ICS-102/62 INTERCOM STATIONS

INSTRUCTION MANUAL

ICS-102/62 Intercom Stations Instruction Manual

Part Number 810302 Rev. A

Vitec Group Communications, Inc.
4065 Hollis Street
Emeryville, CA 94608-3505
U.S.A

CONTENTS

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.

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

OPERATION

INTRODUCTION

This booklet describes how to use the ICS-102 and ICS-62 intercom stations and their digital equivalents, the ICS-102T and ICS-62T intercom stations. Station 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 stations and the ICS-102T and ICS-62T digital stations.

The ICS-102/102T and ICS-62/62T intercom stations 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 station 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 station functions

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

When data communication is restored, the station 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 station 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 station. 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 station. The amount of muting (measured in dB) is set by the configuration program for each station. 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 station 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 station from latching in the talk position (local latch disable), or to prevent any station from latching a talk to the station (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 station begins monitoring a station, a beep (the monitoring-alert tone) will sound at the station.

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

CALL-WAITING INDICATOR

If a station calls another station 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 station calls a station 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 station 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.

STATION CONNECTED TALLY INDICATOR

This tally is used when a station 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 station will flash once per second when the station 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 stations or interfaces not assigned to a station'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 stations and interfaces that are not assigned to your station.

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

- The calling station'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 stations or interfaces assigned to station 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 station will automatically switch to headset microphone operation. If the headset is unplugged, the station 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 station. 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 station 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 station'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 station 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 station 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 station. 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 station's microphone on and off.
- Mute Mic Output To Frame—turns off the audio from the station to the frame. It does not turn off the Hot Mic output
- Mic Off —momentarily turns off the station's microphone.
- Answer Back Talk/Clear—functions the same as the station'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 station's selected microphone (panel or headset) to the station'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 station has the OPT-100 Auxiliary Audio I/O Option installed.
- Speaker OFF—turns off the station speaker, disabling all audible output from the station.
- PTT: Activate All Talk Keys—implements a push-to-talk function for all talk selectors. When the logic input is active, the station 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 station's first (leftmost) talk selector; a momentary and latching activation.
- Activate Talk Switch #2—equivalent to pressing the station'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 station.
- 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 station 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 station includes a relay controlled by the system program and independent of the local station 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 station in the system, including a direct-inward-access caller.

Mute Relay

The mute relay is activated whenever any talk selector is activated at the station. 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 station 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 station'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 station'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 station'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 stations, including:

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

MOUNTING STATIONS

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

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

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

WIRING

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

Eclipse uses either a twisted, 4-pair transmission, a single-pair twisted, or a coax scheme between the station 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 stations and frames.

Most stations have a DB-15M and an RJ-45 connector to connect them to the frame. Stations 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 station.

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 station.

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

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

ANALOG MATRIX FRAME TO STATION WIRING

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

Although some Matrix Stations have a DB-15M (male) connector for connection to the Matrix frame, most have a built-in RJ-45 connector. For those stations 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, stations 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 station.
- Pair 2 transmits RS-422 data from the station back to the matrix card port.
- Pair 3 transmits analog audio from the station to the matrix card port.
- Pair 4 transmits RS-422 data from the matrix port back to the station.

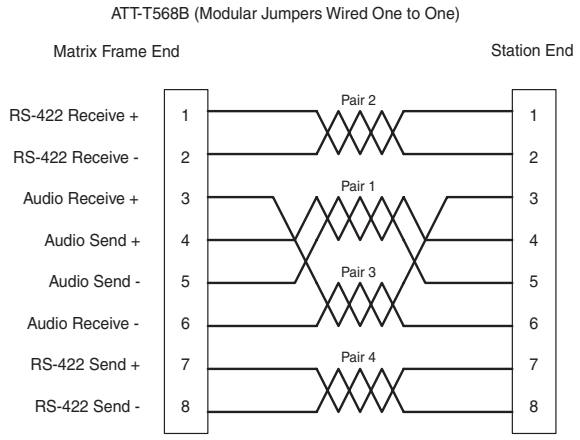


Figure 2: Matrix Frame to Station Wiring

DIGITAL MATRIX FRAME TO STATION WIRING

The ICS-102T and ICS-62T stations differ from the ICS-102 and ICS-62 stations 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 stations to the matrix.

The DIG-2 digital interface module offers two options for wiring the frame to intercom stations. 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 station 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 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 station.

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

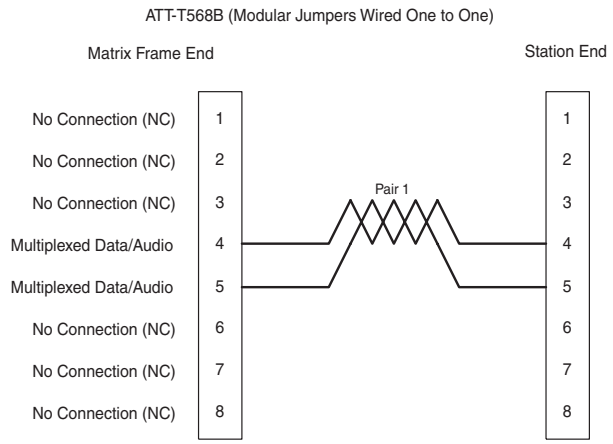


Figure 3: Matrix Frame to Digital Station Wiring Using RJ-45

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 station.

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

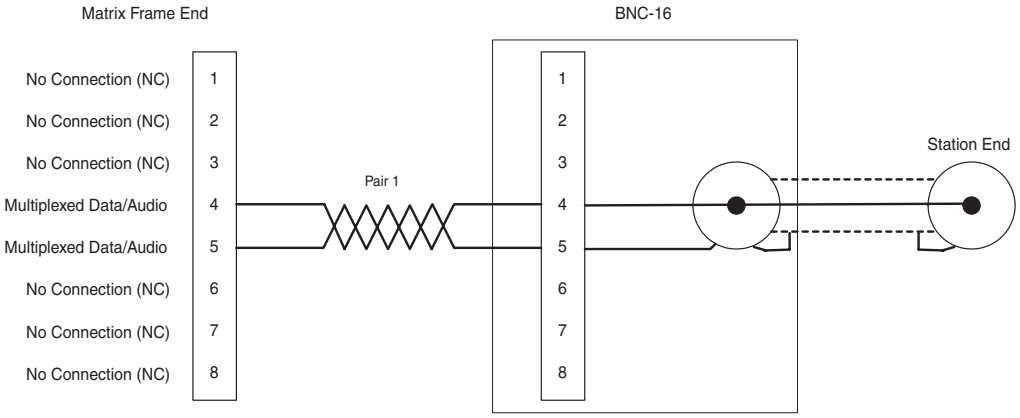


Figure 4: Matrix Frame to Digital Station Wiring Using BNC-16 and Coax

MATRIX STATION MISCELLANEOUS CONNECTOR WIRING

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

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

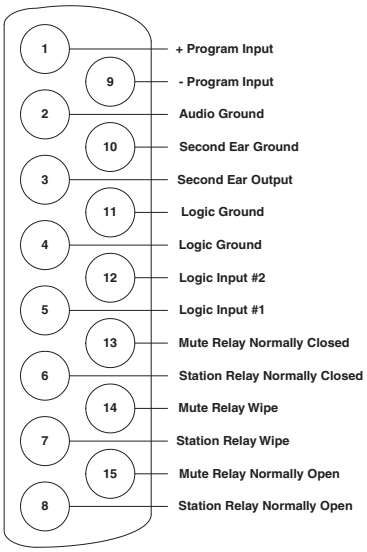


Figure 5: Miscellaneous Connector Pinout

External Program Feed Input

The external program feed input allows the station 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 station's "Program" volume control before being mixed with the audio at the station. The program

feed (program audio) can be heard on the station's speaker and headset; it cannot be heard by other stations in the Matrix system.

To connect an external program feed to the station:

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 station's microphone on and off.
- Mute Mic Output To Frame—turns off the audio from the station 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 station's microphone.
- Answer Back Talk/Clear—the same functions as the station'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 station's selected microphone (panel or headset) to the station'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 station 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 station speaker, disabling all audible output from the station.
- PTT: Activate All Talk Keys (Push To Talk)—when enabled from the configuration program and the logic input is active, the station behaves normally. When this function (logic level) is deactivated, it disables activation of all talk labels, implementing a push-to-talk function for the station. 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 station's first (leftmost) talk selector; a momentary and latching activation.
- Activate Talk Switch #2—equivalent to pressing the station'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 station 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 station. 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 8.

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 station includes a relay controlled by the system program and independent of the local station 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 station in the system, including a direct-inward-access caller. Figure 8 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 9 shows the pinout for the intercom station's DB-15F Auxiliary Audio I/O connector. Following are descriptions and wiring information for the OPT-100 Auxiliary Audio I/O option.

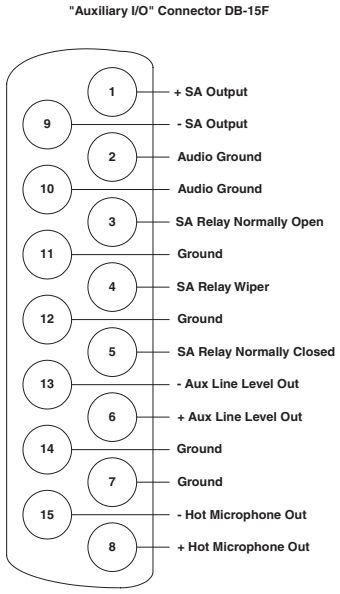


Figure 6: Auxiliary I/O Connector

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 station 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 9).

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 station'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 9).

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 9). 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

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 station'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 9).

MAINS AC POWER

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

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 station.

To connect the transformer, route the cord from the transformer's secondary to the station'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 station 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 station parameters are adjustable either internally on the station'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)
- Station-to-matrix card baud rate (configuration program)

All these parameters are set to factory defaults. Most stations 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 station cover.
2. Find the sidetone control (marked "P2 Sidetone") on the main PCB. See Figure 10.
3. Connect a headset to the station.
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 station cover.

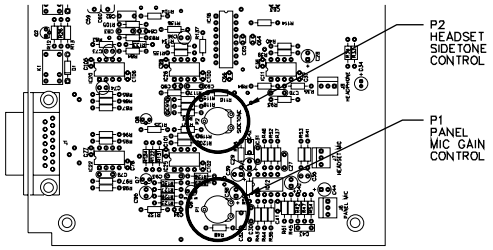


Figure 7: Sidetone and Panel Microphone Gain Adjustment Controls

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

SPEAKER MUTE

When a panel microphone and a speaker are used together, feedback is possible. To reduce this possibility, the station 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 station(s) is predetermined. This function allows talking to someone even if his station’s volume control is off. Two things will happen when a station activates such a label:

- If the destination speaker was off, it will turn on.
- The station’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.

STATION-TO-MATRIX CARD BAUD RATE

The RS-422 serial data communication between a station 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 station automatically adapts.

3 MAINTENANCE

INTRODUCTION

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

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

STATION RESET

The station'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 station 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 station 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 station's LEDs and push-button lights fail to light.**

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

- **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 station.
3. Replace the station.

- **The station appears to activate talk paths, but other stations can't hear the station 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 station audio has not been muted externally through the logic inputs.
3. Make sure the station has not been defined as a nearby station.
4. Activate the Matrix Loopback mode from the station's Maintenance menu to check the audio paths to the matrix.
5. Enable eavesdropping on the station.
6. Test the integrity of the station's audio path by temporarily setting a forced listen to it.
7. Reset the station.
8. Replace the station.

- **The station 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 station to the matrix is plugged in at both ends.
3. Check the integrity of the data paths, especially the polarity for stations using a COM-10 communication module.
4. Check the configuration program to ensure the station has been assigned the correct port type.
5. Confirm the port card or interface type matches the station. Stations with COM-10 communication modules should have MTX-A16 cards. Stations with COM-20 communication modules connect to DIG-2 interfaces.
6. Reset the station's port card in the matrix frame.
7. Replace the station's port card in the matrix frame.
8. Reset the station.
9. Replace the station.

- **No audio from the station's speaker.**

1. Ensure the Intercom knob on the station'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 station's programming feature to test the integrity of the station's audio path by temporarily setting a forced listen to it.
5. Reset the station's port card in the Matrix frame.
6. Replace the station's port card in the Matrix frame.
7. Reset the station.
8. Replace the station.

- **The operator cannot hear another station's page or call signal tones.**

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

- **Announce tones (eavesdropping indication, change tones, etc.) aren't heard at the station.**

1. Adjust the station's "Page Volume" control in the configuration program (refer to the *Eclipse Configuration System Manual*).
2. Check the station'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 station'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 (BILLS OF MATERIALS, COMPONENT DRAWINGS, SCHEMATICS)

MISCELLANEOUS 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

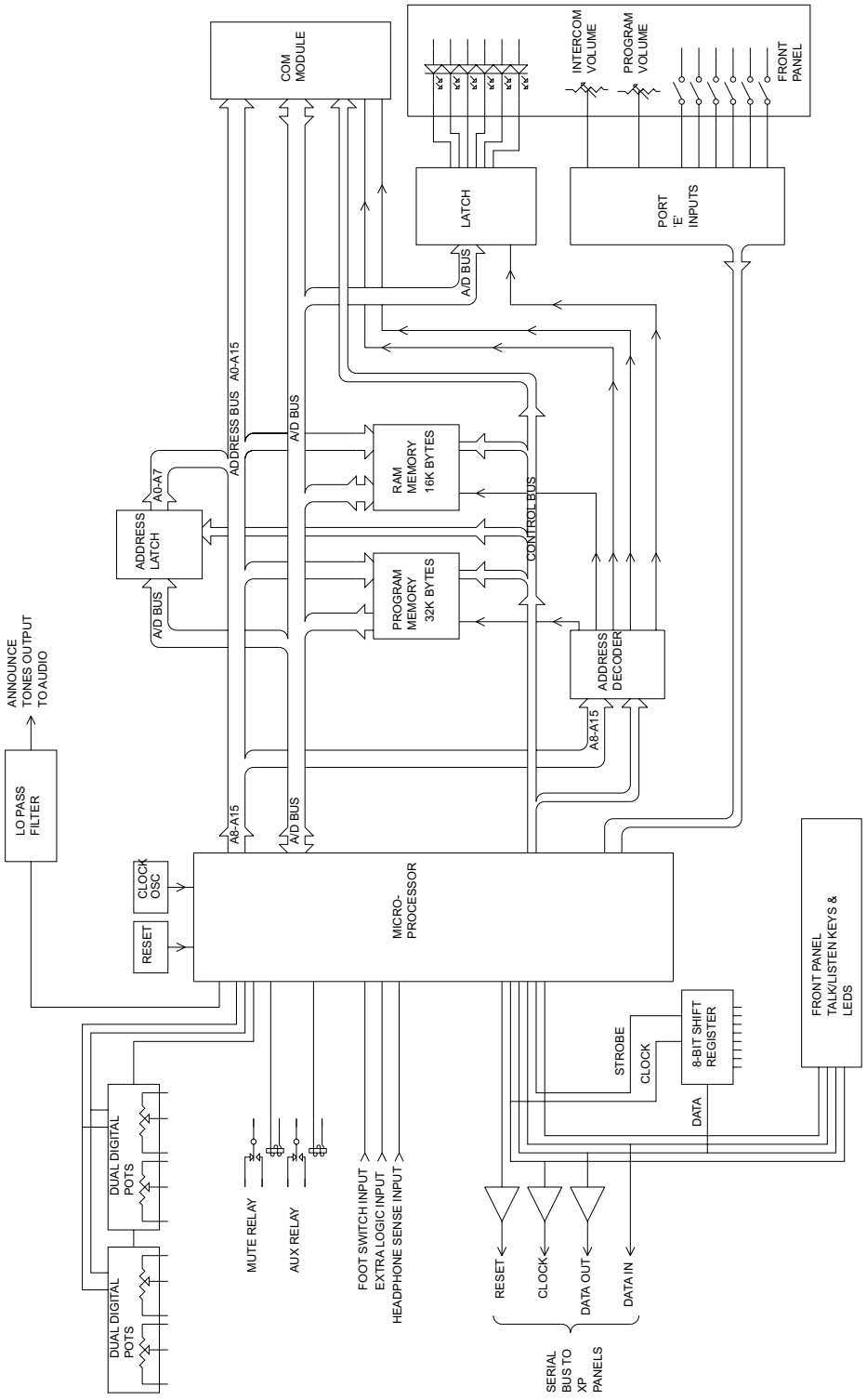
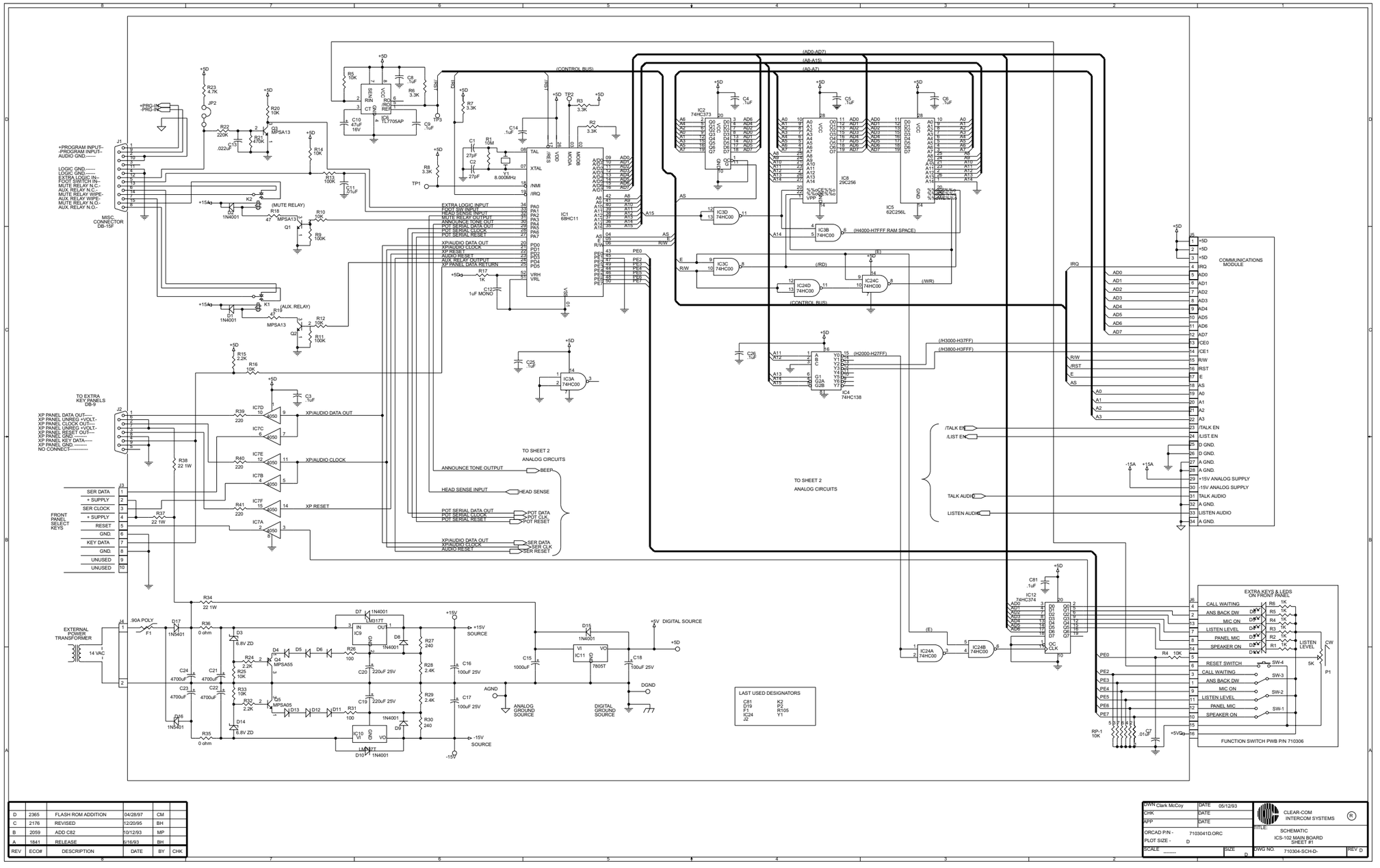


Figure 8: Digital Block Diagram—ICS-102/102T Main PCB



REV	ECO#	DESCRIPTION	DATE	BY	CHK
D	2365	FLASH ROM ADDITION	04/28/97	CM	
C	2176	REVISED	12/20/95	BH	
B	2059	ADD C82	10/12/93	MP	
A	1841	RELEASE	5/16/93	BH	

DWN Clark McCoy	DATE 05/12/93	CLEAR-COM INTERCOM SYSTEMS
CHK	DATE	
APP	DATE	
ORCAD P/N - 7103041D.ORC		TITLE: SCHEMATIC ICS-102 MAIN BOARD SHEET #1
PLOT SIZE - D		
SCALE ----------	SIZE D	DWG NO. 710304-SCH-D- REV D

Figure 9: ICS-102 Main PCB Schematic, Rev.D

ICS-102 AUDIO BLOCK DIAGRAM

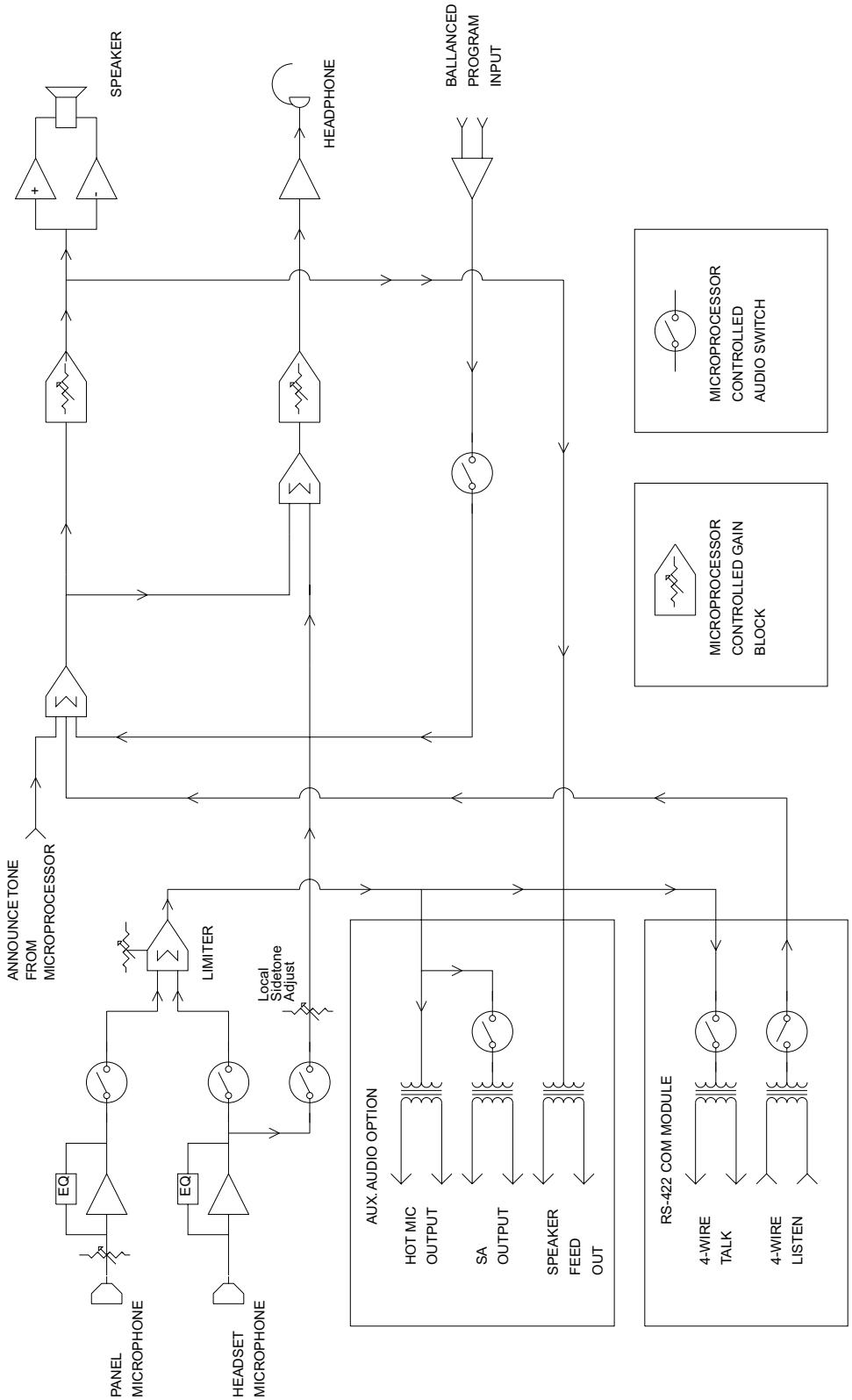


Figure 10:

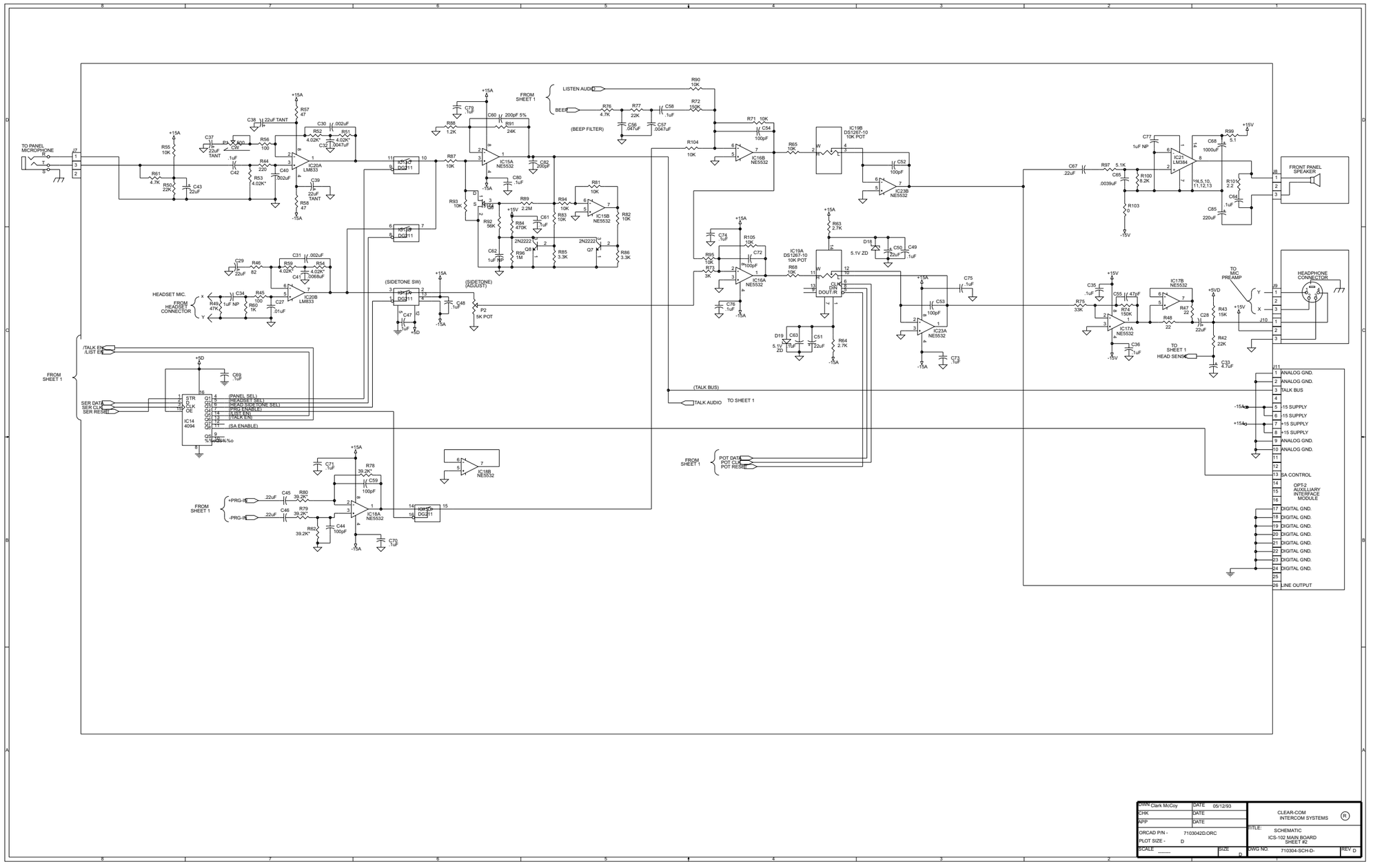


Figure 11: ICS-102 Main PCB Schematic, Rev.D

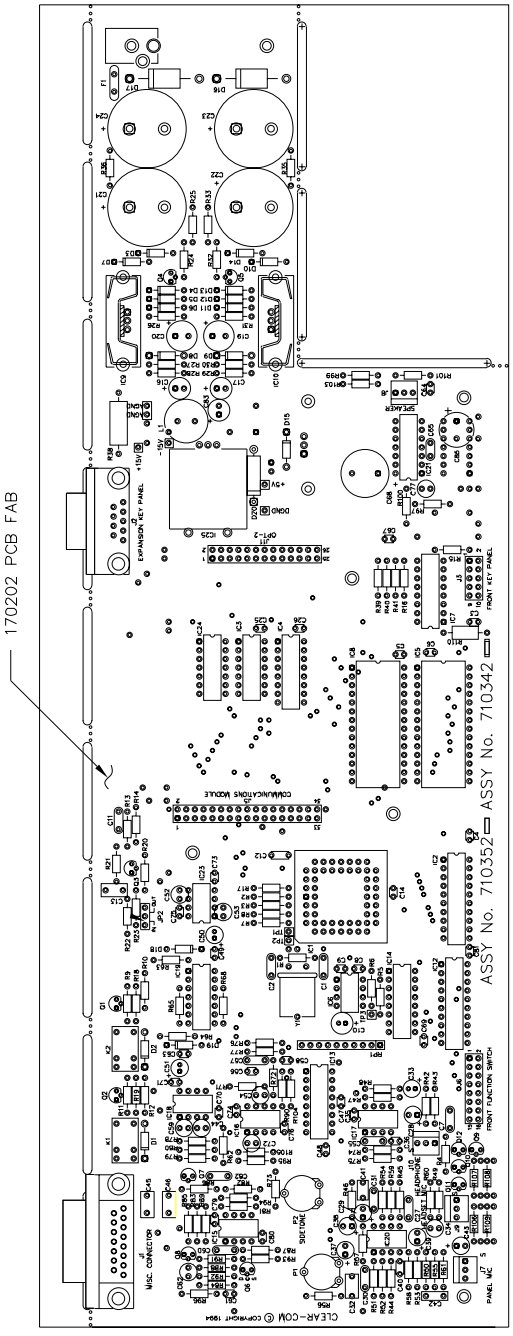


Figure 12: Assembly Drawing—ICS-1016/ICS-1008 Main PCB Rev. A

Bill of Materials for ICS-102/102T Main PCB

Capacitors

Value		Type	Volts	Tol.	Part #	Designator
27	PF	CERAMIC	50	5%	150071	C1 C2
47	PF	CERAMIC	50	10%	150041	C55
100	PF	CERAMIC	50	10%	150006	C44 C52 C53 C54 C59 C72
200	PF	CERAMIC	100	5%	150063	C60 C82
6800	PF	CERAMIC	50	5%	150057	C41
.001	UF	CERAMIC	30	20%	150052	C65 C66
.0022	UF	MYLAR	100	5%	150045	C30 C31 C40
.0047	UF	MYLAR	50	5%	150114	C32
.0047	UF	CERAMIC	50	10%	150016	C57
.01	UF	CERAMIC	30	20%	150012	C7 C11 C27
.022	UF	MYLAR	100	10%	150008	C13
.047	UF	MONO	50	10%	150111	C56
.1	UF	MONO	50	10%	150035	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	100	10%	150085	C42
.22	UF	MYLAR	100	20%	150003	C45 C46
1	UF	CERAMIC	50	10%	150073	C12 C18
1	UF	ALUMINUM NP	50	10%	150002	C3 C62 C77 C78
2.2	UF	ALUMINUM NP	50		150065	C33
22	UF	TANT.	16		150032	C38 C39
22	UF	ALUMINUM	16	20%	150142	C28 C29 C37 C43 C50 C51
33	UF	ALU LOW ESR	35	20%	150130	C84 C83
47	UF	ALUMINUM	16	20%	150143	C10
100	UF	ALUMINUM	25	20%	150099	C16 C17
220	UF	ALUMINUM	25		150137	C19 C20
1000	UF	ALUMINUM	35		150092	C68
4700	UF	ALUMINUM	25		150139	C21 C22 C23 C24

Resistors & Resistor Packs

Value		Power	Type	Tol.	Part #	Designator
1	OHM	1/4W	CARBON FILM	5%	410139	R99 R103
2.2	OHMS	1/4W	CARBON FILM	5%	410113	R101
22	OHMS	1/4W	CARBON FILM	5%	410004	R47 R48
22	OHMS	1W	CARBON FILM	5%	410174	R38
47	OHMS	1/4W	CARBON FILM	5%	410039	R18 R19 R57 R58
82	OHMS	1/4W	CARBON FILM	5%	410038	R46
100	OHMS	1/4W	CARBON FILM	5%	410071	R26 R31 R45 R56
220	OHMS	1/4W	CARBON FILM	5%	410007	R39 R40 R41 R44
240	OHMS	1/4W	CARBON FILM	5%	410060	R27 R30
5	OHMS		TRIM POT		470060	P1
1K	OHMS	1/4W	CARBON FILM	5%	410010	R17 R60
1.2	OHMS	1/4W	CARBON FILM	5%	410041	R88
2.2K	OHMS	1/4W	CARBON FILM	5%	410011	R15 R24 R32
2.4K	OHMS	1/4W	CARBON FILM	5%	410103	R28 R29
2.7K	OHMS	1/4W	CARBON FILM	5%	410040	R63 R64
3.0K	OHMS	1/4W	CARBON FILM	5%	410104	R73
3.3K	OHMS	1/4W	CARBON FILM	5%	410015	R2 R3 R6 R7 R8 R85 R86
4.02K	OHMS	1/8W	METAL FILM	1%	410155	R51 R52 R53 R54 R59
4.7K	OHMS	1/4W	CARBON FILM	5%	410013	R23 R61 R76
5K	OHMS		TRIM POT		470022	P2
8.2K	OHMS	1/4W	CARBON FILM	5%	410037	R100 R102
10K	OHMS	1/4W	CARBON FILM	5%	410016	R4 R5 R10 R12 R14 R16 R20 R25 R33 R55 R65 R68 R71 R81 R82 R83 R87 R90 R93 R94 R95 R104 R105
1	OHM X 9		R-PACK		415001	RP1
15K	OHMS	1/4W	CARBON FILM	5%	410017	R43
22K	OHMS	1/4W	CARBON FILM	5%	410018	R42 R50 R77 R97 R98 R106 R107 R108 R109
24K	OHMS	1/4W	CARBON FILM	5%	410083	R91
33K	OHMS	1/4W	CARBON FILM	5%	410020	R75
39.2K	OHMS	1/8W	METAL FILM	1%	410111	R62 R78 R79 R80
47K	OHMS	1/4W	CARBON FILM	5%	410021	R49
56K	OHMS	1/4W	CARBON FILM	5%	410023	R92
100K	OHMS	1/4W	CARBON FILM	5%	410024	R9 R11 R13
150K	OHMS	1/4W	CARBON FILM	5%	410026	R72 R74
220K	OHMS	1/4W	CARBON FILM	5%	410028	R22
470K	OHMS	1/4W	CARBON FILM	5%	410030	R21 R84
1M	OHM	1/4W	CARBON FILM	5%	410058	R96

2.2M	OHMS	1/4W	CARBON FILM	5%	410153	R89
10M	OHMS	1/4W	CARBON FILM	5%	410059	R1

Diodes and Transistors

Device	Description	Part #	Designator
DIODE	1N957B ZENER 6.8V .4W 5%	480026	D3 D14
DIODE	1N4003 RECT 1A 200PIV	480058	D1 D2 D7 D8 D9 D10 D15
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D4 D5 D6 D11 D12 D13
DIODE	1N5231B ZENER 5.1V .5W 5%	480038	D18 D19
DIODE	1N5339 ZENER 5.6V 5W	480182	D20
DIODE	1N5401 RECT 3A 100PIV	480005	D16 D17
TRANSISTOR	2N2222 NPN 30V	480006	Q7 Q8 Q9 Q10 Q11 Q12
TRANSISTOR	J174 JFET PCHAN 8V VGS	480079	Q6
TRANSISTOR	MPS-A05 NPN 60V	480052	Q5
TRANSISTOR	MPS-A13 NPN 30V DARL	480004	Q1 Q2 Q3
TRANSISTOR	MPS-A55 PNP 60V	480050	Q4

Integrated Circuits

Device	Description	Part #	Designator
4050B	CMOS HEX BUFFER	480077	IC7
4094B	CMOS 8 BIT SHIFT REGISTER	480107	IC14
68HC11A	CMOS MCU 52 PIN PLCC FP	480132	IC1
4HC00	CMOS QUAD NAND	480157	IC3 IC24
74HC138	CMOS 3 TO 8 LINE DECODER	480120	IC4
74HC373	CMOS OCTAL D LATCH	480142	IC2
74HC374	CMOS OCTAL D FL/FLOP	480143	IC12
DG211CJ	CMOS QUAD ANALOG SWITCH	480092	IC13
GM76C256L	CMOS SRAM 32K X 8 100NS	480183	IC5
DS1267-10	DIGITAL POT, DUAL 10K	480195	IC19
LM384	OPAMP, POWER 4W	480012	IC21 IC22
LM833N	OPAMP, DUAL LO NOISE	480175	IC20
NE5532	OPAMP, DUAL LO NOISE	480070	IC15 IC16 IC17 IC18 IC23
78SR105HC	REGULATOR, 5V SWITCHER 1A	480206	IC25
LM317T	REGULATOR, POS ADJ 1.5A	480167	IC9
LM337T	REGULATOR, NEG ADJ 1.5A	480177	IC10
TL7705AP	RESET SUPERVISOR IC	480134	IC6

Miscellaneous

Device	Description	Part #	Designator
CONNECTOR	2.1MM CO-AX PC MTG POWER	210213	J4
CONNECTOR	DB-9F RT ANG PC MTG	210186	J2
CONNECTOR	DB-15F RT ANG PC MTG	210187	J1
CRYSTAL	8.000MHZ PARALLEL CRYSTAL	230003	Y1
FUSE	0.90A POLY SWITCH	520036	F1
JUMP JACK	JUMP JAX	210103	JP2
RELAY	SPDT 12V PC RELAY ITT#SZ12	450006	K1 K2

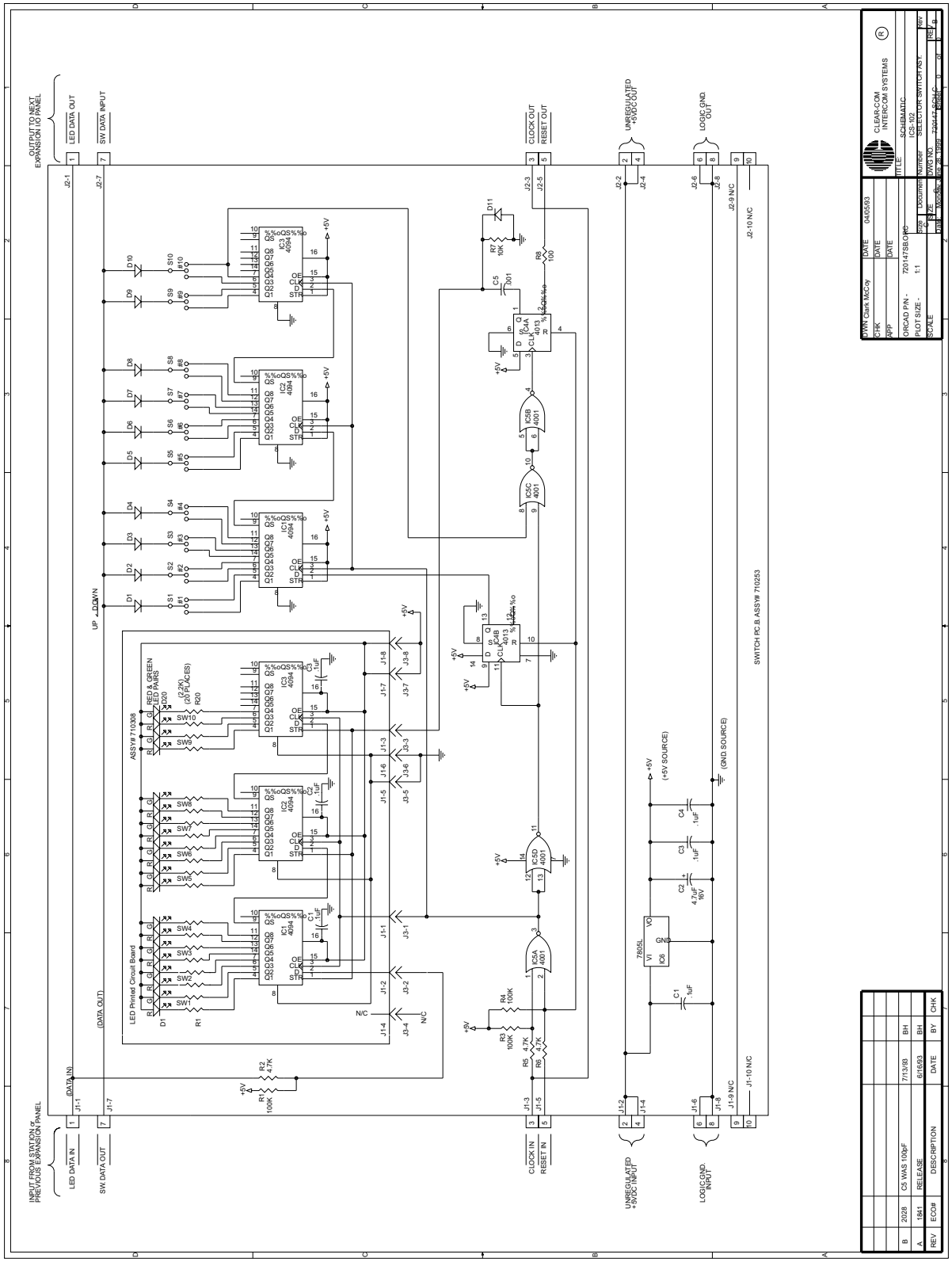


Figure 13: Schematic ICS-102/ICS-102T Selector Switch PCB Rev.B

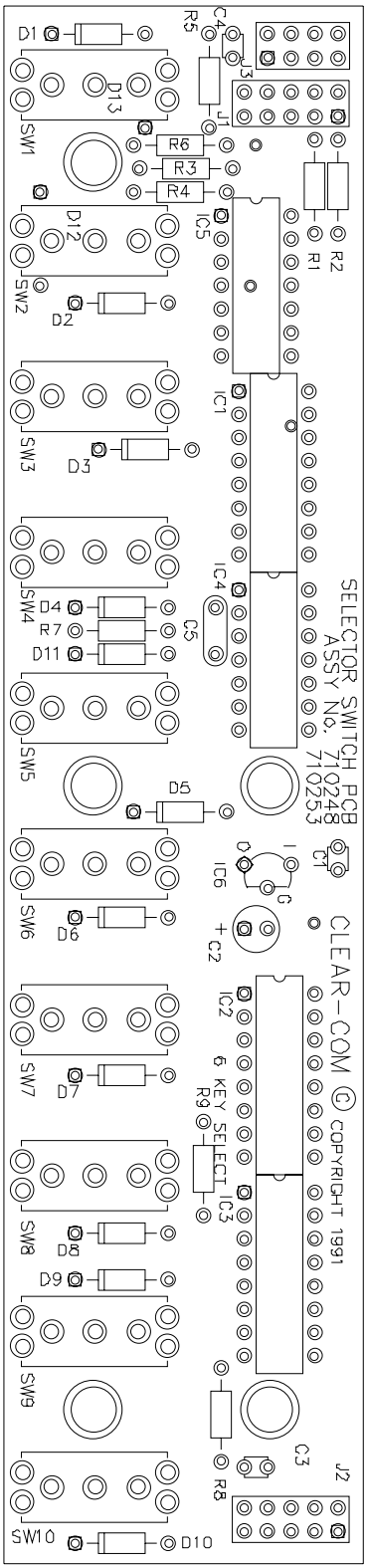


Figure 14: ICS-102/102T Selector Switch PCB Rev.D

Bill of Materials for ICS-102 Selector Switch PCB

Capacitors

Value		Type	Volts	Tol.	Part #	Designator
0.001	uF	Ceramic Disc	30	20%	150052	C5
0.1	uF	Monolithic	50	10%	150035	C1 C3 C4
4.7	uF	Aluminum	50		150087	C2

Resistors & Resistor Packs

Value		Power	Type	Tol.	Part #	Designator
100	OHM	1/4	Carbon Film	5%	410071	R8
4.7K	OHM	1/4	Carbon Film	5%	410013	R2 R5 R6
10K	OHM	1/4	Carbon Film	5%	410016	R7
100K	OHM	1/4	Carbon Film	5%	410024	R1 R3 R4

Diodes and Transistors

Device	Description	Part #	Designator
Diode	1N4148 SIGNAL 10MA 75PIV	480000	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11

Integrated Circuits

Device	Description	Part #	Designator
Logic Chip	4001 CMOS 4 2 IN NOR GATE	480112	IC5
Logic Chip	4013 CMOS DUAL D FF	480171	IC4
Logic Chip	4094B CMOS SHIFT REGISTER	480107	IC1 IC2 IC3
Regulator	7805L POS 5V REG. TO-92 PKG	480088	IC6

Miscellaneous

Device	Description	Part #	Designator
SWITCH	SP3T MOM-OFF-MOM PC MTG	510080	S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S10

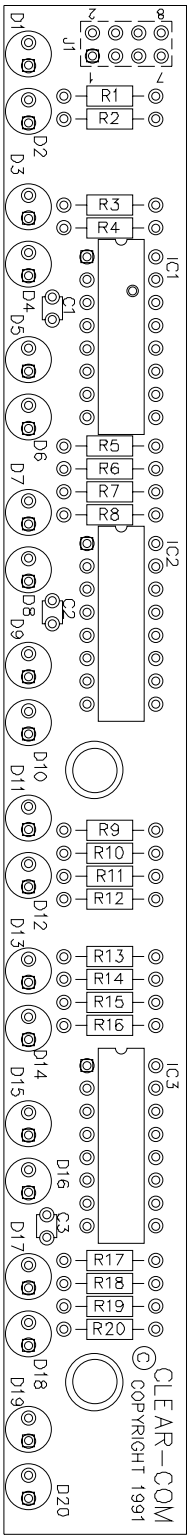


Figure 15: Assembly Drawing ICS-102/102T Selector Switch LED PCB Rev.A

Bill of Materials for ICS-102/102T Selector Switch LED PCB

Capacitors

Value		Type	Volts	Tol.	Part #	Designator
0.1	uF	Monolithic	50	10%	150035	C1 C2 C3

Resistors & Resistor Packs

Value		Power	Type	Tol.	Part #	Designator
1K	OHM	1/4	Carbon Film	5%	410010	R1-R20(20)

Integrated Circuits

Device	Description	Part #	Designator
Logic Chip	4094B CMOS SHIFT REGISTER	480107	IC1 IC2 IC3

Miscellaneous

Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP LED	390045	D2 D4 D6 D8 D10 D12 D14 D16 D18 D20
LED	RED, ROUND, FLAT TOP LED	390044	D1 D3 D5 D7 D9 D11 D13 D15 D19

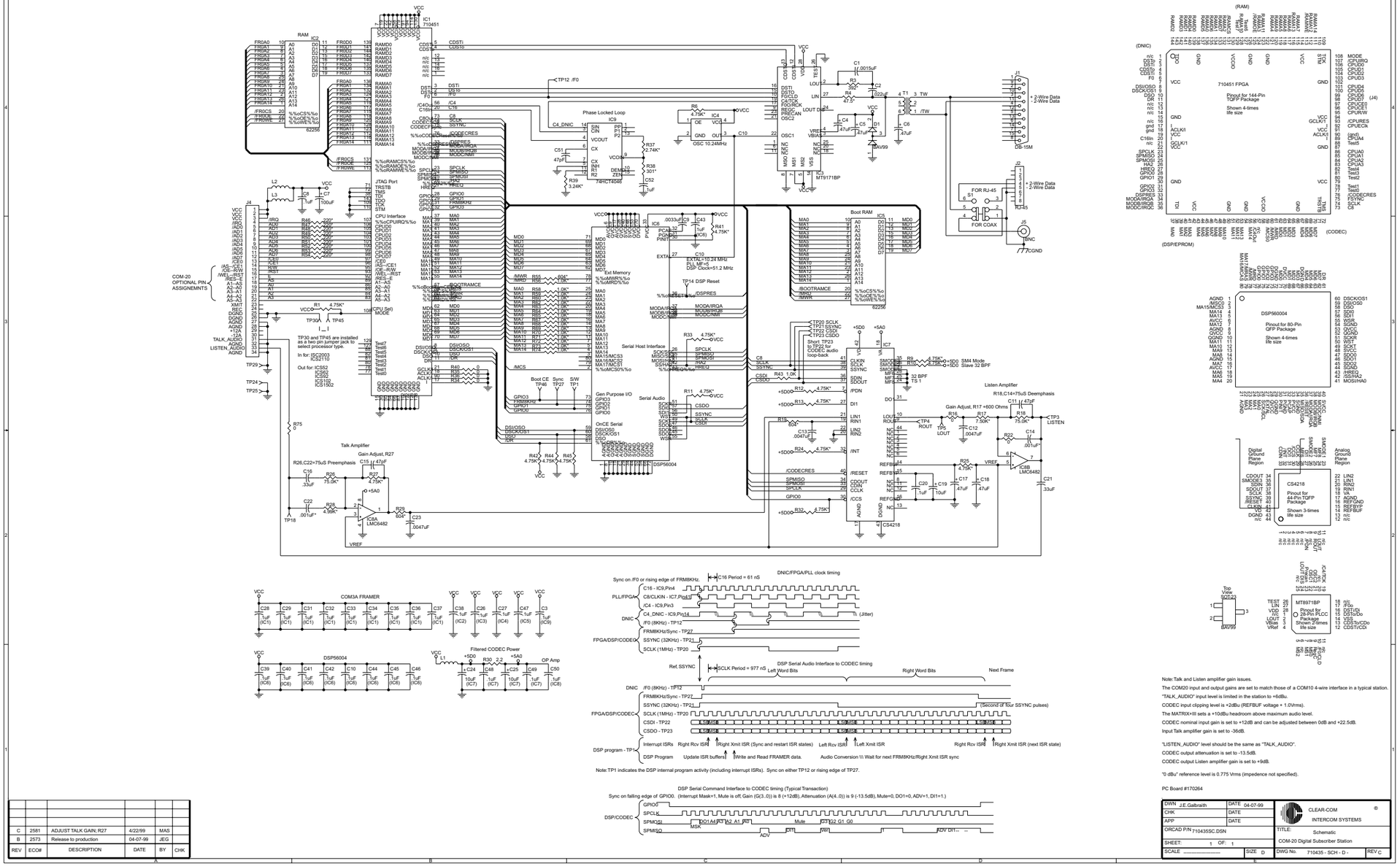


Figure 16: COM-20 Communication PCB Rev.C

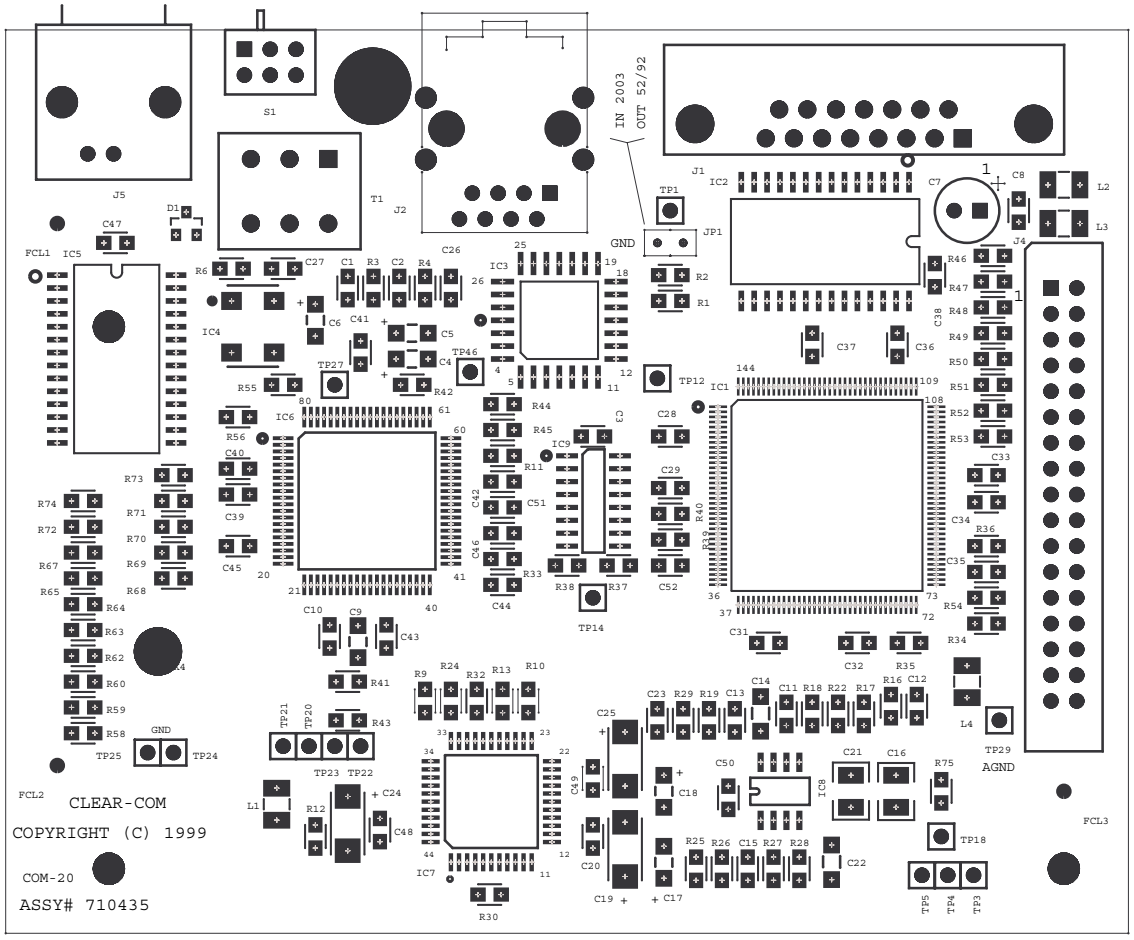


Figure 17: Assembly Drawing—COM-20 Communications PCB Rev.A

Bill of Materials for COM-20 Communication PCB

Capacitors

Value		Type	Volts	Tol.	Part #	Designator
.001	uF	Ceramic Disc SMD	50V	1%	151001	C14 C22
.00	33	Ceramic Disc SMD	50V	5%	151002	C9
47	pF	Ceramic Disc SMD	50V	5%	151120	C11 C15 C51
.0015	uF	Ceramic Disc SMD	50V	5%	151138	C1
.0047	uF	Ceramic Disc SMD	50V	10%	151156	C12 C13 C23
.022	uF	Ceramic Disc SMD	50V	10%	151164	C2
.1	uF	Ceramic Disc SMD	50V	10%	151172	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
.33	uF	Ceramic Disc SMD	25V	10%	151178	C16 C21
.47	uF	Tantalum SMD	35V	10%	151184	C4 C5 C6 C17 C18
10	uF	Tantalum SMD	25V	10%	151192	C19 C24 C25
100	uF	Aluminum	16V	20%	150155	C7

Resistors

Value		Power	Type	Tol.	Part #	Designator
0	OHM	1/10	SMD		411100	R16 R22 R34 R35 R36 R40 R75
2.2	OHM	1/10	SMD	5%	411181	R30
47.5	OHM	1/10	SMD	1%	411262	R4
221	OHM	1/10	SMD	1%	411326	R46 R47 R48 R49 R50 R51 R52 R53 R54
301	OHM	1/10	SMD	1%	411339	R38
392	OHM	1/10	SMD	1%	411350	R3
604	OHM	1/10	SMD	1%	411368	R29 R19 R55
1.00K	OHM	1/10	SMD	1%	411389	R43 56 R58 R59 R60 R62 R63R64 R65 R67 R68 R70 R71 R72R73 R74 R69
2.74K	OHM	1/10	SMD	1%	411431	R37
3.24K	OHM	1/10	SMD	1%	411438	R39
4.75K	OHM	1/10	SMD	1%	411454	R1 R6 R9 R10 R11 R12 R13 R24 R25 R32
4.75K	OHM	1/10	SMD	1%	411454	R33 R41 R42 R44 R45 R27
4.99K	OHM	1/10	SMD	1%	411456	R28
7.50K	OHM	1/IO	SMD	1%	411473	R17
75.0K	OHM	1/10	SMD	1%	411569	R26 R18

Diodes and Transistors

Device	Description	Part #	Designator
Diode	BAV99 DUAL DIODE... SMD	481033	D1

Integrated Circuits

Device	Description	Part #	Designator
62256	CMOS SRAM 32K X 8	481047	IC2 IC5
6482	DUAL CMOS OPAMP RAIL/RAIL	481022	IC8
0.24MHZ	CRYSTAL CLOCK OSCILLATOR	231004	IC4
4218	16-BIT 2 CHANNEL CODEC	481041	IC7
74HCT4046A	CMOS PHASE LOCK LOOP...SOIC16	481045	IC9
MT9171AP	DIGITAL NETWORK INT.	481046	IC3
56004	24-BIT DSP 40MHZ	481071	IC6

IFPGA	DNIC FRAMER, COM 20	710451	IC1

Miscellaneous

Device	Description	Part #	Designator
Connector	JUMP JAX	210103	JP1
Connector	HEADER MULTI PIN HEADER((PER)PIN)	210112	JP1(2)
Connector	15 PIN (M) RT ANG PC MTG D TYPE CON	210188	J1
Connector	DUAL ROW HEADER 17 POS. .230IN	210279	J4
Connector	RJ-45 RT ANG MOD CON 1-PORT SHIELDED	210335	J2
Connector	BNC RT ANGLE PC MNT W/THREAD BUSH	210354	J5
Inductor	FERRITE EMI SUPPRESSOR 400MA	181001	L1 L2 L3
Switch	DPDT MICRO-SUBMINIATURE SWITCH	510124	S1
Transformer	2745B 2:1 PULSE TRANSFORMER	560023	T1

4 SPECIFICATIONS

0 dBv 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 VITEC GROUP COMMUNICATIONS WARRANTY

Vitec Group Communications (VGC) 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.

Clear-Com offers 24/7 customer support.

Return authorization numbers are required for all returns.

Both warranty and non-warranty repairs are available.

TECHNICAL SUPPORT

To ensure complete and timely support to its customers, VGC 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 VGC. A TSC is fully available to VGC'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 (Click the 24 X 7 User Support symbol on the Web site.)

For technical support from the Americas and Asia

Call: +1 510 496 6666 or 800 VITEC USA

Web site: www.clearcom.com (Click the 24 X 7 User Support symbol on the Web site.)

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 VGC, and shipping damage. Products with their serial numbers removed or defaced are not covered by this warranty.

WARRANTY REPAIRS

While VGC 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 VGC 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 VGC is covered under the warranty.

This warranty does not include defects arising from installation (when not performed by VGC), 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 VGC provided product.

NON-WARRANTY REPAIRS

Equipment that is not under warranty must be sent prepaid to VGC. 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 VGC determine, in its reasonable discretion, that any part of a product is defective due to faulty materials or workmanship, VGC 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

VGC 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. VGC has the qualified technical staff to support any and all emergency site activities should they occur.

LIABILITY

The foregoing warranty is VGC'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 VGC 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 VGC'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 sites 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 (Click the 24 X 7 User Support symbol on the Web site.)

For returns from the Americas and Asia

Call: +1 510 496 6666 or 800 VITEC USA

Web site: www.clearcom.com (Click the 24 X 7 User Support symbol on the Web site.)

Email: support@clearcom.com

FAX: +1 510 496 6610

WARRANTY VALIDATION

To validate your warranty, fill in the information below, and mail it to your local Technical Service Center.

Model No. _____ Serial No. _____
Date Purchased _____
Purchased from (dealer name) _____
Address _____
City _____ State _____
Country _____ ZIP/Postal Code _____