DVP3000
DVP3000U
Digital Video Processor

Installation and
Operations Manual

P

FAROUDJA
PICTURE PLUS

Table of Contents

This manual applies to both the DVP3000 and DVP3000U. All features listed for the DVP3000
also apply to the DVP3000U. Features unique to the DVP3000U will be highlighted.

Made in USA

Product Description

On June 24, 1998 Yves Faroudja was awarded the prestigious Charles F. Jenkins Lifetime Achievement Award from the Academy of Television Arts and Sciences for his video processing technology. Faroudja's first Emmy was awarded in 1991. Some of this award winning technology is used in the DVP3000.

The Faroudja DVP3000 Digital Video Processor/Scaler is the ideal solution for optimizing the growing selection of display devices that require high performance results.

The unit is a precision video instrument used to convert 480i interlaced signals into high-resolution progressively scanned images .

The DVP3000 removes typical video processing artifacts while also increasing color purity and image detail by using a process called Picture Plus™ technology. (See page 3 for details).

It offers unique flexibility to select different scan rates and aspect ratios to get the most out of the display device whether it be a CRT, LCD, DLP or Plasma based display.

The DVP3000 is a full function Scaler that offers computer scan rates of VGA, SVGA, XGA and SXGA plus HDTV scan rates of 1080i, 720p, 960p (Quadrupling) and even 1080p. This flexibility allows for optimization of any type of display technology. CRTs can be set to provide maximum scan lines with maximum detail and any pixel-based display can be connected at the projector's native resolution.

Another key feature for optimizing the image is internal Aspect Ratio selection. This

provides perfect image geometry no matter what type of source is used, either Letterbox, Anamorphic or 4:3. Since the DVP3000 manipulates the aspect ratio, the display only needs one memory.

The DVP3000 accepts all types of interlaced sources; Composite, S-Video and Component. It is also forward compatible with future sources including the progressive output from DVD players by upconverting the signal to a higher scan rate. It also has connections for any high resolution source such as HDTV or Computer to pass-through to the display while offering controls for Contrast and Color.

Two key new technologies are implemented in the DVP3000. DCDi ™, Directional Correlation Deinterlacing, prevents the introduction of motion artifacts from video original material such as sporting events. The Scan-Lock ™ Bandwidth Expansion circuit optimizes the detail settings for each scan rate.

The DVP3000 offers a 10-bit color decoder for noise free color reproduction. A Time Base Corrector helps to stabilize unstable sources such as VHS tapes.

The DVP3000 comes with a multi-function smart remote control that allows for both toggle and direct access control of all functions plus has the commands for seven other theater devices already loaded into its memory.

The greatest benefit of the DVP3000 is the image quality, a result of a complex three stage process called Picture Plus™ Technology.

Stage 1 – Color Decoding: Adaptive Comb Filter- Cross Color Suppression - Bandwidth Expansion

In order for the display to create an image, it must receive Red, Green and Blue signals. The separation of RGB from a composite or S-video signal is called decoding. This process, usually done incorrectly, introduces many errors into the picture. The most visible errors are called Dot Crawl, seen as moving dots along color edges, and Rainbow patterns, seen as a moving rainbow over fine lines such as patterned shirts a news anchor might wear.

Faroudja's patented 10-bit **Adaptive Comb Filter** and **Cross-Color Suppression** circuit eliminates these errors yielding much improved color purity and edge detail even in scenes with fast motion.

Most composite video and S-Video sources have been filtered to reduce the amount of signal (bandwidth) for recording and transmission purposes. This can significantly reduce color edge detail causing colors, such as Red, to blur onto White backgrounds.

Faroudja's Patented **Color Bandwidth Expansion** circuit actively monitors the color signal and significantly increases color edge detail to levels typically found only in production studio original material.

Stage 2 – Film and Video DCDi Motion Tracking

Changing the structure of the video source from interlaced to progressive is a difficult process when the signal contains any motion.

For material originated from video cameras, such as sporting events, DCDi ™ is used. Directional Correlation Deinterlacing prevents the introducing of jagged edges and blurring. For video converted from film cameras, the patented 3/2 pull-down detection circuit is used.

These circuits allow the unit to recombine the interlaced film or video frame back into its original structure limiting the introduction of motion errors. Horizontal, vertical and even angled lines are correctly reproduced.

Stage 3 – Luminance Bandwidth Expansion

Faroudja's patented **Luminance Bandwidth Expansion** circuit is able to greatly increase the perceived resolution of any video source by reducing the time it takes the signal to change from one level to the next (called Rise-Times). This normally can only be accomplished by increasing the bandwidth of the signal. Faroudja's unique circuit yields detail levels typically found only with high-bandwidth production studio original material.

The DVP3000 applies the new Scan-Lock feature. The Bandwidth Expansion circuit is applied after the scaling stage. This allows for the circuit to optimize, or "Lock" to each scan rate. The optimized settings are automatically recalled each time the scan rate is selected.

It is the combined affect of all three stages that yield the superior image quality only Faroudja can offer, regardless of scanning rate. By never compromising at any point in the circuitry, Faroudja processors will yield unparalleled image quality, matching 35mm film in color, detail and dramatic impact.

Installation
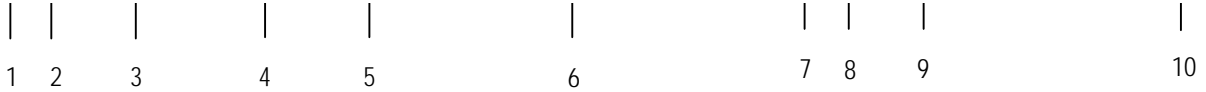
Unpacking

Remove the DVP3000 unit from the shipping container and examine it for any signs of shipping damage or missing items (check inventory list below). All shipping materials should be saved if the unit is to be moved or returned for service.

Installation

The DVP3000 processor is designed to be either placed on a table or rack mounted. If the rack mounting installation kit is to be used, the rack mount ears are mounted by using 3 screws. It will be necessary to support the rear of the unit if it will be shipped in the rack by using rack support rails supplied by the rack manufacturer.

Ventilation

The unit is cooled by a fan located on the top panel. Air is drawn from vents along the sides and bottom of the chassis. **These vents must not be blocked**. When rack mounted, a minimum of 1.75" (1 rack unit height) of free space is required above and below the unit to allow for proper cooling. A forced air fan should be added to the rack installation if power amps are located in the same air space.

Rear Panel I/O

Inputs
1. S-Video (4 Pin DIN)

2. Composite Video (RCA)

3. Component Video
   Interlaced or Progressive(RCA)

4. HDTV/Computer (D15M)
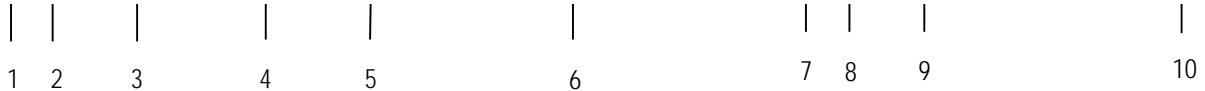
10. AC Power

Outputs

5. RGBHVC, YUV or YPrPb (D15F)

6. RGBHVC, YUV or YPrPb(BNC)

Control

7. Screen Trigger (12V , 3.5mm , 2or 3pin)

8. Remote IR sensor (5V, 3.5mm, 3pin)

9. RS232 Port (D9F)

11. Access Plate for Future Upgrades

Inventory	
1 – DVP3000	1 – Remote + Batteries
1 – Owner's Manual	2 – Rack Mount Ears
1 – Power Cord	1 – Warranty Card

1 2   3   4   5   6   7 8   9   10

Connections

This page outlines how different sources and displays can be connected to the DVP3000. Because of the high performance of the DVP3000 it is very important to use the highest quality cables possible, for both input and output signals.

Both the RGB BNC and the D15 Monitor output connections are active at all times and can run two displays simultaneously.

To avoid AC ground loop problems, the source equipment, DVP3000 and projector should all be running on the same AC power line (one correctly rated for the power requirements).

Source Inputs

1. S-Video (Y/C) sources such as DVDs, Satellite systems, S-VHS tape decks (when using S-VHS tapes only), Hi-8 tape decks.

2. Composite video sources such as Laserdisc players, cable TV, VHS tape decks, 8mm tape decks.

3. Interlaced Component video sources such as DVDs and professional tape decks. Progressive Component signals from DVDs are also connected here.

4. High scan rates sources such as HDTV and computers as a pass-through to the projector.

Outputs

5. D15F connector for use with computer monitors or to a second display device.

6. BNC connectors for main output to display devices. For YPrPb outputs use:
   Red = Pr
   Green = Y
   Blue = Pb

Note: If HDTV or Computer signals are to be used, the projector must have separate H & V sync cables installed.

Control

7. 12V trigger to activate automatic screen relays.

8. IR receiver connection allows for use with external IR receivers so unit can be installed behind walls.

9. RS232 D9F connection for use with RS232 control systems

10. AC Power connection.

Installation

Setup

Setup offers functions that must be done when the unit is initially installed. Some user features are not available with a few of the Setup selections so this must be done first. To prevent accidental alteration of the setup parameters, **setup can only be done from the front panel or with the RS232 interface.**

Here are the Functions in the order they appear in the menu when pressing the **+** button after the initial Self Test is completed. Press the **Function** keys + or - to toggle through the Functions. Press the **Value** keys + or - to change selections and values.

Image Size
Normal   (Default)
Cropped

Note: Normal is defined as the full image being sent from the output stage to the display, also know as Underscan. Cropped is defined as the image edges being slightly cropped to remove errors caused by an unstable scan.

Scan Rate
(See Notes on Scan Rate Selection)
Line Doubled   (Default)
Frame Doubled*
800x600
720p
1024x768
Line Quadrupled (960p)
1280x1024
1080p
1080i

Do not select a scan rate that exceeds the displays specifications. Damage may occur to the display or possibly the image may not be seen.

- Note: Frame Doubling in the DVP3000U is available for line rates of 480P for NTSC and 576P for PAL only.

Screen Shape
4:3
Widescreen   (Default)

Note: This should be set to match the primary screen shape in the installation. This is important to recall the proper geometry settings in the DVP3000. (See *Aspect Ratio Control* section on page 7)

Video Standard
NTSC
NTSC/PAL (Auto-detect)   (Default)
PAL M   DVP3000U
PALN

Note: In the DVP3000U, the NTSC/PAL auto-detect setting should be selected.

Output Format
RGB   (Default)
YUV
YPrPb

Note: The HD Pass-through input format must be the same as the output format for proper operation.

C – Sync on H
On
Off   (Default)

Composite Sync on the H connector.

Sync on Green
On
Off   (Default)

Note: Sync on Green is NOT available when using the HD Pass-through input.

Pass-Through Formats
800X600
1024X768
1280X1024
1600X1200
Custom 1
Custom 2
HDTV (720p or 1080i)
WVHS

Note: It is necessary to identify which signal format and refresh rate is being used in order to synchronize the output. If the scan rate being used is not listed, try each of the offered rates until an image appears.

Pass-Through V Rate
>60Hz
>75Hz
>85Hz

Note: If the HDTV Format is selected, the V-Rate selection is not available.

OSD Status
>On (Default)
>Off

OSD Position
>0-255

Note: 0 is top of the screen

RS232 Baud rate
>4800
>9600 (Default)
>19200

DCDi Mode
>On (Default)
>Off

Film Mode
>On (Default)
>Off

Exit Setup Menu
>Press Factory

Selecting the Proper Scan Rate

For fixed panel display devices (DLP, LCD, Plasma, etc.) optimum performance is achieved by choosing the native resolution of the display.

For CRT based projectors there are a few options. If the screen used is a wide angle format, the projector geometry should be set for Anamorphic sources. In general, the higher the scan rate chosen, the better the image will

become, being more cinematic with increased light output and contrast ratio. However, if too high of a scan rate is chosen the image can begin to appear soft as the scan lines start to over lap. The bandwidth of the display must also be considered when choosing a scan rate.

As a guide line, the following settings are recommended:

Widescreen Applications

CRT Size	Recommended Scan Rate
7″	800X600, 720p
8″	720p, 1024X768
9″	1024X768, 960p, 1280X1024, 1080p

4:3 Applications

CRT Size	Recommended Scan Rate
7″	720p, 1024X768
8″	1024X768, 960p
9″	960p, 1280X1024, 1080p

Aspect Ratio Control

The DVP3000 has a unique Aspect Ratio control to allow for maximum performance from a display device. There are two types to choose from.

For proper operation, the correct screen shape must be selected first in the Setup menu!
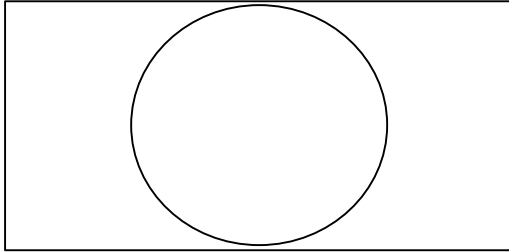
Wide Angle Screens

This setting should be used on CRT projectors with wide angle screens.

## The projector geometry must be set for Anamorphic sources!

How it Works

With "Widescreen" selected in the Setup menu, the on-screen image looks like this with both Anamorphic and Letterbox sources:

Since the DVP3000 controls the aspect ratio conversion, the projector stays in the anamorphic setting providing maximum resolution. The scan structure benefits of anamorphic squeezing are maintained for letterbox .
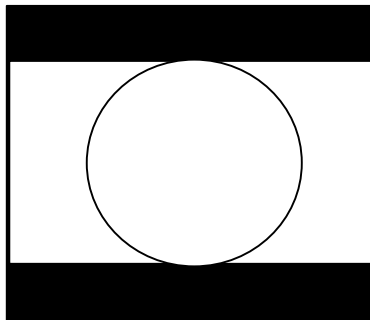
With 4:3 sources, the image looks like this:
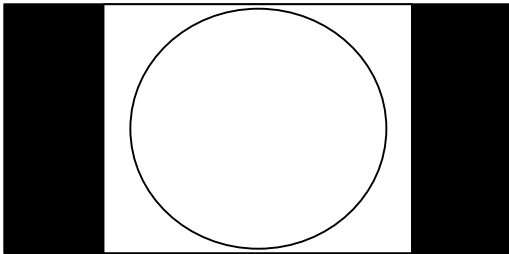
This is a very powerful feature and does not require multiple projector memories.

4:3 Screens

This setting should be used with any fixed panel display device (LCD, DLP, etc.) or CRT with a 4:3 Aspect Ratio screen.

The image looks like this with Letterbox and Anamorphic sources:

And for 4:3 sources:
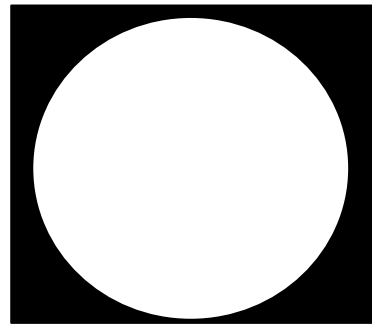
Note: The Anamorphic scaling feature on a 4:3 screen is only available at scan rates 720p and faster.

The complex Aspect Ratio algorithms operate automatically. Enter the proper source type with the remote control and the DVP3000 will calculate the proper geometry while the display device stays in the one memory.

Note: DVDs come in Anamorphic, Letterbox and 4:3 formats. In most cases, the DVD player must be set for the proper type. See your DVD manual for details.
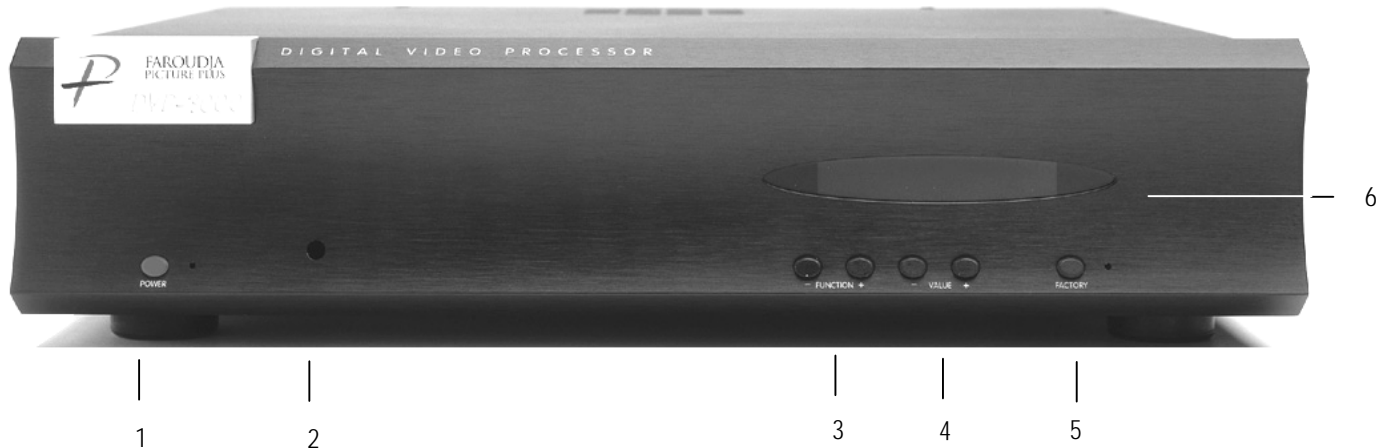
Front Panel Controls

1. **Power/Standby:** Press to turn the unit On (Green) or to Standby (Red)

2. **Infrared Sensor window**

3. **Function + / - :** Cycles up or down through the available control Functions

4. **Value +/ - :** Adjusts the levels or changes settings of the Function selected.

5. **Factory Preset:** Recalls all settings to Factory levels. This also functions as an Enter button for functions such as storing presets.

6. **LCD** Display: Provides readout of all Functions and Values.

Note: When Functions are accessed via the front panel controls no On-Screen-Displays are visible.

Operation

There are three ways to control the unit; from the front panel, from the remote control and via RS232. Controlling from the front panel requires cycling through the available functions. Controlling from the remote can be either by cycling through the functions or by direct access.

When the unit first powers up it will go through a complete Self-Test procedure. The following list of control options then become available. The list is in the order of appearance when pressing the **+** button on the front panel.

Input Format
 Composite
 S-Video
 Component
 HDTV-Pass (RGB, YUV, YPrPb)*

Note: The DVP3000 will auto-detect if the Component input is interlaced or progressive. The DVP3000U will also auto-detect if the input is NTSC or PAL.

* The HDTV Pass-Through will list what type of output was selected in the Setup menu (RGB, YPrPb, YUV). The Pass-Through input format must match the output listed.

Input Aspect Ratio
 Anamorphic
 Letterbox
 4:3 (Default)
Note: Aspect Ratio control with 4:3 screens is only available at scan rates of 720p or higher.

Brightness
 0-255, Factory 128

Contrast
 0-255, Factory 128

Color

    0-255, Factory 128

Tint

    0-255, Factory 128

Detail

    0-15, Factory 8

Noise Reduction

    0-15, Factory 8

Recall Preset

    Select Preset 1, Press Factory
    Select Preset 2, Press Factory
    Select Preset 3, Press Factory
    Select Preset 4, Press Factory
    Select Factory, Press Factory

Note: To recall Presets, first select it using the Value keys, then press the Factory key to recall the preset. The word **Changed** will appear if any adjustment has been made in the picture and was not stored in a preset.

Save Preset

    Save to Preset 1, Press Factory
    Save to Preset 2, Press Factory
    Save to Preset 3, Press Factory
    Save to Preset 4, Press Factory

Note: To save Presets, first select the desired preset with the Value keys, then press Factory to enter.

Enter / Exit Setup menu

    Press Factory

<u>Storing User Preset</u>

There are a total of 20 presets that can be stored, four for each input (Composite, S-Video, Component Interlaced, Component Progressive and HDTV Pass-Through). Each preset stores all picture and setup functions. This includes scan rates, output format and picture levels.

The DVP3000U offers an additional bank of 16 presets for PAL sources.

Remote Control Operation

The remote control is a multi-function smart remote that can control up to eight sources including the DVP3000. See the separate remote manual for complete instructions. The following instructions cover the operation of the DVP3000 only.

In many cases there are three ways to control the unit:

    1. By toggling through the different **Functions** and **Values** using the $\triangle \triangledown \triangleleft \triangleright$ Keys.

2. By Direct Access + $\triangleleft \triangleright$ keys.

3. By Direct Access + 1, 2, 3 keys

To activate the control of the DVP3000 press:

                  FDJA

To turn **On** press:

          (POWER)

To select an **Input** press:

          (<u>INPUT</u> CENTER)

Each press toggles to the next input or press the number pad while the OSD is visible for:

1. Composite Video
2. S-Video
3. Component
4. HDTV/Computer Pass-through

To select a **User Preset** press:

PRESET
SUR

Repeated pressing will toggle through the four User and one Factory presets.

The presets can also be directly accessed by pressing the **PRESET** button and then the keypad:
0 = Factory
1 = User Preset 1
2 = User Preset 2
3 = User Preset 3
4 = User Preset 4

The User Presets store all picture adjustment information including scan rate, output format and Aspect Ratio. To **Store** the settings press:

STORE
ENTER

The OSD will display which preset is currently selected. Select the desired preset to store the information using the Value keys and then press the **Store** key again.

To change **Aspect Ratio** press:

ASPECT
MENU

Repeat pressing will toggle through the different Aspect Ratios (If available. See the Setup section for details). Pressing the Value key after pressing the Aspect key will also toggle through the choices.

The Aspect Ratios can also be directly accessed by pressing the **ASPECT** button and then the keypad:

1 = 4:3
2 = Letterbox
3 = Anamorphic

Brightness can be accessed by pressing:

BRIGHT
LAST

Then adjust the **Values** by pressing the ◁ ▷ buttons. For direct access, press the **BRIGHT** button, then enter the value on the keypad such as **138**.

Contrast can be accessed by pressing:

CONTRAST
PIP

Then adjust the **Values** by pressing the ◁ ▷ buttons. For direct access, press the **CONTRAST** button, then enter the value on the keypad such as **158**.

Color can be accessed by pressing:

COLOR
SWAP

Then adjust the **Values** by pressing the ◁▷ buttons. For direct access, press the **COLOR** button, then enter the value on the keypad such as **150**.

Tint can be accessed by pressing:

TINT
M PIP

Then adjust the **Values** by pressing the ◁▷ buttons. For direct access, press the **TINT** button, then enter the value on the keypad such as **150**.

Detail can be accessed by pressing:

DETAIL
STOP

Then adjust the **Values** by pressing the ◁▷ buttons. For direct access, press the **DETAIL** button, then enter the value on the keypad such as **7**.

Noise Reduction can be accessed by pressing:

N.R.
PAU

Then adjust the **Values** by pressing the buttons. For direct access, press the **N. R.** button, then enter the value on the keypad such as **5**

Adjusting Detail

The Detail and Noise Reduction settings have been optimized for most sources. However, the viewers tastes and the types of software used may require making adjustments of these settings to fine tune the image. Theses controls are very effective to either increase detail or to help clean up poor quality video material. It is recommended that adjustments be made in small increments until the desired results are achieved.

It is important to not use too much Detail as the image will start to look artificial.

RS232 Control

Connector: DB-9 Female

Baud rate: 9600 default, 8 bit, 1 stop bit and No Parity (Adjustable 4800, 9600, 19,200)

Pin Configuration:

Pin 5 = Ground
Pin 3 = Rx
Pin 2 = Tx

All commands to the DVP3000 are sent using ASCII text strings.

Note: A command must start with the string header DVP3000 or DVP3000U.

Following the header, a comma is used to delimit the header from the command. All the commands with their descriptions will be listed below. All the text strings are terminated with a carriage return (0x13). The header and command are not case sensitive.

Since the picture settings are Input specific, the input to be used, i.e. Video, Y/C or YPrPb, must be selected first before adjusting and storing settings.

EXAMPLE:
DVP3000,x,b128,C175,K128,N10,d6 (0x13 or cr)

Setup Commands

Command	Function
SZ#	Image Size (0=Cropped, 1=Normal)
S#	Scan Rate (0-8)

0= Line Doubled
1= Frame Doubled*
2= 800x600
3= 720p
4= 1024x768
5= Line Quadrupled (960p)
6= 1280x1024
7= 1080p
8= 1080i

W#	Screen Shape, (0=Widescreen, 1=4x3)
Fn	Input Video Standard 0=1=Auto,2=PALN 3=PALM
M#	Output Mode (0-2) (0=RGB, 1=YCrCb, 2=YPrPb)
CS#	Comp Sync (1=On, 0=Off)
G#	Sync on Green (1=On, 0=Off)
HS#	HD Pass Scan Rate (0-7)

0= 800X600
1= 1024X768
2= 1280X1024
3= 1600X1200
4= Custom 1
5= Custom 2
6= HDTV (720p or 1080i)
7= WVHS

HF#	HD Frame Rate (0-2)

0 = 60Hz
1 = 75Hz
3 = 85Hz

Command	Function
OSDON	Turn OSD On
OSDOFF	Turn OSD Off
OV#	OSD Vertical Start (0=top off screen)
E0/E1	ECHO OFF/ON

Operation Commands

Command	Function
ON/OFF	Power ON/OFF
HELP	Display Help Menu
ST	Report Current Status*
V	Video
Y	Y/C
X	YCrCb
VP	480P
HDR	HDTV Passthrough RGB
HDY	HDTV Passthrough YUV
HDP	HDTV Passthrough YPrPb
B#	Brightness (0-255)
C#	Contrast (0-255)
K#	Color (0-255)
T#	Tint (0-255)
N#	Noise Reduction (0-15)
D#	Detail (0-15)
A#	Input Aspect Ratio (0-2) (0=4x3, 1=Letterbox, 2=Anamorphic)
L#	Store User Preset (1-4)
P#	Recall Preset (0-4) (1-4=User, 0=Factory)

P5 in the ST means something changed since the last preset was recalled.

Infrared Control Notice: All commands via Infrared are direct access. The Power On/Off control is a two command macro. The second command must occur within .25 seconds of the first command.

On	Power, Function Up
Off	Power, Function

DVP3000 / DVP3000U

Inputs (Interlaced)

Composite	1vpp
S-Video	Y – 1v pp
	C -286mv pp
Component (YCrCb)	Y - 1vpp
(Interlaced)	Cr – 700mv pp
	Cb – 700mv pp
Component (YPrPb)	Y - 1vpp
(Progressive)	Cr – 700mv pp
	Cb – 700mv pp
Computer/HDTV	D15M (Progressive or Interlaced)

(Note: Input format must match output format)

Remote Control "D9F"   RS-232 ASCII

IR Receiver   Tip =+5V, Ring = Signal, Body = Ground

Outputs

Resolution and Scan Rate Specifications: see Appendix A

		Pin	Function
R,G,B	0.700mv pp, TTL Sync	1	Red Output
		2	Green Output
YPrPb	700mv pp, Sync on Y-1vpp	3	Blue Output
RGsB	G – 1vpp,	6	Red Gnd
	RG – 700mv pp	7	Green Gnd
D15F		8	Blue Gnd
Horizontal Sync:	4.0 vpp TTL	10	Sync Gnd
		11	Sync Gnd
Vertical Sync:	4.0 vpp TTL	13	H Sync Output
		14	V Sync Output
Composite Sync :	4.0 vpp TTL		

Custom Presets   20 for DVP3000
16 additional for DVP3000U

12V Screen Trigger   Tip = 12V-150mA, Ring = Not Used, Body = Ground

Internal Aspect Ratio Control

16:9 Screen:	Anamorphic-Letterbox-4:3
4:3 Screen:	Anamorphic-Letterbox-4:3 at scan rates 720p+

Dimensions	17L X 17.25W X 4.24H (with feet)
Weight	19.5lbs, 31lbs shipping
Power Consumption	60w 100-240VAC
	50/60Hz Auto Ranging

Appendix A – Scan Rate Specifications

NTSC MODE

	Line Double	Frame Double	800x600	720P	1024x768	Quad	1280x1024	1080P	1080i
Horizontal Frequency (KHz)	31.468	62.938	37.76	44.95	48.31	62.94	63.89	67.43	33.715
Vertical Frequency (Hz)	59.94	119.88	59.94	59.94	59.94	59.94	59.94	59.94	59.94
Scan Type	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Interlaced
H Sync Polarity	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative	Negative
V Sync Polarity	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative	Negative
Tri-level sync on Y/G	NO	NO	NO	Select	NO	NO	NO	NO	Select
Bi-level sync on Y/G	Select	Select	Select	NO	Select	Select	Select	Select	NO

PAL MODE

	Line Double	Frame Double	800x600	720P	1024x768	Quad	1280x1024	1080P	1080i
Horizontal Frequency (KHz)	31.254	62.5	31.254	37.5	40.3	62.5	53.3	56.25	28.125
Vertical Frequency (Hz)	50	100	50	50	50	50	50	50	50
Scan Type	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Interlaced
H Sync Polarity	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative	Negative
V Sync Polarity	Negative	Negative	Positive	Negative	Negative	Negative	Negative	Negative	Negative
Tri-level sync on Y/G	NO	NO	NO	Select	NO	NO	NO	NO	Select
Bi-level sync on Y/G	Select	Select	Select	NO	Select	Select	Select	Select	NO

Computer/HDTV Pass-Through Mode

	800x600	800x600	800x600	1024x768	1024x768	1024x768	1280x1024	1280x1024	1280x1024	1600x1200	1600x1200	1600x1200
Horizontal Frequency (KHz)	37.879	46.875	53.674	48.363	60.263	68.677	63.981	79.976	91.146	75	93.75	106.25
Vertical Frequency (Hz)	60	75	85	60.004	75.029	84.997	60.02	75.025	85.024	60	75	85
Scan Type	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.	Prog.
H Sync Polarity	Positive	Positive	Positive	Negative	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
V Sync Polarity	Positive	Positive	Positive	Negative	Positive	Positive	Positive	Posiitive	Positive	Positive	Positive	Positive

Computer / HDTV Pass-Through Mode (Continued)

	Custom 1	Custom 2	720p	1080i
Horizontal Frequency (KHz)			44.95	33.715
Vertical Frequency (Hz)			59.94	59.94
Scan Type	Prog.	Prog.	Either	Interlaced
H Sync Polarity	Negative	Positive	Negative	Negative
V Sync Polarity	Positive	Negative	Negative	Negative

LIMITED WARRANTY

Faroudja Laboratories, Inc. ("Faroudja") warrants that its products will be free of defects in workmanship and material and conform substantially to published specifications under normal use and service. This warranty is made to the first purchaser of the products and extends for twelve (12) months from the date of sale. The warranty does not apply to products damaged as a result of accident, misuse, neglect, alteration, improper installation, unusual physical or electrical stress or unauthorized repair. All warranty claims should be made at the place of purchase. No products may be returned to Faroudja without its consent. If requested by Faroudja, purchaser agrees to provide proof of purchase and to return defective products to Faroudja, transportation charges prepaid. Faroudja's only liability with respect to products that do not meet the foregoing warranty, and for which appropriate transportation arrangements have been made, will be to repair or, at Faroudja's option, replace defective products or portions thereof.

THE FOREGOING WARRANTY IS IN LIEU OF ALL WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, REGARDING THE PRODUCTS, AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY OTHER WARRANTY OBLIGATIONS ON THE PART OF FAROUDJA.

IN NO EVENT WILL FAROUDJA BE LIABLE FOR LOSS OF PROFITS OR GOODWILL, OR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND, HOWEVER CAUSED, WHETHER BY FAROUDJA'S BREACH OF WARRANTY OR BY FAROUDJA'S SOLE OR CONCURRENT NEGLIGENCE OR OTHERWISE.

Faroudja may change product specifications and warranty policy at any time without notice.

FAROUDJA Laboratories 750 Palomar Ave., Sunnyvale, California 94086
Tel: 408-735-1492 Fax:408-735-8571
www.faroudja.com