Gentner

AVT7000 and AVT7100

Installation and Operations Manual

Copyright Information

AVT7000 and AVT7100 Installation and Operations Manual
Gentner Part No. 800-113-700 (Rev. 2.00)
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This equipment complies with the requirements of the EU guidelines:

CE

89/336/EEC	"Electromagnetic Compatibility"
73/23/EEC	"Electrical operating material for use within specific voltage limits"

Conformity of the equipment with the above guidelines is attested by the CE mark.

Gentner Communications Corporation is committed to protecting the environment and preserving our natural resources.

This manual has been printed entirely on recycled paper.

Contents continued

List of Figures

List of Tables

Contents

Introduction

Congratulations on purchasing the AVT Audio for Video Teleconferencer. The latest digital technology has been incorporated into this outstanding product. The AVT supports video *and* audio teleconferencing. It incorporates an echo cancellation span of 112 milliseconds with a bandwidth of 7kHz (the bandwidth of most video systems). This higher bandwidth translates into higher audio quality. The AVT system will meet the growing needs of any organization — from small to large.

The AVT was designed to work in almost any acoustic environment using most kinds of peripheral equipment. Although many acoustic factors come into play in the design and layout of conference facilities, the AVT was built with superior acoustic-cancellation features. This enables you to have the most trouble-free acoustically pleasing conference possible. Several optional accessories are available to compliment your AVT, including the DH1A Digital Hybrid, MPAII Mixer/Power Amplifier, microphones and speakers.

This manual explains how to install, set up and operate your AVT system. It also provides instructions on how to improve room acoustics and resolve minor technical problems, should any arise.

If you need information on how to install, set up or operate your system, please contact Gentner Communications Corporation at the location noted below. We welcome and encourage your comments so we can continue to improve our products and serve your teleconferencing needs.

Gentner Communications Corporation
1825 Research Way
Salt Lake City, Utah 84119
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FAX: Worldwide (801) 977-0087 In U.S.A. (800) 933-5107
FAX-On-Demand 24-Hour Information Service (800) 695-8110
Worldwide Web Page @ http:\\www.gentner.com

Warranty Registration

Please register your AVT by completing the self-addressed, postage prepaid warranty registration card and return it to Gentner Communications by mail. You may also FAX it to the above listed fax number or call Gentner Communications. When your product is properly registered, Gentner Communications will be able to serve you better should you require technical assistance or desire to receive upgrades, new product information, etc.

Unpacking

Ensure that the following equipment (See Figure 1, below.) was received with your shipment:

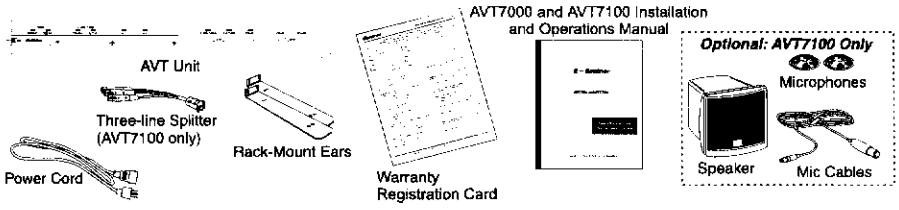


Figure 1. Equipment diagram

SHIPPING NOTE:

Gentner Communications is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

Tools Required

- Small flat-head screwdriver (for fine tuning adjustment pots)
- Medium Phillips screwdriver (if rack mounting)

Features and Benefits

- Two models to meet your equipment and budget requirements
- Superior acoustic echo cancellation
- 100-percent digital audio processing
- Full-duplex operation
- Digital gain processing
- Simultaneous Phone Add and four-wire (video) operations (with additional telephone interface)
- Built-in microphone preamplifier (AVT7100 only)
- Built-in speaker driver (AVT7100 only)
- Contact closures via RS232 port
- Privacy button for private conversations
- Sleek design for in-room or rack installation
- Reliable operation and setup integrity
- Optional remote control

Product Description

The AVT series models contain superior digital echo-cancellation circuitry for both video and audio applications.

Model AVT7000

The AVT7000 contains superior digital echo-cancellation circuitry for both video and audio applications. It operates with a 7kHz bandwidth for higher audio quality, and at least 112 millisecond acoustic echo-cancellation span. Used in conjunction with the MPAII, this product's audio performance will serve the needs of most medium-to-large teleconferencing applications. Your AVT7000 comes complete with a Quick Reference Guide, and AVT7000 and AVT7100 Installation and Operations Manual.

Model AVT7100

The AVT7100 is identical to the AVT7000 in every respect, *except* that it contains its own built-in microphone preamplifier (that accepts up to three microphones) and speaker driver that delivers up to 3W of power to one 4ohm speaker.

Adjustable Settings

Both AVT series models contain adjustable transmit and receive trim pots, to match your room and network equipment levels. They also contain a simple setup procedure, and switches for echo cancellation and echo suppression that can be individually set to accommodate your room's specific needs.

Echo Elimination

Front-panel acoustic echo canceller and acoustic echo suppressor LEDs will flash green/red, graphically indicating whether echo cancellation and/or echo suppression controls are working adequately. Both AVT series models operate with a 112-millisecond acoustic echo-cancellation span.

Noise Filtering

Internal filters remove unwanted noise below 50Hz and above 7kHz.

Phone Add and Four-Wire (Video) Modes

Both AVT series models will operate in Phone Add and four-wire (video) modes. By adding a DH1A to your AVT, you can make two-wire (telephone) conference calls (Phone Add). This feature allows either separate conference calls or the addition of a caller to your videoconference. The front panel contains a Phone Add and a four-wire (video) push-on/push-off button with LEDs to indicate which mode is active.

Microphones and Speakers

For this feature, the AVT7000 requires the use of a mixer/power amplifier, such as the MPAII. The AVT7100 contains a built-in preamplifier and speaker driver. This enables the system to sum audio from up to three microphones and deliver up to 3W of output power to drive a 4ohm speaker. Both series models were designed to work with the MPAII (an eight-channel automatic mixer with a two-channel 15W power amp).

Accessories

Both models can be accessorized with an optional remote-control device, speakers and microphones, and all cabling required for setup. See Appendix C (Page 20) for a complete listing of accessories.

Before You Install

The AVT is designed to work in almost any acoustic environment. To maximize your teleconference audio quality, we recommend that you prepare your teleconferencing site by taking the following factors into consideration:

Acoustic Room Treatment

Conference room treatment is recommended to improve the operation of your teleconferencing system. Rooms that have large areas of windows, white boards, hard floors, etc., are acoustically "live." These areas increase the amount of audio reverberation in the room which, in turn, reduces the audio quality of your teleconference. You should minimize the amount of audio reverberation where possible.

You can improve room acoustics by installing acoustic panels, drapes and other wall fabrics. Another way to improve overall room acoustics is to keep room noise (i.e. computers and fans) to a minimum.

Power Requirements

Both models automatically accommodate voltage requirements ranging from 85–240Vac 50/60Hz power. No switching is required.

Video CODEC

When using the AVT in four-wire (video) mode, a video circuit must be supplied by the user. This device, such as a video CODEC, uses special lines for handling transmission and reception of video and audio signals. Your equipment must match the audio input and output requirements of the AVT four-wire (video) connection (i.e. transmit output and receive input). Check Specifications (Page 15) for this information.

The audio from the AVT is compatible with most popular CODECs, satellite transceivers, fiber-optic transceivers or dedicated four-wire telephone interfaces, regardless of transceiver or network delays. The four-wire (video) connection is not capable of plugging directly into two telephone lines; a four-wire telephone interface is required.

VIDEOCONFERENCING NOTE:
Gentner Communications strongly advises using a qualified sound contractor or audiovisual specialist when installing equipment and circuitry for videoconferencing.

Auxiliary Equipment

Any auxiliary equipment to be used with the AVT (i.e. MPAII Mixer/Power Amplifier, DH1A Digital Hybrid, microphones, speakers, recording equipment, etc.) should be available at time of installation.

Equipment Placement

The AVT can be placed on a cart or table in the conference room or other nearby location (up to 1,000 feet from the conference room). The AVT is designed for office or conference room display. Rubber "feet" are included to protect your table surface.

If your application requires mounting the AVT in a 19" equipment rack, rack-mount ears are supplied with each AVT. For rack-installation instructions, see Step 1 — Placement (below).

Environmental Requirements

The AVT can be safely operated in a room with varying temperatures between 32° and 100° F.

Installation

Follow these step-by-step instructions to install your AVT:

Completed Installation

The following block diagram (See Figure 2, below.) shows the AVT system when installation is complete.

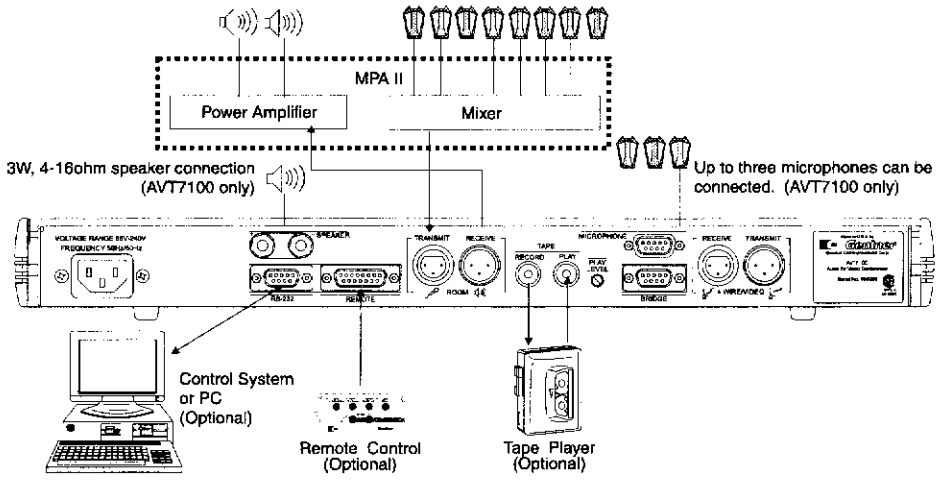


Figure 2. System block diagram

Step 1 — Placement

Your system is shipped for desktop or cabinet placement. Place the AVT in a convenient place in the conference room, on a table, or in a cabinet.

Rack-mount ears are included in the shipment for converting to a rack-mountable unit, if desired.

1) Remove the two screws from the side panels and retain for later use.
2) Remove the decorative end caps from the side panels.
3) Place the rack ears on the sides of the AVT unit, with the ears facing out.
4) Secure the rack ears to the side panels with the same screws.
5) Remove the rubber feet from the bottom of the AVT, if necessary.
6) Mount the unit in a standard 19" equipment rack using the screws provided. Do not block any ventilation holes.

Step 2 — Make Connections

Refer to AVT back panel connections (See Figure 3, next page, top.) for a description and placement of each of the connections you will be making. Each connection is numbered for easy identification.

Power

The power module [1] (See Figure 4, next page.) will operate at any level between 85–240Vac, 50–60Hz.

Installation Continued

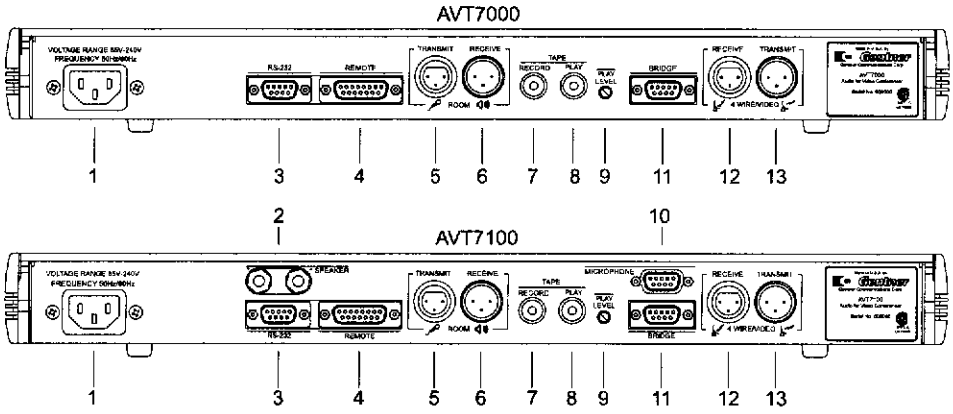


Figure 3. AVT numbered back panels

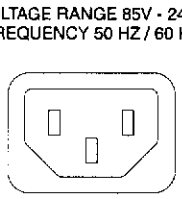


Figure 4. AVT power module

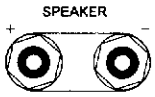


Figure 5. AVT7100 speaker connector

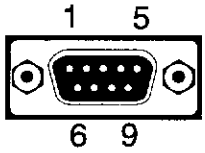


Figure 6. AVT RS232 connector

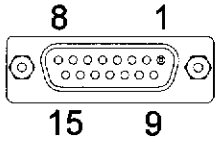


Figure 7. AVT remote control DB15 connector

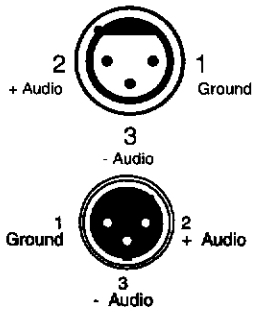


Figure 8. (Top) AVT mixer audio female XLR connector; (Bottom) male XLR connector

Speaker

One 3W, 4–16ohm speaker can be directly connected to the AVT7100 *only* (See Figure 5, left.), eliminating the need for a power amplifier. Connect the speaker wire to the + (red) and - (black) binding post connectors [2].

RS232

If a PC is to be used with your AVT, the RS232 nine-pin female connector [3] (See Figure 6, left.) allows you to use a straight-through cable to the PC's serial port. The serial port is set at 9,600 baud, eight bits, one stop bit, no parity. For serial-port commands, see Appendix D (Page 20); for pinouts, see Appendix B (Page 18).

Remote Control

If using Gentner's optional remote control, plug it into the DB15 REMOTE connector [4] (Figure 7, left). For pinouts, see Appendix B (Page 19).

Or

If using another manufacturer's remote control, plug it into *either* the DB15 REMOTE connector [4], or into the RS232 connector [3], depending on the manufacturer's connector requirements. The detailed RS232 protocol is included in Appendix D (Page 20).

Mixer Audio

Connect the mixer's MASTER OUTPUT to the ROOM TRANSMIT input female XLR socket [5] (Figure 8, left). This audio is sent to the remote conference site.

Connect the AVT's ROOM RECEIVE output male XLR plug [6] to the power amplifier input (PA IN on the MPAII). This is balanced line-level audio (audio from the other location). This audio will be amplified and sent to the speakers.

AVT7100 NOTE:

The AVT7100 has a built-in microphone preamplifier and speaker driver. If more than three microphones or more than one speaker is required for you application or if you are setting up the AVT7000, an MPAII (or other power amplifier/mic mixer) is required.

Auxiliary Equipment

If an audio tape or video recorder is to be used to record both sides of the teleconference, connect a cable between the "record in" or "audio in" of your

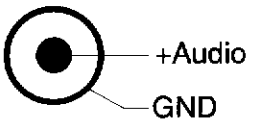


Figure 9. AVT auxiliary equipment RCA jack

recording device and the AVT's TAPE RECORD jack [7].

To allow for audio playback (if you want to play a recorded tape to both locations), plug in the "audio out" or "line out" connector from your VCR or audio tape device into the TAPE PLAY jack [8] (Figure 9, left). The audio is mixed with the receive audio for playback in the local room and is also sent to the remote location.

VCR NOTE:
VCRs that loop record audio to the play output may cause echo and/or feedback. For more information, contact Gentner Communications at the number below.

If an audio tape player or VCR is connected to the AVT for audio transmission to the other site, turn the audio source on and adjust the PLAY LEVEL trim pot [9] on the AVT's back panel. This volume control will adjust the playback audio level in and out of the room.

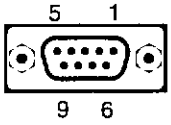


Figure 10. Microphone DB9 connector

Microphone
Plug up to three microphones into the provided three-way splitter. Plug the splitter into the MICROPHONE DB9 connector [10] (See Figure 10, left.) to take advantage of the AVT7100's internal microphone mixer. For pinouts, see Appendix B (Page 18).

AVT7100 NOTE:
This step is only possible with the AVT7100. Also, if more than three microphones are required, an MPAII is required.

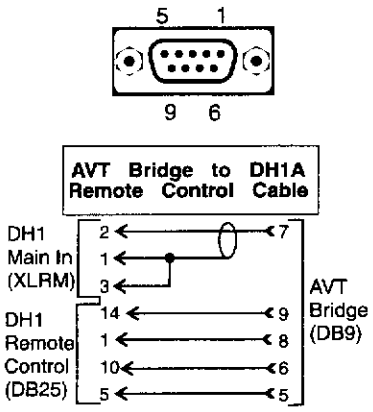


Figure 11. (Top) AVT bridge connector; (Bottom) Bridge cable

Bridge Connector
The BRIDGE AVT male connector [11] (See Figure 11 left.) is used for adding additional telephone-interface equipment such as a DH1A Digital Hybrid or other audio equipment to the system. If you are running in dedicated four-wire (video) mode and need to add a two-wire (telephone) line, a DH1A is recommended. The telephone line and set is plugged into the DH1A. This configuration allows you to conference in four-wire (video) to one site and include a second site via two wire ("Phone Add").

To link the DH1A with the AVT, connect the BRIDGE connectors on the AVT with the following cable to the DH1A.

DH1 NOTE:
Dip switch 1 on the DH1 should be ON (down) for phone add.

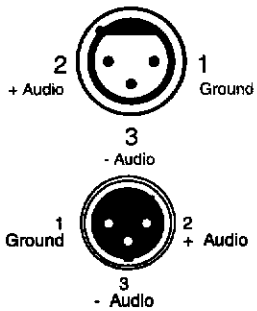


Figure 12. (Top) Four-wire (video) female XLR connector; (Bottom) Four-wire (video) male XLR connector

Four-Wire (Video) Connections
When connecting your AVT to four-wire (video) equipment, connect the transceiver or CODEC output to the AVT's 4 WIRE/VIDEO RECEIVE input [12] (female XLR connector; Figure 12, left). Check your equipment manufacturer's documentation to verify proper connector assignment and specifications.

Connect the AVT's 4 WIRE/VIDEO TRANSMIT output [13] (male XLR connector; Figure 11, left) to the input of the transceiver or CODEC. Check your equipment manufacturer's documentation to verify proper connector assignment and specifications.

LEVEL/IMPEDANCE NOTE:
Check Specifications (Page 15) for proper level and impedance for both male and female XLR connections.

Calibration

The following information will help you make adjustments to optimize your system performance. Verify all components (including microphones and speakers, mixer/power amplifier, CODEC, bridged and auxiliary equipment, etc.) and all connections (See Step 2 — Making Connections, Page 6). Ensure that proper power is supplied to the AVT.

Front Panel Controls

Refer to AVT front panel controls (See Figure 13, below.) for numbered easy identification.

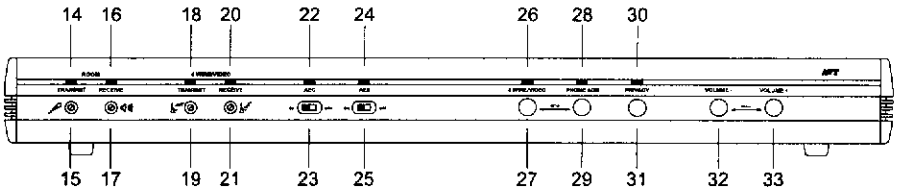


Figure 13. AVT front panel controls

Slide the plexiglass on the front panel to expose the trim pots and switches.

CALIBRATION NOISE NOTE:
Some echo and ringing may be heard while calibrating the AVT. Disregard it and continue with calibration until the end of the procedure. The echo and ringing will disappear.

The PHONE ADD [29] and 4 WIRE/VIDEO [27] push-on/push-off activate and deactivate the respective modes.

Place the AEC [23] switch in the ON position and the AES [25] switch in the OFF position.

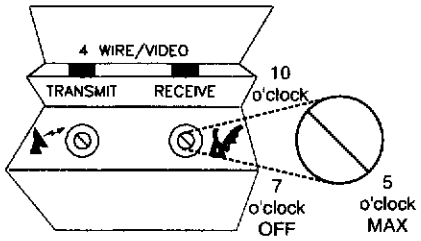


Figure 14. Factory default trim-pot position

Check trim pots [15, 17, 19, 21]. Each adjustment level should be in the (nominal) factory-default position (approximately one-fourth open or in the 10 o'clock position; Figure 14, left).

Four-Wire (Video) Conference

To initiate a four-wire (video) conference, press the 4 WIRE/VIDEO button [27]. The 4 WIRE/VIDEO LED [26] will light and the red PRIVACY LED [30] will extinguish.

Room Transmit Level Adjustment

Someone in the local room should speak into the microphone at a normal distance, in a normal voice. The party at the other location should not speak during the transmit adjustments.

Adjust the ROOM TRANSMIT trim pot [15] while monitoring the ROOM TRANSMIT LED [14]. The ROOM TRANSMIT LED should be solid green while the person is speaking and extinguish when the person stops.

Under normal operating conditions, the ROOM TRANSMIT trim pot [15] is typically set at a 10 o'clock position or one-fourth open (Figure 14, above).

4 Wire/Video Transmit Level Adjustment

Someone in the local room should continue to speak into the microphone

from a normal distance, in a normal voice; the other party should continue to maintain silence. While the person in the local room speaks, adjust the 4 WIRE/VIDEO TRANSMIT trim pot [19] to match the input level of your four-wire (video) equipment. The 4 WIRE/VIDEO TRANSMIT LED [18] should be solid green while the person is speaking and extinguish when the person stops.

Under normal operating conditions, the 4 WIRE/VIDEO TRANSMIT trim pot [19] is typically set at the 10 o'clock position or one-fourth open (Figure 14, previous page).

MULTIPOINT CONFERENCING NOTE:
For applications that will be used in mulitpoint conferencing, it is important to develop a network standard for your transmit level. All sites should conform to this level. Gentner Communications recommends a -10dBm level for multipoint networks.

4 Wire/Video Receive Level Adjustment

Someone in the distant location should speak into their microphone from a normal distance, in a normal voice. The people in the local room should not speak during these receive adjustments. While the person speaks, adjust the 4 WIRE/VIDEO RECEIVE trim pot [21] until the 4 WIRE/VIDEO RECEIVE LED [20] is solid green and *just begins* to flash red on audio peaks.

AUDIO PEAK NOTE:
The 4 WIRE/VIDEO RECEIVE LED [20] is the only *LED that should be set to flash red on audio peaks. This level is 6dB below clipping and is the optimum level for maximum echo cancellation.*

Room Receive Level Adjustment

Someone in the distant location should continue to speak into their microphone from a normal distance, in a normal voice; the local room should maintain silence.

External Power Amp
When using an external power amp, such as the MPAII Mixer/Power Amplifier, adjust the ROOM RECEIVE trim pot [17] to match the input level of your external power amp. Then adjust your power-amp level for a comfortable listening level on the speaker(s).

The ROOM RECEIVE LED [20] should be solid green with receive audio and extinguish when no audio is present.

Phone Add: Two-Wire (Telephone) Conference

Holding a two-wire (telephone) conference requires Phone Add mode. To initiate a Phone Add teleconference, call the remote party using the telephone set. Wait for the party to answer, then press the PHONE ADD button [29]. The PHONE ADD LED [[28] will light. Once the button is pressed, you may hang up the handset.

PHONE ADD TELECONFERENCING NOTE:
This calibration can only be done when using the AVT in conjunction with a DH1A Digital Hybrid. If you are not using the AVT in Phone Add mode, skip to

Calibration Continued

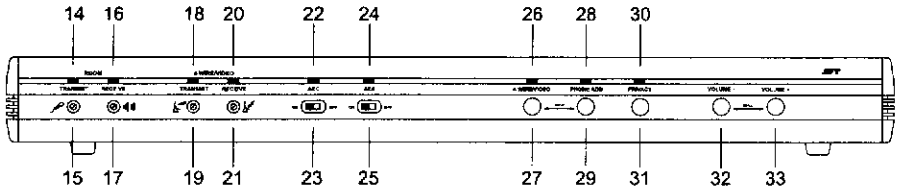


Figure 15. AVT front panel controls

Automatic Setup (below).

Automatic Setup

Once the above settings and adjustments have been completed, the setup routine must be initiated. For best results, neither the party at the other location or anyone in the room should speak during the noise burst of the setup routine. (It will sound like static.) The AES switch [25] (See Figure 15, above.) should be OFF; the AEC switch [23] should be ON.

Momentarily press the PHONE ADD [29] and the 4 WIRE/VIDEO [27] buttons simultaneously. This will transmit a white-noise burst (static) over the speakers for 25 seconds, or until the AVT has adapted for maximum echo cancellation.

During normal conversation, if the AEC LED [22] stays green, no further adjustment to the AES/AEC switches need be made.

During normal conversation, it is normal for the AEC LED [22] to *occasionally* flash red. If the AEC LED turns solid red while the calling party is speaking at normal levels, contact Gentner Communications for setup assistance.

The AES (Acoustic Echo Suppression) switch [25] can be used to help eliminate echo in particularly harsh acoustic environments. However, in typical operating environments, this feature is not used and should remain in the OFF position.

READJUSTMENT NOTE:
If you make any additional adjustments or changes on the front panel, or if any mics or speakers are moved after setup has been completed, initiating the automatic-setup routine is recommended before operating the AVT.

Volume + and Volume –

These front-panel controls [32, 33] should not be adjusted during calibration. Their use will be described in the Operation section (next page).

Front Panel Security

Now that your system has been properly installed, adjusted and calibrated, and setup is complete, your level settings can be hidden from tampering by sliding the front-panel cover to the left-most position.

Videoconferencing

Establishing a Videoconference

Videoconferencing systems and networks vary, and can be as diverse as there are different manufacturers and types of networks used. Your audiovisual installer/specialist should provide the information necessary to establish your videoconference using the type of network your equipment utilizes.

Once your conference connection is established through your network, the AVT will be engaged and audio will be sent to and received from the other room by pressing the 4 WIRE/VIDEO button [27] (Figure 15, previous page). The associated green LED [26] will light when in use. The audio for your video teleconference will be processed through the AVT, using DSP to provide the clearest audio possible along with your video transmission.

Terminating a Videoconference

When the videoconference is concluded, press the 4 WIRE/VIDEO button [27] again. The green LED [26] will go out, indicating the connection is terminated.

Your audiovisual installer/specialist should provide the information necessary to properly terminate your video transmission, depending on the type of equipment you are using.

Phone Add Teleconferencing

The next six subsections illustrate ways to use the Phone Add feature. Althout the AVT was designed as an audio-for-video teleconferencer, it may ablso be used as a Phone Add (telephone) teleconferencer using a DH1A Digital Hybrid. A special feature allows the AVT to carry out two-wire (telephone) and four-wire (video) simultaneously. In other words, you can be in a videoconference, then include an audio-only participant via the telephone line.

Answering a Call With Phone Add

An incoming call will ring on the telephone set (the PHONE ADD LED [28] will flash rapidly during each ring). Answer the call by pressing the PHONE ADD button [29] on either the front panel or the remote-control pad. The green PHONE ADD LED [28] will turn on and the red PRIVACY LED [30] will turn off. The call may also be answered on the telephone set and then given to the AVT by pressing the PHONE ADD button [29], if you prefer.

Making a Call With Phone Add

Using your telephone set, call someone. After the other party has answered the call, press the PHONE ADD button [29] (Figure 15, previous page). The PHONE ADD LED [28] will light and the PRIVACY LED [30] will turn off. The AVT takes control of the call and disables the telephone set. You should now hang up the handset.

Disconnecting a Call With Phone Add

When you are finished with the call, press the PHONE ADD button [29] again. The PHONE ADD LED [28] will dim and the PRIVACY LED [30] will light up.

Privacy

If you wish to mute your conversation (so the remote party cannot hear you),

Operation Continued

press the PRIVACY button [31]. The red PRIVACY LED [30] will light up; however, you will still be able to hear the other location. When you want to resume two-way communication with the other party, press the PRIVACY button [31] again (Figure 16, below). The PRIVACY LED [30] will turn off, re-establishing two-way communication with your party.

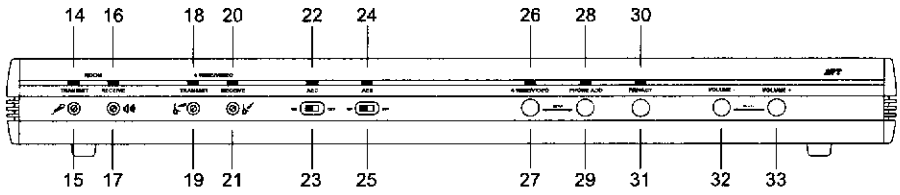


Figure 16. Front panel controls

PRIVACY NOTE:
When using the PRIVACY button [31], both the two-wire (telephone) and four-wire (video) send audio is muted.

Increasing Listening Volume

If the audio on the speakers is not loud enough, press and hold the VOLUME + button [33] until the desired listening level is reached. This does *not* adjust the level of the audio the other location hears.

Decreasing Listening Volume

If the audio on the speakers is too loud, press and hold the VOLUME – button [32] until the desired listening level is reached. This does *not* adjust the level of the audio that the other location hears.

Restoring Listening Volume to Default

To restores the volume level to nominal, mid-range setting, press the VOLUME + [33] and VOLUME – buttons [32] simultaneously for a moment.

VOLUME DEFAULT NOTE:
At the conclusion of each conference, the volume levels are automatically restored to the nominal, mid-range setting.

Remote Control Option

The optional Gentner Remote Control contains six essential operational buttons: 4 Wire/Video, Telephone, Privacy, Phone Add, Volume + and Volume –. The 4 Wire/Video, Telephone and Privacy buttons operate exactly as their respective buttons on the AVT's front panel. The phone-add feature is activated by pressing the Phone Add button on the remote control. (On AVT systems not set up for phone-add operation, the Phone Add button on the remote control remains inoperational.) The 4 Wire/Video, Telephone, Privacy and Phone Add buttons each contain their respective LEDs to graphically indicate current operation mode. These four buttons are push-on/push-off in operation.

The Volume + and Volume – buttons will incrementally increase/decrease the caller's volume level, in the same manner as using the respective buttons on the AVT front panel.

If using the AVT in a phone-add configuration, the BRIDGE connector [10]

(See Figure 3, Page 6.) contains ON/OFF control for the DH1A. These are connected directly to the AVT BRIDGE connector (phone add ON/OFF, phone add STATUS). This allows control of both units with one remote device. For BRIDGE connector pinouts, see Appendix B (Page 19).

DH1A NOTE:
If using a DH1A, dip switch 1 on the DH1A must be in the DOWN position to allow latching, ON/OFF control.

Emergency Restoration

As long as power is maintained, your system will maintain all information the AVT has "learned" about your room environment.

Following a power failure, the AVT will reset itself to factory default settings. On first connection of two-wire (telephone) or four-wire (video), a three-second white noise (static) burst will automatically be emitted to quickly read the room and make internal settings for echo elimination.

If the system is still unstable or echo is present, a full setup routine should be initiated to set the system to optimal operation. Momentarily press the PHONE ADD [29], 4 WIRE/VIDEO [27] buttons simultaneously. AEC/AES switches and volume should be kept in the position set prior to the outage. The receive volume level will reset to nominal levels. Two-wire (telephone) or four-wire (video) operation will need to be reinitiated by pressing the required button (LED will light). The telephone call will need to be redialed, when using the telephone mode.

FOUR-WIRE (VIDEO) NOTE:
If continual power failures occur, your AVT can be programmed to automatically retrain when power is restored. To do this, connect pins 8 and 9 together on the REMOTE [4] connector (Figure 3, Page 6). The system will power up in four-wire (video) mode, train for 25 seconds, and remain in the four-wire (video) mode.

To lock the AVT in the four-wire (video) mode continually, connect pins 15 and 9 together on the REMOTE connector [4]. This mode locks the unit into four-wire (video) mode and disables the 4 WIRE/VIDEO button [27].

When Not in Use

When the AVT is not in use, the red Privacy LED [30] will remain lit, and the green telephone LED [26] and four-wire (video) LED [28] will be off (if in auto-answer mode, they will be blinking).

POWER NOTE:
Power should be maintained to the unit at all times.

Four-Wire (Video) Teleconferencing

The AVT provides all connections necessary to perform point-to-point audioconferencing over a standard telephone line (Phone Add mode). When open microphones and speakers are used at each location, two AVTs should be used (See Figure 17, below; disregard CODEC connection.), one at each location, to achieve maximum audio quality. The two locations may be either in the same building or at distant sites. Only one AVT is required when the distant location is using a handset or speakerphone. If you are conferencing room-to-room, and you want to maintain full-duplex, you must use one AVT in each room.

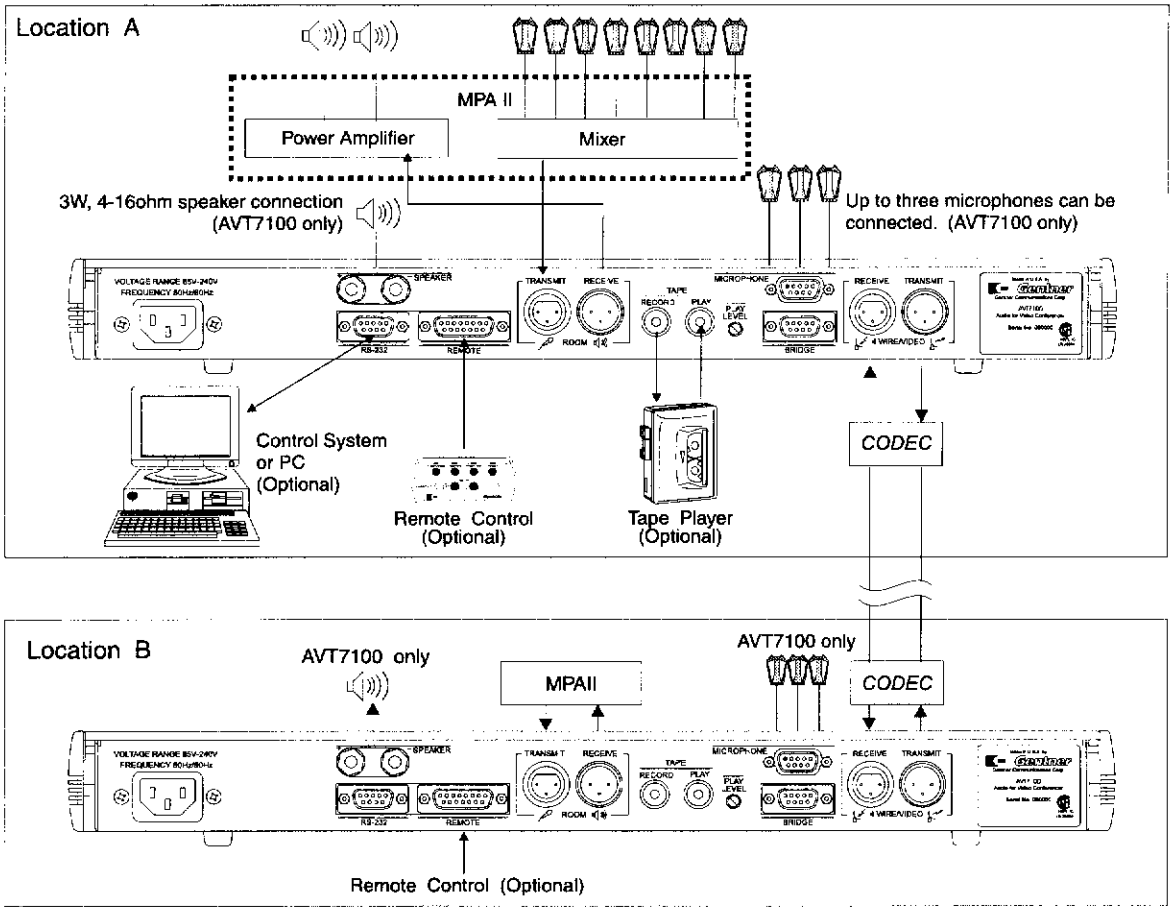


Figure 17. Two-AVT connection

AVT COMPATIBILITY NOTE:
The AVT is compatible with most other manufacturer's teleconferencing equipment; however, systems with full-duplex capability are recommended.

Phone Add Teleconferencing

The AVT can be used to provide full-duplex audio for videoconferencing applications. One AVT is required to interface to a video CODEC or transceiver system at each location.

Figure 17 (above) illustrates a two-AVT connection in a videoconferencing scenario. If using two AVT for four-wire (video) conferencing *only*, disregard the telephone applications. If your application *occasionally* uses telephone (two wire) conferencing, make all connections shown.

Bridging Multiple Calls

Telephone bridge services, such as 1-800 LETS MEET, are available to connect multiple remote sites to your AVT conference. The bridging service can connect all callers together then direct them to one AVT. The number of distant locations that can be conferenced together is dependent upon the telephone bridge service used. Contact 1-800 LETS MEET at 1-800 LETS MEET for more information. 1-800 LETS MEET's bridge service offers the best audio quality possible when bridging your sites together.

Specifications

AVT

Dimensions
19"/48.3cmW x 1.75"/4.45cmH x 10"/25.4cmD

Weight
10 lbs./4.5 kg dry 13 lbs./5.9 kg shipping

Connectors

POWER:	Auto-adjusting power module
REMOTE:	DB15 female
ROOM TRANSMIT INPUT:	3-pin female XLR; balanced bridging >20k Ω input impedance; +4dBu nominal level, adjustable
ROOM RECEIVE OUTPUT:	3-pin male XLR; balanced; 50 Ω (designed to drive ≥ 600 Ω inputs); +4dBm nominal level, adjustable
4 WIRE TRANSMIT OUTPUT:	3-pin male XLR; balanced; 50 Ω (designed to drive ≥ 600 Ω inputs); -10dBm nominal level, adjustable
4 WIRE RECEIVE INPUT:	3-pin female XLR; balanced, bridging >20k Ω input impedance; -10dBu nominal level, adjustable
RECORD OUTPUT:	Phono connector; unbalanced; 1k Ω output impedance (designed to drive ≥ 10k Ω inputs); -10dBu nominal level
PLAYBACK INPUT:	Phono connector; 10k Ω input impedance; -10dBu nominal, adjustable
BRIDGE:	DB9 male
RS232:	DB9 female
*SPEAKER:	Binding post; 3W into 4ohms
*MICROPHONE:	DB9 male

**AVT7100 only*

Power Requirements

85–240Vac; 50/60Hz; (Fuse) 2 amp 250Vac, Slo Blo type

Frequency Response

50Hz to 7kHz ±1dB in four-wire (video) mode

Operating Temperature

32–100° F

Specifications are subject to change without notice.

Warranty

Gentner Communications Corporation (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this equipment be defective, the Manufacturer agrees, at its option, to:

A. Repair or replace any defective part free of charge (except transportation charges) for a period of one year from the date of the original purchase, provided the owner returns the equipment to the Manufacturer at the address set forth below. No charge will be made for parts of labor during this period;

B. Furnish replacement for any defective parts in the equipment for a period of one year from the date of original purchase. Replacement parts shall be furnished without charge, except labor and transportation.

This Warranty excludes assembled products not manufactured by the Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

THIS WARRANTY IS VOID IF:

A. The equipment has been damaged by negligence, accident, act of God, or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,

B. The equipment has been altered or repaired by other than the Manufacturer or an authorized service representative of the Manufacturer; or,

C. Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the equipment which, in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the equipment; or,

D. The equipments original serial number has been modified or removed.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE EQUIPMENT, nor is any person or company authorized to assume any warranty for the Manufacturer or any other liability in connection with the sale of the Manufacturer's products.

Manufacturer does not assume any responsibility for consequential damages, expenses, or loss of revenue or property, inconvenience, or interruption in operation experienced by the customer due to a malfunction in the purchased equipment. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the purchaser shall promptly notify the Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, the Manufacturer will give instructions respecting the shipment of the equipment, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the equipment during shipping and the Manufacturer assumes no responsibility for such damage. All shipping costs shall be paid by the customer.

This warranty extends only to the original purchaser and is not assignable or transferable.

Gentner Communications Corporation, 1825 Research Way, Salt Lake City, Utah 84119

FCC Part 15 Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Changes or modifications not expressly approved by Gentner Communications Corporation could void the user's authority to operate the equipment.

FCC Part 68 Compliance

FCC Registration Number: FBIUSA21442BRN

A label containing, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment is prominently posted on the top plate, near the rear of the equipment. If requested, this information must be provided to your telephone company.

USOC Jacks: This device uses RJ11C and RJ21-X terminal jacks.

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to obtain the maximum RENs for the calling area.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice for you to make the necessary modifications in order to maintain uninterrupted service.

If you experience problems with this equipment, contact Gentner Communications Corporation, 1825 Research Way, Salt Lake City, Utah 84119, or by phone at (801) 975-7200 for repair and warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

No user serviceable parts are contained in this product. If damage or malfunction occurs, contact Gentner Communications for instructions on its repair or return.
This equipment cannot be used on telephone company provided coin service. Connection to Party Line Service is subject to state tariffs.

IC Compliance

NOTICE: The Industry of Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by Gentner Communications. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

IC Certification Number: 19706306A

Safety Information

CAUTION: For use only with certified telecommunication equipment.

ATTENTION: Pour utilisation seulement avec du materiel de telecommunications certifie de marque.

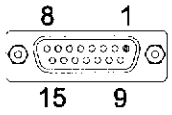
Appendix A: Glossary

Throughout this manual, you may notice some unfamiliar terms. Some of these terms and how they relate to the AVT appear below.

AEC	Acoustic echo cancellation.
AES	Acoustic echo suppression
Digital Echo Cancellation	The AVT digitally subtracts acoustic echo from the audio being returned to the caller. The AVT digitally eliminates both direct and indirect acoustic echoes, making the conference much more intelligible.
Full-Duplex Operation	Both locations can speak simultaneously without interruption, because the AVT does not use switching to cut off either the transmit or receive audio signals. This produces full-duplex operation.
Digital Gain Processing	The AVT uses special digital gain processing techniques to maintain consistent audio levels within the room. Receive volume levels will be maintained consistently, even when changes occur in the other room, or telephone line conditions change.
PBX	Private branch exchange. This is a common form of business telephone system.

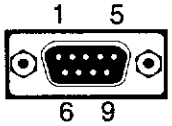
Appendix B: Connector Pinouts

Table 1. Remote Control DB15 Connector Pinouts



Pin Number	Control	Pin Number	Control
1	Ground	9	Ground
2	Two-wire audio switch	10	Two-wire lamp
3	Four-wire audio switch	11	Four-wire lamp
4	Privacy switch	12	Privacy lamp
5	Phone add switch	13	Phone add lamp
6	Volume up	14	Not used
7	Volume down	15	Not used
8	Four-wire mode		

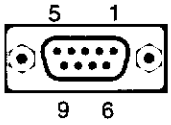
Table 2. RS232 DB9 Connector Pinouts



Pin Number	Control	Pin Number	Control
1	DCD	6	DSR
2*	Transmit	7	No connection
3*	Receive	8	CTS
4	DTR	9	No connection
5*	Ground		

* Required for computer or remote control

Table 3. Bridge DB9 Connector Pinouts



Pin Number	Control	Pin Number	Control
1	Transmit In 1	6	Phone Add Audio In
2	Transmit In 2	7	Phone Add Audio Out
3	Receive Out 1	8	Phone Add On
4	Receive Out 2	9	Phone Add Off
5	Ground		

Technical Description

Transmit In 1 and 2. Unbalanced inputs summed with the ROOM TRANSMIT XLR.

Receive Out 1 and 2. Unbalanced outputs derived from the ROOM RECEIVE XLR.

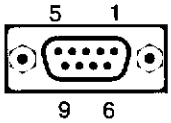
Phone Add Audio In. Input mixed with the RECEIVE INPUT XLR (for local speakers) and the TRANSMIT OUTPUT XLR (for remote speakers).

Phone Add Audio Out. Output derived from the TRANSMIT OUTPUT XLR (local room microphones) and the RECEIVE INPUT XLR (remote room microphones).

Phone Add On. The control/status output to communicate with the phone-add unit.

Phone Add Off. The status input of the phone-add unit.

Table 4. DB9 Microphone Connector Pinouts



Pin Number	Control	Pin Number	Control
1	Mic 1+	6	Mic 3-
2	Mic 1-	7	Ground
3	Mic 2+	8	Ground
4	Mic 2-	9	Ground
5	Mic 3+		

Appendix C: Available Options

Accessory	Gentner Part Number
Tabletop Omni Microphone	910-103-148
Tabletop Unidirectional Microphone	910-103-158
Delta Microphone	910-103-333
Wall Mount Speaker	910-103-010
Mixer/Power Amplifier	910-101-001
Remote Control	910-110-100

Appendix D: Serial Port Commands

The RS232 serial port will accept serial commands. The commands provide the same control as the front-panel switches, except that the serial commands will not control either the AEC or the AES switches.

RS232 Serial Port Protocol

9600 baud, 8 bits, 1 stop bit, no parity.

When the serial port is connected to a computer, the following information will be displayed on the screen on power-up:

```
Teleconferencing Interface
Gentner Communications Corporation © 1993

Ports Initialized

POC vx.x
RAM ..... OK
CODEC ..... OK

INTERRUPTS $Revision: x.xx$
INTERRUPTS SETUP $Revision: x.xx$
BACKGROUND $Revision: x.xx$

MONITOR $Revision: x.xx$
```

The AVT is now in the serial command mode. The commands that the AVT will take in this mode are shown in Table 4 (below). These commands are designed to allow users to control the AVT through the serial port.

The basic structure of the serial commands are one or two letters with a digit following the letters. The two letters identify the command type. The digit or lack of a digit tells the AVT what to do with the current command.

Table 5. AVT Serial Port Commands

Function	Command	Function	Command
Four-wire (video)	4W	Phone Add	PA
Privacy	P	Setup	S
Volume down	L-	Volume up	L+

SERIAL COMMAND NOTE:
All commands are not complete until you hit ENTER.

Four-Wire (Video)

The 4W1 command has the same function as the four-wire video switch. It connects or disconnects the AVT in four-wire mode.

4W1 <CR>
Connects the AVT in four-wire mode.
The AVT responds, 4W1 <CR> (if connected) *or* 4W0 <CR> (if not connected).

4W0 <CR>
Disconnects the To from four-wire mode.
The AVT responds, 4W0 <CR>.

4W <CR>
Returns the four-wire connect state.
The AVT responds, 4W1 <CR> (if connected) *or* 4W0 <CR> (if not connected).

Phone Add

To put the AVT in phone-add mode, send

PA1 <CR>
Enables phone add.
The AVT responds, PA1 <CR>.

PA0 <CR>
Disables phone add.
The AVT responds, PA0 <CR>.

PA <CR>
Returns the current phone-add status.
The AVT responds, PA1 <CR> (if phone-add active) *or* PA0 <CR> (if phone-add inactive).

Privacy

The AVT's privacy mode will work if the AVT is connected to either the telephone lines (two wire) or the four-wire interface. To enable the privacy through the serial port, send the following characters:

P1 <CR>
Enables privacy mode.
The AVT responds, P1 <CR>.

P0 <CR>
Disables privacy mode. The AVT responds, P0 <CR>.

P <CR>
Returns the current status of privacy. The AVT responds, P1 <CR> (if privacy is enabled) *or* P0 <CR> (if privacy is disabled).

Volume Up and Volume Down

The volume up command us initiated by sending the following characters:

L+ <CR>
Increases the volume level. The AVT responds, L+ <CR>.

L- <CR>
Decreases the volume level. The AVT responds, L- <CR>.

Volume Status

The AVT will return the volume status by sending the following characters:

L <CR>
Returns the current volume level. The AVT responds, L+1 <CR> (for example) if the volume level is up one decibel, *or* L-3 <CR> (for example) is the volume level is down three decibels.

Setup

To put the AVT into setup mode, send

S1 <CR>
Puts the AVT into setup mode. The AVT responds, S1 <CR>.

SETUP NOTE:
The AVT must be connected in four-wire (video) or two-wire (telephone) mode first.

S0 <CR>
Takes the AVT out of setup mode. The AVT responds, S0 <CR>.

S <CR>
Returns the current status of setup mode. The AVT responds, S1 <CR> (if in setup mode) *or* S0 <CR> (if not in setup mode).

SETUP EXIT NOTE:
The setup training will timeout after 25 seconds.

Status

A special command returns the entire status of the AVT in one command. The character string for the command is

ST <CR>
Returns the entire AVT status. The AVT responds in the following order:
AAx
Sx
Lxx
Px
PAx
4Wx

Appendix E: PC Command Quick Reference

4W <CR>	Return four-wire connect status
4W1 <CR>	Connect in four wire
4W0 <CR>	Disconnect in four wire
P <CR>	Return privacy status
P1 <CR>	Enables privacy
P0 <CR>	Disable privacy
L <CR>	Return current volume level
L+ <CR>	Increase volume level
L- <CR>	Decrease volume level
AA <CR>	Return current auto answer status
AA1 <CR>	Enable auto answer
AA0 <CR>	Disable auto answer
S <CR>	Return current setup status
S1 <CR>	Enable setup
S0 <CR>	Disable setup
PA <CR>	Return current phone add status
PA1 <CR>	Enable phone add
PA0 <CR>	Disable phone add
ST <CR>	Return all above status

Appendix F: AVT Block Diagram