CLEAR-COM ECLIPSE

ICS 92/52 INTERCOM PANELS

INSTRUCTION MANUAL

ICS 92/52 Intercom Panels Instruction Manual

Part Number 810301Z Rev. 4

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IMPORTANT SAFETY INSTRUCTIONS

Please read and follow these instructions before operating an ICS-92/52 intercom panel.

For your safety, it is important to read and follow these instructions before operating an ICS-92/52 intercom panel:

(1) **WARNING:** To reduce the risk of fire or electric shock, do not expose an ICS-92/52 intercom panel to rain or moisture. Do not operate an ICS-92/52 intercom panel near water, or place objects containing liquid on it. Do not expose an ICS-92/52 intercom panel to splashing or dripping water.

(2) For proper ventilation, make sure ventilation openings are not blocked. Install the ICS-92/52 according to the directions in the Installation Chapter of this manual.

(3) Do not install an ICS-92/52 intercom panel 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-panel.

(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 panel's chassis.

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

(7) Unplug the ICS-92/52 panel 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-92/52 panel 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-92/52 panel's chassis.
- The ICS-92/52 panel has been exposed to rain or moisture.
- The ICS-92/52 panel does not operate normally.
- The ICS-92/52 panel has been dropped.

Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on an ICS-92/52 intercom panel, they warn you

of the potential danger of electric shock if the panel 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 chapter describes how to operate the ICS-92 and ICS-52 intercom panels and their digital equivalents, the ICS-92T and ICS-52T intercom panels. Panel operators can use this manual after the Eclipse System has been correctly installed and configured.

DESCRIPTION

The ICS-92/92T and ICS-52/52T intercom panels are each assembled in a small 1-RU high (1.75 in. or 44.45 mm) chassis. The ICS-92/92T has nine selector keys; the ICS-52/52T has five. The ICS-92/92T and ICS-52/52T have the following features:

- Individually adjustable listen levels
- Panel fits in one vertical rack unit (1.75 in. or 44.45 mm)
- A five character LED display above each selector key
- Built-in speaker and optional plug-in panel microphone
- Front-panel headset connector
- Call signaling capability
- “Answer Back” facility
- Local program input
- Programmable relay
- Mute relay
- Two logic inputs for external control of selected panel functions.

The ICS-92/92T and ICS-52/52T can be equipped with the following options:

- XPL-12/22 expansion key 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 LEDs 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 “intercom” volume controls. The speaker volume can also be affected by three software-controlled functions: Page Override, Mute Level, and Listen Level Adjustment.

Intercom Volume

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” on page 1-6.

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 Button” on page 1-6). 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.

Display Screen

The “Answer Back” selector and each talk/listen selector has a five-character LED display above it to indicate its assigned label. If more than one talk label is assigned to a talk selector, only the first one will be displayed.

Pushing the “Listen Labels” button will toggle the talk/listen selector display between the talk and listen labels. The green LED next to the “Listen Labels” button will light when the listen labels are displayed.

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 will be cleared when the call is answered or after the call is terminated and the answer-back, auto-clear time out lapses.

Regardless of whether a selection is programmed with a caller’s label, the label will be placed in the answer-back stack (see “Removing Labels from the Answer-Back Stack” on page 1-5).

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. Panels and interfaces that are assigned to a panel's selectors also can be answered with the answer-back facility.

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

Answer Back Display

The answer-back display is located above the "Answer Back" key. It displays the call that is next in line from a list of as many as eight incoming calls. This list is referred to as the answer-back stack.

Answer Back Selector

The "Answer Back" selector answers calls from panels and interfaces that are both assigned and unassigned to the panel.

When a call arrives from a panel or interface:

- The calling panel's label will be placed in the answer-back stack and be shown in the answer-back display. The maximum stack size is eight calls.
- 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 also be indicated by their associated LEDs.

Answer-Back Label Selection

If another call or calls 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 and to display the next label in the answer-back stack.
2. Once the desired label is displayed, press the selector down to talk.

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 Buttons

The following are the panel's function selectors:

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

Panel Mic Button

This button 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.

Mic On Button

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

Speaker On Button

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

Listen Level Button

The Listen Level button 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:

1. Push (for less than 1 seconds) and quickly release the “Listen Level” button.
2. 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.

3. Use the selector associated with the intended label to increase (up) or decrease (down) the volume.
4. To exit, push the “Listen Level” button or wait for the 3 seconds 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 second) and quickly release the “Listen Level” button.
2. Press and hold the “Listen Level” button for 3 seconds
3. Release the “Listen Level” button.

Call Signals

To activate a call signal:

1. Push and hold (for at least 1 second) the “Listen Level” button until the panel indicates it is in “Call Signal” mode.

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 seconds).

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” button for at least 1 second to activate the call-signal mode.
2. While holding the “Listen Level” button, press the talk selector of the desired telephone’s label.
3. Release the “Listen Level” button.

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.

Listen Labels Button

The “Listen Labels” button displays listen labels on the front panel and any display expansion panel (XPL-12 or XPL-22) connected to the panel. Momentarily pressing and quickly releasing the button will cause all panels to display the listen labels assigned to the selectors. If the listen and talk labels are the same, then there will be no change. When this function is active the green LED next to the “Listen Labels” button will be lit. To exit this mode momentarily press and release the “Listen Labels” button again. The panel displays will return to their normal state and the green LED next to the “Listen Labels “ button will be extinguished.

Panel Upgrade Facility

If a panel firmware upgrade is downloaded to the matrix by ECS with the “Panel Prompt” option set the panel user will be asked whether the firmware upgrade should be applied. The panel will display the message “UPGRD TO VER nnnnn YES NO” on the display, with each word as a label (nnnnn is the version number). The panel keys will flash indicating an upgrade is available. This prompt will be displayed when the upgrade is available if the panel is online, or when the panel goes online if it is offline when the upgrade is downloaded to the matrix.

The panel operator can decline the upgrade by pressing the “NO” key after which the panel will return to the normal display. If the upgrade is declined it will not be offered again until a black reset is performed on the matrix.

If the panel user pressed the “YES” key a confirmation request is display on the panel. The confirmation display is “ARE YOU SURE nnnnn YES NO”. If the user selects the “NO” key the upgrade will be cancelled and will not be offered again until a black reset is performed on the matrix.

If the user selects the “YES” key the firmware upgrade will be applied to the panel.

ADJUSTING THE DISPLAY BRIGHTNESS

On ICS-52 and ICS-92 panels the display brightness can be adjusted by pressing and holding the Listen Labels button.

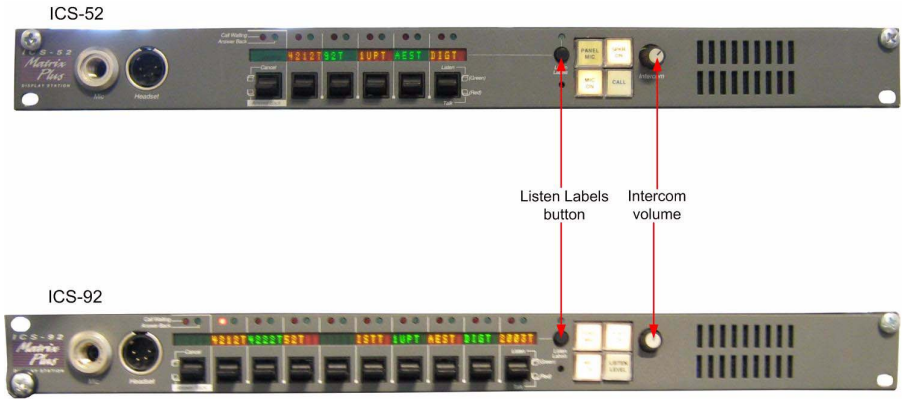


Figure 1-1: Display Brightness Controls

Turn the volume control knob clockwise increase s the display brightness and turning it anticlockwise decreases the display brightness. When the display brighness is set to the required level release the Listen Labels button.

When the display brightness of an ICS-52 or ICS-92 panel is adjusted the display brightness of any attached expansion panel is also changed to the same brightness.

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 12 additional selectors. The XPL-22 expansion panel provides 22 additional selectors. 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 covers the installation of the ICS-92/92T and ICS-52/52T intercom panels. It also describes panel adjustments available for:

- Headset sidetone
- Panel microphone gain
- Speaker mute
- Page volume level
- Panel-to-matrix card baud rate

DESCRIPTION

Installation of the ICS-92/92T and ICS-52/52T, including options such as expansion key panels, are identical to the ICS-2003 except for the following:

- Digital wiring for the ICS-92T and ICS-52T
- Mains AC power
- No front-panel adjustment of local program input
- Physical size
- No “Second Ear” output

WIRING

DIGITAL MATRIX FRAME TO PANEL WIRING

The ICS-92T and ICS-52T differ from the ICS-92 and ICS-52 because they include a digital audio/data communications module (COM-20) that works in conjunction with the DIG-2 digital interface module to connect the digital panel to the matrix frame.

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 the options and accessories that are installed.

For more information on the DIG-2 digital interface and the DIF-102 frame which houses it, refer to the *DIG-2/DIF-102 Digital Interface and Frame Instruction 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.

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.

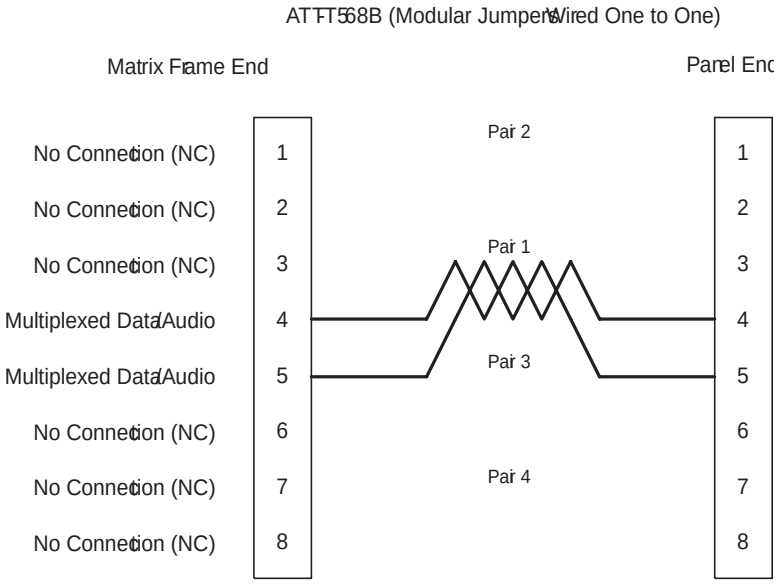


Figure 2-2: Matrix Frame to Digital Panel Wiring Using RJ-45

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.

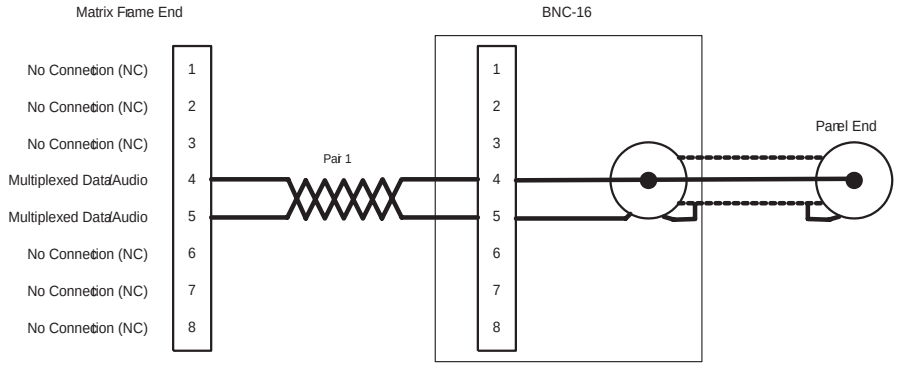


Figure 2-3: Matrix Frame to Digital Panel Wiring Using BNC-16 and Coax

MAIN AC POWER

The ICS-52/52T and ICS-92/92T panels can be powered by any source that can supply between 12 and 16 V RMS AC at 750 mA. The panels are shipped with a wall-mounted transformer that provides 14 V RMS AC to the panel. Two types of transformer 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 ampere "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 3.
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.

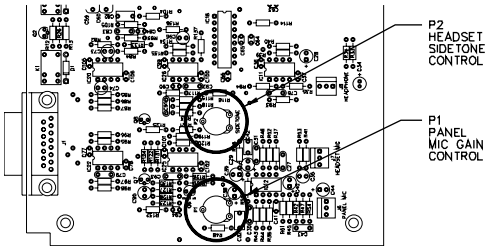


Figure 2-4: Sidetone and Panel Microphone Gain Adjustment Controls

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 3.
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)'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 section provides panel microprocessor resetting instructions, troubleshooting guidelines, schematics, assembly drawings, and component lists for the ISC-92 and ICS-52 intercom panels and the ICS-92T and ICS-52T digital intercom panels. For information on XPL Accessory Panels, the OPT-100, and the COM-1 communications module, see the *ICS-2003 Intercom Panel Instruction Manual (part 810303Z)*.

These panels operate 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 "Listen Labels" button on the right side of the unit's front panel. If the panel is acting erratically, try resetting it by doing one of the following:

- Inserting a small screwdriver or a stiff piece of wire (such as a bent paper clip) into the hole and pushing the reset button.
- Unplugging the panel from AC power and reconnecting.

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. For troubleshooting guidelines for the entire system, see the Overview chapter of this manual.

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. Enable Eavesdropping on the panel.
5. Test the integrity of the panel's audio path by temporarily setting a forced listen to it.
6. Reset the panel.
7. Replace the panel.

The panel is inoperative and all red LEDs flash slowly.

1. Wait 60 seconds If the matrix frame has just been powered up, it is possible it is still downloading the configuration to the Matrix 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 matrix card type matches the panel. Panels with COM-10 communication modules should have an MTX-A8 or MVX-A8. Panels with COM-20 communication modules should have an MTX-D8 or MVX-D8.
6. Reset the panel's matrix card in the Matrix frame.
7. Replace the panel's matrix 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. Check the configuration program and the panel's logic inputs to ensure the speaker has not been software disabled.
5. Test the integrity of the panel's audio path by temporarily setting a forced listen to it.
6. Reset the panel's Matrix card in the Matrix frame.
7. Replace the panel's Matrix card in the Matrix frame.
8. Reset the panel.
9. 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 *PGM-WIN System Configuration 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. Check the panel’s Configuration menu to see if the monitoring tones and change tones are 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.

BILL OF MATERIALS

MISCELLANEOUS

Device	Description	Part #
CABLE	10-PIN FLAT CABLE	770011
CABLE	16-PIN FLAT CABLE (SPLIT	770010
CABLE	34-PIN FLAT CABLE	730181
CLAMP	CABLE CLAMP, 3/16IN PLASTIC	640054
FLASH ROM	ICS-92 PROGRAM	710414
SPEAKER	41 X 71MM, SMALL MAGNET	500138
TRANSFORMER	POWER PLUG-IN 117/14VAC	400008
TRANSFORMER	POWER PLUG-IN 220/14VAC	400011

ICS-92/52 DIGITAL BLOCK DIAGRAM

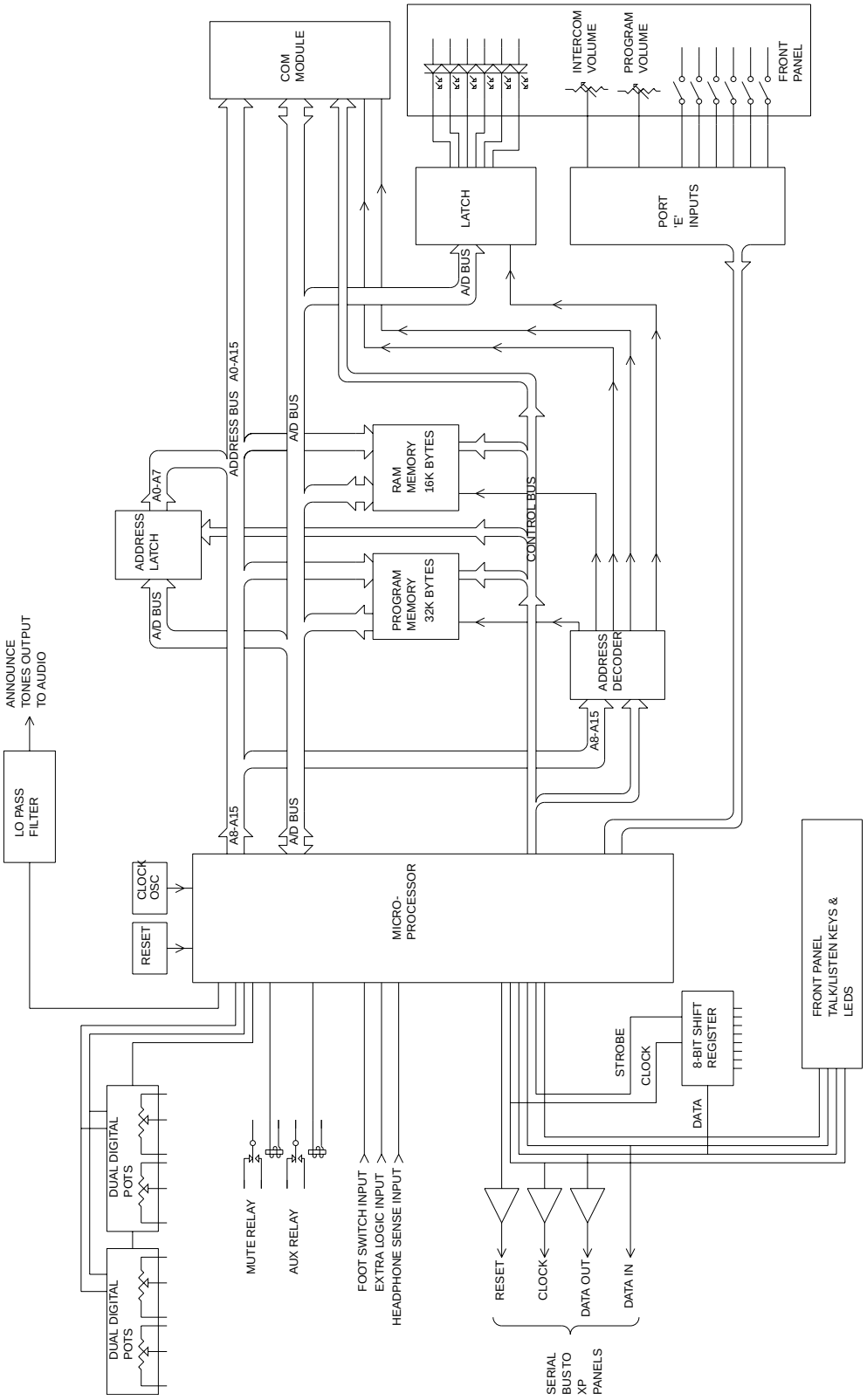
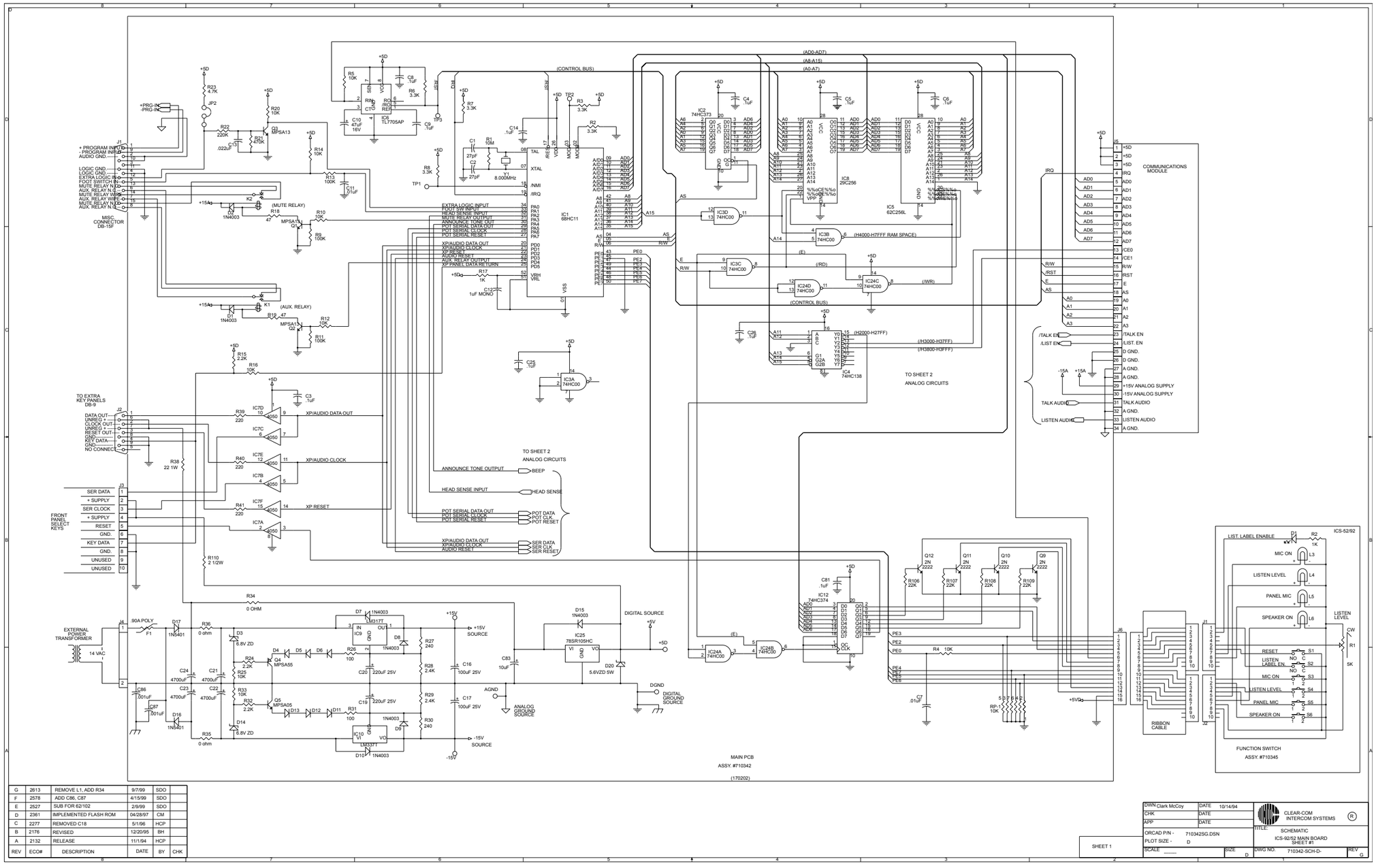


Figure 3-5: Digital Block Diagram—ICS-92/92T/ICS-52/52T Main PCB



REV	ECO#	DESCRIPTION	DATE	BY	CHK
G	2613	REMOVE L1, ADD R34	9/7/99	SDO	
F	2578	ADD C86, C87	4/15/99	SDO	
E	2527	SUB FOR 62/102	2/9/99	SDO	
D	2361	IMPLEMENTED FLASH ROM	04/28/97	CM	
C	2277	REMOVED C18	5/1/96	HCP	
B	2176	REVISED	12/20/95	BH	
A	2132	RELEASE	11/1/94	HCP	

DWN Clark McCoy	DATE 10/14/94	CLEAR-COM INTERCOM SYSTEMS	
CHK	DATE	TITLE: SCHEMATIC ICS-92/52 MAIN BOARD SHEET #1	
APP	DATE		
ORCAD P/N - 710342SG.DSN			
PLOT SIZE - D			
SCALE ———	SIZE D	DWG NO. 710342-SCH-D-	REV G

SHEET 1

Figure 3-6: Schematic—ICS-92/92T/ICS-52/52T Main PCB Sheet 1 Rev. G

ICS-92/52 AUDIO BLOCK DIAGRAM

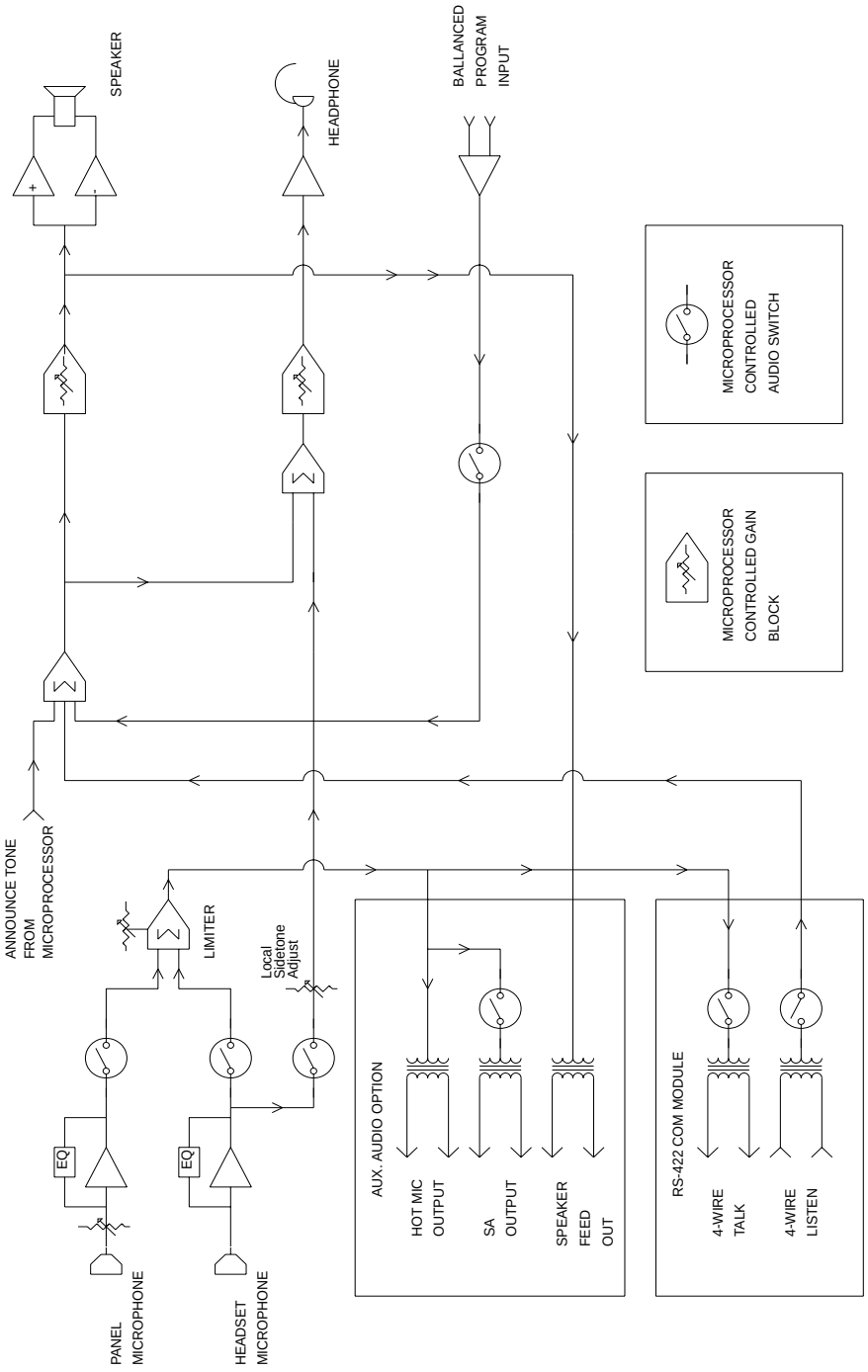


Figure 3-7: Audio Block Diagram—ICS-92/ICS-52 Main PCB

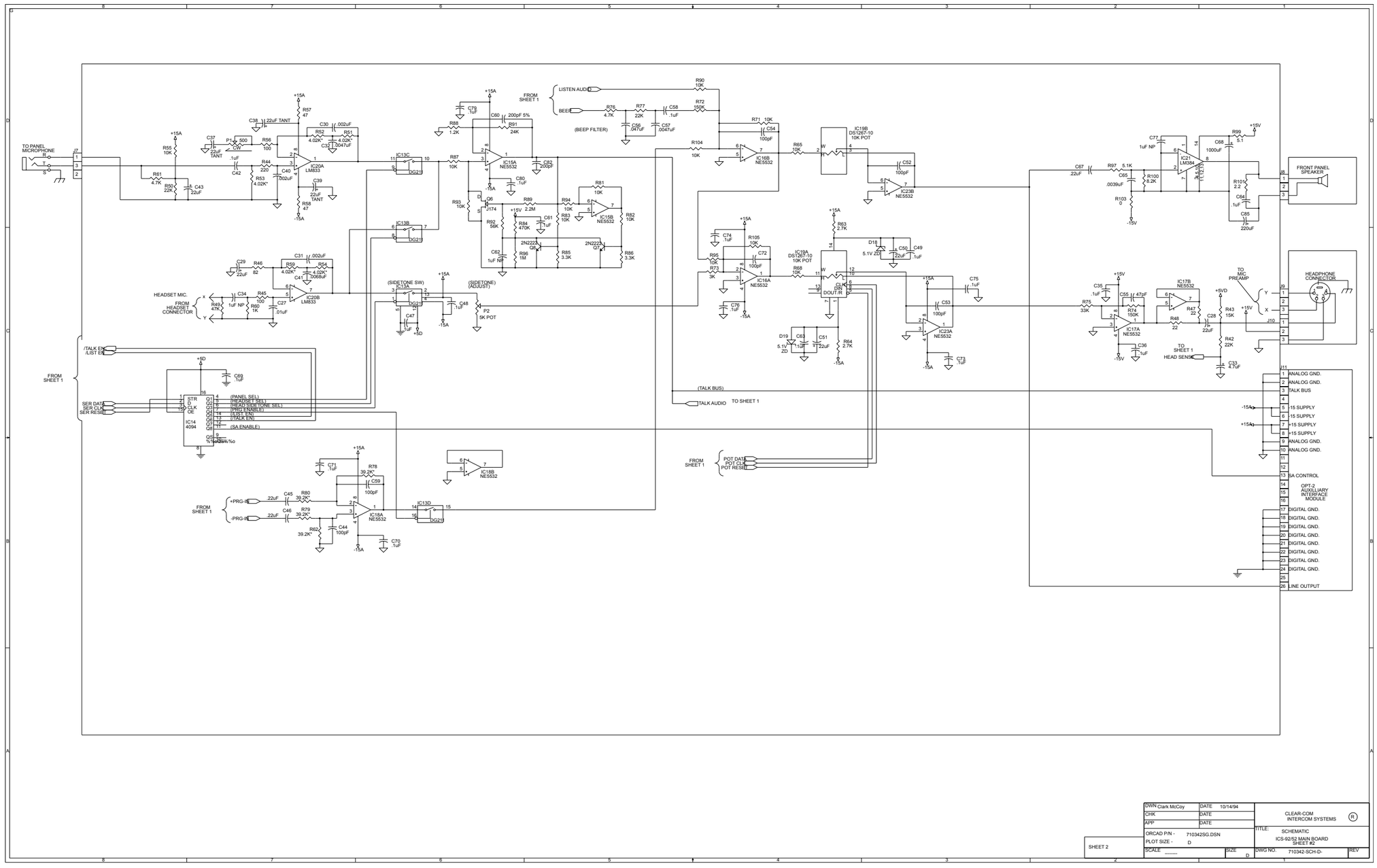


Figure 3-8: Schematic—ICS-92/92T/ICS-52/52T Main PCB Sheet 2 Rev. G

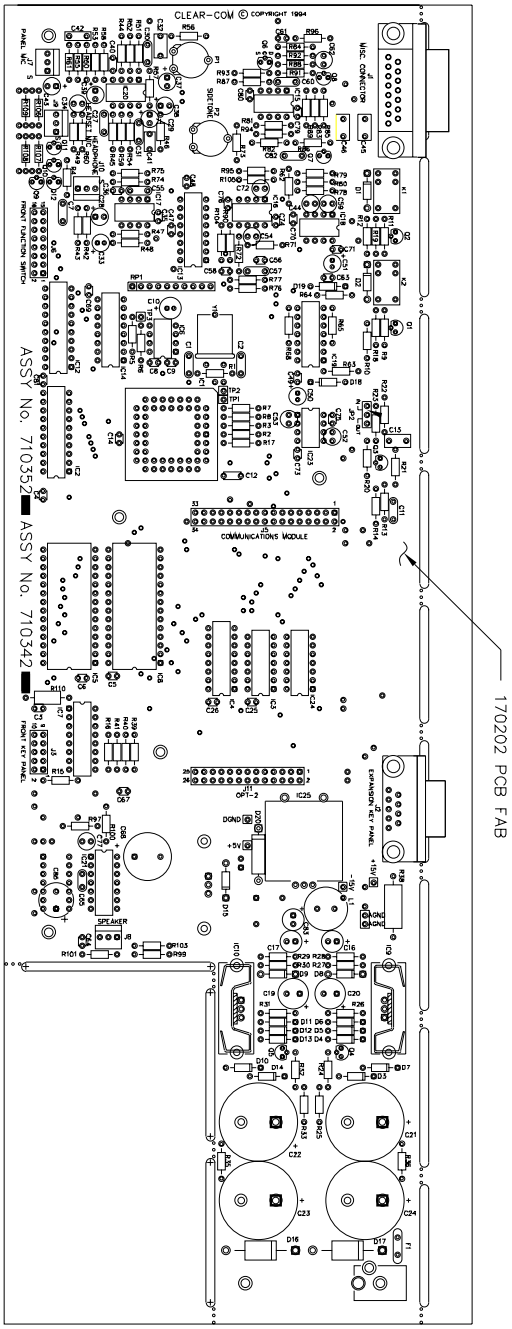


Figure 3-9: Assembly Drawing—ICS-92/92T/ICS-52/52T Main PCB Rev. E

BILL OF MATERIALS FOR ICS-92/92T 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

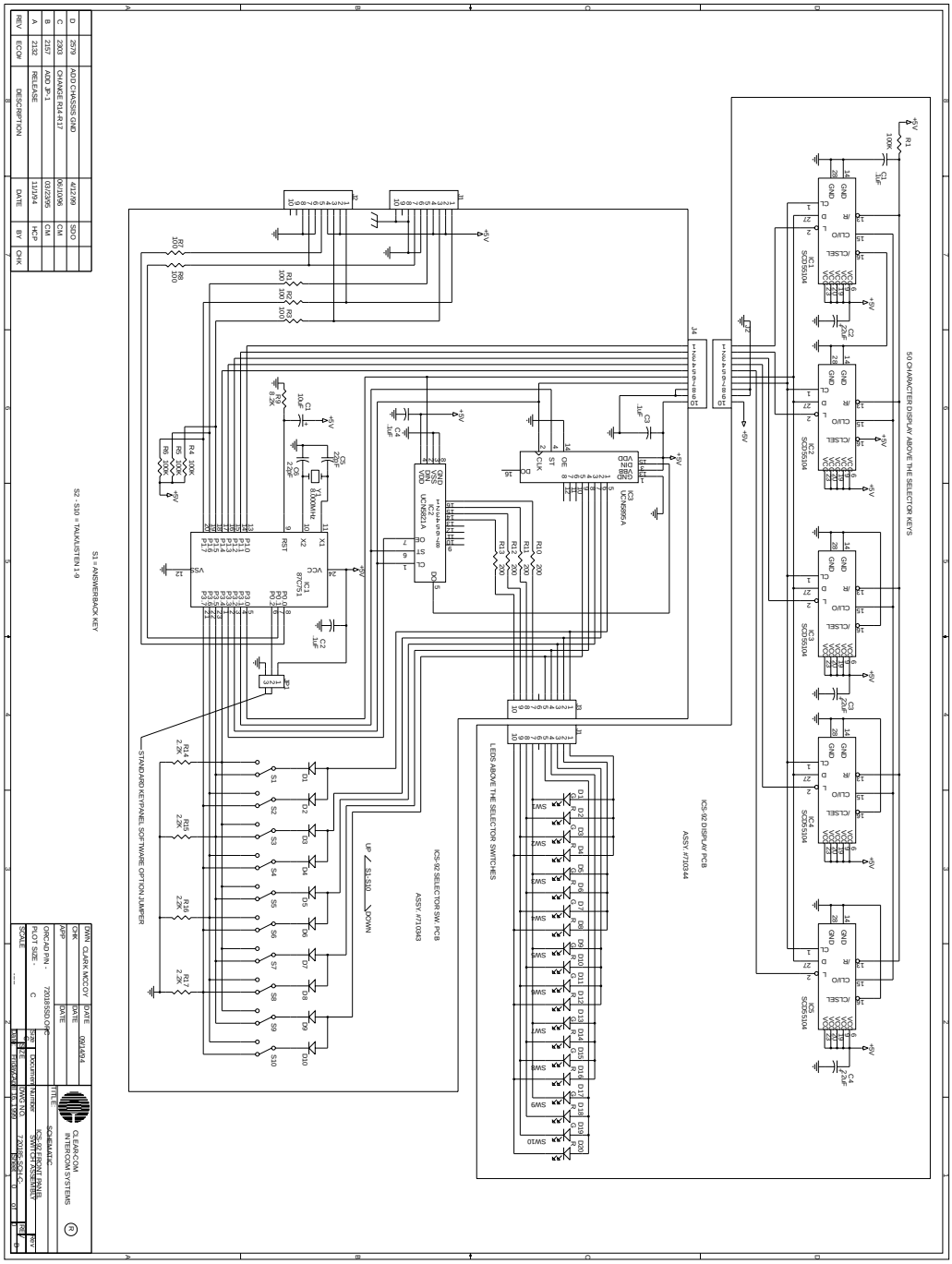


Figure 3-10: Schematic—ICS-92/92T Selector Switch Assembly Rev. D

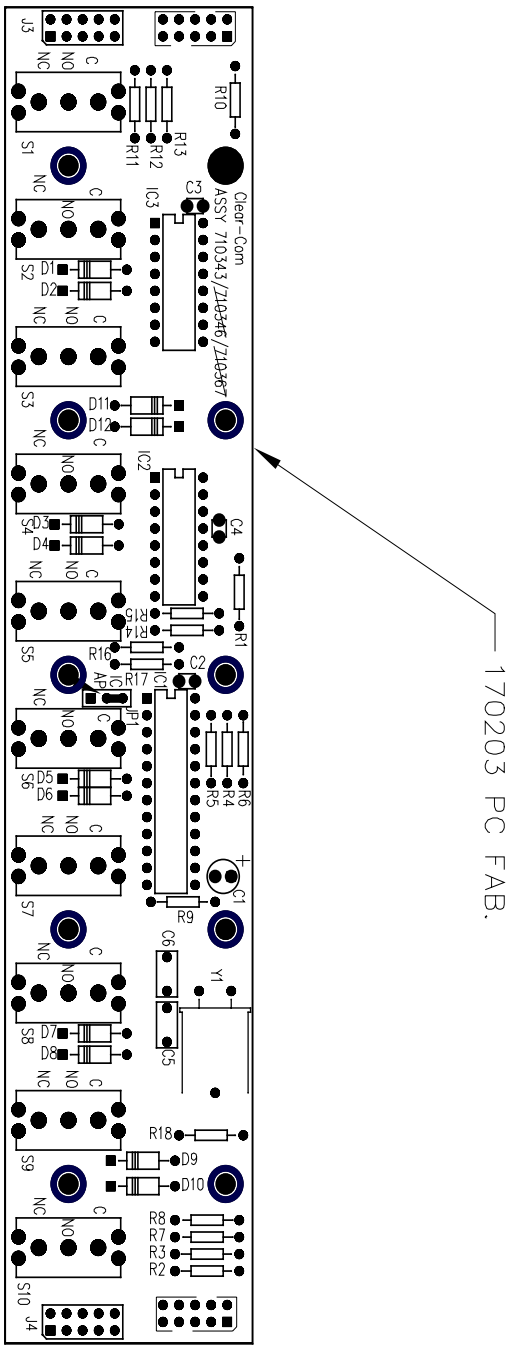


Figure 3-11: Assembly Drawing—ICS-92/92T Selector Switch PCB Rev. D

BILL OF MATERIALS FOR ICS-92/92T SELECTOR SWITCH PCB

CAPACITORS

Value		Type	Volts	Tol.	Part #	Designator
22	PF	CERAMIC	50	10%	150098	C5 C6
1	UF	MONO	50	10%	150035	C2 C3 C4
10	UF	ALUMINUM	50		150064	C1

RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
0	OHM	JUMPER		600000	R18
1	OHMS 1/4W	CARBON FILM	5%	410071	R1 R2 R3 R7 R8
200	OHMS 1/4W	CARBON FILM	5%	410072	R10 R11 R12 R13
4.7K	OHMS 1/4W	CARBON FILM	5%	410013	R14 R15 R16 R17
8.2K	OHMS 1/4W	CARBON FILM	5%	410037	R9
100K	OHMS 1/4W	CARBON FILM	5%	410024	R4 R5 R6

DIODES AND TRANSISTORS

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

INTEGRATED CIRCUITS

Device	Description	Part #	Designator
710353	PROGRAMED MICRO P,87C751	710353	IC1
UCN5821A	CMOS 8 BIT SHFT REG I SINK	480164	IC2
UCN5895	CMOS 8 BIT SHFT REG I SOURCE	480210	IC3

MISCELLANEOUS

Device	Description	Part #	Designator
CRYSTAL	8.000MHZ PARALLEL HC-49U	230003	Y1
SWITCH	SP3T MOM-OFF-MOM PC MTG	510080	S1-S10

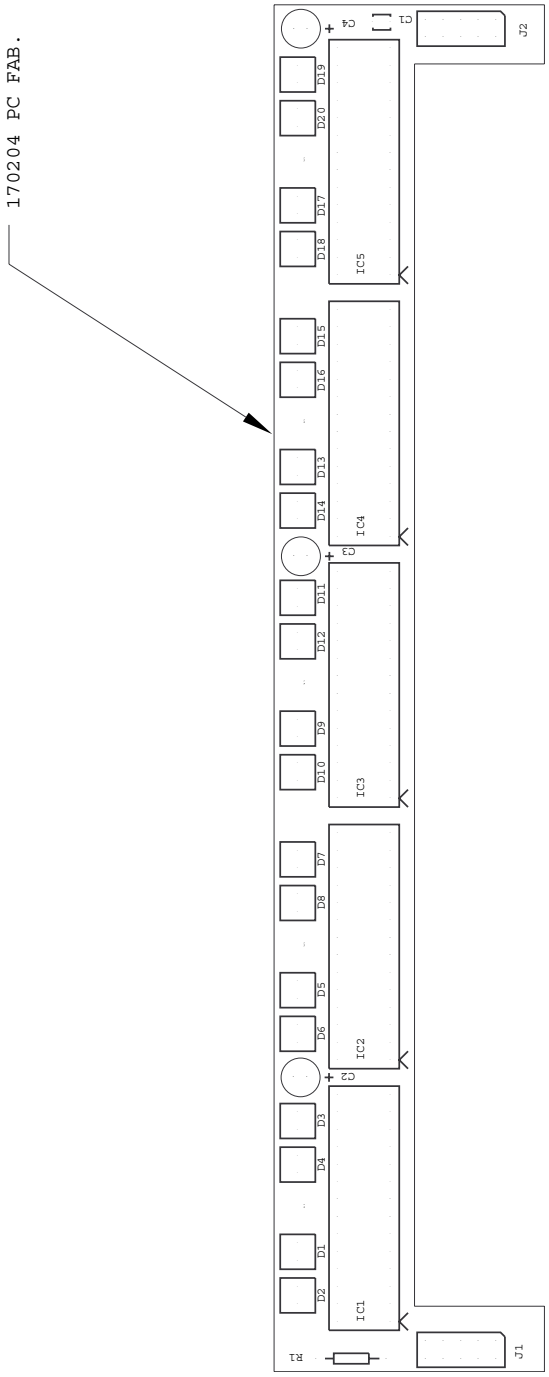


Figure 3-12: Assembly Drawing—ICS-92/92T Display PCB Rev. A

BILL OF MATERIALS FOR ICS-92/92T DISPLAY PCB

CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
.1 UF	MON	50	10%	150035	C1
22 UF	TAN	16		150032	C2 C3 C4

RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
100K OHMS	1/4W	CARBON FILM	5%	410024	R1

DIODES AND TRANSISTORS

Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP LED	390045	D1 D3 D5 D7 D9 D11 D13 D15 D17 D19
LED	RED, ROUND, FLAT TOP LED	390044	D2 D4 D6 D8 D10 D12 D14 D16 D18 D20

INTEGRATED CIRCUITS

Device	Description	Part #	Designator
DISPLAY	10 CHARACTER LED DISPLAY	390050	IC1 IC2 IC3 IC4 IC5

MISCELLANEOUS

Device	Description	Part #	Designator
LENS	TWO COLOR DISPLAY LENS	250694	

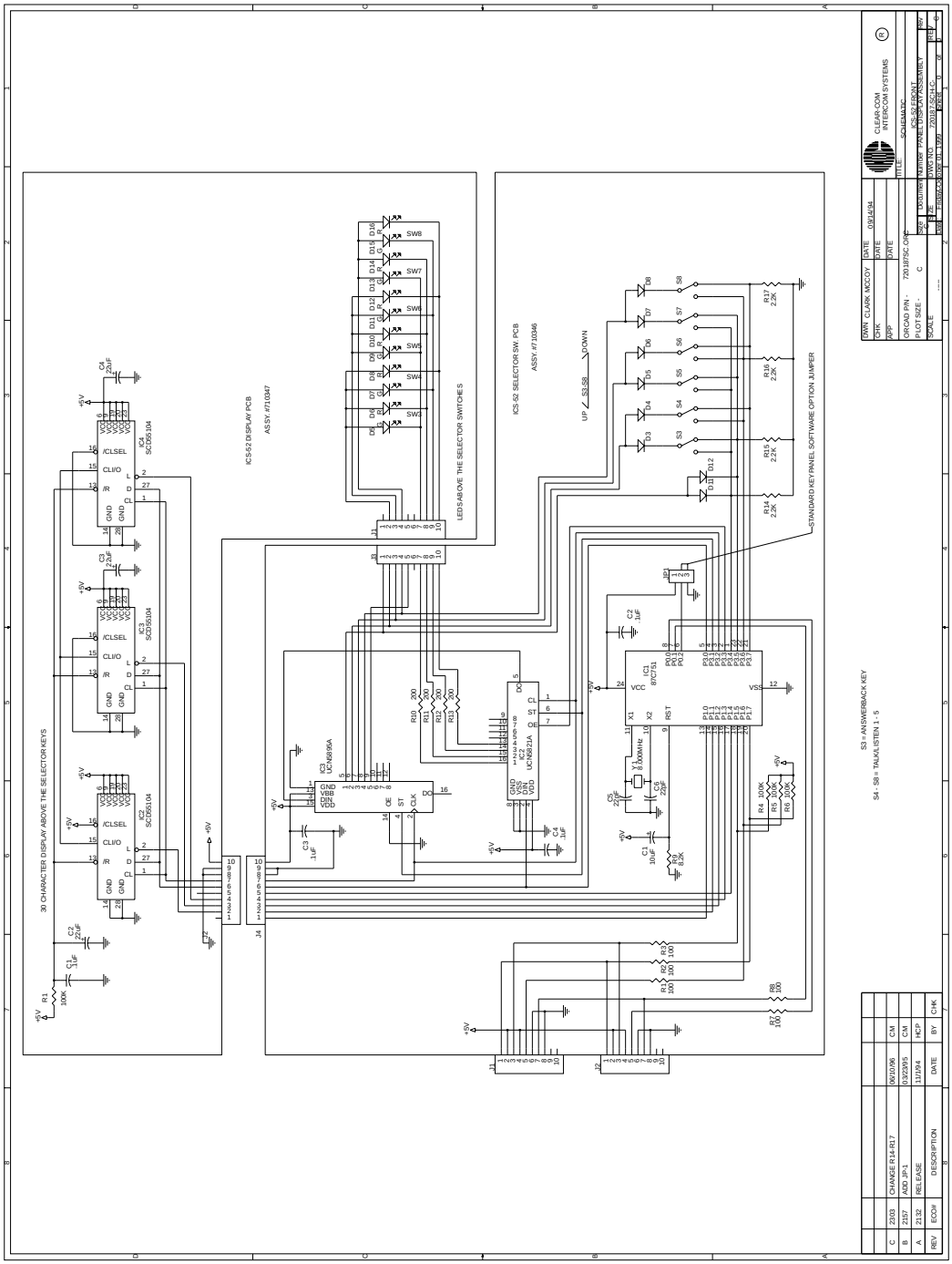


Figure 3-13: Schematic—ICS-52/52T Selector Switch Assembly Rev. C

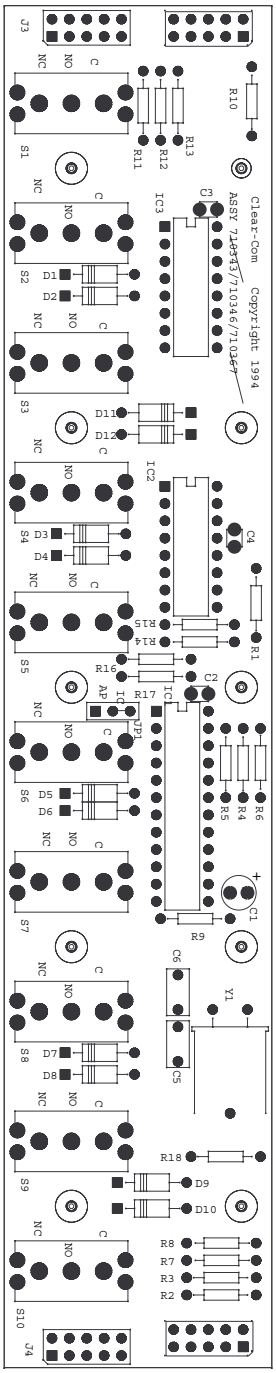


Figure 3-14: Assembly drawing—ICS-52/52T Selector Switch PCB Rev. C

BILL OF MATERIALS FOR ICS-52/52T SELECTOR SWITCH PCB

CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
22PF	CERAMIC	50	10%	150098	C5 C6
1UF	MONO	50	10%	150035	C2 C3 C4
10UF	ALUMINUM	50		150064	C1

RESISTORS & RESISTOR PACKS

Value	Power	Type	Tol.	Part #	Designator
0	OHM	JUMPER		600000	R18
00	OHMS 1/4W	CARBON FILM	5%	410071	R1 R2 R3 R7 R8
200	OHMS 1/4W	CARBON FILM	5%	410072	R10 R11 R12 R13
4.7	OHMS 1/4W	CARBON FILM	5%	410013	R14 R15 R16 R17
8.2K	OHMS 1/4W	CARBON FILM	5%	410037	R9
100K	OHMS 1/4W	CARBON FILM	5%	410024	R4 R5 R6

DIODES AND TRANSISTORS

Device	Description	Part #	Designator
DIODE	1N4148 SIGNAL 10MA 75PIV	480000	D3 D4 D5 D6 D7 D8

INTEGRATED CIRCUITS

Device	Description	Part #	Designator
710353	PROGRAMED MICRO P,87C751	710353	IC1
UCN5821A	CMOS 8 BIT SHFT REG I SINK	480164	IC2
UCN5895	CMOS 8 BIT SHFT REG I SOURCE	480210	IC3

MISCELLANEOUS

Device	Description	Part #	Designator
CRYSTAL	8.000MHZ PARALLEL HC-49U	230003	Y1
SWITCH	SP3T MOM-OFF-MOM PC MTG	510080	S3-S8

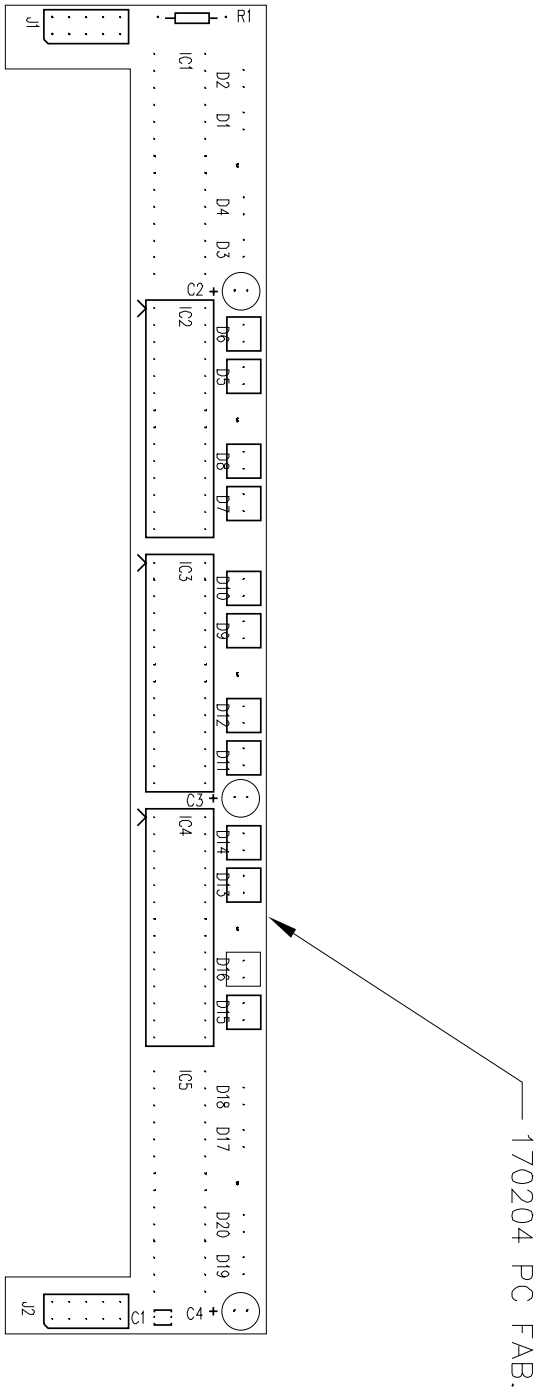


Figure 3-15: Assembly Drawing—ICS-52/52T Selector Switch LED PCB Rev. A

BILL OF MATERIALS FOR ICS-52/52T DISPLAY PCB

CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
.1UF	MON	50	10%	150035	C1
22UF	TAN	16		150032	C2 C3 C4

RESISTORS & RESISTOR PACKS

Value	Power Type		Tol.	Part #	Designator
100K	OHMS 1/4W	CARBON FILM	5%	410024	R1

DIODES AND TRANSISTORS

Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP LED	390045	D5 D7 D9 D11 D13 D15
LED	RED, ROUND, FLAT TOP LED	390044	D6 D8 D10 D12 D14 D16

INTEGRATED CIRCUITS

Device	Description	Part #	Designator
DISPLAY	10 CHARACTER LED DISPLAY	390050	IC2 IC3 IC4

MISCELLANEOUS

Device	Description	Part #	Designator
LENS	TWO COLOR DISPLAY LENS	250694	

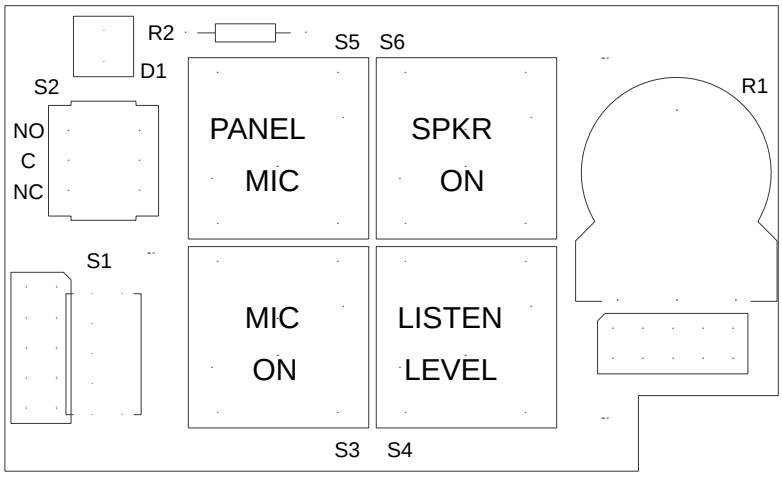


Figure 3-16: Assembly Drawing—ICS-92/92T Function Switch PCB Rev. C

BILL OF MATERIALS FOR ICS-92/ICS-92T FUNCTION SWITCH PCB

RESISTORS & RESISTOR PACKS

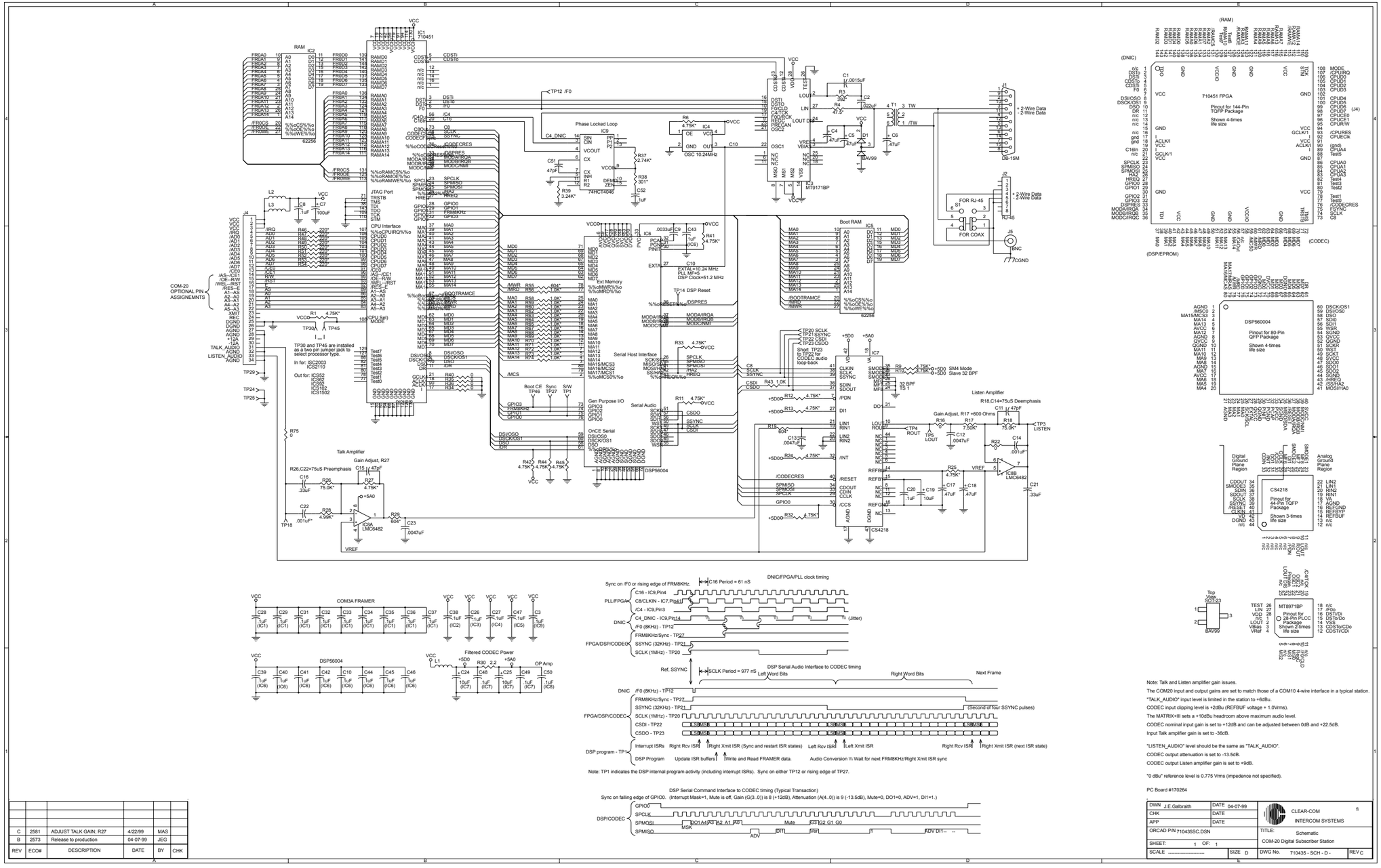
Value	Power	Type	Tol.	Part #	Designator
1K	OHMS 1/4W	CARBON FILM	5%	410010	R2
5K	OHMS	POT PC MOUNT		470072	R1

DIODES AND TRANSISTORS

Device	Description	Part #	Designator
LED	GREEN, ROUND, FLAT TOP	390045	D1

MISCELLANEOUS

Device	Description	Part #	Designator
SWITCH	PUSHBUTTON SWITCH	510089	S1
SWITCH	PUSHBUTTON, DPDT	510107	S2
SWITCH	PUSHBUTTON SWITCH W LAMP	510108	S3 S4 S5 S6



REV	ECO#	DESCRIPTION	DATE	BY	CHK
C	2581	ADJUST TALK GAIN; R27	4/22/99	MAS	
B	2573	Release to production	04-07-99	JEG	

Figure 3-17: Schematic—COM-20 Communications PCB Rev. C

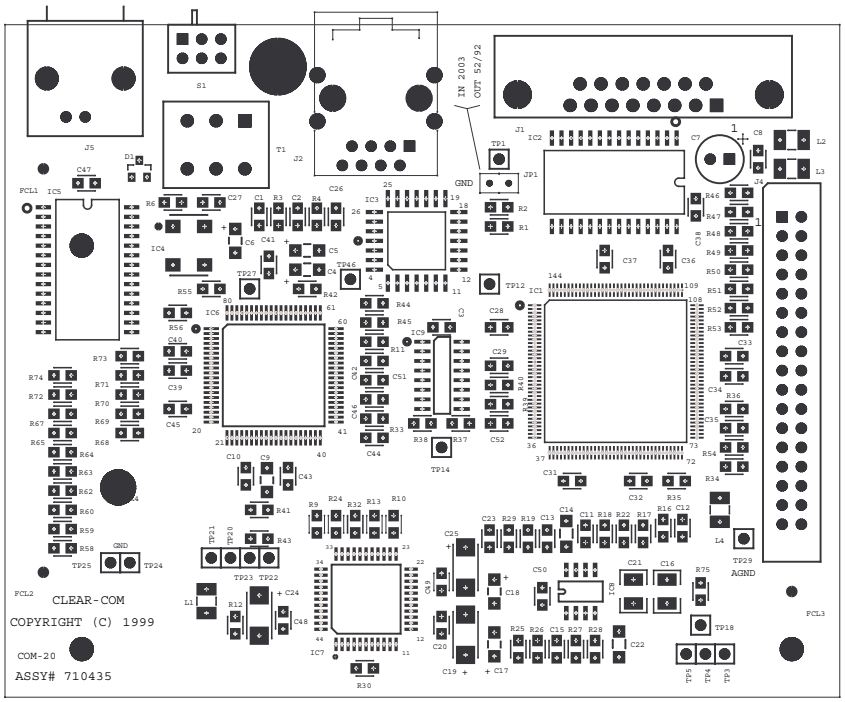


Figure 3-18: Assembly Drawing—COM-20 Communication PCB Rev. A

BILL OF MATERIALS FOR COM-20 COMMUNICATION PCB

CAPACITORS

Value	Type	Volts	Tol.	Part #	Designator
.001 uF	Ceramic Disc	SMD50V	1%	151001	C14 C22
.00 33	Ceramic Disc	SMD50V	5%	151002	C9
47 pF	Ceramic Disc	SMD50V	5%	151120	C11 C15 C51
.0015uF	Ceramic Disc	SMD50V	5%	151138	C1
.0047uF	Ceramic Disc	SMD50V	10%	151156	C12 C13 C23
.022 uF	Ceramic Disc	SMD50V	10%	151164	C2
.1 uF	Ceramic Disc	SMD50V	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	SMD25V	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 1	810010	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-92/52 PANEL

FRONT-PANEL CONTROLS AND CONNECTORS

Talk/Listen Switches:	9 (ICS-92, ICS-92T) 5 (ICS-52, ICS-52T)
Function Keys	4
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
PANEL 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 Panel	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 IFB-104 Interface Instruction Manual - 810268Z

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.