DVP2200
Digital Video Processor

Installation and
Operations Manual

**FAROUDJA
PICTURE PLUS**

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Made in USA

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 DVP2200.

The Faroudja DVP2200 Video Processor 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 NTSC or PAL interlaced signals into high-resolution progressively scanned images .

The DVP2200 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.

First the DVP2200 is a Scaler that offers two scan rates, 480p for NTSC, 576 for PAL or 800x600 for both NTSC and PAL, depending on the requirements of the display device. The second part is Aspect Ratio selection. This allows for perfect image geometry no matter what type of source used, either Letterbox, Anamorphic or 4:3. Since the DVP2200 manipulates the aspect ratio, the display only needs one memory.

The DVP2200 accepts all types of interlaced sources; Composite, S-Video and Component. It also has connections for any high resolution source such as HDTV or Computer to pass-through to the display.

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

The DVP2200 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 DVP2200 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. To separate 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 and S-Video video sources have gone through some filtering 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/Video Motion Tracking

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

Faroudja's patented **Film/Video Motion** logic actively tracks the signal and activates different motion tracking algorithms depending if the signal originated from a video or film camera.

This approach to motion allows the unit to recreate the interlaced film or video frame back into its original structure limiting the introduction of motion errors. Horizontal, vertical and even 45° angled lines are correctly reproduced.

Stage 3 – Luminance Bandwidth Expansion

The human eye has excellent ability to judge detail with black and white (luminance) information and limited ability with color information.

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.

It is the combined affect of all three stages that yield the superior image quality only Faroudja can offer, regardless of what scanning rate the processor is operating at. 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.

1	2	3	4	5	6	7	8	9	10

Unpacking

Remove the DVP2200 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 DVP2200 processor is designed to be 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

To reduce noise, the unit has been designed to operate properly without a fan. The unit is cooled by convection. As the heat rises out of the vents on the top of the unit, cool air is drawn in frm the bottom. **These vents must not be blocked**. When rack mounted, a minimum of 1.25" (1 rack unit height) of free space is required above and below the unit to allow for proper cooling. A force 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 (RCA)

4. HDTV/Computer (D15M)

Outputs

5. RGBHV or YPrPb (D15F)

6. RGBHV or YPrPb(BNC)

7. 12V Trigger (3.5mm Mini-Jack , 2or 3pin)

8. 5V (3.5mm Mini-Jack , 3pin)

9. RS232 Port (D9F)

10. Power

Inventory

1 – DVP2200   1 - Remote
1 – Owner's Manual   2 – Rack Mount Ears
1 – Power Cord
1 – Warranty Card

Connections

This page outlines how different sources and displays can be connected to the DVP2200. Because of the high performance of the DVP2200 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, DVP2200 and projector should all be running on the same AC power line (one correctly rated for the power requirements).

Inputs

1. S-Video 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. Component video sources such as DVDs and professional tape decks.

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.

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

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.

Setup

Setup offers specific Functions that must be done when the unit is initially installed. Some user features are not available with some 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. Press the **Function** keys + or - to toggle through the Functions. Press the **Value** keys + or - to change selections and values.

Format:

Auto NTSC/PAL(B) – PAL(N) –PAL M

Output:

RGB –YPrPb

Sync (Sync on Green, RGB output mode only):

On/Off

Scan Rate:

480p(576pPAL) – 800x600(NTSC/PAL)

Screen Shape

16:9(Anamorphic) – 4:3

Sync Select (800x600 mode only):

Standard – Inverted

OSD (On-Screen-Display):

On/Off

OSD Height (OSD must be On. From bottom to top of screen)

0 – 244

Definitions

Format: This allows for use in countries that operate on the different types of PAL video.

Output: Most displays require RGB signals. Some newer HDTV sets require the YPrPb format.

Sync: In the RGB mode Sync on Green can be useful for RGB distribution. Sync on Green should not be used with standard installations.

Scan Rate: Select the rate that optimizes the display device. For CRT projectors, the 480p(576p for PAL) setting should be selected for entry level Data-Grade projectors. Graphics-Grade 7″ and 8″ CRT projectors should use the 800x600 setting.

For fixed panel displays (LCD, DLP) the 800x600 mode should be used (as long as the native resolution exceeds 800x600).

Screen Shape: The DVP2200 has different aspect ratio calculations depending on the type of screen being used. The correct screen shape needs to be set for proper operation. (See next section)

Sync: The 800x600 standard scan rate(VESA Specification) has a Positive TTL sync. Some displays cannot handle this type of sync so this setting inverts the sync to Negative.

OSD: The On-Screen-Display can be turned on and off for more professional presentations.

OSD Height: The position of the OSD can be adjusted for optimum viewing. The actual range of control is affected by which Aspect Ratio is selected.

Screen Shape

The DVP2200 has a unique Aspect Ratio control to allow for maximum performance from a display device. For proper operation, the unit must be set to the type of screen being used. There are two types to choose from.

16:9 Screens

This setting should be used on CRT projectors with 16:9 screens.

The projector geometry must be set for Anamorphic sources!

How it Works

With the projector set to the 800x600 setting, for example, the image looks like this with both Anamorphic and Letterbox sources:

600 Lines
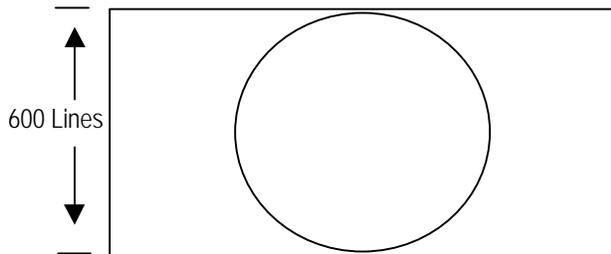
With 4:3 sources, the image looks like this:

600 Lines
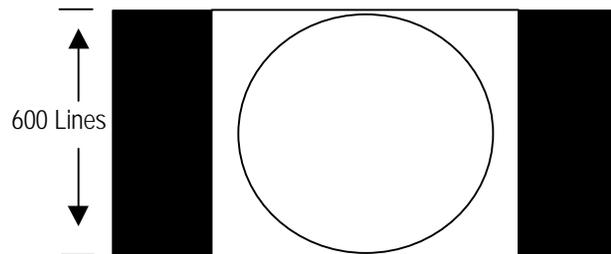
This is a very powerful feature and does not require multiple projector memories.

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.

With the projector set to the 800x600 setting, for example, the image looks like this with Letterbox sources:

600 Lines
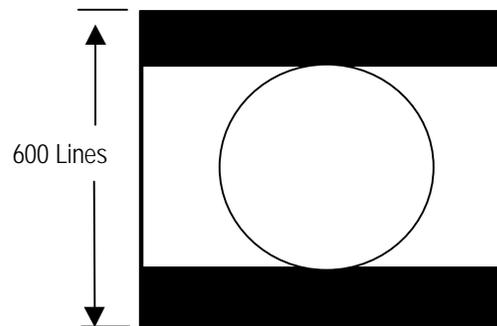
And for 4:3 sources:

600 Lines
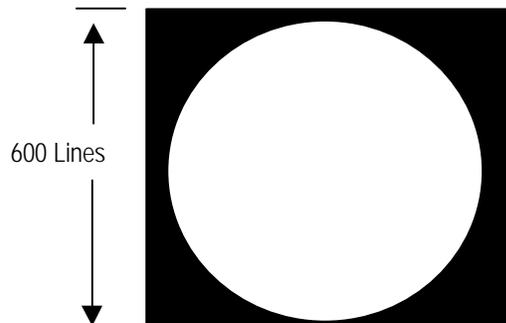
The complex Aspect Ratio algorithms operate automatically. Enter the proper source type with the remote control and the DVP2200 will calculate the proper geometry.

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

Note: The Anamorphic Aspect Ratio is not available with 4:3 screens.

6

1 2 3 4 5
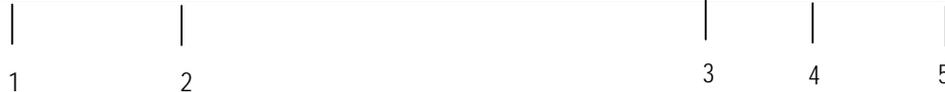
Front Panel Controls

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

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 accessing each function.

The available control functions are listed below in the order they appear on screen:

Input

→ Video – S-Video – YCrCb - HDTV ←

Preset

→ Factory – Preset 1 – Preset 2 – Preset 3 – Preset 4 ←

Aspect Ratio
(Only available with 16:9 screens. See *Setup*)

→ Anamorphic – Letterbox - 4:3 ←

Brightness:	0– 255 Preset @128
Contrast:	0– 255 Preset @175
Color:	0– 255 Preset @128
Tint:	0– 255 Preset @128
Detail:	0-15 Preset @ 5
Noise Reduction:	0-15 Preset @ 10

Store User Preset: See *Storing Preset* Section

Setup: See *Setup* section

Storing User Preset

There are four custom presets for each input selection in both NTSC and PAL sources for a total of 24 (The HDTV pass-through does not offer presets). Select **Store User Preset** on the menu by pressing the **Function** buttons. Select a preset using the **Value** key. Press the **Factory** key to store.

Remote Control Operation

The remote control is a multi-function smart remote that can control up to eight sources including the DVP2200. See the separate remote manual for complete instructions. The following instructions cover the operation of the Faroudja product 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 DVP2200 press:

FDJA

To turn **On** press:

POWER

To select an **Input** press:

INPUT
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 Video
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 Presets store all picture adjustment information plus 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 and press the **Store** key again.

To change **Aspect Ratio** press:

ASPECT
MENU

Repeat pressing will toggle through the different Aspect Ratios (if available).

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

1 = Anamorphic
2 = Letterbox
3 = 4:3

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**.

Brightness can be accessed by pressing:

BRIGHT
PREV CH

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**.

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
AUD

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:

NOISE
PAUSE

Then adjust the **Values** by pressing the ◁ ▷ buttons. For direct access, press the **NOISE RED** button, then enter the value on the keypad such as **5**

RS232 Control

Connector: DB-9 Female

Baud rate: 9600 default, 8 bit,
1 stop bit and No Parity
(Adjustable 600, 1200, 2400,4800, 19,200)

Pin Configuration:

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

All commands to the DVP2200 are sent using ASCII text strings.

Note: A command must start with the string header DVP2200.

Following the header, a comma is used to delimit the header from the command. All the commands with their descriptions will be listed below. Some commands are sent to the DVP2200 one at a time, however the commands of B,C,K,N and D may all be sent as the same text string and in any order by using commas between each command. 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: DVP2200,b128.C175,K128,N10,d6 (0x13 or cr)

Command   Description   Range   Notes
(* = Factory Default, % = Must be a SINGLE command)

Command	Description	Range	Notes
A#	Aspect Ratio %	*1,2 or 3	1 = Anamorphic 2 = Letterbox 3 = 4:3 *(Note: not available if a 4:3 screen shape is selected in the Setup menu)*
B###	Brightness	0 – 255	Factory Preset = 128
C###	Contrast	0 – 255	Factory Preset = 128
D##	Detail Level	0 – 15	Factory Preset = 06
E#	Echo On/Off %	0 or *1	RS-232 character feedback. 0=off, 1= on
F#	Video Standard %	1 – 3	1 = Automatic NTSC / PAL-B 2 = PAL –N 3 = PAL-M
G#	Sync on Green %	*0 or 1	0 = No Sync on Green 1 = Sync on Green *(Note: RGB output must be selected first)*
H	HDTV Input %	----	Selects Pass-through Input
HELP	Display Help Menu %	----	Displays all commands to the host controller
I#	Sync Inverter %	*0 or 1	0 = Positive Sync 1 = Negative Sync **(Note: Available only when 800X600 mode is selected in the Setup Menu)**
K###	Color	0 – 255	Factory Preset = 128
L#	Store Presets %	1 – 4	Loads the current settings in to a user Preset location. 1 = Store User Preset 1 2 = Store User Preset 2 3 = Store User Preset 3 4 = Store User Preset 4

Command	Description	Range	Notes
M#	Output Format %	1 or 2	1 = Selects RGB output format 2 = Selects YCrCb output format
N###	Noise Reduction	0 – 15	Factory Preset = 10
ON	Power On %	----	----
OFF	Power Off %	----	Places the DVP2200 in standby mode.
O##	On Screen Display %	Off/On/0-255	Setup the OSD menu. OFF will disable the OSD ON will enable the OSD 0 – 255 will set the height of the OSD on the display. Note that no OSD is displayed when an RS-232 command is issued.
P#	Recall Preset # %		P0 = Factory Preset P1 = User Preset 1 P2 = User Preset 2 P3 = User Preset 3 P4 = User Preset 4
S#	Scan Rate %	1 or 2	1 = 480p mode (640x480) 2 = 600p mode (800x600)
ST	Status %	(See Below)	Returns All settings back to host controller
T###	Tint %	0 – 255	Factory Preset = 128. (Note: NTSC only)
V	Video Input %	----	
W#	Screen Shape %	1 or 2	1 = 4:3 Screen 2 = 16:9 Screen
X	YCrCb Input %	----	
Y	S-Video Input %	----	

The 'ST' command returns a text string of all the current settings so the user/host controller can verify the units status. This string is a fixed length so that if used in a controller type system, string parsing is made simpler. An example of the string is shown below:

```
DVP2200:X,NTSC,P0,A1,B128,C175,K128,T128,D06,N10,M1,G0,W2,S1,I0,F1,OSD000
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |  |   |--OSD ###
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |  |      OSD OFF
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |  |      OSD ON
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |  | ------F1 NTSC/PAL(1)
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |  |       F2 PAL_N(2)
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |  |       F3 PAL-M(3
       |   |   |  |   |    |    |    |    |   |   |  |  |  |  |--------SYNC NONINV(0)
       |   |   |  |   |    |    |    |    |   |   |  |  |  |          SYNC INV(1)
       |   |   |  |   |    |    |    |    |   |   |  |  |--------------480P(1)
       |   |   |  |   |    |    |    |    |   |   |  |                600x800(2)
       |   |   |  |   |    |    |    |    |   |   |  |-----------------4x3(1)
       |   |   |  |   |    |    |    |    |   |   |                   16x9(2)
       |   |   |  |   |    |    |    |    |   |   |----------------------SOG OFF(0)
       |   |   |  |   |    |    |    |    |   |                         SOG ON(1)
       |   |   |  |   |    |    |    |    |   |--------------------------RGB(1)
       |   |   |  |   |    |    |    |    |                             YPrPb(2)
       |   |   |  |   |    |    |    |    |------------------------------NOISE RDCT##
       |   |   |  |   |    |    |    |-------------------------------------DETAIL##
       |   |   |  |   |    |    |-----------------------------------------TINT###
       |   |   |  |   |    |-------------------------------------------------COLOR###
       |   |   |  |   |-----------------------------------------------------CONTRAST###
       |   |   |  |-------------------------------------------------------BRIGHTNESS###
       |   |   |----------------------------------------------------------ANAMORPHIC(1)
       |   |   |                                                          LETTERBOX(2)
       |   |   |                                                          4x3(3)
       |   |   |-----------------------------------------------------------PRESET (0)
       |   |                                                               PRESET (1)
       |   |                                                               PRESET (2)
       |   |                                                               PRESET (3)
       |   |                                                               PRESET (4)
       |   |                                                                PRESET (5)*
       |   |  |------------------------------------------------------------NTSC
       |   |                                                               PAL
       |   |                                                               525L
       |   |                                                               625L
       |   |----------------------------------------------------------------VIDEO(V)
       |                                                                    Y/C(Y)
       |                                                                    YCrCb(X)
       |                                                                    HDTV(H)
       |--------------------------------------------------------------------DVP2200:HEADER
```

* = Preset 5 on a return string indicates the unit is NOT in a stored preset.

DVP2200

<u>Inputs</u> (Interlaced)
(*NTSC/PAL B, M, N)*

Composite	1vpp
S-Video	Y - 700mv pp
	C -286mv pp
Component (YCrCb)	Y - 1vpp
	Cr – 700mv pp
	Cb – 700mv pp
Computer/HDTV	D15F (Progressive or Interlaced)
Remote Control "D9F"	RS-232 ASCII

<u>Outputs</u> (Progressive)

Resolution	480p(NTSC) 576p(PAL) / 800x600 (NTSC/PAL)
R,G,B	0.700mv pp,
	TTL Sync
YPrPb	700mv pp
RGsB	G – 1vpp,
	RG – 700mv pp
Horizontal Sync:	4.0 vpp
31.5 / 37.8KHz (NTSC)	
32.3KHz (PAL)	
Vertical Sync:	4.0 vpp
59.9Hz (NTSC)	
50Hz (PAL)	
Composite Sync :	4.0 vpp
Custom Presets	24
(Four per Input per Format - NTSC and PAL)	

<u>Internal Aspect Ratio Control</u>

16:9 Screen:	Anamorphic-Letterbox-4:3
4:3 Screen:	Letterbox, 4:3
Dimensions	17L X 17.25W X 4.24H (with feet)
Weight	17lbs
Power Consumption	40w 100-240VAC
	50/60Hz Auto Ranging

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.

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