CLEAR-COM ECLIPSE

ICS-102/62
INTERCOM PANEL

INSTRUCTION MANUAL

ICS-102/62 Intercom Panel Instruction Manual

Part Number 810302Z Rev. 3

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IMPORTANT SAFETY INSTRUCTIONS

Please read and follow these instructions before operating an ICS-102/62 intercom station.

For your safety, it is important to read and follow these instructions before operating an ICS-102/62 intercom station:

(1) **WARNING:** To reduce the risk of fire or electric shock, do not expose an ICS-102/62 intercom station to rain or moisture. Do not operate an ICS-102/62 intercom station near water, or place objects containing liquid on it. Do not expose an ICS-102/62 intercom station to splashing or dripping water.

(2) For proper ventilation, make sure ventilation openings are not blocked. Install the ICS-102/62 according to the directions in the Installation Chapter of this manual.

(3) Do not install an ICS-102/62 intercom 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 Communication Systems.

(7) Unplug the ICS-102/62 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 ICS-102/62 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 ICS-102/62 station's chassis.
- The ICS-102/62 station has been exposed to rain or moisture.
- The ICS-102/62 station does not operate normally.
- The ICS-102/62 station has been dropped.

Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on an ICS-102/62 intercom station, they warn

you of the potential danger of electric shock if the station is used improperly. They also refer you to important operating and maintenance instructions in the manual.

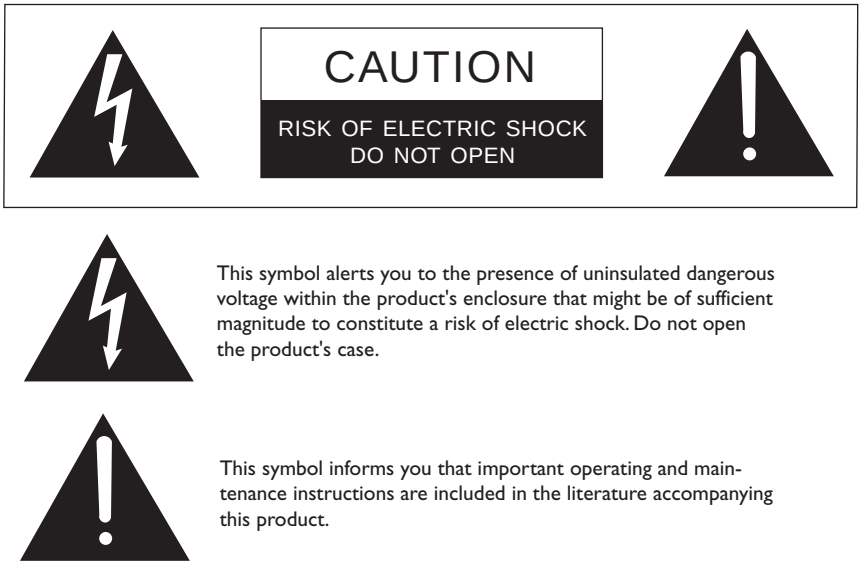

Figure 1: Safety Symbols

OPERATION

INTRODUCTION

This manual describes how to use the ICS-102 and ICS-62 intercom panels and their digital equivalents, the ICS-102T and ICS-62T intercom panels. Panel operators can use this manual after the Eclipse System has been correctly installed and configured.

DESCRIPTION

This chapter describes how to operate the ICS-102 and ICS-62 intercom panels and the ICS-102T and ICS-62T digital panels.

The ICS-102/102T and ICS-62/62T intercom panels are each assembled in a small, 1-RU high (1.75 in. or 44.45 mm) chassis. The ICS-102/102T has ten selectors while the ICS-62/62T has six. Each panel has the following features:

- Individually adjustable listen levels
- Fits in one rack unit (1.75 inches or 44.45 mm) of a standard equipment rack
- Built-in speaker and optional plug-in panel microphone
- Front-panel headset connector
- Call signalling capability
- Answer Back facility
- Local program input without front-panel control
- Programmable relay
- Mute relay
- Two logic inputs for external control of selected panel functions

The panel can both be equipped with the following options:

- XPL-12 and XPL-22 Expansion Panels
- OPT-100 Auxiliary Audio Output.

FRONT-PANEL CONTROLS AND INDICATORS

The front-panel controls and indicators include:

- Communication-error indicator
- Talk/listen selectors and indicators
- Answer Back facility
- Function buttons

COMMUNICATION-ERROR INDICATOR

If the panel should lose data communication with the matrix frame, all of the red lights on the front of the panel will flash slowly.

When data communication is restored, the panel will automatically return to normal operation.

SPEAKER/HEADSET LEVEL CONTROLS

To adjust the speaker or headset volume, use the knob labeled “intercom,” as described below. The speaker volume can also be affected by three software-controlled functions: Page Override, Mute Level, and Listen Level Adjustment.

INTERCOM VOLUME CONTROL

The “intercom” volume control sets the overall level of all signals coming from the matrix frame, except for the page mode, which is controlled by an internal software function (see the next section “Page Override”).

PAGE OVERRIDE

Page Override is a special function in the panel in which the intercom volume defaults to a preset to a value when commanded to by the central matrix. Any fixed group can be assigned the page override function through the configuration program.

The configuration program determines preset value for each panel. If the preset value is lower than the setting of the front-panel volume control, the volume will be controlled by the front panel control.

MUTE LEVEL

This turns down the speaker level when any talk is active at the panel. The amount of muting (measured in dB) is set by the configuration program for each panel. This function helps prevent possible feedback. The maximum amount of muting is 15 dB below full volume. If the front panel control is set below that level, then muting will have no effect.

LISTEN LEVEL ADJUSTMENT

The level of any active listen path can be adjusted individually. Refer to “Listen-Level Mode” later in this chapter.

TALK/LISTEN SELECTORS AND INDICATORS

The following section describes the operation of the talk/listen selectors and their associated indicators.

SELECTOR OPERATION

The selectors operate as both talk and listen selectors; they also work as volume controls when the panel is in listen-level mode (see “Listen Level Mode” later in this chapter). Pressing a selector down accesses a talk label; pushing it up accesses a listen label. Pushing the talk selector down and quickly releasing it will “latch” the selector and the talk path will stay active until it is pressed again. Pressing and holding a talk selector causes the talk path to stay active only for as long as it is held down. Listen selectors operate in the same manner.

To prevent the selector on the panel from latching in the talk position (local latch disable), or to prevent any panel from latching a talk to the panel (global latch disable) use the configuration program.

TALK AND LISTEN INDICATORS

When a talk path is active, the red LED above the selector lights continuously. When a listen path is active, the green LED above the selector lights continuously.

MONITORING/EAVESDROPPING INDICATORS

If any other panel begins monitoring a panel, a beep (the monitoring-alert tone) will sound at the panel.

To inhibit the monitoring-alert tone, use the configuration program.

CALL-WAITING INDICATOR

If a panel calls another panel with a selector programmed for that label, the LED will rapidly flash red. This flashing is a call-waiting tally. To answer the incoming call, push the indicated talk selector. The call-waiting tally clears when the call is answered, or after the call is terminated and the answer-back time-out lapses.

If another panel calls a panel without a button programmed for that label, it will be placed in the answer-back stack (see “Removing Labels from the Answer-Back Stack”).

IN-USE TALLY INDICATOR

If a selector is assigned to a label and another panel is currently using that label, the LED will double-flash once per second to indicate the label is in use. This tally must be enabled from the configuration software.

TELEPHONE OFF-HOOK TALLY INDICATOR

When a telephone interface is assigned to a talk selector, the talk LED will flash once per second if that telephone is off the hook. This tally must be enabled from the configuration program.

RADIO RECEIVER ACTIVE TALLY INDICATOR

When a two-way radio interface port is assigned to a talk selector, the LED will flash once per second when that radio's receiver is active. This tally must be enabled from the configuration program.

PANEL CONNECTED TALLY INDICATOR

This tally is used when a panel is connected to the frame by a high-speed data line (such as an ISDN or T1 line) that might be inactive periodically. The red LED of any talk selector associated with that panel will flash once per second when the panel is on-line. This tally must be enabled from the configuration program.

AUDIO PRESENCE TALLY INDICATOR

When a label is assigned to a listen selector, the LED will flash once per second to indicate someone is talking on that channel. This tally must be enabled from the configuration program.

ANSWER-BACK FACILITY

The primary function of the answer-back facility is to answer calls from other panels or interfaces not assigned to a panel's selectors.

The following sections describe the use of the answer-back facility.

ANSWER BACK SELECTOR

You use the Answer Back selector to answer calls from panels and interfaces that are not assigned to your panel.

When a call from a panel or interface not assigned to the panel arrives:

- The calling panel's label will be placed in the answer-back stack.
- The red LED will flash.

These two conditions will continue until the call is answered, or until the answer-back time-out period lapses and the caller's label is

automatically removed. To answer the call, push the Answer Back selector. The red LED will turn off and the green LED will turn on, indicating an active talk path to the caller. The talk path is active for as long as the selector is held.

Note: The Answer Back selector cannot be latched; it is a momentary-only function.

Calls from panels or interfaces assigned to panel selectors will only be indicated by their associated LEDs.

ANSWER-BACK LABEL SELECTION

If another call comes in while using the answer-back selector:

- The user will hear the caller's voice.
- The label will be placed in the answer-back stack.

To answer the next caller:

1. Push up on the Answer Back selector to remove the current caller's label.
2. Press down on the Answer Back selector to talk to the next caller.

REMOVING LABELS FROM THE ANSWER-BACK STACK

Any label will be automatically removed from the stack if it is not answered within a certain time interval, which is set by the answer-back auto-clear time in the configuration program.

To manually remove the current caller's label from the answer-back stack, push up on the Answer Back selector.

FUNCTION SELECTORS

Two dual-function toggle switches allow you to choose among the following four functions:

- Panel Mic
- Speaker On
- Mic On
- Listen Level

PANEL MIC SELECTOR

This selector selects the panel or headset microphone. If a headset is plugged in, the panel will automatically switch to headset microphone operation. If the headset is unplugged, the panel will automatically switch back to panel microphone operation. The LED will be on when the panel microphone is active.

SPEAKER ON SELECTOR

This selector functions only when a headset is plugged into the panel. To toggle the speaker on and off, push the Speaker On selector. The LED indicates when the speaker is on.

MIC ON SELECTOR

This selector activates the panel or headset microphone, whichever has been selected. The LED indicates when the microphone is on. If a talk is activated while the microphone is off, it will turn on.

LISTEN LEVEL SELECTOR

The Listen Level selector has four functions:

- Activating the listen-level mode
- Resetting the listen-level settings
- Sending call signals
- Releasing auto-answered telephone lines

Listen-Level Mode

To use the listen-level adjust mode, push (for less than 1 sec.) and quickly release the Listen Level selector.

The LEDs of all active listen selectors will begin to flash to indicate the function is on.

Note: Only active selectors can be adjusted in listen-level mode.

Use the selector associated with the intended label to increase (up) or decrease (down) the volume.

To exit, push the Listen Level selector or wait for the 3 sec. time-out.

Note: If the active listen path is pushed higher than the maximum value, the other paths will be driven down so that the desired path has more emphasis.

Listen Level Reset

To reset the Listen Level to default settings:

1. Press (for less than 1 sec.) and quickly release the Listen Level selector.
2. Press and hold the Listen Level selector for 3 sec.
3. Release the Listen Level selector.

Call Signals

To activate a call signal:

1. Push and hold (for at least 1 sec.) the Listen Level selector until the panel indicates it is in Call Signal mode.
2. Push down the talk selector with the desired label.

The call signal will be sent each time the selector with that label assignment is pushed down and will remain so until the call-signal mode times out (about 5 sec.).

Call signals can be issued to any talk label assigned to a panel's talk/listen selectors. If more than one label is assigned to a selector, all labels will receive the signal. If a label is a fixed group, the entire group will receive the call signal. If the label is a party line, then every panel listening on the party line will receive the call signal.

Remote Telephone Line Release

This function is available only if specifically enabled in the configuration program.

To hang up a telephone interface left off the hook:

1. Push and hold the Listen Level selector for at least 1 sec. to activate the call-signal mode.
2. While holding the Listen Level selector, press the talk selector of the desired telephone's label.
3. Release the Listen Level selector.

Note: In addition to hanging up the telephone interface, this will deactivate any talk/listen selector set to the interface from anywhere in the system.

REAR-PANEL CONNECTORS

This section describes only those rear-panel functions directly affecting normal panel operation. These include the functions available through the "Miscellaneous" connector and those added by the use of the "OPT-100 Auxiliary Audio" connector. The actual functions these inputs and outputs perform depend on the installation of the individual panel. This section only describes the general use of these functions. For a more complete description, see the Installation chapter.

MISCELLANEOUS CONNECTOR

The Miscellaneous connector includes the following functions:

- Logic input #1
- Logic input #2
- Programmable relay
- Mute relay

Logic Inputs #1 and #2

Each input can control one of several functions, determined through the configuration program. Typically, these inputs are connected to an external foot switch, a panel-mounted switch, or the logic output of another device.

The following functions are available:

- Mic On/Off—toggles the panel's microphone on and off.
- Mute Mic Output To Frame—turns off the audio from the panel to the frame. It does not turn off the Hot Mic output
- Mic Off —momentarily turns off the panel's microphone.
- Answer Back Talk/Clear—functions the same as the panel's "Answer Back" selector. Holding down the switch activates a talk to a label in the answer-back stack. To clear the label, quickly press and release the switch.
- Studio Announce—sends the output of the panel's selected microphone (panel or headset) to the panel's Studio Announce (SA) audio output, and activates the SA relay. The microphone output is not sent to the frame. The SA output and relay are only present if the panel has the OPT-100 Auxiliary Audio I/O Option installed.
- Speaker OFF—turns off the panel speaker, disabling all audible output from the panel.
- PTT: Activate All Talk Keys—implements a push-to-talk function for all talk selectors. When the logic input is active, the panel operates normally. When the logic input is deactivated, all active talk selectors are disabled. Any controls (relays, etc.) assigned to the labels are activated or deactivated along with their assigned labels. The LED indicators associated with the active talk selectors operate normally regardless of the PTT status. This input only controls latched talks.
- Activate Talk Switch #1— equivalent to pressing the panel's first (leftmost) talk selector; a momentary and latching activation.
- Activate Talk Switch #2—equivalent to pressing the panel's second talk selector; a momentary and latching activation.
- Activate Listen Labels Button—equivalent to pressing the "Listen Labels" button to display listen labels on any display expansion panel (XPL-12 or XPL-22) connected to the panel.
- PTT: Activate Two-Way Radio Keys—implements a push-to-talk function for all two-way radio talk selectors. When the logic input is active, the panel operates normally. When the logic input is deactivated, all active two-way radio talk selectors are disabled. Any controls (relays, etc.) assigned to the labels are activated or deactivated along with their assigned labels. The LED indicators

associated with the active two-way radio talk selectors operate normally regardless of the PTT status. This input only controls latched talks.

Programmable Relay

Each Eclipse system panel includes a relay controlled by the system program and independent of the local panel function. This relay can be assigned to any label(s) in the system, which will activate whenever a talk or listen is set to that label(s). If activating the relay is the only action desired, assign the relay to a “control” label. See the *Eclipse Configuration System Manual* for more details.

The relay can activate an external device, such as an applause light in a studio, a cue light, or a security door lock. Any programmable relay in the system can be activated from any panel in the system, including a direct-inward-access caller.

Mute Relay

The mute relay is activated whenever any talk selector is activated at the panel. The mute relay is commonly wired such that whenever it is activated, the volume of the monitor speaker in that room is decreased (muted).

OPT-100 AUXILIARY AUDIO OPTION

The OPT-100 Auxiliary Audio option provides the following features:

- Hot Mic output
- SA audio and relay outputs
- Auxiliary audio line level output.

Hot Mic Output

The Hot Mic output is a balanced, line-level, transformer-isolated feed of the signal from the currently selected microphone (panel or headset). The Hot Mic output is active regardless of whether the panel has talk paths set and regardless of the front-panel’s control settings.

Studio/Stage Announce Audio and Relay Outputs

The SA output is a balanced, line-level, transformer-isolated feed with the same signal sent to the Hot Mic output, except it is only active when the SA button on the panel’s front panel is pressed or when activated by Logic Input #1 or #2, which is configured for the Studio Announce Function.

Auxiliary Audio Line Level Output

The Auxiliary Audio Line Level output is a balanced, line-level, transformer-isolated feed of the input to the panel's internal speaker. For example, this output could be used to feed an external amplifier connected to loudspeakers.

EXPANSION PANEL OPERATION

Optional expansion panels provide additional selectors that operate the same way as a panel's selectors, including talk, listen, tally, and error indication.

The XPL-12 expansion panel provides 10 additional keys, while the XPL-22 provides 20 additional keys. Each expansion panel offers illuminated 5-character labels for every key.

Only one rack unit (1RU) of a standard Electronics Industry Association equipment rack is required for each expansion panel. The panels' compact size makes them ideal for use in TV control rooms, edit suites, mobile OB vans, and any other location where many talk/listen keys are necessary but space it at a premium.

2 INSTALLATION

INTRODUCTION

This chapter describes the installation of the ICS-102/ICS-102T and ICS-62/62T intercom panels, including:

- Panel placement
    - Wiring
    - Mains AC power
    - Adjustments
    - Configuration
    - Accessory panels

MOUNTING PANELS

Locate all intercom panels at comfortable heights for operation and leave at least 2 inches (51 mm) of clearance behind the rear of the panel's chassis to allow for cable connectors.

Accessory panels, that are intended to expand or enhance panel operation, are usually mounted next to or near the panel with which they are associated. Leave at least 2 inches (51 mm) of clearance behind the rear of the panel to allow for cable connectors.

Accessory panels can be located as far as 25 ft. (7.6 m) away from the panel. A 6-ft. (1.8 m) cable is supplied to connect them.

WIRING

This section provides detailed wiring diagrams for all panels' wiring systems.

Eclipse uses either a twisted, 4-pair transmission, a single-pair twisted, or a coax scheme between the panel and the frame using the industry standard RJ-45 connector. Refer to *Installing an Eclipse Matrix System: An Overview* for RJ-45 connector installation and use, and the type of cable needed for connection between panels and frames.

Most panels have a DB-15M and an RJ-45 connector to connect them to the frame. Panels with only a DB-15M connector include a kit containing one DB-15F/RJ-45 adapter. The adapter allows the use of RJ-45 connectors on both ends of the connection between the frame and the panel.

Connections to external devices via the Miscellaneous connector, use the included DB-15M connector to construct one or more cables to connect external devices to the panel.

The following sections describe connecting the panel to the matrix frame, and all the connections between the panel and local devices. Each of the following sections describes cable and panel connector wiring:

- Analog matrix frame to panel wiring
- Digital matrix frame to panel wiring
- Matrix panel Miscellaneous connector wiring
- OPT-100 Auxiliary Audio I/O option
- Binaural headset wiring

ANALOG MATRIX FRAME TO PANEL WIRING

The analog audio RS-422 data communications module (COM-10) uses a 4-pair wiring scheme between the frame and panels. This module requires an MVX-A16 card in the frame.

Although some Matrix Panels have a DB-15M (male) connector for connection to the Matrix frame, most have a built-in RJ-45 connector. For those panels with a DB-15 male connector, Clear-Com provides a properly wired DB-15F (female) to RJ-45 adapter for direct connection with RJ-45 terminated cables. Additionally, panels configured for digital communication are equipped with a BNC.

Four-pair analog wiring is typically wired with shielded CAT5 RJ-45 cable.

- Pair 1 transmits analog audio from the matrix port to the panel.
- Pair 2 transmits RS-422 data from the panel back to the matrix card port.
- Pair 3 transmits analog audio from the panel to the matrix card port.
- Pair 4 transmits RS-422 data from the matrix port back to the panel.

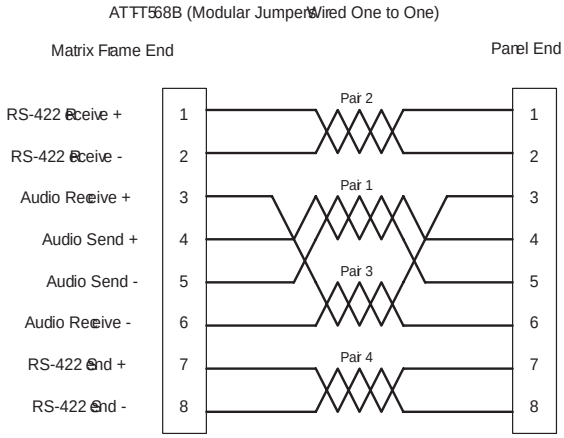

Figure 2-1: Matrix Frame to Panel Wiring

DIGITAL MATRIX FRAME TO PANEL WIRING

The ICS-102T and ICS-62T panels differ from the ICS-102 and ICS-62 panels because they contain an internal digital audio/data communications module (COM-20) that works in conjunction with the DIG-2 digital interface module to connect digital panels to the matrix.

The DIG-2 digital interface module offers two options for wiring the frame to intercom panels. One option is a single pair of double shielded (braid and foil) 24 AWG conductor CAT-6 Enhanced STP cable with RJ-45 connectors.

The second option, available because only one pair is required, is 75-ohm (RG59) braid shielded coax cable. For this option, a BNC-16 adaptor is required.

In addition, each panel may require other connector wiring, depending on what options and accessories are installed.

Note: For more information on the DIG-2 digital interface and the DIF-102 frame which houses it, refer to the DIF-102/DIG-2 manual (part no. 810312Z) in the Eclipse set of manuals.

Single-Pair Digital

Single-pair digital wiring requires double-shielded 24 AWG conductor CAT-6E enhanced STP cable with RJ-45 connectors. Pair 1 transmits and receives multiplexed audio or data between the matrix port and the panel.

Note: Ensure that the Select switch on the panel's rear panel is in the correct position for the intended use.

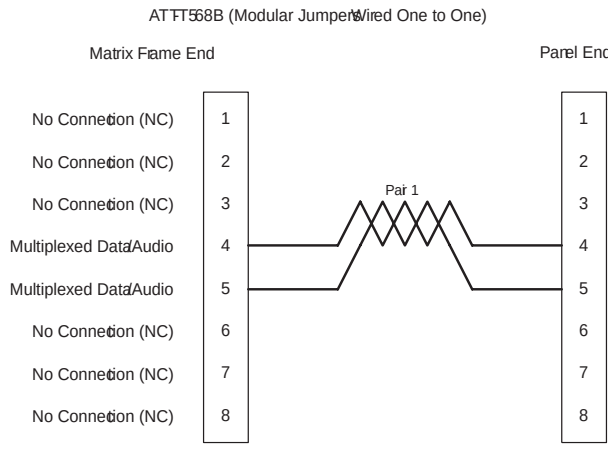

Figure 2-2: Matrix Frame to Digital Panel Wiring Using RJ-45

Coax Digital

Coax digital wiring requires double-shielded 24 AWG conductor CAT-6 Enhanced STP cable connected to a 75-ohm (RG59) braid- shielded coax cable with a BNC-16 adaptor.

Pair 1 transmits and receives multiplexed digital and analog between the matrix port and the panel.

Note: Ensure that the Select switch on the panel's rear panel is in the correct position for the intended use.

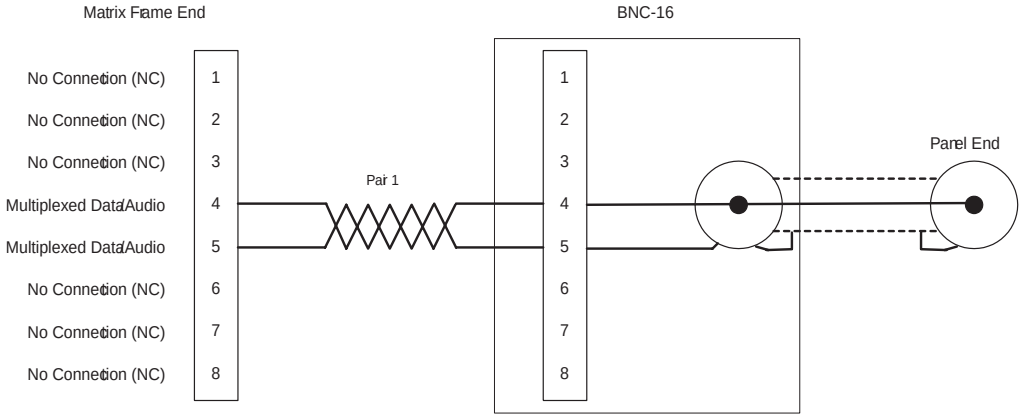

Figure 2-3: Matrix Frame to Digital Panel Wiring Using BNC-16 and Coax

MATRIX PANEL MISCELLANEOUS CONNECTOR WIRING

Most local devices connect with the panel via the Miscellaneous connector.

The following sections discuss how to wire the various functions available on the “Miscellaneous” connector.

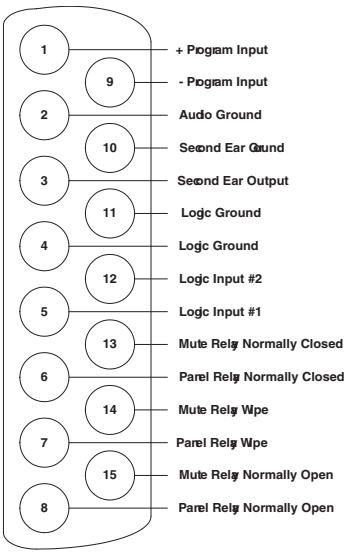

Figure 2-4: Miscellaneous Connector Pinout

External Program Feed Input

The external program feed input allows the panel operator to simultaneously monitor audio from an external source and intercom audio.

The input is designed to accept a balanced, line-level audio feed at a nominal level of 0 dB. The program feed input passes through the panel’s “Program” volume control before being mixed with the audio at the panel. The program feed (program audio) can be heard on the panel’s speaker and headset; it cannot be heard by other panels in the Matrix system.

To connect an external program feed to the panel:

1. Connect the balanced audio pair to pins 1 and 9.
2. Connect a shield or ground connection if available to the connector’s pin 2 (see Figure 8).

Logic Input #1 and #2

Each input can control one of several functions, determined through the configuration program. Typically, these inputs are connected to an external foot switch, a panel-mounted switch, or the logic output of another device.

The following functions are available:

- Mic On/Off—toggles the panel’s microphone on and off.

- Mute Mic Output To Frame—turns off the audio from the panel to the frame. It does not turn off the Hot Mic output **(**described in “OPT-100 Auxiliary Audio I/O Option” on page 2-8). For an example of how to use this option, see “External Program Feed Input” on page 2-4).
- Mic Off —momentarily turns off the panel’s microphone.
- Answer Back Talk/Clear—the same functions as the panel’s “Answer Back” key. Holding down the switch activates a talk to a label in the answer-back stack. To clear the label, quickly press and release the switch.
- Studio Announce—sends the output of the panel’s selected microphone (panel or headset) to the panel’s Studio Announce (SA) audio output, and activates the SA relay. The microphone output is not sent to the frame. The SA output and relay are only present if the panel has the OPT-100 Auxiliary Audio I/O Option installed. (The SA options are described in “OPT-100 Auxiliary Audio I/O Option” on page 2-8).
- Speaker OFF—turns off the panel speaker, disabling all audible output from the panel.
- PTT: Activate All Talk Keys (Push To Talk)—when enabled from the configuration program and the logic input is active, the panel behaves normally. When this function (logic level) is deactivated, it disables activation of all talk labels, implementing a push-to-talk function for the panel. Any controls (relays, etc.) assigned to the labels are activated or deactivated along with their assigned labels. The LED indicators associated with the active labels behave normally regardless of this input’s activity. This input controls momentary and latched talks.
- Activate Talk Switch #1—equivalent to pressing the panel’s first (leftmost) talk selector; a momentary and latching activation.
- Activate Talk Switch #2—equivalent to pressing the panel’s second talk selector; a momentary and latching activation.
- Activate Listen Labels Button—equivalent to pressing the “Listens” button on the keypad; all modes of the “Listens” button are supported.
- PTT: Activate Two-Way Radio Keys—implements a push-to-talk function for all two-way radio talk selectors. When the logic input is active, the panel operates normally. When the logic input is deactivated, all active two-way radio talk selectors are disabled. Any controls (relays, etc.) assigned to the labels are activated or deactivated along with their assigned labels. The LED indicators associated with the active two-way radio talk selectors operate normally regardless of the PTT status. This input only controls latched talks.

Use normally open type switches to activate the logic inputs. Connect the switches as follows (see Figure 8):

- Logic input #1—pins 4 to 5 (pin 4 = ground)
- Logic input #2—Pins 11 to 12 (pin 11 = ground)

Note: Do not apply external voltage to the logic inputs.

Mute Relay Contacts

The mute relay is activated whenever any talk selector is activated at the panel. The mute relay is commonly wired such that whenever it is activated, the volume of the monitor speaker in that room is decreased (muted). See Figure 2-4.

Both normally open and normally closed contacts are provided. They are rated at 1 Amp at 24 VDC. This 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 this relay.

Programmable Relay Contacts

Each panel includes a relay controlled by the system program and independent of the local panel function. This relay can be assigned to any label(s) in the system, which will activate whenever a talk or listen is set to that label(s). If activating the relay is the only action desired, assign the relay to a Control label. See the *Eclipse Configuration System Manual* for more details.

The relay can activate an external device, such as an applause light in a studio, a cue light, or a security door lock. Any programmable relay in the system can be activated from any panel in the system, including a direct-inward-access caller. Figure 2-4 shows the wiring of the relay contacts to the Miscellaneous connector.

Both normally open and normally closed contacts are provided. They are rated at 1 Amp at 24 V DC. This 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 this relay.

OPT-100 AUXILIARY AUDIO I/O OPTION

The OPT-100 Auxiliary Audio option provides the following features:

- Hot Mic output
- SA audio and relay outputs
- Auxiliary audio line level output

Figure 2-5 shows the pinout for the intercom panel's DB-15F Auxiliary Audio I/O connector. Following are descriptions and wiring information for the OPT-100 Auxiliary Audio I/O option.

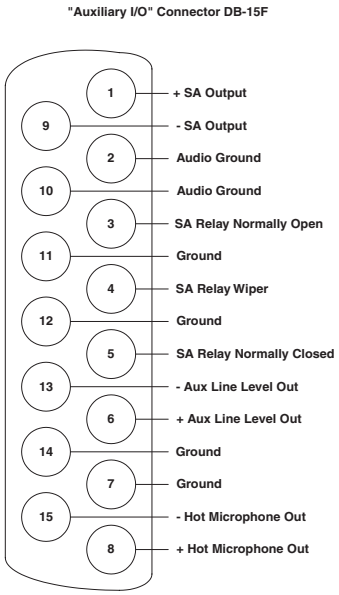

Figure 2-5: Auxiliary I/O Connector

Hot Mic Output

The Hot Mic output is a balanced, line-level, transformer-isolated feed of the signal from the currently selected microphone (panel or headset). The Hot Mic output is active regardless of whether the panel has talk paths set and regardless of the front-panel's control settings.

Connect to pins 8 and 15 for a balanced output. Pin 7 is available as a shield or ground source (see Figure 2-5).

Studio/Stage Announce Audio and Relay Outputs

The SA output is a balanced, line-level, transformer-isolated feed with the same signal sent to the Hot Mic output, except it is only active when the SA button on the panel's front panel is pressed or when activated by Logic Input #1 or #2, which is configured for the Studio Announce Function.

Connect to pins 1 and 9 for a balanced SA audio output. Pin 2 is available as a shield or ground source (see Figure 2-5).

Both normally open and normally closed contacts are provided. They are rated at 1 Amp at 24 VDC. This 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 this relay (see Figure 2-5). The following table shows the pins available for the SA relay.

Pin Description	Pin Number
N.O. (normally open)	3
WIPER (common)	4
N.C. (normally closed)	5

Table: 2-1 Studio Announce Pins Availability

Auxiliary Audio Line Level Output

The Auxiliary Audio Line Level output is a balanced, line-level, transformer-isolated feed of the input to the panel's internal speaker. For example, this output could be used to feed an external amplifier connected to loudspeakers.

Connect to pins 6 and 13 for a balanced output. Pin 14 is available as a shield or ground source (see Figure 2-5).

MAINS AC POWER

The ICS-102/ICS-102T panels and ICS-62/ICS-62T panels can be powered by any source supplying between 12 and 16 V RMS AC at 750 mA. The panels are shipped with a wall-mountable transformer that provides 14 V RMS AC to the panel.

Two types of transformers are available: one operates on a mains AC input power of 117 V (part number 730166) and the other operates on a mains AC input power of 220 V (part number 820049). Make sure to specify the proper transformer when ordering the panel.

To connect the transformer, route the cord from the transformer's secondary to the panel's "AC Power Input" connector on the rear panel. This is a 2.1 mm coax connector. When routing the cord make sure to use the stress relief on the rear panel.

The power input to the panel is internally protected with a 0.9 a "poly fuse," a self-healing fuse that will recover when the fault is removed.

ADJUSTMENTS

The following panel parameters are adjustable either internally on the panel's main PCB, or externally by selecting options in the configuration program:

- Headset sidetone (main PCB)
- Panel microphone gain (main PCB)
- Speaker mute (configuration program)
- Page volume level (configuration program)
- Panel-to-matrix card baud rate (configuration program)

All these parameters are set to factory defaults. Most panels should operate at these default settings; however, some applications may require readjustment.

HEADSET SIDETONE

Sidetone is the sound of the user's voice in his headset.

To adjust sidetone:

1. Remove the panel cover.
2. Find the sidetone control (marked "P2 Sidetone") on the main PCB. See Figure 10.
3. Connect a headset to the panel.
4. While speaking into the headset microphone, use a small screwdriver to turn the sidetone control until the sidetone is at the desired level.
5. Re-install the panel cover.

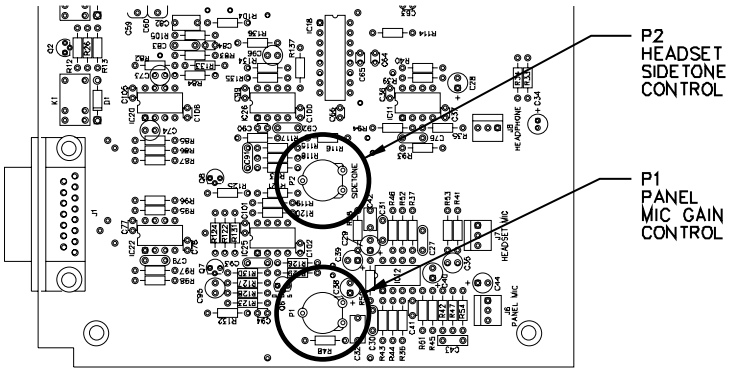

Figure 2-6: Sidetone and Panel Microphone Gain Adjustment Controls

PANEL MICROPHONE GAIN

You can adjust the preamplifier gain of the panel microphone over a range of 0 to 10 dB; the maximum is the panel microphone gain's default setting. However, if two panels are talking to each other at the

same time with the panel microphone gain set to maximum, feedback may occur even if the speaker mute (see the “Speaker Mute” section, next) is set to maximum. In this case, it will be necessary to turn the panel microphone gain down. Similarly, in some noisy environments it may be necessary to turn the panel microphone gain down and have the operator talk more closely into the microphone.

To adjust the panel microphone gain:

1. Remove the panel cover.
2. Use a small screwdriver to adjust the control marked “P1” on the Main PCB. See Figure 10.
3. Reinstall the panel’s cover.

SPEAKER MUTE

When a panel microphone and a speaker are used together, feedback is possible. To reduce this possibility, the panel software will mute (turn down) the speaker level by some predetermined amount when both the microphone and speaker are enabled. The speaker mute can be adjusted from 0 to 15 dB; its default setting is 6 dB.

Refer to the *Eclipse Configuration System Instruction Manual* for instructions on muting the speaker.

PAGE VOLUME LEVEL

When Page Override is assigned to a label, the audio level at the destination panel(s) is predetermined. This function allows talking to someone even if his panel’s volume control is off. Two things will happen when a panel activates such a label:

- If the destination speaker was off, it will turn on.
- The panel’s speaker output will be at the predetermined level regardless of the “Intercom” volume control setting, unless this control is set higher than the predetermined level.

The page volume level can be adjusted within a range of 0 to 10, equivalent to the front-panel control settings of 0 equals off and 10 equals full pot. The page volume level’s default setting is 5.

Refer to the *Eclipse Configuration System Instruction Manual* for instructions on using Page Override.

PANEL-TO-MATRIX CARD BAUD RATE

The RS-422 serial data communication between a panel and other devices can operate at standard (19.2 k baud, the default) and long-line (9600 baud) baud rates. Use long-line only if encountering problems with the standard baud rate.

The baud rate is set from the configuration program and the panel automatically adapts.

3 MAINTENANCE

INTRODUCTION

This chapter provides panel microprocessor resetting instructions, troubleshooting guidelines, schematics, assembly drawings, and component lists for the ICS-102/ICS-102T intercom panel.

The panel operates at 14 VAC, supplied from an external transformer. Transformers can be ordered for either 117 VAC or 220 VAC.

PANEL RESET

The panel's microprocessor has a reset button located in an unmarked hole just below the "Intercoms" knob on the left side of the unit's front panel. If the panel is acting erratically, try resetting it by doing one of the following:

- Insert a small screwdriver or a stiff piece of wire (such as a bent paper clip) into the hole and push the reset button.
- Unplug the panel from AC power and reconnect.

Troubleshooting

When experiencing the symptoms listed below, attempt the following solutions in the order outlined. The solutions are listed in order of difficulty with the first being the most simple and easy.

• The panel's LEDs and push-button lights fail to light.

1. Check mains AC power into the panel.
2. Ensure the external power supply is properly connected to the panel.
3. Replace the panel.

• The LED indicator above a selector key does not light when the key is pressed.

1. Ensure the selector key has a label assigned to it (the LED indicator will not light without an assigned label).
2. Reset the panel.
3. Replace the panel.

• The panel appears to activate talk paths, but other panels can't hear the panel operator.

1. Check "Mic On/Off" and "Panel Mic" buttons to ensure the intended microphone is selected and on.

2. If the correct microphone is turned on, ensure the panel audio has not been muted externally through the logic inputs.
3. Make sure the panel has not been defined as a nearby panel.
4. Activate the Matrix Loopback mode from the panel's Maintenance menu to check the audio paths to the matrix.
5. Enable eavesdropping on the panel.
6. Test the integrity of the panel's audio path by temporarily setting a forced listen to it.
7. Reset the panel.
8. Replace the panel.

• The panel is inoperative and all red LEDs flash slowly.

1. Wait 60 sec. If the matrix frame has just been powered up, it is possible it is still downloading the configuration to the port cards.
2. Ensure the cable connecting the panel to the matrix is plugged in at both ends.
3. Check the integrity of the data paths, especially the polarity for panels using a COM-10 communication module.
4. Check the configuration program to ensure the panel has been assigned the correct port type.
5. Confirm the port card or interface type matches the panel. Panels with COM-10 communication modules should have MTX-A16 cards. Panels with COM-20 communication modules connect to DIG-2 interfaces.
6. Reset the panel's port card in the matrix frame.
7. Replace the panel's port card in the matrix frame.
8. Reset the panel.
9. Replace the panel.

• No audio from the panel's speaker.

1. Ensure the Intercom knob on the panel's front panel is turned up.
2. Ensure the Speaker On/Off button is on.
3. Check whether audio can be heard in a headphone.
4. Use the configuration computer or an ICS-2003 panel's programming feature to test the integrity of the panel's audio path by temporarily setting a forced listen to it.
5. Reset the panel's port card in the Matrix frame.
6. Replace the panel's port card in the Matrix frame.
7. Reset the panel.
8. Replace the panel.

• The operator cannot hear another panel's page or call signal tones.

1. Adjust the "Page Volume" control of the panel using the configuration program (refer to the *Eclipse Configuration System Manual*).

2. Check the panel's configuration to see if page override is enabled.

• Announce tones (eavesdropping indication, change tones, etc.) aren't heard at the panel.

1. Adjust the panel's "Page Volume" control in the configuration program (refer to the *Eclipse Configuration System Manual*).
2. Check the panel's Configuration menu to see if page override is enabled.

• Accessory panel keys do not function.

1. Check the accessory panel's connection on the panel's rear panel.
2. Ensure the external AC power transformers are correctly connected to the accessory panels.
3. Check the configuration program to ensure the correct number of keys are configured.

TECHNICAL REFERENCE

BILL OF MATERIALS FOR THE ICS-102/102T

Device	Description	Part #
Cable	10-PIN FLAT CABLE	770001
Cable	16-PIN FLAT CABLE	770008
Cable	34-PIN FLAT CABLE	730181
Clamp	CABLE CLAMP, 3/16IN PLASTIC	640054
Flash ROM	ICS-102 PROGRAM	710416
Speaker	41 X 71MM, SMALL MAGNET	500138
Transformer	POWER PLUG-IN 117/14VAC	400008
Transformer	POWER PLUG-IN 220/14VAC	400011

ICS-102 DIGITAL BLOCK DIAGRAM

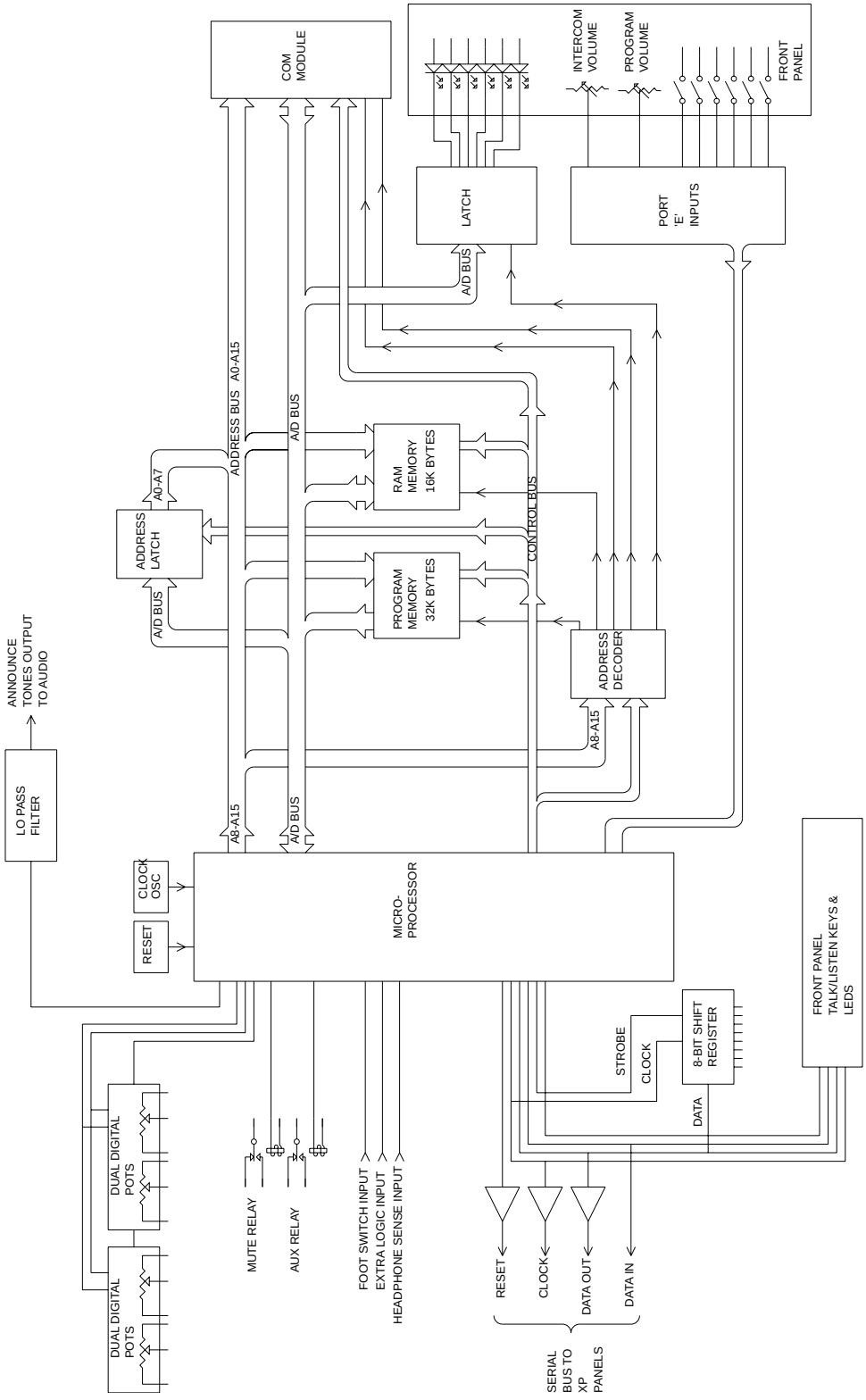

Figure 3-7: Digital Block Diagram—ICS-102/102T Main PCB

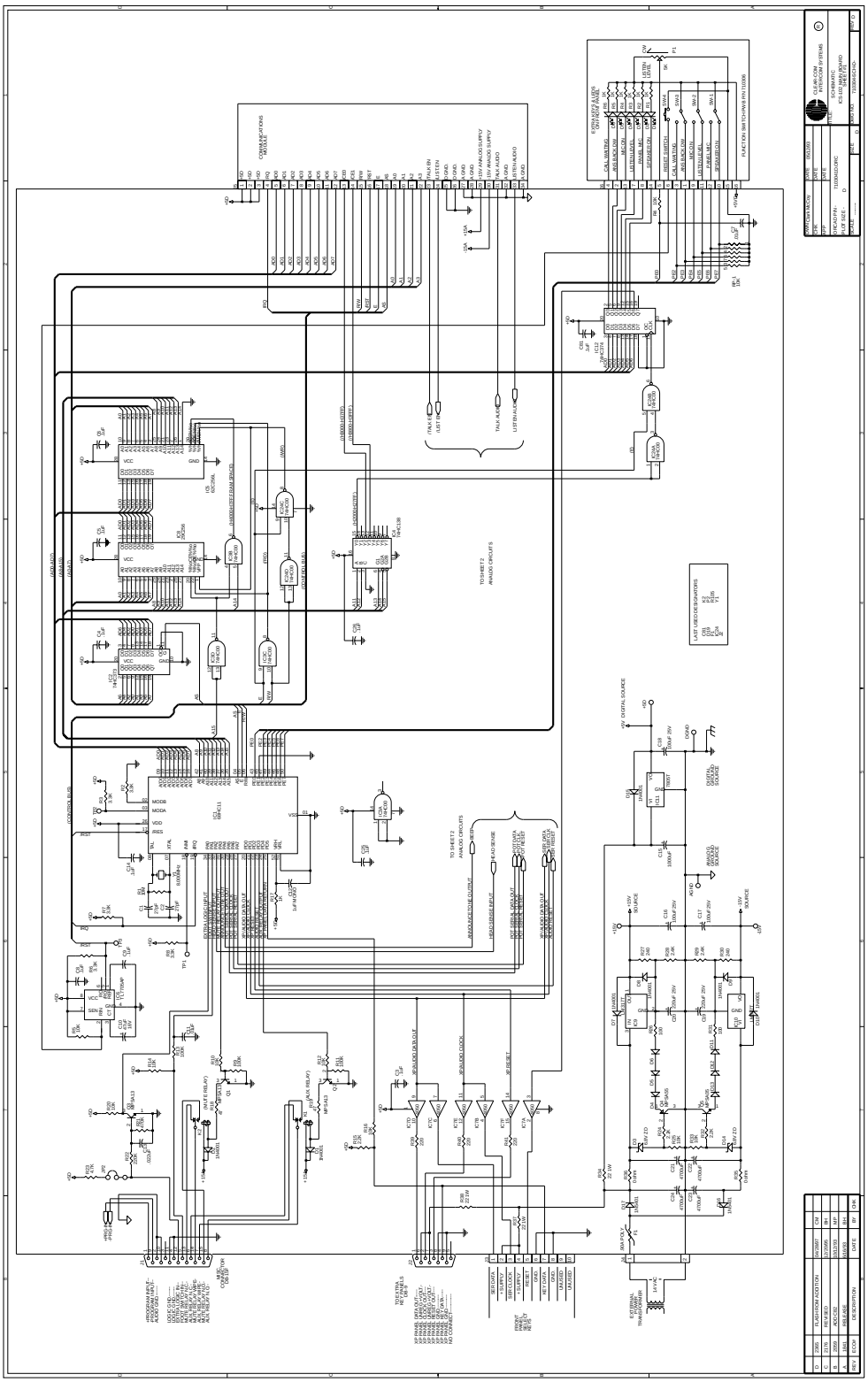

Figure 3-8: ICS-102 Main PCB Schematic Rev D (part 1)

ICS-102 AUDIO BLOCK DIAGRAM

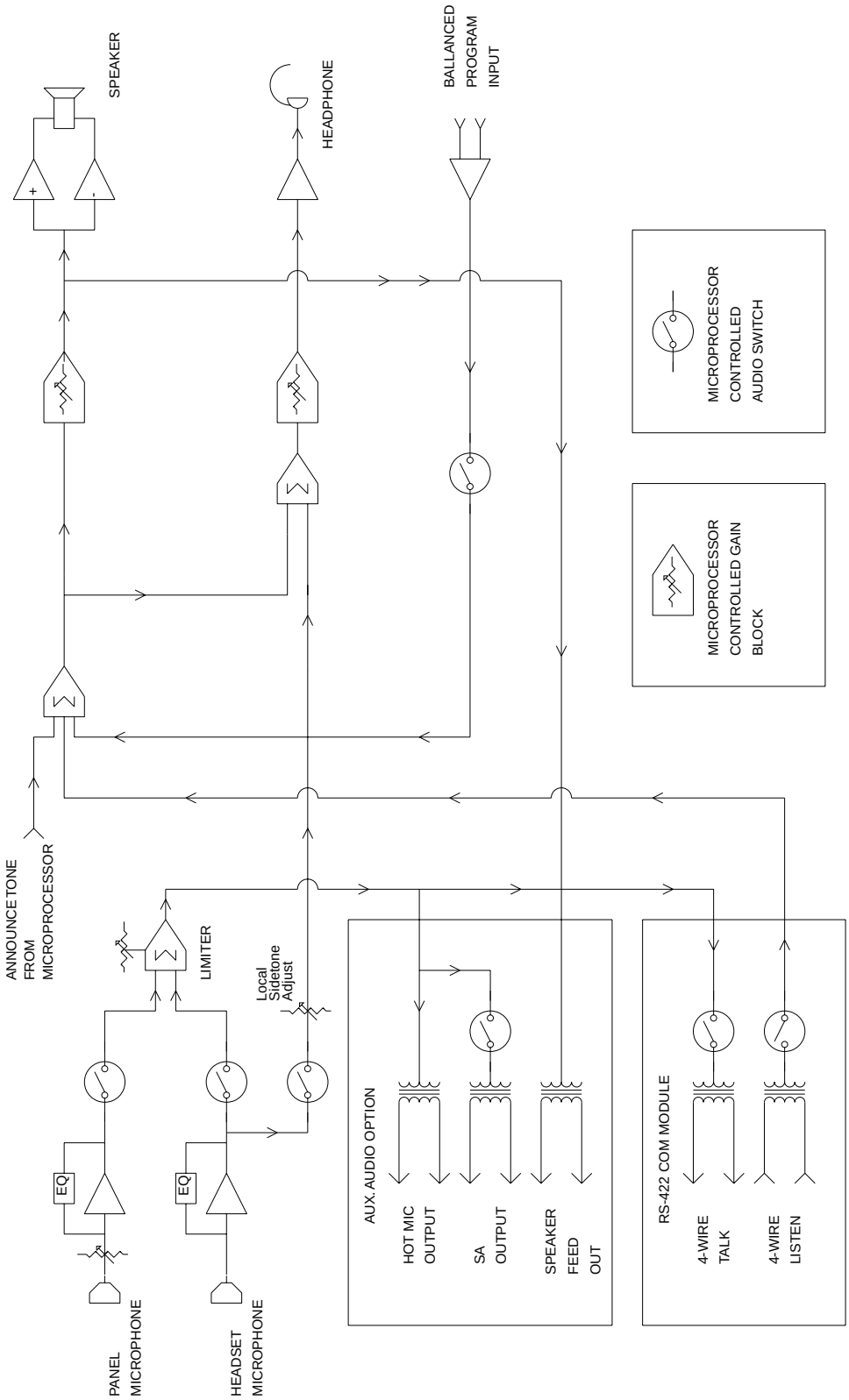

Figure 3-9: ICS-102 Audio Block Diagram

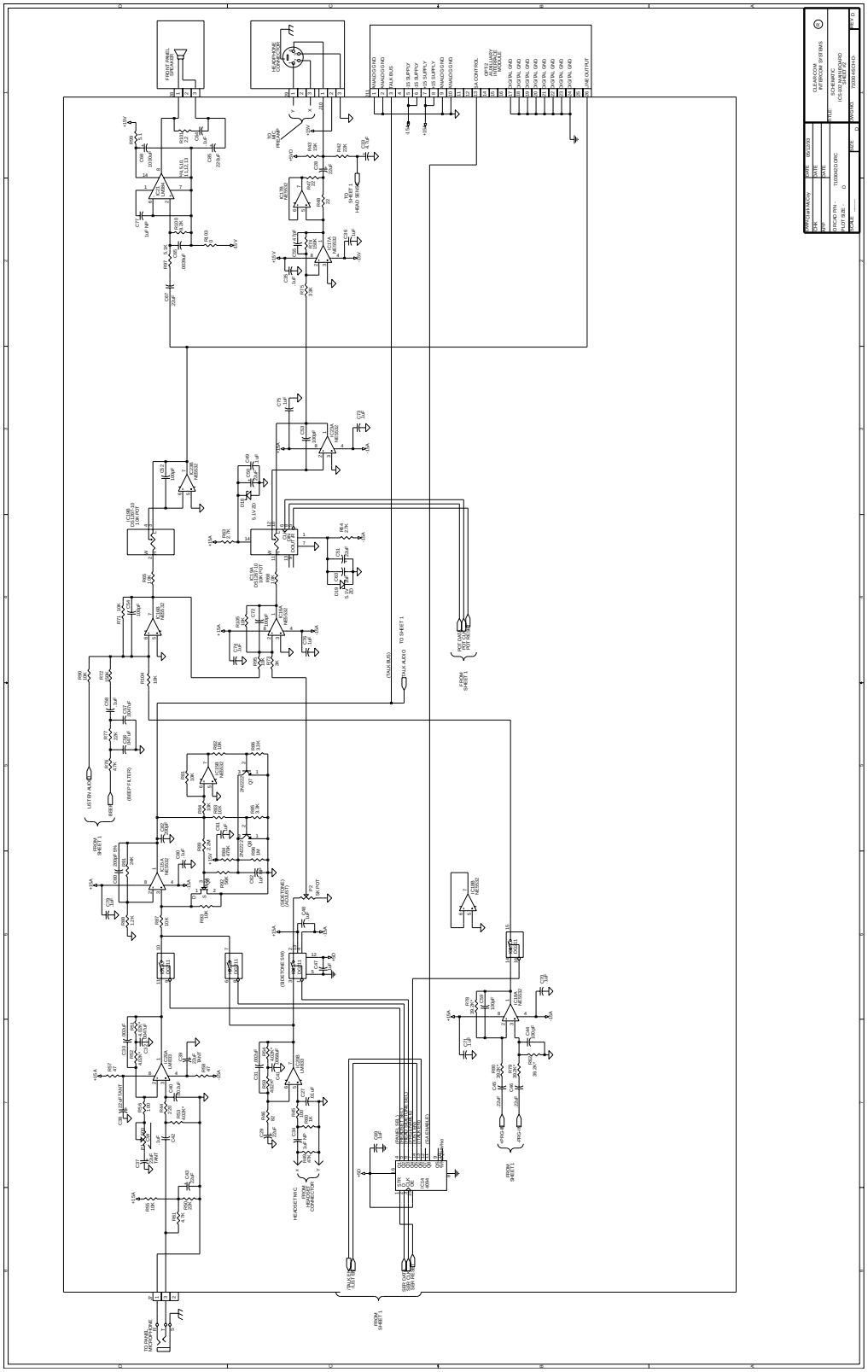

Figure 3-10: ICS-102 Main PCB Schematic Rev D (part 2)

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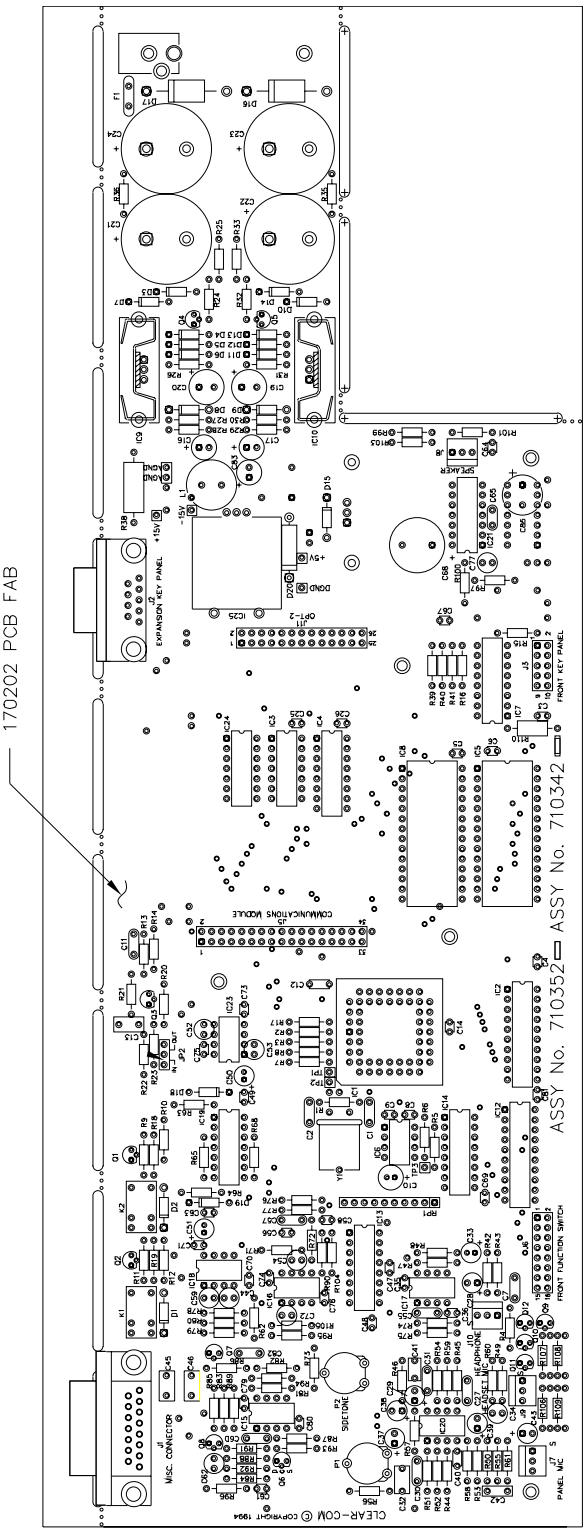

Figure 3-11: Main PCB

BILL OF MATERIALS

ICS-102/102T MAIN PCB

Capacitors

Designator	Description	Qty
C1 C2	27 PF CERAMIC 50V 5%	2
C55	47 PF CERAMIC 50V 10%	1
C44 C52 C53 C54 C59 C72	100 PF CERAMIC 50V 10%	6
C60 C82	200 PF CERAMIC 100V 5%	2
C41	6800 PF CERAMIC 50V 5%	1
C65 C66	.001 UF CERAMIC 30V 20%	2
C30 C31 C40	.0022 UF MYLAR 100V 5%	3
C32	.0047 UF MYLAR 50V 5%	1
C57	.0047 UF CERAMIC 50V 10%	1
C7 C11 C27	.01 UF CERAMIC 30V 20%	3
C13	.022 UF MYLAR 100V 10%	1
C56	.047 UF MONO 50V 10%	1
C9 C14 C25 C26 C35 C36 C47 C48 C49 C58 C61 C63 C3 C4 C5 C6 C8 C76 C79 C80 C81 C64 C67 C69 C70 C71 C73 C74 C75	.1 UF MONO 50V 10%	29
C42	.1 UF MONO 100V 10%	1
C45 C46	.22 UF MYLAR 100V 20%	2
C12 C18	1 UF CERAMIC 50V 10%	2
C3 C62 C77 C78	1 UF ALUMINUM NP 50V 10%	4
C33	2.2 UF ALUMINUM NP 50V	1
C38 C39	22 UF TANT. 16V	2
C28 C29 C37 C43 C50 C51	22 UF ALUMINUM 16V 20%	6
C84 C83	33 UF ALU LOW ESR 35V 20%	2
C10	47 UF ALUMINUM 16V 20%	1
C16 C17	100 UF ALUMINUM 25V 20%	2
C19 C20	220 UF ALUMINUM 25V	2
C68	1000 UF ALUMINUM 35V	1
C21 C22 C23 C24	4700 UF ALUMINUM 25V	4

Resistors & Resistor Packs

Designator	Description	Qty
R99 R103	1 OHM 1/4W CARBON FILM 5%	2
R101	2.2 OHMS 1/4W CARBON FILM 5%	1
R47 R48	22 OHMS 1/4W CARBON FILM 5%	2
R38	22 OHMS 1W CARBON FILM 5%	1
R18 R19 R57 R58	47 OHMS 1/4W CARBON FILM 5%	4
R46	82 OHMS 1/4W CARBON FILM 5%	1
R26 R31 R45 R56	100 OHMS 1/4W CARBON FILM 5%	4
R39 R40 R41 R44	220 OHMS 1/4W CARBON FILM 5%	4
R27 R30	240 OHMS 1/4W CARBON FILM 5%	2
P1	5 OHMS TRIM POT	1
R17 R60	1K OHMS 1/4W CARBON FILM 5%	2
R88	1.2 OHMS 1/4W CARBON FILM 5%	1
R15 R24 R32	2.2K OHMS 1/4W CARBON FILM 5%	3
R28 R29	2.4K OHMS 1/4W CARBON FILM 5%	2
R63 R64	2.7K OHMS 1/4W CARBON FILM 5%	2
R73	3.0K OHMS 1/4W CARBON FILM 5%	1
R2 R3 R6 R7 R8 R85 R86	3.3K OHMS 1/4W CARBON FILM 5%	7
R51 R52 R53 R54 R59	4.02K OHMS 1/8W METAL FILM 1%	5
R23 R61 R76	4.7K OHMS 1/4W CARBON FILM 5%	3
P2	5K OHMS TRIM POT	1

Designator	Description	Qty
R100 R102	8.2K OHMS 1/4W CARBON FILM 5%	2
R4 R5 R10 R12 R14 R16 R20 R25 R33 R55 R65 R68 R71 R81 R82 R83 R87 R90 R93 R94 R95 R104 R105	10K OHMS 1/4W CARBON FILM 5%	23
RP1	1 OHM X 9 R-PACK	1
R43	15K OHMS 1/4W CARBON FILM 5%	1
R42 R50 R77 R97 R98 R106 R107 R108 R109	22K OHMS 1/4W CARBON FILM 5%	9
R91	24K OHMS 1/4W CARBON FILM 5%	1
R75	33K OHMS 1/4W CARBON FILM 5%	1
R62 R78 R79 R80	39.2K OHMS 1/8W METAL FILM 1%	4
R49	47K OHMS 1/4W CARBON FILM 5%	1
R92	56K OHMS 1/4W CARBON FILM 5%	1
R9 R11 R13	100K OHMS 1/4W CARBON FILM 5%	3
R72 R74	150K OHMS 1/4W CARBON FILM 5%	2
R22	220K OHMS 1/4W CARBON FILM 5%	1
R21 R84	470K OHMS 1/4W CARBON FILM 5%	2
R96	1M OHM 1/4W CARBON FILM 5%	1
R89	2.2M OHMS 1/4W CARBON FILM 5%	1
R1	10M OHMS 1/4W CARBON FILM 5%	1

Diodes and Transistors

Designator	Description	Qty
D3 D14	DIODE 1N957B ZENER 6.8V .4W 5%	2
D1 D2 D7 D8 D9 D10 D15	DIODE 1N4003 RECT 1A 200PIV	7
D4 D5 D6 D11 D12 D13	DIODE 1N4148 SIGNAL 10MA 75PIV	6
D18 D19	DIODE 1N5231B ZENER 5.1V .5W 5%	2
D20	DIODE 1N5339 ZENER 5.6V 5W	1
D16 D17	DIODE 1N5401 RECT 3A 100PIV	2
Q7 Q8 Q9 Q10 Q11 Q12	TRANSISTOR 2N2222 NPN 30V	6
Q6	TRANSISTOR J174 JFET PCHAN 8V VGS	1
Q5	TRANSISTOR MPS-A05 NPN 60V	1
Q1 Q2 Q3	TRANSISTOR MPS-A13 NPN 30V DARL	3
Q4	TRANSISTOR MPS-A55 PNP 60V	1

Integrated Circuits

Designator	Description	Qty
IC7	4050B CMOS HEX BUFFER	1
IC14	4094B CMOS 8 BIT SHIFT REGISTER	1
IC1	68HC11A CMOS MCU 52 PIN PLCC FP	1
IC3 IC24	4HC00 CMOS QUAD NAND	2
IC4	74HC138 CMOS 3 TO 8 LINE DECODER	1
IC2	74HC373 CMOS OCTAL D LATCH	1
IC12	74HC374 CMOS OCTAL D FL/FLOP	1
IC13	DG211CJ CMOS QUAD ANA-LOG SWITCH	1
IC5	GM76C256L CMOS SRAM 32K X 8 100NS	1
IC19	DS1267-10 DIGITAL POT, DUAL 10K	1
IC21 IC22	LM384 OPAMP, POWER 4W	2
IC20	LM833N OPAMP, DUAL LO NOISE	1
IC15 IC16 IC17 IC18 IC23	NE5532 OPAMP, DUAL LO NOISE	5
IC25	78SR105HC REGULATOR, 5V SWITCHER 1A	1
IC9	LM317T REGULATOR, POS ADJ 1.5A	1
IC10	LM337T REGULATOR, NEG ADJ 1.5A	1
IC6	TL7705AP RESET SUPERVI-SOR IC	1

Miscellaneous

Designator	Description	Qty
J4	CONNECTOR 2.1MM CO-AX PC MTG POWER	1
J2	CONNECTOR DB-9F RT ANG PC MTG	1
J1	CONNECTOR DB-15F RT ANG PC MTG	1
Y1	CRYSTAL 8.000MHZ PARAL-LEL CRYSTAL	1
F1	FUSE 0.90A POLY SWITCH	1
JP2	JUMP JACK JUMP JAX	1
K1 K2	RELAY SPDT 12V PC RELAY ITT#SZ12	2

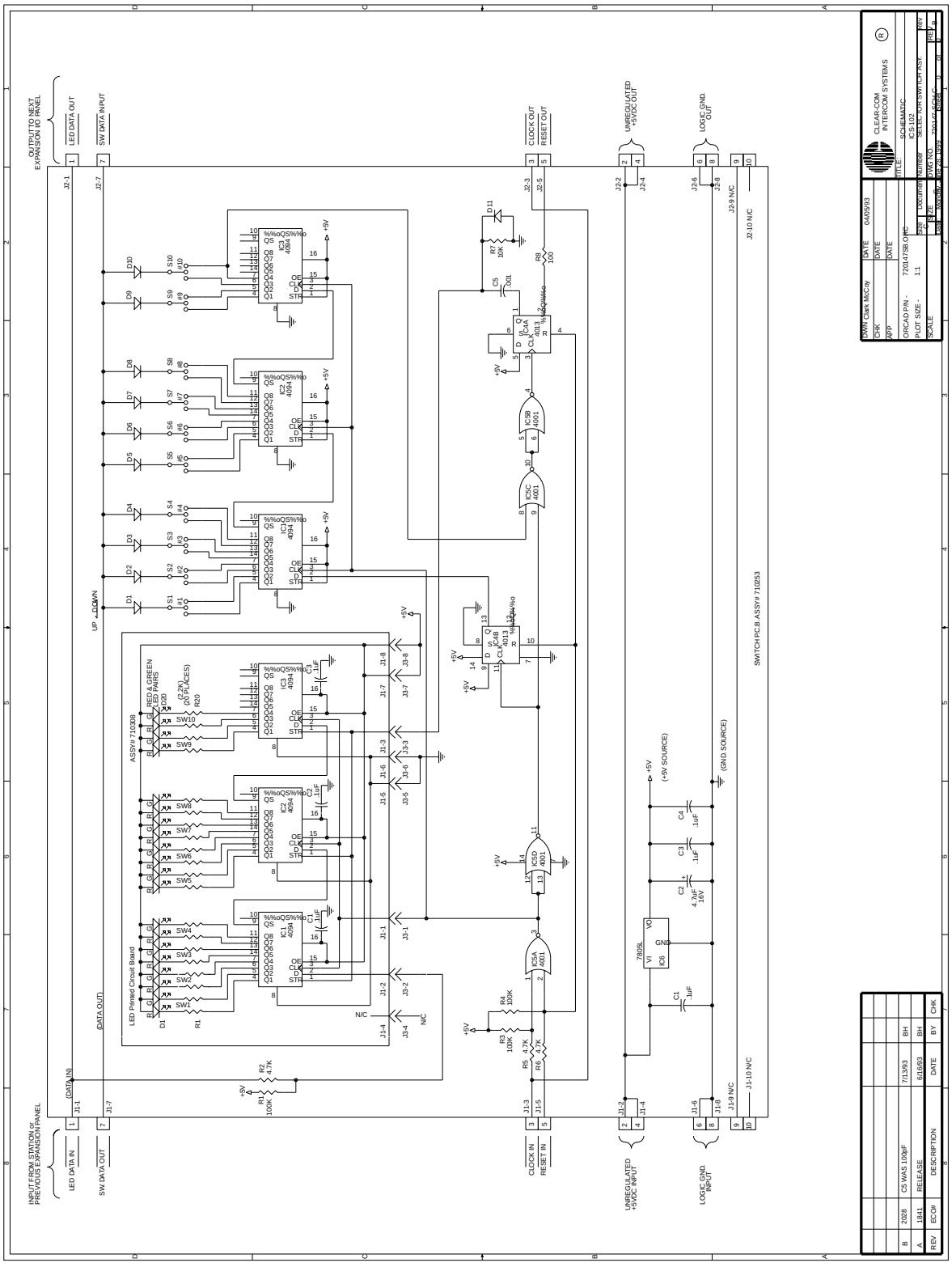

Figure 3-12: ICS-102/ICS-102T Selector Switch PCB Schemtatic Rev B

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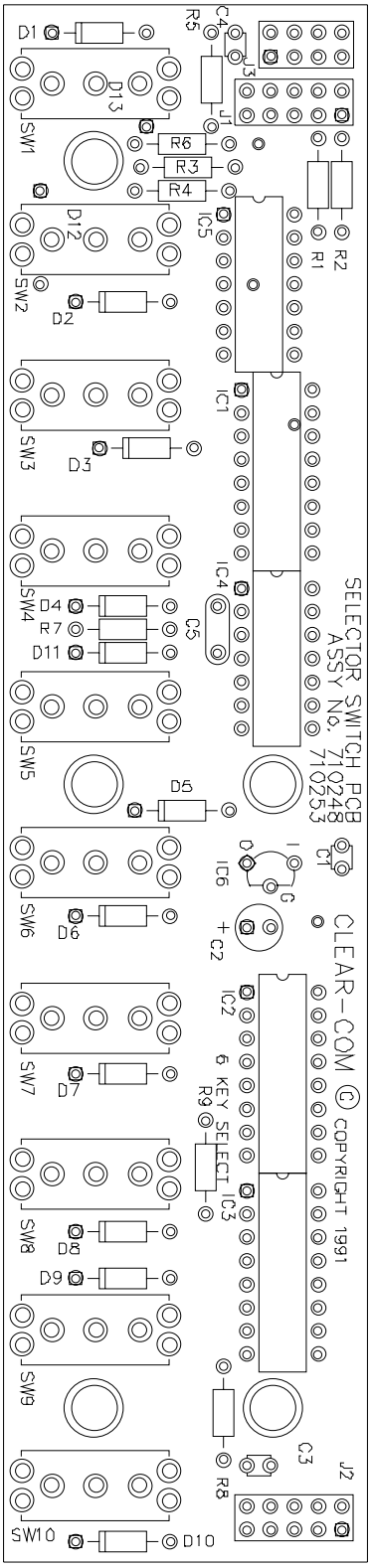

Figure 3-13: ICS-102/102T Selector Switch PCB

BILL OF MATERIALS FOR ICS-102 SELECTOR SWITCH PCB

Capacitors

Designator	Description	Qty
C5	0.001 uF Ceramic Disc 30 20%	1
C1 C3 C4	0.1 uF Monolithic 50 10%	3
C2	4.7 uF Aluminum 50	1

Resistors & Resistor Packs

Designator	Description	Qty
R8	100 OHM 1/4 Carbon Film 5%	1
R2 R5 R6	4.7K OHM 1/4 Carbon Film 5%	3
R7	10K OHM 1/4 Carbon Film 5%	1
R1 R3 R4	100K OHM 1/4 Carbon Film 5%	3

Diodes and Transistors

Designator	Description	Qty
D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11	Diode 1N4148 SIGNAL 10MA 75PIV	11

Integrated Circuits

Designator	Description	Qty
IC5	Logic Chip 4001 CMOS 4 2 IN NOR GATE	1
IC4	Logic Chip 4013 CMOS DUAL D FF	1
IC1 IC2 IC3	Logic Chip 4094B CMOS SHIFT REGISTER	3
IC6	Regulator 7805L POS 5V REG. TO-92 PKG	1

Miscellaneous

Designator	Description	Qty
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S10	SWITCH SP3T MOM-OFF-MOM PC MTG	11

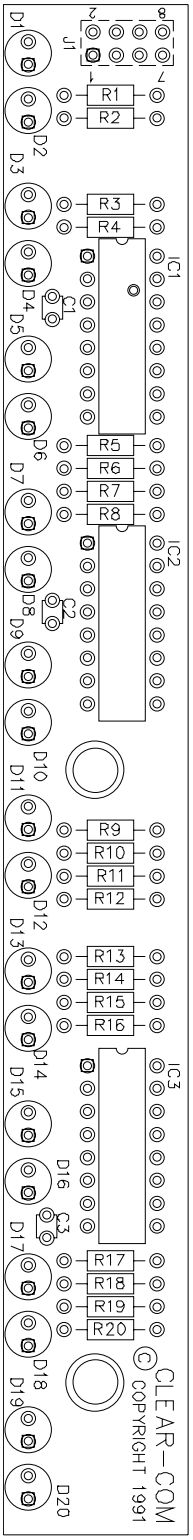

Figure 3-14: Assembly Drawing ICS-102/102T Selector Switch LED PCB

BILL OF MATERIALS FOR ICS-102/102T SELECTOR SWITCH LED PCB

Capacitors

Designator	Description	Qty
C1 C2 C3	0.1 uF Monolithic 50V 10%	3

Resistors & Resistor Packs

Designator	Description	Qty
R1-R20(20)	1K OHM 1/4 Carbon Film 5%	20

Integrated Circuits

Designator	Description	Qty
IC1 IC2 IC3	Logic Chip 4094B CMOS SHIFT REGISTER	3

Miscellaneous

Designator	Description	Qty
D2 D4 D6 D8 D10 D12 D14 D16 D18 D20	LED GREEN, ROUND, FLAT TOP LED	10
D1 D3 D5 D7 D9 D11 D13 D15 D19	LED RED, ROUND, FLAT TOP LED	9

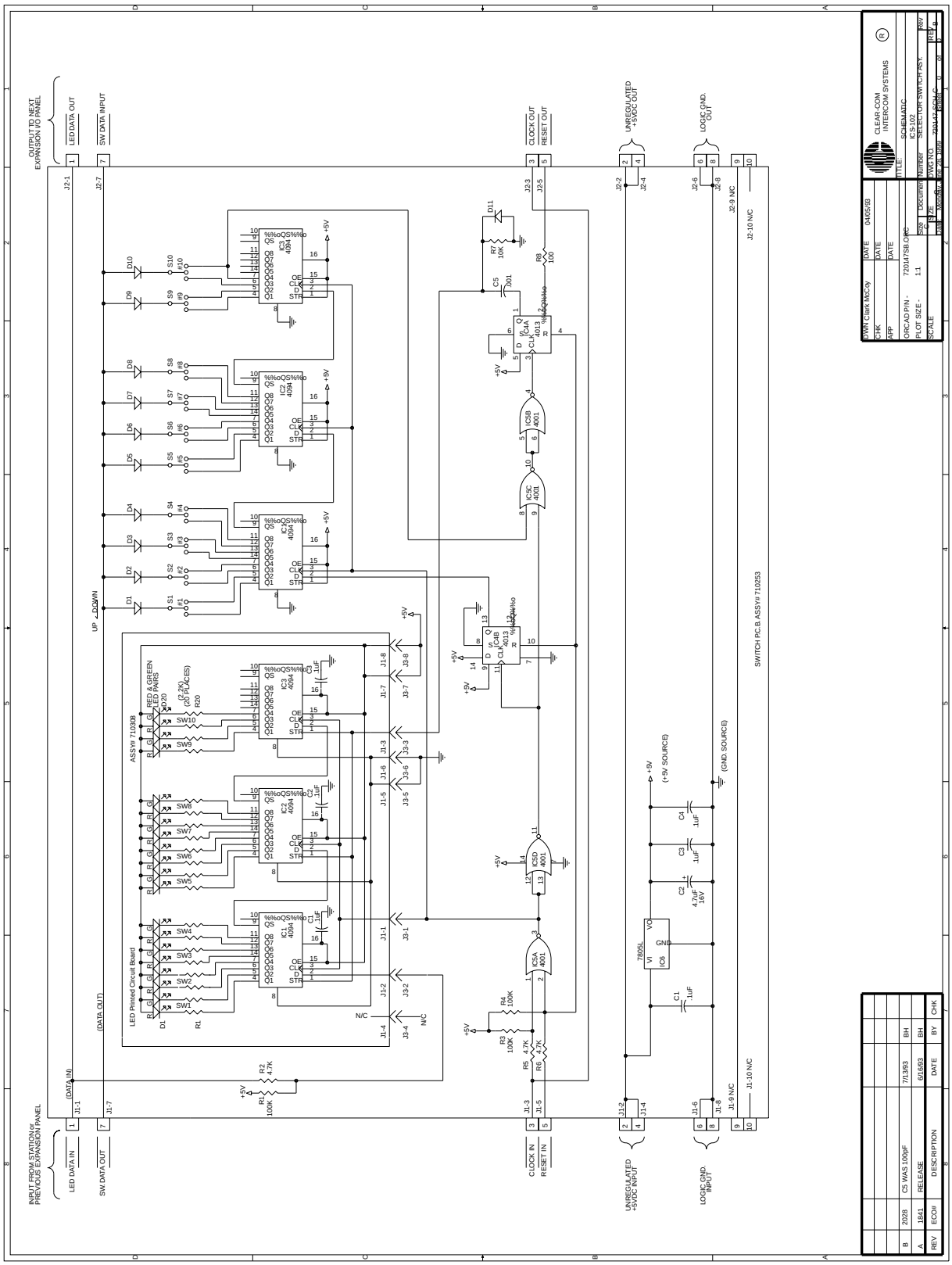

Figure 3-15: ICS-102/102T Selector Switch PCB Schematic

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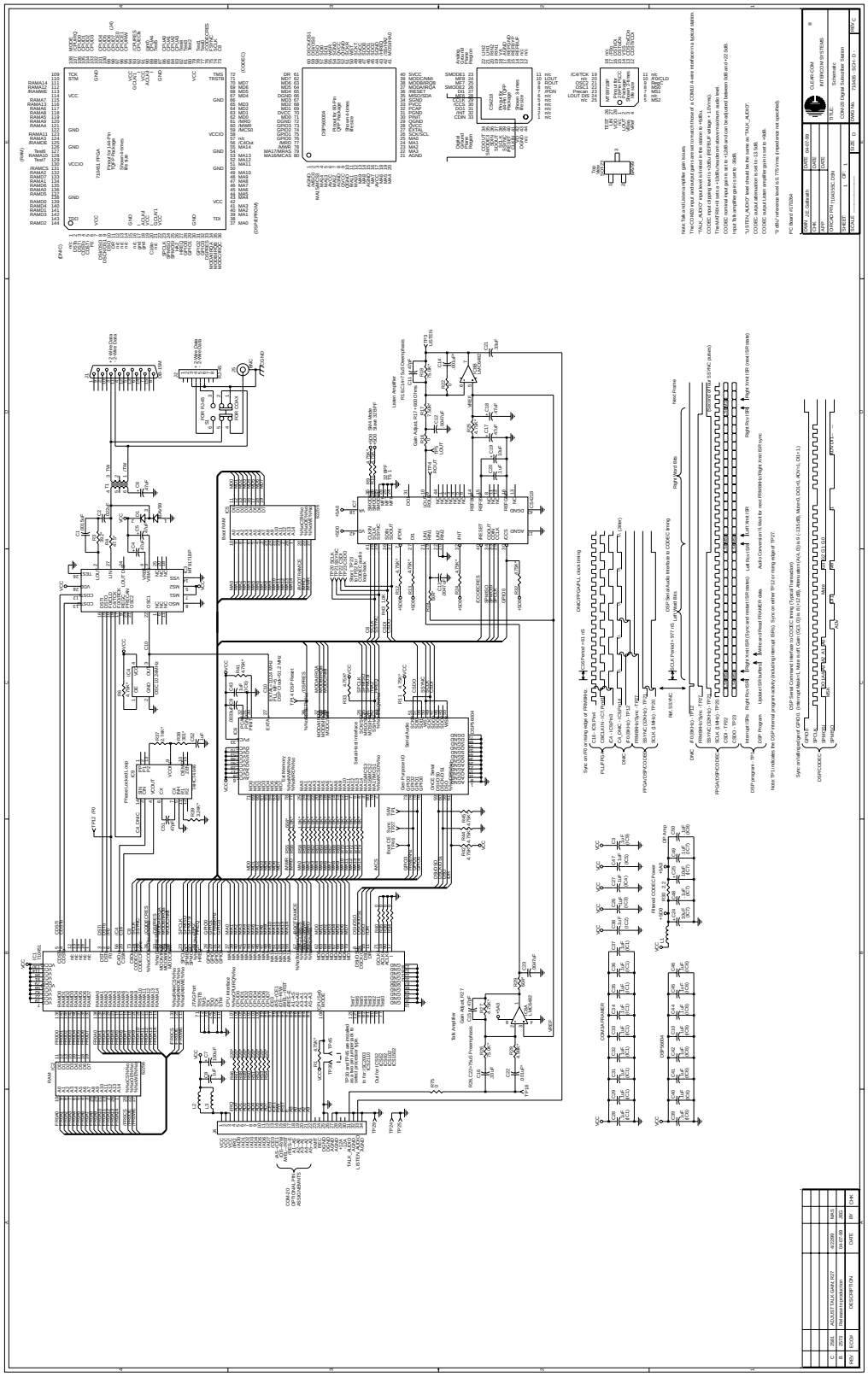

Figure 3-16: COM-20 Communications PCB Rev C

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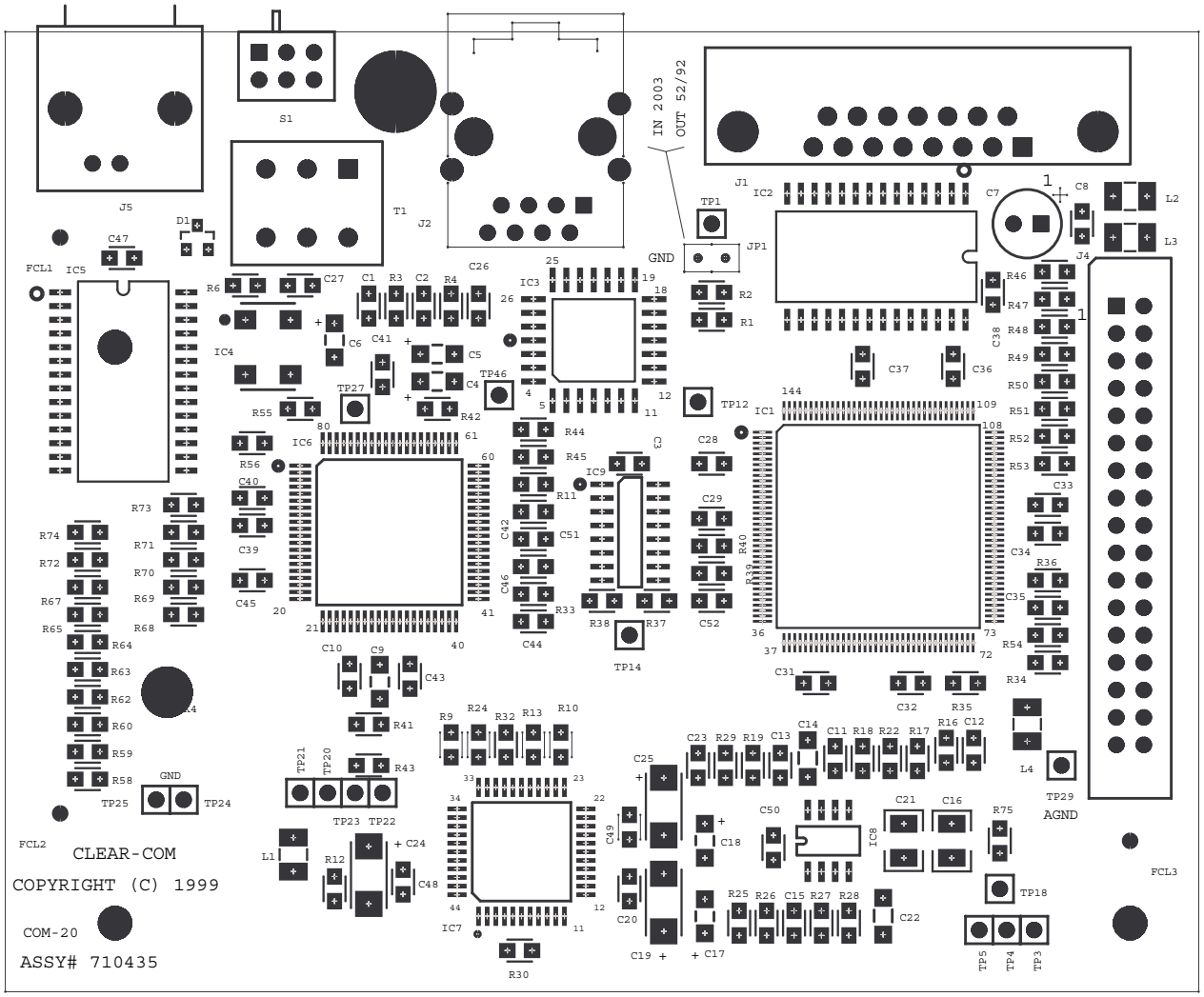

Figure 3-17: COM-20 Communications PCB Rev.A (part no. 710435)

BILL OF MATERIALS FOR COM-20 COMMUNICATION PCB (PART NO. 710435)

Capacitors

Designator	Description	Qty
C14 C22	.001 uF Ceramic Disc SMD 50V 1%	2
C9	.00 33 Ceramic Disc SMD 50V 5%	1
C11 C15 C51	47 pF Ceramic Disc SMD 50V 5%	3
C1	.0015 uF Ceramic Disc SMD 50V 5%	1
C12 C13 C23	.0047 uF Ceramic Disc SMD 50V 10%	3
C2	.022 uF Ceramic Disc SMD 50V 10%	1
C3 C8 C10 C20 C26 C27 C28 C29 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 C43 C44 C45 C46 C47 C48 C49 C50 C52	.1 uF Ceramic Disc SMD 50V 10%	29
C16 C21	.33 uF Ceramic Disc SMD 25V 10%	2
C4 C5 C6 C17 C18	.47 uF Tantalum SMD 35V 10%	5
C19 C24 C25	10 uF Tantalum SMD 25V 10%	3
C7	100 uF Aluminum 16V 20%	1

Resistors

Designator	Description	Qty
R16 R22 R34 R35 R36 R40 R75	0 OHM 1/10 SMD	7
R30	2.2 OHM 1/10 SMD 5%	1
R4	47.5 OHM 1/10 SMD 1%	1
R46 R47 R48 R49 R50 R51 R52 R53 R54	221 OHM 1/10 SMD 1%	9
R38	301 OHM 1/10 SMD 1%	1
R3	392 OHM 1/10 SMD 1%	1
R29 R19 R55	604 OHM 1/10 SMD 1%	3
R43 R56 R58 R59 R60 R62 R63R64 R65 R67 R68 R70 R71 R72 R73 R74 R69	1.00K OHM 1/10 SMD 1%	17
R37	2.74K OHM 1/10 SMD 1%	1
R39	3.24K OHM 1/10 SMD 1%	1
R1 R6 R9 R10 R11 R12 R13 R24 R25 R32	4.75K OHM 1/10 SMD 1%	10
R33 R41 R42 R44 R45 R27	4.75K OHM 1/10 SMD 1%	6
R28	4.99K OHM 1/10 SMD 1%	1
R17	7.50K OHM 1/IO SMD 1%	1
R26 R18	75.0K OHM 1/10 SMD 1%	2

Diodes and Transistors

Designator	Description	Qty
D1	Diode BAV99 DUAL DIODE... SMD	1

Integrated Circuits

Designator	Description	Qty
IC2 IC5	62256 CMOS SRAM 32K X 8	2
IC8	6482 DUAL CMOS OPAMP RAIL/RAIL	2
IC4	0.24MHZ CRYSTAL CLOCK OSCILLATOR	1
IC7	4218 16-BIT 2 CHANNEL CODEC	1
IC9	74HCT4046A CMOS PHASE LOCK LOOP...SOIC16	1
IC3	MT9171AP DIGITAL NET-WORK INT	1
IC6	56004 24-BIT DSP 40MHZ	1
IC1	IFPGA DNIC FRAMER, COM 20	1

Miscellaneous

Designator	Description	Qty
JP1	Connector JUMP JAX	1
JP1(2)	Connector HEADER MULTI PIN HEADER((PER)PIN)	2
J1	Connector 15 PIN (M) RT ANG PC MTG D TYPE CON	1
J4	Connector DUAL ROW HEADER 17 POS. .230IN	1
J2	Connector RJ-45 RT ANG MOD CON 1-PORT SHIELDED	1
J5	Connector BNC RT ANGLE PC MNT W/THREAD BUSH	1
L1 L2 L3	Inductor FERRITE EMI SUP-PRESSOR 400MA	3
S1	Switch DPDT MICRO-SUBMIN-IATURE SWITCH	1
T1	Transformer 2745B 2:1 PULSE TRANSFORMER	1

4 SPECIFICATIONS

Note: 0 dBu is referenced to 0.775 V RMS

ICS-102/62

Front-Panel Controls and Connectors

Talk/Listen Switches:	10 (ICS-9102, ICS-102T) 6 (ICS-62, ICS-62T)
Function Keys	2 toggle keys; 4 functions
Answer Back Switch	1
Volume Controls	1
Headset Connector	1 D4M XLR
Panel Mic Connector	1-1/4 inch Phone Jack

Rear-Panel Connectors

Miscellaneous	DB-15F
To Matrix	DB-15M
Audio IO (OPT-100)	DB-15F
Accessory	DB-9F
AC Power	IEC-320

Panel Microphone Input

Type:	Electret
Input Level	40 dBv
Impedance	200 Ohms

Headset Microphone Input

Type	Dynamic
Input Level	-55dBv
Gain Adjustment Range	+/- 5dB
Impedance	200 Ohms

Local Program Input

Type	Electronically Balanced
Impedance	8k Ohms Bridging
Level	0 dBv will produce full output of speaker when volume control is fully clockwise

Headphone Outputs

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

Speaker Amplifier Output

Impedance	8 Ohms
Power	4 W

Line Input (2 -pair Listen from Matrix)

Type	Transformer Balanced
Impedance	8k Ohms Bridging
Level	0 dBv nominal
Freq. Resp.	100 Hz to 15 kHz +/- 2 dB

Line Output (2-pair Talk to Matrix)

Type	Transformer Balanced
Impedance	150 Ohms (when talk active)
Level	0 dBv nominal
Freq. Resp.	100 Hz to 15 kHz, +/- 2 dB

Logic Input #1

Type	5 V logic with pull-up resistor
Logic	True = Short to Ground

Logic Input #2

Type (Option 1)	5 V logic with pull-up resistor
Logic (Option 1)	True = Short to Ground
Type (Option 2)	External Voltage Sense
Logic (Option 2)	Lo = 0 - +2 VDC, Hi = +4 - +30 VDC

Mute Relay

Contact Type	1 pair SPDT (single form C)
Contact Voltage Rating	24 VDC
Contact Current Rating	1 Amp continuous, 2 Amps peak at 24 VDC

Station Relay

Contact Type	1 pair SPDT (single form C)
Contact Voltage Rating	24 VDC
Contact Current Rating	1 Amp continuous, 2 Amps peak at 24 VDC

Power

AC Input to Station	Between 12 and 16 VAC at 750 mA Mains AC Power Input to Wall-Mount Transformer 16 W (150 mA at 115 VAC)

Temperature

Operating	Between 0 and 50 C (32 to 125 F)
Storage	Between 0 and 70 C (32 to 150 F)

Humidity

Operation and Storage	Between 20% and 90%, Non-Condensing

Package Dimensions

Height	1.75 in. (44mm), 1 RU
Width	19.0 in. (483mm)
Depth	6.75 in. (171mm)
Weight	4.27 lbs. (2.0kg)

OPT-100 AUXILIARY AUDIO I/O OPTION

Audio

Output Signal Levels	0.0 dBv nominal
Impedance	600 Ohms, transformer balanced
Frequency Response	100 Hz to 10 kHz, +/- 2 dB of mic preamp or external program input
Distortion	Less than 0.5% THD

SA Relay

Contact Type	1 pair SPDT (single form C)
Contact Voltage Rating	24 VDC
Contact Current Rating	1 Amp continuous, 2 Amps peak at 24 VDC

ACCESSORY PANELS

XPL-12

Height	1.75 in. (44 mm), (1 RU)
Width	19.0 in. (483 mm)
Depth	2.50 in. (64 mm)
Weight	1.5 lbs. (0.7 kg)
Power	14 VAC, 0.5 Amps (120 VAC 770 mA wall-mount transformer supplied with unit. 220 VAC version available on special order)

XPL-22

Height	1.75 in. (44 mm), (1 RU)
Width	19.0 in. (483 mm)
Depth	2.50 in. (64 mm)
Weight	1.8 lbs. (0.8 kg)
Power	14 V AC, 0.5 Amps (120 V AC 770 mA wall-mount transformer supplied with unit. 220 V AC version available on special order).

Notice About Specifications

While Vitec Group Communications makes every attempt to maintain the accuracy of the information contained in its product manuals, that information is subject to change without notice. Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

5 GLOSSARY

Analog Port Any of the Eclipse matrix's analog input/output RJ-45 connectors that are used to connect cable from the matrix to panels and interfaces. Each "port" connects to a separate audio channel in the matrix intercom system.

Bus A bus is the channel or path between the components in the matrix along which electrical signals flow to carry information from one component to the next. In the Eclipse matrix the bus is located in the etched surface of the midplane.

Call Signal A call signal is an electronic signal sent from one panel or interface to another. A call signal can be audible and/or visual. Typically a call signal is sent to get the attention of a panel operator who may have turned down their intercom speaker's volume or removed their headset. It can also be sent to activate an electronic relay.

Category-5 cable EIA/TIA 568 category specification relating to network cabling. Shielded category-5 cabling is required for Eclipse matrix wiring.

CellCom Digital wireless communications product. Sold under the CellCom name in USA and as FreeSpeak in Europe and Asia.

Central Matrix The term "central matrix" is used to differentiate the central hardware and software of the intercom system from the connected audio devices. The central matrix consists of:

1. The metal housing for the circuit cards and power supplies.
2. The circuit cards.
3. The power supplies.
4. The rear panel connectors which connect the matrix's hardware to panels and interfaces.

Destination A device such as an intercom panel, beltpack, or interface to which audio signals are sent. The device from which audio signals are sent is called a "source".

Duplex All real-time communication between individuals talking face to face is full duplex, meaning that they can both talk and listen simultaneously. The Eclipse Omega matrix provides full-duplex audio.

ECS Eclipse Configuration System. Software program that guides the operation of the central matrix circuit cards and connected panels.

EMS Element Management System. Software program that is used to manage the Concert server system resources.

Ethernet International standard which describes how information is transmitted across a network. Provides for the efficient organization of network components.

Fiber-optic Cable A fiber-optic cable consists of a glass core covered with a reflective material called “cladding” and several layers of buffer coating to protect the cable from the environment. A laser sends light pulses through the glass core to the other end of the cable.

FreeSpeak Digital wireless communications product. Sold under the FreeSpeak name in Europe and Asia and CellCom in USA.

Full Duplex Refers to transmission of signals in two directions simultaneously.

IFB “Interruptible Foldback”. The term “foldback” refers to sending “program” audio, or some other audio mix, back to announcers while they are on the air. Doing so allows announcers to monitor themselves, other announcers, videotapes of commercials, or some mix of sources, while they on the air. This is typically found in television news and live broadcast events.

Announcers typically wear a small ear piece so they can hear the selected foldback audio mix. When a director wants to give directions to an announcer on air, or to announce changes in the program, the director must “interrupt” the foldback. To do this, the director uses a channel specifically set up to interrupt the foldback audio.

Interface Module A piece of electronic hardware designed to convert the 4-wire signals of a central matrix port to some other form of communication, such as 2-wire party line, telephone, etc. The interface module is connected to a central matrix port. The external non-4-wire device is then connected to the interface module.

ISO The ISO function, short for “panel ISOlation”, allows a panel operator to call a destination and interrupt all of that destination’s other audio paths and establish a private conversation. When the call is completed the destination’s audio pathways are restored to their original state before the interruption.

IV-R Instant Voice Router. Software that routes digital audio data between Concert users and between Concert users and Eclipse systems.

Label A label is an alphanumeric name of up to five characters that identifies a source, destination, or control function accessed by an intercom panel. Labels appear in the displays of the intercom panel. Labels can identify panels, ports interfaced to other external equipment, fixed groups, party lines, and special control functions.

Mode A term used to describe a light path through a fiber as in multimode or single mode.

Multimode Fiber-optic Cable The glass core of a multimode fiber is larger than the core of a single mode fiber, which causes the transmitted light beam to disperse as it travels through the core. Single mode fiber, with its smaller core, concentrates the light beam so that it carries signals further. Multimode fiber was the first type of fiber offered

by manufacturers. Single-mode fiber evolved as production methods improved.

Multiplexing The process by which two or more signals are transmitted over a single communications channel. Examples include time division and wavelength division multiplexing.

Nanometer (nm) Common unit of measure for wavelength. One billionth of a meter.

Non-volatile Memory Data stored in the CPU's firmware (ROM) that is not lost when the power is turned off.

Optical Signal A laser at one end of a fiber-optic cable pulses on or off to send a light signal through the glass core of the cable to the other end of the cable. Because the light signals are binary (on or off), the signal is digital.

Panel Also referred to as "station" in some cases (usually older manuals). Any intelligent intercom device connected to the rear-panel analog ports of the central matrix. This term does not refer to devices connected through interface modules.

Port Any of the input/output connections (RJ-45 connectors) on the back panel of the central matrix. These connectors and the attached cables connect the central matrix to remote intercom devices. The term "port" emphasizes that the connection is a "portal" between the central matrix and the remote intercom devices.

Program Any separate audio source that is fed into the intercom channels. In television applications, for example, "program" audio is the audio that is broadcast on air.

Rack Unit or RU Standardized unit of mounting space on a rack panel. Each rack unit is 1.75 inches (44.45 mm) of vertical mounting space. Therefore 1 RU is 1.75 inches (44.45 mm) of vertical mounting space, 2 RU is 3.5 inches (88.9 mm), 3 RU is 5.25 inches (133.35 mm), and so on.

Remote Panel Any intelligent intercom device connected to the back-panel ports of the central matrix. This term does not refer to devices connected through interfaces.

Sidetone The sound of the panel operator's own voice heard in their own earphone as they speak.

Single-mode Fiber-optic Cable The glass core of a single-mode fiber is smaller in diameter than the core of a multimode fiber, so that the light signal transmitted over the core is more concentrated than with multimode fiber, which allows the signal to travel further. Single-mode fiber evolved from multimode fiber as production methods improved.

Source In this manual, the term "source" refers to a device—such as an intercom panel, interface, or beltpack —that sends audio into the matrix. The device to which audio is sent is called a "destination".

VOX In the Eclipse system, when audio at a panel exceeds a threshold, a light switches on at the panel's port card to visually cue the operator. The threshold level is set in the Eclipse Configuration Software.

V-Series Communications panels used with Eclipse systems providing advanced facilities. Available in rack mount and desktop formats.

Wavelength-division Multiplexing (WDM) A method of multiplexing optical signals developed for use on fiber-optic cable. Each signal is assigned a particular wavelength on the light spectrum and therefore many signals can be transmitted simultaneously without interfering with each other.

ECLIPSE MANUALS

The following manuals are available covering Eclipse products and accessories.

SOFTWARE MANUALS

Eclipse Configuration System (ECS) Instruction Manual - 810299Z

Eclipse Logic Maestro Instruction Manual - 810414Z

Eclipse Production Maestro Quick Start Guide - 810409Z

Eclipse Production Maestro Installation and User Guide - 810410Z

Eclipse DECTSync Manual - 810412Z

Eclipse Host Computer Interface (HCI) Manual - 810413Z

HARDWARE MANUALS

Eclipse Omega Matrix Instruction Manual - 810290Z

Eclipse Median Matrix Instruction Manual - 810347Z

Eclipse PiCo Matrix Instruction Manual - 810348Z

Eclipse-32 Matrix Instruction Manual - 810315Z

Eclipse Matrix Installation Manual - 810298Z

Eclipse Upgrade Reference Manual - 810377Z

Eclipse V-Series Panels User Manual - 810365Z

Eclipse FOR-22 4-Wire Interface Instruction Manual - 810306Z

Eclipse CCI-22 Party Line Interface Instruction Manual - 810307Z

Eclipse TEL-14 Telephone Interface Instruction Manual - 810308Z

Eclipse GPI-6 General Purpose Inputs Instruction Manual - 810309Z

Eclipse RLY-6 General Purpose Outputs Instruction Manual - 810310Z

DIG-2 Digital Interface Instruction Manual - 810311Z

IMF-3, IMF-102, DIF-102 Interface Module Frame Instruction Manual - 810313Z

Eclipse AES-6 Digital Interface Instruction Manual - 810383Z

Eclipse BAL-8 Isolation Interface Instruction Manual - 810403Z

Eclipse V-Series AES-3 Option Card Installation Instructions - 810388Z

Eclipse V-Series XLR-7M Upgrade Instructions - 810405Z

Eclipse V-Series T-Adapter Installation Instructions - 810406Z

Eclipse FIM-202D Fiber Interface Instruction Manual - 810385Z

Eclipse FIM-102 Fiber Interface Instruction Manual - 810319Z

Eclipse FIM-108 Fiber Interface Instruction Manual - 810291Z

Eclipse 4000 Series II Panels Installation Guide - STA0530Z

Eclipse 4000 Series II Panels User Guide - STA0531Z

Eclipse ICS 1008E/1016E Panels Instruction Manual - 810404Z

Eclipse ICS 102/62 Panels Instruction Manual - 810302Z

Eclipse ICS 2003 Panel Instruction Manual 810303Z

Eclipse ICS 92/52 Panels Instruction Manual - 810301Z

Eclipse i-Station Instruction Manual - 810305Z

Eclipse ICS-21 Speaker Panel Instruction Manual - 810263Z

Eclipse ICS-22 Speaker Panel Instruction Manual - 810264Z

Eclipse ICS-24 Headset Panel Instruction Manual - 810265Z

Eclipse Digital Wireless Beltpack Instruction Manual - 810376Z

LIMITED WARRANTY

This document details the Clear-Com Standard Limited Warranty for all new products for sale within all regions with the exception of Military, Aerospace, and Government (MAG).

EXCEPT AS SET FORTH HEREIN ("LIMITED WARRANTY"), CLEAR-COM MAKES NO OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, NONINFRINGEMENT OF THIRD PARTY RIGHTS, OR FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH ARE EXPRESSLY DISCLAIMED.

1. **Standard Limited Warranty.** Clear-Com Communication Systems ("Clear-Com") warrants its products, including supplied accessories, against defects in material or workmanship for the time periods as set forth below provided it was purchased from an authorized Clear-Com dealer or distributor.

   a) Pursuant to this Limited Warranty, Clear-Com will, at its option:

      i) repair the product using new or refurbished parts, or;

      ii) replace the product with a new or refurbished product.

   b) Remedies: In the event of a defect, the rights detailed in 1 (a) are your exclusive remedies. For purposes of this Limited Warranty, "refurbished" means a product or part that has been returned to its original specifications.

   c) Standard Warranty Period (by Product):

      i) All Clear-Com brand systems and products, including belt packs, have a Limited Warranty of two years, with the exception of;

         (1) Cables, accessories, components & consumable items have a Limited Warranty of 90 days.

         (2) Any Clear-Com product that has been classified as obsolete at the time of sale has a Limited Warranty of 90 days from sales and will be replaced with the same product or a sales credit will be issued, at the sole discretion of Clear-Com.

         (3) Headsets, handsets, microphones, and associated spare parts, as well as UHF wireless IFB products, have a Limited Warranty of one year.

         (4) UHF WBS Analog wireless intercom systems have a Limited Warranty of three years.

(5) All software products, including Concert (Client and Server), ECS, Production Maestro and Logic Maestro are warranted for one year and shall substantially conform to published specifications. The media on which the Software is furnished is warranted to be free of defects in material and workmanship (under normal use) for a period of one year.

(6) Any Clear-Com products that are listed within the last time buy period have the same Limited Warranty for their type 1.i 1 - 1.i.5 as above.

d) Any Clear-Com product that is repaired or supplied as a replacement under the terms of this Limited Warranty shall inherit the remaining warranty period from the original product.

e) Standard Warranty Period Start Date

i) Dealer / Distributor Sales: In view of Dealer or Distributor stocking practices, the Standard Warranty Period for products sold through Dealers or Distributors will commence from the Clear-Com invoice date and will include an automatic extension of three months. Any valid warranty claim within the Standard Warranty Period as determined by the Clear-Com invoice date will be covered without further supporting evidence. All warranty claims after this date must be supported by the Customer's proof of purchase that demonstrates the product is still within the Standard Warranty Period (as detailed in Section 1.c.i above, plus the automatic three month extension) from their purchase date.

ii) Direct Sales: The Standard Warranty Period will commence from the date the product was shipped from Clear-Com to the Customer. The Standard Warranty Period start date for contracts that include commissioning will be the date of the Site Acceptance Test (SAT) or one month from conclusion of the commissioning project, whichever is earlier.

f) Invalidation of Warranty

i) This Limited Warranty shall be invalidated if the product's outer case has been opened and internal modifications have been made or damage has occurred, or upon the occurrence of other damage or failure not attributable to normal wear and tear. Authorized modifications with Clear-Com's express written permission will not invalidate the warranty.

g) Software Updates

i) Software Updates are released periodically to correct discovered program bugs. During the Warranty Period, software updates are available to Customers free of charge.

h) Software Upgrades

i) Software Upgrades include new Features and/or Functional Enhancements and are not included as part of the Standard Warranty but may be purchased at the published rates.

ii) Note: In the absence of a Software Update containing a program correction and no available workaround to mitigate the problem, at the discretion of Service, Sales, Engineering, or Product Management, the Customer may be provided a Software Upgrade under warranty.

2. **Exclusions.** Services do not cover damage or failure caused by any occurrence beyond Clear-Com's reasonable control, including without limitation acts of God, fire, flooding, earthquake, lightning, failure of electric power or air conditioning, neglect, misuse, improper operation, war, government regulations, supply shortages, riots, sabotage, terrorism, unauthorized modifications or repair, strikes, labor disputes or any product failure that Clear-Com determines is not a result of failure in the Services provided by Clear-Com. Further Services excluded from this Agreement include: services required due to errors or omissions in Customer purchase orders; installation or maintenance of wiring, circuits, electrical conduits or devices external to the products; replacement or reconditioning of products which, in Clear-Com's opinion cannot be reliably maintained or properly serviced due to excessive wear or deterioration; Customer's failure to maintain the installation site in accordance with the environmental specifications of the products; or service on products removed from the location originally specified by Customer and/or reinstalled without the prior written approval of Clear-Com. Customer will pay Clear-Com's then current published charges to restore such Covered Products to a condition eligible for further service under this Agreement. Clear-Com shall be excused from and shall not be liable for any failure or delay in performance under this Agreement due to the foregoing or any causes beyond its reasonable control.

3. **Limitation of Liability. IN NO EVENT WILL CLEAR-COM BE LIABLE UNDER THIS AGREEMENT FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING WITHOUT LIMITATION LOST PROFITS), REGARDLESS OF THE FORM OF ACTION, EVEN IF ADVISED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES.**

4. **Assignment.** Neither party may assign this Agreement or any portion thereof without the prior written consent of the other, except in the event of a merger, sale of all or substantially all of the assets or other corporate reorganization.

5. **Ownership of replaced parts or product.** All replaced parts or products become the property of Clear-Com.

6. **Entire Agreement.** This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof, and supersedes all prior or contemporaneous proposals, oral or written, and all other communications between them relating to the subject matter of this Agreement.

TECHNICAL SUPPORT & REPAIR POLICY

NOVEMBER 1, 2008

In order to ensure that your experience with Clear-Com and our World Class products is as beneficial, effective and efficient as possible, we would like to define the policies and share some "best practices" that can accelerate any problem solving processes which we may find necessary and to enhance your customer service experience. Our Technical Support, Return Material Authorization, and Repair Policies are set forth below. These Policies are subject to revision and constantly evolve in order to address our Customers' and the Market's needs. Accordingly these are provided by way of guidance and for information only and may be changed at anytime with or without Notice.

TECHNICAL SUPPORT POLICY

a) Telephone, online, and e-mail technical support will be provided by the Customer Service Center free of charge during the Warranty Period.

b) Technical support will be provided free of charge for all software products under the following conditions:

i) The application, operating, and embedded software is installed on a product covered by Clear-Com's Limited Warranty, and:

(1) The software is at the current release level; or,

(2) The software is one (1) version removed from current.

ii) Older versions of software will receive "best-effort" support, but will not be updated to correct reported bugs or add requested functionality.

c) For Technical Support:

i) North and South America, (inc. Canada, Mexico, and the Caribbean) & US Military:

Hours:	0800 - 1700 Pacific Time
Days:	Monday - Friday
Tel:	+1 510 337 6600
Email:	CustomerServicesUS@vitecgroup.com

ii) Europe, the Middle East and Africa:

Hours:	0800 - midnight Central European Time

Days: Monday - Friday
Tel: +49 40 853 999 700
Email: TechnicalSupportEMEA@vitecgroup.com

iii) Asia-Pacific:
Hours: 0800 - 1700 Pacific Time
Days: Monday - Friday
Tel: +1 510 337 6600
Email: CustomerServicesAPAC@vitecgroup.com

d) Email Technical Support is available for all Clear-Com branded products free of charge for the life of the product, or two years after a product has been classified as obsolete, whichever comes first.

e) Support for Distributor and Dealer Sales

i) Distributors and Dealers may utilize the Customer Service Centers once a system has been installed and commissioned. Clear-Com Systems and Applications Engineers will provide support to the Distributor from the pre-sales stage through to satisfactory installation for new system purchases. Customers will be encouraged to contact their Dealer or Distributor with their installation and technical support enquires rather than using the Customer Service Centers directly.

f) Support for Direct Sales

i) Customers may utilize the Customer Service Centers once a system has been installed and commissioned by Clear-Com Systems and Applications Engineers, or in the case of project installations, once the Project Team has completed the hand-over to the Support Centers.

RETURN MATERIAL AUTHORIZATION POLICY

a) Authorizations: All products returned to Clear-Com or a Clear-Com Authorized Service Partner must be identified by a Return Material Authorization (RMA) number.

b) The Customer will be provided with an RMA number upon contacting Clear-Com Sales Support as instructed below.

c) The RMA number must be obtained from Clear-Com via phone or email prior to returning product to the Service Center. Product received by the Service Center without a proper RMA number is subject to return to the Customer at the Customer's expense.

d) Damaged equipment will be repaired at the Customer's expense.

e) Returns are subject to a 15% restocking fee.

f) Advance Warranty Replacements (AWRs);

i) *During the first 30 days of the Standard Warranty Period:* Once the equipment fault has been verified by Clear-Com or its authorized representative, Clear-Com will ship a new replacement product. The Customer will be provided with an RMA number and be required to return the faulty equipment within 14 days of receipt of the replacement or will be invoiced for the list price of a new product.

ii) *During days 31-90 of the Standard Warranty Period:* Once the equipment fault has been verified by Clear-Com or its authorized representative, Clear-Com will ship a like-new, fully refurbished replacement product. The Customer will be provided with an RMA number and be required to return the faulty equipment within 14 days of receipt of the replacement or will be invoiced for the list price of a new product.

iii) To obtain an RMA number or request an AWR:

(1) North and South America, Asia-Pacific, and US Military:

Hours:	0800 - 1700 Pacific Time
Days:	Monday - Friday
Tel:	+1 510 337 6600
Email:	SalesSupportUS@vitecgroup.com

(2) Europe, the Middle East and Africa:

Hours:	0800 - 1700 GMT + 1
Days:	Monday - Friday
Tel:	+ 44 1223 815000
Email:	SalesSupportEMEA@vitecgroup.com

iv) Note: AWRs are not available for UHF WBS Analog wireless intercom systems. UHF WBS Analog wireless intercom systems out-of-box failures must be returned to Alameda for repair.

v) Note: Out-of-box failures returned after 90 days will be repaired and not replaced unless approved by Clear-Com Management.

vi) Note: AWRs are not available after 90 days of receipt of product unless an AWR Warranty Extension is purchased at the time of product purchase.

vii) Note: Shipping charges, including duties, taxes, and insurance (optional), to Clear-Com's factory is the responsibility of the Customer. Shipping AWRs from Clear-Com is at Clear-Com's expense (normal ground or international economy delivery). Requests for expedited shipping (E.g. "Next-Day Air") and insurance are the responsibility of the Customer.

REPAIR POLICY

a) Repair Authorizations: All products sent to Clear-Com or a Clear-Com Authorized Service Partner for repair must be identified by a Repair Authorization (RA) number (see above).

b) The Customer will be provided with an RA number upon contacting Clear-Com Customer Services as instructed below.

c) The RA number must be obtained from Clear-Com via phone or email prior to returning product to the Service Center. Product received by the Service Center without a proper RA number is subject to return to the Customer at the Customer's expense.

d) Return for Repair

i) Customers are required to ship equipment at their own cost (including transportation, packing, transit, insurance, taxes and duties) to Clear-Com's designated location for repair.

(1) Clear-Com will pay for the equipment to be returned to the Customer when it is repaired under warranty.

(2) Shipping from Clear-Com is normal ground delivery or international economy. Requests for expedited shipping (E.g. "Next-Day Air") and insurance are the responsibility of the Customer.

ii) **Clear-Com does not provide temporary replacement equipment ("loaner") during the period the product is at the factory for repair.** Customers should consider a potential prolonged outage during the repair cycle, and if required for continuous operations purchase minimum spare equipment required or purchase an AWR Warranty Extension.

iii) No individual parts or subassemblies will be provided under warranty, and warranty repairs will be completed only by Clear-Com or its Authorized Service Partners.

iv) Customers requesting a non-warranty repair will be provided an estimate of the total repair cost prior to the return of the equipment. In the event that Clear-Com is unable to estimate

the cost of repair, the Customer may elect to return the product to the factory for an estimate. The Customer is responsible for shipping costs both to and from the factory in the event they choose not to accept the estimate.

v) The Customer must provide either a purchase order for the repair work, or will be required to make an advance payment (as a debit against the Dealer's line of credit, or credit card) prior to the repaired product being returned to the Customer.

vi) For requesting a Repair Authorization number:

(1) North and South America, Asia-Pacific, and US Military:

Hours:	0800 - 1700 Pacific Time
Days:	Monday - Friday
Tel:	+1 510 337 6600
Email:	CustomerServicesUS@vitecgroup.com

(2) Europe, the Middle East and Africa:

Hours:	0800 - midnight Central European Time
Days:	Monday - Friday
Tel:	+49 40 853 999 700
Email:	TechnicalSupportEMEA@vitecgroup.com

vii) Note: Clear-Com's Limited Warranty does not cover normal wear and tear. The Customer will be charged the full cost of the repair if their equipment has been tampered with by non-approved personnel, or has been subject to damage through electrical failure, liquid damage or mishandling. The Customer Service Center will provide the Customer with a cost estimate for any such repairs prior to undertaking the work.