I-SERIES INTERCOM STATIONS

INSTRUCTION MANUAL

i-Series Instruction Manual

Part Number 810305 Rev. 2

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IMPORTANT SAFETY INSTRUCTIONS

Please read and follow these instructions before operating an i-station.

For your safety, it is important to read and follow these instructions before operating an i-station:

(1) **WARNING:** To reduce the risk of fire or electric shock, do not expose an i-station to rain or moisture. Do not operate an i-station near water, or place objects containing liquid on it. Do not expose an i-station to splashing or dripping water.

(2) For proper ventilation, make sure ventilation openings are not blocked. Install the i-station according to the directions in the Installation Chapter of this manual.

(3) Do not install an i-station near a heat source such as a radiator, heat register, stove, or other apparatus (including amplifiers) that produces heat. Do not place naked flame sources such as candles on or near an i-station.

(4) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades, with one blade wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

(5) Protect the power plug from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the i-station's chassis.

(6) Only use attachments/accessories specified by Clear-Com Intercom Systems.

(7) Unplug the i-station during lightning storms or when unused for long periods of time.

(8) Refer all servicing to qualified service personnel. Servicing is required when:

- The i-station has been damaged in any way, such as when a power-supply cord or plug is damaged.
- Liquid has been spilled or objects have fallen into the i-station's chassis.
- The i-station has been exposed to rain or moisture.
- The i-station does not operate normally.
- The i-station has been dropped.

Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on an i-station, they warn you of the potential danger of electric shock if the i-station is used improperly. They also refer you to important operating and maintenance instructions in the manual.

This symbol alerts you to the presence of uninsulated dangerous voltage within the product's enclosure that might be of sufficient magnitude to constitute a risk of electric shock. Do not open the product's case.

This symbol informs you that important operating and maintenance instructions are included in the literature accompanying this product.

Figure 1: Safety Symbols

OPERATING AN I-SERIES INTERCOM STATION

The i series of intercom stations for the Eclipse matrix system represent an innovative concept in intercom station design. Each station is constructed from several individual units called modules, which can be added or removed in the field, giving you exceptional flexibility in planning a station's initial configuration and then easily changing the configuration as future operational needs change.

Clear-Com i-series intercom stations are designed with configurable front and back panels.

FEATURES OF I-SERIES INTERCOM STATIONS

The i-series design emphasizes simplicity. No specialized training is required to operate an i-series station. Intuitive lighting indicates the status of keys for ease of use. Each key may be programmed as either a talk, a listen, or a talk-with-listen.

Features of the i-stations include:

- Configurable front-panel modules. You can choose the number of keys on a station—from 8 to 32—and add or remove keys as needed. Configurable expansion panels are available to give you access to up to 32 more keys, for a total of 64 keys in two rack units (2 RU) controlled by one station.
- Full graphic LED-backlit displays for each key on display stations.
- 16-button keypad module for DTMF dialing and station reprogramming.
- Individual crosspoint volume adjust on every station.
- Auto-sensing headset and microphone connectors.
- Access to multiple audio sources and multiple speaker and headset inputs and outputs when an auxiliary options module is installed. The auxiliary options module provides you with two relays and two GPIs (general-purpose inputs) that can be used either locally or system-wide.
- Advanced menu features allow you to assign new destinations and sources to your station directly from your station, to program IFB sources and destinations, to dial telephone interfaces, to transform your station into an assignment panel, to reset local volume levels, and more.

You have exceptional flexibility to plan a station's initial configuration and then easily customize the configuration as future needs change.

I-SERIES CONSTRUCTION

i-Series stations are sturdily constructed from the highest quality components. Each i-station's chassis is constructed of cold-rolled steel. Front-panel modules and removable rack ears are cast from aluminum. All external connectors and switches are made of the highest quality components and are structurally reinforced.

Keys feature long-life LED illumination. Displays are full-graphic LCD with long-life LED backlighting. LEDs are made of non-organic materials which ensure years of trouble-free use.

i-Series internal architecture is based on the widely used Motorola M-Core processor. All audio is digitized by CODECs and routed to a DSP to be controlled as desired by the user.

All i-series stations have internal power supplies.

I-SERIES MODULES

i-Series intercom stations are designed in standardized units called modules. Because the stations are designed this way, you can add or remove components, such as keys, in the field without replacing the entire intercom station. Repairing and upgrading stations is easier, faster, and less expensive. The following sections give you an overview of i-series modules.

KEY MODULE

The key module is the basic building block of an i-series intercom station. A station can accommodate from one to four key modules which can be added or removed as needed.

Each key module has eight backlit keys that glow in either green or red to indicate their talk/listen status. Each key has a 5-character alphanumeric display that shows its currently programmed assignment. The alphanumeric name of an assignment is typically called a “label.”

Display stations feature backlit LCD displays with labels that are updated instantly as you program them from the Eclipse Configuration System. Non-display stations have slots for paper labels. You can print and update paper labels from the Eclipse Configuration System. A display and non-display key module are illustrated in Figure 1.

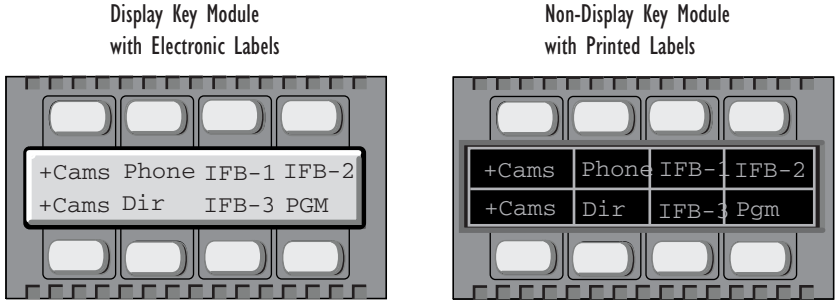


Figure 1: Key Modules

FUNCTION KEY MODULE

The function key module contains the intercom station’s basic and advanced controls. There are two types of function key modules in the i-series. The 16-key

module has a numeric keypad while the 4-key module does not, as illustrated in Figure 2.

The 4-key module contains the keys that control basic intercom functions such as switching between gooseneck/headset speakers and microphones, sending call signals, and adjusting listen levels. It has separate volume controls for intercom and program sources. The operation of the this module is discussed later in the chapter.

The 16-key module includes the basic function keys and adds a 12-button numeric keypad for dialing telephone interfaces and for programming advanced features. Advanced features allow you to:

- Temporarily deactivate all latched keys on a station.
- Override the on/off or volume settings at a destination.
- Assign new sources and destinations to your station from your station.
- Program IFB sources and destinations.
- Reset microphone and sidetone volume levels.
- Receive a variety of information about your station on the station's LCD displays.

These functions are described in detail later in this chapter.

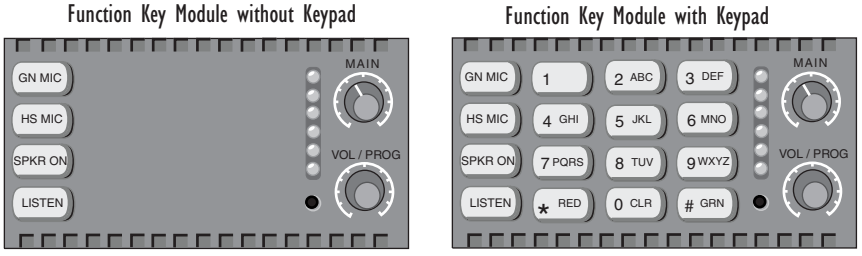


Figure 2: Function Key Modules

MIC-HEADSET MODULE

Every i-series intercom station has a mic-headset module equipped with an auto-sensing headset and microphone connector and an integrated loud speaker.

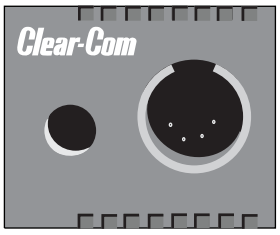


Figure 3: Mic-Headset Module

LEVEL-CONTROL MODULE

The level-control module is used in conjunction with a key module to give you a constant visual read-out of each key's volume level.

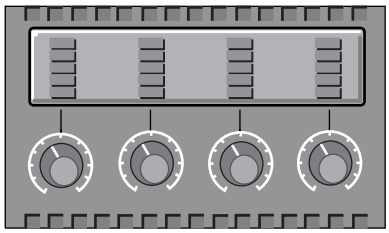


Figure 4: Level-Control Module

AUXILIARY OPTIONS MODULE

The auxiliary options module connects your i-station to a variety of audio and control functions.

The auxiliary options module connects your i-station to a variety of audio and control inputs and outputs. It is an optional module that can be installed in the factory or in the field, depending on your needs. Located on the rear-panel of the i-station's chassis, it provides the following functions:

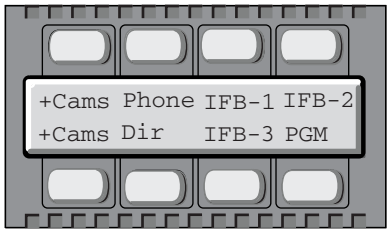
- General purpose inputs
- Relay outputs
- Speaker-feed output
- Line-level output
- Hot-microphone output
- Balanced-program input
- Auxiliary microphone input

The auxiliary option module's functions are described in detail later in this chapter.

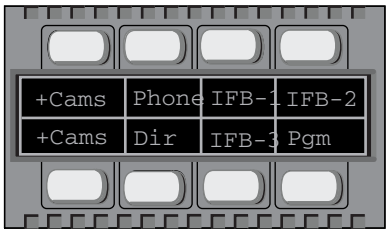
CONSTRUCTING AN I-STATION FROM MODULES

All i-series intercom stations are constructed of selected combinations of the front- and rear-panel modules. There are a total of eleven front-panel modules and two rear-panel modules in the i-series. Figure 5 on page 1-5 shows you the eleven front-panel modules. Figure 6 on page 1-6 shows you some typical i-stations formed from the basic modules.

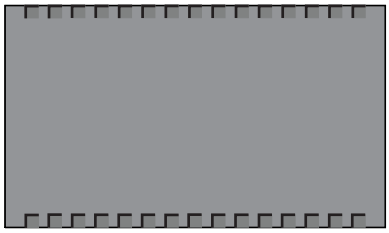
KEY MODULES



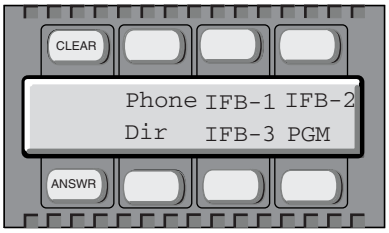
Display Key Module



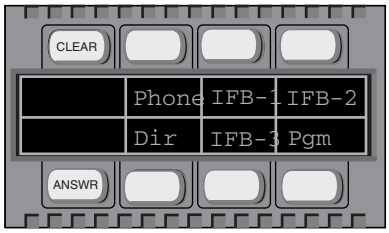
Non-Display Key Module



Blank Key Module

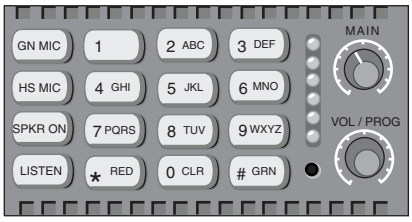


Display Key Module
with Clear and Answer Keys

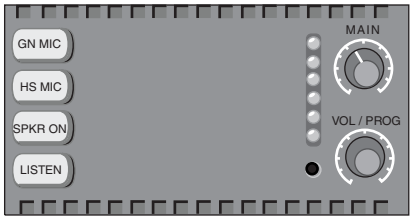


Non-Display Key Module
with Clear and Answer Keys

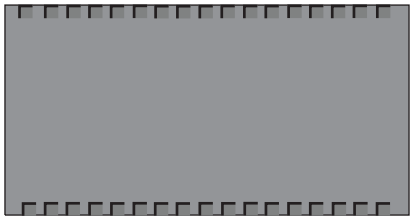
FUNCTION KEY MODULES



Function Key Module with Keypad

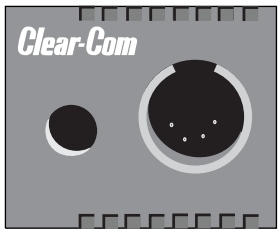


Function Key Module without Keypad

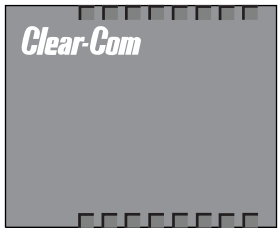


Blank Function Key Module

MIC-HEADSET MODULES

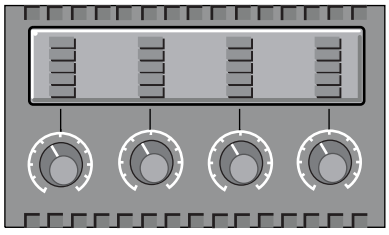


Mic-Headset Module



Blank Mic-Headset Module

LEVEL-CONTROL MODULE



Level-Control Module

Figure 5: The Eleven Front-Panel Modules

i1430 Intercom Station

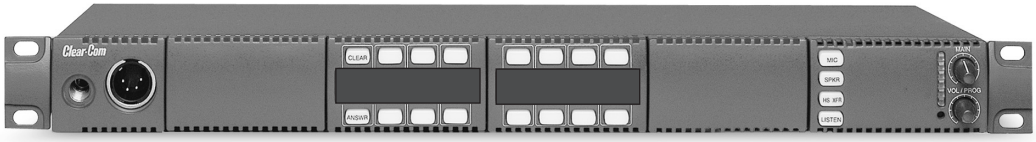
4 Display Key Modules

Function Key Module with Keypad

i1200 Intercom Station

2 Non-Display Key Modules

Function Key Module without Keypad



e1410 Key Expansion Panel

4 Display Key Modules

v1400 Volume-Control Expansion Panel

4 Volume-Control Modules

Figure 6: Typical Intercom Stations Constructed from Modules

START-UP SEQUENCES

NON-DISPLAY KEY MODULE START-UP SEQUENCE

When a station with non-display key modules is connected to power, all keys on each key module will flash red, then green, and will revert to their programmed colors (red for talk or talk-with-listen; green for listen). If there is no communication to the Eclipse matrix, the keys will flash red once per second until communication to the matrix is established.

DISPLAY KEY MODULE START-UP SEQUENCE

When a station with display key modules is connected to power, each of the display modules will show the following message:

Clear-Com
Vx.x.x@2000

"V.x.x.x" represents the firmware version of the panel. All keys will flash red, then green, and will show their programmed colors and labels if there is communication to the matrix.

If there is no communication to the matrix, the display will show the message "No connection to Eclipse." The keys will then flash red once per second until communication to the Eclipse matrix is established.

FUNCTION KEY MODULE START-UP SEQUENCE

When an intercom station is connected to power, all of the keys on the function key module will flash red, then green, and will revert to their programmed colors if there is communication to the matrix.

If there is no communication to the matrix, the keys will be dark until communication is established.

FRONT PANEL CONTROLS AND LIGHTS

A NOTE ABOUT TERMINOLOGY

In this manual, the term "source" refers to a device—intercom station, interface, beltpack, or a variety of other devices—that sends audio to your intercom station. It represents a "listen" path to your station. The term "destination" refers to a device to which you send audio. It represents a "talk" path from your intercom station.

The names of these sources and destinations appear in the display of your intercom station and are called "labels." A label is a 5-character alphanumeric name that identifies a source, destination, or control function accessed by your intercom station.

ABOUT DISPLAYS

The 5-character name, or "label," that you assign to a key is displayed next to the key on the key module. The labels on the upper row refer to their corresponding upper-row keys and the labels on the lower row refer to their corresponding lower-row keys.

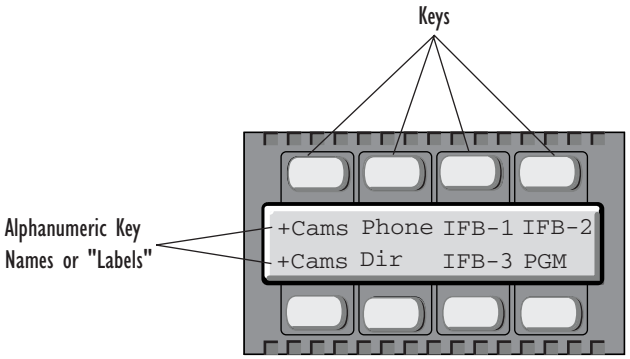


Figure 7: Key Module

Active keys are bright red or green. Non-active keys are dim red or green. Keys that are not assigned are off, with no illumination.

Display stations have full-graphic LED-backlit displays that you program from the Eclipse Configuration System. Non-display stations have metal grooves into which paper labels can be inserted. Paper labels can be printed from the Eclipse Configuration System.

ABOUT KEYS

Each key on any key module can be assigned as a talk, a listen, or a talk-with-listen from the Eclipse Configuration System. See the *Eclipse Configuration System Manual* for more information.

Temporary or Latched Action

When you press a key to talk or listen, the key can be switched on either temporarily or continuously.

When you switch a key on temporarily, it is active for the particular period of time you require. Press and hold the key down for the desired length of time needed to talk or listen, then release the key to return it to its non-active state. You will only be able to talk or listen while you press the key.

Continuous or "latched" action allows you to lock a key into place, so that you can talk or listen hands-free. Quickly tap a key to "latch" or "lock" it into place to talk or listen. The key will glow brightly to indicate that it is active. The key will remain latched until you tap it again to return it to its non-active state.

Active and Non-Active Keys

When you activate a key—that is, when you press or latch the key to talk or listen— the key becomes bright red or green. When you press or latch an assigned talk key, the key lights up bright red while you talk to the destination.

When you press or latch an assigned listen key, the key lights up bright green while you listen to the source.

Otherwise, a key that is not active—that is, a key that is not being used to talk or listen— will be dimmed: dim red for a talk or talk-with-listen key; dim green for a listen key.

Table 1 shows the key colors associated with active or non-active talk, listen, or talk-with-listen keys.

KEY	ACTIVE	NON-ACTIVE
TALK	A talk key glows bright red when you press or latch the key to talk.	A talk key glows dim red when it is not active.
LISTEN	A listen key glows bright green when you press or latch the key to listen.	A listen key glows dim green when it is not active.
TALK-WITH-LISTEN	A talk-with-listen key glows bright red when you press or latch the key to talk. When you activate a listen, the talk-with-listen key will glow bright green.	If in talk mode, a talk-with-listen key glows dim red when not active. There is no non-active listen mode. A talk-with-listen key always reverts to non-active talk.

Table 1: Key Colors for Active and Non-Active Keys

ABOUT LIGHTS

A key can be programmed to light up in a variety of ways to indicate its status. These options are discussed in the following sections. If you decide to use one of these options, it must usually first be set up in the Eclipse Configuration System. A table summarizing all of the light options is located at the end of the section.

Call-Waiting Light

A key will flash rapidly (four times per second) when a source calls you. When you press the key to talk, the key becomes bright red to indicate that it is active. When you release the key, it becomes dim red to indicate that it is not active, if the source is no longer sending audio.

If a key is active when a second source calls you, the key will not flash at the call-waiting rate, but will continue to glow solidly bright red to indicate that it is active. You will know another source is calling because you will hear their audio, the answer-back key will blink, and the source's label will appear in the display above the answer-back key. You can answer the second source by pressing the answer-back key.

This option is set up by default in the Eclipse Configuration System, and it can be changed or cancelled if desired. Both the call-waiting light flash length and the amount of time the light flashes before the call is removed from the answer-back stack are programmable in the Eclipse Configuration System. See the *Eclipse Configuration System Manual* for more information.

In-Use Light

A key will double-flash once per second to indicate that a destination you are trying to call is in use.

The in-use light is a feature that must be set up in the Eclipse Configuration System. For more information, see the *Eclipse Configuration System Manual*.

Telephone Off-Hook Light

A key will flash red once per second if a telephone interface is assigned to that key, and the telephone interface is off-hook. The central matrix will cause each key assigned to the telephone interface on every station in the system to flash at the off-hook rate whenever the telephone interface is active (off-hook) at one or more of the stations.

If you press or latch a key that is flashing at the telephone off-hook rate, the key will glow solidly bright red to indicate that the key is active. When you release the key, it will resume flashing at the telephone off-hook rate.

The telephone off-hook light is set up by default in the Eclipse Configuration System. For more information, see the *Eclipse Configuration System Manual*.

Radio-Receiver Active Light

The green light on a key will flash once per second if a radio receiver is assigned to that key, and the radio receiver is active. The central matrix will cause each key assigned to the radio receiver on every station in the system to flash at the radio-receiver active rate whenever the radio receiver is active at one or more of the stations.

If you press or latch a key that is flashing at the radio-receiver active rate, the key will glow solidly bright green to indicate that the key is active. When you release the key, it will resume flashing at the radio-receiver active rate.

The radio-receiver active light is a feature that must be set up in the Eclipse Configuration System. For more information, see the *Eclipse Configuration System Manual*.

Audio-Presence Light

If you assign a source to your station as a listen-only key, the key will flash green once per second if there is audio present at the source.

The audio-presence light is a feature that must be set up in the Eclipse Configuration System. For more information, see the *Eclipse Configuration System Manual*.

Incompatible Firmware Light

If the firmware on your station is incompatible with the matrix, all lights on the station will blink bright red once per second, and if displays are present, they will read: "Firmware Version Incompatible."

SUMMARY OF KEY MODULE LIGHTS

Table 2 summarizes the meaning of key colors and blink rates on a key module.

DISPLAY KEYS	LED COLOR	BLINK RATE
Key programmed as listen-only	dim green	none
Key programmed as talk or talk-with-listen	dim red	none
Listen key active	bright green	none
Talk-with-listen key active	bright red	none
Talk-with-listen key listen-only active	bright green	none
Call Waiting	bright red	4x per second
In Use	dim red	2x per second
Audio Presence	dim green	1x per second *(continued)*
Station Connected	dim red	1x per second
Telephone Off-Hook	dim red	1x per second
Radio Receiver Active	dim green	1x per second
Incompatible Firmware	bright red	1x per second

Table 2: Key Colors and Blink Rates

ANSWER-BACK FEATURE

With the answer-back feature you can reply to incoming calls from sources not assigned to keys on your intercom station. You can also call out to destinations not assigned to keys on your station.

If a second unassigned source calls you while you are speaking to the first unassigned source, the second call will be placed in the "answer-back stack," a group of up to six waiting calls that are answered in sequence.

Note: *All incoming calls can be answered at the answer-back key—whether from sources with assigned keys on the intercom station or from sources without assigned*

keys. Typically, however, only calls from sources without assigned keys are answered there.

The following sections describe how to use the answer-back feature.

Answer-Back and Clear Keys

The answer-back key is the leftmost lower key on any intercom station. The clear key is the leftmost upper key on any intercom station. (See Figure 8.) The keys are labeled "ANSWR" and "CLEAR."

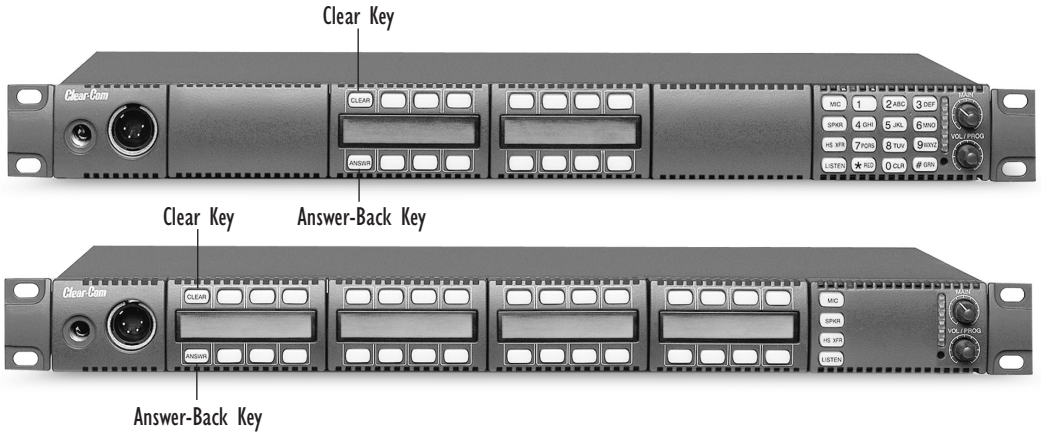


Figure 8: Answer-Back and Clear Keys

Answering a Call with the Answer-Back Key

When a source that is not assigned to a key on your station calls you:

- The calling source's label appears in the display above the ANSWR key.
- The ANSWR key flashes bright red to indicate a waiting call.

These conditions will continue until you press the ANSWR key to talk or until the answer-back time-out period lapses and the call is automatically removed from the answer-back stack.

With the answer-back feature, you can reply to incoming calls from sources not assigned to keys on your station.

***Note:** The answer-back time-out period is set in the Eclipse Configuration System. It can be set between 10 and 60 seconds. After the time-out period has elapsed, the call will be removed and will no longer be available to answer.*

To answer a call from an unassigned source at the answer-back key:

1. Press the ANSWR key to talk to the caller.
   When you press the ANSWR key, it becomes solid red to indicate that it is active. Note that the ANSWR key cannot be latched; it is a momentary function.
2. When you complete the call, release the ANSWR key.
   When you release the key, it becomes dim red to indicate that it is inactive.
3. Press the CLEAR key to remove the caller's label from the display.

***Note:** The display clears automatically when the answer-back time-out period elapses after you release the ANSWR key.*

Figure 9 illustrates the steps for answering a call from an unassigned source at the answer-back key.

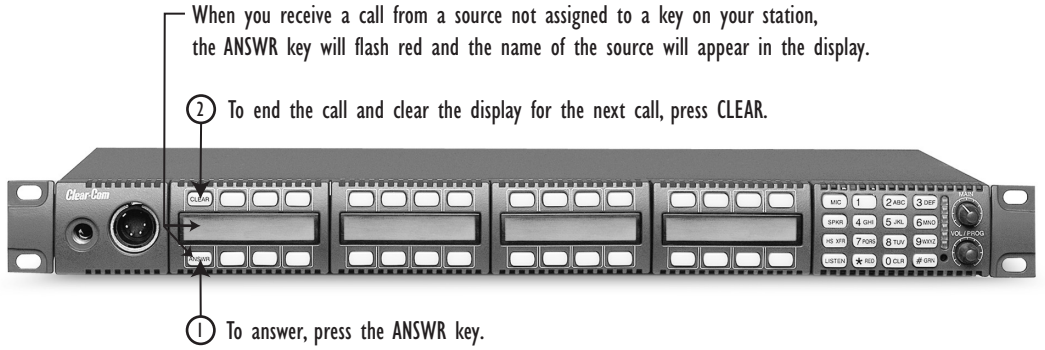


Figure 9: Answering a Call from an Unassigned Source at the Answer-Back Key

Answering a Second Call from the Answer-Back Stack

If a second unassigned source calls you while you are talking to the first unassigned source:

- The second caller's audio will come through on your station's speaker.
- The second call will be placed in the "answer-back stack" (a call list of up to six possible waiting calls). The second caller's label will appear directly above the current caller's label. The current caller's label appears in the display directly above the ANSWR key.
- The light on the ANSWR key will flash to show that a call is waiting *and* that a call is currently in progress—by flashing at the call-waiting rate to show that a call is waiting; but flashing bright red–dim red instead of the usual bright red–off to show that a call is also currently in progress.

You cannot latch an outgoing call from the answer-back key. This function is momentary only.

To answer a call waiting in the answer-back stack:

1. Press the ANSWR key to speak to the caller.
   The new caller's label will appear in the position directly above the ANSWR key, while the next waiting call (if there is one) will display in the position directly above it. A total of six calls can wait in the answer-back stack. Only the two most recent caller's labels will appear in the display above the ANSWR key.
2. When you complete the call, release the ANSWR key.
3. Press the CLEAR key to remove the caller's label from the display.
   - The next unassigned caller's label appears in the display above the ANSWR key.
   - The display clears automatically when the answer-back time-out period elapses after you release the ANSWR key.
4. When the next caller's label appears above the ANSWR key, press the ANSWR key to talk to the caller.

5. Repeat steps 2 and 3 until all the calls in the answer-back stack are answered.

SUMMARY OF ANSWER-BACK AND CLEAR KEY LIGHTS

When you press the ANSWR key, you will talk to the destination whose label is in the display. To clear the display, and talk to the next caller, press the CLEAR key.

Table 3 summarizes the meanings of the color and blink rates for the answer-back and clear keys.

ANSWER-BACK KEY	KEY COLOR	BLINK RATE
No calls at answer-back	off	none
Call received at answer-back	bright red	4x per second
Answer-back key pressed	dim red	none
Clear key pressed	off	none
CLEAR KEY	**KEY COLOR**	**BLINK RATE**
No calls at answer-back	off	none
Answer-back stack not empty	dim green	none
Clear key pressed	bright green	none

Table 3: Colors and Blink Rates for Answer-Back and Clear Keys

VOLUME CONTROLS

Speaker and Headset Volume Controls

Adjusting Intercom Volume

You adjust the master intercom volume on your station's speaker and headset with the main volume knob on the function key module, as shown in Figure 10. Turn the knob clockwise to increase the volume, counterclockwise to decrease it.

The volume program knob is multi-functional. In addition to adjusting the program volume, it adjusts listen levels, scrolls through menu items, and selects menu items. These functions are discussed later in this chapter.

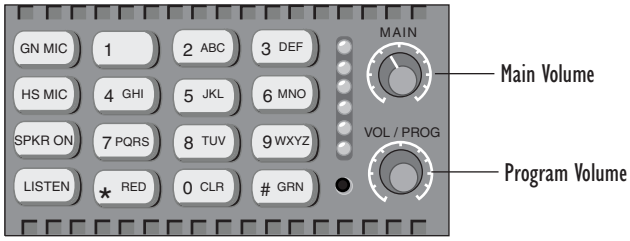


Figure 10: Main Volume and Program Volume Controls

Adjusting Program Input Volume

You receive program input at your station through the auxiliary options module, so this module must be present before you can adjust the program input. If you do not have the auxiliary options module installed on your station, the VOL/PROG knob on the function keypad will not operate.

You adjust the program input volume on your station's speaker and headset with the program volume knob, labeled "VOL/PROG" on the function key module. Turn the knob clockwise to increase the volume, counterclockwise to decrease it.

The six LEDs located to the left of the program volume knob indicate the program volume level. As the volume goes up or down, the number of LEDs that are illuminated changes. Minimum volume is indicated by one illuminated LED; maximum volume is indicated by six illuminated LEDs.

You control the brightness of the six-segment LED with the Display Brightness settings in the Eclipse Configuration System. Refer to the *Eclipse Configuration System Manual* for more information.

Note: *You can also use the program volume knob to adjust listen levels, to scroll through menu items, and to select menu items. These functions are discussed later in this chapter.*

Adjusting Listen Levels

When you need to monitor several incoming sources at once, you can vary the volume of the sources by setting "listen levels."

For example, in a control room you may be listening simultaneously to the lighting department, the sound department, and the tape editing department, but because you need to cue the director when the show is ready to go on the air, listening to the tape editing department takes highest priority. You need to adjust the volumes of the monitored sources so that the tape editing department is louder than the others. To do this, you set listen levels.

The VOL/PROG knob operates in two ways. You rotate the knob clockwise or counterclockwise to adjust volume levels or to scroll through menu items. You press the knob in, as if it were a key, to select items in a menu.

To adjust the listen level of an incoming source:

1. Press the desired listen key.
   The listen key becomes bright green.
2. Press and release the VOL/PROG knob.
   The listen key becomes dim green and flashes.
3. Press and release the listen key again.
   The listen key becomes bright green.
4. Rotate the VOL/PROG knob either clockwise to increase the source's volume or counterclockwise to decrease the source's volume.
5. When the required volume has been reached, press and release the VOL/PROG knob to accept the setting.
6. Press and release the listen key.
   The source's volume is now set at the required level.

Note: *If you try to push an active listen path higher than the maximum possible volume, you will drive the volume of all other active paths downward, thus putting more emphasis on the desired path.*

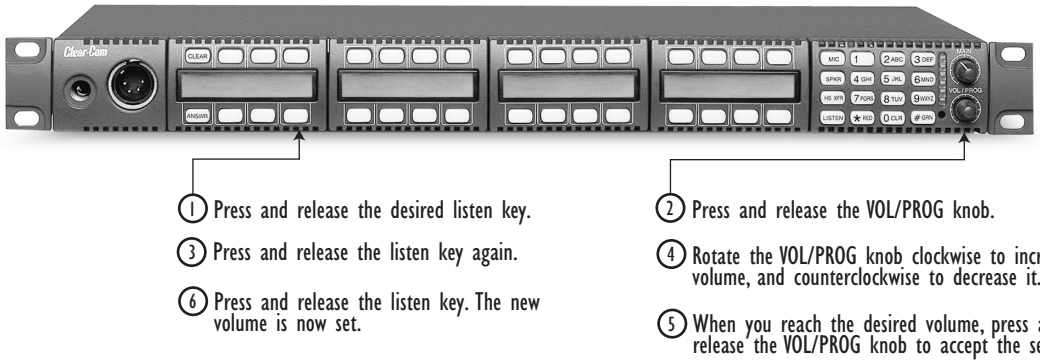


Figure 11: Adjusting Listen Levels

Resetting Listen Levels to the Default Level

You can reset all listen levels to the default, which is the highest possible volume.

To reset all listen keys back to the default level.

1. Press the 7 key on the numeric keypad to enter Local Preferences mode.
   The display on the leftmost key module shows the first two items in a list of local preferences.
2. Scroll through the list by turning the VOL/PROG knob.
   You can also scroll through the list one item at a time by pressing the CLEAR key to scroll up the list and the ANSWR key to scroll down the list.
3. When the menu item "Reset Listen Levels" appears in the display, select the item by pressing the VOL/PROG knob in, as if it were a key.
   The display will read "Listen Level Reset Sent to Matrix."

All listen keys are reset to the highest possible volume.When you activate a listen key at your station, audio will come in at that level. If a caller sends audio to you, that audio will come into your station at the highest possible volume.

For more information on local preferences, see "Local Preferences" under "Using the Advanced Function Keys" later in this chapter.

Note: *The VOL/PROG knob operates in two ways. You rotate the knob to adjust volume levels and to scroll through menu items. You press the knob in, as if it were a key, to select items in a menu.*

2 ACCESSING I-SERIES BASIC FUNCTIONS

There are four basic function keys.

The four basic function keys provide convenient one-touch access to such basic intercom functions as turning the microphone on and off. Located on the leftmost side of a function key module, the keys are labeled as follows:

- GN MIC (gooseneck microphone on/off)
- HS MIC (headset microphone on/off)
- SPKR ON (speaker on/off)
- LISTEN (listen-only/call signal/remote telephone release)

Figure 1 illustrates the location and purpose of the basic function keys. A more detailed discussion of each key follows.

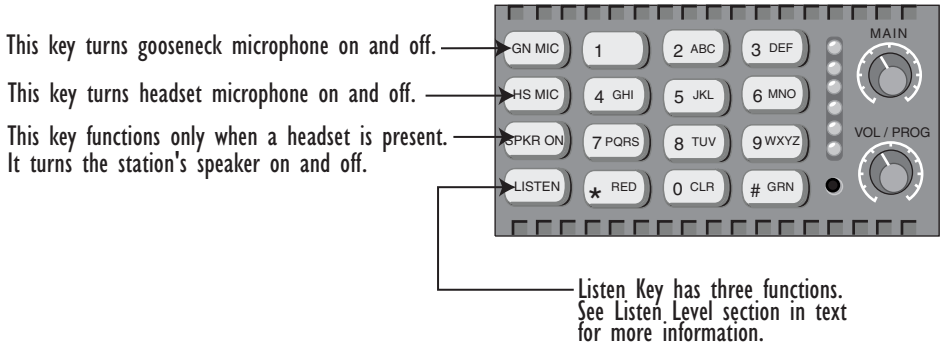


Figure 1: Basic Function Keys

TURNING THE GOOSENECK MICROPHONE ON AND OFF

The gooseneck microphone key, labeled "GN MIC," turns your station's gooseneck microphone on or off. Press once to turn the microphone on; press again to turn the microphone off.

The gooseneck microphone is your station's default microphone unless a headset is plugged in. When a headset is plugged in, an auto-sensing circuit in the station automatically turns the headset microphone on and turns the gooseneck microphone off. The headset microphone always takes precedence over the gooseneck microphone.

If you press a talk key while the gooseneck microphone is plugged in but off, the gooseneck microphone automatically turns on for the duration of the call. The GN MIC key glows dim green whenever the gooseneck microphone is present but off and bright green whenever the microphone is present and on. If a

gooseneck microphone is not present, the GN MIC key will not illuminate. Table 4 summarizes the key colors for active and non-active microphone and speaker keys.

TURNING THE HEADSET MICROPHONE ON AND OFF

The headset microphone key, labeled "HS MIC," turns your station's headset microphone on and off. Press once to turn the microphone on; press again to turn the microphone off.

When a headset is plugged in to the station, the headset microphone automatically becomes active and the gooseneck microphone is switched off. To switch to the gooseneck microphone, press the gooseneck microphone key, labeled "GN MIC." When the headset is unplugged, the gooseneck microphone automatically becomes active.

The HS MIC key glows dim green whenever a headset microphone is present but off, and bright green whenever a headset microphone is present and on. When a headset microphone is not present, the key will not illuminate. Table 4 on page 1-22 summarizes the key colors for active and non-active microphone and speaker keys.

TURNING THE SPEAKER ON AND OFF

The speaker on/off key, labeled "SPKR ON," functions only when a headset is plugged into the station. Pressing the speaker on/off key toggles the headset speaker on and off. Press the key once to turn the headset speaker off, and again to turn the headset speaker back on. As the headset speaker turns off, the panel speaker will turn on and vice versa.

The key glows dim green whenever the headset speaker is off, and bright green whenever the headset speaker is on.

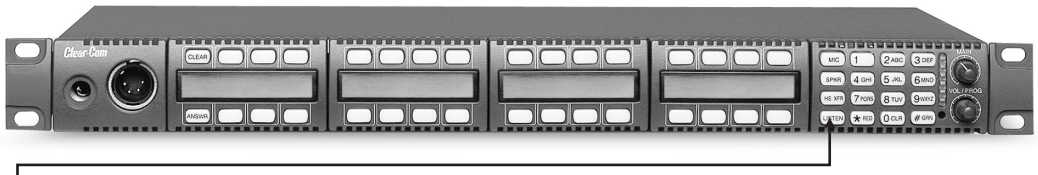
Note: *Unlike the microphones, both speakers can never be turned off at the same time. The panel loudspeaker is always active unless a headset or alternative speaker source has replaced it. That is why this key is non-functional when a headset is not plugged in.*

USING THE "LISTEN" KEY TO ACCESS FUNCTIONS

The LISTEN key has three functions:

- Activates the "monitor mode" of a "talk-with-listen" key
- Sends call signals
- Releases remote telephone lines

Figure 2 summarizes how to access these functions from the LISTEN key. The sections that follow discuss the functions in detail.



1. MONITOR MODE
To activate the "listen" function of a "talk-with-listen" key, press the LISTEN key less than five seconds ("tap" the key) and then tap the desired "talk-with-listen" key. The LISTEN key illuminates bright green.

2. CALL SIGNAL
To send a call signal, press the LISTEN key for between 1 and 5 seconds and then press the key of the destination that you want to send the call signal to. The LISTEN key illuminates bright red.

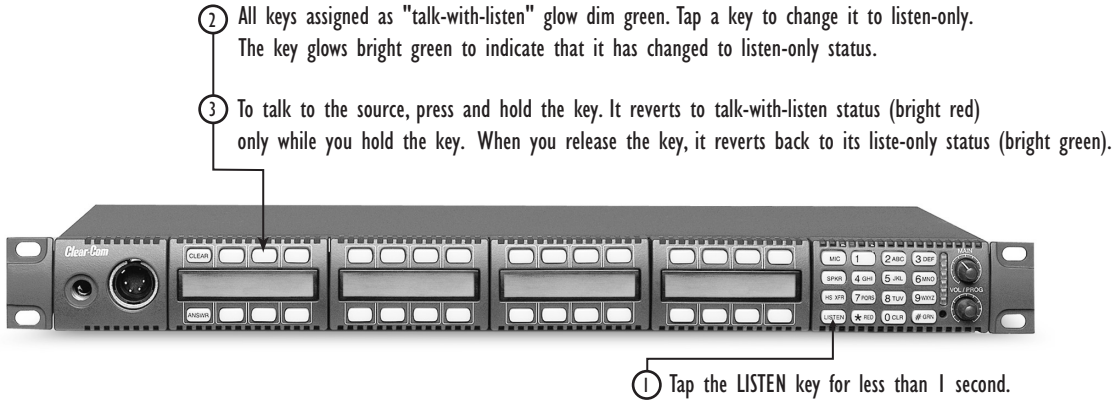
3. RELEASE A REMOTE TELEPHONE LINE
To release a remote telephone line, press the LISTEN key for 5 seconds and continue to hold while you press the desired telephone interface key. The LISTEN key turns dim red and flashes on and off.

Figure 2: Accessing Features from the Listen Key

Activating the "Monitor Mode" of a Talk-with-Listen Key

Note: *To avoid confusion, in this manual the LISTEN key on the function-key module is referred to in all capital letters. On your i-station "LISTEN" is printed on this key in all capital letters as well. Keys on your station programmed to "listen" are referred to in this manual in lower-case letters, as in "the listen key glows bright green."*

The i-station "monitor mode" allows you to momentarily change the status of a key from listen-only to talk-with-listen. By pressing and holding the listen-only key, you momentarily change it to a talk-with-listen key.



2. All keys assigned as "talk-with-listen" glow dim green. Tap a key to change it to listen-only. The key glows bright green to indicate that it has changed to listen-only status.

3. To talk to the source, press and hold the key. It reverts to talk-with-listen status (bright red) only while you hold the key. When you release the key, it reverts back to its liste-only status (bright green).

1. Tap the LISTEN key for less than 1 second.

Figure 3: Activating the "Monitor Mode" of a Talk-with-Listen Key

To activate the "monitor mode" of a talk-with-listen key:

1. Press the LISTEN key on the function key module for less than one second ("tap" the key).
   - Each key assigned as a talk-with-listen glows dim green to indicate that its "monitor mode" is available for activation.
   - The LISTEN key on the function key module glows bright green while in this mode.
2. Tap a dim-green key to activate it.
   The key glows bright green to indicate its change to an active listen-only key.
3. To talk to the source, press and hold the key.
   The key glows bright red to indicate that a talk-with-listen call is active. When you release the key, it reverts back to its active listen-only mode (bright green). The talk-with-listen function cannot be latched; it is only active while you press the key.

To cancel the key's monitor mode and revert back to the talk-with-listen mode:

1. Tap the LISTEN key on the function-key module.
2. Tap the desired active listen-only key (bright green).
   The formerly active listen-only key now glows dim red to indicate that it has reverted back to its non-active talk-with-listen mode. If you press the key to talk, it glows bright red.

Note: You must tap the LISTEN key on the function key module for each key you activate in "monitor mode."

You can scroll one item at a time through items in a displayed list by pressing the CLEAR key to scroll up and the ANSWR key to scroll down.

Sending Call Signals

A call signal is an electronic signal that is sent from one station or interface to another to get a station operator's attention. It can be used for a variety of more technical purposes as well, such as to activate a relay to open a door, set off an alarm, or activate a public address (PA) system.

To send a call signal:

1. Press and hold the LISTEN key for between 1 and 5 seconds. The LISTEN key turns bright red to indicate that you have entered the "call-signal send" mode.
2. Press the key of the destination that you want to send the call signal to.
   A call signal of three loud beeps is sent to a destination each time that you press the destination's key.
3. To send a call signal to a new destination, press the new destination's key.
   A call signal is sent to the new destination each time you press that destination's key.
4. To exit "call-signal send" mode, tap the LISTEN key and release.
   - You can also exit "call-signal send" mode by simply not pressing a display key for five seconds. The mode will automatically time-out.

- When you exit "call-signal send" mode, the LISTEN key changes from bright red to no illumination.

You can send a call signal to any destination with a designated key on your station. If more than one destination is assigned to a key, each destination will receive the call signal. If the destination is a party line, then every station listening on the party line will receive the call signal.

Note: *The call signal is sent at the page-override volume level, which is programmable in the Eclipse Configuration System. For more information, see the Eclipse Configuration System Manual.*

Releasing Remote Telephone Lines

To release a telephone interface that has been left off-hook:

1. Enable "remote telephone release" for that station in the Eclipse Configuration System.
   Often this feature will already be set up in the configuration system software. For more information, refer to the *Eclipse Configuration System Manual*.
2. Press and hold the LISTEN key for more than 5 seconds.
   The LISTEN key turns bright green and flashes on and off.
3. While still holding the LISTEN key, press the desired telephone interface key on any key module.
   The telephone interface will hang up. All audio paths to and from the telephone interface will be deactivated.
4. Release the LISTEN key to exit.

SUMMARY OF FUNCTION KEY MODULE LIGHTS

Table 4 summarizes the meanings of the colors and blink rates for all the keys on the function key module.

GN MIC KEY	KEY COLOR	BLINK RATE
Gooseneck mic off	dim green	none
Gooseneck mic on	bright green	none
HS MIC KEY	**KEY COLOR**	**BLINK RATE**
Headset not present	off	none
Headset present and off	dim green	none
Headset present and on	bright green	none
SPKR ON KEY	**KEY COLOR**	**BLINK RATE**
Speaker on	dim green	none
Speaker off	bright green	none

(continued)

LISTEN KEY	KEY COLOR	BLINK RATE
No function	off	none
Listen-only call mode	bright green	none
Call-signal send mode	bright red	none
Remote telephone hang-up	bright green	1x per second
0–9, *, # KEYS	**KEY COLOR**	**BLINK RATE**
No function	off	none
Key pressed or mode active	bright green	none
Dial mode	dim red	none
Dial mode and key pressed	bright red	none

Table 1: Colors and Blink Rates for Keys on Function Key Module

3 ACCESSING I-SERIES ADVANCED FUNCTIONS

You access the advanced features from the function module's numeric keypad or from the feature menu.

i-Series intercom stations have advanced features that you access in one of the following two ways:

- By pressing the number key associated with the feature. For example, when you press the "1" key on the numeric keypad, you enter "telephone dialing" mode. Figure 1 shows the features associated with each number key on the numeric keypad. A fuller discussion of each feature follows.
- By scrolling through the feature menu. For example, you can scroll through the feature menu, and select "dial" to access the "telephone dialing" mode. The advantage of a menu is that you do not have to memorize each available key function. See "Selecting Features from the Menu" later in this chapter for more information.

Most of the features are available only when a station is connected to the matrix, but some are available even when a station is not connected to the matrix. (The requirements for each feature are given in the following sections.) Figure 1 and Table 1 below list features and identify which number keys on the keypad are associated with each.

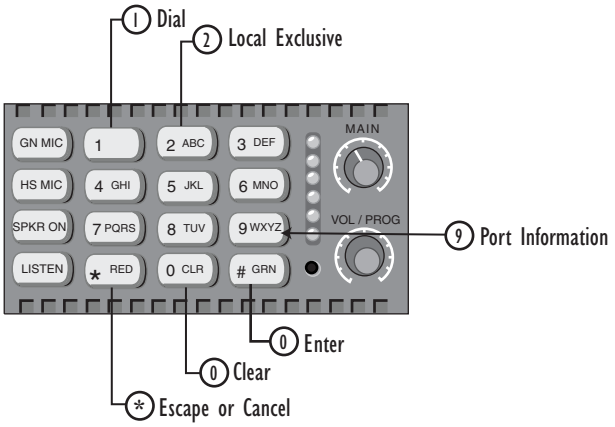


Figure 1: Features Accessed by Keys on the Numeric Keypad

OVERVIEW OF ADVANCED FEATURES

KEY	FUNCTION	DESCRIPTION
1	Dial	Enters telephone dialing mode.
2	Local Exclusive	Enters mode to temporarily deactivate all keys except the one being used.
6	N/A	Not used.
9	Port Information	Gives you the station's port number, label, associated CPU card, and current firmware version number.
0 CLR	Clear	Clears the current display entry and takes you back to the previous menu.
*** RED**	Escape or Cancel	Abandons all unsaved programming and returns the station to normal use.
# GRN	Enter	Saves the current programming changes and reverts the station to normal use.
VOL/PROG KNOB	Display Contrast Adjust Baud Rate Adjust	Allows you to adjust contrast lighting on displays and to adjust the station's baud rate

Table 1: Advanced Key Functions

TELEPHONE DIALING FROM THE KEYPAD

You can dial from the keypad on a function key module as if you were dialing from a standard telephone keypad. When you press the number keys, standard DTMF tones are generated to all active talk key destinations. Note that this feature is only available when the central matrix is connected and online.

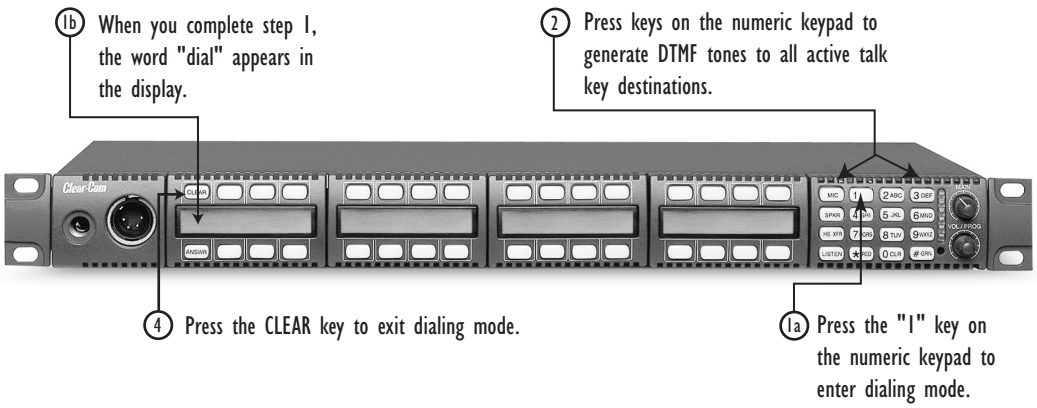


Figure 2: Telephone Dialing from the Function Keypad Module

To generate standard DTMF tones to all active talk key destinations:

1. Press the "1" key on the keypad to enter dialing mode.
   - The keypad becomes a telephone touch-tone dialing pad.
   - The word "dial" appears in the display below the CLEAR key.
   - All 12 valid dialing keys on the keypad glow dim red.
2. Press keys on the numeric keypad (0–9, *, #) to generate standard DTMF tones to all active talk-key destinations.
3. Press the CLEAR key to exit dialing mode.

   Dialing mode automatically times out if you do not press a key on the numeric keypad (0–9, *, #) for five seconds.

To select an item with the VOL/PROG knob, press the knob in, as you would press a key, when the desired item appears in the display.

ACCESSING "LOCAL EXCLUSIVE"

When you activate the "local exclusive" feature, all previously latched keys on your station deactivate temporarily while you either talk to one destination or listen to one source. Note that the "local exclusive" feature is only active when the matrix is connected and online.

To activate the local exclusive function:

1. Press the "2" key on the keypad to enter "local exclusive" mode.
2. Press any talk or listen key (even an already latched key).
   - When you press a talk or listen key, all previously latched keys (both talks and listens) deactivate temporarily, and you can talk or listen from that key exclusively.
   - The feature is only active while you press the key–it cannot be latched.
   - The "2" key on the keypad will glow bright green while this feature is active.
3. To exit "local exclusive," release the key you pressed in step 2.
   - The previously latched keys will return to their active state.
   - You can also exit this feature by not pressing a key for five seconds.
   - This feature does not work on the answer-back (ANSWR) key.

You can also select this feature from the menu. See "Accessing Feature Menus" later in this chapter for more information.

ACCESSING PORT INFORMATION

The port information feature gives you the following information about your station:

- The station's port number at the central matrix
- The station's label at the central matrix
- The station's current firmware version number

Your station must be connected to the central matrix to access all of the port information. If your station is not connected to the central matrix, only the station's current firmware version number will be displayed.

To obtain port information:

1. Press the "9" key on the numeric keypad to enter "port information" mode.
   The leftmost display on the station will show the station's current matrix port number, matrix label, and firmware version number.
2. Press the ESCAPE key (labeled "*RED") to exit.
   The display will automatically time out after five seconds.

You can also access this feature through the menu. For more information, see "Accessing Feature Menus" later in this chapter.

CLEARING THE CURRENT PROGRAMMING

Press the CLEAR key (labeled "0 CLR") on the numeric keypad to clear the current entry on the leftmost display and take you back to the previous menu, if any.

ESCAPING THE CURRENT PROGRAMMING

Press the ESCAPE key (labeled "*RED") on the numeric keypad to abandon all unsaved programming and revert the station to normal use.

ENTERING THE CURRENT PROGRAMMING

Press the ENTER key (labeled "#GRN") on the numeric keypad to save the current programming changes and revert the station to normal use.

ADJUSTING BACKGROUND LIGHTING AND BAUD RATE

You can adjust the background lighting on front-panel displays directly from your i-station. You can also adjust the station's baud rate directly from the station.

To adjust background lighting on all front-panel displays on the station:

1. Press the VOL/PROG knob in, as if it were a key, for three seconds.
   The station's leftmost display shows the first two items in a five-item list: (1) Set Baud Rate, (2) Display Contrast, (3) Module Information, (4) Station Information, and (5) Exit.
2. Scroll through the list by rotating the VOL/PROG knob.
   You can also scroll through the list one item at a time by pressing the CLEAR key to scroll up the list and the ANSWR key to scroll down the list.
3. When the list item "Display Contrast" is highlighted, select it by pressing in and releasing the VOL/PROG knob, as if it were a key.

A submenu, as shown in Figure 3, appears in the display showing the current contrast value for the station's displays.

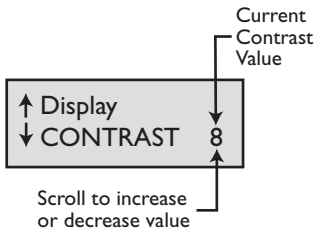


Figure 3: Submenu of Display Contrast Values

4. Scroll through the range of values by rotating the VOL/PROG knob.

   The values range from the lowest contrast value of 0 to the highest contrast value of 10.

5. When the desired value appears in the display, select it by pressing the ENTER key (labeled "#GRN").

   The selected value goes into effect immediately.

6. Exit from the submenu by pressing the ESCAPE key (labeled "*RED"). To escape the submenu and return to the previous menu, press the CLEAR key (labeled "CLR").

To change the station's baud rate:

1. Press the VOL/PROG knob in, as if it were a key, for three seconds.

   The station's leftmost display shows the first two items of a five item list: (1) Set Baud Rate, (2) Display Contrast, (3) Module Information, (4) Station Information, and (5) Exit.

2. Scroll through the list by rotating the VOL/PROG knob.

   You can also scroll through the list one item at a time by pressing the CLEAR key to scroll up the list and the ANSWR key to scroll down the list.

3. When the list item "Set Baud Rate" is highlighted, select it by pressing in and releasing the VOL/PROG knob, as if it were a key.

   A submenu, as shown in Figure 4, appears in the display showing the current baud rate.

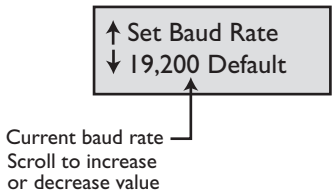


Figure 4: Submenu of Baud Rate Values

4. Scroll through the submenu of baud rates by rotating the VOL/PROG knob.

   The submenu gives you a choice of four baud rates: 19,200 (Default), 9600, 4800, and 2400 baud.

5. When the desired baud rate appears in the display, select it by pressing the ENTER key (labeled "#GRN").

   The selected baud rate goes into effect immediately.

6. Exit from the submenu by pressing the ESCAPE key (labeled "*RED"). To escape the submenu and return to the previous menu, press the CLEAR key (labeled "CLR").

SELECTING A FEATURE FROM THE FEATURE MENU

The advantage of using the menus is that you can see all of the available features listed and then select the desired feature simply by pressing the VOL/PROG knob when the feature's menu item appears in your station's display.

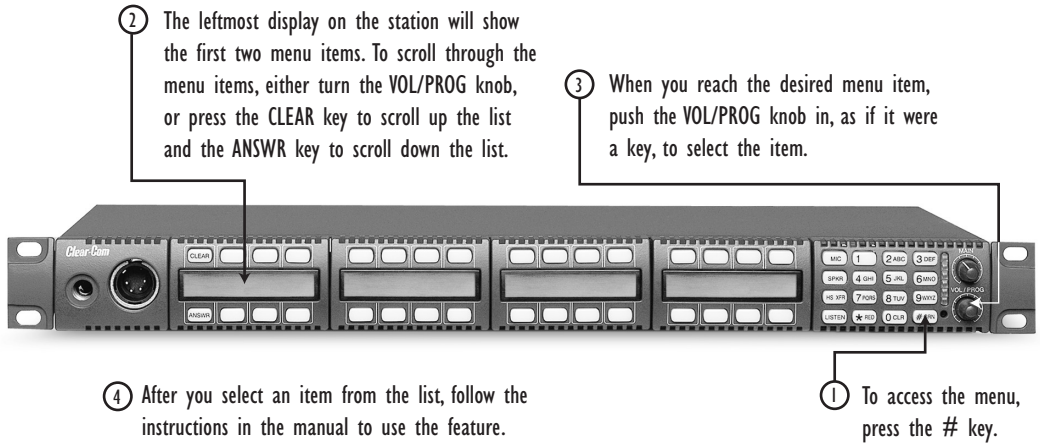


Figure 5: Selecting a Feature from the Feature Menu

To select a feature from the feature menu:

1. Press the ENTER key (labeled "#GRN") on the numeric keypad.
   The leftmost display on the station will show the first two menu items.
2. Scroll through the menu items by pressing the ANSWR key to scroll down the list and the CLEAR key to scroll up the list. Each time you press the ANSWR key or the CLEAR key, you scroll one item on the list.
   You can also rotate the VOL/PROG knob to scroll through the menu items.
3. When you reach the desired menu item, press the VOL/PROG knob in, as if it were a key, to select the item.
   To exit from the menu, press the ESCAPE key (labeled "*RED").
4. After you select a feature, follow the instructions from the appropriate section in this chapter to use the feature.

Note: *You can also select a menu item simply by first pressing the ENTER key (labeled "#GRN"), then pressing the number key that corresponds to the menu item—for example, the 1 key for the first menu item, the 2 key for the second menu item, and so on. This method is often quite faster than scrolling through several menu items to select an item. The same procedure can be used for submenus.*

4 CONNECTING TO AN ECLIPSE MATRIX, TO AC POWER, AND TO AUDIO OPTIONS

REAR-PANEL MODULES

You connect an i-series intercom station to the central matrix, to audio options, and to an expansion panel through the connectors located on the station's rear panel. The connectors are organized into the following two modules:

- The communications module, which is standard on all i-series intercom stations. This module connects an i-station to the central matrix and, if required, to an expansion panel.
- The auxiliary options module, which as its name implies, is optional. This module connects an i-station to a variety of audio and control functions. The functions available from this module are described later in this chapter.

The station's rear panel also contains an AC power connector to the station's internal universal AC power supply.

Figure 1 illustrates the rear panel of an i-series intercom station.

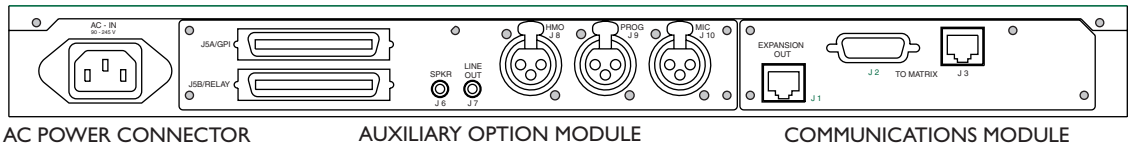


Figure 1: Rear Panel of an i-Series Intercom Station

AC POWER

The leftmost connector in the illustration, labeled "AC Power Connector," connects the station to the internal universal AC power supply. The power supply operates over a voltage range of 90 to 245 VAC and a frequency range of 45 to 65 Hz. The maximum power input is 60 watts, with 30 watts typical and 30 A (amps) peak inrush.

COMMUNICATIONS MODULE

The communications module connects an i-station to the central matrix and to an expansion panel. There are three connectors on the communications module, labeled J1 through J3, as shown in Figure 2.

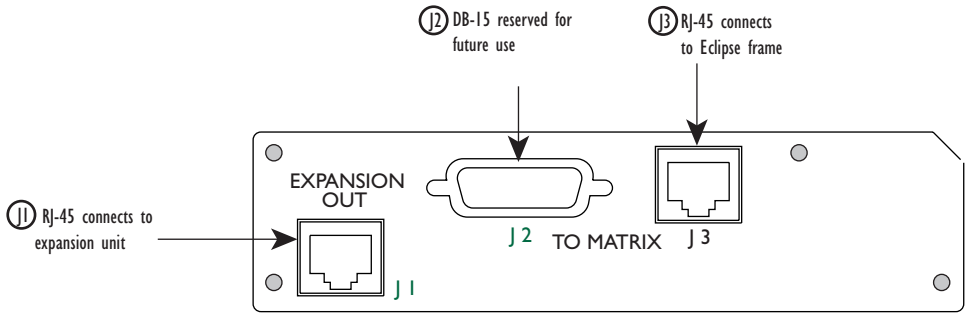


Figure 2: Communications Module Connectors

J1 Expansion Out Connector

The connector labeled J1 is an RJ-45F that connects the i-station to an expansion panel. Shielded category-5 cable is required.

J2 DB-15M Connector (Reserved for Future Use)

The connector labeled J2 is a DB-15M connector reserved for future use.

J3 To Matrix Connector

The connector labeled J3 is an RJ-45F that connects the i-station to an Eclipse matrix frame. Shielded category-5 cable is required.

AUXILIARY OPTIONS MODULE

The auxiliary options module connects your i-station to the following audio and control inputs and outputs:

- General purpose inputs
- Relay outputs
- Speaker-feed output
- Line-level output
- Hot-microphone output
- Program input
- Auxiliary microphone input

Figure 3 shows the location of each connector on the auxiliary options module.

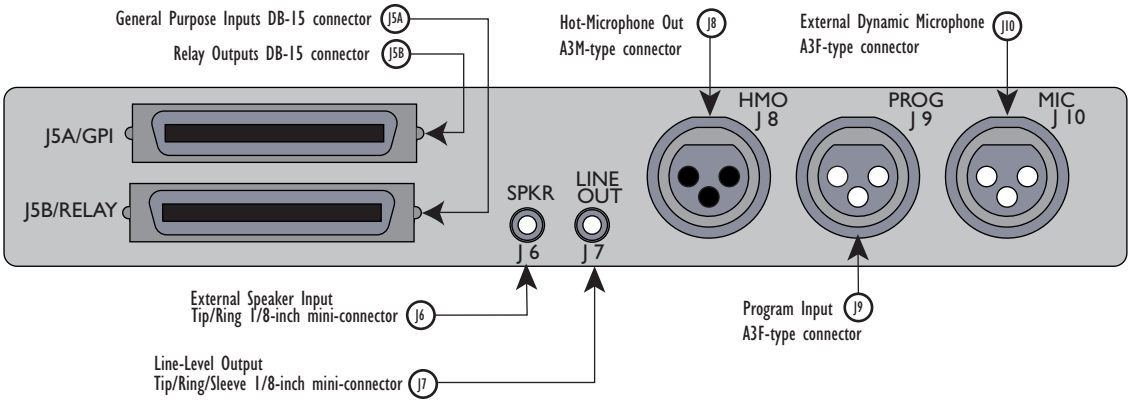


Figure 3: Auxiliary Options Module Connectors

J5A General Purpose Inputs Connector

The DB-15F connector labeled "J5A" connects your i-station to two local general purpose inputs (GPIs). The remaining six local general purpose inputs are reserved for future use.

The general purpose inputs connector is provided so that you can connect an external logic device—such as an external foot switch, a panel-mounted switch, or the logic output of some other device—to your station.

When the external logic device is activated, it sends a control signal into your station's microprocessor to perform one of several preset functions. such as turning the station's microphone off or on, muting the microphone's output, or turning the station's speaker off. You choose the function to be performed from the Eclipse Configuration System.

Before wiring a logic device to the GPI connector, you must first select the logic device's function in the Eclipse Configuration System. For more information, refer to the *Eclipse Configuration System Manual*.

The setting options are:

- Microphone On/Off
- Mute Mic Output to Frame
- Microphone Off (Momentary)
- Answerback Talk/Clear
- Speaker Off
- PTT: Activate All Talk Keys
- PTT: Activate Two-Way Radio Talk Keys
- Activate Talk Switch #1
- Activate Talk Switch #2

These settings are described in detail in the following sections.

Microphone On/Off (Toggle)

The "Microphone On/Off" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to shut the station's microphone on or off.

With the GPI connector, you can connect an external logic device—such as an external foot switch, a panel-mounted switch, or the logic output of some other device—to your station.

To use a logic device to turn the station's microphone off and on:

1. Select the "Microphone On/Off" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to turn the station's microphone on. Switch off the logic device to turn the station's microphone off.

Mute Microphone Output to Frame

The "Mute Mic Output to Frame" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to shut off the audio going from the station to the matrix frame.

Note that this feature does not turn off the "hot-microphone" output described later in this chapter. The A3M standard XLR connector labeled "J8" on the back of your i-station is the hot-microphone output connector. It provides a line-level output of the selected microphone's audio (headset or panel) that is always "on" (or "hot"). Only the station's microphone on/off key can override this output.

To use a logic device to shut off the audio going from the station to the frame:

1. Select the "Mute Mic Output to Frame" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to shut off the audio going from the station to the frame.

   Note that the "hot-microphone" output has not been shut off.

Microphone Off (Momentary)

The "Microphone Off" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to momentarily shut off the station's microphone.

While you press and hold the switch on the remote device, the microphone is shut off, but when you release the switch, the microphone resumes normal operation.

To use a logic device to turn the station's microphone off momentarily:

1. Select the "Microphone Off (Momentary)" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to shut the station's microphone off momentarily.

While you press and hold the switch on the logic device, the microphone is shut off, but when you release the switch, the microphone resumes normal operation. This function cannot be latched.

Answerback Talk/Clear

The "Answerback Talk/Clear" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to function as the station's answer-back key.

To use a logic device to activate the station's answerback key:

1. Select the "Answerback Talk/Clear" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to activate the station's answer-back key. Holding down the switch activates a talk path to the current destination in the answer-back stack.

   Note that the logic switch, like the answer back key itself, cannot be latched. It functions momentarily only.
4. To clear the current call, and go to the next call in the answer-back stack, quickly press and release the switch.

Speaker Off

The "Speaker Off" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to shut off the station's loudspeaker.

To use a logic device to shut off the station's loudspeaker:

1. Select the "Speaker Off" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to shut off the station's loudspeaker.

You can activate all latched keys at a station with an external logic device, such as a headset with a push-to-talk switch.

PTT: Activate All Talk Keys

The PTT: Activate All Talk Keys function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to activate all latched keys at your station. When the logic device is not activated, you will not be able to talk from any latched key at your station.

For example, some headsets are equipped with a push-to-talk switch on their headset cords. The push-to-talk switch can be wired to operate as a logic device. When an intercom operator wants to talk to any destination with a latched key on his station, he will only be able to do so if he first pushes the push-to-talk switch on the headset cord.

To use a logic device to activate all latched talk keys:

1. Select the "PTT: Activate All Talk Keys" option in the Eclipse Configuration System.
2. Attach a logic device (such as a foot switch, panel-mounted switch, a push-to-talk headset, and so on) to the i-station's GPI connector.

3. Switch on the logic device to activate all latched keys at your station.

   The logic device will activate keys latched both before and after you enabled this function in the Eclipse Configuration System.

Note that the latched keys at your station may appear to be active, since their talk lights will illuminate, but they actually only activate when you switch on the connected logic device. Any controls (relays, etc.) assigned to the keys along with the audio functions are now also only activated when signaled by the remote device.

You can, however, activate a talk path on any key by pressing and holding the key in momentary mode while you talk. The PTT: Activate All Talk Keys function only affects latched keys.

PTT: Activate 2-Way Radio Talk Keys

You can install a logic device to activate a key assigned to a 2-way radio.

The PTT: Activate 2-Way Radio Talk Keys function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to activate all latched keys at your station *that are assigned to a 2-Way Radio Interface*. The PTT: Activate 2-Way Radio Talk Keys function operates similarly to the PTT: Activate All Talk Keys function, except that it only affects latched keys *assigned to a 2-Way Radio Interface*. All other latched keys at your station operate normally and are not activated by the logic device.

When the logic device is not activated, you will not be able to talk from any latched key *assigned to a 2-way radio* at your station.

For example, some headsets are equipped with a push-to-talk switch on their headset cords. In this case, when the intercom operator wants to talk to a *2-way radio* from a latched key, he will only be able to do so if he first pushes the push-to-talk switch on the headset cord.

This function is valuable in applications that use 2-way radios because typically these systems transmit on only one frequency, and if more than one person transmits on the same frequency at any one time, the radio waves are interfered with so that no radio operator in the system can hear.

Using the PTT: Activate 2-Way Radio Talk Keys function allows an operator to determine precisely when he transmits audio on a 2-way radio interface.

To use a logic device to activate a key assigned to a 2-way radio:

1. Select the "PTT: Activate 2-Way Radio Talk Keys" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, panel-mounted switch, a push-to-talk headset, and so on) to the i-station's GPI connector.
3. Switch on the logic device to activate all latched keys *assigned to 2-way radios* at your station.

   The logic device will activate keys latched both before and after you enabled this function in the Eclipse Configuration System.

Note that the latched keys *assigned to two-way radio keys* at your station may *appear* to be active, since their talk lights will illuminate, but they are only active when you switch on the connected logic device. Any controls (relays, etc.)

assigned to the 2-way radio keys along with the audio functions now also are only active when signalled by the remote device.

You can, however, activate a talk path from any key *assigned to a 2-way radio* by pressing and holding the key in momentary mode while you talk. The PTT: Activate 2-Way Radio Keys function only affects latched keys.

Activate Talk Switch #1

The "Activate Talk Switch #1" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to activate the station's upper leftmost talk key.

To use a logic device to activate the station's leftmost talk key:

1. Select the "Activate Talk Switch #1" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to activate the station's upper leftmost talk key.

   This feature is momentary only, so that you must press and hold the logic device's switch to activate the station's talk key. When you release the switch, the station's talk key is no longer activated. The station's talk key cannot be latched with the Activate Talk Switch #1 option.

Activate Talk Switch #2

The "Activate Talk Switch #2" function allows you to set up an external logic device, such as a panel-mounted switch, a foot switch, or the logic output of some other device, to activate the station's *second* upper leftmost talk key (the key directly to the right of the leftmost upper key).

To use a logic device to activate the station's second upper leftmost talk key:

1. Select the "Activate Talk Switch #1" option in the Eclipse Configuration System.
2. Connect a logic device (such as a foot switch, a panel-mounted switch, or the logic output of another device) to the i-station's GPI connector.
3. Switch on the logic device to activate the station's second upper leftmost talk key.

   This feature is momentary only, so that you must press and hold the logic device's switch to activate the station's talk key. When you release the switch, the station's talk key is no longer activated. The station's talk key cannot be latched with the Activate Talk Switch #2 option.

(J5B) Relay Outputs Connector

The DB-15F connector labeled "J5B" connects your i-station to three single-pole double-throw (SPDT) relays with contact ratings of 30 VDC (volts direct current) at 1 A (ampere).

A relay is a switch that you control remotely. You program the relay in the Eclipse Configuration System to close a contact whenever an intercom station's key is pressed. When the contact is closed it completes an electronic circuit's signal path so that a remote device, such as a light, is powered.

The relay outputs connector connects to three single-pole double-throw (SPDT) relays.

You can program a relay to mute a speaker, to turn on an applause light, to turn on a door lock, or for a variety of other functions. For example, to get the attention of a station operator working in a high-noise environment such as a control booth, you can program a relay to switch on a light at his station each time he receives an incoming call, thus insuring that he will not miss the incoming call.

The i-station has three relays: the auxiliary relay, the mute relay, and the studio announce (SA) relay.

Contact ratings for the relays are 30 VDC at 1 A.

Mute Relay

The mute relay is controlled by the Eclipse Configuration System. It is typically used to decrease or shut off an externally mounted loudspeaker. When you activate this feature, pressing any talk key on the station will decrease or shut off the volume at an externally mounted loudspeaker. This function helps to ensure that noise from the external loudspeaker does not disrupt the communication at the intercom station.

Both normally open and normally closed contacts are provided. They are rated at 30 VDC (volts direct current) at 1 A (ampere). The mute relay is not designed for switching mains AC line voltage. To switch an external device running on mains AC line voltage, use an external relay (or other switching mechanism) activated by the relay.

Auxiliary Relay

The auxiliary relay is controlled by the Eclipse Configuration System. When you attach the programmable relay to any source or destination's label in the intercom system through the Eclipse Configuration System, whenever that label's key is pressed on any station in the system, the relay activates as well.

Typically, a relay is used to activate an external device such as an applause light in a studio, a cue light, or a security door lock. For example, you can program a relay so that whenever anyone in the intercom system presses a key to talk to a specific station, the relay in that station will activate and turn on a visual indicator (such as a light) to get the station operator's attention.

Note: *You can activate a relay that is independent of any talk-or-listen function by creating a "control" label in the Eclipse Configuration System. When you activate the control label, only the relay activates. No audio signal activates in conjunction with the relay.*

Studio Announce (SA) Relay

The Studio Announce (SA) relay is controlled by the Eclipse Configuration System. The SA relay momentarily turns off all "talk" paths leaving the station and sends the station's microphone audio out through the SA output. This function overrides external IFB and ISO, interrupting matrix communications to these external systems.

You can program the relay to activate whenever you press a designated source or destination's key at the intercom station.

(J6) External Speaker Input Connector

The 1/8-inch tip/sleeve mini-connector labeled "J6" connects to and powers an external speaker. Its impedance rating is 4–8 Ohms and its power rating is 1/2 watt at 4 Ohms.

Note that when you plug an external speaker into this connector, the front-panel internal speaker is still active. You can deactivate one or both speakers through the Eclipse Configuration System.

The front-panel's main-volume knob controls the volume for both the rear-panel and front-panel speakers. The volume of both speakers is the same.

(J7) Line-Level Output Connector

The 1/8-inch tip/ring/sleeve mini-connector labeled "J7" is a line-level, transformer-balanced output of all of the audio that comes to the station from the central matrix. All of the audio that you would hear at a station's speaker, from all sources, is sent through this connector. The output's volume is at line level, bypassing the station's audio controls.

This output is typically connected to an externally powered speaker, amplifier, or ceiling speaker system.

The line-level output connector's output impedance is 600 Ohms and its level is nominally 0 dBv. Frequency response is 50 Hz–15 kHz (± 2 dB).

(J8) Hot-Microphone Output Connector

The A3M standard XLR connector labeled "J8" provides a line-level output of the selected microphone's audio (headset or panel) that is always "on" (or "hot"). Only the station's microphone on/off key can override this output.

This connector's output impedance is 600 Ohms. Its level is nominally 0 dBv. Frequency response is 50 Hz–15 kHz (± 2 dB).

A typical application is to permanently wire the station's microphone audio output to all cameras so that the camera operators can hear the director at all times, regardless of what other tasks they are performing. This audio output can also be connected to many types of external speakers, such as external wall speakers. The purpose of this output is to provide an audio output that is always "on" and cannot be interrupted by other audio sources.

Note: *The Eclipse Configuration System's "listen" or "eavesdropping" function will accomplish the same results as the hot-microphone output. See the Eclipse Configuration System Manual for more information.*

(J9) Balanced Program Input Connector

The A3F standard XLR connector labeled "J9" connects an external source of audio to your station so that you can hear it in addition to the intercom audio at

your station. The external source of audio, or "program" audio, can be heard on your station's speaker and headset, but it cannot be heard by other stations in the Eclipse matrix system.

(J10) External Dynamic Microphone Input Connector

The A3F standard XLR connector labeled "J10" is a balanced input for an external dynamic microphone. It is not transformer isolated. Its input level is -40 dBv with a gain adjustment range of ± 5 dB. Impedance is 200 Ohms.

Note: *Dynamic microphones generate their own power while electret microphones do not. The J10 connector cannot be modified for an electret microphone.*

CONNECTING TO AN I-STATION EXPANSION PANEL

An i-series expansion panel connects to an i-series intercom station and gives you access to 32 additional keys. Figure 4 illustrates an i-series expansion panel. Both the basic and advanced keys on an expansion panel operate the same as their corresponding keys on an i-station.

The expansion panel is available with either five-character LCD displays or with areas for paper labels. It connects to an i-station through an RJ-45 connector on the rear panel.

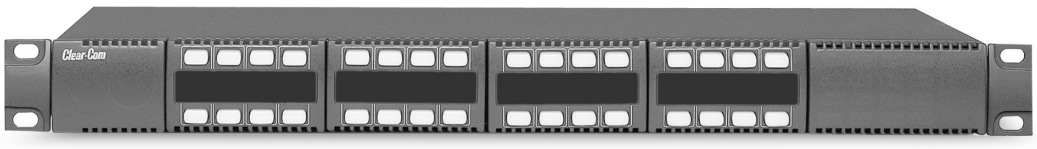


Figure 4: i-Station Expansion Panel

OPERATING A V-STATION

The v-station expansion panel, referred to as the "v-station," gives you separate rotary control knobs for adjusting source listen levels, with a real-time visual display of listen levels as you adjust them. The v-station's four level-control modules (v-modules) allow you to adjust listen levels for 16 individual sources. Figure 1 illustrates a v-station expansion panel.

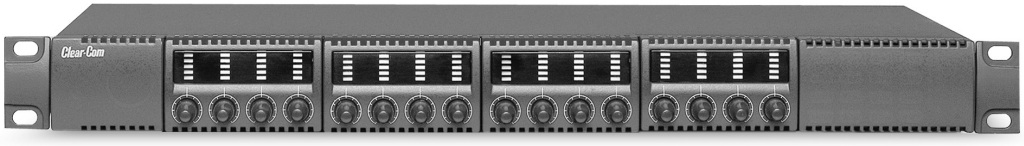


Figure 1: v-Station Expansion Panel

One v-station controls the listen levels for the upper row of key assignments on the i-station or i-station expansion panel. A second v-station controls the listen levels for the lower row of key assignments on the i-station or i-station expansion panel, as shown in Figure 2.

Note that any v-station rotary control knob associated with a "clear" or "answer-back" key on an i-station does not operate, as those keys have special functions.

A v-station connects to an i-station through RJ-45 connectors labeled "expansion in" and "expansion out" on the rear of each station. Figure 3 shows how to wire the stations using CAT-5 cable.

If you connect two v-stations to an i-station, the v-station connected to the i-station's "expansion out" connector controls the volume for the sources assigned to the i-station's upper row of keys. The next v-station, which connects to the first v-station's "expansion out" connector, controls the listen levels for the sources assigned to the i-station's lower row of keys.

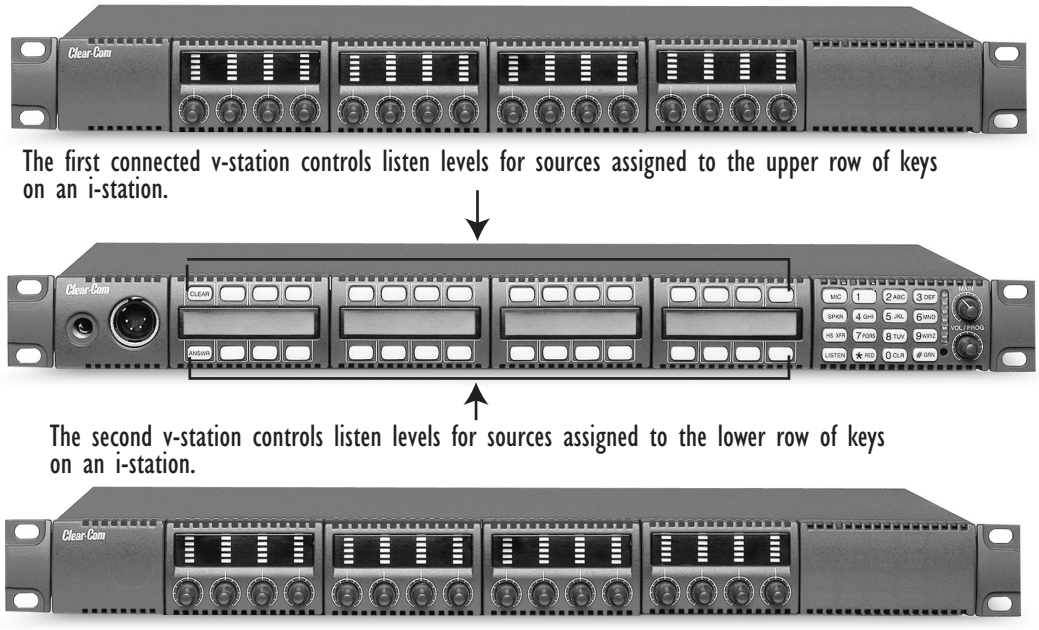
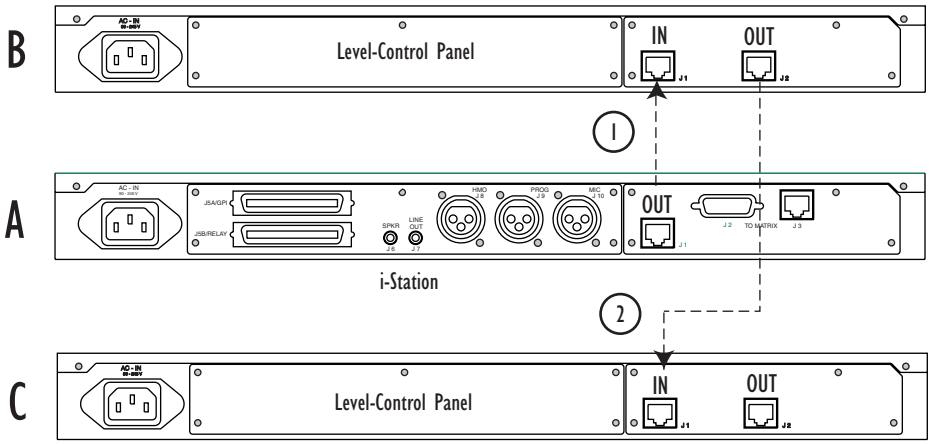


Figure 2: Two v-stations control and display listen levels for one i-station

Connecting an i-Station to two v-Station Expansion Panels ...



1. Connect the OUT connector of the main i-station (A) to the IN connector of the first v-station expansion panel (B).
2. Connect the OUT connector of the first v-station expansion panel (B) to the IN connector of the second v-station expansion panel (C).

*NOTE: The connectors are actually labeled "expansion out" and "expansion in," but have been shortened to IN and OUT on the diagram for clarity.

Figure 3: Connecting two v-stations to an i-station

ALLOWABLE CONFIGURATIONS

You can connect one i-station expansion panel and up to four v-stations to an i-series intercom station. To form a valid configuration, you cannot connect more than two v-stations together in the "daisy-chain."

The following table shows all station combinations which form a valid configuration. A configuration starts with the main station, which is an i-station with four display key modules, and proceeds with the various combinations of i-station expansion panels and v-stations. The "expansion out" connector of each station connects to the "expansion in" connector of the next station in the configuration, forming a "daisy-chain."

In the table "main i-station" refers to an i-station with four display key modules, "i-expansion" refers to an i-station expansion panel with four display key modules, and "v-station" refers to a v-station expansion panel.

FIRST POSITION	SECOND POSITION	THIRD POSITION	FOURTH POSITION	FIFTH POSITION	SIXTH POSITION
main i-station					
main i-station	v-station				
main i-station	v-station	v-station			
main i-station	i-expansion				
main i-station	v-station	i-expansion			
main i-station	v-station	v-station	i-expansion		
main i-station	v-station	i-expansion	v-station		
main i-station	v-station	v-station	i-station	v-station	
main i-station	v-station	i-expansion	v-station	v-station	
main i-station	v-station	v-station	i-expansion	v-station	v-station

Table 1: All Possible Valid Configurations of v-Stations

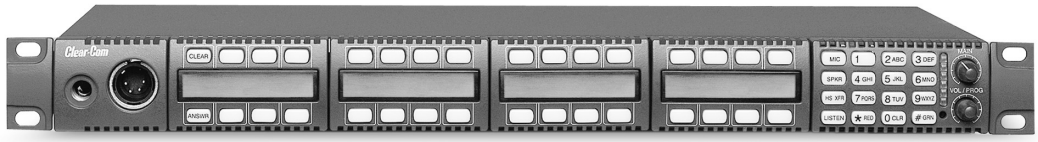
A FULLY POPULATED CONFIGURATION

Figure 4 shows an example of a fully populated configuration, as the configuration would appear in an equipment rack. Figure 5 shows how to connect the stations together with CAT-5 cable.

You can remove any of the v-stations in a fully populated system without affecting the key assignments of the remaining v-stations.

v-Station

Main i-Station (4 display key modules)



v-Station

v-Station

i-Station Expansion Panel

v-Station

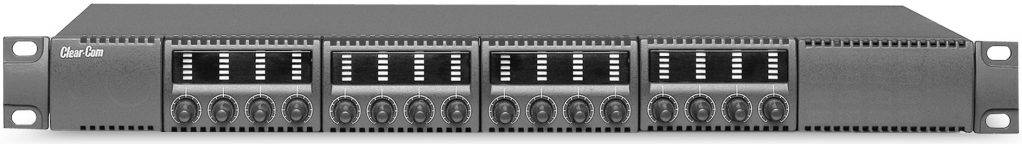
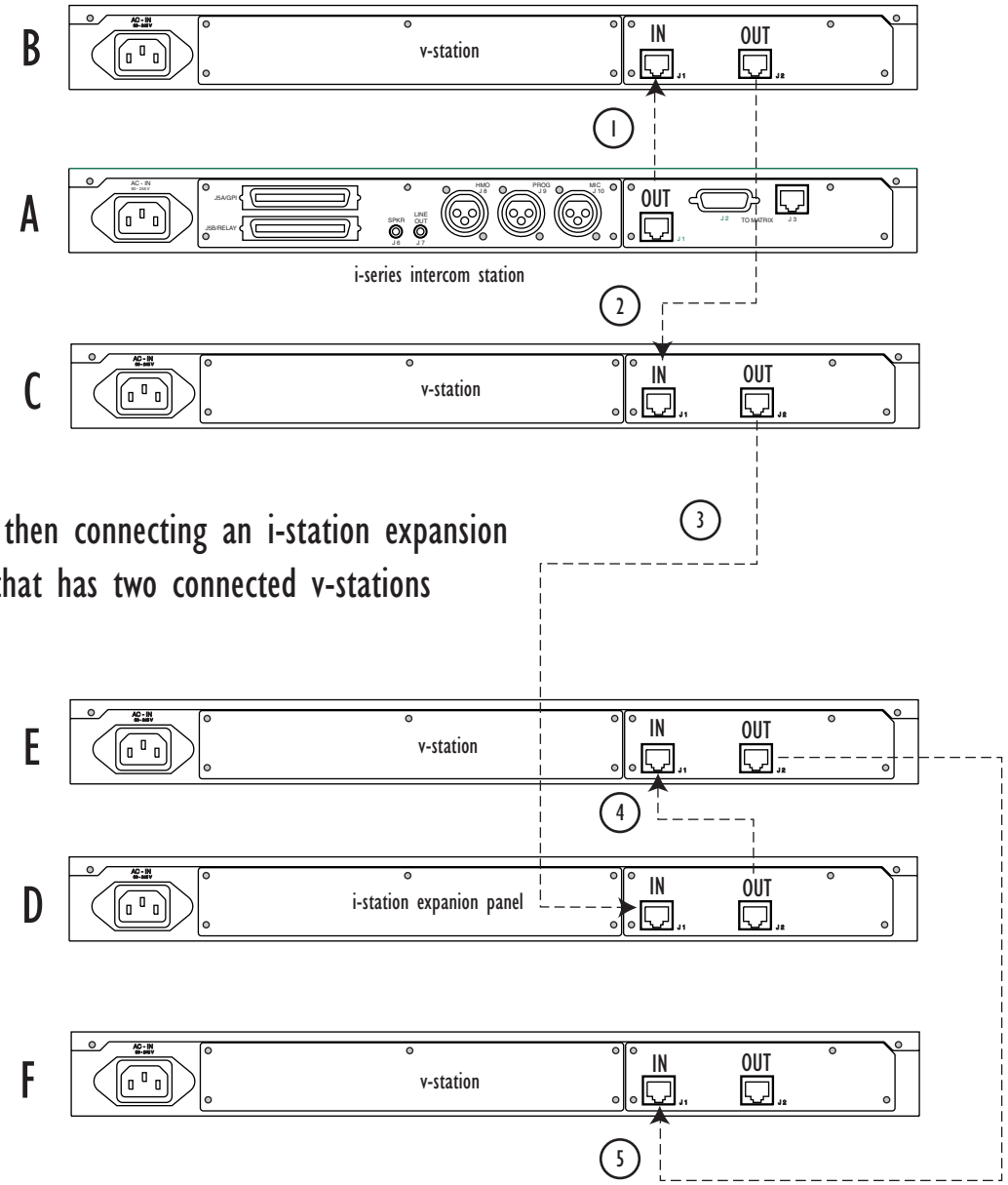


Figure 4: A fully populated configuration of v-stations

Connecting an i-station to two v-stations ...



... and then connecting an i-station expansion panel that has two connected v-stations

1. Connect the OUT connector of the main i-station (A) to the IN connector of the first v-station (B).
2. Connect the OUT connector of the first v-station (B) to the IN connector of the second v-station (C).
3. Connect the OUT connector of the second v-station (C) to the IN connector of the i-station expansion panel (D).
4. Connect the OUT connector of the i-station expansion panel (D) to the IN connector of the third v-station (E).
5. Connect the OUT connector of the third v-station (E) to the IN connector of the fourth v-station (F).

*NOTE: The connectors are actually labeled "expansion out" and "expansion in," but have been shortened to IN and OUT on the diagram for clarity.

Figure 5: Connecting a fully populated configuration of v-stations

6 INSTALLING AN I-SERIES INTERCOM STATION

This chapter describes how to install an i-series intercom station. It also gives wiring diagrams for the station's rear-panel connectors. For programming information, see the *Eclipse Configuration System Manual*.

EQUIPMENT PLACEMENT

All i-series intercom stations require one rack unit of space (1 RU) in a standard 19-inch (48.26 cm) rack.

Put all intercom stations at a comfortable operational height. Leave at least 2 inches (5 cm) of clearance at the rear of the station's chassis to allow for cable connectors and access to the rear-panel controls. For proper ventilation, make sure ventilation openings are not blocked.

***WARNING:** To reduce the risk of fire or electric shock, do not expose the unit to rain or moisture.*

MAINS AC POWER

Each i-station has an internal power supply, with a removable AC power cord. The power supply is "universal," operating over a voltage range of 90 to 245 VAC and 50 to 60 Hz. The maximum dissipation is 40 W.

ADJUSTMENTS

No initial adjustments are required to set up the stations other than the standard input level adjustment made through the Eclipse Configuration System.

CONFIGURATION

Assign each station's name and other parameters by using the Eclipse Configuration System. For instructions, see the *Eclipse Configuration System Manual*.

WIRING

i-Series intercom stations use a twisted 4-pair transmission scheme to connect them to the matrix frame using the industry standard RJ-45 connector. Refer to *Installing an Eclipse Matrix System: An Overview* for connector installation and use, and the type of cable needed for connection between stations and frames.

Each pair of the twisted 4-pair wire has the following function:

- Pair 1 transmits analog audio from the matrix port to the station.
- Pair 2 transmits digital data from the station back to the matrix card port.
- Pair 3 transmits audio from the station to the matrix card port.
- Pair 4 transmits digital data from the matrix port back to the station.

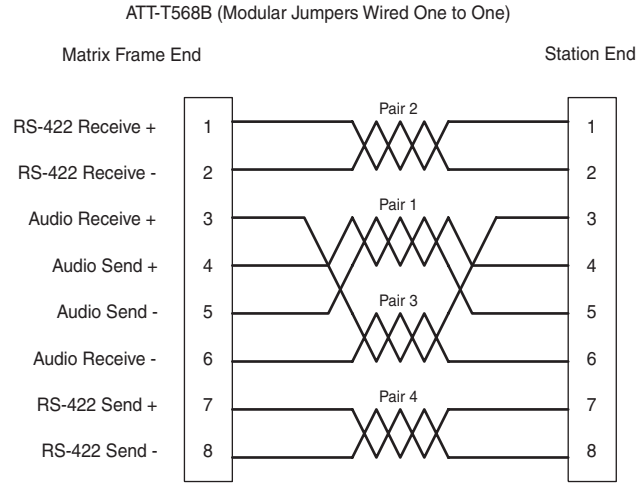


Figure 1: Matrix Frame to Station Wiring

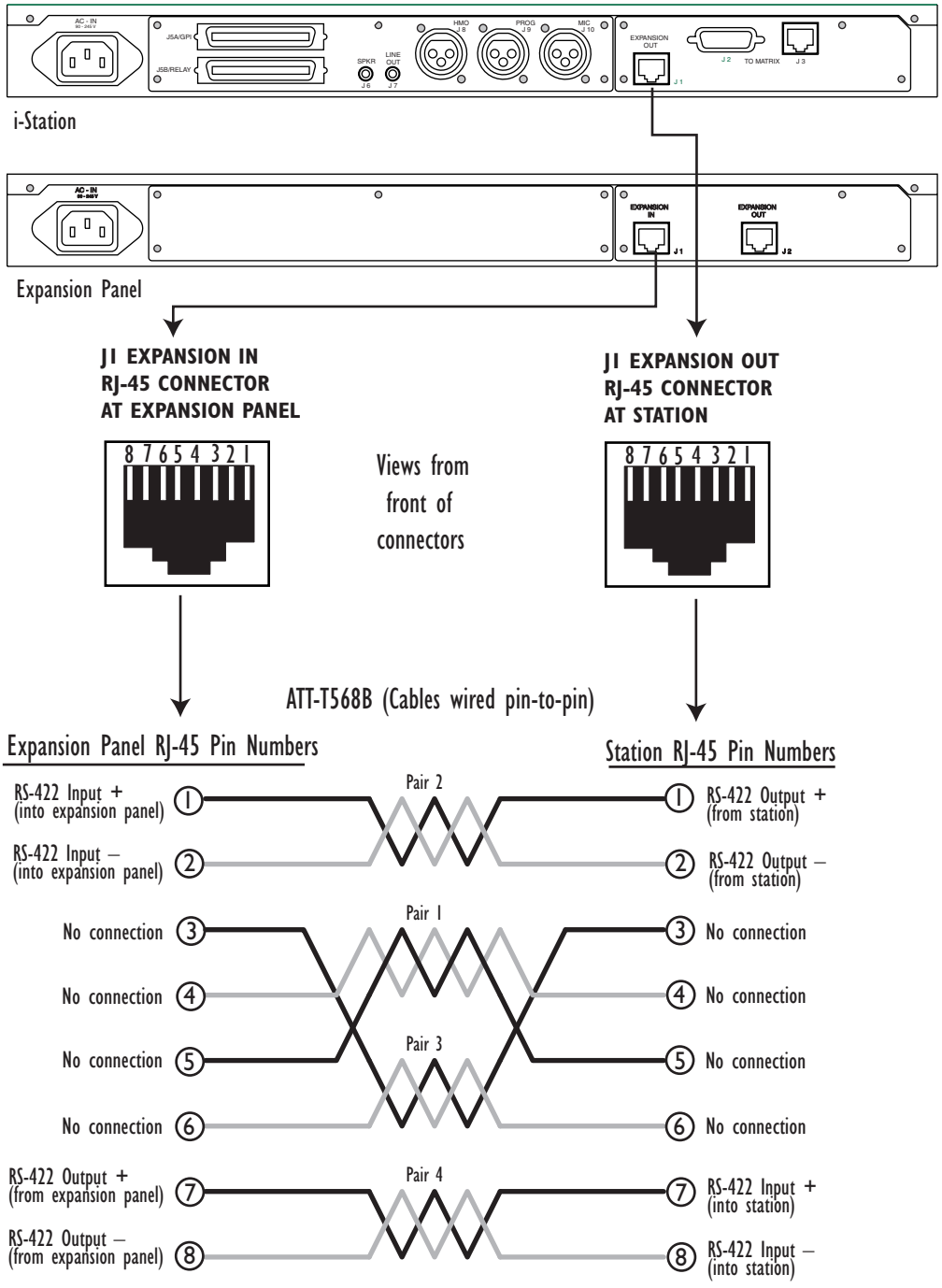
PINOUT DIAGRAMS

The diagrams on the following pages give you the pinout configurations of the i-station's rear-panel connectors. For operating instructions for each connector's output or input, refer to the Operation Chapter of this manual.

Pinout configurations for the following connectors are included:

- Expansion Out Connector (J1)
- RJ-45 to Matrix Connector (J3)
- General Purpose Inputs Connector (J5A)
- Relay Output Connector (J5B)
- Speaker-Feed Output Connector (J6)
- Line-Level Output Connector (J7)
- Hot Microphone Output Connector (J8)
- Program Input Connector (J9)
- Auxiliary Microphone Input Connector (J10)

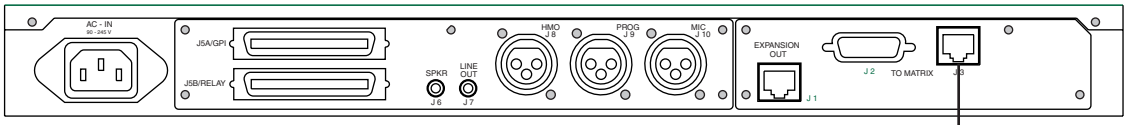
EXPANSION OUT CONNECTOR (J1)



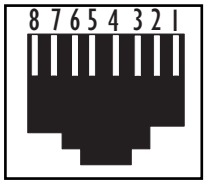
Pair 1 No connection
Pair 2 RS-422 data input from station to Matrix
Pair 3 No connection
Pair 4 RS-422 data output from Matrix to station

Figure 2: Expansion Out Connector Pinout Diagram

RJ-45 TO MATRIX CONNECTOR (J3)

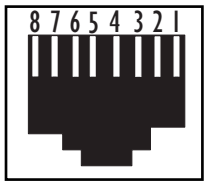


RJ-45 CONNECTOR AT MATRIX PORT

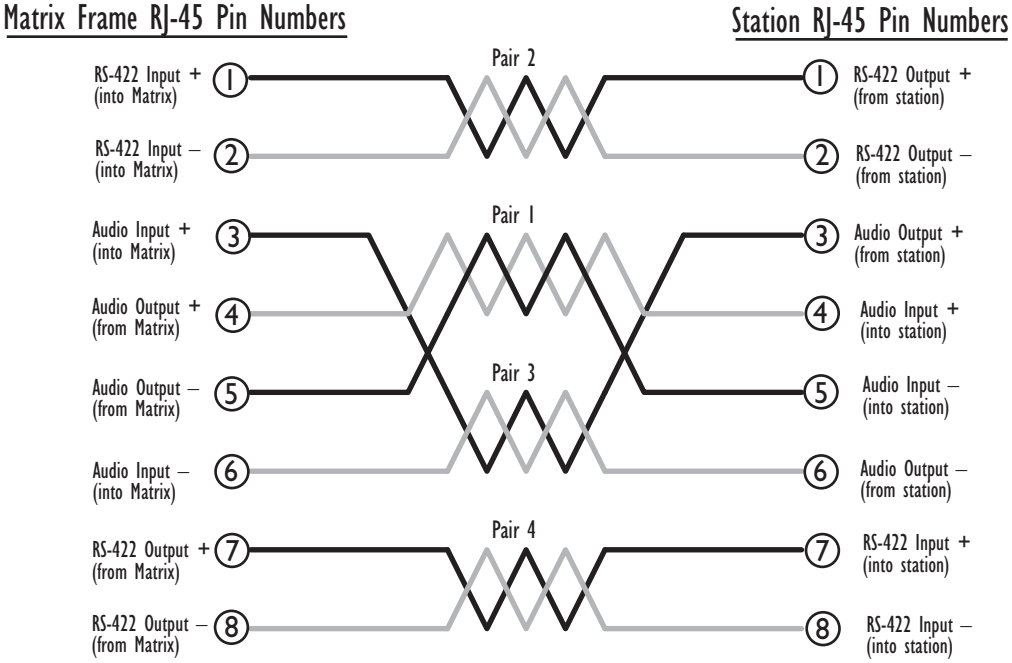


Views from front of connectors

"TO MATRIX" (J3) RJ-45 CONNECTOR AT STATION



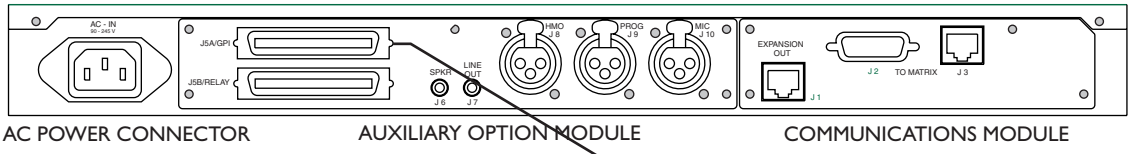
ATT-T568B (Cables wired pin-to-pin)



Pair 1 Audio output from Matrix to station
Pair 2 RS-422 data input from station to Matrix
Pair 3 Audio input from station to Matrix
Pair 4 RS-422 data output from Matrix to station

Figure 3: RJ-45 to Matrix Connector Pinout Diagram

GENERAL PURPOSE INPUTS CONNECTOR (J5A)



AC POWER CONNECTOR | AUXILIARY OPTION MODULE | COMMUNICATIONS MODULE

DB-25 Female Connector

PIN	DESCRIPTION
1	+5 Volts
2	GPI 1, Pin A
3	GPI 2, Pin A
4-9	Reserved for future use
10	+5 Volts
11	Headset Ground
12	Headset Ground
13	Right Headset Out
14	Digital Ground
15	GPI 1, Pin B
16	GPI 2, Pin B
17-22	Reserved for future use
23	Digital Ground
24	Headset Ground
25	Left Headset Out

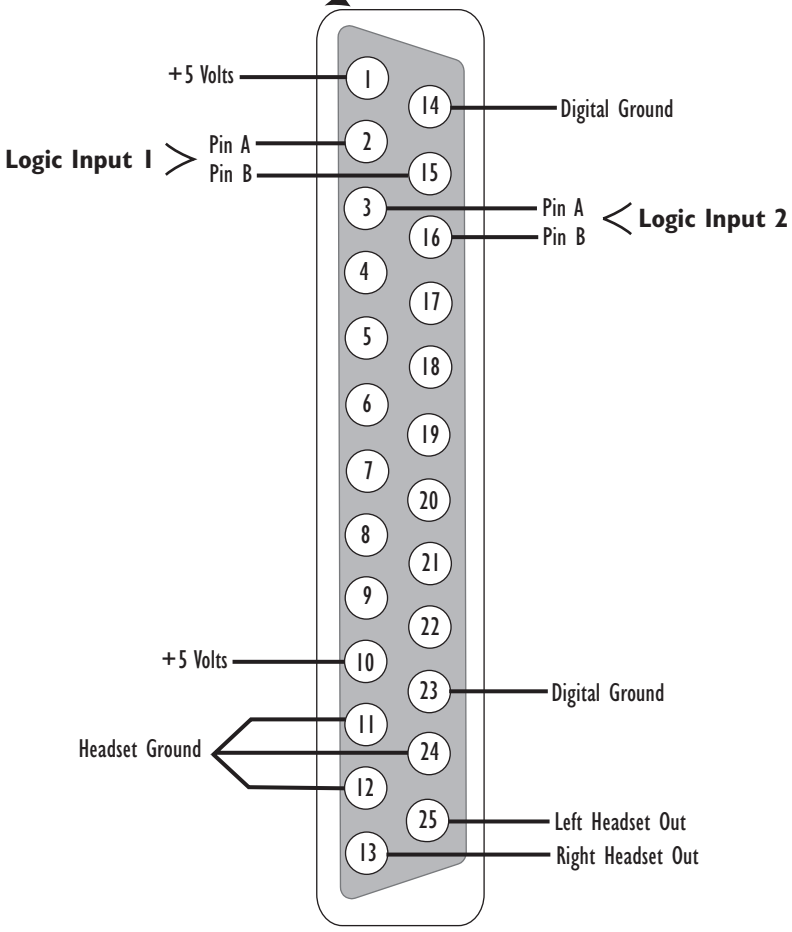
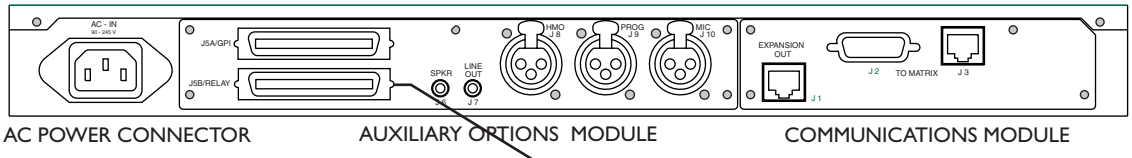


Figure 4: General Purpose Inputs Connector Pinout Diagram

RELAY OUTPUT CONNECTOR (J5B)



DB-25 Female Connector

PIN	DESCRIPTION
1	AUX RELAY Normally Closed Pin
2	AUX RELAY Normally Open Pin
3	MUTE RELAY Common Pin
4	SA RELAY Normally Closed Pin
5	SA RELAY Normally Open Pin
6-12	Reserved for future use
13	Digital ground pin
14	AUX RELAY Common Pin
15	MUTE RELAY Normally Closed Pin
16	MUTE RELAY Normally Open Pin
17	SA RELAY Common Pin
18-25	Reserved for future use

30 VDC at 1 Ampere

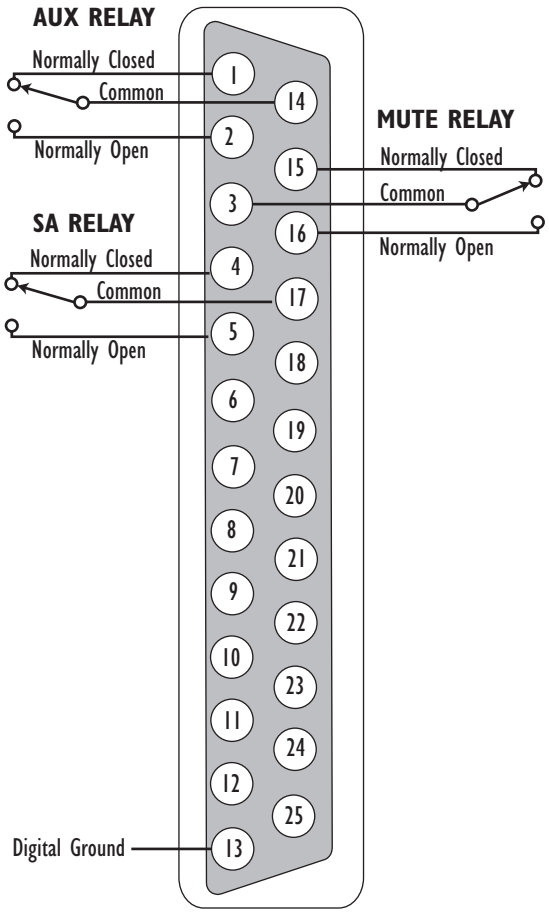
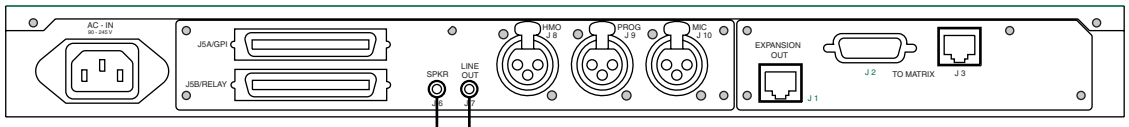


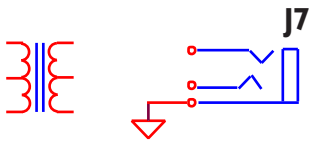
Figure 5: Relay Outputs Connector (J3) Pinout Diagram

SPEAKER-FEED OUTPUT (J6)
LINE-LEVEL OUTPUT (J7)



LINE LEVEL OUTPUT CONNECTOR (J7)

1/8-inch (12.7 mm) tip/ring/sleeve mini-connector

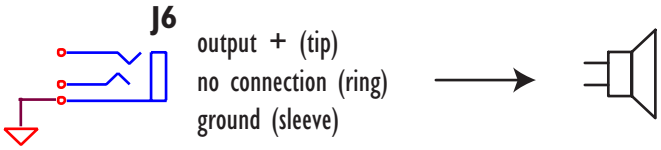


ouput + (tip)
output – (ring)
ground (sleeve)

Impedence: 600 Ohms
Level: nominally 0 dBv
Frequency Response: 50 Hz 15 kHz (+/- 2 dB)

EXTERNAL SPEAKER OUTPUT CONNECTOR (J6)

1/8-inch (12.7 mm) tip/sleeve mini-connector

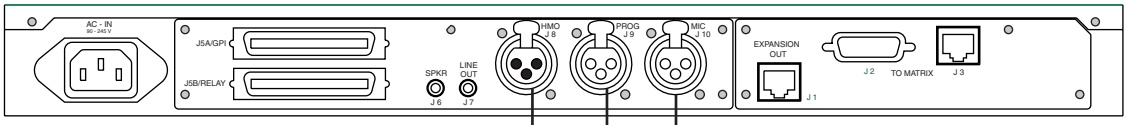


output + (tip)
no connection (ring)
ground (sleeve)

Impedence: 4 8 Ohms
Power: 1/2 watt at 4 Ohms

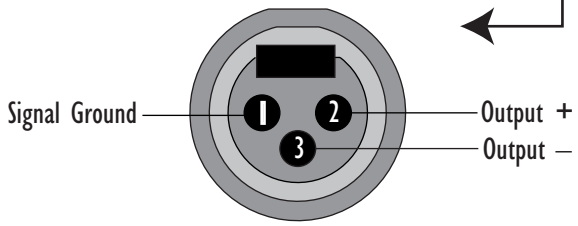
Figure 6: Connector Pinout Diagrams for Speaker-Feed Output and Line-Level Output

HOT MICROPHONE OUTPUT (J8)
PROGRAM INPUT (J9)
AUXILIARY MICROPHONE INPUT (J10)



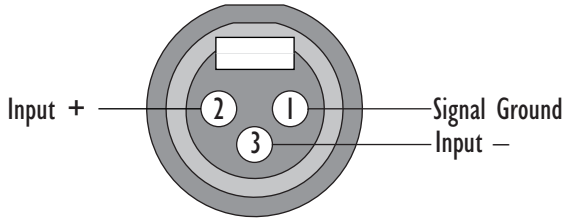
Hot Microphone Output (Line Level) Connector (J3) A3 Male

PIN	DESCRIPTION
1	Signal Ground
2	Input +
3	Input –



Program Input (Line Level)Connector (J9) A3 Female

PIN	DESCRIPTION
1	Signal Ground
2	Input +
3	Input –



Auxiliary Microphone Input (Mic Level) (J10) A3 Female

PIN	DESCRIPTION
1	Signal Ground
2	Input +
3	Input –

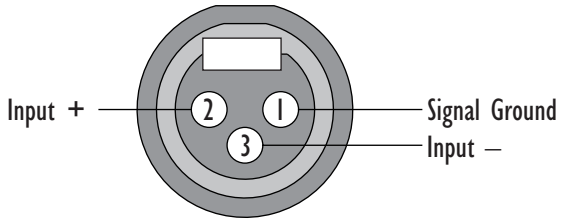


Figure 7: Connector Pinout Diagrams for Hot Microphone Output (J3), Program Input (J9), and Auxiliary Microphone Input (J10)

7 MAINTAINING AN I-SERIES INTERCOM STATION

This chapter provides maintenance information: troubleshooting tips, block diagrams, component layout drawings, bills of materials, and schematics.

***CAUTION**: These servicing instructions are for use by qualified personnel only. To reduce the risk of electrical shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.*

GENERAL TROUBLESHOOTING

Every i-station's microprocessor has a reset button located, as shown in Figure 1, in an unmarked hole located next to the program volume knob (labeled "VOL/PROG"). If a station acts erratically, try resetting it. Often this will clear the problem.

To reset a station, insert a small screwdriver or a piece of wire (such as a bent paper clip) into the hole and push the reset button. Another way to reset the station is to disconnect and re-connect the AC power cord.

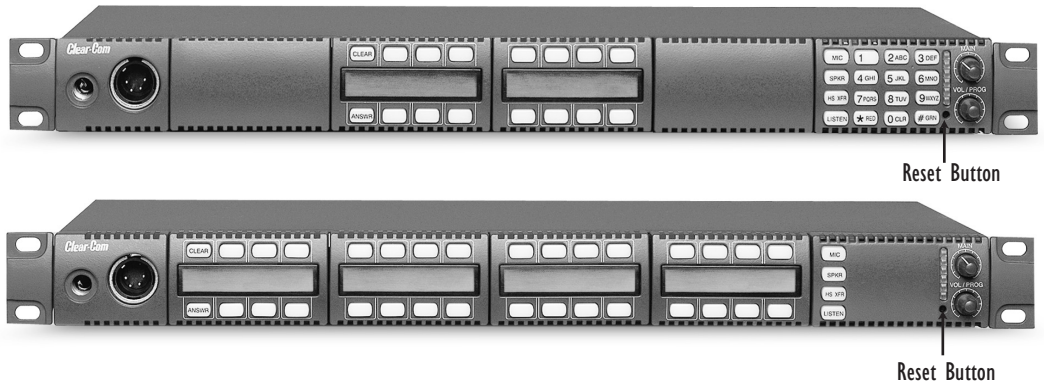


Figure 1: Reset the station if problems occur

TROUBLESHOOTING TIPS

Listed below are some of the more common problems you may experience while using an i-station, the possible causes, and suggested solutions.

SYMPTOM	CAUSE	SOLUTION
A key does not light when pressed.	The key has not been assigned in the Eclipse Configuration System.	1. Ensure that key has a label assigned to it in the Eclipse Configuration System. (The key will not light without an assigned label.) 2. Reset the station. 3. Replace the station.
The station's displays and keys do not light.	Power to the station is off.	1. Check mains AC power to the station. 2. Replace the station.
The display shows unexpected characters.		1. Power the station off and turn it back on. 2. Reset the station's matrix card in the matrix frame. 3. Replace the station.
Keypad function keys do not operate, or the station beeps when a key is pressed.	The function may have been inhibited from the Eclipse Configuration System.	1. Check the Eclipse Configuration System to be sure the function is enabled. 2. Reset the station. 3. Replace the station.
The station appears to activate talk paths, but other stations can't hear the station operator.	1. Correct microphone may not be selected or on. 2. The station may have been defined as a nearby station in the Eclipse Configuration System. 3. The station does not have eavesdropping enabled.	1. Check MIC and HS XFR keys to ensure the intended microphone is selected and on. 2. Check Eclipse Configuration System to make sure the station has not been defined as a nearby station. 3. Check Eclipse Configuration System to make sure eavesdropping is enabled. 4. Test the integrity of the station's audio path by temporarily setting a forced listen to it. 5. Reset the station. 6. Replace the station.

SYMPTOM	CAUSE	SOLUTION
The station is inoperative and all red keys flash slowly.	1. The matrix frame has just been powered up and is still downloading the configuration to the matrix cards. 2. Cable is disconnected. 3. Data paths are corrupted. 4. Station has not been assigned correct port type. 5. Matrix card type does not match station. Stations with COM-10 Communications Modules should have MTX-A8 or MVX-A8. Stations with COM-20 Communications Modules should have MTX-D8 or MVX-D8.	1. Wait 60 seconds. 2. Make sure the cable to station and matrix is plugged in at both ends. 3. Check the integrity of the data paths, especially the polarity for stations using a COM-10 Communications Module. 4. Check Eclipse Configuration System to make sure the station has been assigned the correct port type. 5. Confirm that the matrix card type matches the station. 6. Reset the station's matrix card in the matrix frame. 7. Reset the station. 8. Replace the station.
No audio from the station's speaker.	1.Volume knob (labeled VOL) on keypad module is turned down. 2. Speaker key (labeled SPKR) is off. 3. Audio cannot be heard in a headphone. 4. Speaker may have been disabled in Eclipse Configuration System.	1. Turn VOL knob up. 2. Make sure SPKR key is on. 3. Check whether audio can be heard in a headphone. 4. Check Eclipse Configuration System and the station's logic inputs to make sure the speaker has not been disabled in the software. 5. Test the integrity of the station's audio path by temporarily setting a forced listen to it. 6. Reset the station's matrix card in the matrix frame. 7. Replace the station's matrix card in the matrix frame. 8. Reset the station. 9. Replace the station.
The operator cannot hear another station's page or call signal tones.	1. Page volume control needs adjusting in Eclipse Configuration System. 2. Page override is enabled in Eclipse Configuration System.	1. Adjust the station's page volume control using Eclipse Configuration System (refer to the *Eclipse Configuration System Manual* for more information.) 3. Check the Eclipse Configuration System to make sure page override is not enabled for the station. 4. Reset the station. 5. Replace the station.

SYMPTOM	CAUSE	SOLUTION
Announce tones (eavesdropping indication, change tones, and so on) are not heard at the station.	Monitoring tones and change tones are not enabled in Eclipse Configuration System.	Check Eclipse Configuration System to make sure monitoring tones and change tones are enabled.
No speaker audio from the external program feed.	1. Program volume knob (labeled VOL/PROG) is not turned up. 2. Program source is not producing audio.	1. Turn up VOL/PROG knob. 2. Check program source. 3. Reset the station. 4. Replace the station.
The headphone is not receiving audio from the external program feed.	1. Program may have been disabled for the second program feed in Eclipse Configuration System.	1. If the external program feed is audible in the speaker, check Eclipse Configuration System to make sure the program was not disabled for the second earphone feed. 2. Replace the station.

ANALOG BLOCK DIAGRAM

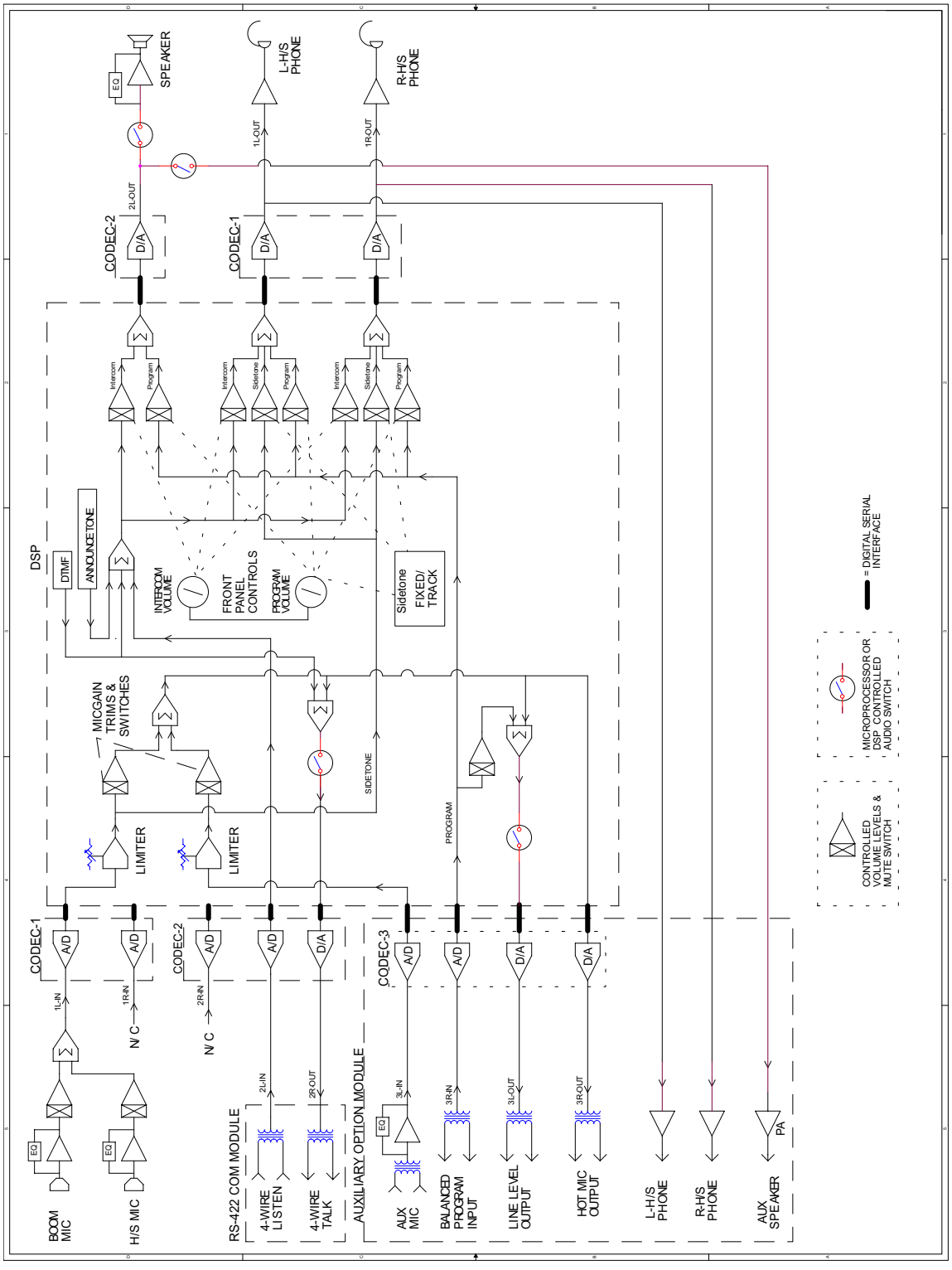


Figure 1: Analog Block Diagram

STATION BLOCK DIAGRAM

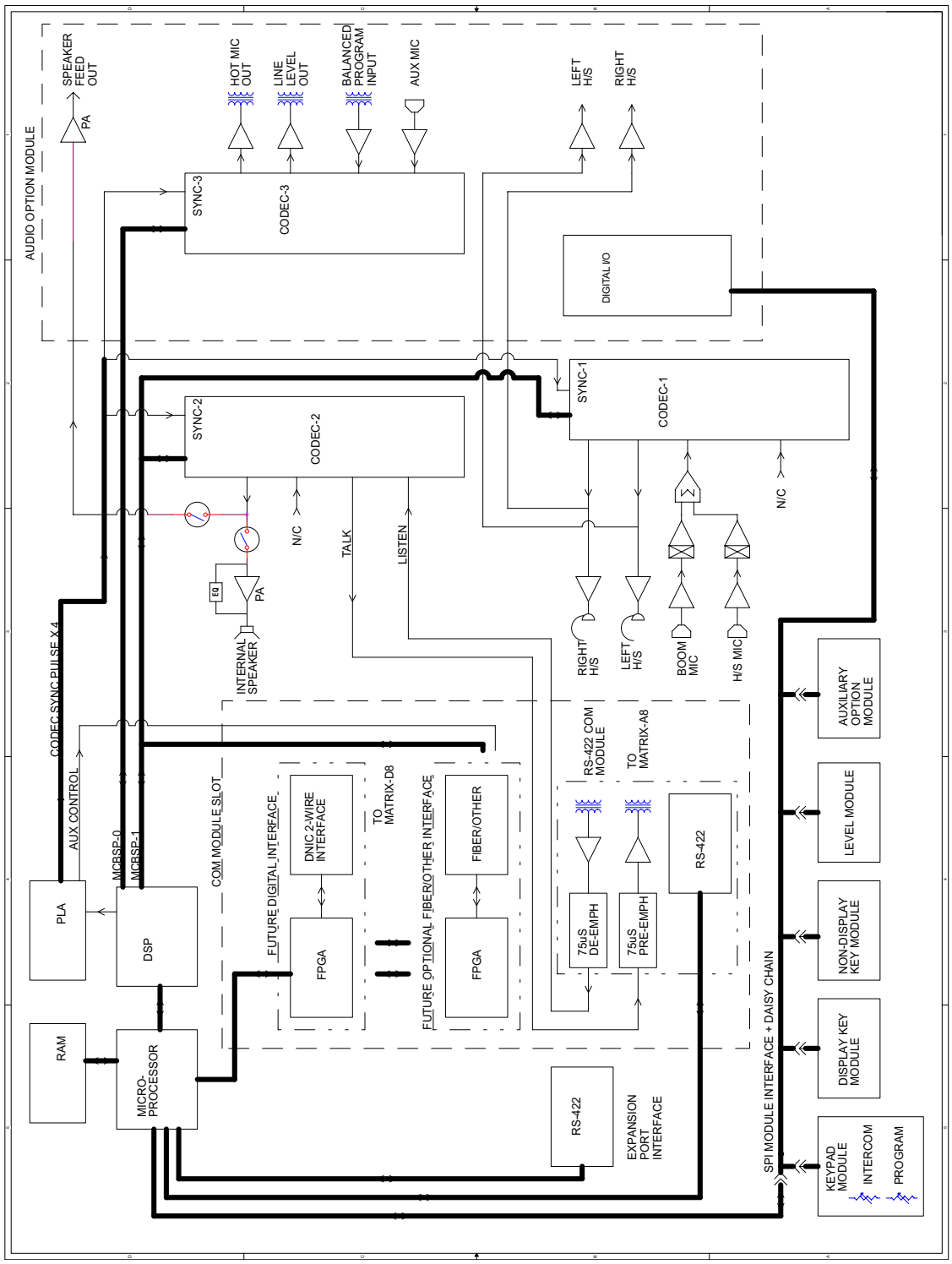


Figure 2: Station Block Diagram

COM-10 COMMUNICATIONS MODULE PCB COMPONENT LAYOUT DRAWING

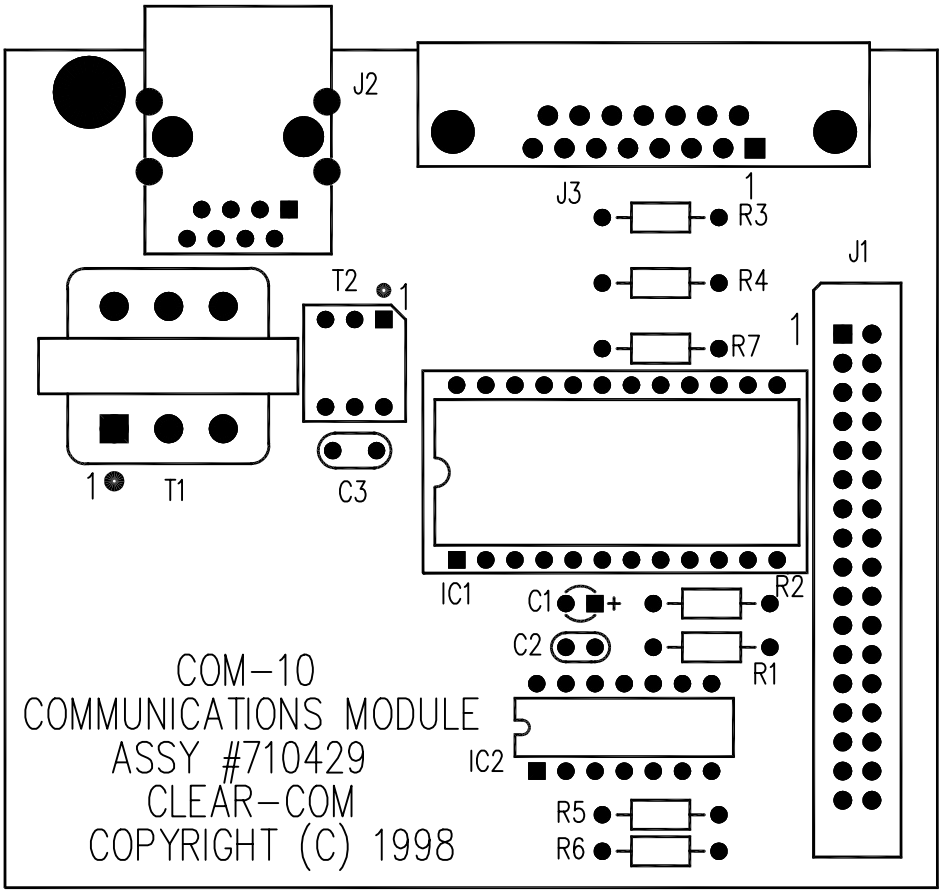


Figure 3: COM-10 PCB Component Layout Drawing

BILL OF MATERIALS

COM-10 RS-422 Communications Module PCB

CAPACITORS

Value	Type	Volts	Tol.	Part#	Designator
22 uF	Tantalum	16V		150032	C1
.1 uF	Monolithic	50V	10%	150035	C2
.0022 uF	Mylar	100V	5%	150045	C3

RESISTORS

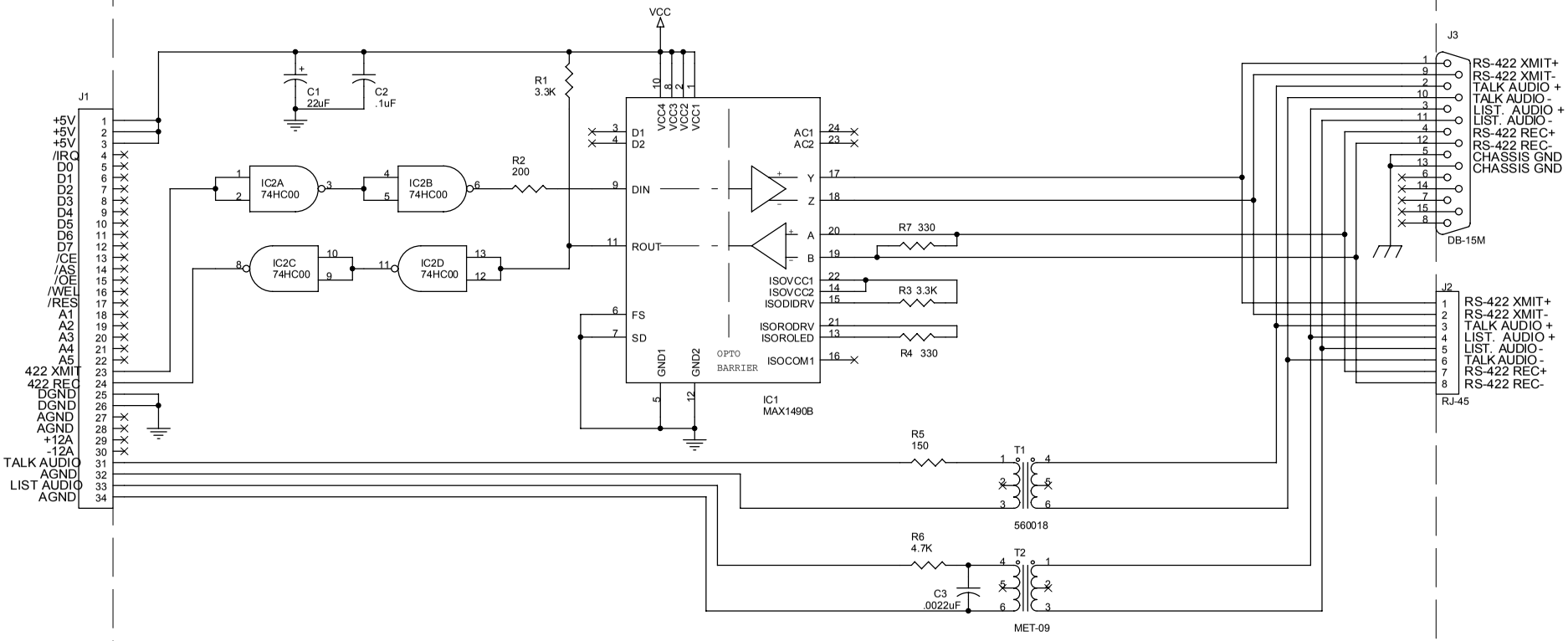
Value	Power	Type	Tol.	Part#	Designator
150 OHM	1/4	Carbon Film	5%	410006	R5
4.7K OHM	1/4	Carbon Film	5%	410013	R6
3.3K OHM	1/4	Carbon Film	5%	410015	R3 R1
330 OHM	1/4	Carbon Film	5%	410061	R4 R7
200 OHM	1/4	Carbon Film	5%	410072	R2

INTEGRATED CIRCUITS

Device	Description	Part#	Designator
IC	74HC00 CMOS QUAD NAND 14 PIN DIP	480157	IC2
IC	1490B ISOLATED RS422 DATAINTERFACE DIP24	480242	IC1
IC	24 PIN DIP SOCKET	210180	IC1

MISCELLANEOUS

Device	Description	Part#	Designator
Connector	15 PIN (M) RT ANG PC MTG D TYPE CON	210188	J3
Connector	DUAL ROW HEADER 17 POS. .230IN	210279	J1
Connector	RJ-45 RT ANG MOD CON 1-PORT SHIELDED	210335	J2
Transformer	600CT/600CT PAN MAGNETICS #TTC108	560018	T1
Transformer	10K:10K MINIATURE TRANSFORMER	560034	T2



REV	ECO#	DESCRIPTION	DATE	BY	CHK
A	2442	Release To Production			

DWN	Clark McCoy	DATE	04/08/98
CHK		DATE	
APP		DATE	
ORCAD P/N	710429SA.DSN		
SHEET:	1 OF: 1		
SCALE	----------	SIZE	B

CLEAR-COM®
INTERCOM SYSTEMS

TITLE: Schematic

COM-10 Isolated COM Module

DWG No. 710429 - SCH - B REV A

STATION CONTROLLER PCB COMPONENT LAYOUT DRAWING

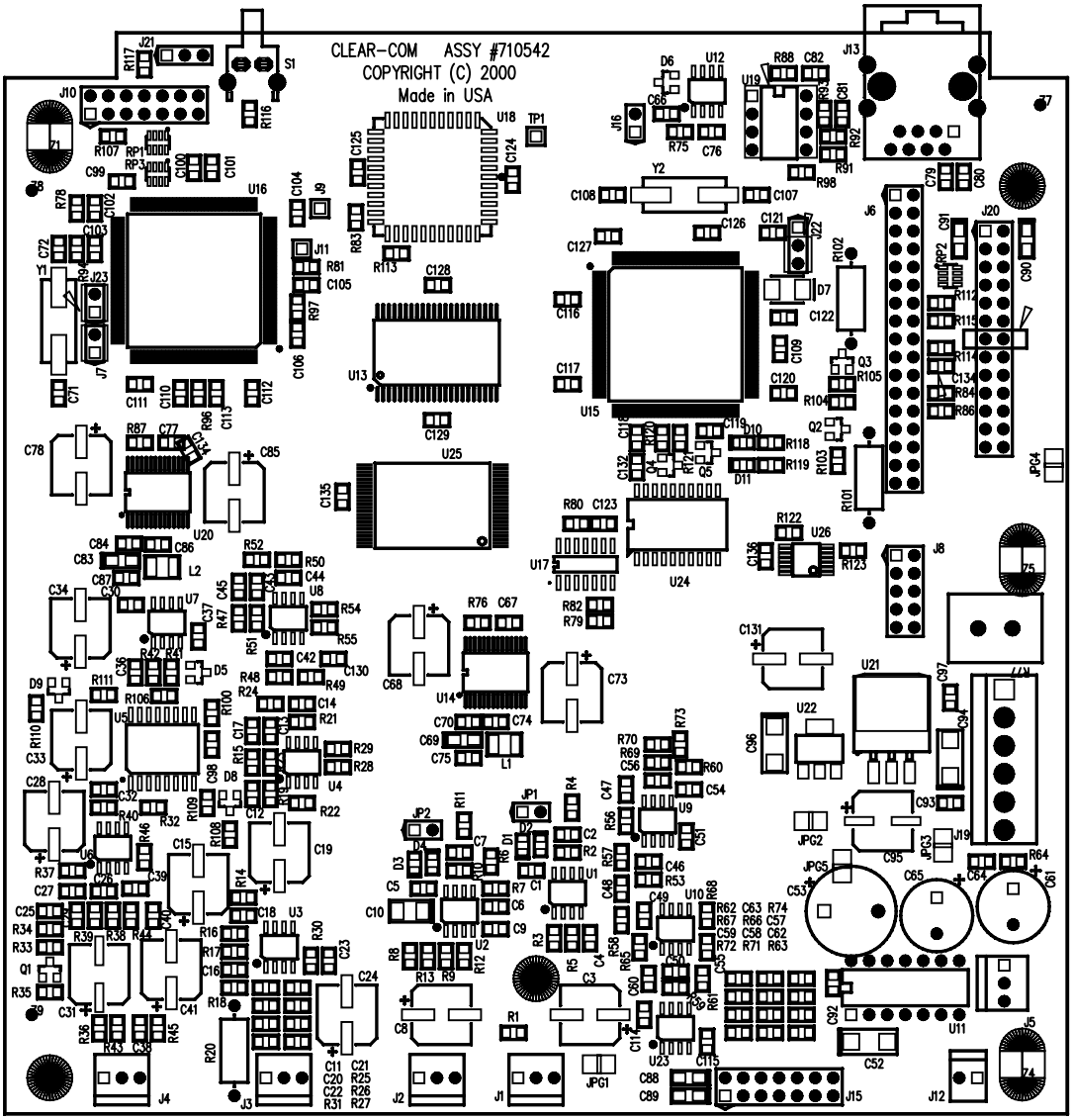


Figure 4: Station Controller PCB Component Layout Drawing

BILL OF MATERIALS

Station Controller PCB

CAPACITORS

Value		Type	Volts	Tol.	Part#	Designator
1000	uF	Aluminum	35V		150092	C53
22	uF	Aluminum	16V	20%	150142	C28
1000	uF	Aluminum	16V		150145	C65
470	uF	Aluminum	35V		150156	C61
22	pF	Ceramic Disc SMD	50V	5%	151116	C134
33	pF	Ceramic Disc SMD	50V	5%	151118	C2 C6 C7 C46 C54 C56 C71 C72 C107 C108
47	pF	Ceramic Disc SMD	50V	5%	151120	C12 C14 C42 C44
220	pF	Ceramic Disc SMD	50V	5%	151128	C50 C79 C80 C81 C82 133
.001	uF	Ceramic Disc SMD	50V	5%	151136	C17 C45
.0022	uF	Ceramic Disc SMD	50V	10%	151152	C11 C26 C39
.0033	uF	Ceramic Disc SMD	50V	10%	151154	C62
.0047	uF	Ceramic Disc SMD	50V	10%	151156	C29 C16
.01	uF	Ceramic Disc SMD	50V	10%	151160	C21 C22 C57 C92 C93 C97 C99 C100 C101 C102 C103 C104 C105 C106 C109 C110 C111 C112 C113 C116 C117 C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129 C132 C135 C136
.015	uF	Ceramic Disc SMD	50V	10%	151162	C58
.022	uF	Ceramic Disc SMD	50V	10%	151164	C25 C55 C59
.047	uF	Ceramic Disc SMD	50V	10%	151168	C63
.1	uF	Ceramic Disc SMD	50V	10%	151172	C1 C4 C5 C9 C13 C18 C20 C23 C27 C30 C30 C32 C36 C37 C38 C40 C43 C47 C48 C49 C51 C60 C64 C66 C67C70 C74 C75 C76 C77 C84 C86 C87 C98 C114 C115 C130
1	uF	Tantalum SMD	16V	10%	151185	C69 C83 C88 C89 C90 C91
4.7	uF	Tantalum SMD	16V	10%	151189	C10
10	uF	Tantalum SMD	25V	10%	151192	C52 C94 C96
22	uF	Aluminum SMD	50V	20%	151200	C3 C8 C15 C19 C24 C28 C33 C34 C41 C73 C85 C131
47	uF	Aluminum SMD	25V	20%	151202	C78 C68
100	uF	Aluminum SMD	25V	10%	151203	C95 C31

RESISTORS

Value		Power	Type	Tol.	Part#	Designator
680	OHM	1/2	Carbon Film	5%	410165	R20
330	OHM	1/2	Carbon Film	5%	410169	R101 R102
27	OHM	5	Carbon Comp	5%	410216	R77
0	OHM	1/10	SMD		411100	R122 R123
2.2	OHM	1/10	SMD	5%	411181	R64
10.0	OHM	1/10	SMD	1%	411197	R87 R76
22.1	OHM	1/10	SMD	1%	411230	R57
47.5	OHM	1/10	SMD	1%	411262	R14 R30 R40 R46
82.5	OHM	1/10	SMD	1%	411285	R16 R100 R118 R119
100	OHM	1/10	SMD	1%	411293	R3 R5 R9 R12 R25 R91 R92

RESISTORS (CONTINUED)

Value		Power	Type	Tol.	Part#	Designator
221	OHM	1/10	SMD	1%	411326	R37 R44 R93
604	OHM	1/10	SMD	1%	411368	R15 R24 R47 R52
1.00K	OHM	1/10	SMD	1%	411389	R27 R107 R108 R109 R110 R111
1.21K	OHM	1/10	SMD	1%	411397	R72
2.00K	OHM	1/10	SMD	1%	411418	R84
2.21K	OHM	1/10	SMD	1%	411422	R71
2.74K	OHM	1/10	SMD	1%	411431	R62 R74
3.32K	OHM	1/10	SMD	1%	411439	R75 R78 R79 R80 R81 R82 R83 R86 R94 R96 R97 R106 R112 R115
4.02K	OHM	1/10	SMD	1%	411447	R17 R18 R38 R39 R45
4.32K	OHM	1/10	SMD	1%	411450	R66 R67
4.75K	OHM	1/10	SMD	1%	411454	R28 R29 R43 R54 R55 R88 R98 R116 R117 R120 R121
5.62K	OHM	1/10	SMD	1%	411461	R36
8.25K	OHM	1/10	SMD	1%	411477	R33 R35
10.0K	OHM	1/10	SMD	1%	411485	R1 R2 R4 R6 R7 R10 R11 R19 R21 R22 R23 R32 R41 R42 R48 R49 R50 R51 R56 R60 R69 R70 R73 R103 R104 R105 R113 R114
15.0K	OHM	1/10	SMD	1%	411502	R8
20.0K	OHM	1/10	SMD	1%	411514	R53
22.1K	OHM	1/10	SMD	1%	411518	R13
23.7K	OHM	1/10	SMD	1%	411521	R61
68.1K	OHM	1/10	SMD	1%	411565	R59 R63
100K	OHM	1/10	SMD	1%	411581	R34 R58 R65 R68
475K	OHM	1/10	SMD	1%	411646	R26
10K	OHM		Carbon Comp		416016	RP1
3.3K	OHM		Carbon Comp		416023	RP2 RP3

DIODES AND TRANSISTORS

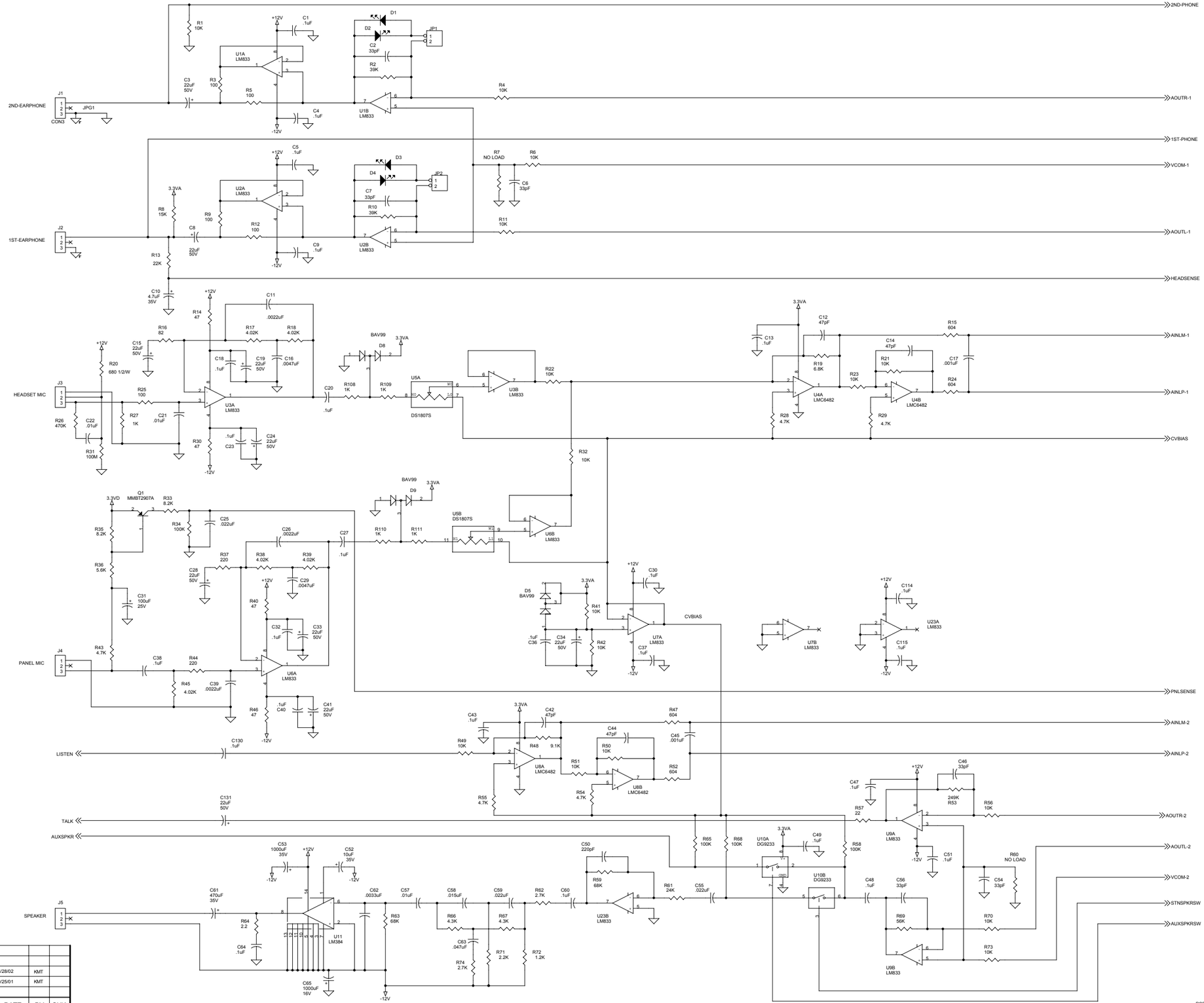
Device	Description	Part#	Designator
Diode	10BQ040 SRECT 1A 40V... SMD	481021	D7
Transistor	2222A NPN 40V 600MA... SMD	481026	Q3 Q4 Q5
Transistor	2907A PNP 60V 600MA... SMD	481027	Q1 Q2
Diode	BAV99 DUAL DIODE... SMD	481033	D5 D6 D8 D9

MISCELLANEOUS

Device	Description	Part#	Designator
	LM384 POWER 4W OP AMP 14 PIN	480012	U11
	MAX3488CPA RS-422 TRANSCRIVER	480247	U19
	6482 DUAL CMOS OPAMP RAIL/RAIL ... SMD	481022	U4 U8
	833 DUAL OPAMP ... SMD	481023	U1 U2 U3 U6 U7 U9 U23
	TLC320AD77C CODEC SMD	481083	U14 U20
	LM1086 3.3V LOW-DROPOUT REGULATOR TO-263 SMD	481086	U21
	TMS320VC5402 FIXED-POINT DSP SMD	481087	U16
	MMC2107 MICROCONTROLLER SMD	481088	U15

MISCELLANEOUS (CONTINUED)

Device	Description	Part#	Designator
	LM319 DUAL HIGH SPEED COMPARATOR SMD	481089	U17
	DG9233 SMD	481091	U10
	TPS3705 PROCESSOR SUPERVISOR SMD	481092	U12
	CY7C1020V 32K X 16 SRAM SMD	481093	U13
	LM1117 1.8V LOW DROPOUT REGULATOR SOT223 SMD	481095	U22
	DS1807 DUAL DIGITAL A/TAPPER POT SO1C16 SMD	481096	U5
	74HC244 CMOS 3-ST NONINVERTDR 501CWIDE20 SMD	481099	U24
	74AC125 CMOS QUAD TRI-STATE BUFR TSSOP14 SMD	481102	U26
	29LV200 CMOS FLASH ROM 128KX16 SMD	481103	U25
Switch	PUSHBUTTON SWITCH SPST RT ANGLE PC MOUNT	510099	S1
	PLD, I-102 ASSEMBLY	710561	U18
Inductor	FERRITE EMI SUPPRESSOR 400MA SMD1210 SMD	181001	L1 L2
	8 PIN DIP SOCKET	210101	U19
	JUMP JAX	210103	
Connector	HEADER MULTI PIN HEADER((PER)PIN)	210112	JP1 (2) JP2(2) J7(2) J16(2) J21(3) J22(3) J23(2)
Connector	HEADER MULTI-PIN BREAKAWAY W/LATCH (PER	210217	J1(3) J2(3) J3(3) J4(3) J5(3)
Connector	HEADER .156IN BREAKAWAY W/LATCH (PER PIN	210234	J19
Connector	DUAL ROW HEADER 5 POS. .230IN	210275	J8
Connector	DUAL ROW HEADER 13 POS. 230IN	210277	J20
Connector	DUAL ROW HEADER 17 POS. .230IN	210279	J6
Connector	DUAL ROW HEADER 7 POS. .320IN	210282	J15
Connector	DUAL ROW HEADER 7 POS. .230IN	210287	J10
Connector	RJ-45 RT ANG MOD CON 1-PORT SHIELDED	210335	J13
Crystal	12.2880MHZ PARALLEL CRYSTAL SMD	231011	Y1
Crystal	8.000 MHZ PARALLEL CRYSTAL 2-PIN SMD	231012	Y2
LED	LED SMD 0805 RED SMD	391001	D1 D2 D3 D4 D10
LED	LED SMD 0805 GREEN SMD	391002	D11



REV	ECO#	DESCRIPTION	DATE	BY	CHK
C	3044	VALUE CHANGES	3/28/02	KMT	
B	( )	PRODUCTION RELEASE	9/25/01	KMT	
A	{0000}	{Desc}			

ANALOG

DWN Ken Twain	DATE 8/16/01	CLEAR-COM® INTERCOM SYSTEMS	
CHK	DATE		
APP	DATE	TITLE: Schematic ASPEN	
ORCAD P/N 710542SC.DSN		STATION CONTROLLER PCB	
SHEET: 1 OF: 2			
SCALE ----------	SIZE D	DWG No. 710542 - SCH - D-	REV C

PCB 170301
REV B

POWER RESET

RESET

(DATA BUS D0-D15)

(ADDRESS BUS A0-A14)

CODEC1

CODEC2

DSP

TMS320VC5402

uP

MMC2107-144

SRAM

CY7C1020

FLASH

29LV200

PLD

CY37032V-PLCC

TEST

COM PORT

AUX COM CON

EXPANSION PANEL PORT

RS-422 SOCKETED

MAX3488CPA

FRONT PANEL MODULE PORT

FRONT PANEL DAISY PORT

AUX OPT. MODULE PORT

(CODEC BUS)

(MODULE BUS)

POWER SUPPLY

DSP DECOUPLING CAPS (U16)

For CVDD

For DVDD

uP DECOUPLING CAPS (U15)

OTHER DECOUPLING CAPS

J21: PINS 1-2 = SELF TEST. PINS 2-3 = FACTORY TEST (S1)

PD0: 1=COM-10 0=COM-5

REV	ECO#	DESCRIPTION	DATE	BY	CHK
C	3044	VALUE CHANGES	3/28/02	KMT	
B		PRODUCTION RELEASE	9/25/01	KMT	
A	{0000}	{Desc}			

PARTS NOT USED

C133	
J18	
R85	
R89	
R90	
R95	
R99	

LAST USED

C135	Q5
D11	R123
J22	RP3
L2	U25
	Y2

POWER PINS NOT SHOWN

IC#	PIN #'S
U26	7 = GND,14 = VCC (3.3VD)

PCB 170301 REV B

DIGITAL

DWN Ken Twain	DATE 9/28/01	CLEAR-COM® INTERCOM SYSTEMS	
CHK	DATE		
APP	DATE		
ORCAD P/N 710542SC.DSN		TITLE: Schematic ASPEN	
SHEET: 2 OF: 2		STATION CONTROLLER PCB	
SCALE ----------	SIZE D	DWG No. 710542- SCH - D-	REV C

KEY MODULE PCB COMPONENT LAYOUT DRAWING

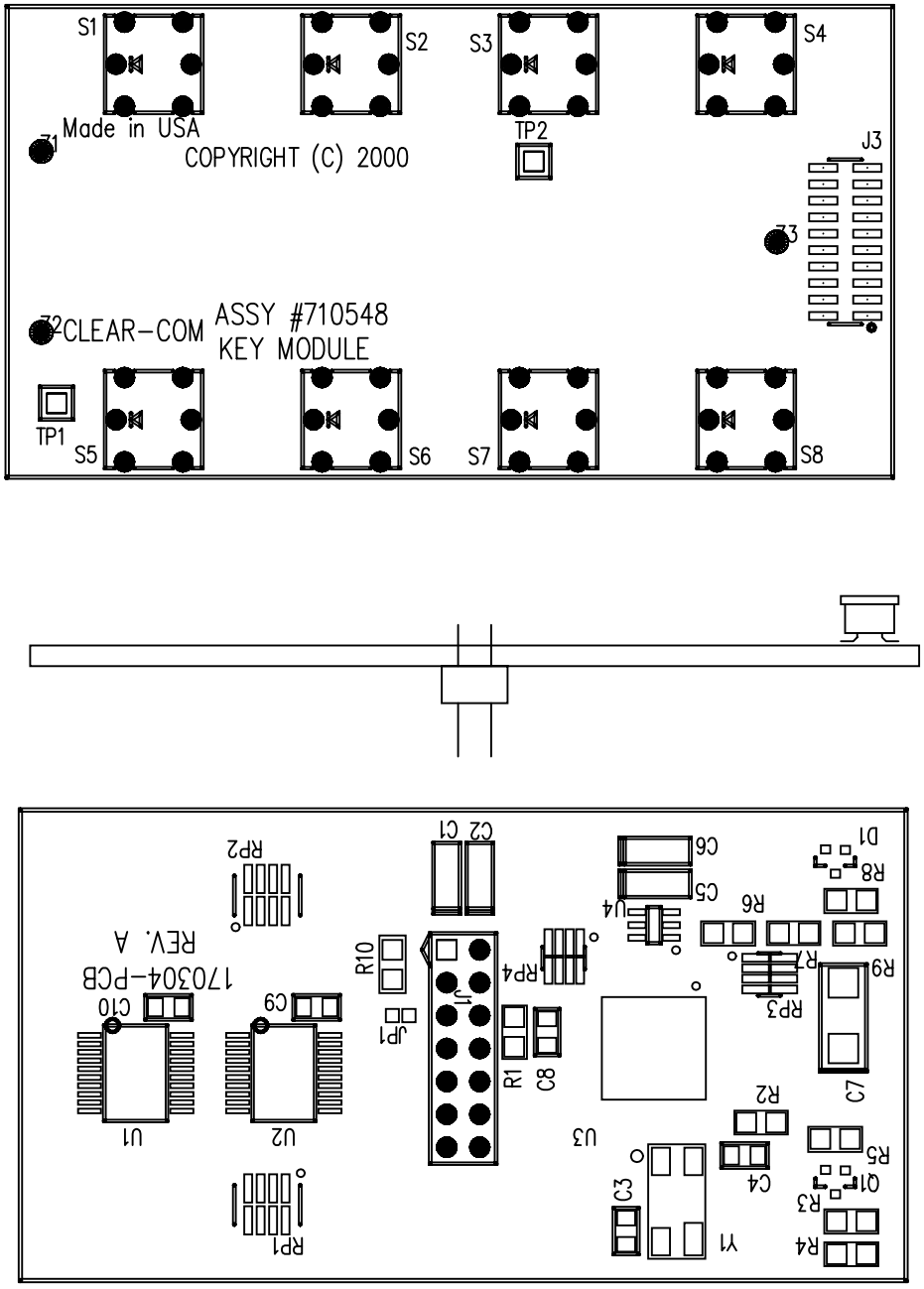


Figure 5: Key Module PCB Component Layout Drawing

BILL OF MATERIALS

Key Module PCB

CAPACITORS

Value		Type	Volts	Tol.	Part#	Designator
33	pF	Ceramic Disc SMD	50V	5%	151118	C3 C4
.1	uF	Ceramic Disc SMD	50V	10%	151172	C8 C9 C10
1	uF	Tantalum SMD	16V	10%	151185	C1 C2 C5 C6
10	uF	Tantalum SMD	25V	10%	151192	C7

RESISTORS

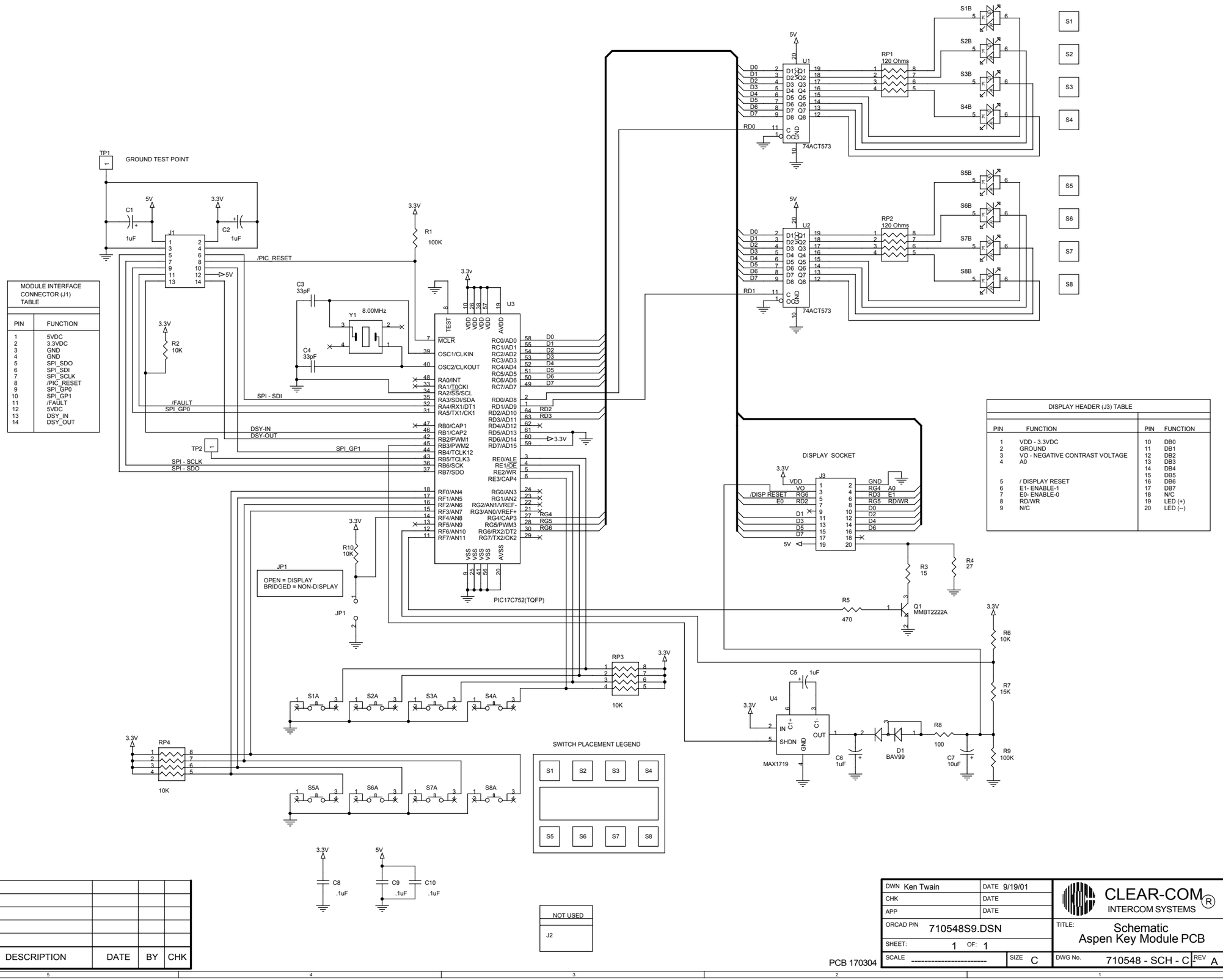
Value		Power	Type	Tol.	Part#	Designator
15.0	OHM	1/10	SMD	1%	411214	R3
27.4	OHM	1/10	SMD	1%	411239	R4
100	OHM	1/10	SMD	1%	411293	R8
475	OHM	1/10	SMD	1%	411358	R5
10.0K	OHM	1/10	SMD	1%	411485	R2 R6 R10
15.0K	OHM	1/10	SMD	1%	411502	R7
100K	OHM	1/10	SMD	1%	411581	R1 R9
10K	OHM		Carbon Comp		416016	RP3 RP4
120	OHM		Carbon Comp		416022	RP1 RP2

DIODES AND TRANSISTORS

Device	Description	Part#	Designator
Diode	BAV99 DUAL DIODE... SMD	481033	D1
Transistor	2222A NPN 40V 600MA... SMD	481026	Q1

MISCELLANEOUS

Device	Description	Part#	Designator
Connector	DUAL ROW HEADER 7 POS. .320IN	210282	J1
Connector	10 POS DUAL ROW HEADER .05" SMD	211001	J3
Crystal	8.000MHZ PARALLEL CRYSTAL CER SMD	231007	Y1
	SWITCH CAP	240102	
	BI-COLOR RED/GREEN 2 SPECIAL FORM LEADS	390065	"PART
	74ACT573 CMOS OCTAL LATCH 3-ST TSS0P20 SMD	481080	U1 U2
	MAX1719 VOLTAGE INVERTER SMD	481084	U4
Switch	TL 1240 N PUSH BUTTON SWITCH W/LED	510128	S1 S2 S3 S4 S5 S6 S7 S8
	MICRO-C, I-102 ASSY	710547	


TP1
GROUND TEST POINT
C1
1uF
C2
1uF
J1
5V
3.3V
/PIC_RESET
R1
100K
R2
10K
C3
33pF
C4
33pF
Y1
8.00MHz
U3
TEST
MCLR
OSC1/CLKIN
OSC2/CLKOUT
RA0/INT
RA1/T0CKI
RA2/SS/SCL
RA3/SDI/SDA
RA4/RX1/DT1
RA5/TX1/CK1
RB0/CAP1
RB1/CAP2
RB2/PWM1
RB3/PWM2
RB4/TCKL12
RB5/TCLK3
RB6/SCK
RB7/SDO
RE0/ALE
RE1/OE
RE2/WR
RE3/CAP4
RF0/AN4
RF1/AN5
RF2/AN6
RF3/AN7
RF4/AN8
RF5/AN9
RF6/AN10
RF7/AN11
RG0/AN3
RG1/AN2
RG2/AN1/VREF-
RG3/AN0/VREF+
RG4/CAP3
RG5/PWM3
RG6/RX2/DT2
RG7/TX2/CK2
VDD
VSS
AVDD
AVSS
PIC17C752(TQFP)
D0
D1
D2
D3
D4
D5
D6
D7
/FAULT
SPI_GP0
SPI - SDI
DSY-IN
DSY-OUT
SPI_GP1
SPI - SCLK
SPI - SDO
TP2
JP1
OPEN = DISPLAY
BRIDGED = NON-DISPLAY
R10
10K
U1
U2
74ACT573
RP1
120 Ohms
RP2
120 Ohms
RD0
RD1
S1B
S2B
S3B
S4B
S5B
S6B
S7B
S8B
S1
S2
S3
S4
S5
S6
S7
S8
RP3
10K
RP4
10K
S1A
S2A
S3A
S4A
S5A
S6A
S7A
S8A
SWITCH PLACEMENT LEGEND
DISPLAY SOCKET
J3
/DISP RESET
E0
D1
D3
D5
D7
VDD
VO
GND
RG4
RD3
RG5
RD0
D2
D4
D6
A0
E1
RD/WR
R3
15
R4
27
R5
470
Q1
MMBT2222A
U4
MAX1719
C5
1uF
C6
1uF
C7
10uF
D1
BAV99
R6
10K
R7
15K
R8
100
R9
100K
C8
.1uF
C9
.1uF
C10
.1uF
MODULE INTERFACE CONNECTOR (J1) TABLE
PIN FUNCTION
1 5VDC
2 3.3VDC
3 GND
4 GND
5 SPI_SDO
6 SPI_SDI
7 SPI_SCLK
8 /PIC_RESET
9 SPI_GP0
10 SPI_GP1
11 /FAULT
12 5VDC
13 DSY_IN
14 DSY_OUT
DISPLAY HEADER (J3) TABLE
PIN FUNCTION PIN FUNCTION
1 VDD - 3.3VDC 10 DB0
2 GROUND 11 DB1
3 VO - NEGATIVE CONTRAST VOLTAGE 12 DB2
4 A0 13 DB3
14 DB4
5 / DISPLAY RESET 15 DB5
6 E1- ENABLE-1 16 DB6
7 E0- ENABLE-0 17 DB7
8 RD/WR 18 N/C
9 N/C 19 LED (+)
20 LED (–)
NOT USED
J2
REV ECO# DESCRIPTION DATE BY CHK
A {0000} {Desc}
PCB 170304
DWN Ken Twain DATE 9/19/01
CHK DATE
APP DATE
ORCAD P/N 710548S9.DSN
SHEET: 1 OF: 1
SCALE SIZE C
CLEAR-COM INTERCOM SYSTEMS
TITLE: Schematic Aspen Key Module PCB
DWG No. 710548 - SCH - C REV A

KEYPAD MODULE FRONT (CONTROLS) PCB COMPONENT LAYOUT DRAWING

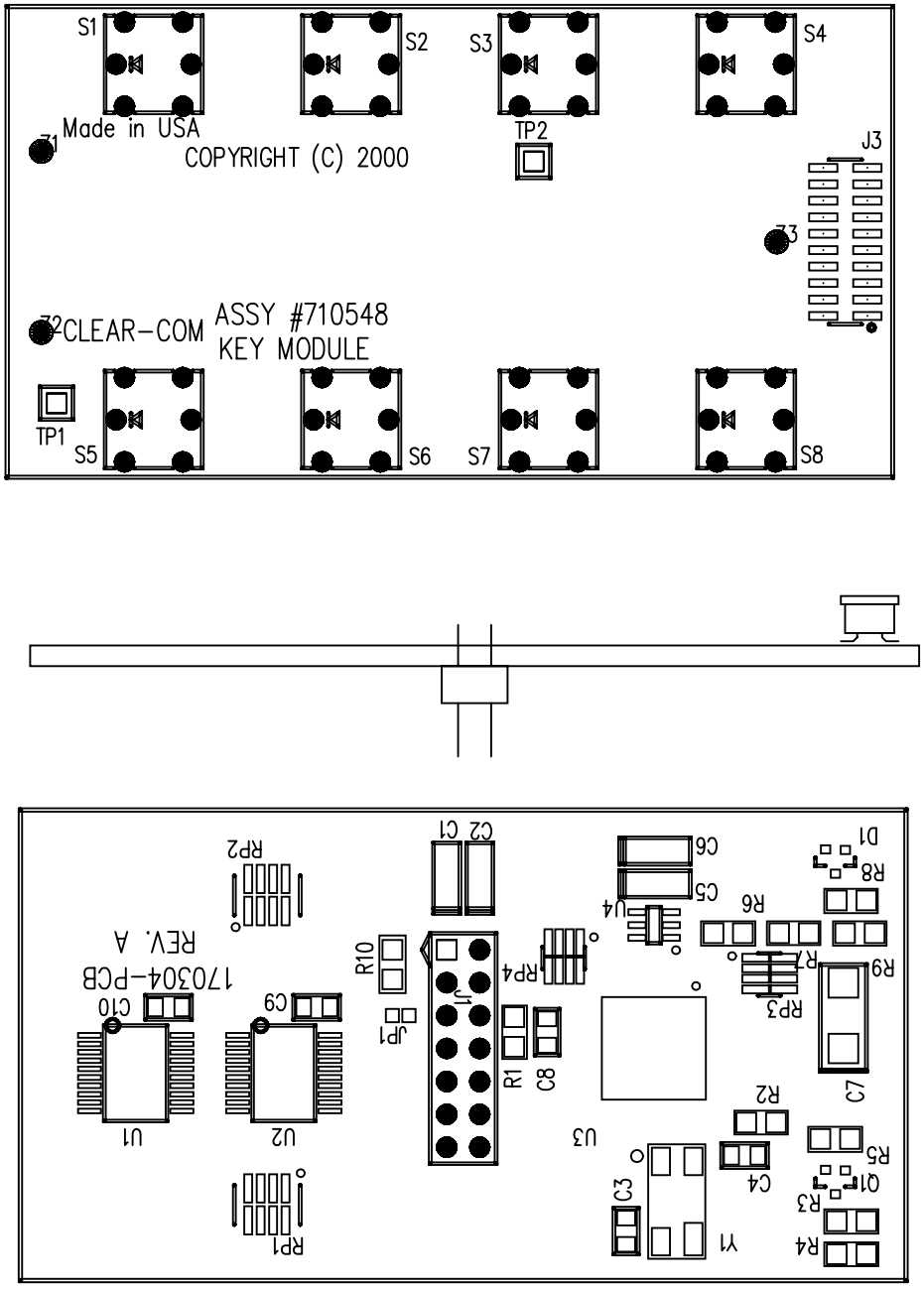


Figure 6: Keypad Module Front (Controls) PCB Component Layout Drawing

BILL OF MATERIALS

Keypad Module Front (Controls) PCB

MISCELLANEOUS

Device	Description	Part#	Designator
Connector	HEADER, FEMALE, 2X16 .05" PCB	210385	J12 J14
	KEYCAP, W/LEGEND "HSXFR" I-102	240111	
	KEYCAP, W/LEGEND "MIC" I-102	240112	
	KEYCAP, W/LEGEND "SPKR" I-102	240113	
	KEYCAP, W/LEGEND "LISTEN" I-102	240124	
	BI-COLOR RED/GREEN		
	2 SPECIAL FORM LEADS	390065	"PART
Pot	5K LINEAR POT VERT PC MOUNT	470077	R11
Switch	TL 1240 N PUSH BUTTON		
	SWITCH W/LED	510128	S1 S5 S9 S13
	SWITCH BUTTON SPST TL1105D	510131	
	ROTARY ENCODER W/PUSH ON		
	SWITCH	510134	EN1
LED	RED, ROUND, FLAT TOP LED	390044	D1
LED	GREEN, ROUND, FLAT TOP LED	390045	D2 D3 D4 D5 D6

NOTE: * = PARTS NOT LOADED FOR 4-BUTTON KEYPAD

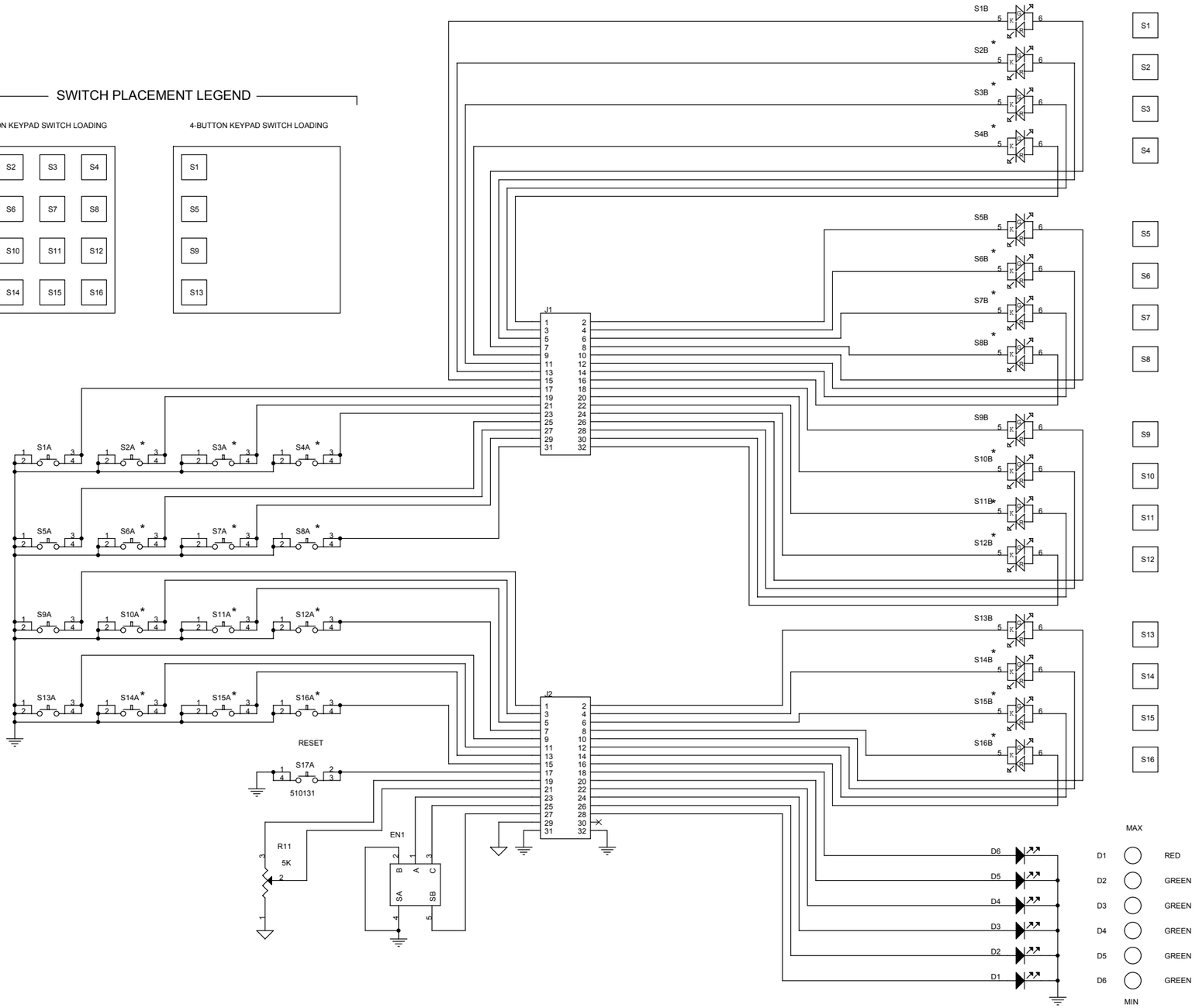
SWITCH PLACEMENT LEGEND

16-BUTTON KEYPAD SWITCH LOADING

S1	S2	S3	S4
S5	S6	S7	S8
S9	S10	S11	S12
S13	S14	S15	S16

4-BUTTON KEYPAD SWITCH LOADING

S1
S5
S9
S13



REV	ECO#	DESCRIPTION	DATE	BY	CHK
A	{0000}	{Desc}			

NOT USED

PCB 170302

DWN Ken Twain	DATE 5/7/01	CLEAR-COM® INTERCOM SYSTEMS	
CHK	DATE		
APP	DATE		
ORCAD P/N 710545S9.DSN		TITLE: Schematic ASPEN KEYPAD CONT. PCB	
SHEET: 1 OF: 1			
SCALE ----------	SIZE C	DWG No. 710545 - SCH - C	REV A

KEYPAD MODULE BACK (ELECTRONICS) PCB COMPONENT LAYOUT DRAWING

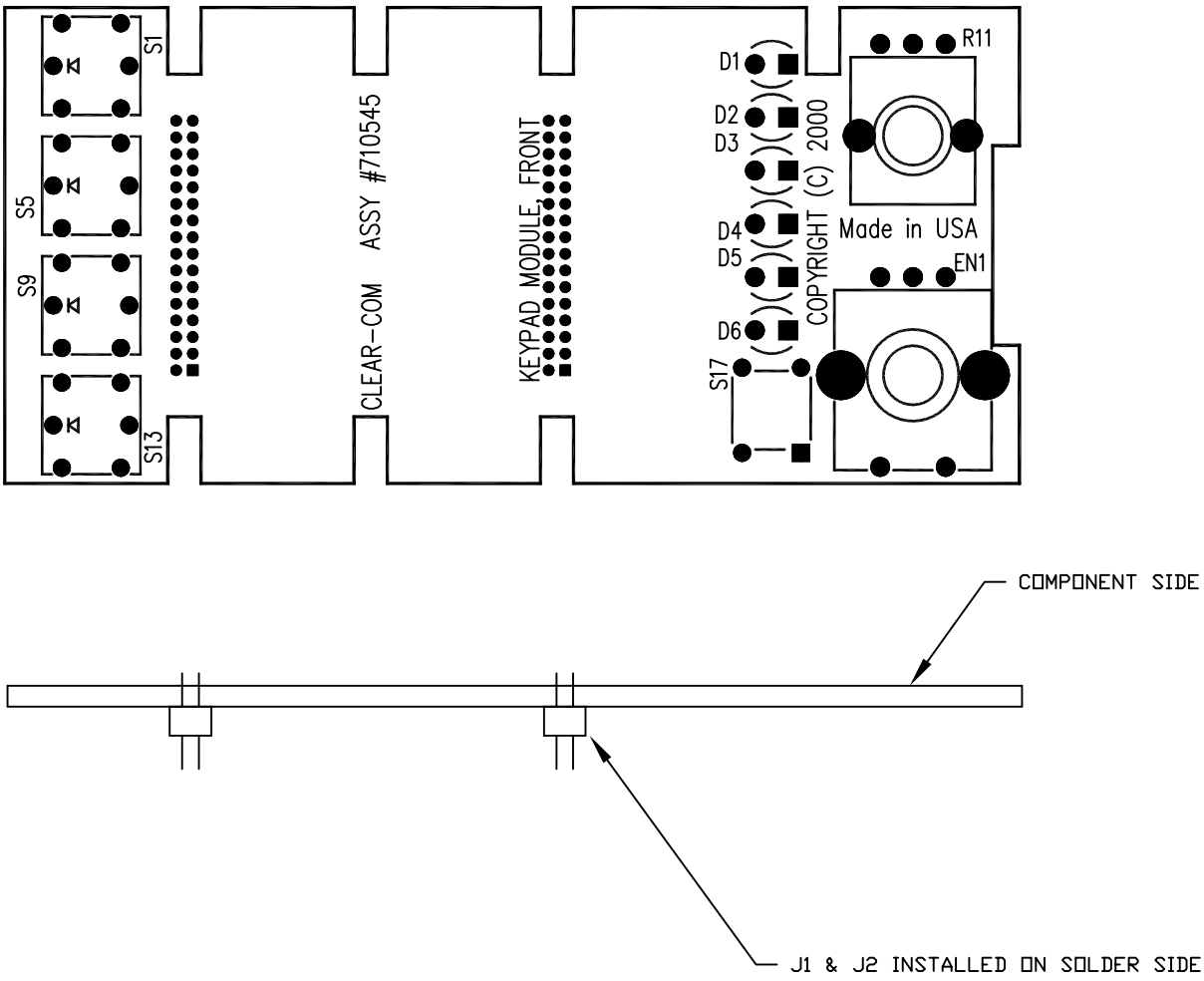


Figure 7: Keypad Module Back (Electronics) PCB Component Layout Drawing

BILL OF MATERIALS

Keypad Module Back (Electronics) PCB

CAPACITORS

Value		Type	Volts	Tol.	Part#	Designator
33	pF	Ceramic Disc SMD	50V	5%	151118	C4 C5
.1	uF	Ceramic Disc SMD	50V	10%	151172	C6 C7 C8 C9 C10 C11
1	uF	Tantalum SMD	16V	10%	151185	C1 C2 C3

RESISTORS

Value		Power	Type	Tol.	Part#	Designator
10.0	OHM	1/10	SMD	1%	411197	R2
10.0K	OHM	1/10	SMD	1%	411485	R3 R4 R5 R6 R7
100K	OHM	1/10	SMD	1%	411581	R1
10K	OHM		Carbon Comp		416016	RP7 RP8 RP9 RP10
120	OHM		Carbon Comp		416022	RP1 RP2 RP3 RP4 RP5 RP6

MISCELLANEOUS

Device	Description	Part#	Designator
Connector	HEADER, 2X16 .05" PCB	210384	P2 P4
Connector	HEADER, 2X7 .1" RA PCB	210396	J1
Crystal	8.000MHZ PARALLEL CRYSTAL CER SMD	231007	Y1
	74ACT573 CMOS OCTAL LATCH 3-ST TSS0P20 SMD	481080	U1 U2 U4 U5 U6
	MICRO-C, I-102 ASSY	710547	U3

MODULE INTERFACE CONNECTOR (J1) TABLE	
PIN	FUNCTION
1	5VDC
2	3.3VDC
3	GND
4	GND
5	SPI_SDO
6	SPI_SDI
7	SPI_SCLK
8	/PIC_RESET
9	SPI_GP0
10	SPI_GP1
11	/FAULT
12	5VDC
13	DSY_IN
14	DSY_OUT

REV	ECO#	DESCRIPTION	DATE	BY	CHK
A	{0000}	{Desc}			

DWN Ken Twain	DATE 9/19/01
CHK	DATE
APP	DATE
ORCAD P/N 710454S9.DSN	
SHEET: 1 OF: 1	
SCALE ----------	SIZE C

CLEAR-COM® INTERCOM SYSTEMS

TITLE: Schematic

ASPEN KEYPAD ELECT. PCB

DWG No. 710454- SCH - C- REV A

PCB 170303

AUXILIARY OPTIONS MODULE PCB COMPONENT LAYOUT DRAWING

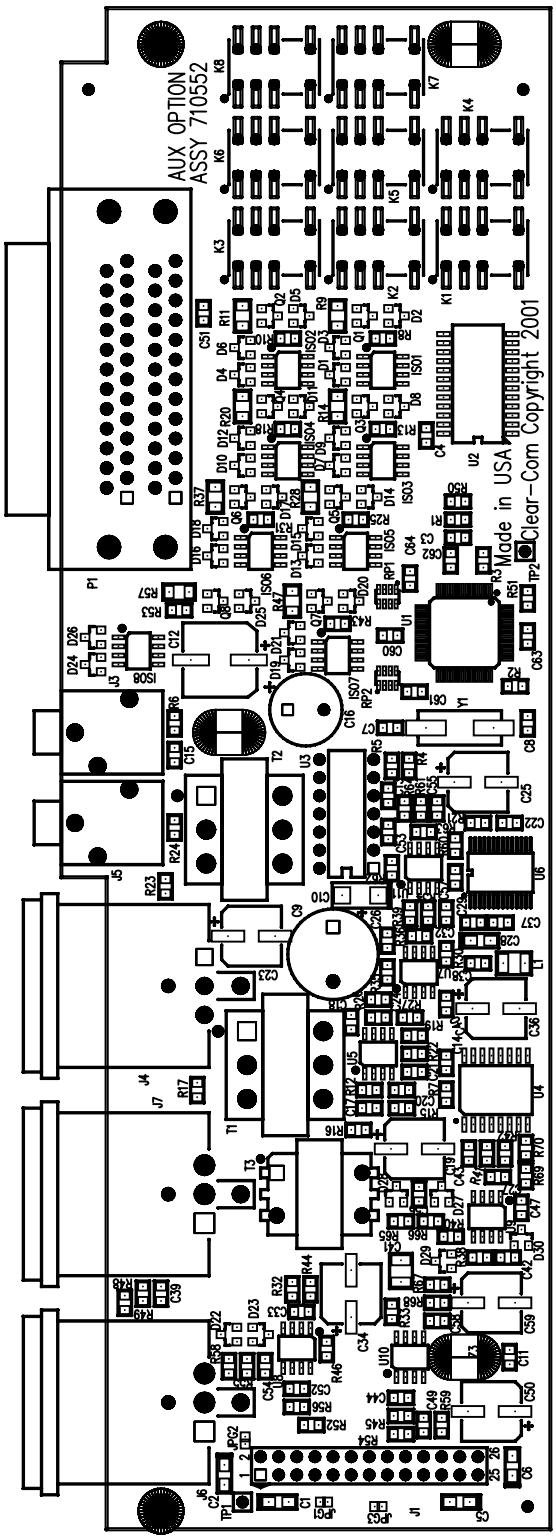


Figure 8: Auxiliary Options Module PCB Component Layout Drawing

BILL OF MATERIALS

Auxiliary Options Module PCB

CAPACITORS

Value		Type	Volts	Tol.	Part#	Designator
1000	uF	Aluminum	35V		150092	C9
1000	uF	Aluminum	16V		150145	C16
33	pF	Ceramic Disc SMD	50V	5%	151118	C7 C8 C17 C21 C24 C33 C44 C49 C52
470	pF	Ceramic Disc SMD	50V	5%	151132	C39 C54
.001	uF	Ceramic Disc SMD	50V	5%	151136	C55 C32
.0022	uF	Ceramic Disc SMD	50V	10%	151152	C27
.0033	uF	Ceramic Disc SMD	50V	10%	151154	C13
.0047	uF	Ceramic Disc SMD	50V	10%	151156	C43
.01	uF	Ceramic Disc SMD	50V	10%	151160	C3
.022	uF	Ceramic Disc SMD	50V	10%	151164	C11
.1	uF	Ceramic Disc SMD	50V	10%	151172	C4 C14 C15 C18 C20 C22 C26 C29 C37 C38 C40 C42 C47 C53 C56 C57 C58 C60 C61 C62 C63 C64
.22	uF	Ceramic Disc SMD	50V	10%	151176	C41
1	uF	Tantalum SMD	16V	10%	151185	C1 C2 C5 C6 C28
10	uF	Tantalum SMD	25V	10%	151192	C10
22	uF	Aluminum SMD	50V	20%	151200	C19 C23 C34 C36 C50 C59
47	uF	Aluminum SMD	25V	20%	151202	C25
220	uF	Aluminum SMD	25V	10%	151204	C12

RESISTORS

Value		Power	Type	Tol.	Part#	Designator
2.2	OHM	1/10	SMD	5%	411181	R6
10.0	OHM	1/10	SMD	1%	411197	R21 R33 R59
47.5	OHM	1/10	SMD	1%	411262	R38 R48 R58
82.5	OHM	1/10	SMD	1%	411285	R7 R8 R10 R13 R18 R25 R31 R43 R53
301	OHM	1/10	SMD	1%	411339	R46
604	OHM	1/10	SMD	1%	411368	R16 R23 R30 R34 R39 R60 R61 R64
1.00K	OHM	1/10	SMD	1%	411389	R17 R24 R49 R55 R69 R70
1.21K	OHM	1/10	SMD	1%	411397	R5
4.02K	OHM	1/10	SMD	1%	411447	R41 R42
4.99K	OHM	1/10	SMD	1%	411456	R32 R56
8.25K	OHM	1/10	SMD	1%	411477	R40
10.0K	OHM	1/10	SMD	1%	411485	R1 R2 R3 R12 R15 R19 R22 R26 R27 R35 R36 R44 R45 R50 R51 R52 R54 R62 R63 R65 R66R67 R68
23.7K	OHM	1/10	SMD	1%	411521	R4
4.7K	OHM	1/4	SMD	5%	411711	R9 R11 R14 R20 R28 R37 47 R57
10K	OHM		Carbon Comp		416016	RP2 RP1

DIODES AND TRANSISTORS

Device	Description	Part#	Designator
Transistor	2222A NPN 40V 600MA... SMD	481026	Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8
Diode	BAV99 DUAL DIODE... SMD	481033	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D30

INTEGRATED CIRCUITS

Device	Description	Part#	Designator
IC	LM384 POWER 4W OP AMP 14 PIN	480012	IC3
IC	6482 DUAL CMOS OPAMP RAIL/RAIL ... SMD	481022	IC9
IC	833 DUAL OPAMP... SMD	481023	IC5 IC7 IC8 IC10 IC11
IC	M0C211 OPTOCOUPLER... SMD	481032	ISO1 ISO2 ISO3 ISO4 ISO5 ISO6 ISO7 ISO8
IC	TLC320AD77C CODEC SMD	481083	IC6
IC	DS1807 DUAL DIGITAL A/TAP PER POT SO1C16 SMD	481096	IC4
IC	MIC58P01 8-BIT PARALLEL INPUT LATCH SOIC SMD	481098	IC2

MISCELLANEOUS

Device	Description	Part#	Designator
Transformer	600CT/600CT PAN MAGNETICS #TTC108	560018	T1 T2
Transformer	10K-10K AUDIO TRANSFORMER	560020	T3
	MICRO-C, I-STATION ASSEMBLY	710547	
Inductor	FERRITE EMI SUPPRESSOR 400MA SMD1210 SMD	181001	L1
Transformer	HEADER MULTI PIN HEADER (PER)PIN	210112	TP1(1) TP2(1)
Connector	3 COND MINI PHONE JACK	210128	J3 J5
Connector	3 PIN MALE RT ANG PLASTIC INSERT #3MDHI	210245	J4
Connector	3 PIN FEMALE RT ANG PLASTIC INS #3FDHI-O	210246	J6 J7
Connector	DUAL ROW HEADER 13 POS. 230IN	210277	J1
Connector	DUAL DB25 (F) STACKED, RA	210408	P1
Crystal	8.000 MHZ PARALLEL CRYSTAL 2-PIN SMD	231012	Y1
	#2-56 X 3/16IN PAN HEAD PHILLIPS MACH SC	280214	
Relay	RELAY SPDT 5VDC W/POLARIZED COIL SMD	451001	K1 K2 K3 K4 K5 K6 K7 K8

MODULE INTERFACE CONNECTOR (J1) TABLE

PIN	FUNCTION	PIN	FUNCTION
1	5VDC	14	DSY_IN
2	3.3VDC	15	SDIN34
3	GND	16	SDOUT3
4	GND	17	SCLK
5	SPI_SDO	18	MCLK
6	SPI_SDI	19	LRCLK13
7	SPI_SCLK	20	PDN_RSTB
8	/PIC_RESET	21	A_GND
9	SPI_GP0	22	L_H/S_OUT
10	SPI_GP1	23	R_H/S_OUT
11	/FAULT	24	SPKR FEED OUT
12	TEST	25	+12V
13	DSY_OUT	26	-12V

REV	ECO#	DESCRIPTION	DATE	BY	CHK
B		P1 PINOUT CORRECTION	4/11/02	KMT	
A	{0000}	{Desc}			

PARTS NOT USED

C30	C48		
C31	Z2		
C35			
C45	R29		
C46	R51		

DWN Ken Twain	DATE 1/7/02	CLEAR-COM® INTERCOM SYSTEMS	
CHK	DATE		
APP	DATE		
ORCAD P/N 710552SB.DSN		TITLE: Schematic ASPEN AUX. OPTION PCB	
SHEET: 1 OF: 1			
SCALE ----------	SIZE D	DWG No. 710552- SCH - D-	REV B

PCB 170306

EXPANSION PANEL CONTROLLER PCB COMPONENT LAYOUT DRAWING

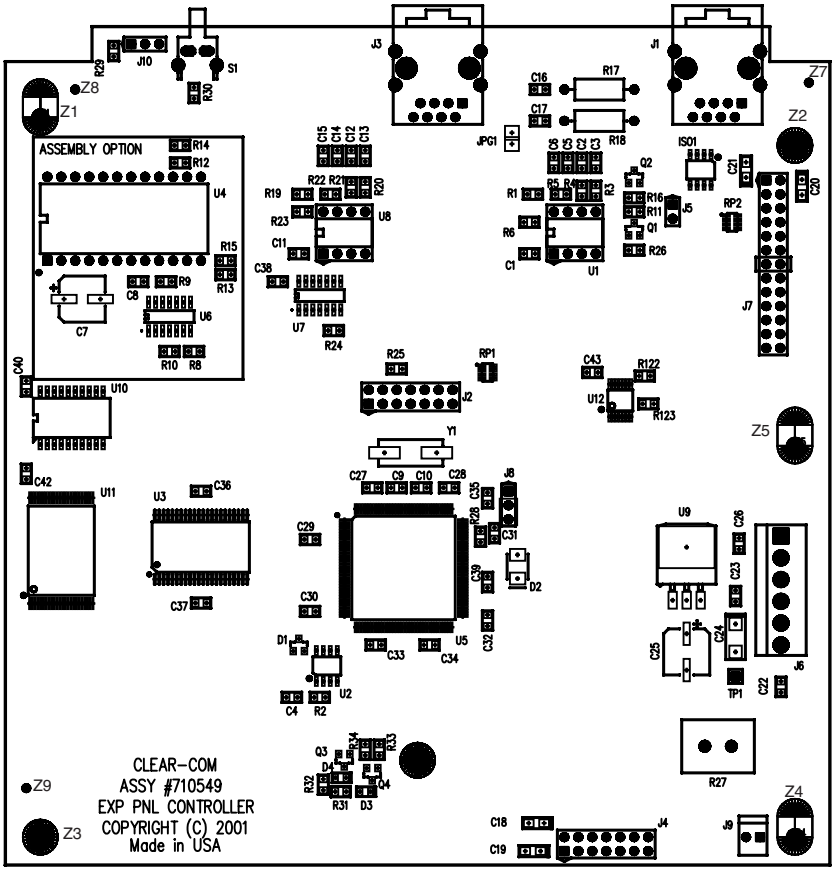


Figure 9: Expansion Panel Controller PCB Component Layout Drawing (710549)

BILL OF MATERIALS

Expansion Panel Controller PCB (710549)

CAPACITORS

Value		Type	Volts	Tol.	Part#	Designator
22	pF	Ceramic Disc SMD	50V	5%	151116	C9 C10
220	pF	Ceramic Disc SMD	50V	5%	151128	C2 C3 C5 C6 C12 C13 C14 C15 C16 C17
.01	uF	Ceramic Disc SMD	50V	10%	151160	C22 C23 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C42 C43
.1	uF	Ceramic Disc SMD	50V	10%	151172	C1 C4 C11
1	uF	Tantalum SMD	16V	10%	151185	C18 C19 C20 C21
10	uF	Tantalum SMD	25V	10%	151192	C24
100	uF	Aluminum SMD	25V	10%	151203	C25

RESISTORS

Value		Power	Type	Tol.	Part#	Designator
330	OHM	1/2	Carbon Film	5%	410169	R17 R18
15	OHM	5	Carbon Comp	5%	410217	R27
0	OHM	1/10	SMD		411100	R122 R123
82.5	OHM	1/10	SMD	1%	411285	R31 R32
100	OHM	1/10	SMD	1%	411293	R3 R4 R20 R21
221	OHM	1/10	SMD	1%	411326	R22 R5
1.00K	OHM	1/10	SMD	1%	411389	R25
3.32K	OHM	1/10	SMD	1%	411439	R2 R28
4.75K	OHM	1/10	SMD	1%	411454	R1 R6 R19 R23 R29 R30 R33 R34
10.0K	OHM	1/10	SMD	1%	411485	R11 R16 R24 R26
10K	OHM		Carbon Comp		416016	RP1
3.3K	OHM		Carbon Comp		416023	RP2

DIODES AND TRANSISTORS

Device	Description	Part#	Designator
Diode	10BQ040 SRECT 1A 40V... SMD	481021	D2
Transistor	2222A NPN 40V 600MA... SMD	481026	Q2 Q3 Q4
Transistor	2907A PNP 60V 600MA... SMD	481027	Q1
Diode	BAV99 DUAL DIODE... SMD	481033	D1

INTEGRATED CIRCUITS

Device	Description	Part#	Designator
IC	M0C211 OPTOCOUPLER... SMD	481032	ISO1

MISCELLANEOUS

Device	Description	Part#	Designator
	LM1086 3.3V LOW-DROPOUT REGULATOR TO-263 SMD	481086	U9
	TPS3705 PROCESSOR SUPERVISOR SMD	481092	U2
	CY7C1020V 32K X 16 SRAM SMD	481093	U3
	74HC00 CMOS QUAD NAND GATE SMD	481097	U7
	74HC244 CMOS 3-ST NONINVERTDR 501CWIDE20 SMD	481099	U10

MISCELLANEOUS (CONTINUED)

Device	Description	Part#	Designator
	74AC125 CMOS QUAD TRI-STATE BUFR TSSOP14 SMD	481102	U12
Switch	PUSHBUTTON SWITCH SPST RT ANGLE PC MOUNT	510099	S1
	MICRO-P, E-STATION	710581	
	FLASH, APP, E-STATION	710582	
	8 PIN DIP SOCKET	210101	
	JUMP JAX	210103	
Transformer	HEADER MULTI PIN HEADER (PER PIN)	210112	TP1(1) J5(2) J8(3) J10(3)
Connector	HEADER .156IN BREAKAWAY W/LATCH (PER PIN	210234	J6(6)
Connector	DUAL ROW HEADER 13 POS. 230IN	210277	J7
Connector	DUAL ROW HEADER 7 POS. .320IN	210282	J2 J4
Connector	RJ-45 RT ANG MOD CON 1-PORT SHIELDED	210335	J1 J3
Crystal	8.000 MHZ PARALLEL CRYSTAL 2-PIN SMD	231012	Y1
LED	LED SMD 0805 RED SMD	391001	D3
LED	LED SMD 0805 GREEN SMD	391002	D4
	MAX3488CPA RS-422 TRANSCRIVER	480247	U1 U8

POWER RESET

(DATA BUS)

(RS-422 BUS)

(ADDRESS BUS)

(MODULE BUS)

RUN: JUMPER PINS 1-2
PROGRAM: JUMPER PINS: 2-3

uP

MMC2107-144

SRAM

CY7C1020

FLASH

29LV200

TEST

SOCKETED

RS-422

U1 MAX3488CPA

U8 MAX3488CPA

ISO OPTION (IF USED, DO NOT LOAD IC1)

U4 MAX1490B

U6A LM319M

U6B LM319M

EXPANSION PANEL PORT -IN

EXPANSION PANEL PORT - OUT

FRONT PANEL MODULE PORT

FRONT PANEL DAISY PORT

AUX OPT. MODULE PORT

NOTE: J7, PINS 13 AND 14 MUST BE JUMPERED IF AUX-101 OPTION NOT INSTALLED

POWER SUPPLY

U9 LM1086-3.3

U5 DECOUPLING CAPS

DECOUPLING CAPS

U3 U7 U10 U11 U12

REV	ECO#	DESCRIPTION	DATE	BY	CHK
A	{0000}	{Desc}			

PARTS NOT USED

C41
J5

POWER PINS NOT SHOWN

IC#	PIN #'S
U7	7= GND, 14 =VCC(3.3VD)
U10	10= GND, 20 =VCC(3.3VD)
U12	7 = GND,14 = VCC (3.3VD)

DWN	Ken Twain
DATE	9/28/01
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ORCAD P/N	710549S9.DSN
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SCALE	----------
SIZE	D

CLEAR-COM® INTERCOM SYSTEMS

TITLE: Schematic ASPEN
EXP PNL CONTROLLER PCB

DWG No. 710549 SCH - D- REV A

8 SPECIFICATIONS

0 dBv is referenced to 0.775 volts RMS

BASIC STATION

Front-Panel Controls and Connectors

Talk/Listen Buttons	6 (1 key module) 14 (2 key modules) 22 (3 key modules) 30 (4 key modules)
Function Buttons	4
Telephone Keypad Buttons (optional)	12
Answer Back Button	1
Clear Button	1
Volume Controls	Main, Vol/Prog
Headset Connector	XLR-4M
Panel Mic Connector	Locking 1/4-in. phone jack

Rear-Panel Connectors

To Matrix	DB-15 (for 2-wire interfaces) RJ-45 (for 4-wire interfaces)
Expansion Option	RJ-45

Panel Microphone Input

Type	Electret with proprietary phone jack
Input Level	- 40 dBv
Gain Adjustment Range	0 to 20 dB
Impedance	200 Ohms

Headset Microphone Input

Type	Dynamic
Input Level	- 55 dBv
Gain Adjustment Range	0 to 20 dB
Impedance	200 Ohms

Line Input/Output

Type	Transformer Balanced
Input Impedance	8k Ohms Bridging
Output Impedance	150 Ohms
Level	0 dBv nominal
Frequency Response	50 Hz to 15 kHz, ± 2 dB

Headphone Outputs

Impedance	50 to 600 Ohms
Power	1/2 W into 50 Ohms

Temperature

Operating	0° to 50° C (32° to 125° F)
Humidity	20% to 90%, noncondensing

Power

In-Line Power Supply, with 3-pin EIA connector, UL approved power supply

Voltage	90 to 245 VAC, 50 to 60 Hz, 40 VA max.

Dimensions

Height	1.75 in. (45 mm)
Width	17 3/8 in. (436 mm)
Depth	8.25 in. (210 mm)

Weight

7.5 lbs.

EXPANSION STATION

Front-Panel Controls and Connectors

Talk/Listen Buttons	6 (1 key module) 14 (2 key modules) 22 (3 key modules) 30 (4 key modules)

Rear-Panel Connectors

Expansion Option	RJ-45

MODULES

Display Key Module

Talk/Listen Buttons	8
Display	LCD

Each button can light either bright red, bright green, dim red, or dim green
Data and daisy connector on back of module

Non-Display Key Module

Same as Display Key Module but without LCD display

Keypad Module

Numeric keypad buttons	12
Function buttons	4
Level-control trimpots	2

Data and daisy connector on back of module

Function Key Module

Same as Keypad Module but without 12 numeric keypad buttons

Auxiliary Options Module

Balanced Program Input

Type	Transformer Balanced
Input Impedance	8K Ohms Bridging
Frequency Response	50 Hz to15 KHz, ± 2 dB
Connector	3-pin XLR female

Auxiliary Microphone Input

Type	Dynamic
Input Level	-40 dBv
Gain Adjustment Range	±5 dB (software)
Impedance	200 Ohms
Connector	3-pin XLR female

Line Level Output

Type	Transformer Balanced
Output Impedance	600 Ohms
Level	0 dBv nominal
Frequency Response	50 Hz to 15 kHz, ± 2 dB
Connector	mini-phone

Hot Microphone Output

Type	Transformer Balanced
Output Impedance	600 Ohms
Level	0 dBv nominal
Frequency Response	50 Hz to 15 kHz, ± 2 dB
Connector	3-pin XLR male

Speaker Feed Output

Impedance	4 to 8 Ohms
Power	1/2 watt at 4 Ohms
Connector	mini-phone

Relay Output

Two relay outputs	
SPDT	
Contact Rating	30 VDC at 1 ampere
Connector	DB-25 female

GPI Input

Two GPI inputs	
Connector	DB-25 female

9 GLOSSARY

Answer Back: The answer-back key on an intercom station allows you to respond to calls from stations or interfaces not currently assigned to a key on your station. If more than one source sends audio to you, the waiting calls are stored in the "answer-back" stack in the order they are received until you respond to them or clear them.

Call Signals: A call signal is an electronic signal sent from one station or interface to another. A call signal can be audible and/or visual. It is used to get the attention of a station operator; to control a device, such as a relay or radio transmitter; or to activate the call lights on an external Clear-Com party-line system.

Channel: A two-way talk path.

Destination: A device—intercom station, beltpack, interface, or a variety of other devices—that you send audio to. A "talk" path is typically established from your intercom station to a destination station or interface.

Download: In traditional computer terminology, to download data means to transfer data from a large computer's memory to the memory of another device, usually a smaller computer. In this manual, to download data specifically means to transfer data from the matrix frame to a station, or from the Eclipse Configuration System to the matrix frame.

Eclipse Configuration System: Software program that controls the central matrix circuit cards and most features of connected remote stations.

ISO: The ISO function, short for "station ISOlation," allows you to call a destination and interrupt all of that destination's other audio paths and establish a private conversation. When you complete your call, the destination's audio is restored to whatever was active before the interruption.

Label: A label is a five-character alphanumeric name that identifies a source, destination, or control function accessed by your intercom station. Labels appear in the displays of the intercom station. Labels can identify stations, ports interfaced to other external equipment, fixed groups, party lines, and special control functions.

Labels can contain as many as five characters, using numbers, capital letters, and all punctuation marks except the question mark. Blank spaces are not allowed as the "leading" (first) character; however, the underscore character ("_") will appear as a space when viewed on the display screen on an i-station. Blank label names are not allowed. The Eclipse Configuration System will replace any blank label name with its default.

All labels in the system have a factory default, and any label can be returned to the factory default by typing a "leading" space in the first position and pressing the ENTER key.

For more information on labels, including assigning them in the Eclipse Configuration System, see the *Eclipse Configuration System Manual.*

Metric Conversions: The following table gives common metric conversions.

U.S. to Metric Measurement	Metric to U.S. Measurement
1 inch = 2.54 centimeters	1 centimeter = 0.39 inch
1 foot = 0.30 meter	1 meter = 3.3 feet
1 mile = 1.6 kilometers	1 kilometer = 0.62 miles

Rack Unit or RU: Standardized unit of mounting space on a rack panel. Each rack unit is 1.75 inches of vertical mounting space. Therefore 1 RU is 1.75 inches of vertical mounting space, 2 RU is 3.5 inches, 3 RU is 5.25 inches, and so on.

Sidetone: The sound of your own voice heard in your own earphone as you speak.

Source: In this manual, the term "source" refers to a device—intercom station, interface, beltpack, or a variety of other devices—sends audio into the matrix. A "listen path" is established from a station or interface.

Upload: In traditional computer terminology, to upload data means to transfer data from one computer to another. In this manual, to upload data specifically means to transfer data from an station to the matrix, or from the matrix to the Eclipse Configuration System.

7 WARRANTY

Clear-Com guarantees this product to be free of manufacturing defects in material and workmanship under normal use for a period of two years from the date of purchase.

TECHNICAL SUPPORT

Clear-Com offers 24/7 customer support.

Return authorization numbers are required for all returns.

Both warranty and non-warranty repairs are available.

To ensure complete and timely support to its customers, Clear-Com maintains Technical Service Centers (TSC) staffed by qualified technical personnel. A Technical Service Center is staffed to respond to all technical inquiries and to troubleshoot technical problems regarding all products supplied by Clear-Com. A TSC is fully available to Clear-Com's customers during the full course of their warranty period.

Instructions for reaching our Technical Service Centers are given below.

For technical support from Europe, the Middle East, and Africa

Call: +49 40 66 88 40 40 Monday through Friday 09:00 – 17:00 (GMT)

+49 40 66 88 40 41 24hrs, any day (But you must have your PIN number ready.)

Web site: www.clearcom.com

For technical support from the Americas and Asia

Call: +1 510 496 6666

Web site: www.clearcom.com

Email: support@clearcom.com

FAX: +1 510 496 6610

EXCEPTIONS

This warranty does not include damage to a product resulting from cause other than part defect and malfunction. The VGC warranty does not cover any defect, malfunction, or failure caused beyond the control of VGC, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the manual, defective or improperly associated equipment, attempts at modification and repair not approved by Clear-Com, and shipping damage. Products with their serial numbers removed or defaced are not covered by this warranty.

WARRANTY REPAIRS

While Clear-Com will ensure complete system integrity by providing whatever support is necessary to resolve any failure covered under the terms of the warranty, the normal procedure will be to repair or replace any defective Line

Replaceable Unit (LRU) that is returned to Clear-Com during the warranty period.

A Line Replaceable Unit (LRU) is defined as: an assembly that can be safely removed from the system and readily replaced by plugging in a new unit. In the case of ancillary items such as power supplies, the entire power supply would be returned. Whereas, in the case of circuit cards, control panels, etc., only these assemblies would be returned for repair. All equipment provided by Clear-Com is covered under the warranty.

This warranty does not include defects arising from installation (when not performed by Clear-Com), lightning, power outages and fluctuations, air conditioning failure, improper integration with non-approved components, defects or failures of customer furnished components resulting in damage to Clear-Com provided product.

NON-WARRANTY REPAIRS

Equipment that is not under warranty must be sent prepaid to Clear-Com. If requested, an estimate of repair costs will be issued prior to service. Once repair is approved and completed, the equipment will be shipped freight collect from the TSC.

REPLACEMENT UNITS

Should Clear-Com determine, in its reasonable discretion, that any part of a product is defective due to faulty materials or workmanship, Clear-Com shall at its expense, repair or replace such part and return the repaired/replacement part to the customer. The provisions of this warranty shall apply to the repaired/replacement part for the unexpired portion, if any, of the warranty period.

EMERGENCY ON-SITE ASSISTANCE

Clear-Com can provide emergency on-site technical assistance in support of warranty activities. The level of support effort required will be decided on a case-by-case basis. Clear-Com has the qualified technical staff to support any and all emergency site activities should they occur.

LIABILITY

The foregoing warranty is Clear-Com's sole and exclusive warranty. There are no other warranties (including without limitation warranties for consumables and other supplies), or guarantees, expressed or implied (including, without limitation, any warranties of merchantability or fitness for a particular purpose), of any nature whatsoever, whether arising in contract, tort, negligence of any degree, strict liability or otherwise, with respect to the products or any part thereof delivered hereunder and/or with respect to any non-conformance or defect in any such product and/or part thereof delivered hereunder and/or with respect to any non-conformance or defect in any such product and/or part

thereof delivered hereunder, or any other warranties or guarantees, including but not limited to any liability of Clear-Com for any consequential and/or incidental damages and/or losses (including loss of use, revenue, and/or profits). In any event, the maximum extent of Clear-Com's liability to customer hereunder shall not under any circumstances exceed the cost of repairing or replacing any part(s) fount to be defective within the warranty period as aforesaid.

RETURNING EQUIPMENT FOR REPAIR

All equipment returned for repair must be accompanied by:

- Documentation stating the return address, telephone number, date of purchase, and a description of the problem.
- A repair reference number.

To obtain a repair reference number, contact the appropriate Technical Service Center at the phone numbers or Web site listed below. Our representatives will give you instructions and addresses for returning your equipment. By talking with our representatives, many problems can be resolved on the phone.

For returns from Europe, the Middle East, and Africa

Call: +49 40 66 88 40 40 Monday through Friday 09:00 – 17:00 (GMT)

+49 40 66 88 40 41 anytime, any day

(But you must have your PIN number ready)

Web site: www.clearcom.com

For returns from the Americas and Asia

Call: +1 510 496 6666

Web site: www.clearcom.com

Email: support@clearcom.com

FAX: +1 510 496 6610