# FIM-202D
# MATRIX FIBER INTERFACE

## INSTRUCTION MANUAL

FIM-202D Matrix Fiber Interface Instruction Manual


Part Number 810385Z Rev. 3

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# IMPORTANT SAFETY INSTRUCTIONS

*Please read and follow these instructions before operating this product.*

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Only use attachments/accessories specified by the manufacturer.
10. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
13. **WARNING:** To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

**Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on this product, they warn you of the potential danger of electric shock if the main 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 2-1: Safety Symbols*

**EMC AND SAFETY**

**The FIM-202D meets all relevant CE and FCC specifications set out below:**

**EN55103-1 Electromagnetic compatibility. Product family standard for audio, video, audio-visual, and entertainment lighting control apparatus for professional use. Part 1: Emissions.**

**EN55103-2 Electromagnetic compatibility. Product family standard for audio, video, audio-visual, and entertainment lighting control apparatus for professional use. Part 2: Immunity.**

**And thereby compliance with the requirement of Electromagnetic Compatibility Directive 2004/108/EC and Low Voltage Directive 2006/95/EC**

**This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

# CONTENTS

# OPERATION

## DESCRIPTION

With a Clear-Com FIM-202D System, you can connect Clear-Com intercom panels or interfaces to the central matrix using fiber-optic cables at distances of up to 12 miles (20 km).

The system consists of one FIM-202D at the matrix-frame end and another FIM-202D unit at the matrix-panel end. Connecting the pair of interfaces with fiber rather than with the standard 4-wire twisted pair copper, gives you advantages such as increased security from electromagnetic and RF interference, flexibility in equipment placement, ease of maintenance, and often, reduced cost.

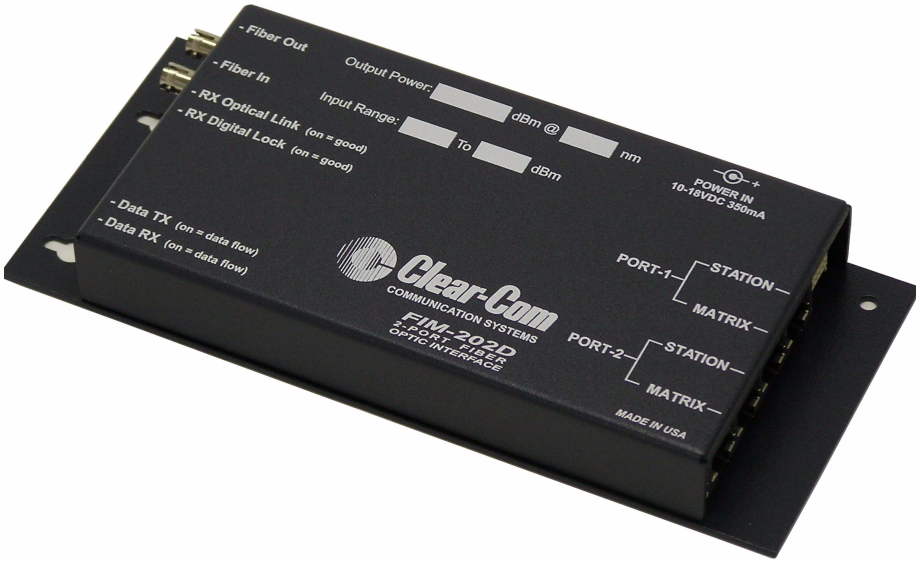


*Figure 1-1: FIM-202D Unit*

## CONNECTING INTERCOM PANELS TO THE CENTRAL MATRIX

The Clear-Com FIM-202D system transmits audio and data signals from 1 or 2 intercom panels or interfaces using easily available standard Ethernet cable to the matrix frame through the process illustrated in Figure 1-2. The illustration shows both directions of the signal flow as the system transmits in full-duplex mode.

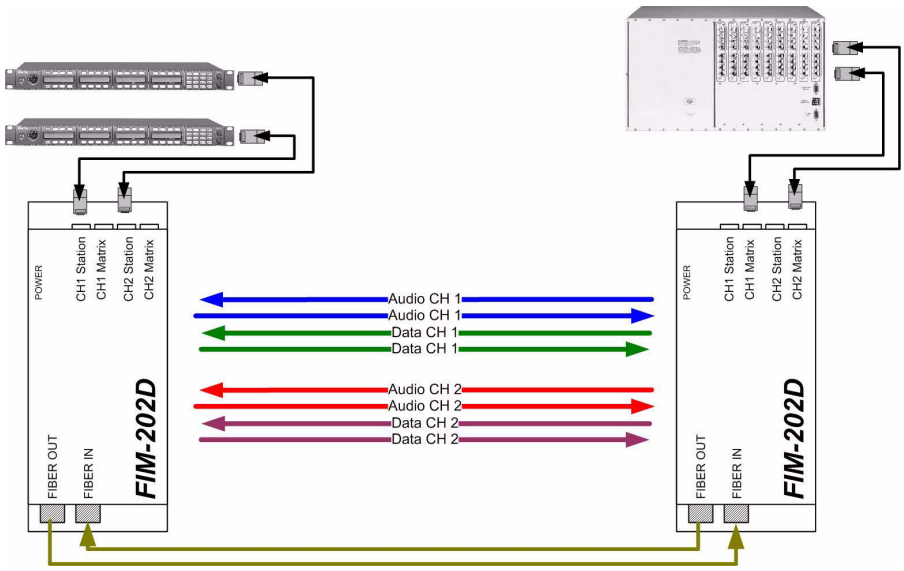


*Figure 1-2: Connecting Intercom Panels to the Central Matrix*

1. Matrix Plus 3 and Eclipse intercom panels transmit analog audio signals and digital data signals to the first FIM-202D unit via standard Ethernet copper cable terminated with RJ-45 connectors.
2. The first FIM-202D unit converts the analog audio signals to digital audio signals through an analog-to-digital converter (ADC) located on the FIM-202D unit's main circuit board.
3. The first FIM-202D unit then multiplexes (combines) the digital audio signals with the already digital data signals.
4. The first FIM-202D then converts the multiplexed digital signal into an optical signal.
5. The first FIM-202D then transmits the optical signal over fiber-optical cable to the second FIM-202D unit, where a similar but reverse process occurs to convert the signal back to its original format.
6. The second FIM-202D unit converts the received optical signal to a digital signal.
7. The second FIM-202D then "demultiplexes" (separates) the digital signal back into it's separate audio and data signals for each intercom unit.
8. The second FIM-202D then converts the digital audio signals for each intercom panel to analog audio signals by sending the signals through a digital-to-analog converter (DAC) located on the FIM-202D unit's main circuit board.
9. The second FIM-202D unit then transmits the analog audio and digital data signals for each intercom panel to the central matrix over standard Ethernet copper cable terminated with RJ-45 connectors.

| CIRCUIT | DESCRIPTION |
|---|---|
| Analog-to-Digital (A/D) Converters | High speed analog-to-digital converters for each audio channel. |
| Multiplexer | Sequentially presents two RS-422 digital inputs and two digitized audio signals from the A/D converters to the optical output driver. |
| Demultiplexer | Takes sequential digital signals from the *pin* diode and separates them into 4 separate lines: two to the D/A converters and two to the RS-422 transmitters. |
| Digital-to-Analog (D/A) Converters | High speed digital-to-analog converters for each audio channel convert the digitized audio signal back to analog audio. |

10. The central matrix receives the intercom panels' audio and data signals in the same format in which they were originally sent by the Matrix Plus 3 or Eclipse intercom panels.

***Warning: Always use extreme caution with fiber-optic equipment. Never look directly into the light port or into the end of the optical fiber while either FIM-202D unit is operating. Even if you do not see visible light, eye damage is possible.***

## CONNECTING INTERFACE MODULES TO THE CENTRAL MATRIX

With a pair of FIM-202D units you can also remotely connect Clear-Com rack-mounted Matrix interface modules to the central matrix. For example, using a Clear-Com CCI-22 dual party-line interface at one end, you can connect two independent, external 2-wire party line systems to the central matrix over large distances. Or, with a Clear-Com TEL-14 Telephone Interface Module, you can send telephone audio to the central matrix over a secured, interference-free fiber-optic line. By using a Clear-Com FOR-22 4-wire interface module, you can send 4-wire audio plus transmit keying over a fiber-optic line. You can also use a Clear-Com EF-701M to interface 2-wire Clear-Com or RTS party lines to the central matrix over a fiber-optic link.

Figure 1-3 shows a system with connected interface modules.

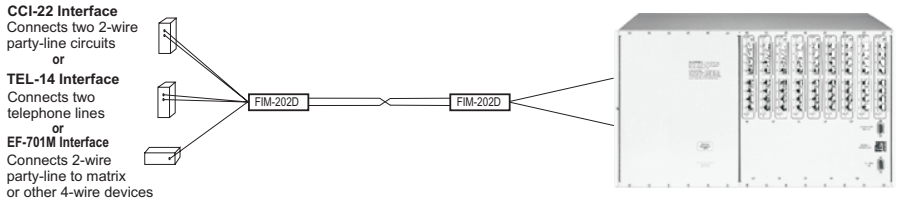


*Figure 1-3: Connecting Interface Modules to the Central Matrix*

# USING THE FIM-202D IN CONJUNCTION WITH THE EF-701M AS A STAND-ALONE PARTY LINE EXTENDER

Using a Clear-Com EF-701M at each end of a FIM-202D set, you can extend Clear-Com or RTS 2-wire party line intercoms over a fiber-optic link independent of a matrix intercom system.

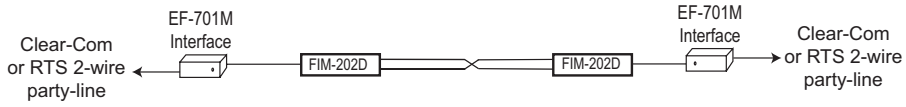


*Figure 1-4: EF-701M and FIM-202D as Party-Line Extender*

The party lines are linked by connecting the EF-701M to the FIM-202D using shielded CAT5 cable, plugging into the "CH1 Station" port on the FIM-202D and the “Matrix” port on the EF-701M. Set the Matrix/Direct switch (switch 1 on the rear of the EF-701M) to the up position and the CC/TW switch (switch 2) to the required position depending on party line type.

See figure Figure 1-5 below for an example of this setup.

Ensure that each pair of EF-701M units are connected to the same station ports on the FIM-202D interfaces i.e. CH1 Station to CH1 Station, CH2 Station to CH2 Station.

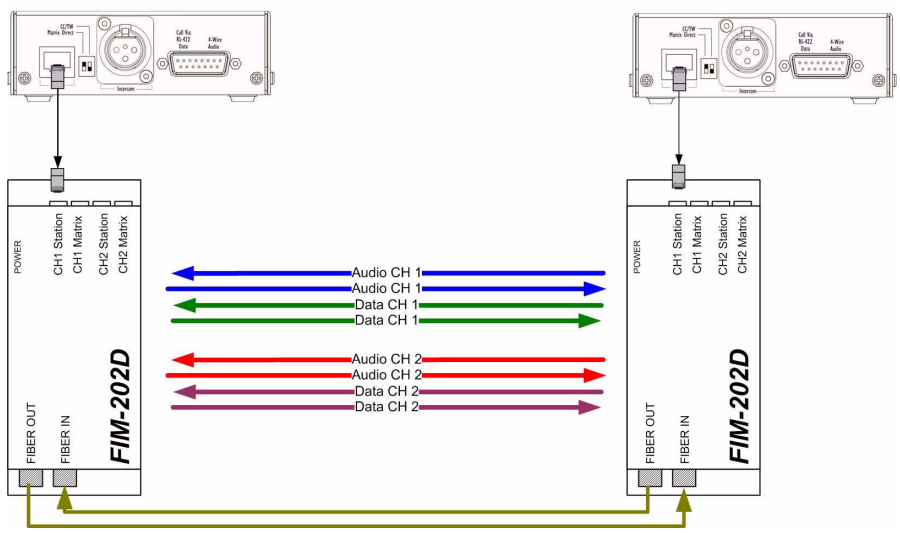


*Figure 1-5: Party Line Extension Using FIM-202D*

Both channels of the FIM-202D can be used allowing a second party line to be extended using two more EF-701M units connecting to the second “CH2 Station” ports.

## FIM-202D TWO-FIBER CONFIGURATION

In a standard two-fiber system, identical FIM-202D units are used at each location. The units both transmit at 1300 nm on ST connector “Fiber Out” and receive the 1300 nm signal on ST connector “Fiber In”. They are connected by the two fibers so that the optical output of each box is connected to the optical input of the other. In both one- and two-fiber systems, the input of channel 1 on one unit becomes the output of channel 1 on the other unit, and vice versa.

The two FIM-202D units in the two-fiber version are identical, so the units are interchangeable.

# FIM-202D FRONT PANEL CONNECTORS AND LIGHTS

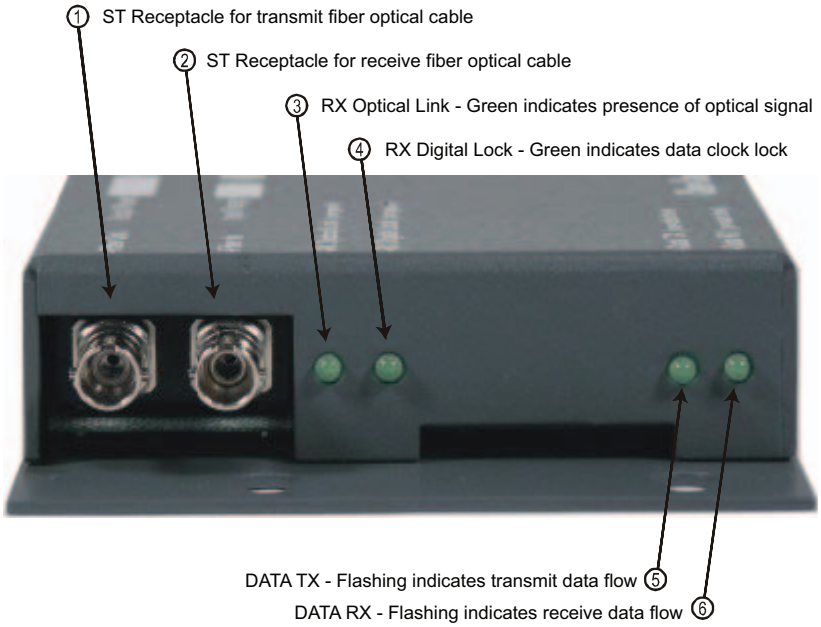


*Figure 1-6: Front Panel of FIM-202D Unit*

## Fiber Out

Fiber Optic ST type receptacle for connection of transmit Fiber Optic Cable to other FIM-202D unit.

## Fiber In

Fiber Optic ST type receptacle for connection of receive Fiber Optic Cable from other FIM-202D unit.

## RX Optical Link

On (green) indicates presence of sufficient optical signal from other FIM-202D unit for communication.

## RX Digital Lock

On (green) indicates presence of digital clock signal from other FIM-202D unit.

## DATA TX

Flashing green indicates transmit data is flowing.

## DATA RX

Flashing green indicates receive data is flowing.

# FIM-202D REAR PANEL CONNECTORS

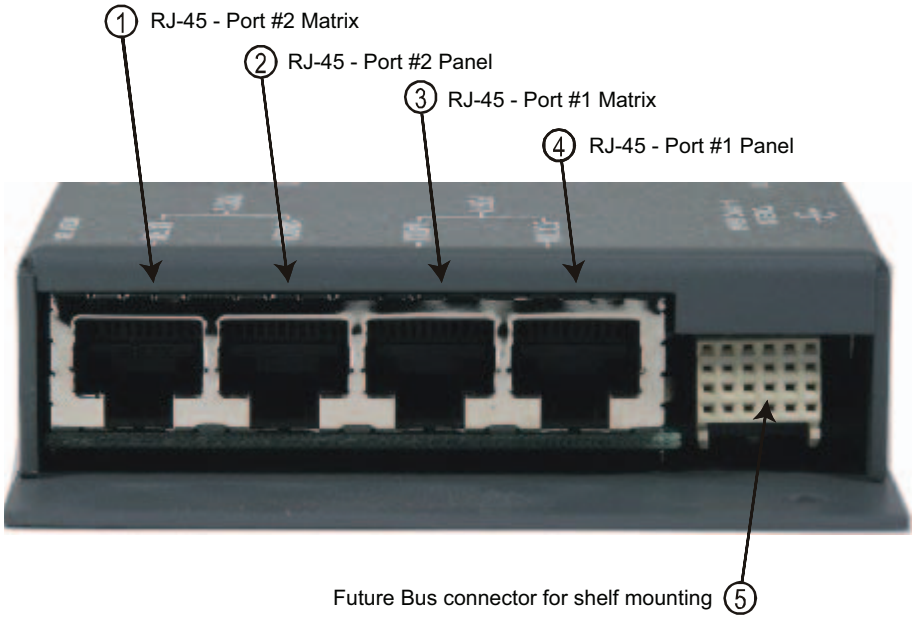


*Figure 1-7: Rear Panel of FIM-202D Unit*

## Port #2 Matrix

For Matrix end of FIM-202D link. Connect RJ-45 Ethernet CAT5 cord from here to Matrix port.

## Port #2 Panel

For Panel end of FIM-202D link. Connect RJ-45 Ethernet CAT5 cord from here to Panel or Interface.

## Port #1 Matrix

For Matrix end of FIM-202D link. Connect RJ-45 Ethernet CAT5 cord from here to Matrix port.

## Port #1 Panel

For Panel end of FIM-202D link. Connect RJ-45 Ethernet CAT5 cord from here to Panel or Interface.


*Figure 1-8: FIM-202D Shown with Wall Mounted Power Supply*

# 2 INSTALLATION

## UNPACKING

When you receive your Clear-Com FIM-202D System, check to make sure you have received all components of the system. The following items make up a Clear-Com FIM-202D:

• FIM-202D multiplexer/demultiplexer unit

• External power supply

• You will require two FIM-202D units to complete a circuit.

Inspect the units for mechanical damage. Inspect all electrical connectors for bent or damaged pins and latches. Report any damage to the carrier and to Clear-Com Communication Systems.

Leave the protective plastic caps on the optical connectors until it is time to attach the fibers to the units.

## SELECTING AND INSTALLING FIBER-OPTIC CABLE

The person installing the FIM-202D units is responsible for providing the fiber optic cable runs. The FIM-202D will operate with either Single-Mode or Multi-Mode Fiber Optic Cable. You will experience the best distance performance when using Single-Mode cable as shown in Table 2-1.

| FIBER CORE DIAMETER | MAXIMUM FIBER LENGTH |
|---|---|
| 50 microns (multimode) | 3 miles (5 km) |
| 62.5 microns (multimode) | 2 miles (3 km) |
| 8 microns (single mode) | 12 miles (20 km) |

*Table 2-1: Maximum Fiber Lengths*

Mark or tag the optical fibers when they are pulled, carefully avoiding the fiber tip, so that their identity is known at both ends. If there is confusion about the identity of the two fibers, shine a flashlight at one end of the fiber and look for light at the other end.

***Warning:Do not use the FIM-202D optical output to identify cables. Never look directly into the end of the optical fiber while either end of the system is operating. Even if you do not see visible light, eye damage is possible.***

Inspect the fiber ends and clean them with clean, dry compressed air or with Kim-Wipes that have been saturated with isopropyl alcohol. Fingerprints or other dirt on the optical connector end surfaces will reduce the received optical signal level.

# CONNECTING FIBER-OPTIC CABLE TO THE FIM-202D


*Figure 2-1: ST Optical Connections on an FIM-202D Unit's Front Panel*

Refer to Figure 2-1 before connecting the optical fiber to the ST optical connectors on the FIM-202D unit's front panel.

The FIM-202D is compatible with industry standard ST-type connectors. You may use installed backbone cables or dedicated cables with it.

Always follow the connector manufacturer's directions when fastening a connector to the cable.

On a two-fiber system, connect the cables so that:

- transmitter ST **"Fiber Out"** at the near end connects to receiver ST **"Fiber In"** at the far end and
- transmitter ST **"Fiber Out"** at the far end connects to receiver ST **"Fiber In"** at the near end.

Figure 2-2 illustrates the entire wiring scheme for the FIM-202D system.

# CONNECTING AUDIO/DATA CABLES TO THE FIM-202D

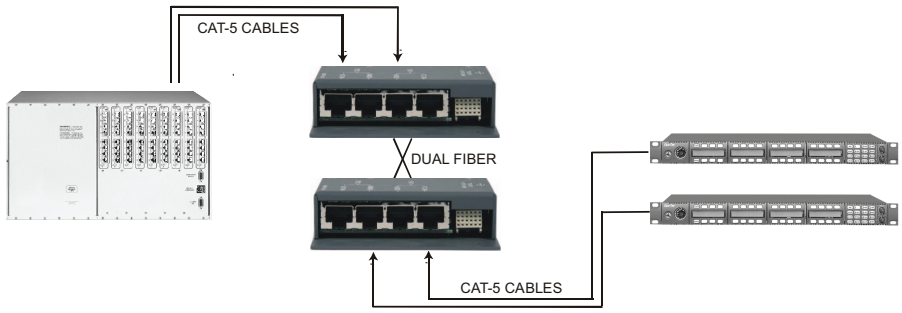


*Figure 2-2: Wiring an FIM-202D to intercom panels or interfaces*

RJ-45 connectors on the FIM-202D unit's rear panel connect the unit to audio and data inputs and outputs as shown in Figure 2-2. Figure 2-3 illustrates the standard Ethernet type CAT-5 cable pinout configuration. The maximum length for CAT-5 cables is 10,000 feet (3 km).

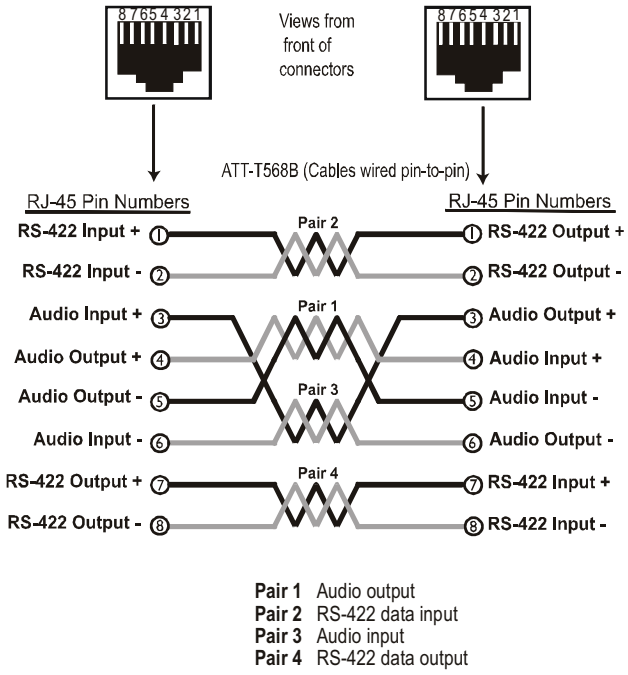


*Figure 2-3: CAT-5 Cable Pinout Diagram*

## COMPATIBILITY WITH FIM-102D INTERFACES

The FIM-102D and FIM-202D interfaces are not fully compatible. If FIM-202D and FIM-102D units are used together to create a link this will result in an audio level offset of 5dB.

# 3 MAINTENANCE

## TROUBLESHOOTING TIPS

Listed on the next page are some of the more common problems that you may experience, their possible causes and suggested solutions.

| SYMPTOM | POSSIBLE CAUSE | |
|---|---|---|
| No operation, indicators all off. | No power. | Make sure the external power supplies are plugged in to a suitable power outlet and to the power receptacle on the FIM-202D |
| No operation, RX Optical Link and RX Digital Lock leds are lit. | Optical communications failure. | Check for broken or disconnected fibers. Check to see if the FIM-202D at the other end is operating correctly. |
| FIM-202D units are operating correctly, but connected panels or interfaces are not. | | Check RJ-45 cables or Matrix configuration. |

If you are unable to resolve a problem with your FIM-202D unit, call Clear-Com Intercom Systems at (510) 337-6600 and ask for the Service Department. See the Warranty Chapter for more information.

## PREVENTIVE MAINTENANCE

Every two years verify the adequacy of optical power at the far end of each optical fiber with an optical power meter.

# 4 SPECIFICATIONS

## FIM-202D TECHNICAL SPECIFICATIONS

0 dBu is referenced to 0.775 volts RMS

### Audio

| | |
|---|---|
| Transmission Method | Digital, TDM, 24-bit, 48k samples/sec |
| Input Impedance | 600 Ohms balanced |
| Output Impedance | 30 Ohms balanced |
| Maximum Input Level (600 Ohms) | +18 dBm (peak) |
| Maximum Output Level (from 30 Ohms balanced) | +18 dBm into 600 Ohms |
| Frequency Response (@0 dBm) from 50 Hz to 15 kHz | ±0.2 dB |
| Total Harmonic Distortion + Noise from 20 Hz to 20 kHz (@ +8 dBm) | <0.2% |
| at 1 kHz (@ +18 dBm) | <0.007% |
| CMRR (Common Mode Rejection Ratio) | 0.2 |
| Signal to Noise Ratio, unweighted, 20 Hz - 20 kHz, ref. to +18 dBm clip level | >80 dB |
| Aggregate Digital Data Rate | 147.456 MB |

### Mechanical/Electrical/Environmental

| | |
|---|---|
| Connectors | RJ-45; coaxial |
| Optical Connectors | ST-type |
| Power Connector | 2.5mm Circular |
| Input Voltage Range | 9-18 Vdc |
| Power Consumption (@13.8V per end, all channels at full level) | <5 watts |
| Temperature Range | –40° to 65°C |
| Humidity Range | 0 to 95% non-condensing |
| A/C Adapters | supplied |

### Electro-Optical System Margin Data

| | |
|---|---|
| Operating Wavelength | 1300 nm |
| TX output into cable | -10 to -15 dBm |
| RX sensitivity | ≤ 34 dBm |
| OP Margin Single Mode | 19 dBm |
| OP Margin Multi Mode | 12 dBm |

## Matrix Data Communications (Frame-to-Panel Digital Data)

| | |
|---|---|
| Transmission Rate | RS-422, Balanced TTL Levels, 0 to 150 kBits/sec |
| Jitter | 1.12 msec* |

*Higher rates possible dependent upon user system jitter tolerance.

## Power Requirements

| | |
|---|---|
| Voltage | 9-18 VDC |

***Warning:Absolute maximum voltage is 18 VDC. Equipment damage may occur at higher voltages.***

### NOTICE ABOUT SPECIFICATIONS

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

# 5 GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

# ECLIPSE MANUALS

The following manuals are available covering Eclipse products and accessories.

## SOFTWARE MANUALS

Eclipse Configuration System (ECS) Instruction Manual - 810299Z

Eclipse Logic Maestro Instruction Manual - 810414Z

Eclipse Production Maestro Quick Start Guide - 810409Z

Eclipse Production Maestro Installation and User Guide - 810410Z

Eclipse DECTSync Manual - 810412Z

Eclipse Host Computer Interface (HCI) Manual - 810413Z

## HARDWARE MANUALS

Eclipse Omega Matrix Instruction Manual - 810290Z

Eclipse Median Matrix Instruction Manual - 810347Z

Eclipse PiCo Matrix Instruction Manual - 810348Z

Eclipse-32 Matrix Instruction Manual - 810315Z

Eclipse Matrix Installation Manual - 810298Z

Eclipse Upgrade Reference Manual - 810377Z

Eclipse V-Series Panels User Manual - 810365Z

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

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

Eclipse TEL-14 Telephone Interface Instruction Manual - 810308Z

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

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

DIG-2 Digital Interface Instruction Manual - 810311Z

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

Eclipse AES-6 Digital Interface Instruction Manual - 810383Z

Eclipse BAL-8 Isolation Interface Instruction Manual - 810403Z

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

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

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

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

Eclipse FIM-102 Fiber Interface Instruction Manual - 810319Z

Eclipse FIM-108 Fiber Interface Instruction Manual - 810291Z

Eclipse 4000 Series II Panels Installation Guide - STA0530Z

Eclipse 4000 Series II Panels User Guide - STA0531Z

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

Eclipse ICS 102/62 Panels Instruction Manual - 810302Z

Eclipse ICS 2003 Panel Instruction Manual 810303Z

Eclipse ICS 92/52 Panels Instruction Manual - 810301Z

Eclipse i-Station Instruction Manual - 810305Z

Eclipse ICS-21 Speaker Panel Instruction Manual - 810263Z

Eclipse ICS-22 Speaker Panel Instruction Manual - 810264Z

Eclipse ICS-24 Headset Panel Instruction Manual - 810265Z

Eclipse Digital Wireless Beltpack Instruction Manual - 810376Z

# LIMITED WARRANTY

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

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

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

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

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

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

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

   c) Standard Warranty Period (by Product):

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

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

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

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

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

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

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

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

e) Standard Warranty Period Start Date

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

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

f) Invalidation of Warranty

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

g) Software Updates

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

h) Software Upgrades

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

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

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

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

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

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

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

# TECHNICAL SUPPORT & REPAIR POLICY

# NOVEMBER 1, 2008

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

## TECHNICAL SUPPORT POLICY

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

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

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

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

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

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

c) For Technical Support:

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

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

ii) Europe, the Middle East and Africa:

| | |
|---|---|
| Hours: | 0800 - midnight Central European Time |

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

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

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

e) Support for Distributor and Dealer Sales

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

f) Support for Direct Sales

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

## RETURN MATERIAL AUTHORIZATION POLICY

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

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

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

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

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

f) Advance Warranty Replacements (AWRs);

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

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

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

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

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

(2) Europe, the Middle East and Africa:

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

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

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

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

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

## REPAIR POLICY

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

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

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

d) Return for Repair

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

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

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

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

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

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

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

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

vi) For requesting a Repair Authorization number:

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

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

(2) Europe, the Middle East and Africa:

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

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