

# Options

---

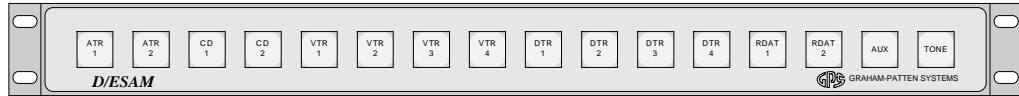
## In This Chapter

This chapter provides detailed instructions for installing and operating a variety of options offered for the D/ESAM 820 mixer. Following is a partial list of topics. For a complete list, refer to the Table of Contents.

- Assignment Panel ..... Page 4-2
- Assignment Panel Installation..... 4-2
- Assignment Panel Operations ..... 4-3
- Equalization Panel ..... 4-4
- Equalization Panel Installation ..... 4-5
- Equalizer Operations ..... 4-11
- Input Connector Panel - DATS to AES Converters..... 4-14
- Input Connector Panel - XLR Analog ..... 4-16
- Output Connector Panels ..... 4-18
- Floppy Disk Storage System..... 4-21
- Installation ..... 4-21
- Disk Functions..... 4-22
- Displaying The Disk Directory..... 4-24
- Writing To Disk..... 4-25
- Reading From Disk..... 4-28
- Erasing The Disk ..... 4-31
- Formatting The Disk..... 4-32
- Changing The Disk ID..... 4-33
- Changing Date and Time ..... 4-34
- Delay ..... 4-36
- Delay Hardware Installation ..... 4-38
- Virtual Machine Setup..... 4-40
- Delay Operation..... 4-42
- Output Delay ..... 4-42
- Logical Machine Delay..... 4-43
- User Virtual Machine Delay ..... 4-45
- Processing Loops..... 4-52
- Processing Loops Installation ..... 4-53
- Processing Loops Module Setup ..... 4-55
- Processing Loops Operation..... 4-60

# Assignment Panel

The **Assignment Panel** option provides a quick and simple way of performing the **Machine Assignment** function — assigning logical letters to virtual machines.



*Assignment Panel*

The **Assignment Panel** contains a single row of 16 buttons, each of which is dedicated to a Virtual machine in your facility. Up to 3 **Assignment Panels** can be connected for a maximum capability of 48 dedicated machine buttons. Assignment Panel legends should be specified at time of purchase. However, button caps are removable if you need to change Virtual Machine legends.

The buttons on the Assignment Panel(s) correspond to virtual machines in your system. For example, on Assignment Panel 1, buttons 1 through 16 correspond to virtual machines 1 through 16 as assigned on the Maintenance Terminal. Furthermore, if you do not have a virtual machine number 10 created, Assignment Panel button number 10 will not work.

## Assignment Panel Installation

The table below lists items that comprise the optional Assignment Panel:

*Assignment Panel Equipment List*

Quantity	Description	Note
1	Assignment Panel	a.
1	25-conductor cable. Connects Assignment panel to Control Panel.	b.

### *Notes*

- a. Up to three Assignment Panels can be connected to the Control Panel.
- b. 5 ft. length is standard. Other custom cable lengths are available.

Mount **Assignment Panel**(s) directly above the Control Panel for maximum convenience, and allow for cable length. The table below lists specifications:

*Assignment Panel Specifications*

Item	Specification	Note
Dimensions	1.75" H, 19" W, 2" D	
Connectors	25-pin "D"	
Cables	5 ft. cable	a.

### *Notes*

- a. 5 ft. length is standard. Custom lengths are available. If more than one panel has been ordered, special 1-to-3 branching cable is supplied.

## Assignment Panel Operations

Use the following procedure to assign a logical letter to a Virtual Machine with the **Assignment Panel**:

1. Select a logical machine letter (**R**, **A** through **H** or **AUX**) in the PREVIEW section.
2. Select the desired Virtual Machine on the **Assignment Panel**.

The selected button lights on the Assignment Panel to confirm your selection and the logical letter is now assigned to the new Virtual Machine. Repeat as required to assign or re-assign additional machine.

The only exception to standard Assignment Panel procedure is when *one* specific virtual machine is labeled “**TONE**” and is accessible on any Assignment Panel. When the “master” **TONE** function is pressed, the button lights, all current mixer crosspoints are turned off and tone is placed on all output buses (Program and Preview buses 1 through 4).

As a reminder, in the Preview Bus section of the main status menu (**Screen 0**), a reverse “**T**” indicates that **Tone** has been selected for all buses:

Screen 0...Main Status and Menu Display																	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	0 FX MENU
PVW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	1 Logical Machines
BUS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	2 Virtual Machines
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	3 Maint and Setup
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	4 Equalizer
PGM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		5 Delay
&	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		6
PST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		7 Error Messages

*Tone Mode Display on Status Menu*

When **TONE** is pressed again or when **UNDO** is pressed, the mixer returns to its previous state. In Chapter 5, refer to the “**Virtual Machine Operations - Menu 1**” section for instructions on configuring the **TONE** machine.

### Assignment Panel Light Adjustment

Use the following steps to adjust the intensity of Assignment Panel buttons and LEDs:

1. Hold down **LOCK/UNLK** on the Control Panel.
2. Turn the *left* **ROTARY KNOB** in the MONITORING section and adjust Assignment Panel buttons for the desired brightness.
3. Release **LOCK/UNLK** to complete the procedure.

Note that the button intensities on the Assignment Panel(s), EQ Panel and the Control Panel *track* together as they are adjusted.

# Equalization Panel

D/ESAM's **Parametric Equalizer Panel** option provides the ability to add EQ effects to any or all 16 active mixer sources.



Equalization Panel

On *each* channel, this option allows you to perform 3-band parametric equalization with high and low-cut filters, notch filters, 6dB of additional gain as required and phase invert.

## NOTE

You can invert channel phase *locally* on the D/ESAM 820 Panel without EQ option installed.

All adjustments are made on the EQ Panel using dedicated buttons and an array of continuously rotating “shaft-encoded” knobs. EQ parameters can be stored and recalled using D/MEM. Note that all EQ parameters follow the “Logical” machine.



Customers receiving both the Control and EQ Panels at the same time will note that the Ø **INV** button (in the ASSIGNMENT / CONFIGURATION section) is replaced by the **FX OFF** button. **FX OFF** is the “master” effects off button that allows you to turn audio effects *off* everywhere — on or off the panel. The Ø **INV** button appears on the EQ Panel in the lower right corner and performs the same function as on the main Control Panel.



Customers upgrading to the EQ Option will receive an **FX OFF** keycap as part of the EQ Option package.

## Equalization Panel Installation

The table below lists items that comprise the optional 16-channel Parametric Equalizer:

*Parametric Equalizer Equipment List*

Quantity	Description	Note
1	Equalizer Control Panel	
4	“Slave” Processor Modules	a.
1	15-conductor cable. Connects Equalizer Panel to Control Panel	b.
1	AC Power Cord	

### *Notes*

- a. If D/ESAM is shipped with Equalizer option, Slave modules are factory installed on Master Processor Module in main chassis.
- b. 5 ft. length is standard. Other custom cable lengths are available.

Mount the **Equalizer Panel** directly above the Control Panel or at any desired location for maximum operator convenience. Be sure to allow for cable length.

The table below lists **Equalizer Panel** specifications:

*Equalizer Panel Specifications*

Item	Specification	Note
Dimensions	1.75" H, 19" W, 6" D	
Voltage	85-264 VAC	
Frequency	47-440 Hz	
Power	40 Watts maximum	
Connectors	Two (2) 15-pin “D”, Panel Bus	a.
Cables	5 ft. cable	b.

### *Notes*

- a. One of the two “Panel Bus” connectors is used to connect Equalizer to the Control Panel’s Panel Bus jacks. The other will be used for system expansion. Panel Bus connectors are loop-through.
- b. 5 ft. length is standard. Other custom cable lengths are available.

## Equalizer Panel Functions

Status

The Equalizer panel consists of two groups of control buttons on each side of the panel, low and high cut filters and three bands of parametric equalizers: low, mid and high.

From left to right, following are descriptions of each panel function:

EQ  
IN

The **EQ IN** button enables or disables equalization (effects processing) for a selected fader channel or channels. When EQ is on, the button lights and the **FX** LED above the selected fader(s) lights.

+6dB

The **+6dB** button adds an additional 6dB of gain to the selected channel or channels. The system permits an intermix of channels with and without gain. The button lights when gain is enabled.

The next three functions (**NOTCH 1**, **NOTCH 2** and **Low Cut Filter**) are interactive. The following rules apply:

- Only two of the three functions can be enabled at one time.
- The **NOTCH 1** and **NOTCH 2** functions are interlocked — lighting one turns the other off. If you wish both notches on, press both buttons simultaneously.
- If you select both notch filters, the **Low Cut Filter** goes off. If you subsequently turn off either notch filter, the **Low Cut Filter** returns to previous settings.
- If both notch filters are on and you try to adjust the **Low Cut Filter**, nothing happens until one notch is disabled.

NOTCH  
1

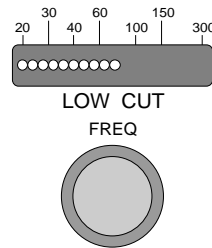
The **NOTCH 1** button enables and disables the first notch filter. The button lights when the filter is on.

NOTCH  
2

The **NOTCH 2** button enables and disables the second notch filter. The button lights when the filter is on.

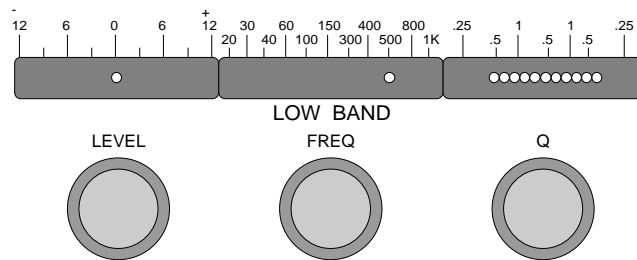
Values for both notch filters are selected on the Maintenance Terminal. This allows notch filter values to accommodate different line frequencies, field rates, and De-Emphasis. In Chapter 5, refer to the “**Frequencies - Menu 5.2**” section for details.

The figure below illustrates the **Low Cut Filter**:



The **Low Cut Filter** provides frequency selection from 20 to 300 Hz and 12 dB per octave roll off. With the **FREQ** knob fully counter-clockwise, the filter is off. Turn clockwise to select the frequency at which low cut filtering begins. The display's LEDs indicate the selected frequency.

The figure below illustrates the **Low Band Parametric Equalizer**:

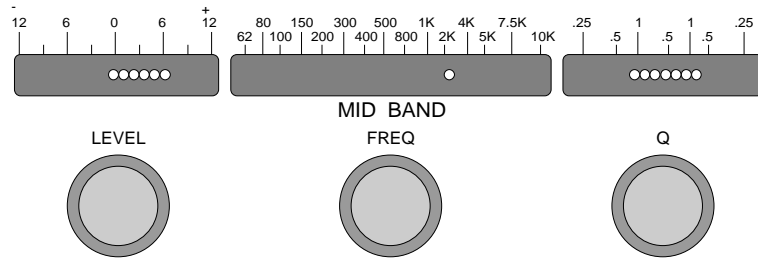


The **Low Band Parametric Equalizer** provides the following controls:

- **Level** adjustment of  $\pm 12$ dB
- **Frequency** selection from 20Hz to 1KHz
- **Q** adjust from 5 (narrow band of frequencies) to .25 (wide band of frequencies)

To use the **Low Band Equalizer**, select the center frequency, adjust level and set Q value. LEDs indicate all settings. Note that when level is set to **0**, the Low Band EQ is *off*.

The figure below illustrates the **Mid Band Parametric Equalizer**:

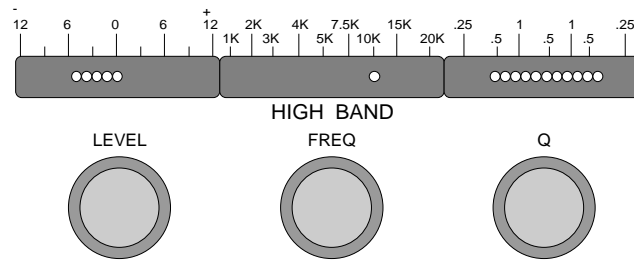


The **Mid Band Parametric Equalizer** provides the following controls:

- Level adjustment of  $\pm 12$ dB
- Frequency selection from 62Hz to 10KHz
- Q adjust from 5 (narrow band of frequencies) to .25 (wide band of frequencies)

To use the **Mid Band Equalizer**, select the center frequency, adjust level and set the Q value. LEDs indicate all settings. Note that when level is set to **0**, the Mid Band EQ is *off*.

The figure below illustrates the **High Band Parametric Equalizer**:

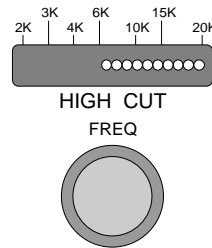


The **High Band Parametric Equalizer** provides the following controls:

- Level adjustment of  $\pm 12$ dB
- Frequency selection from 1KHz to 20KHz
- Q adjust from 5 (narrow band of frequencies) to .25 (wide band of frequencies)

To use the **High Band Equalizer**, select center frequency, adjust level and set Q value. LEDs indicate all settings. Note that when level is set to 0, the High Band EQ is *off*.

The figure below illustrates the **High Cut Filter**:



The **High Cut Filter** provides frequency selection from 2KHz to 20KHz and 12dB per octave roll off. With the **FREQ** knob fully clockwise, the filter is off. Turn counter-clockwise to select the frequency at which high cut filtering begins. The display's LEDs light to indicate the selected frequency.



The **FLAT** button performs two distinct functions:

- *Quickly* pressing **FLAT** returns the following five EQ panel values to **0** (zero) for the selected fader channel(s):
  - Low Band Level
  - Mid Band Level
  - High Band Level
  - Low Cut Filter
  - High Cut Filter

This method is a “partial” reset. No other panel controls are affected.

## NOTE

The **FLAT** button remains lit when all five values listed above are flat. When any EQ value is changed from **0** (boosted or cut) or when the low or high cut filter is activated, the **FLAT** light goes out. All other panel controls *do not* affect the **FLAT** light.

- Pressing and holding **FLAT** for 1.5 seconds returns *all* panel values to default settings for the selected fader channel(s). This is a “full” reset which returns all EQ functions to the following default conditions and also frees EQ Blocks:
  - **EQ IN, NOTCH 1, NOTCH 2** and **+6dB** to “off”
  - **High Cut Filter** and **Low Cut Filter** to “off”
  - All frequency bands to center
  - All levels to 0 (zero)
  - All **Q** values to .25

## NOTE

Status

EQ BLOCKS indicate memory usage for equalization data. The maximum number of EQ blocks is 2559. If EQ block usage exceeds 2559, an error message will be displayed. You can free EQ space by setting a channel's values to default conditions using the method described above.

## NOTE

When more than one channel with different EQ values is selected, blanking the panel and turning the **COPY** light on, the **FLAT** button is *still* active. You can now return a *group* of channels to default conditions.

COPY

The **COPY** button allows you to copy EQ values from one fader channel to another. Refer to the “**Copy EQ**” section for instructions.

The last two buttons on the EQ Panel operate independently of other panel functions:

EQ  
EXT

The **EQ EXT** (external) button enables and disables editor control of EQ functions. Pressing **EQ EXT** lights the button and assigns control to an external editing system. The EQ Panel remains active when external control is enabled.

∅  
INV

The ∅ **INV** (Phase Invert) button allows you to invert the phase of a selected channel or channels. To invert phase, press and *hold* ∅ **INV**, then press the **SELECT** button for the desired channel(s). The red ∅ LED above the selected fader(s) lights.

To return phase to normal, press and *hold* ∅ **INV**, then press the **SELECT** button for the desired channel(s) to be toggled off.

## Equalizer Operations

Use the following procedure to equalize a channel or channels:

1. Ensure that *no* buttons are lit in the ASSIGNMENT / CONFIGURATION section and that **FX OFF** is *not* lit.
2. Press the **SELECT** button(s) for the channel or channels to be equalized. The button(s) light and the selected channels are now *connected* to the EQ panel.

EQ settings can be *pre-set* at this point, but processing is not yet occurring.

3. Press **EQ IN** on the EQ panel to begin effects processing. The **EQ IN** button lights and the **FX LED** above the selected fader(s) lights.
4. Adjust EQ settings as required.

Use the following procedure to equalize a *different* channel or channels:

1. Turn off the current **SELECT** buttons. This disconnects the EQ panel from the selected fader(s), but EQ processing remains *on*. All EQ values for the selected channel(s) remain in effect.
2. Press the **SELECT** button(s) for the *new* channel or channels to be equalized. This step re-connects new channels to the EQ panel.
3. Press **EQ IN** to begin effects processing. The button lights and the **FX LED** above the new fader(s) lights.
4. Adjust EQ settings as required.

Use the following procedure to *turn off* equalization for a channel or channels:

1. Press the **SELECT** button(s) for the channel(s) to be turned off.
2. Press **EQ IN** (on the EQ panel) to turn off a selected channel(s) or the **FX OFF** button (on the main Control Panel) to stop *all* effects processing. The **EQ IN** button and the **FX LED** above the selected fader(s) turns off.

Remember the following important points regarding EQ:

- All EQ parameters can be adjusted on a single channel or a *group* of channels simultaneously, depending on the number of **SELECT** buttons lit. All parameters remain until changed.
- Each time the **SELECT** button is lit for a specific channel(s), the EQ panel immediately updates and displays current EQ status. If the desired **SELECT** button is enabled, that channel(s) can be adjusted.
- EQ assignments stay with the logical machine. If you swap machines during an edit session, (for example, A-VTR and R-VTR), EQ values previously set for A now belong to the new A-VTR. EQ values previously set for R now belong to the *new* R-VTR. Use care during these situations or use **EQ COPY** to copy previous EQ values to the new logical machine.

- If **SELECT** buttons are currently lit during the EQ process and a button in the ASSIGNMENT / CONFIGURATION section is pressed (to perform a specific assignment function), *all* **SELECT** lights go out to allow you to perform the new assignment function without restriction. When the assignment function is complete, the **SELECT** buttons return to their previous condition.
- The D/ESAM system does not provide the ability to automatically change EQ settings (for a specific logical machine) over the course of a single transition. If you wish to perform this effect during an edit, it can be accomplished manually or by setting up a “duplicate” logical machine, that is, assigning one virtual machine two different logical names. This process allows you to dissolve from machine to machine (identical *virtual* machines with different *logical* names) and thus change EQ values during the transition.
- Effects processing (using an EQ mix source) *only* occurs when EQ is assigned to a channel, when that channel is enabled (**FX** light on) and when the channel is routed to at least one output bus. For example:
  - If channels are assigned to faders, the **FX** light is on and the channels are assigned to output buses, effects processing is taking place.
  - If channels are assigned to faders, the **FX** light is on, but the channels are **OFF**, effects processing is *not* occurring.
  - If channels are removed from the panel with **FX** on and the channel is *not* selected on the Preview Switcher, effects processing does *not* occur.
  - If channels are removed from the panel with **FX** on and the specific channel *is* selected on the Preview Switcher, effects processing is taking place.
- One EQ “process” is defined as EQ assigned to one fader channel *with one source present*. One process uses one EQ source. If the number of EQ sources is exceeded, the following message appears:

**MAXIMUM NUMBER OF EQ SOURCES EXCEEDED**

When this occurs, you have exceeded the maximum number of individual EQ processes, as determined by the four “Slave” Processor Modules installed on Master Processor board in the chassis.

To prevent the error message, remove unneeded EQ processes from the Control Panel as required.

## Copy EQ

All EQ parameters can be copied easily from a “source” channel to one or more “destination” channels. Use the following procedure to copy EQ values:

1. Press the **SELECT** button for the channel whose values you wish to copy. This channel is the “source.” The EQ Panel updates and displays current EQ status.
2. On the **SELECT** row, press the button(s) of the “destination” channel(s). If source and destination values are *different*, the EQ Panel goes blank and the **COPY** button lights.

### NOTE

If the “source” and “destination” values are *the same*, the EQ Panel remains lit, as it recognizes that copying is not necessary.

3. Press **COPY**. All EQ values are copied from source to destination and the EQ panel returns to active mode.

Remember the following important points regarding the copy function:

- You can copy to two or more destination channels.
- You can *not* make EQ adjustments while the **COPY** button is lit.
- You *can* return selected channels to default settings while the **COPY** button is lit.

### CAUTION

When grouped channels have different EQ values, pressing **COPY** causes channel 1’s EQ values to be copied to all remaining channels in the group. If you wish to adjust just one channel’s EQ values, you must first “ungroup” channels.

## EQ Panel Light Adjustment

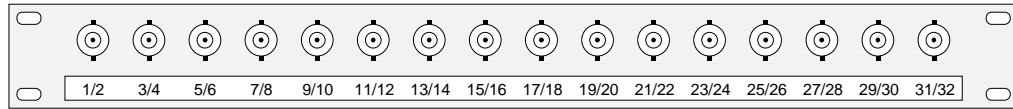
Use the following procedure to adjust the intensity of EQ Panel buttons and LEDs:

1. Hold down **LOCK/UNLK** on the main Control Panel.
2. Turn the *left* **ROTARY KNOB** in the MONITORING section and adjust EQ Panel buttons and LEDs for the desired brightness.
3. Release **LOCK/UNLK** to complete the procedure.

Note that the button intensities on the EQ Panel, Assignment Panel(s) and the Control Panel track together as they are adjusted.

# Input Connector Panel - DATS to AES Converters

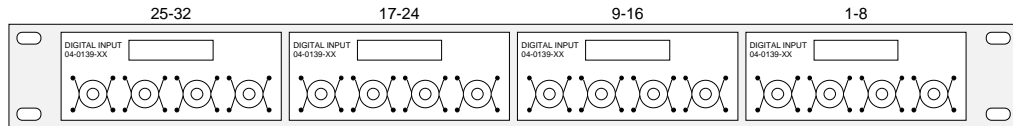
The **Input Connector Panel - DATS to AES Converters** option (P/N 08-0053-XX) is designed to implement the DATS (Digital Audio Transmission System) format. The panel accepts 16 DATS signals (32 audio channels) and connects to D/ESAM's digital audio inputs on the D/ESAM rack unit. The figure below illustrates a front view of the panel:



*Input Connector Panel - DATS to AES Converters, Front View*

The front panel includes 16 BNC connectors, each is capable of carrying two audio channels (1 DATS signal). A designation strip is included for labeling purposes.

The figure below illustrates a rear view of the panel:



*Input Connector Panel - DATS to AES Converters, Rear View*

The back panel includes four DAT-to-AES converter modules with connectors attached. Each connector is capable of carrying eight audio channels.

## NOTE

The rear panel does *not* include channel labels. These labels are shown in the figure above to assist with channel identification.

## Installation and Interconnection

The table below lists panel specifications:

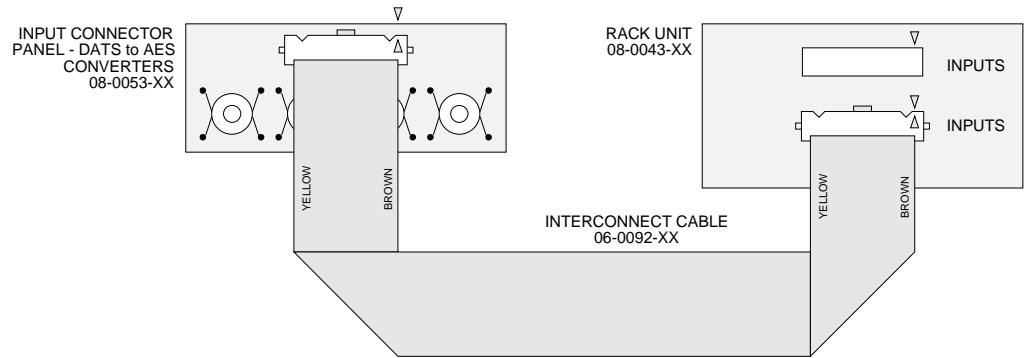
### *Input Connector Panel - DATS to AES Converters Specifications*

Item	Specification	Note
Dimensions	1.75" H, 19" W, 2" D	
Cables	Four (4) 32-conductor ribbon cables supplied with Fan-In Panel.	a.

### **Notes**

- a. 2 ft. length is standard.

The figure below illustrates interconnection between the panel and the D/ESAM rack unit. Interconnection for only one group of eight channels is shown:



*Input Connector Panel - DATS to AES Converters Interconnect*

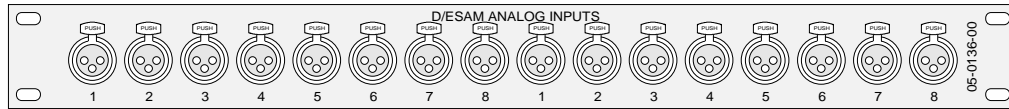
Note the following important points when installing and interconnecting the **Input Connector Panel - DATS to AES Converters**:

- Rack-mount the panel no further than two feet away from the rear of the D/ESAM rack unit.
- When installing the ribbon cable on the back of the panel and the rear of the D/ESAM chassis, note that all connectors are keyed and can only be installed one way.

# Input Connector Panel - XLR Analog

The **Input Connector Panel - XLR Analog** option (P/N 08-0056-XX) provides input connection for two Analog Input Modules. Using standard female XLR connectors, the panel accepts 16 audio channels (eight per Input Module) and connects to D/ESAM's analog audio inputs on the D/ESAM rack unit.

The figure below illustrates a front view of the panel:



*Input Connector Panel - XLR Analog, Front View*

The figure below illustrates a rear view of the panel:



*Input Connector Panel - XLR Analog, Rear View*

The back panel includes two connectors, each capable of carrying eight audio channels.

## Installation and Interconnection

The table below lists panel specifications:

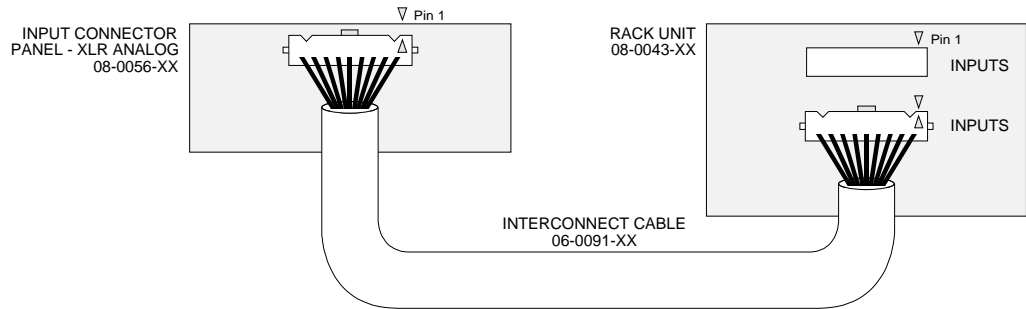
### *Input Connector Panel - XLR Analog Specifications*

Item	Specification	Note
Dimensions	1.75" H, 19" W, 2" D	
Cables	Two (2) multi-conductor cables supplied with Fan-In Panel.	a.

### *Notes*

- a. 2 ft. length is standard.

The figure below illustrates interconnection between the panel and the rack unit. Interconnection for only one group of eight channels is shown:



*Input Connector Panel - XLR Analog Interconnect*

Note the following points when installing and interconnecting the **Input Connector Panel - XLR Analog**:

- Rack-mount the panel no further than two feet away from the rear of the D/ESAM rack unit.
- When installing the multi-conductor cable on the back of the panel and the rear of the D/ESAM chassis, note that all connectors are keyed and can only be installed one way.

# Output Connector Panels

The **Output Connector Panel** option (P/N 08-0054-XX) is available in two different configurations with two different sets of connectors:

- **Output Connector Panel - XLR Analog / AES Digital**

*Connectors:*

- Two digital program outputs in AES format (XLR-Male)
- Four analog program outputs (XLR-Male connectors)
- Four analog monitoring outputs (XLR-Male connectors)

- **Output Connector Panel - XLR Analog / DATS Digital**

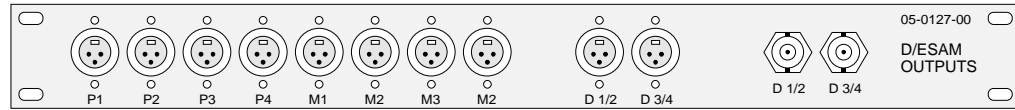
*Connectors:*

- Two digital program outputs in DATS format (BNC connectors)
- Two digital program outputs in AES format (XLR-Male)
- Four analog program outputs (XLR-Male connectors)
- Four analog monitoring outputs (XLR-Male connectors)

**NOTE**

Although both AES and DATS digital output connectors are provided on the **Output Connector Panel**, only one set of digital outputs can be used at any one time. They can not be used simultaneously.

The figure below illustrates a front view of the **Output Connector Panel**:



*Output Connector Panel, Top Front View*

The table below lists panel connectors and their designations:

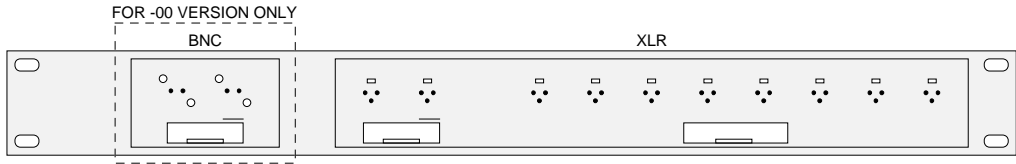
*Output Connector Panel Connectors*

Connector	Specification	Note
P1 through P4	Analog Program Outputs	
M1 through M4	Analog Monitoring Outputs	
D 1/2 and D 3/4 (XLR)	AES Digital Program Outputs	
D 1/2 and D 3/4 (BNC)	DATS Digital Program Outputs	a.

*Notes*

- a. If panel is purchased in DATS format, BNC connectors are provided.

The figure below illustrates a back view of the panel:



Output Connector Panel, Top Back View

The back panel includes one connector for analog program and monitoring, one for AES digital output and (if ordered) one connector for DATS digital output.

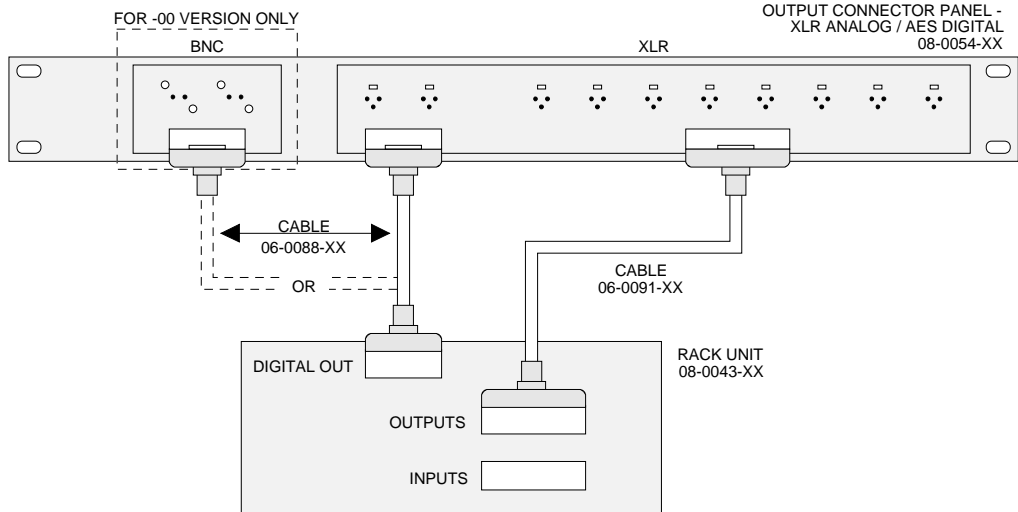
## Installation and Interconnection

The table below lists Output Connector Panel specifications:

Output Connector Panel Specifications

Item	Specification	Note
Dimensions	1.75" H, 19" W, 2" D	
Cables	Two (2) cables are provided: Analog: One (1) 32-conductor cable Digital: One (1) 8-conductor cable for either AES or DATS format	

The figure below shows the interconnection between the panel and the rack:



Fan-Out Panel Interconnect

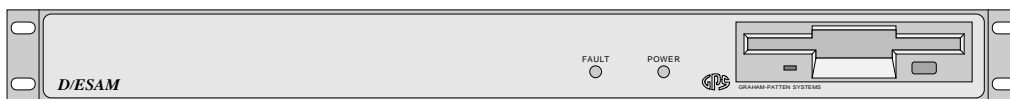
Note the following points when installing and interconnecting the Output Connector Panel:

- Rack-mount the panel no further than two feet from the Rack Unit rear.
- **Analog connection:** All analog cable and chassis connectors are keyed.
- **Digital connection:** All digital cable and chassis connectors are keyed.

# Floppy Disk Storage System

The **Floppy Disk Storage System** option adds a DOS-compatible 3.5" Floppy Disk Drive for storage of D/MEM registers, User Virtual Machine assignments, User Configuration Registers and maintenance setups. Disk management functionality (Read, Write, Directory, Erase, ID, Format) is included.

The figure below illustrates the **Floppy Disk Storage System** panel:



## Installation

The table below lists the items that comprise the Floppy Disk option:

*Floppy Disk Storage System Equipment List*

Quantity	Description	Note
1	Floppy Disk Storage System Panel	
1	15-conductor Panel Bus cable	a.
1	Power cord	

### Notes

- a. 5 ft. length is standard. Other custom cable lengths are available.

The table below lists Floppy Disk Storage System specifications:

*Floppy Disk Storage System Specifications*

Item	Specification	Note
Dimensions	1.75" H, 19" W, 7" D	
Voltage	85-264 VAC	
Frequency	47-440 Hz	
Power	40 Watts maximum	
Connectors	Two (2) 15-pin "D", Panel Bus	a.
Cables	5-ft. cable	b.

### Notes

- a. One of the two "Panel Bus" connectors is used to connect the Disk Drive to the Control Panel's Panel Bus jacks. Panel Bus connectors are loop-through.
- b. 5 ft. length is standard. Custom cable lengths are available.

Mount the **Floppy Disk Storage System** panel directly above other D/ESAM peripherals (such as the Assignment Panels and EQ Panel) or at any desired Console location for maximum convenience. Be sure to allow for cable length. Connect the Floppy Disk panel to the Control Panel's Panel Bus jacks or to an EQ panel (if installed).

## Disk Functions

The following topics are discussed in this section:

- Disk Function basics
- Disk Function Menu Tree
- Displaying the disk directory
- Writing to disk
- Reading from disk
- Erasing the disk
- Formatting the disk
- Changing the disk ID

Three categories of data can be written to or read from disk:

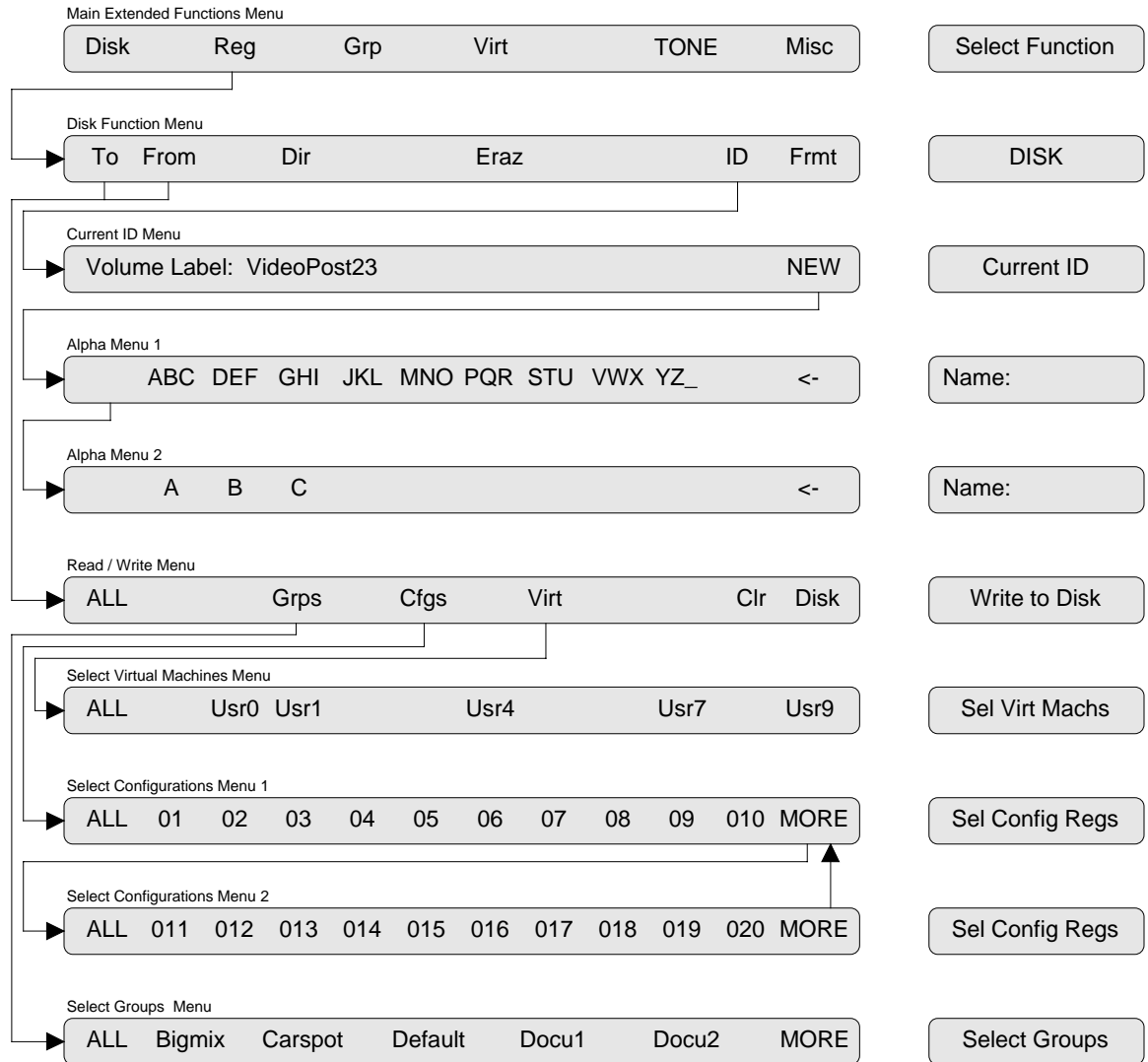
- Standard D/MEM Registers
- User Configuration Registers
- User Virtual Machines

These categories can be written or read as a single "block," or individual registers (or groups) within the categories can be selected.

The disk drive unit supports 1.4 Megabyte disks in MS-DOS format. When registers and groups are written to and read from the disk, renumbering and regrouping can *not* be performed. Use Register Management for these functions.

Note that a special "Set Up" disk can be made from the Maintenance Terminal. In Chapter 5, refer to the "**Maintenance Backup and Restore - Menu 8**" section for instructions.

The figure below illustrates the **Disk Function** menu tree. Each menu is named and each has an associated prompt in the display. Arrows indicate the menu that is accessed when a particular function is selected:

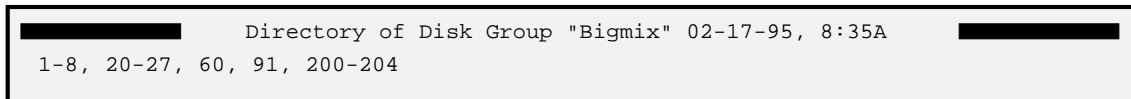


*Disk Function Menu Tree*

The following sections discuss disk operations in detail.



To see more detail for a specific group on disk, press either softkey above the group's name. The **Group Register Directory** appears, which shows a complete listing of all current registers in the group:



#### Group Register Directory

To display register detail for *another* group, select the group in the same manner. Press **CLEAR** to return to the **Group Directory** menu.

- From the **Group Directory**, press **CLEAR** or **ENTER** to return to the **Disk Function Menu** or press **UNDO** to return to the main display.

### Writing To Disk

Three categories of registers can be written from RAM memory to disk:

- Standard D/MEM Registers
- User Configuration Registers
- User Virtual Machines

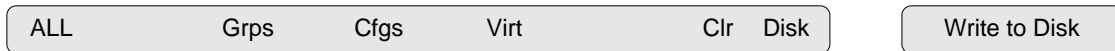
All categories combined together can be written as a single “block,” or individual D/MEM groups, User Configuration Registers or User Virtual Machines *within* the categories can be selected.

Use the following procedure to write data from RAM memory to disk:

- Ensure that the floppy disk is write “enabled.”
- Press **X / EX FUNC** to display the Main Extended Functions Menu.
- Press **SELECT** above the label “**Disk**” to display the Disk Function Menu.



- Press **SELECT** above the label “**To**” to display the **Read / Write Menu**. The display confirms the “write” mode:



- To write *all data* contained in the three register categories from D/ESAM RAM to disk, press the **SELECT** button above the label “**ALL.**” The **SELECT** buttons above the labels “**ALL,**” “**Grps,**” “**Cfgs,**” “**Virt,**” and “**Clr Disk**” light.
- To erase *all existing data* on disk before new data is written, leave the “**Clr Disk**” button lit. To only write *new* data to disk and retain the existing unique categories, press the select button above “**Clr Disk**” to turn off the light and disable the function.

Note that if a group exists on disk with the same name as one in memory, the group on disk will be overwritten by the incoming data.

7. Press **ENTER**. If data is already present on disk, the display prompts

Erase all Grp Cfg Virt data on disk?	YES NO	DISK
--------------------------------------	--------	------

Press **YES** to confirm or **NO** (or **UNDO**) to cancel.

- If **YES** is pressed, writing begins. When finished, the display confirms completion and returns to the **Disk Function Menu**.
- If **UNDO** is pressed, writing is canceled and the display returns to the **Disk Function Menu**.

8. To write *selected data* from D/ESAM RAM to disk, press **SELECT** above the desired category on the **Read / Write Menu**:

- a. Press **SELECT** above the label “**Grps**” to write groups to disk. The **Select Groups Menu** appears:

ALL	Bigmix	Carspot	Default	Docu1	Docu2	MORE	Select Groups
-----	--------	---------	---------	-------	-------	------	---------------

The following options are available:

- Press **SELECT** above the label “**ALL**” to choose all D/MEM register groups. All **SELECT** buttons light.
- Press **SELECT** above *each individual group* that you wish to write to disk. Buttons light when selected.
- Press **SELECT** above the label “**MORE**” to choose groups on additional menu displays.

Press **ENTER** when all groups have been selected. The display returns to the **Read / Write Menu** and the **SELECT** button above “**Grps**” lights to indicate that certain groups have been selected:

1	2	3	4	5	6	7	8	9	10	11	12	
ALL		Grps	Cfgs	Virt		Clr	Disk					Write to Disk

Select additional categories as required.

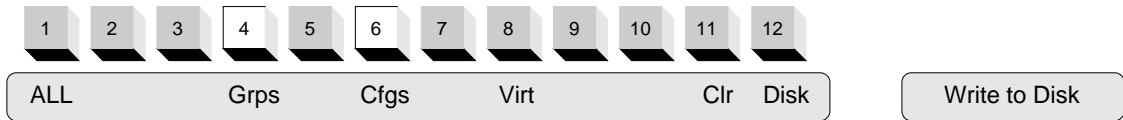
- b. Press **SELECT** above “**Cfgs**” to write specific User Configuration Registers to disk. The **Select Configurations Menu 1** appears:

ALL	01	02	03	04	05	06	07	08	09	010	MORE	Sel Config Regs
-----	----	----	----	----	----	----	----	----	----	-----	------	-----------------

The following options are available:

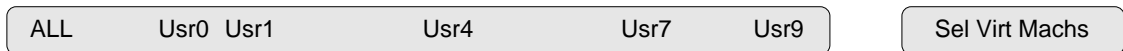
- Press **SELECT** above the label “**ALL**” to choose all User Configuration registers. All **SELECT** buttons light.
- Press **SELECT** above *each individual configuration* that you wish to write to disk. Buttons light when selected.
- For additional registers, press **SELECT** above the label “**MORE**” to display **Select Configurations Menu 2**.

Press **ENTER** when all desired Configurations have been selected. The display returns to the **Read / Write Menu** and the **SELECT** button above “**Cfgs**” lights to indicate that certain configurations have been chosen.



Select additional categories as required.

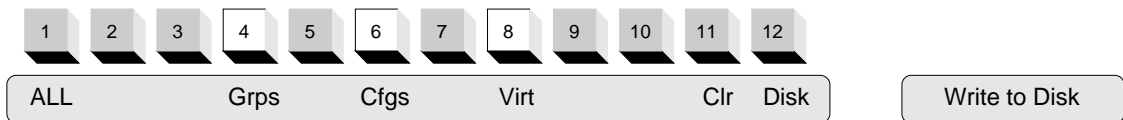
- c. Press **SELECT** above “**Virt**” to write specific User Virtual Machines to disk. The **Select Virtual Machines Menu** appears:



The following options are available:

- Press **SELECT** above “**ALL**” to choose all User Virtual Machines. All **SELECT** buttons light.
- Press **SELECT** above *each individual User Virtual Machine* that you wish to write to disk. Buttons light when selected.

Press **ENTER** when all Machines have been selected. The display returns to the **Read / Write Menu** and the **SELECT** button above “**Virt**” indicates that certain User Virtual Machines are selected.



Select additional categories as required.

9. When all categories have been selected, toggle “**Clr Disk**” *ON* (to erase *all existing data* on disk) or *OFF* (to only write *new data* to disk).
10. Press **ENTER** to begin writing. When **Clr Disk** is lit and duplicate data exists on disk, you will be asked to confirm the process. Press **YES** to confirm or **NO** (or **UNDO**) to cancel the operation.
  - If **YES** is pressed, writing begins. The display confirms completion and returns to the **Disk Function Menu**.
  - If **UNDO** is pressed, writing is canceled and the display returns to the **Disk Function Menu**.

## WARNING

If **CLEAR** or **UNDO** is pressed while the “write” is in progress, all previous data on disk is lost. Only that portion of the data written to disk prior to the cancellation will exist on disk.

Remember the following important points regarding disk write operations:

- If **X / EX FUNC** is pressed accidentally, press it again to restore the main display. This function only works on the **Main Extended Functions Menu**, *not* on Extended Functions sub-menus.
- To return to the main display from *any* Extended Function menu, no matter what the level or branch, press **UNDO**.
- To return to the **Disk Function Menu** from the **Read / Write Menu**, press **CLEAR**.
- The disk drive supports 1.4 Megabyte disks.
- If an unformatted disk is used, the system first asks if you wish to format the disk. Press **YES** to format the disk and then perform the “write” operation or press **NO** to return to the **Disk Functions Menu**.
- Register renumbering and regrouping can not be performed when writing to disk.

### **Reading From Disk**

Three categories of registers can be read from disk back into D/ESAM RAM memory:

- Standard D/MEM Registers
- User Configuration Registers
- User Virtual Machines

All categories combined together can be read in as a single “block,” or individual D/MEM groups, User Configuration Registers or User Virtual Machines *within* the categories can be selected.

Use the following procedure to read data from disk back into RAM memory:

1. Press **X / EX FUNC**.
2. Press **SELECT** above “**Disk**” to display the **Disk Function Menu**.



3. Press **SELECT** above “**From**” to display the **Read / Write Menu**. The display confirms the “read” mode:



4. To read *all data* in the three register categories from disk back to RAM memory, press **SELECT** above “**ALL**.” The **SELECT** buttons above the labels “**ALL**,” “**Grps**,” “**Cfgs**,” “**Virt**,” and “**Clr Mem**” light.
5. To erase *all existing data* in memory before new data is read in, leave “**Clr Mem**” lit. To only read in *new* data and retain existing categories in memory, press **SELECT** above “**Clr Mem**” to disable the function. Note that if a group exists in memory with the same name as one on disk, the group in memory will be overwritten by incoming data.

6. Press **ENTER**. The CHANNEL STATUS DISPLAY prompts

Erase all Grp Cfg Virt data in D/ESAM?

YES NO

DISK

Press **YES** to confirm or **NO** (or **UNDO**) to cancel the operation.

- If **YES** is pressed, reading begins. When finished, the display returns to the **Disk Function Menu**.
- If **UNDO** is pressed, reading is canceled and the display returns to the **Disk Function Menu**.

## WARNING

If **CLEAR** or **UNDO** is pressed while the “read” is in progress, all previous data in RAM is lost. Only that portion of the data read from disk prior to the cancellation will exist in RAM.

7. To read *selected data* from disk back to RAM, press **SELECT** above the desired category on the **Read / Write Menu**:
- Press **SELECT** above “**Grps**” to read specific groups to disk. The **Select Groups Menu** appears:

ALL

Bigmix

Carspot

Default

Docu1

Docu2

MORE

Select Groups

The following options are available:

- Press **SELECT** above “**ALL**” to choose all D/MEM register groups. All **SELECT** buttons light.
- Press **SELECT** above *each individual group* that you wish to read from disk. Buttons light when selected.
- Press **SELECT** above “**MORE**” to choose groups on additional menu displays.

Press **ENTER** when all desired groups have been selected. The display returns to the **Read / Write Menu** and the **SELECT** button above “**Grps**” indicates that groups have been selected:

1

2

3

4

5

6

7

8

9

10

11

12

ALL

Grps

Cfgs

Virt

Clr

Mem

Read from Disk

Select additional categories as required.

- b. Press **SELECT** above “**Cfgs**” to read specific User Configuration Registers. The **Select Configurations Menu 1** appears:



The following options are available:

- Press **SELECT** above “**ALL**” to choose all User Configuration registers. All **SELECT** buttons light.
- Press **SELECT** above *each individual configuration* that you wish to read from disk. Buttons light when selected.
- For additional registers, press **SELECT** above the label “**MORE**” to display **Select Configurations Menu 2**.

Press **ENTER** when all desired Configurations have been selected. The display returns to the **Read / Write Menu** and the **SELECT** button above “**Cfgs**” lights to indicate that certain configurations have been chosen.



Select additional categories as required.

- c. Press **SELECT** above “**Virt**” to read specific User Virtual Machines from disk. The **Select Virtual Machines Menu** appears:



The following options are available:

- Press **SELECT** above “**ALL**” to choose all User Virtual Machines. All **SELECT** buttons light.
- Press **SELECT** above *each individual User Virtual Machine* that you wish to read. Buttons light when selected.

Press **ENTER** when all desired User Virtual Machines have been selected. The display returns to the **Read / Write Menu** and the **SELECT** button above “**Virt**” lights to indicate that certain User Virtual Machines have been selected.



Select additional categories as required.

8. When all categories have been selected, toggle “**Clr Mem**” *ON* (to erase *all existing data* in memory before new data is read) or *OFF* (to only read in *new* data from disk and retain existing unique categories in memory).

9. Press **ENTER** to begin reading. If **Clr Mem** is lit and duplicate data exists in RAM, you will be asked to confirm the process.

Press **YES** to confirm or **NO** (or **UNDO**) to cancel the operation.

- If **YES** is pressed, reading begins. The display confirms completion and returns to the **Disk Function Menu**.
- If **UNDO** is pressed, reading is canceled and the display returns to the **Disk Function Menu**.

Remember the following important points regarding disk read operations:

- If **X / EX FUNC** is pressed accidentally, press it again to restore the main display. This function only works on the **Main Extended Functions Menu**, *not* on Extended Functions sub-menus.
- To return to the main display from *any* Extended Function menu, no matter what the level or branch, press **UNDO**.
- To return to the **Disk Function Menu** from the **Read / Write Menu**, press **CLEAR**.
- Renumbering and regrouping of registers can not be performed when reading from disk. Refer to the “**Register Management**” section in Chapter 3 for details.

### ***Erasing The Disk***

Use the following procedure to erase *all data* from disk (including all D/MEM groups, all individual D/MEM registers, all User Configuration Registers and all User Virtual Machine configurations).

1. Ensure that the floppy disk’s write protect tab is in the **OFF** position. If not, change the tab’s position to **OFF**.
2. Press **X / EX FUNC**.
3. Press **SELECT** above the label “**Disk**” to display the **Disk Function Menu**.



4. Press **SELECT** above the label “**Eraz.**” The display prompts



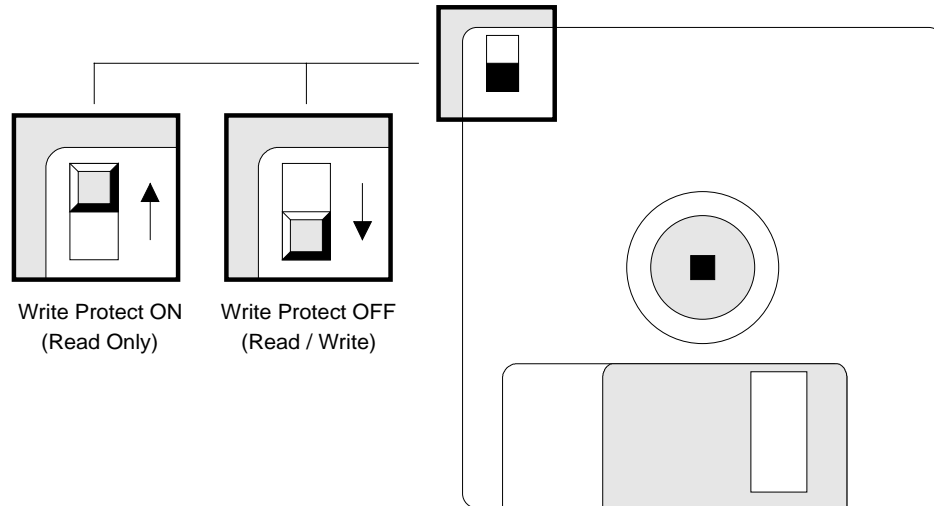
Press **YES** to confirm or **NO** (or **UNDO**) to cancel the operation.

- If **YES** is pressed, erasing begins. *All data* on disk is erased (only the current volume ID is retained). When finished, the display confirms erasure and returns to the **Disk Function Menu**.
- If **UNDO** is pressed, erasing is canceled, the system exits the Extended Functions menus and the display returns to normal mixing mode.

## Formatting The Disk

Use the following procedure to format a blank disk or re-format a disk which already contains data (effectively erasing the entire disk). Note that the disk drive unit supports 1.4 Megabyte disks.

1. Ensure that the floppy disk's write protect tab is in the **OFF** position. If not, change the tab's position to **OFF** as shown below:



2. Press **X / EX FUNC**.
3. Press **SELECT** above the label "**Disk**" to display the **Disk Function Menu**. The display names the menu:



4. Press **SELECT** above the label "**Frmt.**" If there is data already present on disk, the display prompts



Press **YES** to confirm or **NO** (or **UNDO**) to cancel the operation.

- If **YES** is pressed, formatting begins. *All* data on disk (including the current volume ID) is erased as the disk is formatted. When finished, the display confirms erasure and returns to the **Disk Function Menu**. The ID automatically becomes **D/ESAM\_820**. Refer to the "**Changing the disk ID**" section for instructions.
- If **UNDO** is pressed, formatting is canceled, the display returns to the **Disk Function Menu** and the disk is left in an *unusable* state.

## Changing The Disk ID

A floppy disk's ID (volume label) can be changed at any time. Remember that the default label **D/ESAM\_820** is automatically given to the disk after formatting.

Use the following procedure to change the disk ID or enter a new ID:

1. Ensure that the floppy disk's write protect tab is in the **OFF** position.
2. Press **X / EX FUNC**.
3. Press **SELECT** above the label "**Disk**" to display the **Disk Function Menu**. The display names the menu:

To	From	Dir	Eraz	ID	Frmt	DISK
----	------	-----	------	----	------	------

4. Press **SELECT** above the label "**ID**" to display the Current ID Menu. The display shows the current volume label:

Volume Label: VideoPost23	NEW	Current ID
---------------------------	-----	------------

5. Press **ENTER** or **CLEAR** to accept the *current* ID (and return to the **Disk Function Menu**) or press **SELECT** above "**NEW**" to change the current label. The display changes to **Alpha Menu 1**:

ABC DEF GHI JKL MNO PQR STU VWX YZ_	<-	Name:
-------------------------------------	----	-------

6. Press **SELECT** above the *group* of letters which includes the specific letter desired. For example, to use letter "B," press **SELECT** above "**ABC.**" The display changes to **Alpha Menu 2**:

A B C	<-	Name:
-------	----	-------

7. Press **SELECT** above the desired *individual* letter. The display lists your selection and the system returns to **Alpha Menu 1**:

ABC DEF GHI JKL MNO PQR STU VWX YZ_	<-	Name: B
-------------------------------------	----	---------

Volume IDs can include up to 11 alphanumeric characters. Use the **KEYPAD** to enter a numeric value in a name. Repeat steps 6 and 7 until all letters in the new ID have been selected. If a mistake is made, press **SELECT** above "**<-**" to backspace.

8. When complete, press **ENTER** to confirm, **CLEAR** to start again or **UNDO** to cancel. If **ENTER** is pressed, the new ID is written to disk. When finished, the display returns to the **Disk Function Menu**.

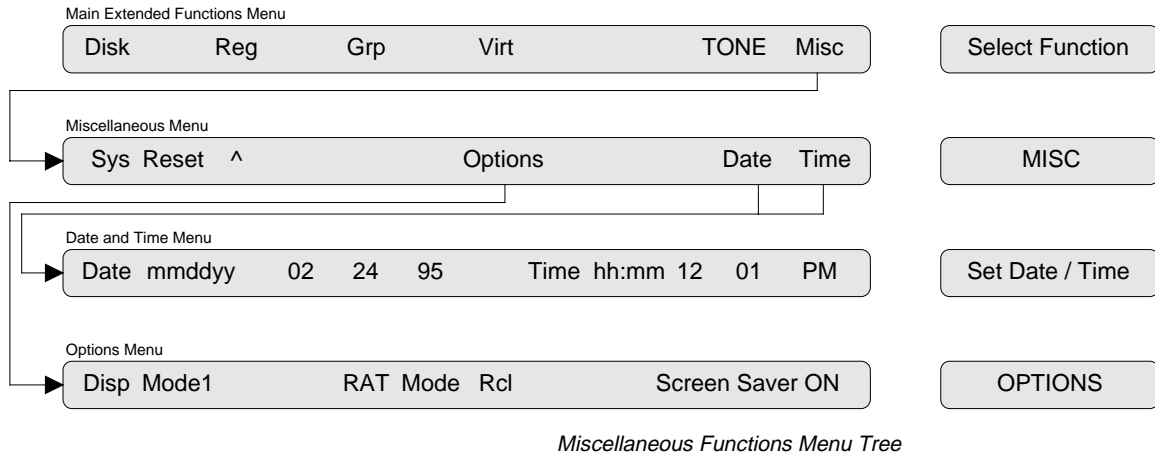
### NOTE

If an unformatted disk is used, the system first formats the disk.

## Changing Date and Time

With the **Floppy Disk Storage System** option installed, the internal date and time can be set from the Control Panel. When D/MEM Registers, User Configuration Registers and User Virtual Machine configurations are written to disk, a date and time “stamp” is added which can be viewed on the Disk Directory Screen.

The figure below illustrates the menu tree for **Miscellaneous** functions. Each display is named and each has an associated prompt in the display. Arrows indicate the menu that is accessed when a particular function is selected:

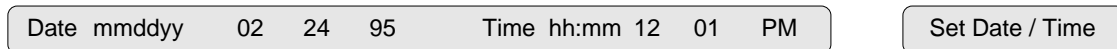


Use the following procedure to change system date and time:

1. Press **X / EX FUNC**.
2. Press **SELECT** above the label “**Misc**” to display the **Miscellaneous Functions Menu**.



3. Press **SELECT** above “**Date**” or “**Time**” to display the **Date And Time Menu**:



The left half of the menu includes the label “**Date**,” the notation format (**mmddy**, **ddmmyy** or **yymmdd**) and one numeric field each for **Month**, **Day** and **Year**. The right half includes the label “**Time**,” the notation format (**hh:mm**) and one numeric field each for **Hour**, **Minute** and **AM/PM**.

4. Press **ENTER** or **CLEAR** to accept the *current* Date and Time (and return to the **Miscellaneous Functions Menu**) or press **SELECT** above the desired field that you wish to change:
  - a. To change the Date, press **SELECT** above the numeric label for the **Month, Day** or **Year**. The number changes to “#” signs:

Date mmddyy

02

##

95

Time hh:mm

12

01

PM

Set Date / Time

- b. Enter the new **Month, Day** or **Year** on the KEYPAD and press **ENTER**. Repeat for the remaining “**Date**” fields if necessary. If a mistake is made, press **CLEAR** *once* to display the “#” signs, press a *second* time to restore the previous value and return to the **Miscellaneous Functions Menu**.
- c. To change the Time, press **SELECT** above the numeric label for the **Hour** or **Minute**. The number changes to “#” signs.
- d. Enter the new **Hour** or **Minute** on the KEYPAD and press **ENTER**. Repeat for the remaining “**Time**” field if necessary. If a mistake is made, press **CLEAR** *once* to display the “#” signs, press a *second* time to restore the previous value and move up one menu to the **Miscellaneous Functions Menu**.
- e. To change between **AM** and **PM**, toggle **SELECT** above **AM/PM** until the desired label is shown. Note that the **AM/PM** toggle is not available if the **Time** format is set to 24-hour mode.

## NOTE

Changing the *format* of the current Date and current Time is performed using the Maintenance menus. Refer to Chapter 5 for instructions.

5. When the process is complete, press **ENTER**. The new Date and Time will be used to “stamp” all files written to disk.

Remember the following points regarding the **Miscellaneous Functions Menu**:

- If **X / EX FUNC** is pressed accidentally, press it again to restore the main display.
- To return to the main display from *any* Extended Function menu, no matter what the level or branch, press **UNDO**.
- To return to the **Miscellaneous Functions Menu** from the **Date and Time Menu**, press **CLEAR**.

---

# Delay

The **D/ESAM 820** Digital Delay Option allows you to re-time audio signals to video signals which have been delayed — typically, due to special effects devices or default delays inherent in digital video tape recorders and digital switchers. The Delay option offers three different types of delay that can be added to the D/ESAM 820 mixer's audio path:

- **Virtual Machine Delay**

This type of delay attaches a default delay to a virtual machine. The value is entered via the Maintenance Terminal and is designed for *permanent* situations in which the delay value never (or rarely) changes. For example, a digital video tape recorder that includes a constant one-frame delay (due to a video frame buffer), would be an excellent machine on which to set a one-frame virtual machine delay. Thus, every time the virtual machine is placed on the panel, the default delay is automatically assigned, without any operator intervention.

During operation, standard virtual machine delay values can be viewed on status display screens 2 and 5, but can only be changed via the Maintenance Terminal. User Virtual Machine delay values, however, *can* be changed on the Control Panel.

- **Logical Machine Delay**

This type of delay is assigned to a logical machine via the control panel, on an “as-needed” basis. For example, logical machines A, B and C can each have their own individual delay values, which move with the logical machine as it is assigned to different virtual machines. If a VTR needs to be routed through an effects device for one edit and removed from the path for the next, the editor can quickly assign — and subsequently remove the logical machine delay as required.

During operation, logical machine delay values can be viewed on status display screen 5 and changed using a simple control panel dialogue.

- **Output Delay**

Output delay is an *overall* delay value placed on the output of the entire mixer, thus affecting *all active signals* on the D/ESAM 820 panel. Similar to logical machine delay, the global output delay value can be entered and removed “as-needed.” An output delay is typically used to compensate for digital video switchers that have a default delay value for the entire system.

During operation, the output delay value can be viewed at the bottom right of *each* status screen and specifically on status screen 5. The Output Delay can be changed using a simple control panel dialogue.

All three types of delay values are *additive*. If a virtual machine has a default “**Virtual Machine Delay**” value, for which you then assign a “**Logical Machine Delay**” and subsequently assign an “**Output Delay**” to the entire mixer, the three values are added together and thus affect the signal accordingly.

During operation, the total delay can be viewed on status display screen 5 and changed by adjusting the individual **Logical** and **Output** delay values. Remember that the virtual machine delay can only be changed at the Maintenance Terminal.

## Installation Overview

Delay installation requires the following procedures:

- **Delay Hardware Installation**
- **Virtual Machine Setup**

If the **Delay** option is already installed and all the setup procedures outlined above have been completed, please skip ahead to the “**Delay Operation**” section.

The table below lists the parts included in the Delay kit. Please contact GPS Customer Support at (800) 422-6662 or (916) 273-8412 if you did not receive all parts listed below:

*Delay Kit Parts Lists*

Quantity	Assembly #	Description
4	04-0157-XX	Delay/Equalizer Slave Modules
2	n/a	Control Panel keycaps ( <b>DELAY, DELAY EXT</b> )

The following tools are required for this installation:

- Maintenance Terminal or PC with terminal emulation software

### NOTE

Observe the following important safety and handling precautions:

- Perform the installation in a completely anti-static environment.
- Stand on an anti-static mat, not a carpet.
- Ground yourself to the chassis before handling internal mechanisms.
- Hold boards from the edges; *do not touch the chips*.
- Make sure the system chassis is turned *OFF*. It is a good idea to disconnect the power cord before proceeding.

## Delay Hardware Installation

This section provides hardware installation instructions for the D/ESAM 820 Audio Delay option. The following two procedures must be performed:

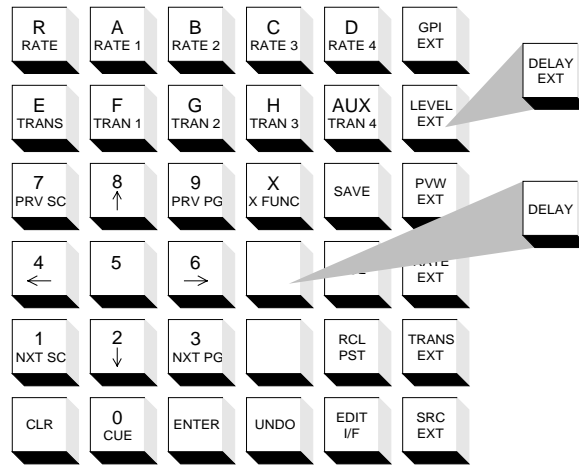
- **Control Panel Upgrade**
- **Master Processor Board Upgrade**

### ***Control Panel Upgrade***

To upgrade the D/ESAM 820 Control Panel for Delay functionality, add two new keycaps to the control panel as follows:

1. Replace the **LEVEL EXT** keycap with the **DELAY EXT** keycap.
2. Replace the *top* blank keycap with the **DELAY** keycap.

The figure below illustrates the keycap replacement locations:



*Keycap Replacement Locations*

This completes the Control Panel upgrade for the Delay option. Proceed with the Master Processor upgrade.

### ***Master Processor Board Upgrade***

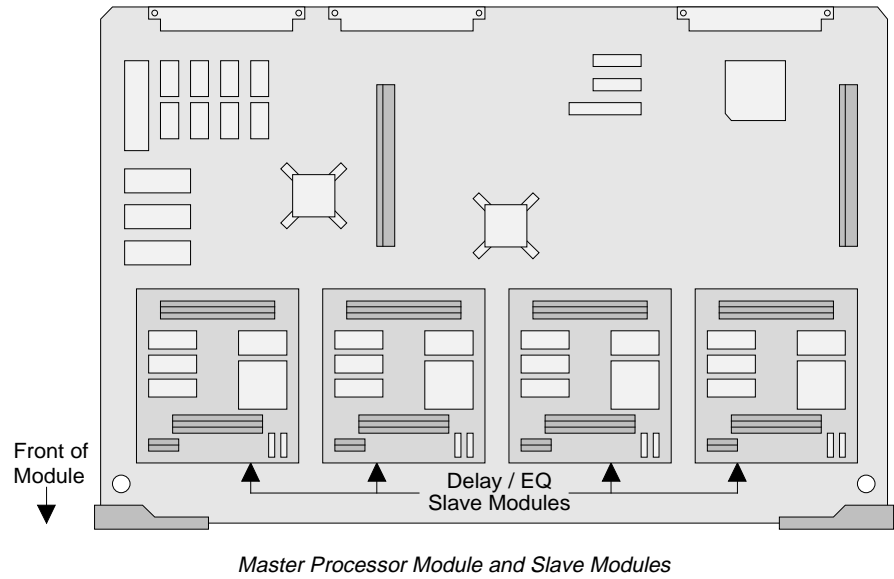
Use the following steps to upgrade the D/ESAM 820 Master Processor Board for Delay functionality.

## **IMPORTANT**

Ensure that this procedure is performed in a completely anti-static environment.

1. Ensure that power is *OFF* in the D/ESAM 820 electronics chassis.
2. Carefully remove the Master Processor Module from the main chassis and place it face-up on a static-free work surface.

3. If your current system is configured with one or more Equalizer Slave Modules (Assy. 04-0128-00), remove *all* modules and return them to Graham-Patten Systems. Use the figure below for reference.



4. Install the four new **Delay/Equalizer Slave Modules** (04-0157-XX) as shown in the figure above. These new modules provide a full 16 channels of delay.
5. Carefully re-install the Master Processor Module in the chassis and turn chassis power back on.

This completes the **Master Processor Module** upgrade for the Delay option.

## NOTE

Please return the older style Slave Modules (GPS Assy. 04-0128-00) to the following address:

**Graham-Patten Systems**  
**13366 Grass Valley Avenue**  
**Grass Valley, CA 95945 USA**  
**Attention: Customer Support**

## Virtual Machine Setup

Setting default virtual machine delay values is accomplished on the Maintenance Terminal, using the **Virtual Machine Operations Menu** (1), as shown below:

```

D / E S A M 8 2 0
Maintenance menu
Virtual Machine Operations - 1

0 Return to main menu - 0
1 Edit / Define Machine
2 List Machines
3 List Inputs
4 Wipe Out All Virtual Machine definitions
5 Re-calculate Virtual Machine Checksum

```

Use the following steps to set default virtual machine delay values:

1. If your Maintenance Terminal has not been connected, refer to the “**RS-232C Terminal**” section in Chapter 5 for connection information.
2. From the **Main Menu**, press **1** to access the Virtual Machine Operations Menu.
3. Press **2** (List Machines) to list all current Virtual Machine assignments and their D/ESAM inputs. A delay column is included at the far right:

Name	Number	Cue	1	2	3	4	5	6	7	8	9	Delay
VTR1	1	0	1	2	3	4	0	0	0	0	0	0.0
VTR2	2	0	5	6	7	8	0	0	0	0	0	0.0
VTR3	3	0	9	10	11	12	0	0	0	0	0	0.0
VTR4	4	21	13	14	15	16	0	0	0	0	0	0.0
ATR1	5	0	33	34	35	36	37	38	39	40	0	0.0
CD1	6	0	40	42	0	0	0	0	0	0	0	0.0

If more machines are assigned than can fit on one screen, you will be prompted to “**Type any key to continue**” to display additional screens.

4. Check the listing for any unexpected delay values and if found, note the associated virtual machine name. Upon software installation, all delay values *should* be **0.0**.
5. Press **ESCAPE** to return to menu 1.
6. Press **1** (Edit / Define Machine) to set default delay values for existing Virtual Machines. This is the *same process* used to define new virtual machines, with an extra step for delay. The following display appears:

Enter machine name or virtual machine number ...

7. Enter the name or number of the Virtual Machine for which you want to define a default delay and press **RETURN**. The display shows a heading with the selected Virtual Machine name and number, followed by a listing of the machine's current input-to-track assignments.
8. For the selected machine, press **TAB** to advance to last field "**Delay.**"
9. Enter the desired delay value, in "frames" and "tenths-of-frames." The valid range is from **0.0** to **7.0** frames, in both 525 and 625 standards.
10. Press **RETURN** to accept the new default virtual machine delay.
11. To enter default delays for additional virtual machines, repeat the procedure starting at step 7 above.
12. When all entries are complete, press **ESCAPE** to return to menu 1. If desired, you can view new values using the "**List Machines Menu.**"
13. To activate *all* changes, press the **RESET** button on the D/ESAM Main Chassis.

Remember the following important points regarding virtual machine delay:

- During mixer operation, virtual machine delay values can be viewed on status display screens 2 and 5, but can *only* be changed via the Maintenance Terminal.
- For additional information on defining and listing virtual machines, see the "**Virtual Machine Operation - Menu 1**" section in Chapter 5.
- Delay values for User Virtual Machines are entered in the **Extended Functions** dialogue using the Panel's User Virtual Machines Menu. See the "**User Virtual Machine Delay**" section for instructions.
- Virtual Machine assignments (and their associated delay values) are stored in register 0 and in the twenty User Configuration Registers, but *not* in D/MEM registers.

## Delay Operation

This section provides detailed instructions for using the delay option. The following topics are discussed:

- **Output Delay**
- **Logical Machine Delay**
- **User Virtual Machine Delay**
- **Delay Status**

Remember that default **Virtual Machine Delay** values are entered via the Maintenance Terminal and can *not* be changed from the Control Panel.

### NOTE

All delay values (including Virtual Machine Delay) can be viewed on the Status Screens.

### Output Delay

**Output Delay** is an *overall* delay value placed on the output of the entire mixer, thus affecting *all active signals* on the D/ESAM 820 panel. Output delay values can be entered and removed “as-needed” but can *not* be placed on the “R machine.

Use the following steps to enter (or change) output delay values:

1. Press **DELAY**. The button lights to confirm and the display shows the *current* output delay value, an example of which is shown below:

Output Dly = 1.0

2. To accept the *current* output delay, press **DELAY** or **ENTER**.
3. To enter a new output delay, type the number in “frames” and “tenths-of-frames” notation on the keypad. The valid range is from **0.0** to **9.9** frame, in both 525 and 625 standards.

### NOTE

You can also use the monitor knobs (**LVL** and **BAL**) to enter the delay value — both knobs have the same function. This method allows you to watch the video monitor while you sync audio.

A sample entry in progress is shown below:

Output Dly = 2.#

Note the following points regarding numeric entry:

- The first number entered appears in the “frames” column, to the left of the decimal point. If **ENTER** is pressed at this point, the # sign is regarded as a zero.

- The second number entered appears in the “tenths-of-frames” column, to the right of the decimal point.
  - Thereafter, numbers “shift left” as they are entered.
  - If you make a mistake, press **CLEAR** to return the display to the “stored” output delay value.
4. When entry is complete, press **ENTER** to confirm the new output delay. The display returns to the default “rate” display.

The output delay value can be checked or “verified” in the following ways:

- The current output delay is displayed in the bottom right-hand corner of all Status Screens (in the “common” area) and on Status Screen 5 (Audio Delay Status Display).
- Press **DELAY**. The current output delay value appears in the display. Press **DELAY** again (or **UNDO**) to return to the default rate display.

Remember the following important points regarding output delay:

- All standard rules for data entry apply.
- To clear the output delay *individually*, use the procedure outlined above and enter **0.0** as the value. To clear the output delay value *and* all logical machine delay values, press **DELAY, CLEAR**. Note that this procedure can be “undone” by pressing **UNDO**.
- Output Delay values are automatically stored in D/MEM registers in the normal manner.
- The **FX OFF** button does *not* affect output delay.
- Output delay can *not* be assigned to the “R machine.
- The **DELAY** button will *not* light if the Delay option is not installed.

### **Logical Machine Delay**

**Logical Machine Delay** is a value assigned to “individual” logical machines via the control panel, on an “as-needed” basis. For example, logical machines A, B and C can *each* have their own individual delays.

Use the following steps to enter (or change) logical machine delay values:

1. On the panel, press **DELAY**. The button lights to confirm the mode and the display shows the current *output* delay value.
2. Using the buttons in the AUTO TRANSITION GROUP, press the letter of the logical machine to which you want to assign a delay. Once pressed, the display shows the selected machine and its current logical machine delay, an example of which is shown below:

B Mach Dly = 2.0

3. To accept the logical machine delay, press **DELAY** or **ENTER**.
4. To enter a *new* logical machine delay for the machine, type the number in “frames” and “tenths-of-frames” notation on the keypad. The valid range is from **0.0** to **9.9** frame, in both 525 and 625 standards.

Note that you can also use the monitor knobs (**LVL** and **BAL**) to enter the delay value — both knobs have the same function. A sample entry is shown below:

B Mach Dly = 1.#

Note the following points regarding numeric entry:

- The first number entered appears in the “frames” column, to the left of the decimal. If **ENTER** is pressed, the **#** sign is regarded as a zero. The second number entered appears in the “tenths-of-frames” column, to the right of the decimal point. Thereafter, numbers “shift left” as they are entered.
  - If you make a mistake, press **CLEAR** to return the display to the “stored logical machine delay value.
5. When entry is complete for the first machine, you have two options:
- Press **ENTER** to confirm the new delay value for the *selected* machine and exit the dialogue completely or
  - Press the letter of the *next* logical machine to which you want to assign a delay and repeat the process from step 4. When you select a new machine, values for the *previous* machine are stored in memory. In this “batch” mode, you can continue to select machines and assign delays and when finished, press **ENTER** to confirm the most recent entry — and exit the dialogue.

When **ENTER** is pressed, the **Fx** LED turns *ON* for the machine.

Logical machine delay values can be checked or “verified” in the following ways:

- *All* current logical machine delays can be viewed on Status Screen 5 (Audio Delay Status Display).
- Press and hold **DELAY** to view delay values for those machines *currently on the panel*. Logical machine delays appear in the CHANNEL STATUS DISPLAY. Release **DELAY** to return to the default “rate” display.
- Press **DELAY**, then using the buttons in the AUTO TRANSITION GROUP, press the letter of any (or all) logical machines whose delay value you wish to check. This method allows you to check values for machines on and off the panel. Press **UNDO** to exit the mode.

Remember the following important points regarding logical machine delay:

- All standard rules for data entry apply.
- To clear a logical machine delay value *individually*, use the steps above and enter **0.0**. To clear *all* logical machine delays *and* the output delay, press **DELAY**, **CLEAR**.
- Logical Machine Delay values are automatically stored in D/MEM registers in the normal manner.
- The **FX OFF** button enables and disables logical machine delay, along with equalization and processing loops, in the normal manner.

- Logical machine delay *can* be assigned to the R machine, but it does *not* affect the R machine when selected and monitored on Preview Bus.
- An assigned logical machine delay value moves with the logical machine, as it is assigned to different virtual machines.
- The **DELAY** button will *not* light if the Delay option is not installed.

### User Virtual Machine Delay

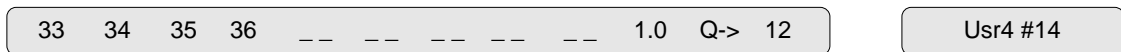
Delay can be added to User Virtual Machines as currently configured on the system. Up to ten User Virtual Machines (**Usr0** through **Usr9**) *must* be defined from the Maintenance Terminal. An initial set of inputs need not be assigned.

Use the following steps to add (or change) delay values for User Virtual Machines:

1. Press **X / EX FUNC**. The **Main Extended Functions Menu** appears, temporarily replacing machine assignments.
2. Press the **SELECT** button above the label “**Virt.**” The display changes to the User Virtual Machines Menu which lists the names of *all* User Virtual Machines as currently defined:



3. Press **SELECT** above the User Virtual Machine to which you want to add delay. The **Define Virtual Machine Menu** appears, which lists the current input values for the selected machine. The *current delay value* is displayed under the #10 **SELECT** button.



4. To change the User Virtual Machine delay value, press the #10 **SELECT** button and enter the desired delay. Note the following points regarding numeric entry:
  - The first number entered appears in the “frames” column, to the left of the decimal point. If **ENTER** is pressed, the **#** sign is regarded as a zero.
  - The second number entered appears in the “tenths-of-frames” column, to the right of the decimal point.
  - Thereafter, numbers “shift left” as they are entered.
  - If you make a mistake, press **CLEAR** to return the display to the “#.#” prompt, allowing you to enter a different value.
5. When data entry is complete, press **ENTER** to confirm the new delay value for the *selected* User Virtual Machine and return to the **User Virtual Machines Menu**.
6. Repeat steps 3 through 5 to add or change delay values for additional User Virtual Machines as desired.

7. Press **UNDO** to return to the main CHANNEL STATUS DISPLAY. The User Virtual Machine(s) on which you assigned delay values can now be assigned to Logical Machines in the normal manner — and the assigned delay is applied.

User Virtual Machine delays can be checked on Status Screen 2 (Virtual Machine Assignment) and on Status Screen 5 (Audio Delay Status Display).

Remember the following points regarding delay values for User Virtual Machines:

- All standard rules for data entry apply.
- If **X / EX FUNC** is pressed accidentally, press it again to restore the main CHANNEL STATUS DISPLAY.
- To return to the main display from *any* Extended Function menu, no matter what the level or branch, press **UNDO**.
- To return to the **Main Extended Functions Menu** from the **User Virtual Machines Menu**, press **CLEAR**.
- User Virtual Machine delay values are *not* stored in D/MEM registers.
- The D/ESAM 820 system treats User Virtual Machine delay values in the same manner as the default Virtual Machine Delay values.

## Delay Status

There are several methods available for checking current system delay values:

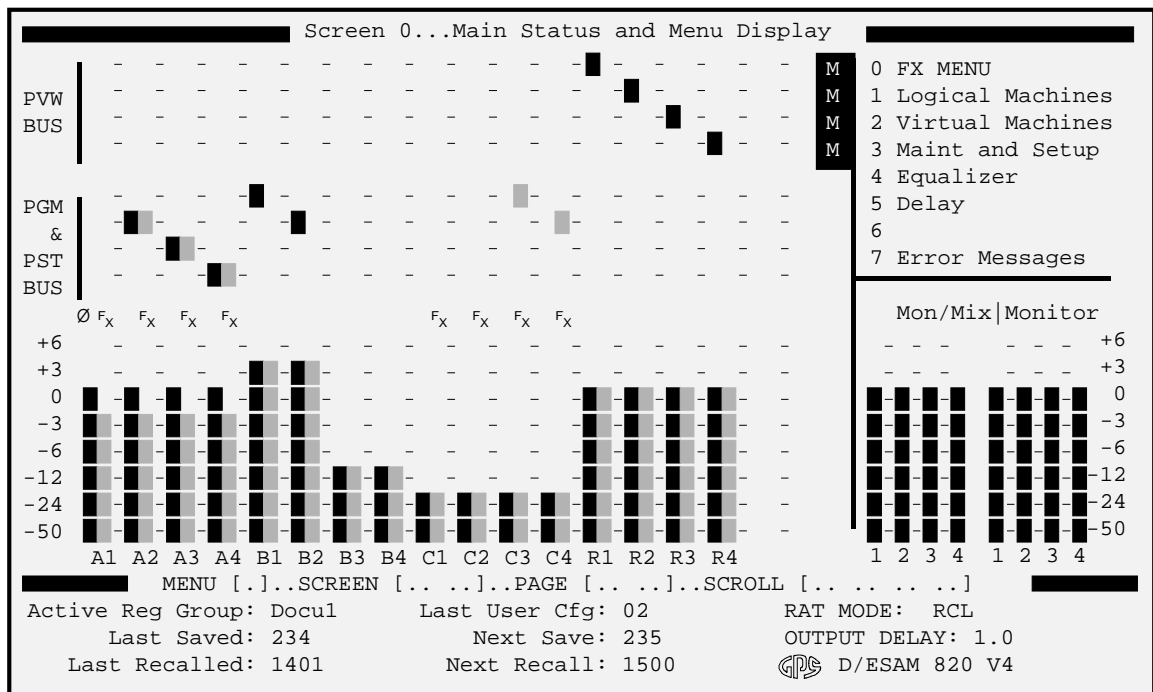
- Virtual Machine Delays can be viewed on Status Screens 2 and 5.
- Output Delays are displayed in the bottom right corner of all Status Screens and on Status Screen 5. You can also press **DELAY** to view the current output delay in the display.
- Logical Machine Delays can be viewed on Status Screen 5. You can also press and hold **DELAY** to view delay values for those machines *currently on the panel*.
- User Virtual Machine Delays can be checked on Screens 2 and 5.

Following is information regarding each Status Screen described above.

### ■ Screen 0

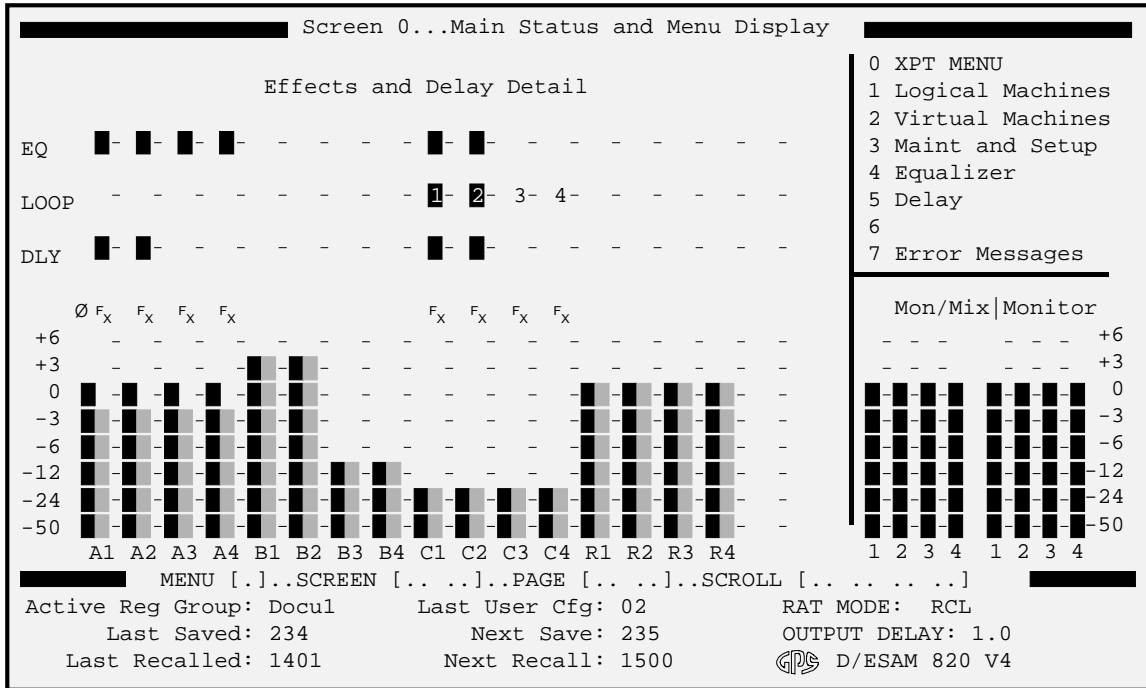
**Screen 0** is a two-screen toggle — pressing **0** toggles between the **Crosspoint Menu (XPT MENU)** and the **Effects Menu (FX MENU)**. In the upper right-hand menu box, the label adjacent to **0** (zero) names the menu that *will be displayed* when **0** is pressed on the keypad.

The figure below illustrates the **Crosspoint Menu**, which includes the “Delay” screen (item number 5) in the upper right-hand menu list:



Screen 0 - Crosspoint Menu

Press **0** to toggle to the **Effects Menu**, as shown below:



Screen 0 - Effects Menu

The bottom half of the **Effects Menu** is *identical* to the **Crosspoint Menu**. The top half provides abbreviated “status” for the three types of available effects:

- The **EQ** (Equalization) line indicates the channels on which equalization is enabled. For *complete* EQ detail, use status screen 4.
- The **LOOP** line indicates the channels on which a processing loop pathway is engaged, with the loop number serving as the indicator.
- The **DLY** (Delay) line indicates the channels on which delay is enabled. For *complete* delay detail, use status screens 2 and 5.

Note the following important points regarding the **Effects Menu** display:

- If the **EQ** line shows check marks in “normal video, EQ is enabled for the corresponding channel. Any highlighted *reverse video* check mark indicates that an equalizer channel is *actively* processing audio.
- If the **LOOP** line shows *numbers* in “normal” video, a processing loop is enabled for the channel. Any highlighted reverse video number indicates that a processing loop is *actively* processing audio.
- If the **DELAY** line shows check marks in “normal” video, delay is enabled for the corresponding channel. Any highlighted *reverse video* check mark indicates that a delay channel is *actively* processing audio.


Note also that the **Output Delay** value is displayed in the bottom right corner, just above the GPS logo. The output delay appears in this location on *all* status screens. If the output delay feature runs out of processing power ( if, for example, one of the slave modules is disabled and over 12 audio channels are being mixed), the output delay label itself changes to reverse video to serve as a warning.

## Screen 2

The figure below illustrates Status Screen 2, Virtual Machine Assignment:

Screen 2...Virtual Machine Assignment													
VIRT MACH	MACH NAME	LOG MACH	VIRTUAL MACHINE TRACKS / PHYSICAL INPUT								VIRT MACH DELAY		
			1	2	3	4	5	6	7	8	9	Q	
1	VTR1		1	2	.	.	.	.	.	.	.	.	.
2	VTR2		3	4	.	.	.	.	.	.	.	.	.
3	VTR3	C	5	6	.	.	.	.	.	.	.	.	.
4	VTR4	D	7	8	.	.	.	.	.	.	.	.	.
5	DTR1	A	33	34	35	36	.	.	.	.	.	9	1.0
6	DTR2	B	37	38	39	40	.	.	.	.	.	10	1.0
7	DTR3		33	34	35	36	.	.	.	.	.	11	1.0
8	DTR4	FR	33	34	35	36	.	.	.	.	.	12	1.0
9	CD1	E	13	14	.	.	.	.	.	.	.	.	.
10	CD2		15	16	.	.	.	.	.	.	.	.	.
11	RDAT1	G	49	50	.	.	.	.	.	.	.	.	.
12	RDAT2	H	51	52	.	.	.	.	.	.	.	.	.
13	ATR1		17	18	19	20	.	.	.	.	.	.	.
14	ATR2		21	22	23	24	.	.	.	.	.	.	.
15	USR1	Ax	49	50	51	52	.	.	.	.	.	.	.
16	TONE		.	.	.	.	.	.	.	.	.	.	.

MENU [0]..SCREEN [7 1]..PAGE [... ]..SCROLL [... ]


Active Reg Group: Docul      Last User Cfg: 02      RAT MODE: RCL  
 Last Saved: 234      Next Save: 235      OUTPUT DELAY: 1.0  
 Last Recalled: 1401      Next Recall: 1500       D/ESAM 820 V4

Screen 2 - Virtual Machine Assignment

The Virtual Machine Assignment menu provides columns for Virtual Machine number, name, the associated logical machine and the physical input associated with each track. The column at the far right lists delay values for Virtual Machines (as entered via the Maintenance Terminal) and delay values for User Virtual Machines (as entered on the **User Virtual Machines Menu**).

### Screen 3

The figure below illustrates the Slave Module section of Status Screen 3, **Maintenance / Setup**:

Screen 3...Maintenance/Setup Display							
----- I/O MODULE CONFIGURATION -----							
MODULE	1	2	3	4	5	6	7
INPUTS	1-8	9-16	17-24		33-40	41-48	LOOPS
INPUTS							1-4
TYPE(bits)	D(20)	D(20)	D(20)		A(20)	A(20)	D(24)
							D(24)
----- SLAVE MODULE CONFIGURATION -----							
MODULE	1	2	3	4			
FUNCTION	DELAY/EQ	DELAY/EQ	DELAY/EQ	DELAY/EQ/LOOP			
----- SYSTEM CONFIGURATION -----							
D/MEM REGS	EQ BLOCKS	SOFTWARE		SYSTEM SETTINGS			
TOTAL...637	TOTAL...2560	PANEL.....4.1	METER.....VU	NOTCH 1...60Hz			
USED ... 7	USED.....2	RACK.....4.1	TV STD...30FPS	NOTCH 2...180Hz			
FREE...630	FREE....2558	EQUALIZER..4.0	DISP MODE....1	TONE STD...1KHz			
		DISK.....4.0	OP LVL...- D(20)				
MENU [0]..SCREEN [7 1 ]..PAGE [.. 3 ]..SCROLL [... .. . .]							
Active Reg Group: Docul		Last User Cfg: 02		RAT MODE: RCL			
Last Saved: 234		Next Save: 235		OUTPUT DELAY: 1.0			
Last Recalled: 1401		Next Recall: 1500		 D/ESAM 820 V4			

Screen 3 - Maintenance / Setup (Page 1)

Under the “**Slave Module Configuration**” heading, the new “delay-specific” slave modules (04-0157-XX) are displayed on screen as “**DELAY/EQ.**”


- If a slave module is physically connected to a **Processing Loop Module**, the display reads “**DELAY/EQ/LOOP.**”

## Screen 5

The figure below illustrates Status Screen 5, Audio Delay Status:

Screen 5...Audio Delay Status Display				
LOGICAL MACHINE	LOG MACH DELAY	VIRT MACH + DELAY	OUTPUT + DELAY	TOTAL DELAY
A	1.0	1.0	1.0	3.0
B	.	.	1.0	1.0
C	.	.	1.0	1.0
D	2.5	.	1.0	3.5
E	.	.	1.0	1.0
F	.	.	1.0	1.0
G	.	.	1.0	1.0
H	.	.	1.0	1.0
Ax	.	.	1.0	1.0
R	.	1.0	-	1.0
Rpvw	-	-	-	-

MENU [.]..SCREEN [7 ..]..PAGE [.. ..]..SCROLL [.. .. . . .]
Active Reg Group: Docul      Last User Cfg: 02      RAT MODE: RCL
Last Saved: 234              Next Save: 235      OUTPUT DELAY: 1.0
Last Recalled: 1401          Next Recall: 1500  D/ESAM 820 V4

Screen 5 - Audio Delay Status

The **Audio Delay Status** screen provides a system-wide display of all delay values. From left to right, columns are provided for logical machine letter, logical machine delay, virtual machine delay, output delay and “total” delay. Note that a “dash” is placed under the **Output Delay** column, adjacent to the “R” machine, because Output Delay can *not* be assigned to “R.”

Because the D/ESAM 820 provides an overall limit of 17 *total* frames of delay throughout the system, the “**Total Delay**” column is important to check periodically, during production situations in which many “delay” processes are in use.

The “total delay equals the sum of a machine’s logical, virtual and output delay values. If the total delay exceeds 17 frames for an individual machine, the label “**Overflow**” appears to the right of a machine’s total delay value, as shown below:

LOGICAL MACHINE	LOG MACH DELAY	VIRT MACH + DELAY	OUTPUT + DELAY	TOTAL DELAY
A	1.0	1.0	1.0	3.0
B	.	.	1.0	1.0
C	.	.	1.0	1.0
D	9.5	7.0	1.0	17.0 <- OVERFLOW

Delay Overflow Display

In this situation, individual delay values are listed as originally entered, but the total delay clips at 17 frames. To remedy the problem, clear or enter new delay values in the normal manner.

# Processing Loops

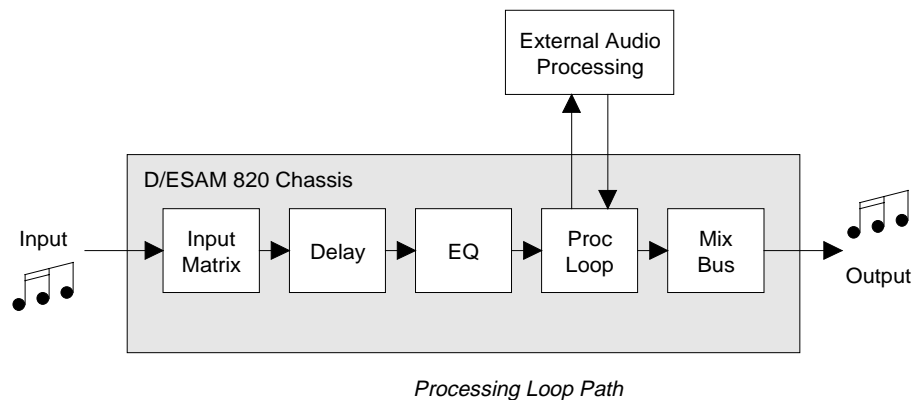
The **D/ESAM 820 Digital Processing Loops Option** allows you to insert external audio processing devices in the D/ESAM 820's audio path, while maintaining full digital audio quality through the traditional D/ESAM user-interface. For the maximum creative potential, a system can be configured with up to 16 processing loops (four per processing loop module).

## NOTE

For proper operation of the Processing Loops option, installation and setup of the Digital Delay Option is a prerequisite. The Processing Loops option can *not* function without the new Delay/Equalizer Slave Modules (04-0157-XX) installed.

A processing loop is in fact a digital audio pathway containing both an input and an output component. A single loop provides the ability to take an audio signal from D/ESAM's input matrix, route it *outside* the chassis to external audio processing devices and route it back inside the system again — entirely in the digital audio domain, without sacrificing any D/ESAM functionality.

The figure below illustrates a simplified diagram of a processing loop path:



The diagram above assumes a full complement of D/ESAM options. In brief, processing loops are pre-fader, post-EQ and post-Delay. With a processing loop engaged, an audio signal passes from the input matrix through delay processing, equalization processing and then to the processing loop module itself where the loop “assignment” is made. Here the signal is routed outside the chassis through a rear-panel connector, to external audio processing equipment. The signal is brought back into the system via the same connector and routed to the mix bus and fader channels in the normal manner. In addition, all D/ESAM monitoring takes processing loops into account.

The following section provides Processing Loop installation instructions.

## Processing Loops Installation

Installation of one (1) Audio Processing Loop Module requires the use of one (1) unused audio input slot inside the D/ESAM chassis. A single Processing Loop Module provides four individual processing loop pathways — each containing an input and an output component. Installation of a *second* module (for an additional four available loops) requires a *second* unused input slot and so on — up to the limit of four Processing Loop Modules per system.

For *each* Processing Loop Module, the following three procedures are required:

- **Processing Loops Hardware Installation**
- **Maintenance Terminal Setup**
- **Audio Harness Connection**

If the **Processing Loops** option is already installed and all the setup procedures outlined above have been completed, please skip ahead to the “**Processing Loops Operation**” section.

The table below lists the parts included in the Processing Loop kit. Please contact GPS Customer Support if you did not receive all of the parts listed below:

*Processing Loop Kit Parts Lists*

Quantity	Assembly #	Description
1	04-0156-00	Processing Loop Module
1	n/a	Control Panel keycap ( <b>PROC LOOP</b> )
1		Interconnect Ribbon Cable
2		Audio Harnesses

The following tools are required for this installation procedure:

- Maintenance Terminal or PC with terminal emulation software

### NOTE

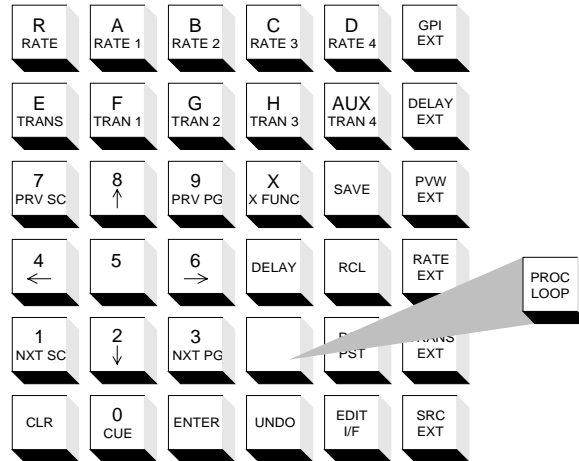
Observe the following important safety and handling precautions:

- Perform the hardware installation in a completely anti-static environment.
- Stand on an anti-static mat, not a carpet.
- Ground yourself to the chassis just before handling any internal mechanism.
- Hold boards from the edges; *do not touch the chips*.
- Make sure the system chassis is turned *OFF*. It is a good idea to disconnect the power cord before proceeding.

## Processing Loops Hardware Installation

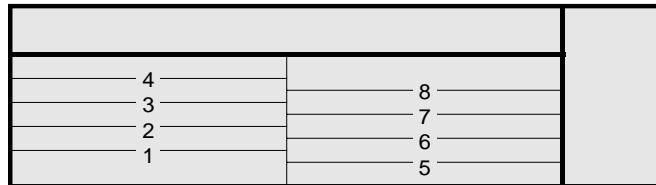
Use the following steps to install Processing Loop hardware:

1. Add one new keycap to the Control Panel, by replacing the *bottom* blank keycap with the **PROC LOOP** keycap. The figure below illustrates the keycap replacement location:



Keycap Replacement Location

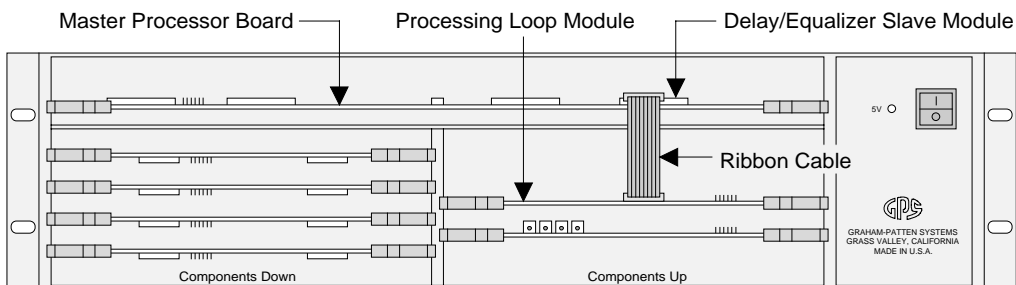
2. Ensure that the entire Digital Delay Option, including the new Delay/EQ Slave Modules, is properly installed.
3. Turn *OFF* the power supply in the D/ESAM electronics chassis.
4. Install the first **Processing Loop Module** into an unused input slot inside the chassis. Note the proper orientation of the board's components (up or down depending upon the slot's location). Also note the slot *number* for use in the subsequent "module definition" procedure. Slots are numbered as shown below:



Chassis Slot Numbering

5. On the Master Processor Board, locate the **Delay/EQ Slave Module** that's *closest* to the **Processing Loop Module** you installed in step 4.
6. Using the supplied ribbon cable, connect jack **J4** on the front of the **Delay/EQ Slave Module** to the jack on the front of the **Processing Loop Module**. Align the triangular **Pin 1** mark on each ribbon cable connector with the **Pin 1** mark near each jack.

The figure below illustrates one example of this connection:



*Processing Loop Module Installation*

7. For all additional modules that you wish to install, repeat steps 4 through 6.
8. When all modules have been installed, restore power to the D/ESAM 820 Chassis.

This completes the hardware installation for the Processing Loops option. Proceed with the “**Processing Loops Module Setup**” section.

## Processing Loops Module Setup

The Processing Loop Module(s) installed in the previous section provide the functionality for the processing loop option. In order for processing loops to work properly, you must *define* the new module type which now resides in the chassis slot. This procedure occurs on the **Module Operations Menu** (4), as shown below:

```

                                D / E S A M 8 2 0
                                Maintenance menu
                                Module Operations - 4

0      Return to main menu - 0
1      Define Module Type
2      List Module Type

```

*Module Operations Menu - 4*

Use the following steps to define the new processing loop modules:

1. If your Maintenance terminal or PC has not been connected, refer to the “**RS-232C Terminal**” section in Chapter 5 for information.
2. From the **Main Menu**, press **4** to access the **Module Operations Menu**.
3. Press **1** (Define Module Type) to set the configuration of the chassis audio modules. *All* module positions must be defined. The following display appears:

Define which module?

4. Enter the chassis slot number of the module to define. Refer to the previous “**Chassis Slot Numbering**” figure for details.
5. Press **SPACE BAR** to toggle through the list of module options:

```
No Module At All
Analog Input Module (40127/40142)
Analog Input Module - 18 bit (40160)
Analog Input Module - 20 bit (40160)
Digital Input Module (40141)
Digital Input Module (40148)
Digital Input Module w/Src (40164)
Digital Processing Loop Module (40156)
Analog Processing Loop Module (40158)
Output Module (40130)
```

6. When the following option appears,

```
Digital Processing Loop Module (40156)
```

press **RETURN** to select.

## NOTE

The Analog Processing Loop Module (40158) is not available at this time.

7. Once the module is defined, the following display appears:

```
Setting the loop numbers for this module.
SPACE to desired value. RETURN to select.
```

8. This function selects a unique set of proc loop numbers, for use during “loop” operations on the Control Panel. Press **SPACE BAR** to toggle through the list of options. The following options are available:

```
Loops 1-4
Loops 5-8
Loops 9-12
Loops 13-16
```

It is recommended that you select “**Loops 1-4**” for the first Proc Loop Module, “**Loops 5-8**” for the second module and so on.

9. When the desired option appears, press **RETURN** to select.
10. For each additional Proc Loop Module installed, repeat steps 4 - 9.
11. When all entries are complete, press **2** (List Module Type) to display a list of chassis audio module configurations. Note the column for “**Loops.**” Following is a sample display:

Module Number	Inputs	Type
1	1 thru 8	Digital Input Module (40141)
2	9 thru 16	Digital Input Module (40141)
3	17 thru 24	Digital Input Module (40141)
4	25 thru 32	Analog Input Module - 20 bit (40160)
5	33 thru 40	Analog Input Module - 20 bit (40160)
6	41 thru 48	No Module At All
7	Loops 1 thru 4	Digital Processing Loops Module (40156) Disabled
8	Outputs	Output Module (40130)

12. Press **ESCAPE** to return to menu 4.
13. Press **0** to return to the Main Menu (0).
14. To activate *all* changes, press the **RESET** button on the Main Chassis. Note that “loop” selections can also be verified on Status Screen 3.
15. After resetting the system, verify that the module listing menu (4.2) shows the connection between the **Processing Loop Module** and the chosen **Slave Module**. For example, the line for module 7 displays a proper connection:

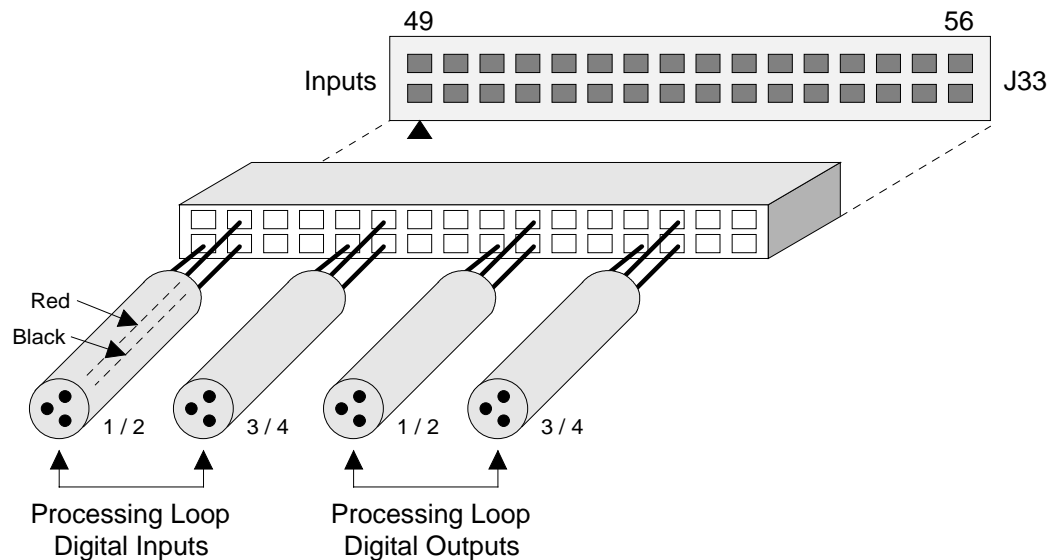
Module Number	Inputs	Type
1	1 thru 8	Digital Input Module (40141)
2	9 thru 16	Digital Input Module (40141)
3	17 thru 24	Digital Input Module (40141)
4	25 thru 32	Analog Input Module - 20 bit (40160)
5	33 thru 40	Analog Input Module - 20 bit (40160)
6	41 thru 48	No Module At All
7	Loops 1 thru 4	Digital Processing Loops Module (40156) Slave 4
8	Outputs	Output Module (40130)

Continue with the **Audio Harness Installation**.

## Audio Harness Installation

For each Proc Loop Module installed, a set of corresponding digital audio input/output harnesses must be installed on the chassis. This connection provides the physical input/output pathway for the proc loop audio. For each processing loop module, the function of its corresponding input connector changes — from an input *only* connector, to a dual-function (input/output) processing loop connector.

The figure below provides an *example* of the harness installation, using **J33** (for a processing loop module installed in chassis slot 7). Note that the connector’s built-in strain relief bracket is not shown in the illustration.



*Processing Loops Audio Harness Installation*

Use the following steps to install audio harnesses for each Processing Loop Module:

1. Note the chassis slot number of the module for which you want to install the harness. Refer to the “**Chassis Slot Numbering**” figure at the beginning of this section for details.
2. Using the data provided in the table below, note the rear connector that must be used for each corresponding chassis slot.

*Module Slot/Chassis Connector Cross Reference*

<b>Module Slot</b>	<b>Rear Chassis Connector</b>	<b>Connector Input Designation</b>
1	J52	Inputs 1-8
2	J42	Inputs 9-16
3	J32	Inputs 17-24
4	J22	Inputs 25-32
5	J53	Inputs 33-40
6	J43	Inputs 41-48
7	J33	Inputs 49-56

3. Connect the processing loop input and output connectors as shown in the figure on the previous page. Note the following important points regarding harness connection:
  - The first four connections (on the left in the figure) are inputs. The second four connections (on the right) are outputs.
  - All digital AES connections are made to the odd numbered chassis inputs. Even numbered connections are not used since each digital AES signal contains two discrete channels.
  - Ensure that the white arrows on the cable connectors align with the white arrows on the D/ESAM chassis.
  - The input indicated by the arrow is the *lowest* numbered input of a group, e.g., input **1** in group **1-8**, input **33** in group **33-40**, etc.
4. Connect digital input and output sources as required. Wiring for AES (digital) signals may require special consideration. The standard AES signal is a non-polarized balanced signal designed for cable runs of up to 100' (and over) using standard two-conductor shielded cable (i.e., Belden 9180 digital video timecode cable).

Use the following table for connecting digital processing loop inputs and outputs to (and from) D/ESAM:

*Digital Processing Loop Connections*

<b>D/ESAM</b>	<b>Source</b>
+ (Red)	+ or –
– (Black)	+ or –
C (Chassis)	GND

This completes the audio harness installation. Refer to the “**Processing Loops Operation**” section for operating instructions.

## Processing Loops Operation

This section provides detailed instructions for using the Processing Loops option. The following topics are discussed:

- **Processing Loops Operation**
- **Processing Loops Status**

During mixer operations, Processing Loops can be used independently, in conjunction with delay or in conjunction with any other D/ESAM feature without restriction. Note that processing loop settings can be viewed on the Status Screens.

### NOTE

If the Processing Loops option is not yet installed, refer to the “**Processing Loops Installation**” section for instructions.

Use the following steps to engage processing loops. The process is *very similar* to standard **Channel Assignment**.

1. Verify the number of processing loops that you have available and the unique set of numbers to which they were assigned during Maintenance Terminal setup. As shown below, this data can be reviewed on Status Screen 3, “**Maintenance / Setup (Page 1)**” in the I/O Module section:

Screen 3...Maintenance/Setup Display								
----- I/O MODULE CONFIGURATION -----								
MODULE	1	2	3	4	5	6	7	8
INPUTS	1-8	9-16	17-34		33-40	41-48	LOOPS	O/P
INPUTS							1-4	
TYPE(bits)	D(20)	D(20)	D(20)		A(20)	A(20)	D(24)	D(24)

Screen 3 - Maintenance / Setup (Page 1), I/O Module Section

As shown above (for module 7), four loops are available with number assignments 1 - 4. These are valid entries during the “loops” dialogue.

2. On the Control Panel, press **PROC LOOP**. The button lights to confirm the mode and the display shows the following prompt:

Sel Chan to Proc

3. In the **Select Row**, press the **SELECT** buttons for the channel(s) that you wish to assign to a processing loop. For example, if machine A appears on fader channels 1 through 4 and you want to assign channels 3 and 4 to processing loops, press **3** and **4**.

When **SELECT** buttons are pressed, the display prompts:

Proc Loop ##

4. On the KEYPAD, select the *starting* processing loop number (i.e., press **1**). The display confirms your entry.
5. Press **ENTER** to confirm. When pressed, the **Fx** LED turns *ON* for the selected channels. *Audio* for the channels is now routed through the loops, allowing you to patch in external processing devices as required.
6. Repeat steps 2 through 5 to assign processing loops to other channels as required.

Processing Loops values can be checked or “verified” in the following ways:

- All processing loop assignments (for machines on the panel) can be viewed on Status Screen 0 (Main Menu), using the Efx Menu toggle.
- Press and hold the **PROC LOOP** button to view processing loop assignments in the display. Release the button to return to the default “rate” display.

Remember the following important points regarding processing loops:

- All standard rules for data entry apply.
- To clear an individual processing loop channel, press **PROC LOOP**, select the channel, press **CLEAR** and **ENTER**.
- To clear all processing loop channels on the board, press **PROC LOOP** then **CLEAR**. This procedure can be “undone” with **UNDO**.
- You can assign just *one* processing loop or a *group* of processing loops, up to the limit of your system (as determined by the number of processing loop modules installed).
- Assigning processing loops *overwrites* those currently on the board and can be used to *move* processing loop assignments from one machine to another.
- If you assign an invalid processing loop, an error message is displayed.
- Processing Loop assignments are stored in D/MEM registers.
- The **FX OFF** button enables and disables processing loop assignments, along with equalization and delay, in the normal manner.
- The **PROC LOOP** button will *not* light if the option is not installed.

