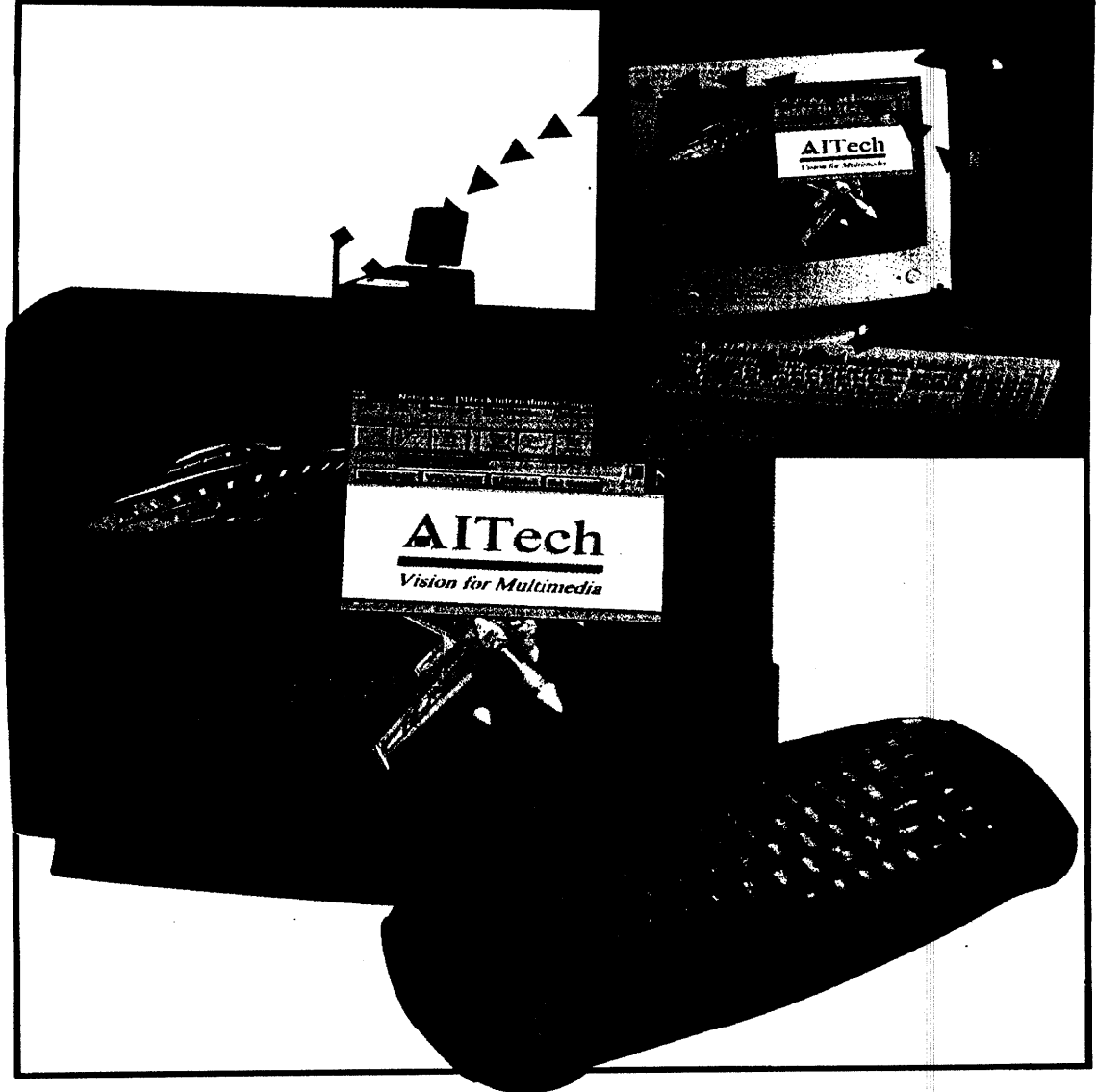


AI Tech

Vision for Net Media

PC/TV AIRLINK II



USER'S GUIDE
for IBM Compatibles

AITech
Vision for Net Media

PC/TV AirLink II

User's Guide

for IBM Compatibles

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PC/TV AirLink II User's Guide

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INTRODUCTION

AI Tech PC/TV AirLink II™ is a wireless PC-to-TV digital scan converter system capable of transmitting audio/video signals through walls up to 70 feet away. This 2.4 GHz transmitter/receiver scan converter system enables you to control your PC with a remote keyboard/mouse, and view everything on a TV monitor. These frequencies do not interfere with the crowded 900 MHz band used by many cordless telephones and other household devices.

This section describes uses for the AirLink system, product features, package contents, system requirements, document organization, and document conventions.

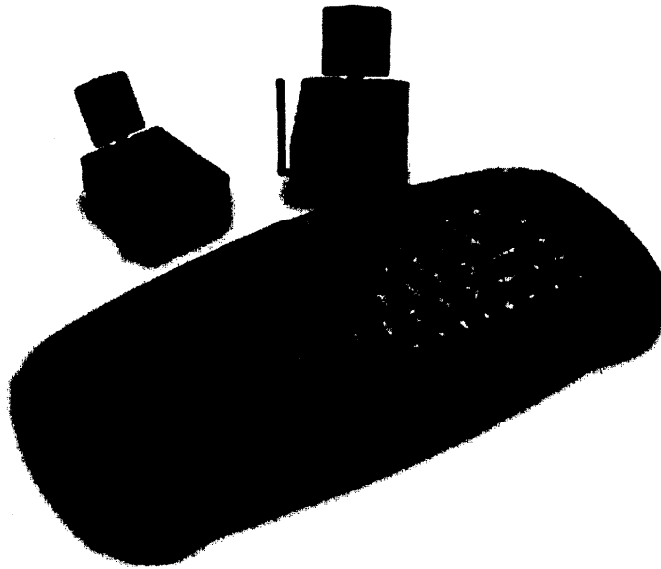
The AirLink system can be used for

- Controlling your PC from any TV
- Surfing the Internet using a TV
- Playing PC-based games
- Running children's educational software
- Giving business presentations
- Viewing video movies without moving VCR, laserdisc player or running messy cables
- Viewing cable or satellite programs on any TV, or listening to stereo-quality music from your receiver on any powered speakers in or outside of the home

The AirLink system also offers safety and security for home or office:

- Monitor sleeping babies, playing children, the elderly or disabled with a camcorder
- Use a camera or miniature CCD camera to view on your TV who is outside the door

Product Features



PC/TV AirLink Transmitter, Receiver, and (optional) Wireless Keyboard

Product Features

The AirLink system offers the following:

- One 2.4 GHz transmitter
- One 2.4 GHz receiver
- 21.34 meters (70 feet) range through obstacles,
30.48 meters (100 feet) direct line of sight
- Directional dipole A/V antennas
- Four different operating channels
- Optional RF wireless keyboard with thumbpad mouse
- A/V cabling
- Two 12 VAC adapters
- Family friendly software bundle

Package Contents

Ensure the following items are included in the package:

- One 2.4 GHz transmitter
- One 2.4 GHz receiver
- Two 12 V AC power adapters & two A/V RCA cables
- One mini-stereo to two RCA connector cable
- VGA Y-cable
- Screen Control Utility and True-TV size driver installation disk
- User's guide
- Four AA sized batteries

At this time, please complete the warranty registration card and return it to AITech to guarantee efficient warranty service and notification of new product information.

System Requirements

System Requirements

Note: *Before installing PC/TV AirLink II, your computer display resolution may be set as high as 1024x768 at 70 Hz (NTSC or PAL) to achieve for optimal video quality on your TV.*

Minimum computer specifications for the AirLink system to work properly:

- IBM-compatible PC (386, or higher)
- Windows 95 or higher operating system
- VGA adapter, capable of outputting 640x480 resolution at 60 Hz vertical refresh (NTSC or PAL)
- Available PS/2 keyboard/mouse ports (for optional wireless keyboard's RF receiver)
- 16 bit sound card (optional-required for sending audio from PC)
- CD-ROM drive (for CD and Video operation)
- Video display device(s) (such as a TV, VCR connected to a TV, or video monitor) with RCA/video input ports

Document Organization

This guide contains the following information:

- Chapter 1, "Getting Started," describes getting started and installing the AirLink II system hardware and software.
- Chapter 2, "Operating AirLink," discusses operation of the AirLink II system including VGA compatibility, software control, transmitter and receiver, and orienting units.
- Appendix A, "Specifications and Interface," provides specifications and signal interconnection information for the AirLink system.
- Appendix B, "Multimedia Basics for AirLink," provides information on resolution, image, quality, and converting VGA to TV.
- Appendix C, "Troubleshooting and Support," describes basic troubleshooting to help you resolve problems you may have with the AirLink system. Technical Support information is also provided.
- Appendix D, "Glossary," provides terms and definitions particular to this product.
- Appendix E, "Licensing and Warranties," documents the software license agreement, hardware and software warranties, and information about FCC radio frequency interference.

Document Conventions

This guide uses the following standard AITech conventions to convey instructions and information:

- Numbered steps denote tasks you perform in the order listed.
- Bulleted lists denote features or options.
- Menu paths appear as selected, separated by a forward slash.
For example:

Choose Start / Settings / Control Panel / Display / Settings.

Special text formats use the following conventions:

- Menu names and other text that appears on the screen or on hardware labels appears in **BOLD UPPERCASE** font. For example:
Click **OK**.
- Path names, file names, and text you enter are shown in monospace font. For example:
The default install directory is **c: \AITECH**.
- Text you must enter as a command is shown in **BOLD UPPERCASE MONOSPACE** font. For example:
C:\>COPY A:\MOVESCR.COM C:\AITECH <ENTER>
- Keyboard keys are shown in **UPPERCASE MONOSPACE** font.
For example:
Press **ALT+A**.

Notes, Cautions, and Warnings appear throughout the manual. Format and contents are as follows.

Note: *Used when information is sufficiently important to require special attention.*

Caution: *Used when information is critical to avoid instrument damage.*

Warning: *Used when information is critical to avoid personal injury when an electrical hazard is present.*

1

GETTING STARTED

This chapter describes how to get started using the AirLink II system, including

- Components necessary for connection configurations
- Initial hardware installation
- Completing installation

Connection Configurations

Table 1-1 lists the equipment necessary for the various types of connections possible with the AirLink II system. PC and notebook "wireless" connections are discussed in Installing AirLink Hardware. For information about the "wired" connection, see Stand Alone "Wired" Connection on page A-8.

Connection Configurations

Table 1 -1. Connection Configurations

AirLink System Parts to Use	PC with Transmitter and Receiver ("Wireless")	Notebook Computer with Transmitter and Receiver ("Wireless")	Notebook Computer with Transmitter as Stand Alone Scan Converter ("Wired")
Transmitter	Yes	Yes	Yes
Receiver	Yes	Yes	—
Wireless Keyboard	Yes	—	—
IR Keyboard Receiver	Yes	—	—
IR Extender	Yes	—	—
A/V Cabling	Yes	Yes	Yes
Audio Cable	Yes	Yes	—
VGA Y-Cable	Yes	Yes	Yes

Installing AirLink II Hardware

This section describes how to connect the AirLink II system hardware:

- Transmitter to PC or notebook
- Receiver to video display device
- Keyboard

When AirLink II is connected between your computer (PC or notebook) and monitor, it must remain powered on (that is, leave the 12V DC adapters attached) or your VGA monitor will lose its display. When the VGA signal is no longer being sent, AirLink automatically switches off while retaining its last settings.

Transmitter and Receiver Connections and Functions

Figure 1-1 through Figure 1-3 illustrate the connections and functions of the AirLink transmitter and receiver.

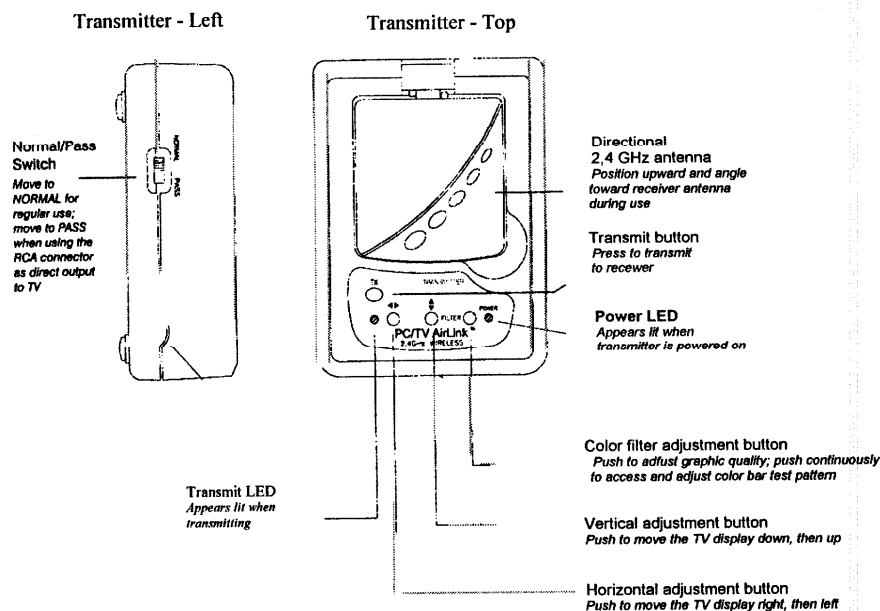


Figure 1 -1Top and left view of the AirLink II transmitter.

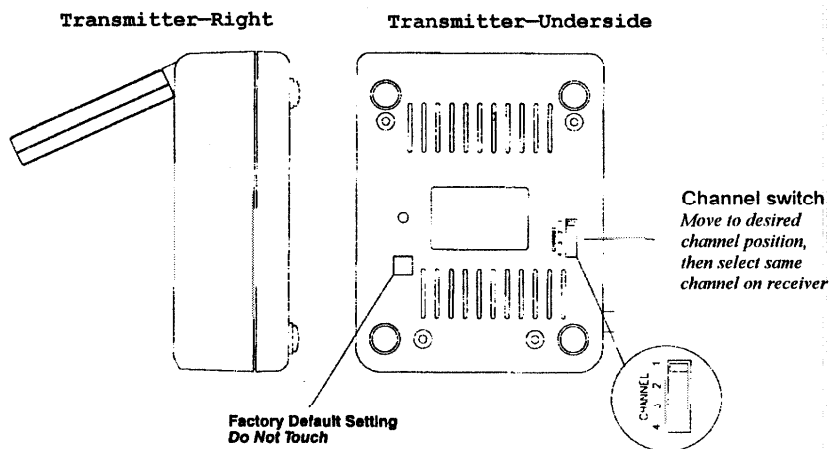


Figure 1-2 Right and underside view of AirLink II transmitter..

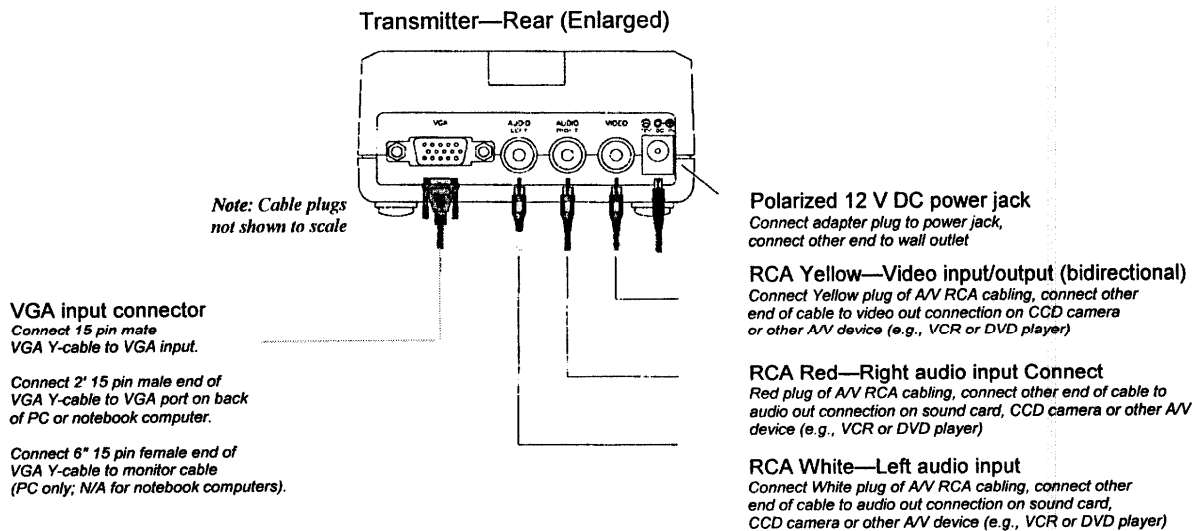


Figure 1-3 Rear view of AirLink II transmitter.

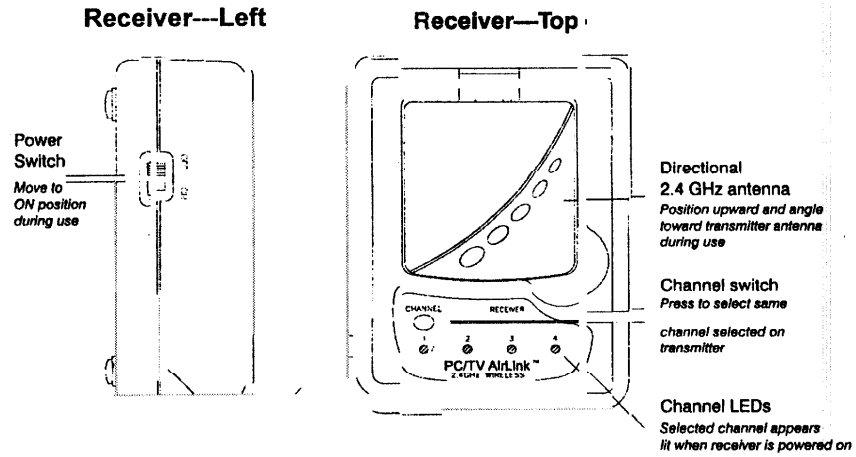


Figure 1-4 Top and left view of AirLink II receiver.

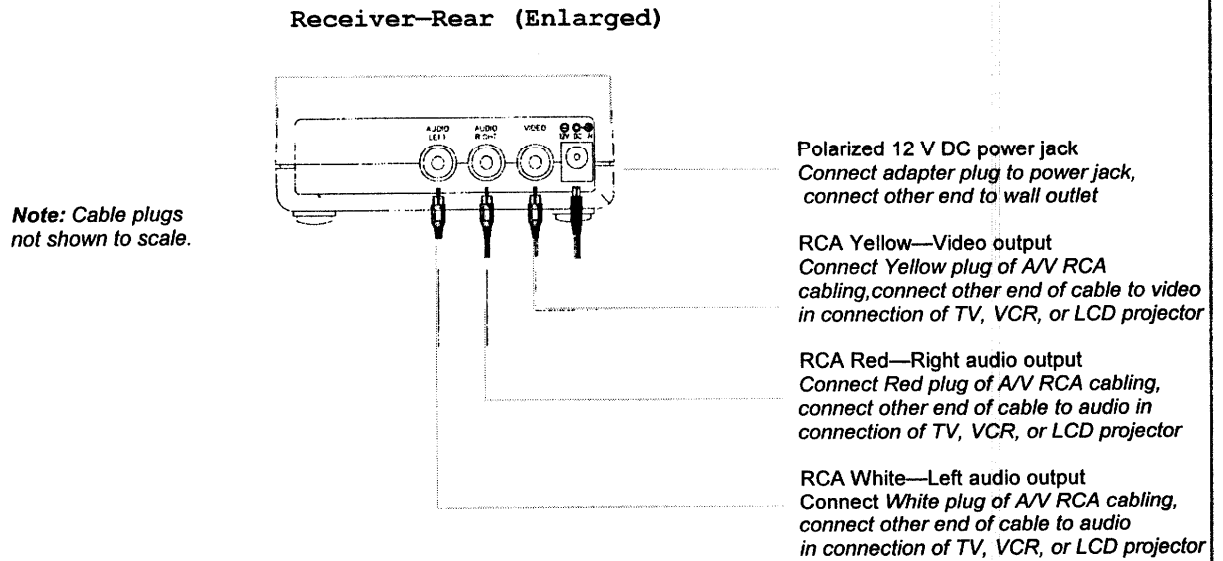


Figure 1-6 Rear view of AirLink II receiver.

A/V RCA cabling is not needed for the transmitter unless connecting to another input source at the transmitter end, such as a DVD drive, or when not using the system with a PC, such as to send A/V signals.

Refer to Appendix A, "Specifications and Interface," for additional information on AirLink II system connections.

Installation Diagrams

Figure 1-7 and Figure 1-8 illustrate the front and back views for connecting the AirLink II system with a PC. Figure 1-9 and Figure 1-10 illustrate the front and back views for connecting the AirLink II system with a notebook computer.

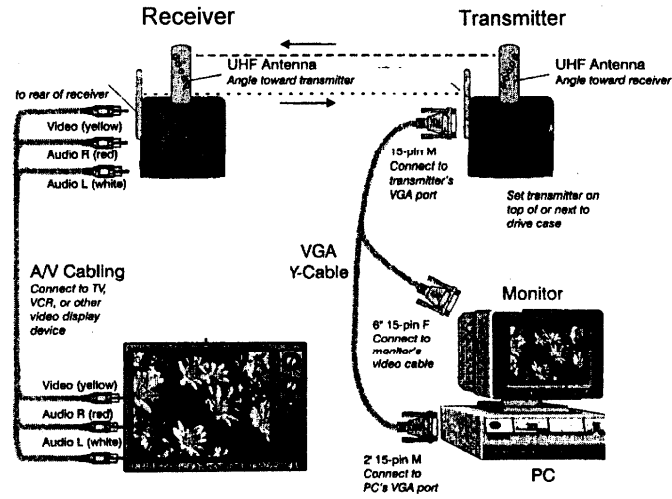


Figure 1-7 System Hookup to PC—Front View

Installing AirLink II Hardware

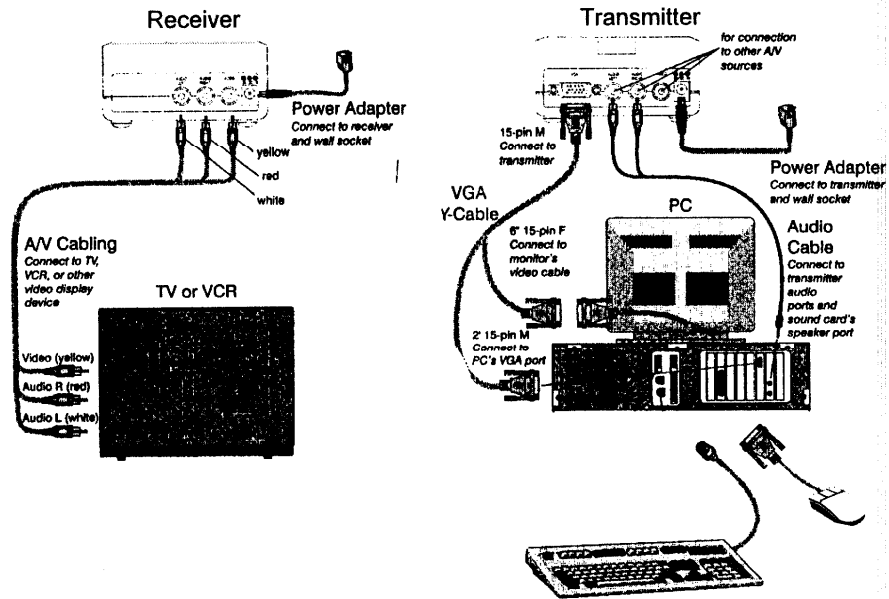


Figure 1-8 System Hookup to PC—Rear View

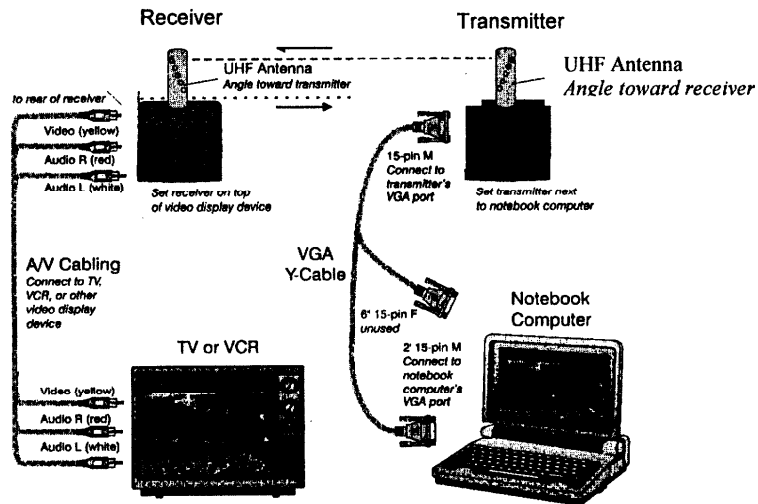


Figure 1-9 System Hookup to Notebook Computer—Front View

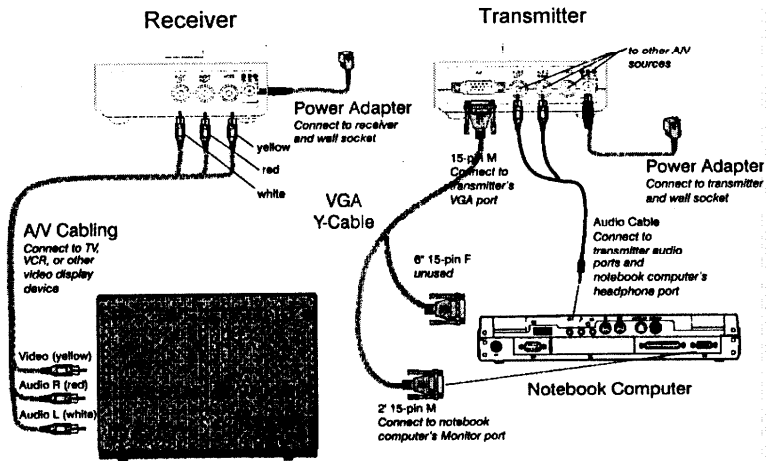


Figure 1-10 System Hookup to Notebook Computer—Rear View

Transmitter and Wireless Keyboard Installation to PC

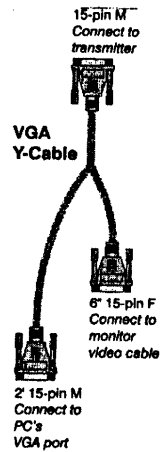
Warning: *Electrical hazard present. Power to all devices must be off before connecting.*

Should you need to replace the 12 V power adapter for transmitter or receiver, new adapter must match the transmitter or receiver voltage and polarity. Use of the wrong voltage and/or polarity can destroy the AirLink II system.

The following describes connecting the AirLink II transmitter to a PC (Figure 1-7 and Figure 1-8).

To connect the Transmitter and Wireless Keyboard to a PC

1. Power off computer and transmitter.
2. Connect 15 pin male VGA Y-cable to transmitter's VGA port.
3. Disconnect monitor video cable from back of computer.
4. Connect 15 pin male VGA Y-cable (2 ft section) to 15 pin female connection of computer (MONITOR).
5. Connect 15 pin female VGA Y-cable (6 in section) to 15 pin male video cable attached to monitor.
6. Connect mini stereo end of audio cable to sound card's speaker port.
7. Connect RCA ends of audio cable to transmitter's AUDIO LEFT and AUDIO RIGHT ports.
8. Angle directional antenna toward receiver location.
9. Using the channel selection switch (located on underside of the transmitter), select a channel.



10. Set **NORMAL/PASS** switch (located on the left side of the transmitter) to **NORMAL**.

*Note: Transmitter RCA A/V connections are bidirectional (input/output). When set to **NORMAL**, RCA port receives (input) A/V signals from any source and transmits them to the receiver. When set to **PASS** (output), RCA port transmits A/V signals from the PC VGA card to the transmitter's **RCA VIDEO** port.*

11. Connect 12 V DC power adapter to transmitter and power on transmitter.

Note: If VGA input and A/V input are connected at the same time, the transmitter automatically switches to VGA input and disables the A/V input. To use the transmitter only as an A/V program sender, disconnect VGA cable.

12. Press transmit (TX) button (located on top of transmitter).

13. Power on computer.

Proceed to Receiver Installation to Video Display Device on page 1-13.

Transmitter Installation to Notebook

Warning: Electrical hazard present.. Power to all devices must be off before connecting.

Installing AirLink II Hardware

Transmitter Installation to Notebook

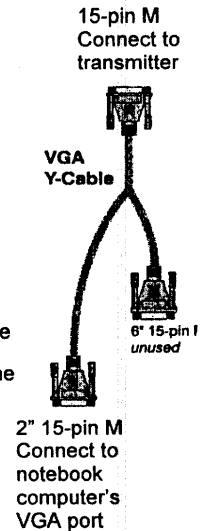
Warning: *Electrical hazard present. Power to all devices must be off before connecting.*

Cautions: *IR antenna is fragile. Handle with care and grasp only at its base to position upward.*

Should you need to replace the 12 V power adapter for transmitter or receiver, new adapter must match the transmitter or receiver voltage and polarity. Use of the wrong voltage and/or polarity can destroy the AirLink II system. The following describes connecting the AirLink II system to a notebook computer (Figure 1-9 and Figure 1-10).

To connect the transmitter to a notebook computer

1. Power off computer and transmitter.
2. Connect 15 pin male VGA Y-cable to transmitter.
3. Connect 15 pin male end of VGA Y-cable (2 foot section) to 15 pin female connection on notebook computer (MONITOR). It is unnecessary to take any action with the 6 inch section, as it is for PC use only.
4. Connect mini din end of audio cable to the notebook computer's HEADPHONE port.
5. Connect RCA ends of audio cable to transmitter's AUDIO LEFT and AUDIO RIGHT ports.
6. Angle directional antenna toward receiver location.
7. Grasp IR antenna at its base and position upward at 90 degree angle.
8. Using the channel selection switch (located on underside of the transmitter), select a channel.



Installing AirLink II Hardware

9. Set **NORMAL/PASS** switch (located on the left side of the transmitter) to **NORMAL**.

Note: *Transmitter RCA A/V connections are bidirectional (input/output). When set to **NORMAL**, RCA port receives (input) A/V signals from any source and transmits them to the receiver. When set to **PASS** (output), RCA port transmits A/V signals from the PC VGA card to the transmitter's RCA **VIDEO** port.*

10. Connect 12V DC power adapter to transmitter and power on transmitter.

Note: *If VGA input and A/V input are connected at the same time, the transmitter automatically switches to VGA input and disables the A/V input. To use the transmitter only as an A/V program sender, disconnect VGA cable.*

11. Press transmit (TX) button (located on top of transmitter).

12. Power on computer.

Proceed to Receiver Installation to Video Display Device.

Receiver Installation to Video Display Device

Warning: *Electrical hazard present. Power to all devices must be off before connecting.*

Should you need to replace the 12 V power adapter for transmitter or receiver, new adapter must match the transmitter or receiver voltage and polarity. Use of the wrong voltage and/or polarity can destroy the AirLink II system.

Receiver and video display device (such as a TV or VCR connected to a TV) hookup (Figure 1-7 through Figure 1-10).

To connect the receiver to a video display device

1. Power off video display device and receiver.

Note: *If connecting to a TV that doesn't have RCA A/V inputs, use the TV's terminal lug connections (see Appendix A, "Specifications and Interface").*

2. Using A/V RCA cable, connect yellow (**VIDEO**), red (**AUDIO RIGHT**), and white (**AUDIO LEFT**) plugs to corresponding colored ports on receiver.

Installing Airlink II Hardware

3. Connect other end of cable to video display device (yellow to **VIDEO IN**, red to **AUDIO RIGHT**, and white to **AUDIO LEFT**).
4. Angle directional antenna toward transmitter location (point side marked "Backside" away from transmitter).
5. Grasp IR antenna at its base and position upward at 90 degree angle.
6. Using the channel selection button (located on topside of the receiver), select same channel as set on transmitter.
7. Set **POWER** switch (located on the left side of the receiver) to *On*.
8. Connect 12 V DC power adapter to receiver and power on receiver.
9. Power on computer and video display device (such as a TV or VCR connected to a TV).
10. Set TV and VCR to correct video line (typically done by way of a setup menu built into your TV or VCR, using the TV or VCR's remote control). Refer to your TV and VCR instruction manual for location of these settings.

Note: *TV default is broadcast signal, therefore this step must be done correctly to receive video signals.*

Completing Installation

1. Should no computer image appear on your TV monitor, try changing the channel you first selected with the channel selection switch located on the bottom of the transmitter and top of the receiver. Other solutions are provided in Appendix C, "Troubleshooting and Support."
2. Usually notebook computers are not capable of maintaining a simultaneous (dual) display on both the TV and LCD display. In the case of Toshiba notebook computers, however, you may press Fn+F5 to cycle through VGA settings until TV displays computer image. In the case of Fujitsu notebook computers, you may press Fn+F10 to cycle through VGA settings until TV displays computer image. Check the user's manual for your notebook to determine whether a hotkey combination exists for toggling the display.

OPERATING AIRLINK II

This chapter describes how to operate the AirLink II system. Topics include the following:

- VGA compatibility
- Software control
- Transmitter operation
- Receiver operation
- Orientation of units
- Multi-user application

VGA Compatibility

To use AirLink, the VGA output of the computer must transmit the following:

- NTSC—Up to 640x480 resolution at 60 Hz vertical refresh
- PAL—Up to 800x600 resolution at 50 Hz vertical refresh

Standard Windows display drivers have set up these frequencies. Otherwise, use the control utility provided by your VGA supplier to set the VGA to these frequencies.

If you are using Windows 95 and the VGA manufacturer does not provide utilities, use the Plug and Play feature of Windows 95 to set up the VGA frequencies.

Alternate Transmitter Connections

This section discusses transmitting audio/video from a satellite receiver, laserdisc player, or VCR to a device other than a TV. (Refer to Figure A-3 on page A-7 and Figure A-4 on page A-8.) Refer to Appendix A, "Specifications and Interface," for additional information on AirLink II system connections.

To transmit audio/video from satellite receiver or laserdisc player

1. Connect a set of A/V cables (or SCART cable labeled **Sender**) to the A/V jacks of the transmitter and **Audio/Video Out** jacks (or SCART connector) of the satellite receiver or laser disc player. Ensure the yellow, red, and white plugs match the yellow, red, and white jacks on the satellite receiver/laserdisc player and transmitter.
2. Plug one end of power adapter into rear of transmitter with the other end into a 230 V (or 120 V) wall outlet. Use only the adapter provided.

Note: *Ensure VGA cable is disconnected.*

3. If your satellite receiver or laserdisc player has only one set of A/V output (or SCART connector) jacks, connect 75 ohm RF coaxial cable from satellite receiver's modulator output to the TV VHF/UHF input terminal.
4. Locate and orient transmitter according to Orienting Transmitter/Receiver UHF Antennas on page 2-14.

Alternate Receiver Connections

This section describes connecting the receiver to a device other than a TV, and receiving wireless PC data, image or audio/video on a TV or projector. It is recommended that the receiver be connected to a high resolution, multimedia LCD projector, large screen TV, or monitor during presentations. (Refer to Figure A-3 on page A-7 and Figure A-4 on page A-8.)

1. Connect AC/DC adapter to AC power outlet.
2. Connect A/V cables to the multimedia LCD projector's RCA video signal input jacks and receiver A/V output jacks. Ensure the yellow, red, and white plugs match the yellow, red, and white jacks on the projector and receiver. If the projector has a single jack for audio input, connect the white plug to that jack.

Connecting Receiver to Remote TV through VCR

The following steps describe connecting the receiver to a remote TV through a VCR. This set up enables recording of transmitted audio/video on a remote VCR, while enjoying the picture and sound on a remote TV or PC image. (Refer to Figure A-3 on page A-7 and Figure A-4 on page A-8.)

1. Connect a set of A/V cables to the A/V output jacks of the receiver and A/V input jacks on a VCR. Ensure the yellow, red, and white plugs match the yellow, red, and white jacks on the receiver and VCR. If the VCR has a single jack for audio input, connect the white plug to that jack.
2. If your TV has A/V input jacks, connect another set of A/V cables to the TV A/V input jacks and A/V output jacks on a VCR.
3. If your TV does not have A/V input jacks, connect a 75 ohm coaxial cable from the TV antenna-in (or VHF/UHF-in) to VCR modulator output.

4. Plug one end of the transmitter or power adapter into the rear panel of the receiver and the other end into a 230 volt (or 120 volt) wall outlet. Use only the adapter provided.

Note: *Ensure ON/OFF switch is set to OFF before connecting.*

5. Locate and orient receiver according to Orienting Transmitter/Receiver UHF Antennas on page 2-5

Orienting Units and Antenna

This section describes orienting of the transmitter and receiver units and their respective antenna.

Orienting Transmitter/Receiver Units

For optimal performance, orient the transmitter and receiver antenna as illustrated in Figure 2-10. For maximum operating range, minimize the number of obstacles (such as TVs, electronic appliances, or large furniture) between the transmitter and receiver units.

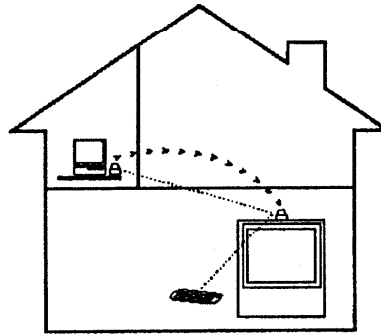


Figure 2-1 *Orientation of Units*

Caution: *Place transmitter and receiver on flat, stable surfaces to prevent damage from falling.*

Multiuser Application

Orienting Transmitter/Receiver UHF Antennas

To broadcast high-quality audio and video, or clear images, use of a directional dipole antenna is required. This antenna is designed for multidirectional pivoting and rotating.

In most situations, the flat-pitted face of the transmitter antenna should be facing the flat pitted face of the receiver antenna at a right angle to an imaginary line drawn between the receiver and transmitter (Figure 2-10). As settings may vary, for optimal reception, additional pivots or rotations may be necessary. If the receiver and transmitter are less than 10 feet apart, keep the antenna flat within their respective casings.

Multiuser Application

If different PCs are being used at the same time, it is suggested that you purchase other AirLink II systems. When other AirLink II systems are being used in the same area, users must coordinate their efforts. When user one pushes the TX button to send a presentation to a remote multimedia LCD projector (or large screen TV), that user should communicate with other users that they are doing this. After the presentation is complete, user two may take over operation.

Note: Remember, only one user may transmit at any given time. All other users must turn off their transmitters or serious interference will occur.

It is recommended that during presentations, a high-resolution CCD camera be connected to the transmitter's A/V input. When making a speech, the unit automatically switches to CCD camera input and attendant sees a clear picture on the screen. The VGA cable must be disconnected for this to work.

Note: Use an AC/DC adapter/or notebook computer when giving long presentations or if the built-in battery is running low.



SPECIFICATIONS AND INTERFACE

This appendix provides specifications for the AirLink II receiver, transmitter, and wireless keyboard and illustrates typical system interface configurations.

Specifications

Video Inputs

- 15-pin VGA analog red, green, blue (RGB) signal;
0.7 V peak-to-peak

Video Outputs

- Complies with NTSC and PAL TV standards
- Composite video (RCA out)
- 1.0+10% V peak-to-peak
- 15-pin VGA pass-through signal
- **Europe only (PAL signal)—SCART**

Computer Interface

- External VGA-to-Digital Scan Converter

Specifications

Video Resolutions/Display Modes

NTSC (North America and Japan)

- Resolution—Up to 640x480 in 16.7 million colors
- Vertical Sync—60 Hz

PAL (Europe, Asia, and South America)

- Resolution—Up to 800x600 in 16.7 million colors
- Vertical Sync—50 Hz

Environmental Requirements

- Storage temperature— -10 to 50 °C
- Operating temperature— 10 to 35 °C

Receiver Specifications

Specification	Value
Output Level	Video 1 volt p-p Audio 1 volt p-p
Frequency	2.4000 GHz–2.4835 GHz, selectable by channel
Channel Access	PLL Synthesizer, four channels
IR-Remote Relay-Transmit Frequency	423 MHz
Output Ports	DC, RCA (audio left, audio right, video)
Noise Figure	3.5 dB
Power Consumption	12 V DC, 350 mA
Dimensions	137 x 125 x 27 mm (3.75 x 5.0 x 2.1 in)
Weight	425 g (15 oz)
Signal Range	21.34 m (70 ft) range direct line of sight; through obstacles will vary, in typical homes up to 15.24 m (50 ft)

Specifications

Transmitter Specifications

Specification	Value
Output Level	90 dB microvolts/meter at 3 meters (comply with FCC, BZT)
Frequency	2.4000 GHz–2.4835 GHz, selectable by channel
Channel Selection	PLL Synthesizer, four channels
Modulation	FM
IR-Remote Output	940 nm with ON/OFF keying
Input Ports	VGA (15 pin RGB signal), RCA (audio left, audio right, video)
Output Ports	VGA (15 pin RGB signal), RCA video
DC Power Input	12 V DC
Video Input Level	1V p-p @ 75 ohm
Audio Input Level	1V p-p @ 600 ohm
Video Input Impedance	75 ohms
Audio Input Impedance	600 ohms
Power Consumption	12 V DC 300 mA maximum
Dimensions	137 x 125 x 27 mm (3.75 x 5.0 x 2.1 in)
Weight	375 g (13 oz)
Audio/Video Signal Range	30.48 m (100 ft) range through obstacles, 91.44 m (300 ft) direct line of sight
Pass-Through Switch	Allows transmitter to function as a stand alone A/V sender.

System Requirements

Note: *Before installing PC/TV AirLink II, your computer display resolution may be set as high as 1024x768 at a refresh rate of 70 Hz (NTSC or PAL). Other resolutions may be used if TV output is not needed.*

Minimum computer specifications for the AirLink II system to work properly:

- IBM-compatible PC (386, or higher)
- Windows 95 or higher
- VGA adapter, capable of outputting 640x480 resolution at 60 Hz vertical refresh (NTSC) or 800x600 resolution at 50 Hz vertical refresh (PAL).
- 16 bit sound card (optional, but required for sending audio from PC)
Video display device(s) (such as a TV, VCR connected to a TV, or video monitor) with RCA composite inputs.
- Minimum 8 MB of free hard disk space
- Keyboard and serial port switch boxes optional, but recommended for convenience

Input and Output Connections

Input and Output Connections

This section provides information about the AirLink II input and output connections. Figure A-1 and Figure A-2 illustrate the connections on the transmitter and receiver components.

Transmitter- Rear (Enlarged)

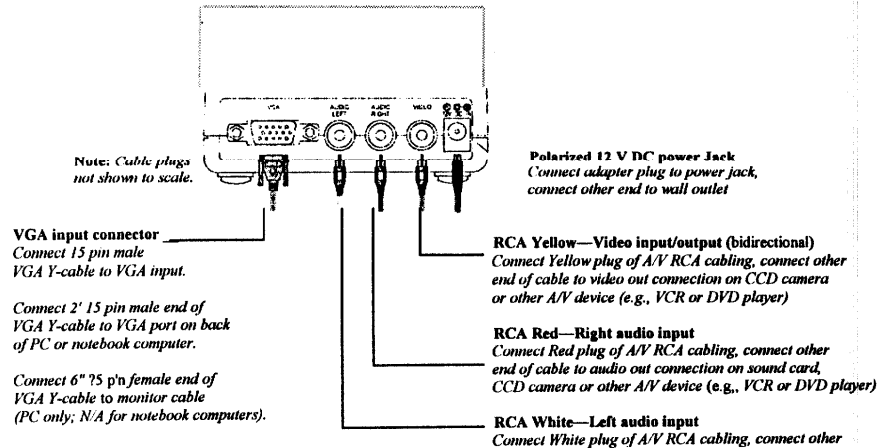


Figure A-1 Rear view of AirLink II transmitter.

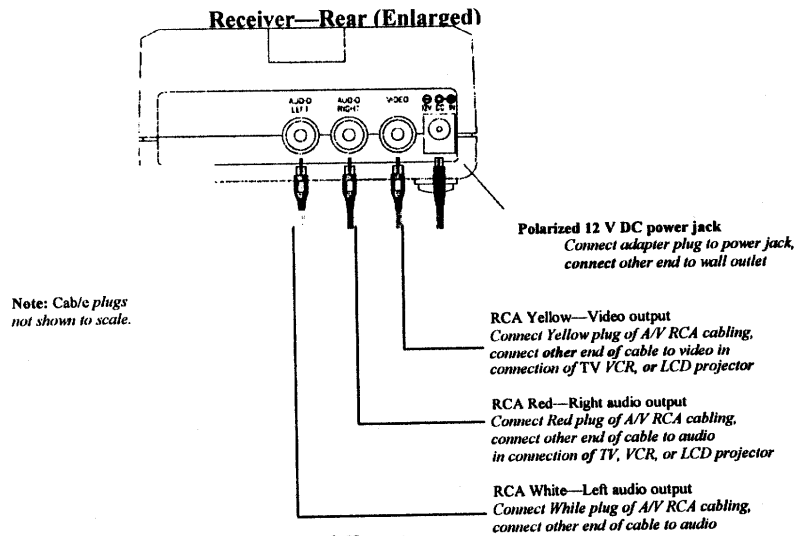


Figure A-2 Rear view of AirLink II receiver.

Connecting to a Computer, Monitor, and Video Display Device

Figure A-3 illustrates the connection between AirLink II and a PC. Figure A-4 illustrates the connection between AirLink II and a notebook computer. See Installing AirLink II Hardware on page 1 -3 for connection instructions.

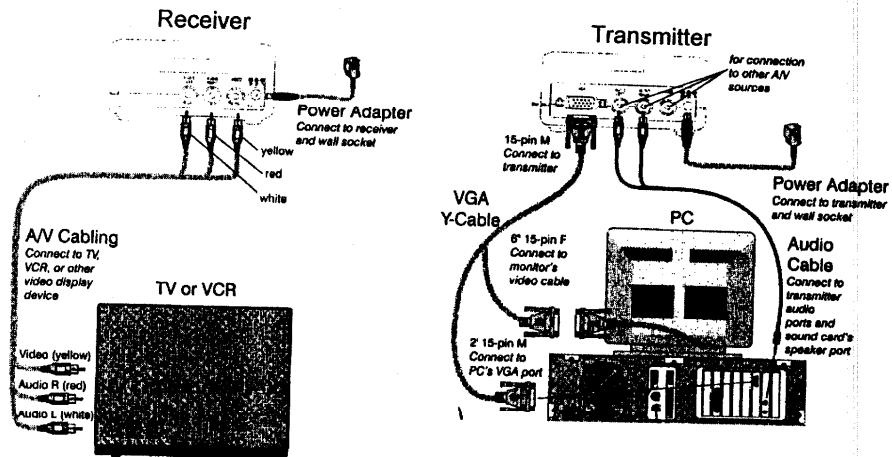


Figure A-3 System Hookup to PC—Rear View

Input and Output Connections

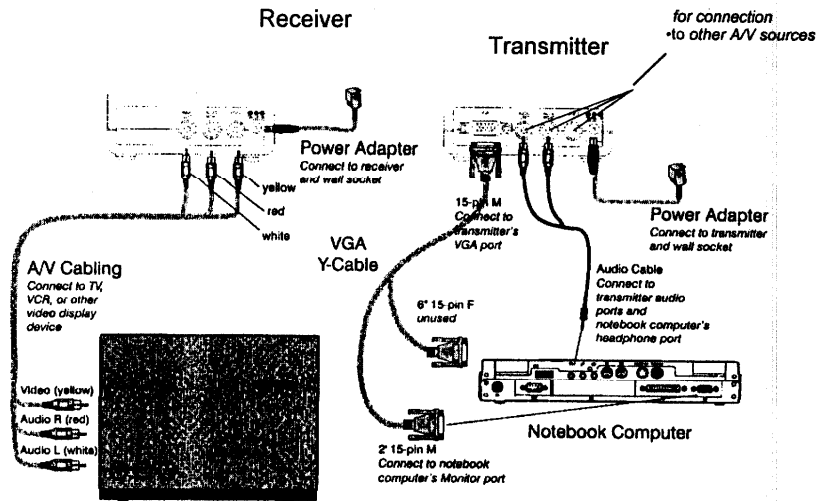


Figure A-4 System hookup to Notebook Computer –Rear View

Input and Output Connections

Terminal Lugs

If your TV only has screws to connect with 300 Ohm Twin Lead Flat wire, you need an inexpensive adapter, a "matching transformer," to connect to AirLink. This adapter allows use of an RF modulator to connect the receiver to the TV. Most TVs come shipped with a matching transformer if they use one. An RF modulator is required at the 75 ohm end, which can then be connected to the VIDEO port on the AirLink (most RF modulators include a connecting composite cable, used for the RCA connection). Figure A-6 illustrates how to connect the matching transformer and RF modulator to the AirLink system.

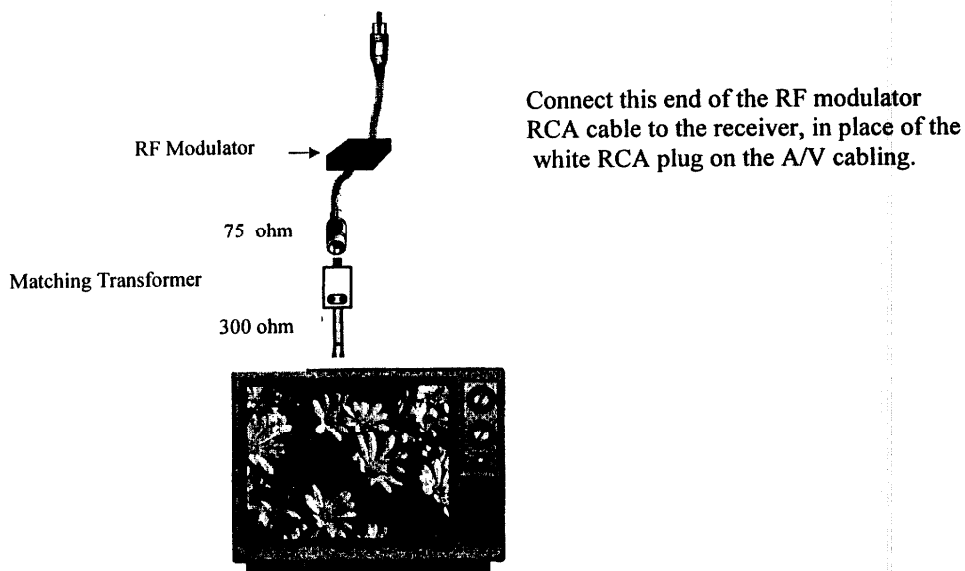


Figure A-5 *Connecting the Matching Transformer to TVs that have terminal lugs (versus RCA input/output ports).*



MULTIMEDIA BASICS FOR AIRLINK II

This appendix describes resolution, image quality, and provides tips for converting VGA to TV. Topics include the following:

- VGA resolution basics
 - Interlaced and noninterlaced resolutions
 - TV and video standards
- Converting VGA to TV

Overview

There are distinct differences between what is seen on a computer monitor and a TV. To achieve the best results, it is important to understand the resolution, image quality, and technology behind these differences.

Resolution is the number of vertical and horizontal elements that make up an image. Typical VGA resolution is 640 pixels (picture elements) across by 480 pixels down (640x480) for NTSC and 800x600 for PAL. Refresh rate is the number of times per second the screen is redrawn. This is usually 60 times per second (60 Hz) for NTSC and 50 times per second for PAL (50 Hz).

VGA Basics

Your VGA card can produce a variety of resolutions. Standard VGA resolution is 16 colors, out of a palette of 262,144 colors. Newer Super VGA (SVGA) resolutions have enabled display up to 16.7 million colors and resolutions up to 1280x1024.

Interlaced and Noninterlaced Resolutions

VGA resolutions can be interlaced or non-interlaced. Interlaced displays require two passes to redraw the screen. The first pass draws the odd lines (1, 3, 5, 7...479), while the second pass draws the even lines (2, 4, 6...480). In interlaced mode, the refresh rate is typically 60 Hz (NTSC) or 50 Hz (PAL). This means that each half of the image is refreshed 30 times per second. Noninterlaced displays redraw each line on the screen in a single pass. This, combined with higher refresh rates (60-72+ Hz) usually results in a more stable image.

TV/Video Basics

The supported TV standards are NTSC (North America and Japan) and PAL (Europe and Asia). Both evolved before the PC and Macintosh and have the following limitations:

- Resolution of 525 lines (NTSC) or 625 lines (PAL)
- Interlaced video only
- Refresh rates of 60 Hz (NTSC) or 50 Hz (PAL)

The TV output mode AirLink II supports is composite video, using RCA A/V RCA cable. Composite video mixes color (chroma) and brightness (luma) information on the same signal.

Note: *AirLink II can also support radio frequency (RF) with an RF modulator (available from most home electronics stores) connected to the VIDEO port to a TV's antenna terminal lugs or coax connector. Refer to Terminal Lugs on page A-8.*

Converting VGA to Television

Because of the capabilities and limitations of VGA and TV, the following AirLink II features allow you to receive the best audio and video results.

- Maximum resolution of 640x480 (NTSC) or 800x600 (PAL) with 16.7 million colors
- Refresh rates from the VGA signal—60 Hz (NTSC) or 50 Hz (PAL)

Change the new ergonomic refresh rates (72+ Hz) to the 60 or 50 Hz rate required by the TV or VCR. When viewed up close, the TV image is not as sharp as your VGA monitor. When viewed at a normal distance (about six feet), the image looks sharper. Images with many single pixel horizontal lines (Windows and line drawings) may flicker, due to the interlaced video signal. AirLink II circuitry, with the Flick-Free filter, minimizes this effect, but may remain noticeable on older TVs.

Tips for Optimal TV Display

Use the following tips when displaying to a TV.

- Do not use high contrast colors, as they tend to bleed.
- Do not use "opposite" colors (red and blue) next to or on top of one another, as they also bleed.
- Increase the display font size.
- Create presentations that are centered both vertically and horizontally on the computer screen. The outer edges of the screen may be reduced when converted to video.
- Change the background color to white. Black text on a white background seems to provide the best resolution to other colors that bleed.



TROUBLESHOOTING AND SUPPORT

This appendix describes basic troubleshooting to help you resolve problems you may have with the AirLink II system. Care and cleaning information, as well as Technical Support information are also provided.

Troubleshooting Problems

This section lists common questions and answers to display and connection problems you may experience with the AirLink II system. Information for fitting Windows (95 and above) to the TV display is also provided. Up-to-date troubleshooting tips may be found on our website at <http://www.aitech.com>. If applying these methods does not solve the problem, contact Technical Support for further assistance.

Display Problems

Table C-1 lists display problems and how to resolve them.

Table C-1 *Troubleshooting Display Problems*

Problem	Resolution
TV monitor display is monochrome, not multicolored.	Computer display is probably monochrome. To correct this, check cable connection to transmitter and ensure it is properly seated. If it is not, it can cause the computer display to go monochrome (all blue).

Troubleshooting Problems

Table C-1 *Troubleshooting Display Problems*

Problem	Resolution
No display on the TV or video tape. No picture or sound.	Check power ON/OFF switches on receiver. Check power switches on the LCD projector and video source (VCR, laser disc player, or satellite receiver). Ensure power plugs are pushed in all the way. Check all cable connections. Check power source to transmitter and receiver. Ensure notebook computer battery current. Ensure transmitter and receiver are facing one another (through the walls, etc.) Ensure display resolution is set At a maximum of 1024x768, 70 Hz (NTSC or PAL). Ensure transmitter and receiver are both set to the same channel. Ensure notebook computer display is set to video out only (use <i>FN+hotkey</i> as necessary). Ensure video display device connected to receiver is set to Video In.

Table C-1 *Troubleshooting Display Problems*

Problem	Resolution
Computer display is fine, but TV display is jumpy.	Ensure you are using a graphic resolution of up to 640x480 at 60 Hz (NTSC) or up to 800x600 at 50 Hz (PAL). Use the Screen Control Utility to adjust the screen.
Interference—noisy picture or audio.	Adjust receiver and transmitter UHF antenna orientation (see <i>Installing AirLink II Hardware</i> instructions on page 1-10 and page 1-12). Select a different channel by pushing the channel selector button on top of the receiver and/or on the bottom of the transmitter so that channels match. Selection of another channel may also work. Turn off microwave ovens. Remove microwave oven from path between transmitter and receiver. Turn off any other transmitters.
Text is difficult to see.	Limitations of the NTSC format make small text difficult to see. Try using a larger font in presentations. Windows 95: Change Display Desktop Pattern to large fonts.
No TV display (or not recording to a VCR), but VGA monitor works.	Ensure the TV video input is set correctly. This setting on the TV or VCR must be switched to Line-In or AUX . Try testing the input by disconnecting the VIDEO output from the AirLink II transmitter and/or receiver and connecting it to a camcorder video output.

Table C-1 *Troubleshooting Display Problems*

Problem	Resolution
Display appears on TV but not on notebook computer.	Most notebook computers are factory set to the internal display. The display is usually an LCD screen and the VGA port is without signals. Consult your computer manual on how to activate the external VGA connector. The external VGA connector is usually configured by • A <i>hotkey</i> to switch between LCD/VGA (such as FN+F5 for Toshiba notebook computers or FN+F10 for Fujitsu notebook computers) • Using a SETUP process • Running a supplied utility program • Rebooting the computer with the VGA cable attached If problems continue, try a standard VGA monitor to become familiar with the process before using AirLink. See also Receiver Installation to Video Display Device on page 1-13.
Colors are bleeding when viewed on the video display device.	Change the color combination on your system to colors that are not pure red, green, or blue.

Troubleshooting Problems

Connection Problems

Table C-2 lists connection problems and how to resolve them.

Table C-2 *Troubleshooting Connection Problems*

Problem	Resolution
No RCA connection on TV.	Purchase an adapter that converts RCA to your TV connection. For example, if you have an RF connector, purchase an RF modulator (and possibly a matching transformer). Consult the manufacturer of your TV or local home electronics store for additional information.
VGA card has a 9 pin VGA connector and does not work.	You may have an EGA graphic card or older VGA card. AirLink II does not support the EGA graphics standard. However, if you have a 9 pin VGA connector, you can obtain a 9- to 15-pin adapter from your VGA manufacturer or local computer store.

Care and Cleaning

Clean outside of transmitter, receiver, wireless keyboard, IR keyboard receiver, and IR extender with a soft cloth, lightly moistened with mild soap and water. Do not use abrasive powder or solvents.

- **Caution:** *Do not get the cables wet or immerse any of the system components in liquid.*

Technical Support

If you have attempted to resolve the AirLink II system problems with the troubleshooting tips and feel you require our assistance, call our Technical Support Hotline at **510-226-8960x295** between 7:30 am and 5:30 pm (PST), Monday through Friday. You may also contact us by Email at tech_support@aitech.com.

Tech support notes are available on our website at

<http://www.aitech.com>.

Placing a Support Call

Before calling, please have the following information available, so a technician may quickly resolve the problem:

- Your name
- Your company name
- Address
- Email address
- Phone and FAX numbers
- Product name and serial number
- Software (True-TV size driver) version number
- Computer system configuration, including
 - DOS and Windows versions
 - Video card manufacturer and device driver versions
 - Video input being used

Technical Support

- Detailed description of problem (including history, what you've tried, and conditions under which you see this occur)
- The number and exact wording of any error message(s) issued by the software

Warranty Information

AI Tech warrants your AirLink II system and Screen Control Utility software for a period of one year from the date of purchase. Products becoming defective during the period will be repaired or replaced.

Repair Services

If you need to send the AirLink II system in for repair or modification, you must first obtain a Return Authorization Number (RA) from AI Tech. *Any product sent to AI Tech without an RA number will be returned to sender.* Call our Technical Support Hotline at 510-226-8960x295 to obtain the RA number for your product.

When you send in your product, ensure it is adequately cushioned to prevent damage during shipping. Include all hardware and software that came with your AirLink II system, so that the integrity of these pieces can also be verified by AI Tech technicians.

Note: *It is recommended that you ship your AirLink II system fully insured. AI Tech is not responsible for loss or damage caused by shipping.*



GLOSSARY

Aspect ratio	Proportional height and width of the picture on screen. Current standard for conventional television receivers or monitors is three by four (3:4).
BIOS	Basic Input/Output System. Built-in series of routines and commands that work with the system hardware to support the transfer of data between the different devices of the system. BIOS information is usually contained on a chip on the computer's motherboard.
Bit	Binary Digit. The smallest information unit recognized by a computer. It is a single digit in a binary (1 or 0) numbering system.
Bits per pixel	Measure of the amount of information stored in each pixel. The more bits per pixel, the more colors or grayscale a pixel can support.
Brightness	Overall level of light and dark in an image.
CD-I	Compact Disc Interactive. Interactive CD standard requiring specialized players.
Chrominance	Portion of video signal that carries color information (hue and saturation, but not brightness), [see <i>luminance</i>]



Contrast	Tonal difference between light, mid-tone, and dark areas of an image. High-contrast images contain sharp blacks and whites; low-contrast images consist primarily of variations in gray.
DCI	Display Control Interface. Microsoft-Intel device-independent graphic interface standard for Windows 3.1x. Usually included with video SVGA drivers, this standard accelerates the video, and is necessary for smooth digital video playback.
DirectDraw	One of the components of Microsoft DirectX. Device-independent graphic interface standard for Windows 95. Usually included with video SVGA drivers, this standard accelerates the video, and is necessary for smooth digital video playback.
DVD	Digital Versatile Disk (originally called "digital video disk"). New optical disk technology expected to rapidly replace the CD-ROM or compact disk. DVD holds 4.7 GB of information on one of its two sides, or sufficient information for a 133 minute movie. DVD uses MPEG-2 file compression standard.
DVD-ROM Player	Typically referred to as a DVD drive, designed to playback DVD-format video or regular CD-ROM disks.
Field	Half a television scanning cycle. Two fields comprise a complete video frame, <i>[see frame]</i>
Frame	Smallest increment of a complete television picture, equal to a thirtieth of a second for NTSC; a twenty-fifth of a second for PAL. <i>[see field, NTSC, PAL]</i>

Interlaced video	Process of scanning frames in two passes, each painting every other line on the screen, with scan lines alternately displayed in even and odd fields. Broadcast TV signals are interlaced. [see <i>noninterlaced video</i>]
IRQ	Interrupt ReQuest. Hardware interrupt for signals from peripheral devices.
Luminance	Black-and-white portion of video signal, which carries brightness information representing picture contrast, light, and dark qualities. [see <i>chrominance</i>]
Noninterlaced video	Process of scanning complete frames in one pass, painting every line on the screen, yielding higher picture quality than that of interlaced video. Most computers produce a noninterlaced video signal. [see <i>interlaced video</i>]
NTSC	National Television Standards Committee. Group formed by Federal Communications Commission to develop U.S. television broadcasting specifications. NTSC refers to all video systems conforming to this 525-line, 30-frame-per-second signal standard, [see <i>PAL</i> , <i>SECAM</i>]
PAL	Phase Alternate Line. 625-line, 25-frame-per-second TV signal used in most of Europe and many other parts of the world, [see <i>NTSC</i> , <i>SECAM</i>]
PCI	Peripheral Component Interconnect. A local bus that provides a high-speed path between the CPU (central processing unit) of the computer and peripheral devices.
RCA plug	Also called <i>phono</i> or <i>RCA phono</i> plug. Popular cable connector for direct audio/video inputs/output signals. Used with A/V cabling provided with AirLink II.

Resolution	Degree of sharpness of a displayed or printed character or image. Monitor resolution is expressed in terms of the number of vertical and horizontal dots on the screen.
RGB	Red/Green/Blue. Color mixing system used in transmitting, displaying, and recording video signals. Color information is processed as separate red, green, and blue components for optimum image quality. All colors are displayed on a video monitor as varying intensities of red, green, and blue dots.
SECAM	Sequential Color and Memory. 625-line, 25-frame-per-second TV signal standard used in France, some former French colonies, and the Soviet Republic. Incompatible with NTSC; PAL and SECAM are partially compatible, [see <i>NTSC, PAL</i>]
SVGA	Super VGA. Extension of the VGA (Video Graphics Array) standard, allowing video adapters to support resolutions of 1,024 x 768 pixels or higher, with 16.7 million colors. AirLink requires an SVGA video adapter supporting 16-bit color or higher, [see <i>VGA</i>]
VGA	Video Graphics Array. Video standard supporting a resolution of 640 x 480 with 16 colors. AirLink can run with a standard VGA graphics card.



LICENSING AND WARRANTIES

This appendix documents the software license agreement, hardware and software warranties, and information about FCC radio frequency interference.

Software License Agreement

AITech International Corporation (AITech) grants the original purchaser a limited, nonexclusive license, without the right to sublicense, to use this copy of AITech software on a single computer at a time. AITech reserves all rights not expressly granted and retains title and ownership of the software including subsequent copies in any media. It is strictly prohibited to copy this software except to load the software from the supplied diskette(s) onto the computer's hard disk solely for the purpose of executing the program and for backup purposes in support of your use of the software on a single computer. You are granted no other rights to copy, duplicate, sell or otherwise distribute this software product supplied to you by AITech.

Software Limited Warranty

Software Limited Warranty

As the only warranty under this agreement, and in the absence of accident, abuse, or misapplication, AITech warrants, to the original licensee only, that the diskettes on which the software is recorded are free from defects in material and workmanship under normal use and service for a period of one year from the date of original purchase as evidenced by a copy of the purchase receipt. AITech's only obligation under this warranty is, at AITech's sole option, to replace the diskette that does not meet AITech's limited warranty and which is returned to AITech, postage prepaid with a copy of the purchase receipt.

THIS WARRANTY GIVES YOU LIMITED SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE. EXCEPT AS EXPRESSLY PROVIDED ABOVE, THE SOFTWARE AND ACCOMPANYING WRITTEN MATERIALS (INCLUDING THE USER GUIDE) ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, EVEN IF AITECH HAS BEEN ADVISED OF THAT PURPOSE. AITECH SPECIFICALLY DOES NOT WARRANT THE OPERATION OF THE SOFTWARE AND WILL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE SUCH PRODUCT EVEN IF AITECH HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE, SO THE ABOVE LIMITATION MAY NOT APPLY.

Hardware Limited Warranty

AITech imaging boards are warranted to be free from failures due to defects in material and workmanship for one year from the date of original purchase as evidenced by a copy of the purchase receipt. During the warranty period, AITech, at AITech's sole discretion, will repair or replace at no charge, the product which, in its opinion, is defective.

The original purchaser is responsible for packing the product for shipment and for the charges to ship the failed product to AITech. AITech is responsible for charges to ship the repaired or replaced product. If any charge to you is involved, the replacement product will be shipped C.O.D.

If the failed product has been modified in any way without the consent of AITech or if the failure is the result of misuse, abuse, or misapplication, AITech has no obligation to repair or replace the failed product.

EXCEPT AS EXPRESSLY PROVIDED ABOVE, THE HARDWARE AND ACCOMPANYING WRITTEN MATERIALS (INCLUDING THE USER'S GUIDE) ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AITECH SPECIFICALLY DOES NOT WARRANT THE OPERATION OF THE HARDWARE AND WILL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE SUCH PRODUCT EVEN IF AITECH HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE, SO THE ABOVE LIMITATION MAY NOT APPLY.

FCC Radio Frequency Interference Statement

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and then on again, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from the circuit to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Shielded cables and I/O cords must be used for this equipment to comply with the relevant FCC regulations. Changes or modifications not expressly approved in writing by AITech may void the user's authority to operate this equipment.