Installation and Operation Manual

DVD-301-01-x

Digital Video Disc Player

Document # 540257

AUDIO INTERNATIONAL® INC.

a DeCrane Aircraft Company

7300 Industry Drive, North Little Rock, AR 72117
Phone: 501-955-2929 Fax: 501-955-2988
www.audiointl.com

Document Revision History

Rev. Level	Date	Description
IR	01/2003	Initial Release
A	04/2004	Updated Power Wiring Requirements, removed Dolby Digital Reference
B	08/2005	Updated IFR compatibility, added 'approx.' to weight

Reference Documents

Document #	Description
524561 Rev IR	DVD-301-01-x Outline Drawing

Service Bulletin List

Service Bulletin #	Subject	Manual Revision	Revision Date

Table of Illustrations

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DVD-301-01-x

Digital Video Disc Player

1.0   General Information

1.1   Introduction

This manual contains information for the proper installation and operation of Audio International's (AI) Digital Video Disc Player, Model # DVD-301-01-x. The "-x" suffix in the model number designates the type of connector utilized; "-1" = Positronic and "-2" = D-Subminiature. Also included are mechanical and electrical characteristics of the unit.

1.2   Purpose of the Equipment

Audio International's DVD-301-01-x is a high-quality video disc player built to support the navigation through and playback of DVD Video Discs. This DVD player is designed with maximum shock isolation and an attractive removable cover bezel. Additionally, the DVD-301-01-x supports all DVD region codes for comprehensive international operation.

DVD-301-01-x can be mounted in a cabinet or bulkhead. A unique strapping feature allows up to eight (8) similar devices to be used in the same system at the same time, while maintaining independent control.

Optionally, a digital audio output is provided via a fiber optic interface to allow input to audio processing modules such as a surround sound processor.

For installation ease, the DVD-301-01-x is designed to be able to replace specific previous versions of various Audio International DVD and VCP players, regardless of current unit size, by the addition of cover bezel kits. See Section 2.5, page 7, for details.

1.3 Operational Features

- ❑ Supports standard commercial audio CD and video DVD
- ❑ Capability to channel stereo analog audio, DTS, and industry standard Digital sound through PCM or provided fiber optic output
- ❑ Supports all DVD region codes for international operation
- ❑ NTSC-Only Video Output
- ❑ Easy-to-use front panel controls
- ❑ Optional infrared remote control capability
- ❑ High fidelity, differential analog audio output
- ❑ Up to 45 advanced functions available for AI's RC5 remote or any AI data bus device for complete system customization
- ❑ Full range (4 Hz to 20 kHz) frequency response
- ❑ Eight (8) language and 32 subtitle options (dependent upon user-supplied disc capabilities)
- ❑ Choice of camera viewing angles (dependent upon disc capabilities)
- ❑ Easy to mount and connect
- ❑ 2x, 4x, and 8x zoom and Pan for enhanced viewing
- ❑ Compact, lightweight package
- ❑ Five (5) Forward and Reverse accelerated scanning speeds with DVD video
- ❑ Four (4) slow forward and reverse speeds with DVD video
- ❑ Internal test signal generation for convenient device validation, system set-up, and system troubleshooting

1.4 Optional Equipment

The DVD-301-01-x is optionally controlled by AI infrared remote or touch screen panels, and it is important to remember that some remote controls possess functions not duplicated by the unit's front panel buttons, such as Menu and Set-Up. While the DVD-301-01-x is a complete and fully functional standalone DVD Player, it is strongly recommended that a remote control device also be employed for thorough enjoyment of the unit.

Audio International also offers a wide variety of monitors, speakers, headphone jacks, video distribution devices, and other equipment that will perfectly complement the DVD-301-01-x and will also be valuable and attractive additions to any cabin interior.

Contact your AI representative for details.

2.0   Application

2.1   Typical Application

The DVD-301-01-x video input typically interfaces with a video monitor or video distribution device (i.e., AV-3232, VSS-0408, etc.). Additionally, the DVD-301-01-x is capable of providing audio output to various audio distribution devices (i.e., AV-3232, AI-LDC101, HDM-3 etc.) Video Input format is Multi-Regional (NTSC and PAL).

2.2   Operating Parameters

Typically, this unit operates between +18 and +32 VDC with a power consumption of less than 1A at +28 VDC. Video output is designed for 75 ohm termination. Analog Audio Output is designed for a 2 V_{RMS} output into not less than 600 ohm.

DVD-301-01-x provides NTSC video output only regardless of regional encoding. Once a DVD is inserted, the DVD-301-01-x will automatically begin playing the disc. If power is interrupted (>200 ms) or power drops below +18 VDC while a disc is playing, the player may shut down. When normal operating power is restored, the DVD-301-01-x will automatically start playing. It stops playback when the end of the disc is reached.

2.3   Media and Format Compatibilities

DVD-301-01-x is compatible with standard commercial audio CD and video DVD. Note that since DVD disc format standards are constantly evolving, some DVD discs may not play properly or may cause the unit to malfunction. AI does not guarantee the DVD-301-01-x is compatible with all media or formats.

Compatible Recordable Media Types	Compatible Formats
CD-R	Standard CD-Audio
CD-RW	Standard DVD-Video
DVD-R	VCD*
DVD+R	SVCD*
	MP3 Audio

* Standard Video CDs are compatible, but those with DVD-like menus may not function properly.

Typical DVD Authoring programs are compatible and produce playable movies. However some programs may create menu structures or controls that are not compatible, or do not display or function as intended.

2.4 Mounting Angle Options

The DVD-301-01-x allows for disc playback at multiple unit mounting angles shown below.
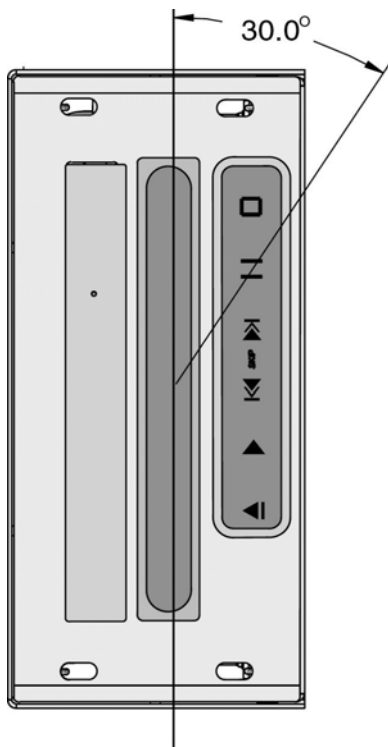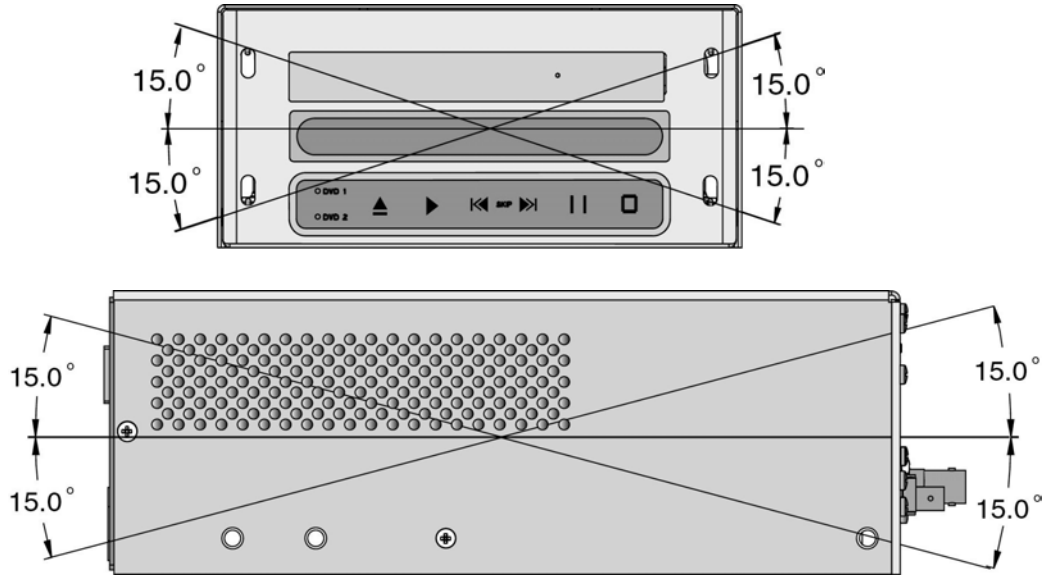
Front View mounted on side with left side down.
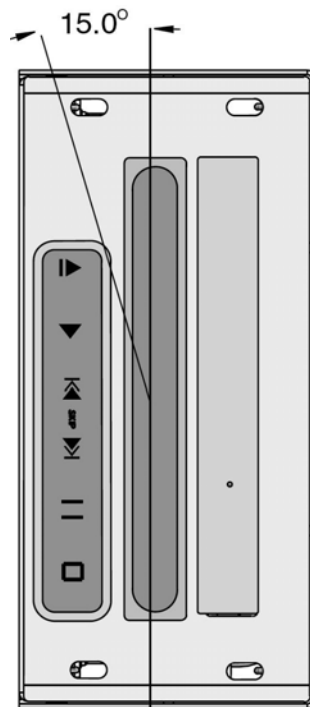
Front View Mounted on side with right side down.

2.5   Cover Bezel Compatibility

DVD-301-01-x provides bracket attachment points designed to support a variety of cover bezels. As such, the customer can replace specific previous versions of various Audio International DVD and VCP players simply by ordering and attaching the proper cover bezel kit to the DVD-301-01-x. Each kit includes the base cover bezel and any hardware needed for installation. Some of the more common replacements are shown below. Contact AI for details.

Cover Bezel Compatibility Chart

| Previous Model #	New/Replacement Model #s	Kit Description
DVD-x01-0x-x	DVD-301-01-1	Base DVD Unit w/Case-Mount Positronic Connectors
	DVDKIT-301-01-1	DVD Install Kit - Cover Bezel Only
DVD-x21-0x-1	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-21-1	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ Positronic Connector
DVD-x21-0x-2	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-21-2	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ D-Sub Connector
DVD-x22-0x-1	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-22-1	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ Positronic Connector, Mounting Rails (x2) w/Screws
DVD-x22-0x-2	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-22-2	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ D-Sub Connector, Mounting Rails (x2) w/Screws
DVD-x23-0x-1	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-23-1	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ Positronic Connector, Mounting Rails (x2) w/Screws
DVD-x23-0x-2	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-23-2	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ D-Sub Connector, Mounting Rails (x2) w/Screws
DVD-x24-0x-1	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-24-1	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ Positronic Connector, Mounting Rails (x2) w/Screws
DVD-x24-0x-2	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-24-2	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ D-Sub Connector, Mounting Rails (x2) w/Screws
VCP-010-0x-1	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-25-1	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ Positronic Connector, Mounting Rails (x2) w/Screws
VCP-010-0x-2	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-25-2	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ D-Sub Connector, Mounting Rails (x2) w/Screws
VCP-011-0x-1, VCP-015-0x-1	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-26-1	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ Positronic Connector, Mounting Rails (x2) w/Screws
VCP-011-0x-2, VCP-015-0x-2	DVD-301-01-2	Base DVD Unit w/Case-Mount D-Sub Connectors
	DVDKIT-301-26-2	DVD Install Kit - Cover Bezel, 12" Wire Bundle w/ D-Sub Connector, Mounting Rails (x2) w/Screws

*** Kits DO NOT include mating connectors.**

2.6   Typical System Block Diagram

2.6.1   This system is fully compatible with Audio International's RS-485 digital data bus system. It can be configured for IR remote control utilizing AI's remote control unit AI-RC5-17xxxx and IFR-485.
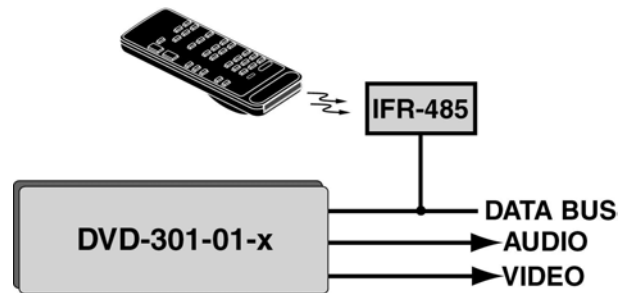
2.6.2   The unit can also be configured for Touch Screen or remote panel control (i.e. entertainment control panels). The panels are on AI's RS-485 digital data bus system and configured to control the operational features of the DVD-301-01-x.
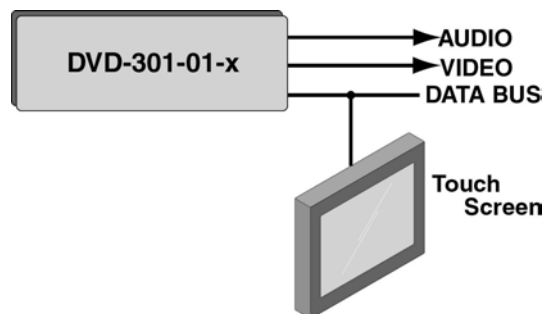
3.0   Installation

   3.1   Preparation

      3.1.1 Careful consideration of the location of this and all other
             audio/visual modules is necessary. Some of the items to be
             considered in the design and layout of the aircraft cabin include:
             - Space
             - Available power supply
             - Environmental conditions (temperature, humidity, etc.)
             - Length of cable runs
             - Location of other aircraft systems (oxygen delivery)

      3.1.2 The DVD-301-01-x shall be installed to conform to the standards
             designated by the customer, installing agency, and existing
             conditions as to the unit location and type of installation.

      3.1.3 Mounting screws are required to secure the unit. Mounting points
             will vary depending on the kit used. Refer to Section 7.0,
             Reference Drawings, for mounting hole diameters and
             configurations.

      3.1.4 All headphone amplifiers and line level amplifiers should be located
             no more than three (3) feet away from source equipment. Long
             low-level audio runs may introduce noise into the audio signal.

      3.1.5 The installing agency shall supply and fabricate all external cables
             to the DVD-301-01-x. The length and routing of external cables
             shall be carefully studied and planned before attempting installation
             of the unit. Allow adequate space for installation of cable and
             connectors. Mating connectors are the responsibility of the
             installing agency. Correct pin assignments as outlined in Section
             3.8 are the responsibility of the installing agency.

   3.2   Unpacking and Inspection

      3.2.1 Carefully open the packaging and remove the DVD-301-01-x.
             Verify that all components have been included in the package per
             the packing list. Inspect the unit for shipping damage.

3.2.2   If damage has occurred during shipping, a claim should be filed with Audio International WITHIN 24 hours and a **Return Request Authorization Number** shall be obtained from AI by contacting the Repair Department at 501.801.0640.   Repackage the unit in its original packaging materials and return it to AI following instructions given by the AI representative.   Refer to the front cover of this manual for address. If no return is necessary, retain the packing list and the packing materials for storage.

3.3   *Cautions & Warnings*

3.3.1   It is important to do a pin-to-pin power and ground check on all connectors.   Ensure that power and ground are applied only where specified.   Damage to the unit may result if power or ground is applied to the wrong points.

3.3.2   **DO NOT** connect or disconnect the unit while power is applied.

3.3.3   **DO NOT** remove any factory-installed screws.   Damage to the unit may result and void any warranties.

3.3.4   **DO NOT** drop the unit or subject it to strong shock.   The unit contains glass parts that may break or crack.

3.3.5   **DO NOT** place foreign objects into openings.   Contact with foreign objects may result in dangerous voltage or electric shock.

3.3.6   **DO NOT** place near strong magnetic fields, radiators or other heat sources.

3.3.7   **DO NOT** use this unit other than for its intended purpose.   Doing so might lead to electric shock or injury.

3.3.8   **DO NOT** use near water, moisture, or volatile sprays. Do not use any type of solvent when cleaning (surface damage may occur).

3.3.9   **DO NOT** look directly into the laser beam through the disc tray opening.   Eyesight may be damaged.

3.3.10   **DO NOT** place fingers in disc tray when the tray is moving.   Tray may close on fingers and may cause injury.

3.3.11   **DO NOT** expose unit to sun or bright light.   Damage to the sensor will result.

3.3.12   The chassis material and structural design of this unit is such that the unit is not capable of containing fire within the unit. This unit does not provide for waterproof operation.

3.3.13   Operating temperature should not exceed –15C to +55C.

3.3.14   **No** periodic scheduled maintenance or calibration is required for continued airworthiness of the DVD-301-01-x Digital Video Disc Player. If the unit fails to perform to specifications, it must be removed and serviced by a qualified service facility.

3.3.15   **ESD** (Electro Static Discharge) guidelines shall be followed.

3.4   Wiring Requirements

3.4.1   Introduction

The installing agency shall supply and fabricate all external cables. The length and routing of external cables shall be carefully studied and planned before attempting installation of the equipment. Allow adequate space for installation of cable and connectors.

3.4.2   Power Wires

Audio International recommends that power and ground wires be 22 AWG minimum. The chassis shall be electrically bonded to the airframe structure by a conductive mounting point with <0.1 Ω resistance using <50 Ω impedance cable. Aluminum wool, nylon webbing impregnated with aluminum oxide abrasive or fiber bristle brushes are the approved tools for removing anodized surfaces at mounting point where the bonding wire is attached. Power and Ground wires shall be in accordance with **MIL-W-22759**. Protect power wires with circuit breakers or fuses located close to the electrical power source bus.

3.4.3   Video Lines

Composite video connections shall be shielded coaxial cable in accordance with the military specifications of **M17/94-RG179**.

3.4.4   AI's RS-485 Data Bus

3.4.4.1   The DVD-301-01-x is designed to interface with other Audio International equipment via AI's proprietary RS-485 serial data bus. The data bus shall be implemented using a twisted shielded pair cable in accordance with **MIL-W-22759**. The wire size for the conductors in this cable shall be 22 AWG, MINIMUM. Shield pins are available for connecting data bus shields when required.

3.4.4.2   Refer to AI document 650007 for RS-485 Serial Data Bus design architecture.

3.4.5   Digital Audio Lines

All digital audio cabling shall be 100/140 μm (core/cladding) multi-mode fiber optic cabling. All fiber optic connectors/couplers shall use ceramic ferrules to minimize adverse reflection effects. BRAND-REX P/N: OC-1011 fiber optic cabling is recommended for use for all digital audio cabling.

3.4.6   Analog Audio Lines

To reduce the opportunity for electrically-induced ground-loop noise, Audio International recommends that all analog audio wire connections be twisted shielded cable with the shield properly grounded at the source (ideal practice) and floating at the load end. If shield cannot be grounded at the source, then ground at the load end with the source end floating. The shield for each cable length shall be terminated at one end only. Terminating both ends of a shield is NOT recommended, and highly increases the likelihood of creating unwanted electrically-induced ground-loop noise into the analog audio signal. Twisted shielded cable shall be 22 AWG (minimum) for low-level audio signals or 16 AWG (minimum) for speaker-level audio signals and shall be in accordance with **MIL-W-22759**. Individual conductor wire gauge in each twisted shielded cable assembly shall increase accordingly with analog audio signal type and any significant increases in cable routing.

3.5   Physical Characteristics

3.5.1   Refer to Section 6.0 for unit dimensions and attachment points.

3.5.2   When mounting the unit, allow sufficient space for mating connectors.

3.5.3   Allow a MINIMUM of one (1) inch of air space around the unit to allow for proper air circulation.

3.5.4   This unit has an internal fan and ventilation holes in the chassis for cooling. Installation recommendation requires 1-inch spacing from other components and structures except the mounting surface for which the unit should be in direct contact.

3.5.5   This unit can be mounted at varying angles with respect to the front bezel. It has the capability of being mounted at a +/- 15-degree angle in the vertical plane and a +/- 15-degree angle in the horizontal plane referencing the front bezel.

3.5.6   All DVDKIT-301-xx-x cover bezels snap easily on the DVD Player's faceplate without the need of special tools. DVDKIT-301-01-x and DVDKIT-301-21-x install kits do not require mounting bracket attachments. DVDKIT-301-22-x, DVDKIT-301-23-x, DVDKIT-301-24-x, DVDKIT-301-25-x and the DVDKIT-301-26-x install kits have two (2) mounting bracket attachments. Each attachment mounts to the DVD-301-01-1-x using two (2) 10-2 holes on each side of the DVD-301-01-x.

3.5.7   Bonding between chassis mounting point and airframe installation to be <1 ohm resistance using <50 ohm impedance cable. No surface prep is required due to conductive chassis finish (except front bezel).

3.6   Clearance and Separation Requirements

When running cables, avoid sharp bends and placing cables near aircraft control cables. Maintain a MINIMUM clearance of three (3) inches from any control cable. If wiring is run parallel to combustible fluid or oxygen lines, maintain a separation of six (6) inches between the lines.

3.7   Electrical Characteristics

3.7.1 Electrical Specifications:

Electrical			
Electrical	Power	800 mA @ +28 VDC	
	Operating Voltage Range	+18 to +32 VDC	
	Data Bus Type	AI RS-485	
	Audio Frequency Response	4 Hz to 20 kHz	
	Audio Output	2 VRMS (factory preset) into 600 ohm load	
	Audio Signal to Noise Ratio	>96 dB (NOMINAL)	
	Dynamic Range	>93 dB	
	Video Output	1 V(p-p) into 75 ohm, NTSC ONLY	
	Infrared Signal Input	+5 V digital logic level	

3.7.2 The DVD-301-01-x utilizes one (1) 15-pin connector for electrical connections, which provides power, data bus control, infrared input, and three (3) address strapping pins and a strapping common for unit identification on the RS-485 data bus and for IR control.

3.7.3 Infrared input provides a ground reference connection (-). For optimum infrared signal transmission, this ground reference should connect to the IFR-9A or IFR-485 module being utilized.

3.7.3 The three (3) address strap pins are able to be connected to the strap common. This provides eight (8) strapping configurations, allowing up to eight (8) identical units to be individually controlled on a system.

3.7.4 The fiber optic transceiver connector (J2) allows proper digital audio output to the audio distribution system.

3.7.5 The video output connector (BNC1) allows proper video output to the video distribution system.

3.8   Mating Connector Information

Model #	Mating Connector
DVD-301-01-1 (J1)	RD15F10JVL0 (Positronic Industries)
DVD-301-01-2 (J2)	DAMA-15S (ITT Cannon)
Optical Digital Audio Output	ST Series optical connector 501380-6 (AMP) or equivalent
Video Output (BNC1)	AMPHENOL 31-71013 or equivalent

3.9   Pinout Assignment and Descriptions

DVD-301-01-x (J1)	
Pin #	**Description**
1	+ 28 VDC Power Input
2	Ground
3	R+ Audio Output
4	R- Audio Output
5	L+ Audio Output
6	L- Audio Output
7	RS-485 Data Bus HI (A)
8	RS-485 Data Bus LO (B)
9	Infrared Input +
10	Infrared Input -
11	IR Strap 2
12	IR Strap 3
13	IR Strap 4
14	IR Strap Common
15	"Pause Mode" Constant GND Input

DVD-301-01-x (J2)
Digital Audio Output

DVD-301-01-x BNC1
Composite Video Output

3.10   Post Installation Test

This section is designed to assist the user in determining whether the DVD Player has been properly installed. First, before applying power, ensure the unit is connected correctly, especially concerning Power and Ground wiring. The audio signal output of the unit is generally connected to cabin speaker systems in addition to headphone locations. Verify all connections before supplying power to the unit.

There are no ON/OFF controls on the unit so ensure that +28 VDC power has been connected. Normally if power is not properly connected, the front panel controls' backlighting will not be illuminated and the player will not respond to any commands. If power is properly connected, the AI logo will appear on the monitor screen.

Activate monitors and speakers from the appropriate control panels. Audio will be supplied through headphones and/or speakers per system design. Make certain that the monitor(s) connected to the DVD Player are on and functional.

Press the EJECT ⏏ button on the Front Panel Controls or by using a remote control device. The disk tray will unlock. Carefully slide tray out and load the tray with a clean, functional DVD disc. Note that the DVD cannot be simply placed on the tray; it must be properly situated on the disc tray's spindles and pressed down until it snaps, refer to the photo below. **Be certain to load the disc correctly—if the DVD has a sticker, it should be loaded with the sticker facing up!** Gently push the DVD tray closed.

*Note: Unit shown with Cover Bezel Kit DVDKIT-301-01-1 for reference only. See Sections 2.4, 6.0, and 7.2 for further information.

The disc should begin loading, which will be indicated on the monitor screen. If the disc does not start playing automatically after it has loaded, then use the DVD player's front panel buttons or the handheld remote control unit to select **PLAY**. DVD material should appear on the appropriate monitor. This material is usually a menu, but this may vary, depending on individual DVD configuration. For CDs, the tracks should be listed on the side of the screen. Audio should channel through the speaker/headphone system.

If sound cannot be immediately heard through speakers or headphones, it may be that the volume is too low and should be increased appropriately. Note that there are no audio controls on the DVD-301-01-x. Any desired adjustments must be performed through other audio distribution devices.

If power is interrupted (>200 msec) or power drops below +18 VDC while a disc is playing, the player may shut down. If a DVD disc is in the player, the unit will begin playback from the beginning of the disc automatically.

4.0   Operation

4.1   Front Panel Controls

DISC TRAY MANUAL EJECT ACCESS
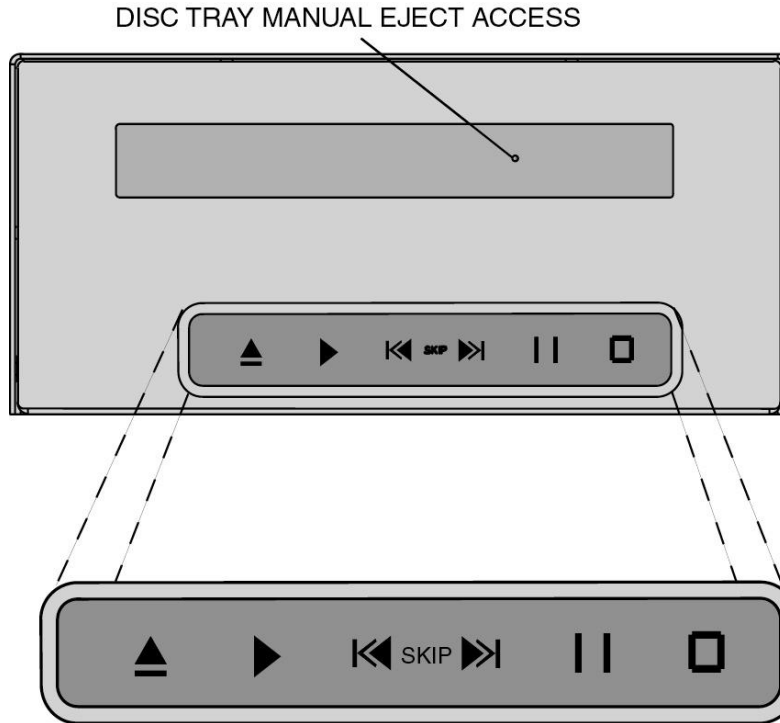
Note: DVDKIT301-01-1 Cover bezel shown for reference only

From left to right, the buttons are:

 EJECT   **PLAY**   **REVERSE SKIP**

FORWARD SKIP   **PAUSE**   **STOP**
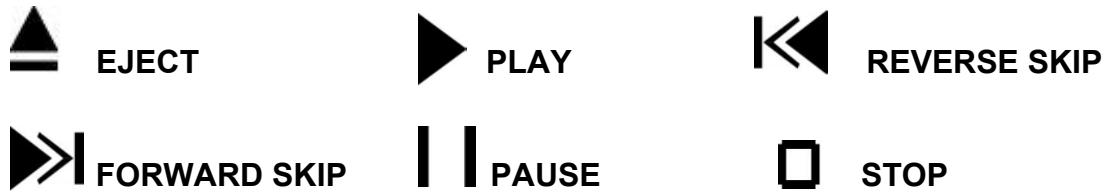
The next several pages detail the functions of these buttons.

4.2   Typical Control Functions:

▲ EJECT BUTTON

The Eject Button allows the user to access the Disc Tray. Pressing the Eject Button with the Tray closed will unlock the Disc Tray. It is then possible to gently pull the tray into an open position. Note that the Tray will not slide out on its own; it is necessary to manually open the tray

The Eject Button is active when the DVD Player is powered on and when the DVD Player is in Standby Mode. If the Eject Button is pressed while the unit is in Standby Mode, the unit will power up and then eject the disc tray.

▶ PLAY BUTTON

The Play Button allows the user to begin or resume normal Playback when the DVD Player is in the following modes: Hold, Stop, Pause, Fast Forward, Fast Reverse, Slow Forward, and Slow Reverse. See the following pages for details on these modes.

◄◄ REVERSE SKIP BUTTON

During movie or audio play, press to skip to the beginning of the previous chapter or CD track.

◄◄ REVERSE BUTTON (Not a front panel button. This feature is found on Remotes and Data Bus-Connected Devices Only)

The Fast/Slow Reverse Button is functionally dependent on the current mode of the DVD Player, and the media type being played.

DVD Video – Fast Reverse: This button is used during normal playback mode.

Display: **Function:**

Display	Function
◄ x2	Pressing the Reverse Button once will place the DVD Player in Fast Reverse x2 Mode with no audio output.
◄ x4	Pressing the Reverse Button a second time will place the DVD Player in Fast Reverse x4 Mode with no audio output.
◄ x8	Pressing the Reverse Button a third time will place the DVD Player in Fast Reverse x8 Mode with no audio output.
◄ x16	Pressing the Reverse Button a fourth time will place the DVD Player in Fast Reverse x16 Mode with no audio output.
◄ x30	Pressing the Reverse Button a fifth time will place the DVD Player in Fast Reverse x30 Mode with no audio output.
◄ x60	Pressing the Reverse Button a sixth time will place the DVD Player in Fast Reverse x60 Mode with no audio output.
◄ x2	Pressing the Reverse Button a seventh time will cycle the Fast Reverse Mode back to Fast Reverse x2.
►	Pressing the Play Button will exit the current Fast Reverse Mode and return the DVD Player to Normal Playback Mode.

Note: VCD supports Fast Reverse x2, x4, and x8 Modes.

REVERSE BUTTON CONTINUED

DVD Video – Slow Reverse: These functions are only active when the DVD Player is in PAUSE mode (see below).

Display: **Function:**

Pressing the Reverse Button once will place the DVD Player in Slow Reverse ½ Mode. The DVD-301-01-x plays backwards at ½ normal Play speed with no audio output.

Pressing the Reverse Button a second time will place the DVD Player in Slow Reverse ¼ Mode. The DVD-301-01-x plays backwards at ¼ normal Play speed with no audio output.

Pressing the Reverse Button a third time will place the DVD Player in Slow Reverse ⅛ Mode. The DVD-301-01-x plays backwards at ⅛ normal Play speed with no audio output.

Pressing the Reverse Button a fourth time will cycle the Slow Reverse Mode back to Slow Reverse ½ Mode.

Pressing the Play Button or the Pause Button will exit the current Slow Reverse Mode and return the DVD Player to Normal Playback Mode or Paused Playback Mode respectively.

Audio CD: Normal Playback:

Pressing the Reverse Button once will place the DVD Player in Fast Reverse X2 Mode.

Pressing the Play Button will exit the current Fast Reverse Mode and return the DVD Player to Normal Playback Mode.

Note: The Reverse Button is not active when a DVD Audio Disc or MP3 CD is played.

 FORWARD SKIP BUTTON

DVD Video – Forward: During movie or audio play, press to skip to the beginning of the next chapter or CD track.

 FORWARD BUTTON (Not a front panel button. This feature is found on Remotes and Data Bus-Connected Devices Only)

The Forward Button is functionally dependent on the current mode of the DVD Player, and the media type played.

Display:	Function:
	Pressing the Forward Button once will place the DVD Player in Fast Forward x2 Mode.
	Pressing the Forward Button a second time will place the DVD Player in Fast Forward x4 Mode.
	Pressing the Forward Button a third time will place the DVD Player in Fast Forward x8 Mode.
	Pressing the Forward Button a fourth time will place the DVD Player in Fast Forward x16 Mode.
	Pressing the Forward Button a fifth time will place the DVD Player in Fast Forward x30 Mode.
	Pressing the Forward Button a sixth time will place the DVD Player in Fast Forward x60 Mode.
	Pressing the Forward Button a seventh time will cycle the Fast Forward Mode back to Fast Forward x2.
	Pressing the Play Button will exit the current Fast Forward Mode and return the DVD Player to Normal Playback Mode.

▶▶ FORWARD BUTTON CONTINUED

DVD Video – Slow Forward: These functions are only active when the DVD Player is in PAUSE mode.

Display: **Function:**

▶ 1/2   Pressing the Forward Button once will place the DVD Player in Slow Forward ½ Mode.

▶ 1/4   Pressing the Forward Button a second time will place the DVD Player in Slow Forward ¼ Mode.

▶ 1/8   Pressing the Forward Button a third time will place the DVD Player in Slow Forward ⅛ Mode.

▶ 1/2   Pressing the Forward Button a fourth time will cycle the Slow Reverse Mode back to Slow Forward ½ Mode.

▶   Pressing the Play Button or the Pause Button will exit the current Slow Forward Mode and return the DVD Player to Normal Playback Mode or Paused Playback Mode respectively.

Audio CD: Normal Playback:

▶ x2   Pressing the Forward Button once will place the DVD Player in Fast Forward X2 Mode.

▶   Pressing the Play Button will exit the current Fast Forward Mode and return the DVD Player to Normal Playback Mode.

Note: The Forward Button is not active when a DVD Audio Disc or an MP3 CD is played.

❙❙ PAUSE BUTTON

DVD Video – Pause: Press the Pause Button once to place the DVD Player in PAUSE Mode. Several functions become available when the DVD Player is in PAUSE mode:

Display: **Function:**

The User can enter Slow Reverse Mode by pressing the Reverse Button. (Not a front panel option. This function is accessible by Remotes and Data Bus-Connected Devices Only)

The User can enter Slow Forward Mode by pressing the Forward Button. (Not a front panel option. This function is accessible by Remotes and Data Bus-Connected Devices Only)

The User can Step through the video by repeatedly pressing the Pause Button.

Normal Playback can be resumed by pressing the Play Button.

DVD Audio/Audio CD/MP3 CD:

Press the Pause Button once to place the DVD Player in Pause Mode.

Normal Playback can be resumed by pressing either the Pause Button or the Play Button.

Note: VCD Supports the Step Function, but does not support the Slow Reverse/Slow Forward Modes.

▢ STOP BUTTON

Press the Stop Button once during playback to place the DVD Player in Hold Mode. Pressing the Play Button at this point will resume playback from the Held point. Pressing the Stop Button again will place the DVD Player in Stop Mode. Pressing Play at this point will restart playback from the beginning of the disc.

4.3   Other Supported RS-485 and IR Commands

EJECT
This Button functions exactly as the front panel EJECT button: it allows the user to access the Disc Tray. Pressing the EJECT Button unlocks the Disc Tray. It is then possible to gently pull the tray into an open position.

SETUP
The SETUP Button toggles display of the Setup Menu, which allows the user to modify the following settings: Aspect Ratio, Still Mode, Screen Messages, Screensaver, Audio Output, Dynamic Compression, Speaker Configuration, Parental Lockout Password and Limitations, and Language Selection. Use the NAVIGATION buttons to advance through the available settings:

- **Aspect Ratio:** The User can choose to display the video they are watching in one of the following Aspect Ratios:
    Widescreen (16:9) **–** Displays video using a 16:9 aspect ratio recommended for widescreen TVs.
    Letterbox (4:3) **–** Displays video using a 4:3 aspect ratio in the letterbox format.
    Pan & Scan (4:3) **–** Displays video using 4:3 aspect ratio in the pan & scan format.
- **Screen Mode:** This option allows the user to toggle display of on-screen messages (i.e. the Play symbol, the Fast Forward symbols, etc.)
- **Code Version:** This is the version number of the currently programmed code. Include this number when requesting technical support.
- **Audio Output:** The User can choose from the following Audio Output Configurations:
    2 Ch. Analog + Compressed (SPDIF)
    2 Ch. (Analog) + PCM (SPDIF)
    5.1 Ch. (Analog) + PCM (SPDIF)
    None + Compressed (SPDIF)
- **Dynamic Compression:** This option allows the User to toggle Dynamic Compression on or off. Dynamic Compression will compress or expand the dynamic range of the signal depending on its content. This feature sacrifices some audio quality in order to "level" the volume in DVDs, reducing the range of both loud and quiet volume extremes for a more moderate listening experience.
- **Language Submenu**
    Audio: This option allows the User to change the preferred audio language if available on the DVD.
    Subtitle: This option allows the User to change the preferred displayed subtitle if available on the DVD.
    Menu: This option allows the User to change the preferred DVD menu language if available on the DVD.
    On-Screen Display: This option allows the User to change the preferred On-Screen Display language. This affects the Setup Menu.

SUBTITLE ON/OFF
Press to access the Subtitle Menu. Cycle through available subtitles with the NAVIGATION Buttons. Press SUBTITLE ON/OFF to exit. Note: Subtitles are available only on DVD Videos.

DISPLAY
Press to display the Title Chapter Time Search Boxes or Track Time Search Boxes, depending on the media.
- **Title Search:** The User can use the NAVIGATION Buttons to cycle through the available Titles on the DVD. The User can also use the NUMBER Buttons to enter a Title Number. Pressing ENTER activates the search.
- **Chapter Search***:* The User can use the NAVIGATION Buttons to cycle through the Chapters available in the current DVD Title. The User can also use the NUMBER Buttons to enter a Chapter Number. Pressing ENTER activates the search.
- **Time Search:** Using the NAVIGATION and NUMBER Buttons, the User can enter a time in the following format—Hours: Minutes: Seconds. Pressing ENTER activates the search.

MENU
Press to display the menu of the current DVD Video or Audio Disc. On some DVDs, pressing MENU a second time will return to normal playback.

NAVIGATION ARROWS
Use the four directional buttons (Up Arrow, Down Arrow, Left Arrow, and Right Arrow) to guide through menu options.

RETURN
The RETURN button acts as a carriage return function for number (ex. time, chapter selection) entry.

ENTER
The ENTER button allows the user to apply changes to the current playback and overall functionality when choosing disc menu and/or player setup selections.

ANGLE
The ANGLE Button allows the User to change angles on DVD Videos that offer angle selection. Press the ANGLE Button once to display the Angle Box and use the NAVIGATION Buttons to cycle through the available angles. Press the ANGLE Button again to close the Angle Box. Note that the ANGLE button only works with DVD video.

SUBTITLE SELECT
The User can cycle through the available subtitles with the NAVIGATION Buttons. Subtitles are available only on DVD Videos.

AUDIO LANGUAGE SELECT
This option allows the User to change the preferred audio language if available on the DVD. Also allows the User to choose from the following Audio Output Configurations: 2 Ch. Analog + Compressed (SPDIF), 2 Ch. (Analog) + PCM (SPDIF), 5.1 Ch. (Analog) + PCM (SPDIF), and None + Compressed (SPDIF)

SEARCH PREV (REW)
During movie or audio play, press to "scan" backward through media. Material will scan while the button is held, and, depending on media, video input will be available.

SKIP PREVIOUS (PREV)
During movie or audio play, press to skip to the beginning of the previous chapter or CD track. The SKIP PREVIOUS Button is functionally dependent on the current mode of the DVD Player, and the media type being played.

SEARCH FORWARD (FFWD)
During movie or audio play, press to "scan" forward through video and/or audio material. Material will scan while the button is held, and, depending on media, video input will be available.

SKIP FORWARD (NEXT)
During movie or audio play, press to skip to the beginning of the next chapter or CD track. The SKIP FORWARD Button is functionally dependent on the current mode of the DVD Player, and the media type played.

PAUSE/STEP
Press the PAUSE Button once to place the DVD Player in Pause Mode. Repeated presses cause the DVD to enter STEP mode.

PLAY
The PLAY Button allows the user to begin or resume normal Playback when the DVD Player is in the following modes: Hold, Stop, Pause, Fast Forward, Fast Reverse, Slow Forward, and Slow Reverse.

STOP
Press the STOP Button once during playback to place the DVD Player in Hold Mode. Pressing PLAY at this point will resume playback from the Held point. Pressing the STOP Button again will place the DVD Player in Stop Mode. Pressing PLAY at this point will restart playback from the beginning of the disc.

RANDOM
Press to play chapters or tracks in random order. Press again to exit Random Mode.

SLOW
Pressing this button plays material at ½ normal speed. Use the SKIP keys (Forward and Reverse) to change material speed. Press SLOW again to return to normal playback.

REPEAT
Repeat Mode allows the User to repeat designated segments of media. Use the NAVIGATION Buttons to cycle through the available Repeat Modes. Select "Off" to exit the current Repeat Mode.
-   **Repeat Chapter:** The DVD-301-01-x will repeat the current chapter until the User exits Repeat Chapter Mode.
-   **Repeat Title**: The DVD-301-01-x will repeat the current title until the User exits Repeat Title Mode.
-   **Repeat Disc**: The DVD-301-01-x will repeat the disc until the User exits Repeat Disc Mode.

A-B REPEAT
Use to continuously repeat all material between two chapters or tracks (designated A and B).

CLEAR
The CLEAR Button is used to clear any On Screen Display Menus.

NUMBER KEYS 0-9, 10
The NUMBER Buttons allow the User to enter Title/Track/Chapter numbers in the respective Search Box. The NUMBER Buttons also allow the User to enter a Parental Lockout Password. Typically, to enter numbers of 2-digit length or longer, the user needs only to type the number as it appears (e.g. for 43, the user would type the "4" button followed by the "3" button). Some older remotes allow only one number entry and come equipped with a "10" button, which, when pressed, adds 10 to the number key pressed. For example, entering 21 would require the user to press the "10" key twice and then the "1" button.

ZOOM
The ZOOM Button opens a small video window that allows the user to see the entire picture while zooming in on a selected portion. Subsequent presses of the ZOOM Button will cycle through the available Zoom Levels (2x, 4x, and 8x). By using the NAVIGATION Buttons, the User can examine different areas of the picture.

TEST
This button function only when there is NO media in the unit. First, it brings up a screen of color bars useful in determining the color setup of the system. This screen lasts for 10 seconds, and then the unit emits a 1k audio test tone as a control to allow the user to modify volume, speaker placement, or other audio functions as needed.

5.0   Instructions for Continued Airworthiness

In addition to the cautions and warnings provided in Section 3.3, the following guidelines and instructions will help ensure proper functionality and performance from the DVD-301-01-x

5.1   Recommended Cleaning Method

DVD-301-01-x should be cleaned routinely at least once every three months to ensure proper functionality. Use a standard DVD cleaning disc (not included with the DVD-301-01-x) and follow the listed directions.

5.2   General Troubleshooting Procedures

- Verify +28 VDC power is applied to the proper pins on the unit. Use a voltmeter to verify correct level.
- Reset by removing power from the unit for at least one (1) minute and reapply power.
- Recheck all connections to the unit for security and all harness runs for possible pinching. Recheck all pinouts for application accuracy.
- Utilizing a voltmeter, oscilloscope, or other voltage instrument, verify proper input voltage on the data bus pins to check data bus integrity. Typical measurements are as follows:
    A to Ground : 4.0 to 4.5 VDC
    B to Ground : 0.1 to 0.2 VDC
  If any device is transmitting (i.e., holding bus active), then these typical measurements would be reversed for the A-to-Ground and B-to-Ground measurements. This troubleshooting tool can help indicate a data bus lockup. If this occurs, remove the data bus from all other equipment one piece at a time. As each is removed, check the bus status to see if it is now functioning properly. Once you have removed the piece or pieces of offending equipment, disconnect power and then reconnect everything but the suspect component, reapply power and test the functionality of the unit.
- The RS-485 data bus is a bi-directional bus that does not have a 'bus controller'. The bus uses a differential digital signal that will transmit only when commands are entered via switch selection or other system synchronizing commands. The "A" leg of the bus is HI and the "B" leg LO.

5.3   Troubleshooting Chart

Problem	Possible Cause	Solution
No picture	➢ Unit is improperly installed ➢ No disc in source unit ➢ No power to Monitor	• Verify +28 VDC power and video input is present • Insert DVD in source unit • Apply power to Monitor
No sound	➢ Unit is improperly installed ➢ Audio system not powered or active ➢ Volume too low	• Verify +28 VDC power and audio input is present • Verify audio system is in active mode • Increase volume to acceptable level
Playback not functioning	➢ Disc not in the disc tray ➢ Disc upside down or not aligned in guide ➢ Incompatible disc in tray ➢ Dirty Disc ➢ Parental lock activated ➢ Menu on the monitor	• Insert a disc in the tray • Reposition disc • Replace disc with compatible one • Clean the disc • Change or cancel parental lock feature • Exit the current menu
No power	➢ Circuit breaker has opened	• Reset circuit breaker
Poor video quality	➢ Poor DVD quality ➢ Noise being introduced into system	• Replace DVD • Move source equipment closer to monitor or distribution modules
Buttons not operating	➢ Moisture may have condensed inside unit.	• Allow unit to warm to room temperature and moisture has evaporated.
DVD disc cannot be loaded	➢ Foreign object in disc slot	• Remove foreign object

5.4   Airworthiness Limitations

No periodic scheduled maintenance or calibration is required for continued airworthiness of the DVD-301-01-x. If the unit fails to perform to specifications, it must be removed and serviced by a qualified service facility.

6.0   Specifications

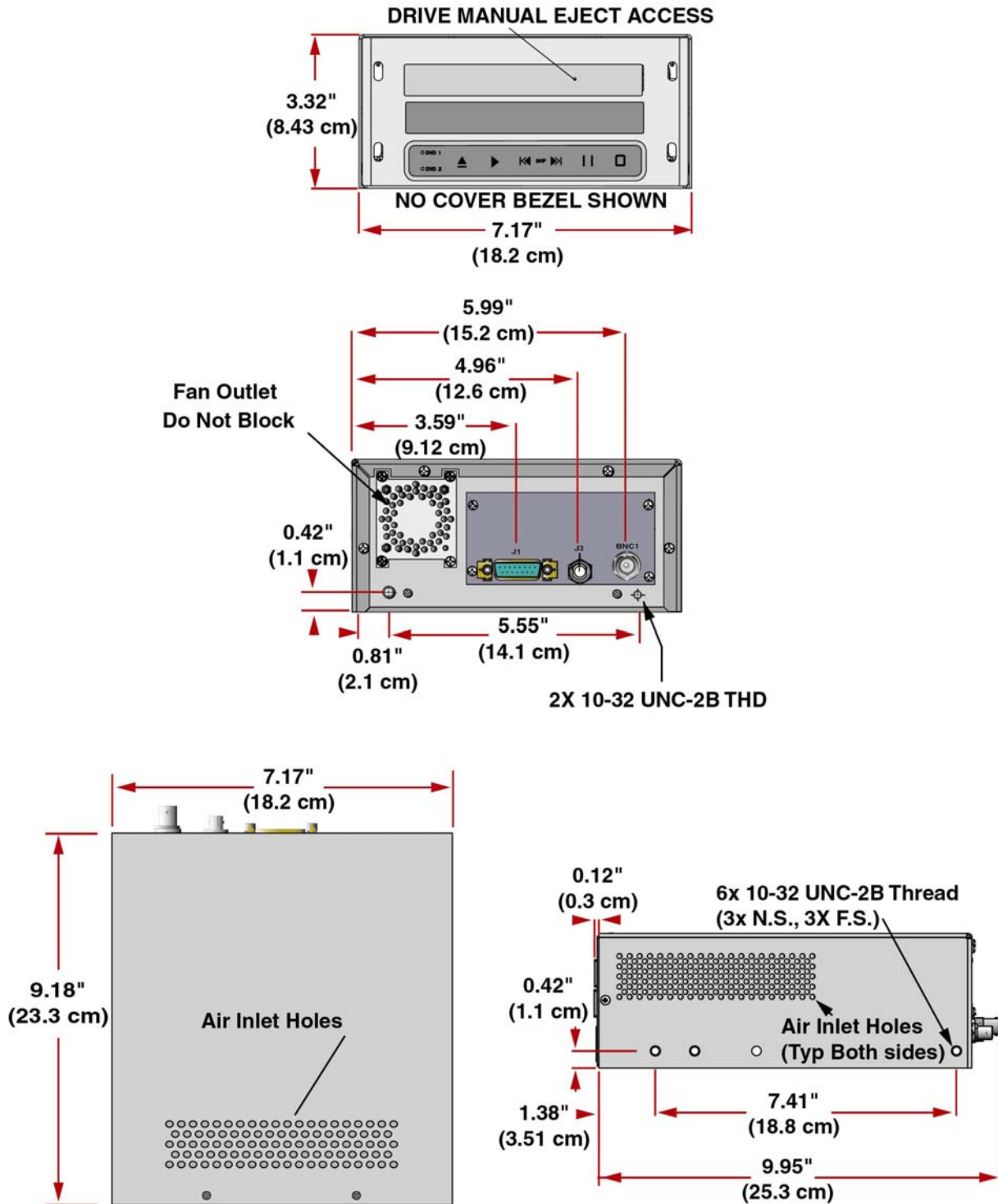| DVD-301 Physical Specifications—Base Unit	
Housing	Anodized Aluminum
Weight	Approx. 3.0 lb / 1.4 kg
Dimensions* (l x w x h)	9.95" x 7.17" x 3.32" 25.3 cm x 18.2 cm x 8.43 cm

* Dimensions provided are for the base unit, DVD-301-01-x. They do not include cover bezel information. Cover bezel dimensions (l x w x h) and weight for each model are listed below:

DVDKIT-301 Physical Specifications—Cover Bezels Only		
Model Number	**Dimensions**	**Approx. Weight**
DVDKIT-301-01-x	3.54" x 7.38" x 0.10" 8.99 cm x 18.7 cm x 0.25 cm	0.11 lb/ 0.05kg
DVDKIT-301-21-x	4.60" x 7.38" x 0.10" 11.7 cm x 18.7 cm x 0.25 cm	0.32 lb/ 0.15kg
DVDKIT-301-22-x	4.45" x 10.55" x 0.10" 11.3 cm x 26.8 cm x 0.25 cm	0.73 lb/ 0.33kg
DVDKIT-301-23-x	4.02" x 14.00" x 0.10" 10.2 cm x 35.56 cm x 0.25 cm	0.80 lb/ 0.4kg
DVDKIT-301-24-x	3.54" x 8.63" x 0.10" 8.99 cm 21.9 cm x 0.25 cm	0.51 lb/ 0.23kg
DVDKIT-301-25-x	4.45" x 10.55" x 0.10" 11.3 cm x 26.8 cm x 0.25 cm	0.73 lb/ 0.33kg
DVDKIT-301-26-x	4.45" x 13.63" x 0.10" 11.3 cm x 34.62 cm x 0.25 cm	1.0 lb/ 0.5kg

7.0   Reference Drawings

     7.1   The following diagrams show the unit dimensions, mounting locations, and connector locations for the DVD-301-01-x.

DRIVE MANUAL EJECT ACCESS

3.32"
(8.43 cm)

NO COVER BEZEL SHOWN

7.17"
(18.2 cm)

5.99"
(15.2 cm)

4.96"
(12.6 cm)

Fan Outlet
Do Not Block

3.59"
(9.12 cm)

0.42"
(1.1 cm)

J1   J3   BNC1

5.55"
(14.1 cm)

0.81"
(2.1 cm)

2X 10-32 UNC-2B THD

7.17"
(18.2 cm)

9.18"
(23.3 cm)

Air Inlet Holes

0.12"
(0.3 cm)

6x 10-32 UNC-2B Thread
(3x N.S., 3X F.S.)

0.42"
(1.1 cm)

Air Inlet Holes
(Typ Both sides)

1.38"
(3.51 cm)

7.41"
(18.8 cm)

9.95"
(25.3 cm)

7.2   Cover Bezel Kit Installation Drawings

    7.2.1   DVDKIT-301-01-x

0.11"
(0.05 cm)

7.38"
(18.7 cm)

3.54"
(8.99 cm)

SNAP IN
COVER BEZEL

DVDKIT Exploded View
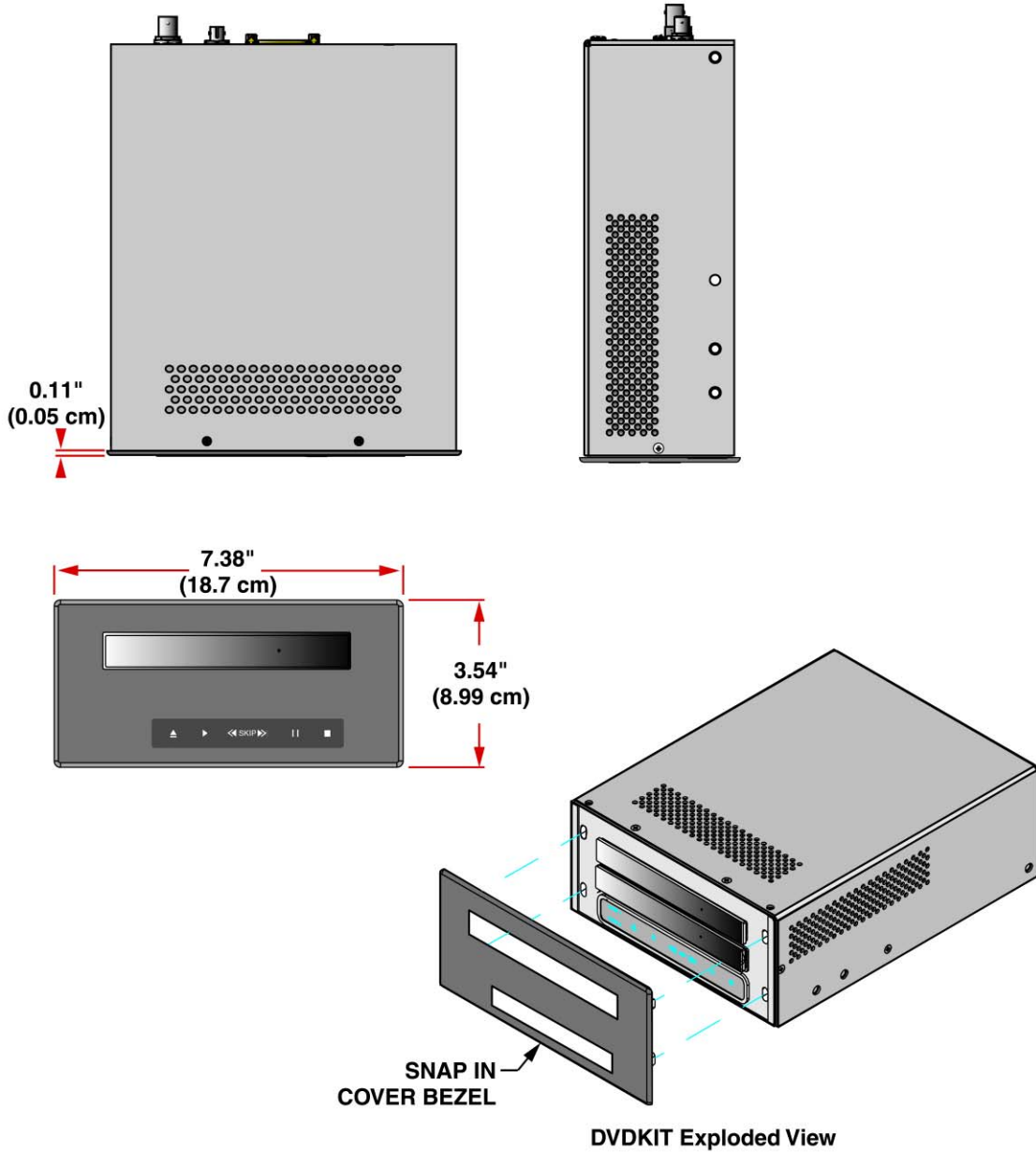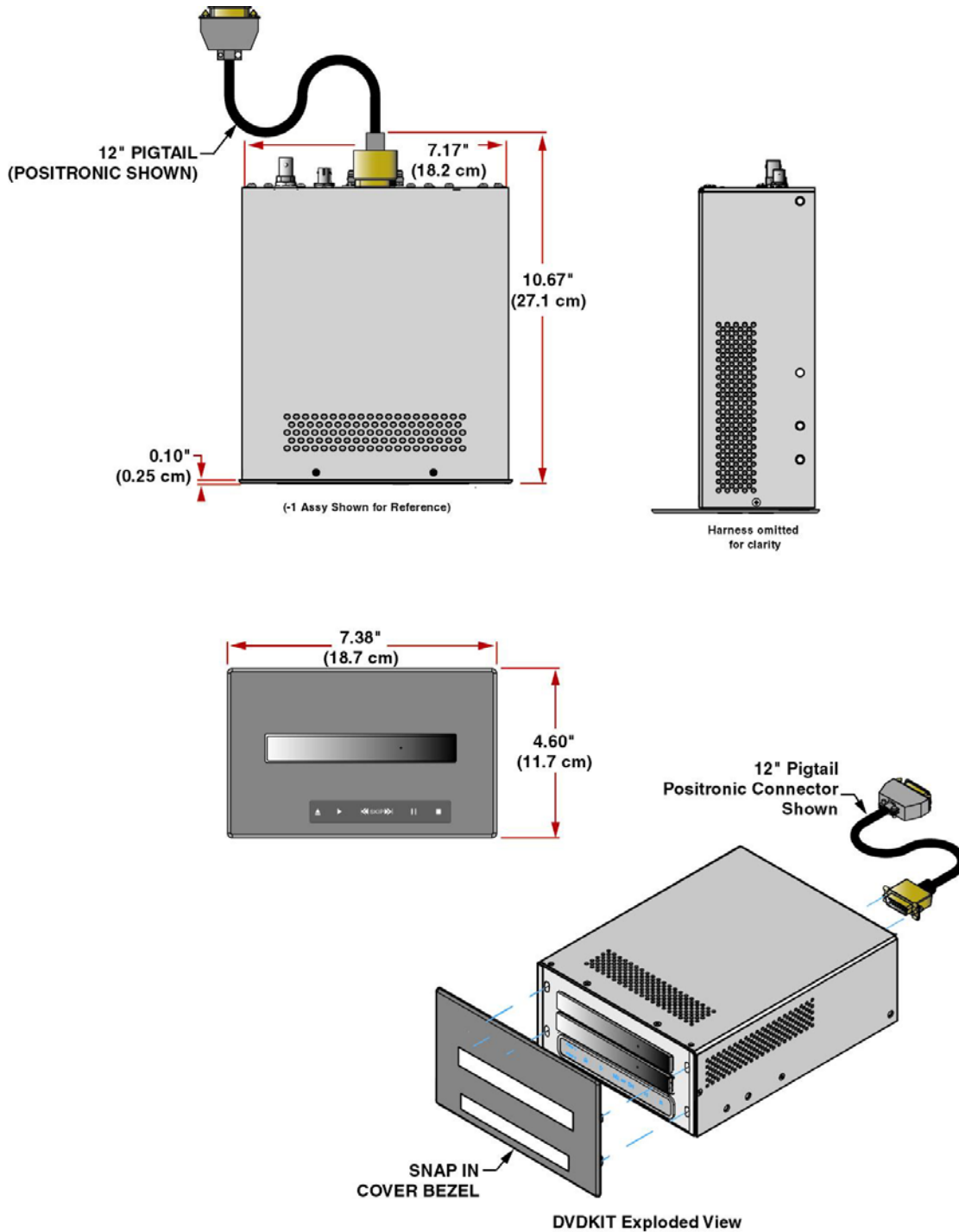
NOTES:
1. DVDKIT-301-01-x Weight: 0.11 lb
2. Total Weight (Base Unit and Kit) 3.11 lb
3. All Measurements Given with ± 0.03" Tolerence

7.3.2 DVDKIT-301-21-x

12" PIGTAIL
(POSITRONIC SHOWN)

7.17"
(18.2 cm)

10.67"
(27.1 cm)

0.10"
(0.25 cm)

(-1 Assy Shown for Reference)

Harness omitted
for clarity

7.38"
(18.7 cm)

4.60"
(11.7 cm)

12" Pigtail
Positronic Connector
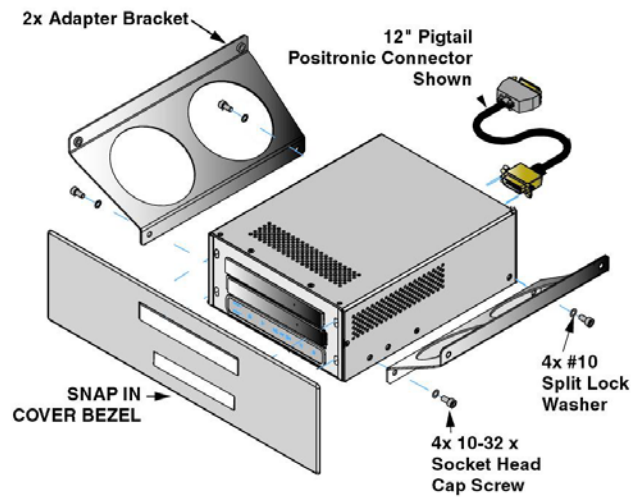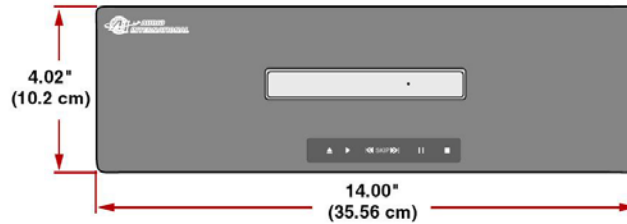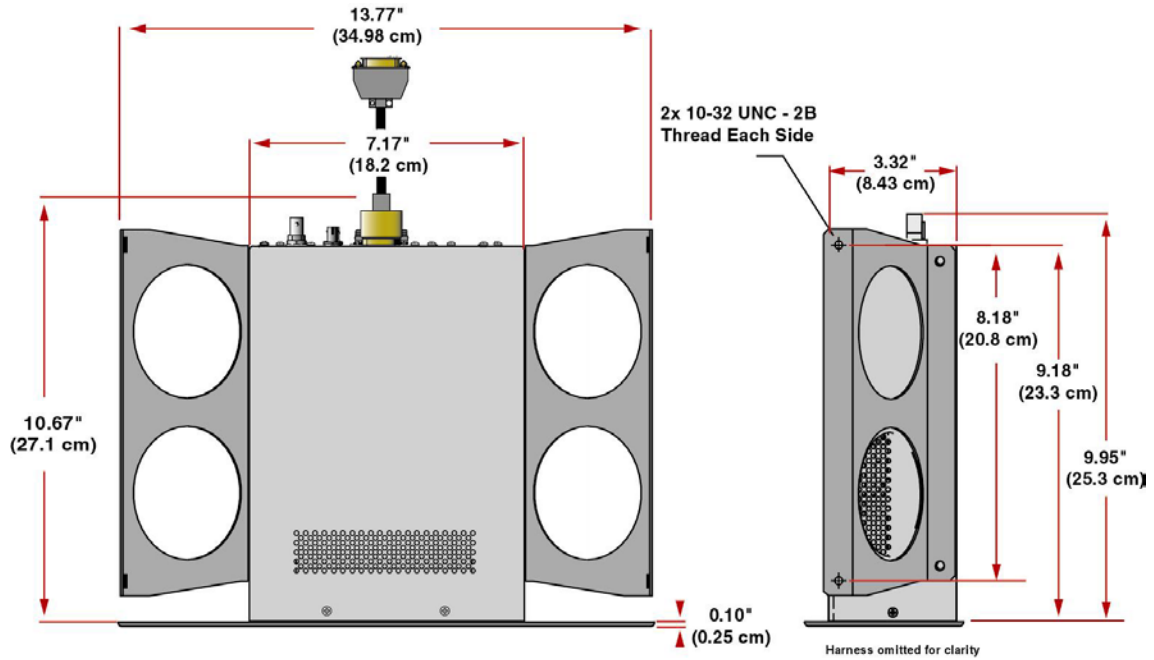Shown

SNAP IN
COVER BEZEL

DVDKIT Exploded View

NOTES:
1. DVDKIT-301-21-x Weight: 0.32 lb
2. Total Weight (Base Unit and Kit): 3.32 lb
3. All Measurements Given with ± 0.03" Tolerence

7.3.3   DVDKIT-301-22-x
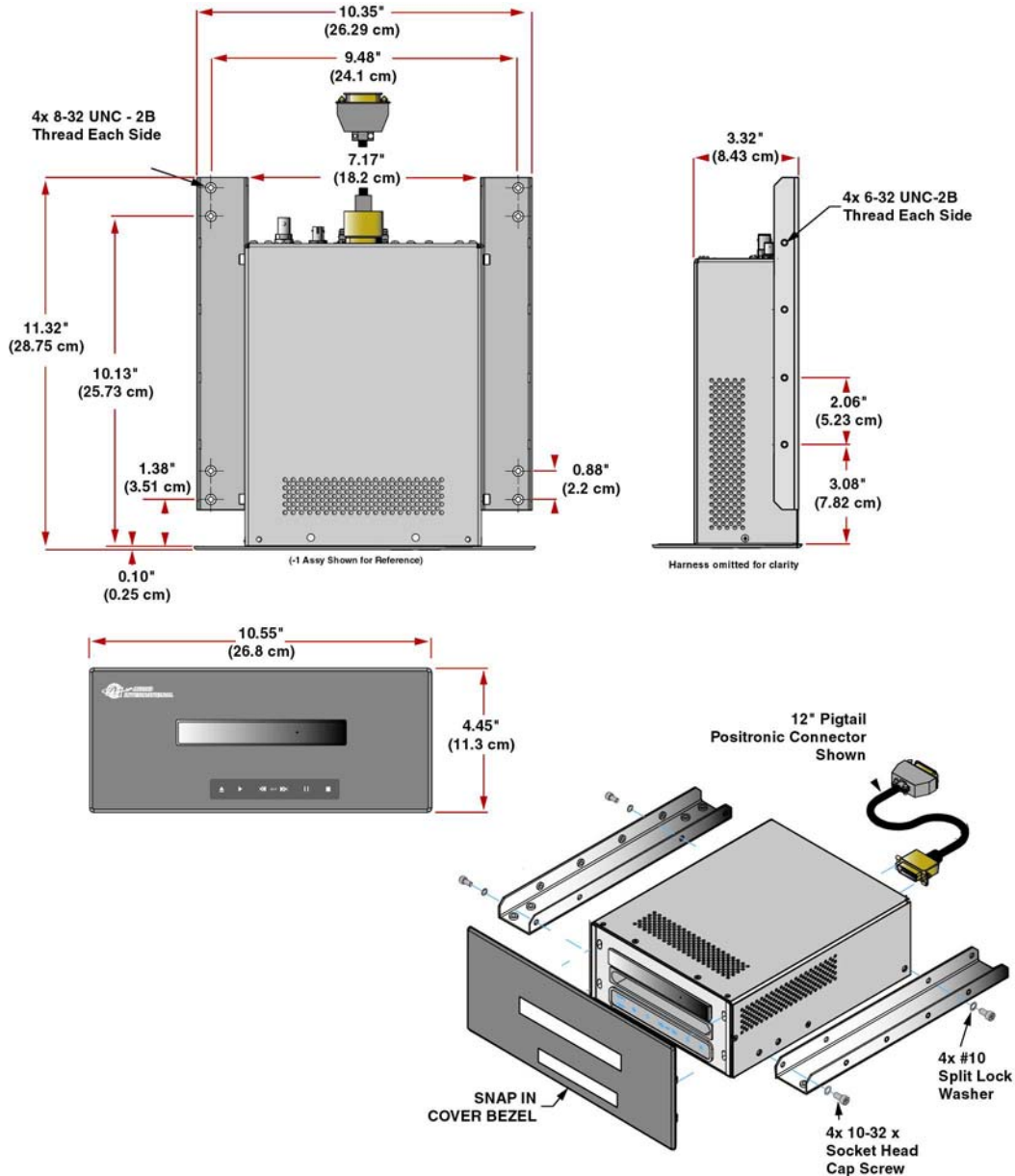
NOTES:
1. DVDKIT-301-22-x Weight: 0.73 lb
2. Total Weight (Base Unit and Kit) 3.73 lb
3. All Measurements Given with ± 0.03" Tolerence

7.3.4 DVDKIT-301-23-x

13.77"
(34.98 cm)

7.17"
(18.2 cm)

2x 10-32 UNC - 2B
Thread Each Side

3.32"
(8.43 cm)

8.18"
(20.8 cm)

9.18"
(23.3 cm)

9.95"
(25.3 cm)

10.67"
(27.1 cm)

0.10"
(0.25 cm)

Harness omitted for clarity

4.02"
(10.2 cm)

14.00"
(35.56 cm)

2x Adapter Bracket

12" Pigtail
Positronic Connector
Shown

SNAP IN
COVER BEZEL

4x #10
Split Lock
Washer

4x 10-32 x
Socket Head
Cap Screw

DVDKIT Exploded View

NOTES:
1. DVDKIT-301-23-x Weight: 0.8 lb
2. Total Weight (Base Unit and Kit) 3.8 lb
3. All Measurements Given with ± 0.03" Tolerence

8.51"
(21.6 cm)

12" PIGTAIL
(POSITRONIC SHOWN)

7.17"
(18.2 cm)

10.67"
(27.1 cm)

0.10"
(0.25 cm)

3.32"
(8.43 cm)

2x 10-32 UNC - 2B
Thread Each Side

9.95"
(25.3 cm)

8.79"
(22.3 cm)

9.18"
(23.3 cm)

1.38"
(3.51 cm)

Harness omitted for clarity

3.54"
(8.99 cm)

8.63"
(21.9 cm)

12" Pigtail
Positronic Connector
Shown

2x Adapter Bracket

4x #10
Split Lock
Washer

SNAP IN
COVER BEZEL

4x 10-32 x
Socket Head
Cap Screw

DVDKIT Exploded View

NOTES:
1. DVDKIT-301-24-x Weight: 0.51 lb
2. Total Weight (Base Unit and Kit): 3.51 lb
3. All Measurements Given with ± 0.03" Tolerence

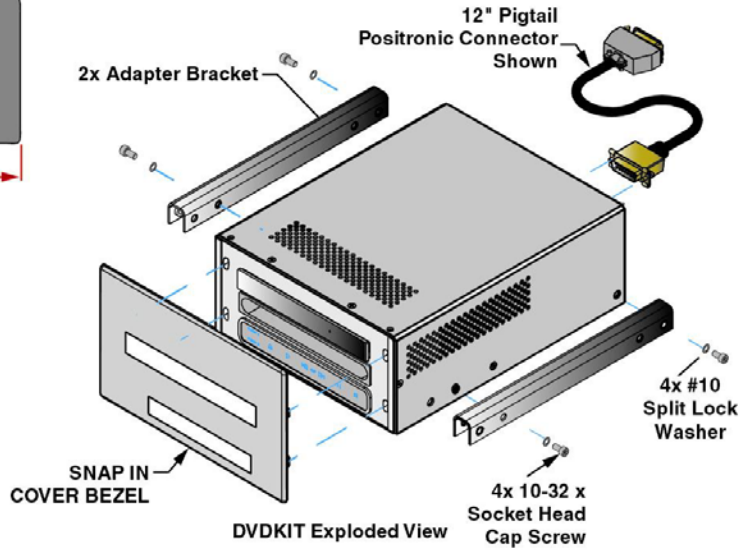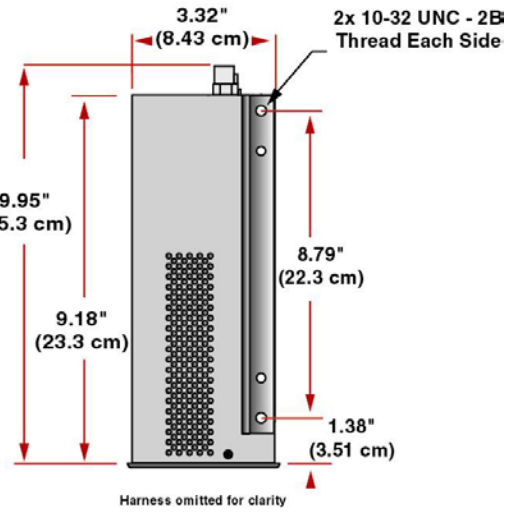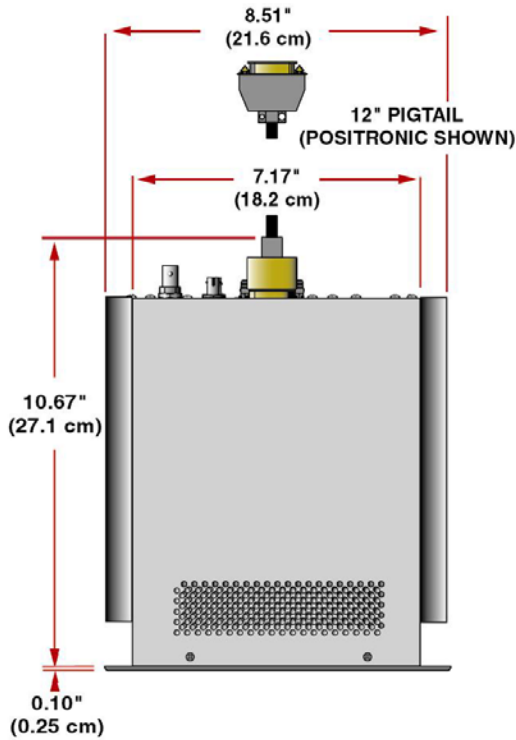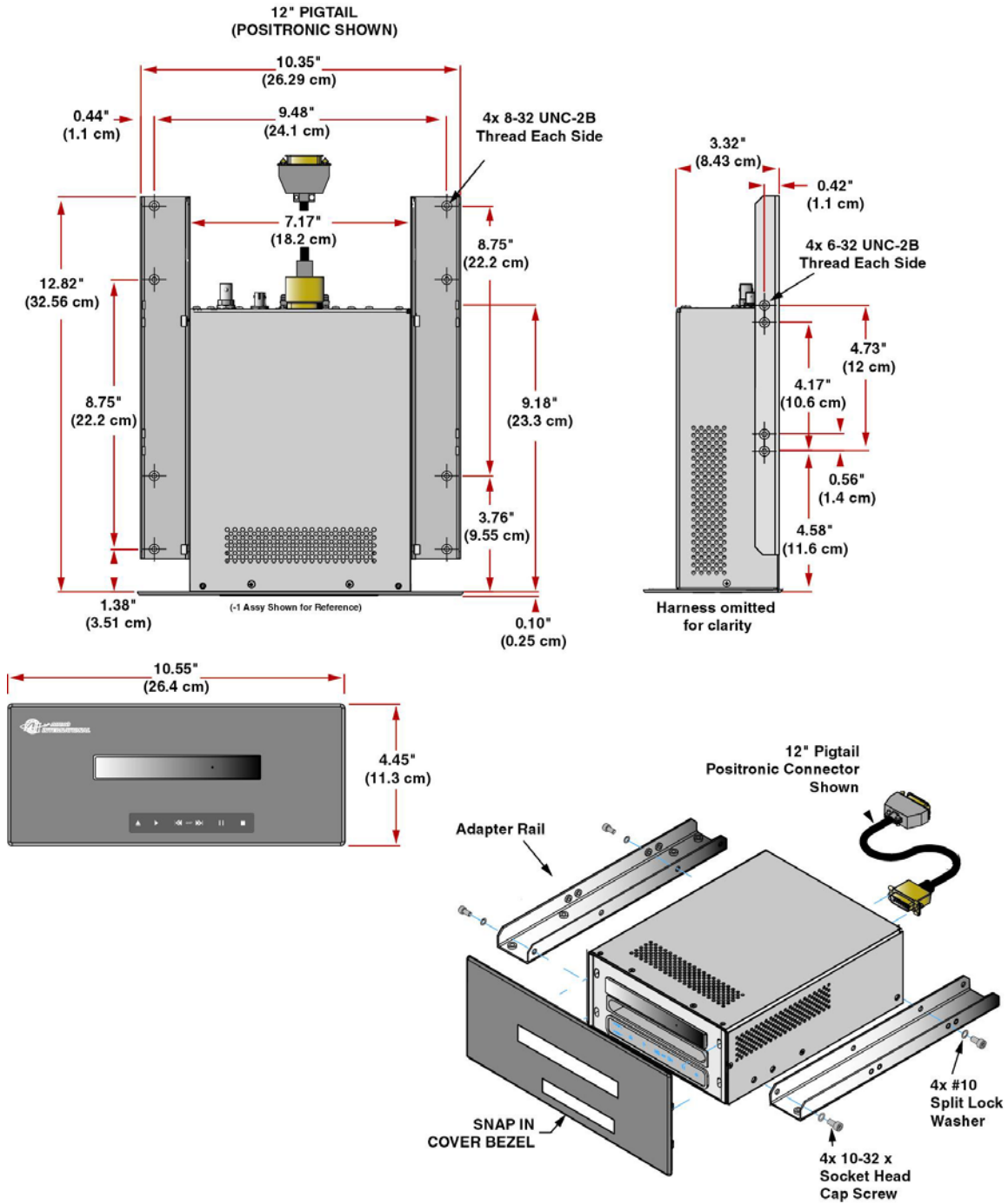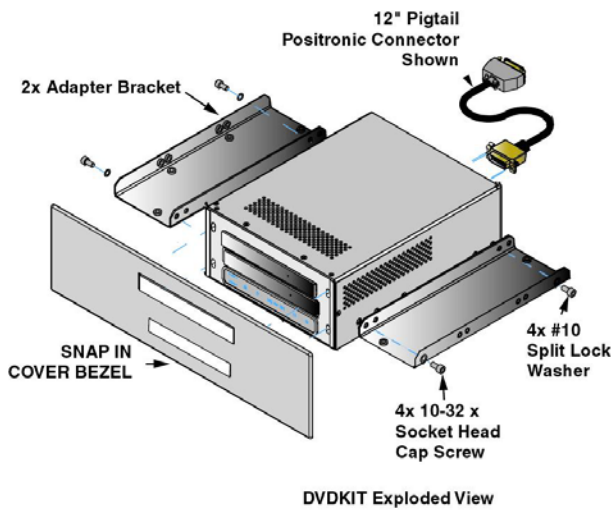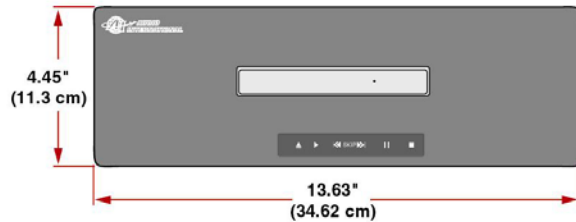### 7.3.6   DVDKIT-301-25-x

12" PIGTAIL
(POSITRONIC SHOWN)

10.35"
(26.29 cm)

0.44"
(1.1 cm)

9.48"
(24.1 cm)

4x 8-32 UNC-2B
Thread Each Side

3.32"
(8.43 cm)

0.42"
(1.1 cm)

7.17"
(18.2 cm)

8.75"
(22.2 cm)

4x 6-32 UNC-2B
Thread Each Side

12.82"
(32.56 cm)

4.73"
(12 cm)

4.17"
(10.6 cm)

8.75"
(22.2 cm)

9.18"
(23.3 cm)

0.56"
(1.4 cm)

3.76"
(9.55 cm)

4.58"
(11.6 cm)

1.38"
(3.51 cm)

(-1 Assy Shown for Reference)

0.10"
(0.25 cm)

Harness omitted
for clarity

10.55"
(26.4 cm)

4.45"
(11.3 cm)

12" Pigtail
Positronic Connector
Shown

Adapter Rail

4x #10
Split Lock
Washer

SNAP IN
COVER BEZEL

4x 10-32 x
Socket Head
Cap Screw

DVDKIT Exploded View

NOTES:
1. DVDKIT-301-25-x Weight: 0.73 lb (0.33 kg)
2. Total Weight (Base Unit and Kit) 3.73 lb (1.69 kg)
3. All Measurements Given with ± 0.03" (0.08 cm) Tolerence

7.3.7   DVDKIT-301-26-x

13.43"
(34.11 cm)

12.46"
(31.65 cm)

9.26"
(23.5 cm)

7.17"
(18.2 cm)

4x 8-32 UNC-2B
Thread Each Side

0.43"
(1.1 cm)

4x 6-32 UNC-2B
Thread Each Side

0.42"
(1.1 cm)

5.59"
(14.2 cm)

9.18"
(23.3 cm)

3.25"
(8.25 cm)

9.64"
(24.5 cm)

3.75"
(9.52 cm)

3.52"
(8.94 cm)

(-1 Assy Shown for Reference)

1.37"
(3.48 cm)

Harness omitted
for clarity

4.45"
(11.3 cm)

13.63"
(34.62 cm)

12" Pigtail
Positronic Connector
Shown

2x Adapter Bracket

SNAP IN
COVER BEZEL

4x #10
Split Lock
Washer

4x 10-32 x
Socket Head
Cap Screw

DVDKIT Exploded View

NOTES:
1. DVDKIT-301-25-x Weight: 1.00 lb (0.454 kg)
2. Total Weight (Base Unit and Kit) 4.0 lb (1.81 kg)
3. All Measurements Given with ± 0.03" (0.08 cm) Tolerence