

Operators Manual

AVDU-1616-xx-02-OPS

Issue A

OPERATORS MANUAL

AVDU-1616-xx-02-OPS

Airborne Video Display Unit



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1 General Description

This manual applies to the AVDU-1616-xx-03 Monitor. The functions described in this manual are inline with the R-TV Harmonised definition.

The Display also provides connections over the system bus to a map interface unit.

This manual relates to a harmonised upgrade to the base operation man machine interface. Future upgrades to the man machine interface are indicated in a MOD strike or firmware upgrade identification plate at the rear of the unit and on the On-screen Display (OSD) of the associated monitor.

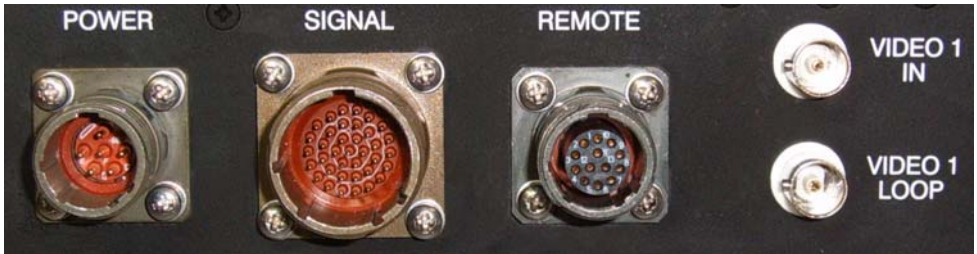
This manual relates to the following man machine interface versions:

Control system Version 2.0 (Harmonised configuration)

On Screen display Version 1.60.A0 (Version displayed in the OSD)

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2 Equipment connections



3 Control Key Functions and legend

The Unit powers on when power is applied to the monitor and the front panel brightness rotary knob is pressed in. The unit will power up the display and associated Video Recorder and Distribution amplifier (if connected).

The brightness rotary control (top) also adjusts the display illumination. The button backlight may be adjusted using the external lighting bus control mode (see over).

4 Display Operation

The following refers to a set of push buttons that are fitted to the front of the unit. In addition to power on/off, and a rotary control for backlight brightness, the control button interface provides for video source selection and an On-Screen Display (OSD) Menu.



The functionality for the buttons on the Display's front panel. The ON/OFF switch is implemented by the rotary brightness control when pushed and isolates the power to the unit.

KEY NUMBER	FUNCTION	KEY LEGEND	COMMENTS
1	Graphic	MAP	MAP: Display the Graphic VGA video input. In case the PC video input is not installed a dedicated message shall be displayed. (A blue screen with 'NO SIGNAL' will be displayed if no signal is detected.)
2	Video 1	FLIR	FLIR: Display FLIR image on the composite Video 1 input. If the FLIR image is not installed the display can either: 1. DPMS "on" (see menu)- Put up a blue screen with a 'NO SIGNAL' message . The display will turn OFF automatically after 10 seconds if no other button is pressed (Standby) 2. DPMS "off" - A blank black screen is shown UNTIL another input is selected by the operator (default)
3	Video 4	VR	VR: Display the image from the Video Recorder presented on the Composite Video 4 input on the signal connector or on the rear BNC
4			Not used
5			Not used
6			Not used
7			Not used
8			Not used

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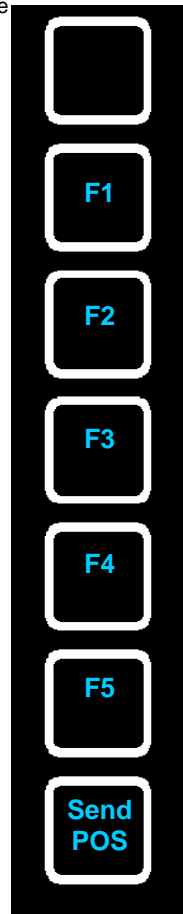
25	FRZ	FRZ: Freeze the Video Picture shown on the display. FRZ button has no affect when in XGA mode. When in FRZ mode, the backlighting of the bezel buttons flashes at a slow rate to show the user the system in FRZ mode.
26	-	Not used
27	Zoom +	Zooms the video image in (no function in Graphic mode)
28	Zoom-	
29	Cont+	Contrast regulation in display mode
30	Cont-	
31	PIP	Picture-in-picture: This button puts the Graphic input (XGA) as the main screen and invokes a video window onto the display. The video window could be MAP FLIR, VR etc. The PIP window can be sized and positioned via the set up menu and stored in non volatile memory.

Map commands will only function when the map is selected as the current source

15		Not used (F9)
14	F1	Sends the F1 function to the Map system.
13	F2	Sends the F2 function to the Map system
12	F3	Sends the F3 function to the Map system
11	F4	Sends the F4 function to the Map system
10	F5	Sends the F5 function to the Map system Requires the Map interface option to be fitted in the display or through a map interface unit connected to the Remote connector
9	Send POS	Sends the F9 function to the Map system

The joystick is enabled in MAP mode and may be used to move the map pointer around the screen in one of eight directions. The map joystick can also be pushed (function depends on the map mode).

In PIP mode the joystick moves the pip position



The in the joystick for three seconds in FLIR mode then pressing the VGA key invokes the On Screen Menu Display (OSD). To exit the menu navigate to the exit page

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5 Key Backlights

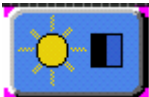
The back illumination of the front panel buttons is controlled by the lighting bus in the aircraft. The aircraft lighting bus is connected to the lighting bus contact in the “Remote” connector. The signal is fed to the Display where it is processed and passed to the peripheral units along the remote data bus.

6 On Screen Display (OSD) operation.

- | | |
|----------------------------------|--|
| To turn on the OSD menu: | In FLIR mode - Press the joystick in and hold for three seconds then press the left most button of the eight selection keys. |
| Move to next icon: | Press the MENU button momentarily (push J in) |
| Select options within icon menu: | Use SEL UP/SEL DN buttons, the selected option is in yellow. |
| Increase/decrease setting: | Use +/- buttons (SEL RIGHT/LEFT) |
| Move selection left/right: | Use +/- buttons, the selected option is in green |
| To confirm the selection: | Use + button (SEL RIGHT) |
| To turn off the OSD Menu | Press the MENU button and hold for three seconds
– this will store the user adjusted settings some settings are returned to the default after the power is removed. |


Note the Default settings are in **BOLD**


On screen Display (OSD) functions

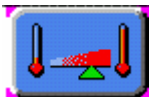


Brightness and Contrast :

The Brightness and contrast of the video and Map are independent

Brightness  Increase/decrease panel brightness level, total: 100 steps (**50**)

Contrast  Increase/decrease panel contrast level, total: 100 steps (**50**)




Colour Temperature : 9500K / 8000K / **6500K** / 5000K

Adjust the warmth of the image displayed. The higher temperature the cooler the image looks like. The lower temperature the warmest image looks.



Video Adjustment : (DISPLAYED IN VIDEO MODE ONLY)

Colour:  adjust video colour level

Tint:  adjust video tint level (NTSC video only)

Sharpness:  adjust video image sharpness level

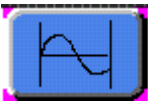
Picture Motion/Still/Normal Select different modes for different Videos

Type **Motion mode** – Good for dynamic scenes
Still mode – Steady and sharp image. For still picture


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displayed.
 Normal mode – “Non-flicker” image. For general use
 change bandwidth to match the source **(DVD)**

Video Type: DVD / VCR



Frequency and Phase : (DISPLAYED IN GRAPHIC MODE ONLY)

Frequency  Adjust the image horizontal size

Phase  Fine tune the data sampling position (adjust image quality)

Picture Type : Motion/Still/Normal
 ISelect still mode to getting a stable still picture displayed inside PIP window.
 Select Normal mode to getting a better display quality for RGB video input
(MOTION)

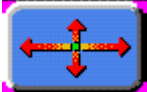


Video System : Select video system and input signals (DISPLAYED IN VIDEO MODE ONLY)

AUTO : automatic detection of NTSC and PAL system (not applicable in SECAM system)
(AUTO)
 NTSC / NTSC 4.43 : manual select NTSC system
 PAL / PAL M : manual select PAL system
 SECAM : manual select SECAM system



Status : Display graphic information: resolution and frequency (DISPLAYED IN GRAPHIC MODE ONLY)



Position :
 Image up/down : Use SEL UP/SEL DN to move the image vertically

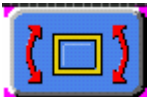


Image left/right : Use +/- SEL RIGHT/LEFT to move the image horizontally

Rotation : Rotates the image from landscape format to portrait format. (DISPLAYED IN VIDEO MODE ONLY)



Picture in Picture : (DISPLAYED IN GRAPHIC MODE ONLY)

PIP Size : / 1 / 2 / 3
 Select PIP window size: close, size 1, size 2 to size 24
 Do not set this to zero or no PIP will be displayed in PIP mode

PIP Source :
 Auto / Comp / Svid/YCbCr
Auto –may be changed by the controller)

Auto – automatic detection of Composite, S-video and Component (May be changed by the controller)

Comp – manual select composite video only

SVid – manual select S-video only

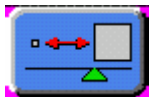
YCbCr/RGB – manual select component video only

(YCbCr/RGB Internally selected by switch to RGSB)

Horizontal Position		adjust the position of the PIP window horizontally
Vertical Position		adjust the position of the PIP window vertically

Advanced PIP Settings :

Brightness		adjust the image brightness of the PIP window
Contrast		adjust the image contrast of the PIP window
Sharpness		adjust the image sharpness of the PIP window
Tint		adjust the tint of the image of the PIP window
Colour		adjust the colour of the image of the PIP window



Video Scaling : (DISPLAYED IN VIDEO MODE ONLY)

Use the UP and DOWN arrow keys to select the following scaling modes.

Normal

Letterbox

Letterbox with Subtitles

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch

Graphic Scaling (DISPLAYED IN GRAPHIC MODE ONLY)

Modes

Use the up and down arrow keys to choose a scalar mode.

Use the + or - key to modify a following scalar parameters.

One to One :

Horizontal Pan	
Vertical Pan	

Fill Screen : enable full screen expansion for lower resolution Image
(Default)

Fill to Aspect ratio : enable fill screen expansion for lower resolution image according to aspect ratio.

Nonlinear Scaling Modes : Horiz Clipping / Horiz Offset / Horiz Stretch / Vert Clipping / Vert Offset / Vert Stretch

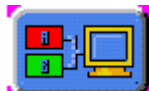
Language : Select OSD menu language display

1. English **(Default)**
2. Danish
3. Chinese (Simplified)
- 4.



Video source : Select the input video signal

Analogue RGB / Component Video / **Composite Video** / S-Video



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Utilities : DISPLAYS THE OSD VERSION = “V1.60A0”



User Setting :	User Timeout	adjust the OSD menu timeout period in a step of 5 seconds (No user adjustment possible – setting will be overridden to always on/5 sec)
	DPMS	Disable / Enable the DPMS function When enabled the screen will display an error message when no input is present on the selected image source. The display will go into standby after a short period if there continues to be no input. The display will “wake up” if an image source returns.
	Display Input	Disable /Enable the input source name on screen (Disabled by default)
	Auto Source Select	: Off - Disable auto source select function. Low - Auto source select enable ONLY in power up. High - Auto source select ALWAYS enable. Set to OFF by Default – screen will display an error message when no input is present)
	Gamma:	1.0 (Default setting) 1.6 2.2
	Video Port Select	Select “Port 1” or “Port 2” of the source Composite/SVideo/YCbCr (Do not adjust these settings it may not be possible to view an image again or return to the OSD)
OSD Setting :		
OSD Horz position :		move the OSD menu horizontally
OSD Vert Position :		move the OSD menu vertically
	OSD Background :	Translucent / Opaque
	OSD Rotate :	Normal / Rotate
Freeze Frame :		Freeze the image (use “+>” button)
Zoom :		Zoom level : enable the zoom in function on the image displayed. Use “+>” Right button to zoom in the image. Use “<-“ Left button to decrease the zoomed

image.

Horizontal Pan



Vertical
Pan



Direct Access #1: Define the hot key function(Right “+” and Left“-“) for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom / Video Source* / PIP

(Normally set to Contrast) This can be set to any other function

Direct Access #2: Define the hot key function (“SEL UP” and “SEL DN“) for one of the following adjustments : Brightness / Contrast / Volume / Freeze / Zoom / Video Source* / PIP

(Automatically set to Brightness)

Display Orientation : Normal / Horizontal Inverse /

Vertical Inverse / Inverse

Calibrate RGB Gain : Colour Calibration

(DISPLAYED IN GRAPHIC MODE ONLY)

Load Factory Defaults : Recall factory default settings.

* By pressing the hot key, the source is in sequence of Analogue

RGB/Composite Video/S-Video/Component Video.



Volume : Not Implemented

Adjust the audio volume level (functions only if the audio add-on installed)



Exit menu

Do not exit the OSD menu using this mode. The User adjustments will not be saved and the exit mode is indeterminate. To Exit the menu Press and hold the Menu button for three seconds. In the event that the menu is exited using this method return to the OSD by pressing and holding the Menu key for three seconds twice (the first will not display the OSD, the second will display the OSD. It will then be possible to exit the menu normally (pressing and holding the Menu key for three seconds) and the adjustments will be saved, Alternatively remove power from the unit by turning the system power switch off.

(applies to V1.60.A0 OSD firmware)

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NOTE:

The OSD settings chosen will be stored in memory. The OSD menu can be cleared from the screen by Moving the selection bar to the EXIT icon pressing the + (Right) button will exit the menu.

6.1 Factory defaults

The following defaults are reset at power on to the factory settings.

User time out = 5 sec (infinite)

Direct Access #2 = brightness (keys used for key backlight brightness)

6.2 Installation Defaults

The following defaults (Shown in blue above) are reset at power on to the installation settings. They may be changed and used but they will be returned to the installation defaults on reapplying power.

DPMS

Display Input - Source Name

Auto Source select (Source Priority)

OSD Transparency

OSD Rotate

Display Orientation

All other settings are remembered during power off and may be changed during operation. This specifically includes:

PIP Size (Reverts to Factory default size on power off)

PIP Location

Direct Key #1

7 A note on Brightness

The front panel brightness control adjusts the illumination level coming from the display unit. It may be adjusted to match the background illumination level present in the aircraft and may be set to very low levels for night operation and high levels for day operation. Care should be taken not to leave the unit powered at high brightness levels when in a static or training mode as high power is drawn by the unit and overheating may occur. There is an independent “brightness” secondary control on the OSD for both the video and the Graphics/map input. This sets the video level of the video or graphic source. It is factory set to its midpoint (50) and it should not be normally necessary to adjust this on a day to day basis.

8 Contrast.

The contrast is normally adjusted using the “Contrast” keys in video mode. Pressing either these keys will display a contrast bar in the centre of the screen. Pressing the keys or holding them will adjust the contrast + or -. The contrast is factory set to its midpoint (50) It should not be necessary to adjust this on a day to day basis unless the contrast level from the sensor video is poor (It is usually better to adjust the sensor settings rather than the “normalised” display. (Holding the key will auto repeat for rapid value change) The contrast settings for the Map and the video are independent and are stored separately.

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9 TROUBLESHOOTING

When troubleshooting the flat panel display system it is worth considering it as separate elements, such as:

- External Equipment; PC settings, video format
- Display Panel (Menu setup, cabling, connection, panel, PC settings)
- Backlight (inverter, cabling, backlight tubes)
- Computer system (display settings, operating system)

Through step-by-step cross checking with instruction manuals and a process of elimination to isolate the issue it is usually possible to clearly identify the problem area.

Note that removing power from the system may clear a system lockup or return the settings to their default condition.

No image:

- If the panel backlight is not working it may still be possible to just see some image on the display.
- A lack of image is most likely to be caused by incorrect connection, lack of power, failure to provide a correctly formatted signal or incorrect graphic card settings.

Image position:

If it is impossible to position the image correctly, (i.e. the image adjustment controls will not move the image far enough), then test using another graphics card. This situation can occur when a custom graphics card, that is not close to standard timings, is used.



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Image appearance:

- A faulty panel can have blank lines, failed sections, flickering or flashing display
- Incorrect graphics card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, to scroll, flicker badly or possibly even no image.
- Incorrect internal jumper settings on the internal controller card may cause everything from total failure to incorrect image. Internal jumper settings are set at the factory.

Continued failure:

If unit after unit keeps failing investigate whether you are short circuiting the equipment or doing something else seriously wrong.

Generally after common sense issues have been resolved we recommend step-by-step substitution of known working parts to isolate the problem.

10 Handling Precautions

Handling of the Remote Control should be in compliance with Real-Time Vision's handling principles.

- 1) Be sure to turn off the power supply when inserting or disconnecting the input connectors.
- 2) Wipe off water or fluid droplets immediately. Long contact with water or other fluids may cause discoloration or spots.
- 3) Since CMOS LSI is used in this module, take adequate static electricity precautions and ensure correct human earth bonding when handling.
- 4) Do not open nor modify the Assembly.
- 5) At the insertion or removal of the Remote Connectors, ensure that the sockets are free from debris and be sure not to damage the Interface pins

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