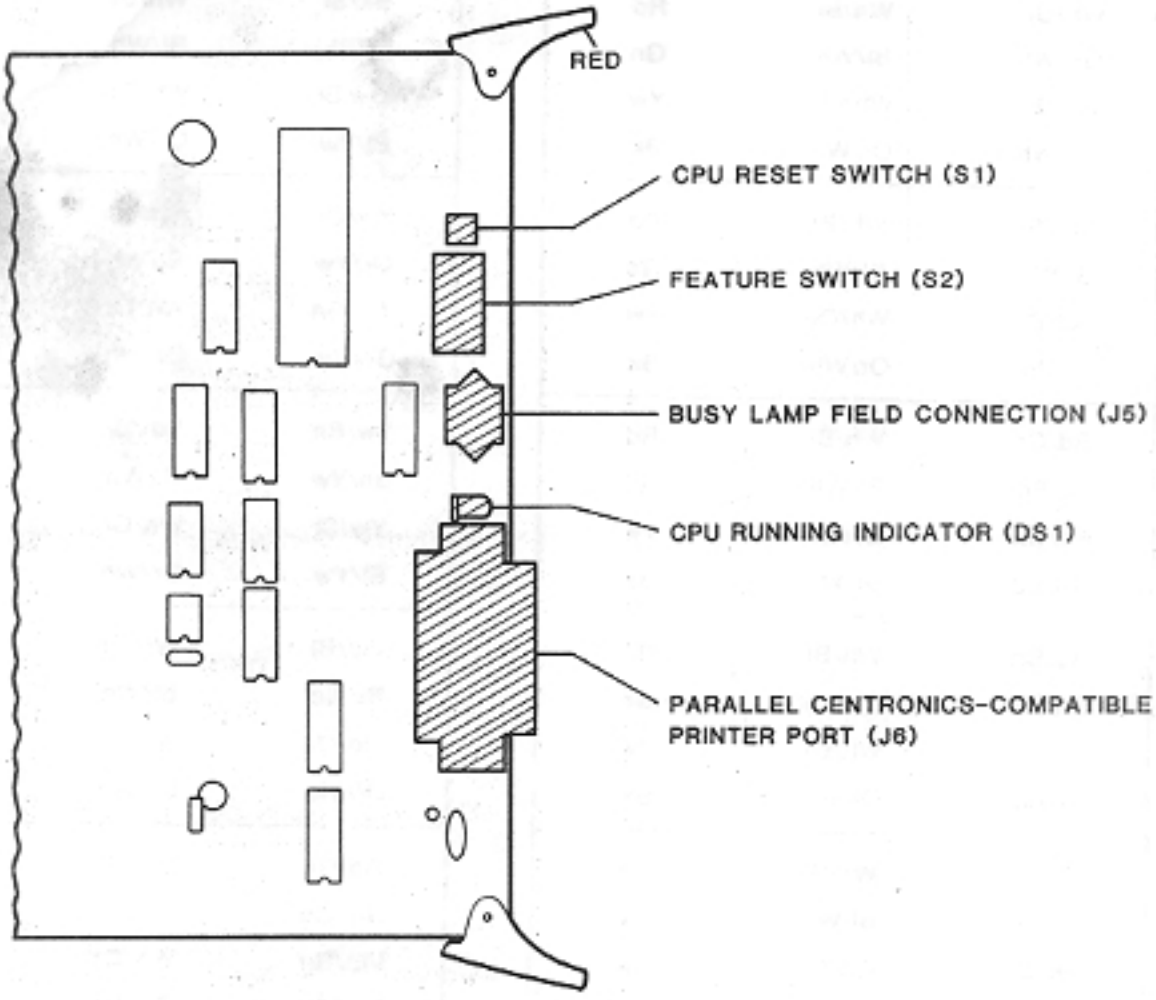

Figure 7-2
CENTRAL PROCESSING UNIT PCB
Optional Equipment Connections

7.14 Connecting Telco Lines

Each RJ11C modular jack from the Telco provides service for one C.O. line. Use a four conductor modular cord to connect each C.O. line into the KSU. The KSU C.O. line cards (blue lever) each contain three C.O. lines. Connect one end of the modular cord into the Telco jack and the other into the C.O. line card receptacles in the order you want the telephone numbers to appear.

7.15 Optional Equipment Connections

The Cohort System has Station Message Detail Recording (SMDR) capability. To access the SMDR feature,an external user-supplied printer must be connected to the 25 pin connector on the CPU line card (Figure 7-2) through the Printer Port access hole. (Refer to Section 5.27).

7.16 Connect a music tuner to TB1 Aux. 1 on power regulator PCB terminal strip (See Figure 7-3). The music tuner must be able to source .35 VRMS into 600 ohm load. The music tuner must have adjustable level output for regulating background music volume (Refer to Section 5.29).

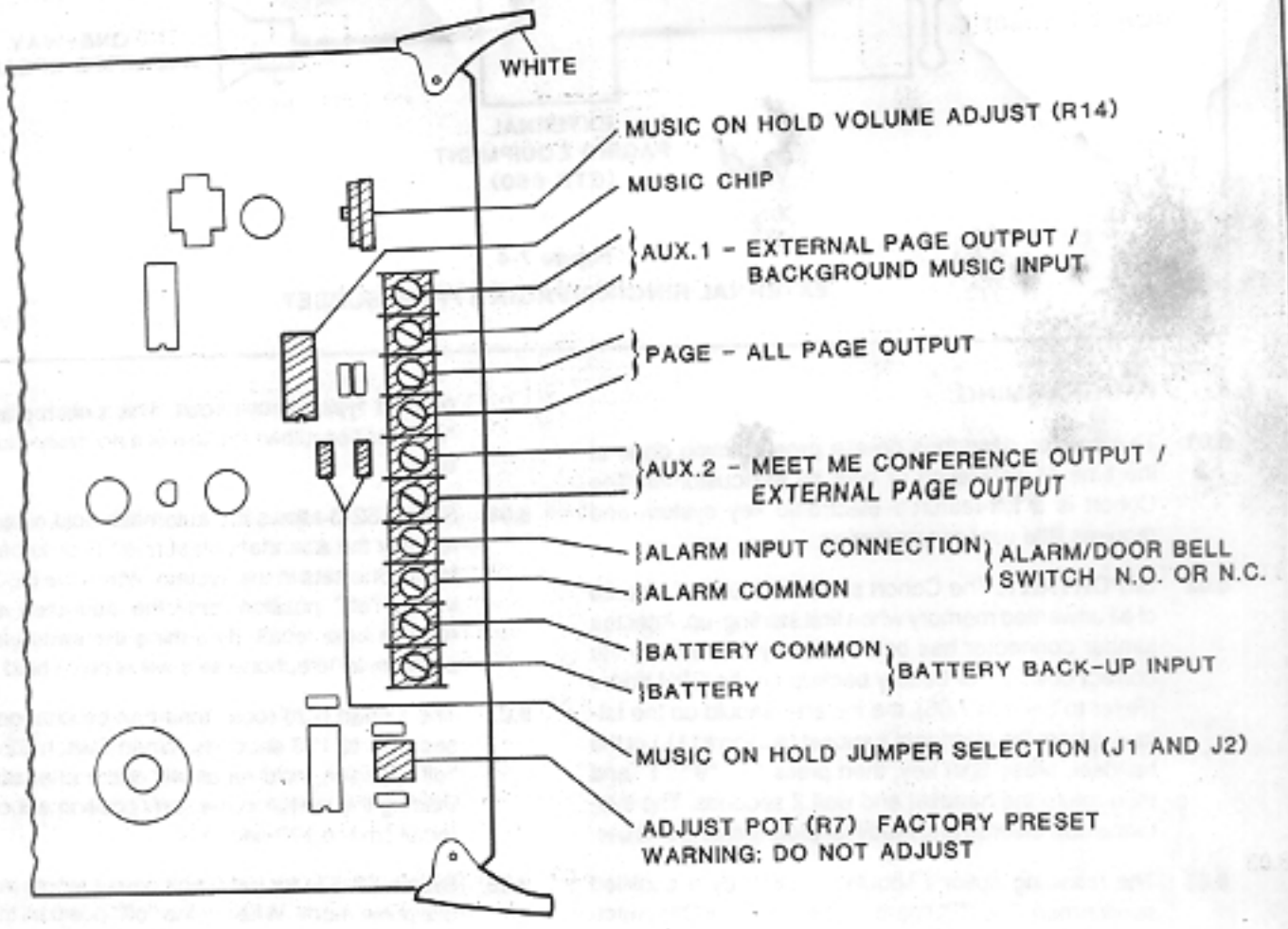

Figure 7-3
POWER REGULATOR PCB
Optional Equipment Connections

7.17 Normally-open or normally-closed contact alarms are connected to TB1 alarm on power regulator PCB terminal strip (see Figure 7-3).

7.18 External paging amplifier equipment can be connected to either Aux. 1, Aux. 2 or Page on the power regulator P C B terminal strip. (Refer to Section 5.34).

7.19 To change the music-on-hold tune, move plug P1 and/or P2 to different pins on J1 and/or J2 (see Figure 7-3).

7.20 To eliminate music-on-hold, remove music chip from power regulator board (see Figure 7-3).

7.21 To attach external ringers and paging systems which can be accessed from a Cohort subset, see Figure 7-4.

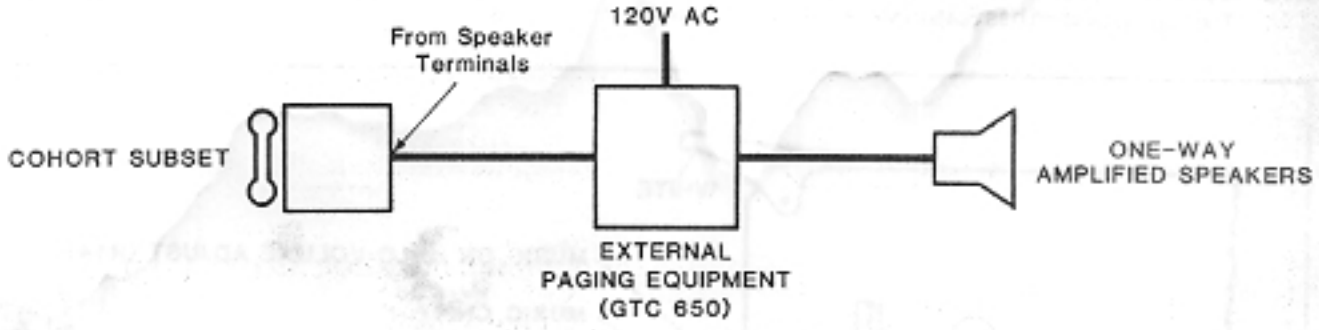

Figure 7-4
EXTERNAL RINGING/PAGING FROM SUBSET

8. PROGRAMMING

8.01 This section describes on-site programming done at the time of installation or later by the customer. The Cohort is a full-featured electronic key system and requires little user programming.

8.02 **IMPORTANT:** The Cohort system should be cleared of all unwanted memory when first starting-up. After the jumper connector has been properly placed into the correct position for battery backup on the CPU board (Refer to Section 7.05), the installer should do the following from the attendant's subset (station #11). Lift the handset, press Shift key, then press "7", "9", "1" and then return the handset and wait 2 seconds. The system is now cleared and ready for programming and use.

8.03 The following options should be done by a qualified serviceman. The CPU card (red lever) has a DIP switch (S2, blue in color) with eight switches. The eight switches are in the "off" position when a CPU line card is shipped.

8.04 Switch S2-1 in the "off" position places the system in the DTMF (tone) mode. Placing the switch in the "on" position will convert the system to dial pulse.

8.05 Switch S2-2 is the alarm switch. In the "off" position the alarm feature must be activated by a normally-open contact type alarm circuit. The switch placed in the "on" position allows the use of a normally-closed circuit alarm.

8.06 Switch S2-3 allows the automatic hold recall to be set for only the attendant station (#11) or to be set for all telephone sets in the system. When the S2-3 switch is in the "off" position, only the attendant station will receive hold recall. By setting the switch in the "on" position, all telephone sets will receive hold recall.

8.07 The Cohort hold recall tone can be changed from 60 seconds to 120 seconds. When Switch S2-4 is in the "off" position, hold recall will occur after 60 seconds. Placing the switch in the "on" position will change the recall time to 120 seconds.

8.08 Switch S2-5 is for inter-digit pause length when in the dial pulse mode. When in the "off" position, the pause is 420 milliseconds. When in the "on" position, the pause is 840 milliseconds.

8.09 The switch S2-6 is used to change the ringing/tone intercom call sequence. When the switch is in the "off" position, tone intercom calls are made by dialing the intercom extension number, and ringing intercom calls are made by pressing "*" and then dialing the intercom extension number. By placing the switch in the "on" position, the access to these functions is reversed

Tone intercom calls are made by first pressing "*" and then the intercom extension number, and ringing intercom calls are made by dialing only the intercom extension number. All ringing intercom calls must be answered by using the handset.

8.10 Switch S2-7 is used to allow one digit to be dialed behind a PBX before toll restriction will be functional. If no digit is required, the S2-7 Switch must be in the "off" position. If a digit is needed, turn the switch to "on".

8.11 The S2-8 switch controls the use of background music. If no external tuner is being used, leave S2-8 in the "off" position. By placing the S2-8 in the "on" position, the background music feature may be used.

NOTE: Figure 8-1 describes the functions of the DIP switch.

8.12 If the Cohort is set for pulse dial, calls may be made by DTMF by pressing Shift Key plus "*" and then the telephone number.

8.13 To increase or decrease the volume of the synthesized music, adjust the blue POT (potentiometer R-14) on the power regulator card using a screwdriver. (See Figure 7-3).

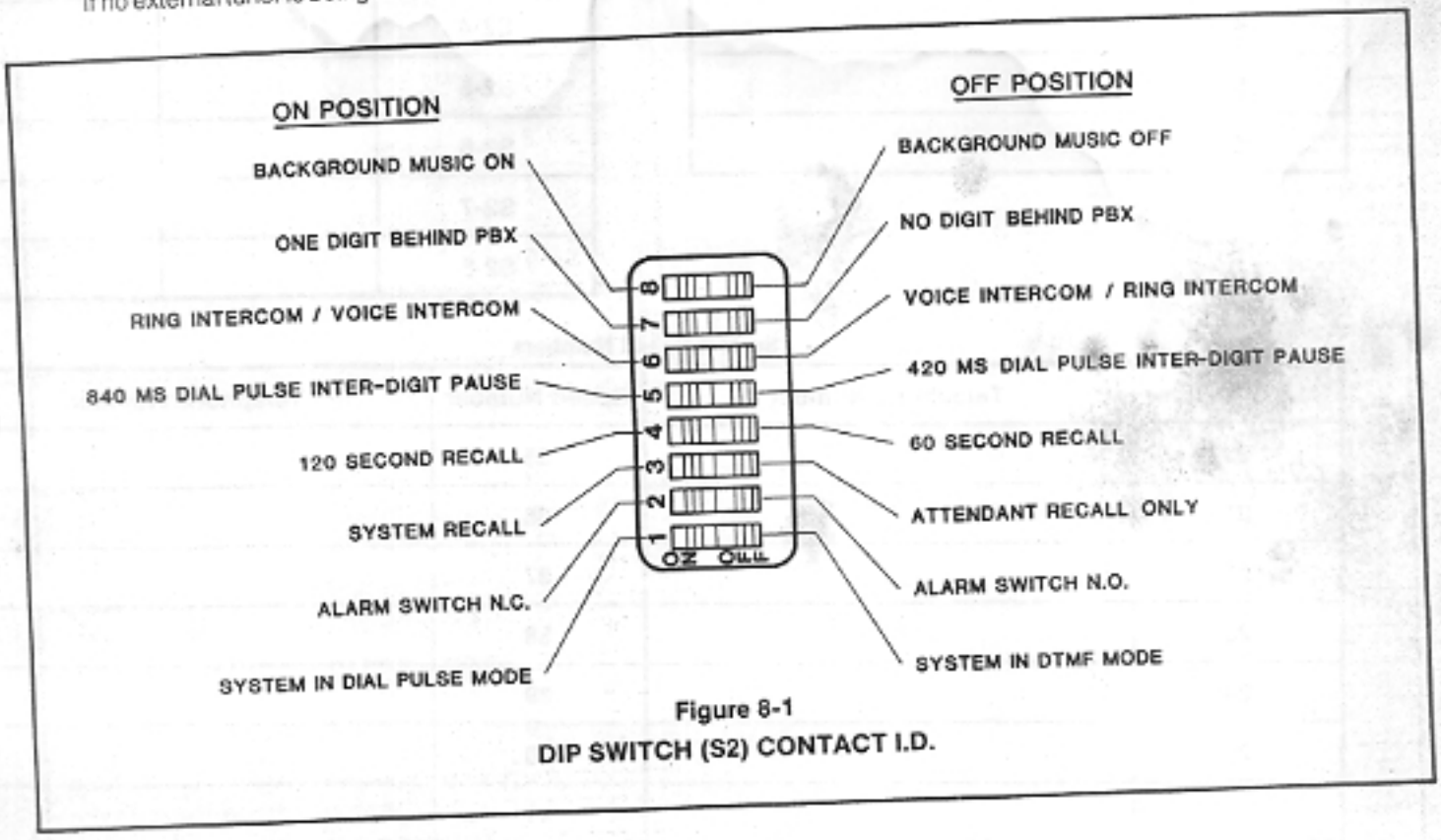

Figure 8-1
DIP SWITCH (S2) CONTACT I.D.

9. PROGRAMMING RECORD

9.01 Figure 9.1 (System Configuration) and Figure 9.2 (Station Configuration) provide for keeping accurate records of the Cohort programming. A copy of the Programming Record should be kept with the KSU at the installation site.

Figure 9-1
SYSTEM PROGRAMMING RECORD

C.O. Line Assignments

C.O. Line	Telephone Number
1	
2	
3	
4	
5	
6	

DIP Switch Contact Positions (See Figure 8-1)

Contact	On	Off
S2-1		
S2-2		
S2-3		
S2-4		
S2-5		
S2-6		
S2-7		
S2-8		

System Speed Numbers

Speed Number	Telephone Number	Speed Number	Telephone Number
20		35	
21		36	
22		37	
23		38	
24		39	
25		40	
26		41	
27		42	
28		43	
29		44	
30		45	
31		46	
32		47	
33		48	
34		49	

Figure 9-2

STATION PROGRAMMING RECORD

Station Speed Numbers

Speed Number	Telephone Numbers			
	Station 11	Station 12	Station 13	Station 14
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
	Station 15	Station 16	Station 17	Station 18
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
	Station 19	Station 20	Station 21	Station 22
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
	Station 23	Station 24	Station 25	Station 26
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				

Figure 9-2
STATION PROGRAMMING RECORD (Continued)

Toll Restriction Class Rating and Flexible C.O. Rings Record

Instructions: Insert class designations (A thru D) in appropriate columns (See Figure 5-7) and check blocks which correspond to a station's line that rings in the day or night mode.

	C.O. Line	Day	Night	Class
Station 11	1			
	2			
	3			
	4			
	5			
	6			
Station 12	1			
	2			
	3			
	4			
	5			
	6			
Station 13	1			
	2			
	3			
	4			
	5			
	6			
Station 14	1			
	2			
	3			
	4			
	5			
	6			
Station 15	1			
	2			
	3			
	4			
	5			
	6			
Station 16	1			
	2			
	3			
	4			
	5			
	6			
Station 17	1			
	2			
	3			
	4			
	5			
	6			
Station 18	1			
	2			
	3			
	4			
	5			
	6			
Station 19	1			
	2			
	3			
	4			
	5			
	6			
Station 20	1			
	2			
	3			
	4			
	5			
	6			
Station 21	1			
	2			
	3			
	4			
	5			
	6			
Station 22	1			
	2			
	3			
	4			
	5			
	6			
Station 23	1			
	2			
	3			
	4			
	5			
	6			
Station 24	1			
	2			
	3			
	4			
	5			
	6			
Station 25	1			
	2			
	3			
	4			
	5			
	6			
Station 26	1			
	2			
	3			
	4			
	5			
	6			

0. MAINTENANCE

CAUTION: The Cohort System contains static-sensitive components. Personnel handling the PCBs or wiring must have knowledge of proper handling techniques for static-sensitive components.

CAUTION: Disconnect all power sources before removing or installing PCBs.

10.01 The following are standard handling procedures for static-sensitive devices.

1. Before handling a PCB, touch the equipment framework or any other grounded item to dissipate stored charges.
2. Hold the PCBs by the edges.
3. Cover work surfaces with a conductive material connected to ground. A static-protective bag with a ground clip provides adequate protection.
4. Store PCBs in static-protective bags.

10.02 To install a PCB in the KSU, engage the edges of the PCB in the guides and push PCB all the way in. To remove, use the release levers and pull the front edge of the PCB.

NOTE: Match colors of card release levers with color names on designation strips.

10.03 With the exception of fuse replacement on individual printed circuit boards, Cohort units are not field repairable. Any Cohort PC board, telephone set, attendant telephone set, or power supply which fails during operation should be replaced with a new or refurbished unit. The interconnect or service company who makes the field replacement should contact an authorized Cohort distributor to return defective parts. The distributor is to be the sole contact with GAI-Tronics concerning repairs.

10.04 Goods sold hereunder are warranted to be free from defects in material and workmanship until one year after the date of shipment. The warranty contained in this document is in lieu of and excludes all other warranties whether express or implied by operation of law or otherwise including any warranty of merchantability or fitness for particular purpose.

10.05 Every claim by Buyer alleging that goods sold hereunder are defective (whether such claim alleges that such defect has arisen from the negligence of Seller, its suppliers, agents, or employees; breach of warranty; breach of contract; strict or absolute liability in tort; or other act, error or omission; or from any other cause whatsoever; or any combination of the foregoing) shall be deemed waived unless such claim is made in writing within the applicable warranty period set forth in Section 10.04. However, if the defect complained of is latent and not discoverable within such warranty period, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

0.06 If (a) Seller's goods are defective in workmanship and/or material and (b) Buyer's claim is made in accordance with this Section 10.05, Buyer may return such goods to Seller, upon which they will be either repaired or replaced, at Seller's option, without charge to Buyer. (However, all charges in connection with removal and reinstallation will not be borne by Seller.)

10.07 The remedies set forth in this Section 10.05 are in lieu of and exclude all other remedies available to Buyer and constitute Buyer's exclusive remedies against Seller regardless of whether Buyer's claim arises from the negligence of seller, its suppliers, agents, or employees; breach of warranty; breach of contract; strict or absolute liability in tort; or other act, error or omission; or from any other cause whatsoever; or any combination of the foregoing.

10.08 Should a supply house determine a Cohort item has failed, a return authorization number (RA#) should be obtained from GAI-Tronics by calling (215) 777-1374.

10.09 The defective part should be shipped, pre-paid, to GAI-Tronics with the return authorization number and a Cohort distributor's purchase order number. GAI-Tronics will accept returns from sources other than authorized supply houses, but not without a distributor being called first and the proper documentation (RA and PO number) included with the return.

10.10 Ship all items to the following address:

GAI-Tronics Corporation
Customer Service Department
400 E. Wyomissing Avenue
Mohnton, PA 19540

RA # _____

NOTE: Call Customer Service at (800) 523-4303 or (215) 777-1374 for a return authorization number before shipment.

10.11 Limited preventative maintenance can be done on the Cohort KSU. Connections and wires can be inspected for breaks. According to environmental conditions, dust may build up on the PCBs. They may be cleaned with a soft, long-bristled brush. **Do not insert** a vacuum cleaner intake into the equipment.

10.12 When a fault is encountered in the Cohort, the first step is to determine if it is a system or a station fault. A system fault is evident in all stations (e.g. - No lights on all stations). A station failure is localized to one station (e.g. - Loss of lights on one station).

10.13 Figure 10-1 is a list of fuses in the Cohort System.

10.14 Figure 10-2 is a guide to locating and correcting faults in the Cohort System.

Figure 10-1
LIST OF FUSES

Power Line Board	1	7/10 Amp Slow Blow
	1	4 Amp Fast Blow
	1	4 Amp Slow Blow
C.O. Line Board	2	3/10 Amp Slow Blows
Station Board	1	2 Amp Slow Blow
	1	3/10 Amp Slow Blow
	4	1 Amp Pico Fuses
CPU Board	1	1 Amp Pico Fuse

Figure 10-2
FAULT DIAGNOSIS

Fault	Indicators	Cause	Corrective Action
System is completely inoperative or System Feature is completely inoperative	LED Light Off CPU PCB Is Off	No AC Power	Check Fuses on Power Supply
			Check All AC Connections
			Verify AC Power
		No DC Power	Verify Power Supply DC Output
			Check Power Supply Fuse
		Faulty Power Reg.	Replace Power Reg. PCB
		System fuses blown	Check and Replace Fuses
		Faulty CPU PCB	Replace CPU PCB
One station is inoperative	LEDS of Station will not function	Faulty Telephone	Replace Telephone
		Faulty Station Cable	Replace Cable
		Defective Cable Terminations	Reterminate Cable
		Defective Cable at KSU	Replace KSU Cable
		Faulty Connecting Blocks	Replace Blocks
		Faulty Fuses	Check and Replace Fuses
Group of Stations inoperative	LEDS of Stations will not function	Faulty Fuses	Check and Replace Fuses
		Faulty Station Line Card	Replace Line Card
One incoming number is inoperative	No dial tone or incoming calls on that number at all stations	Faulty C.O. Cable Pair	Disconnect Cohort from faulty number. Verify dial tone at telephone company interface. Call Telco.
		Faulty C.O. Line Card	Replace Line Card
Group of Incoming C.O. numbers are inoperative	No dial tone or incoming calls for these numbers at all stations	Faulty C.O. Cable Pairs	Disconnect Cohort from all faulty numbers. Verify dial tone at telephone company interface. Call Telco.
		Faulty C.O. Line Card	Replace defective Line Card