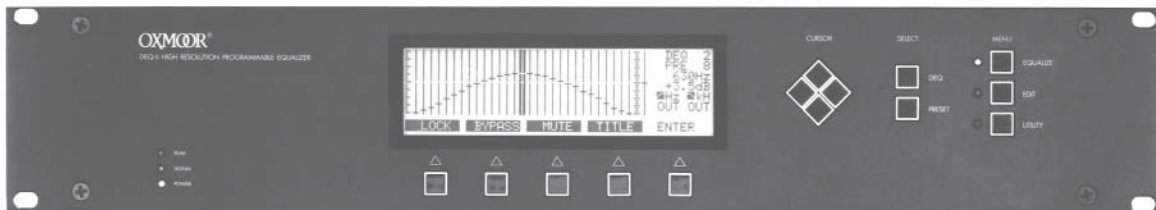


OXMOOR®

C O R P O R A T I O N

A Limited Liability Company

DEQ-I™ & DEQ-II™ HIGH-RESOLUTION PROGRAMMABLE EQUALIZERS



Installation & Operation Manual

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DEQ-I & DEQ-II INTRODUCTION

There are two versions of the DEQ equalizer.

The DEQ-II is a two rack-space device. Its sophisticated control panel includes a number of buttons for parameter entry and a large LCD display that provides setting and status information. The single-channel, 29-band DEQ-II offers 1/3-octave filters and second-order high-pass and low-pass filters, selectable on 1/6-octave frequency spacings. Filter settings are stored in any of eight nonvolatile, programmable memories called PRESETS. The contents of a PRESET can be modified by either the DEQ-II's own control panel, or by a remote controlling device, such as

an IBM compatible, Macintosh, or another DEQ-II. Once a PRESET has been set, it can be locked to prevent tampering.

Like the DEQ-II, the DEQ-I is a single-channel, 29-band, 1/3-octave graphic EQ with 2nd-order high-pass and low-pass filters. Filter settings are stored in 8 programmable PRESETS. The DEQ-I is a one rack-space device without a control panel. Programming is accomplished either through the DEQ-I's COMMUNICATIONS PORT (using a PC, a DEQ-II or some other PA-422 control device) or through the DEQ-I's internal controls.

DEQ-I & DEQ-II QUICK REFERENCE

TERMS USED

PRESET: One of the 8 groups of settings that completely configure the equalizer and defines how it will process audio.

PRESET PORT: A 15-pin D-sub connector on the back panel through which Presets may be selected.

COMMUNICATIONS PORT: The 9-pin D-sub (INPUT-male), (OUTPUT-female) PA-422 connectors on the back panel that are used for serial communication with other equalizers, a PC or another PA-422 control device.

HARDKEYS: Those buttons on the front panel of the DEQ-II whose functions are constant. Hardkeys have labels screened on the front panel.

SOFTKEYS: The buttons on the front panel of the DEQ-II whose functions change depending on the menu.

STATUS AREA: The portion of the LCD display dedicated to displaying the present state of equalizer function.

CURVE AREA: The portion of the LCD display dedicated to displaying the "Active Preset" curve.

SOFTKEY/MESSAGE AREA: The portion of the LCD display dedicated to displaying the Softkey labels and messages. This area also displays DEQ TITLE and PRESET name information.

EQUALIZATION CURVE (or simply, CURVE): A term describing the collection of filter settings (bandpass, high-pass, and low-pass) that completely define how the equalizer will process audio. (*See PRESET at left.*)

ACTIVE PRESET: The Preset that currently has control of the audio.

ACTIVE FILTER BAND: The filter band which is currently addressed by the cursor and for which the slider may be adjusted.

LOGGING ON: Term which describes the act of gaining control of a DEQ-II through its front panel; accomplished by selecting a Main Menu key and (possibly) giving a Password.

LAST EQUALIZER RECALL: Function similar to "last channel recall" of a television remote control; switches between last two active equalizers.

ADDRESS SELECTOR: An 8-position dip-switch which sets the PA-422 address of the equalizer. *Note: This address must be unique for each equalizer in the system.*

BAND CURSOR: A solid "bar" that overlaps the slider "slot" of the "Active Filter Band;" denotes the Active Filter Band.

The logo for OXMOOR, featuring the brand name in a bold, serif, all-caps font. The letters are closely spaced, and there is a registered trademark symbol (®) at the end of the word.

DEQ-I QUICK REFERENCE

DEQ-I DESCRIPTION

(Callouts refer to Figures 1.0 and 1.1)

1. **POWER on LED** is illuminated when the unit is on.
2. **SIGNAL-presence LED** is illuminated when a signal above -40 dBu is present at the unit's output.
3. **PEAK LED** is illuminated when an output level of 17 dBu is reached.
4. **LED DISPLAY** - A seven-segment LED Display that displays the active Preset number.
5. **INPUT CONNECTOR** - XLR input, Pin 2 positive, accepts balanced or unbalanced signals from line-level audio devices.
6. **OUTPUT CONNECTOR** - XLR output, pin 2 positive, accommodates balanced or unbalanced lines.
7. **PRESET SELECT** - Female, 15-pin D-sub connector. Provides for connection of external switches for remote Preset selection. Momentary contact closures required.
8. **PA-422 OUT** - Female, 9-pin D-sub connector. It is

used to carry the PA-422 data to the next equalizer's PA-422 IN or to another PA-422 device.

9. **PA-422 IN** - Male, 9-pin D-sub connector. This port is connected to the PA-422 OUT of another equalizer, a Personal Computer, or a controller with PA-422 output.

10. **PA-422 ADDRESS** - A selector switch that is used to assign an address to the equalizer when connecting two or more equalizers together to form a network.

11. **FUSE HOLDER** - Replace only with approved type of fuse in a rating appropriate to the mains voltage, as indicated on back panel. (See *SPECIFICATIONS*).

12. **POWER CONNECTOR** - Standard IEC 3-pin connector for AC power cord. Use only with grounded (3-wire) outlets. Cord sets are available for all world connection standards.

13. **CHASSIS GROUND** - A screw with a star washer enables the installer to secure a ground wire to the chassis.

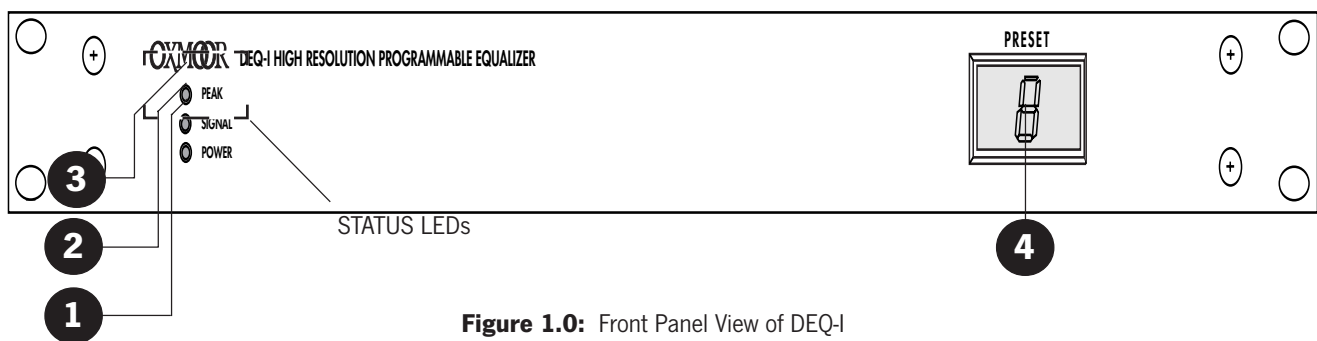


Figure 1.0: Front Panel View of DEQ-I

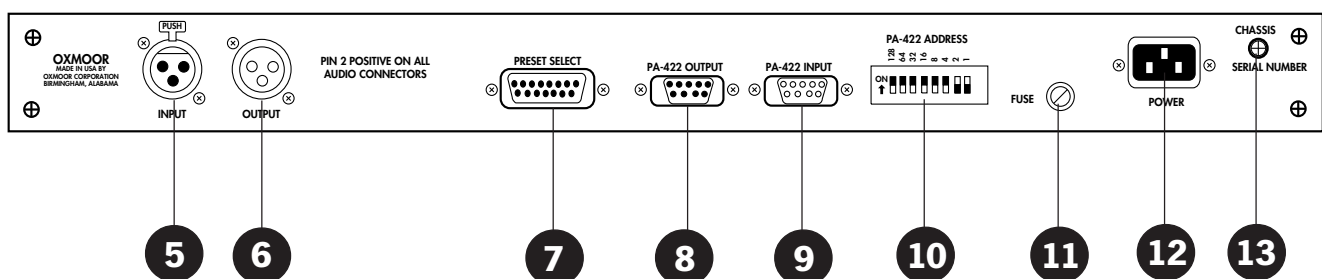


Figure 1.1: Rear Panel View of DEQ-I

DEQ-II QUICK REFERENCE

DEQ-II DESCRIPTION

(Callouts refer to Figures 1.2 and 1.3)

SIGNAL STATUS LEDs:

1. **POWER on LED** is illuminated when the unit is on.
2. **SIGNAL-PRESENCE LED** is illuminated when a signal above -40 dBu is present at the unit's output.
3. **PEAK LED** is illuminated when an output level of 17 dBu is reached.

LCD DISPLAY - A large backlit display that gives a graphic representation of the active curve and immediate information on the status of the equalizer. The LCD display also defines the functions that the Softkeys perform.

CURSOR KEYS - Buttons which are used for selecting and adjusting values and editing text.

SELECT BUTTONS:

4. **DEQ** - Accesses the DEQ select menu. In this mode, select the desired equalizer using the Cursor keys.
5. **PRESET** - Accesses the Preset mode. In this mode you can select the desired Preset by using the Cursor keys. Use the UP and DOWN Cursor keys to select one of eight Presets.

HARDKEYS - These buttons perform dedicated functions as labeled on the front panel.

MENU Buttons - There are three menus which control all functions. Selection of each is confirmed by the illumination of an adjacent LED.

6. **EQUALIZE** - This menu allows:
 - Logging on to the equalizer
 - Adjusting filter settings
 - Adjusting High- and Low-pass Filters
 - Adjusting equalizer gain

7. **EDIT** - This menu allows:
 - Logging on to the equalizer
 - Copying and Pasting of equalization curves
 - Clearing equalization curves stored in Presets
 - Naming the Presets
 - Locking and Unlocking Presets
 - Bypassing and inserting the Equalizer
 - Setting Preset Titles
8. **UTILITY** - This menu allows:
 - Logging on to the equalizer
 - Logging Off (terminating an equalization session)
 - Setting Passwords
 - Adjusting the contrast of the display
 - Turning off the display light
 - Naming the equalizer

SOFTKEYS - These buttons are used to select an action available when you are in EQUALIZE, EDIT, or UTILITY mode. The function each Softkey performs may change depending on which menu has been accessed.

BACK PANEL FEATURES:

9. **INPUT CONNECTOR** - Female, XLR connector, pin 2 positive, accepts balanced or unbalanced signals from line-level devices.
10. **OUTPUT CONNECTOR** - Male, XLR connector, pin 2 positive, accommodates balanced or unbalanced lines.
11. **PRESET SELECT** - Female, 15-pin D-sub connector. Provides for connection of external switches for remote Preset selection. Momentary contact closures required.
12. **PA-422 OUT** - Female, 9-pin D-sub connector. It is used to carry the PA-422 data to the next equalizer's PA-422 IN or to another PA-422 device.
13. **PA-422 IN** - Male, 9-pin D-sub connector. This port is connected to the PA-422 OUT of another equalizer, a Personal Computer, or a controller with PA-422 output.

DEQ-II QUICK REFERENCE (CONTINUED)

14. PA-422 ADDRESS - A selector switch that is used to assign an address to the equalizer when connecting two or more equalizers together to form a network.

15. FUSE HOLDER - Replace only with approved type of fuse in a rating appropriate to the mains voltage, as indicated on back panel. (See *SPECIFICATIONS*).

16. POWER CONNECTOR - Standard IEC 3-pin connector for AC power cord. Use only with grounded (3-wire) outlets. Cord sets are available for all world connection standards.

17. CHASSIS GROUND POST - A screw with a star washer enables the installer to secure a ground wire to the chassis.

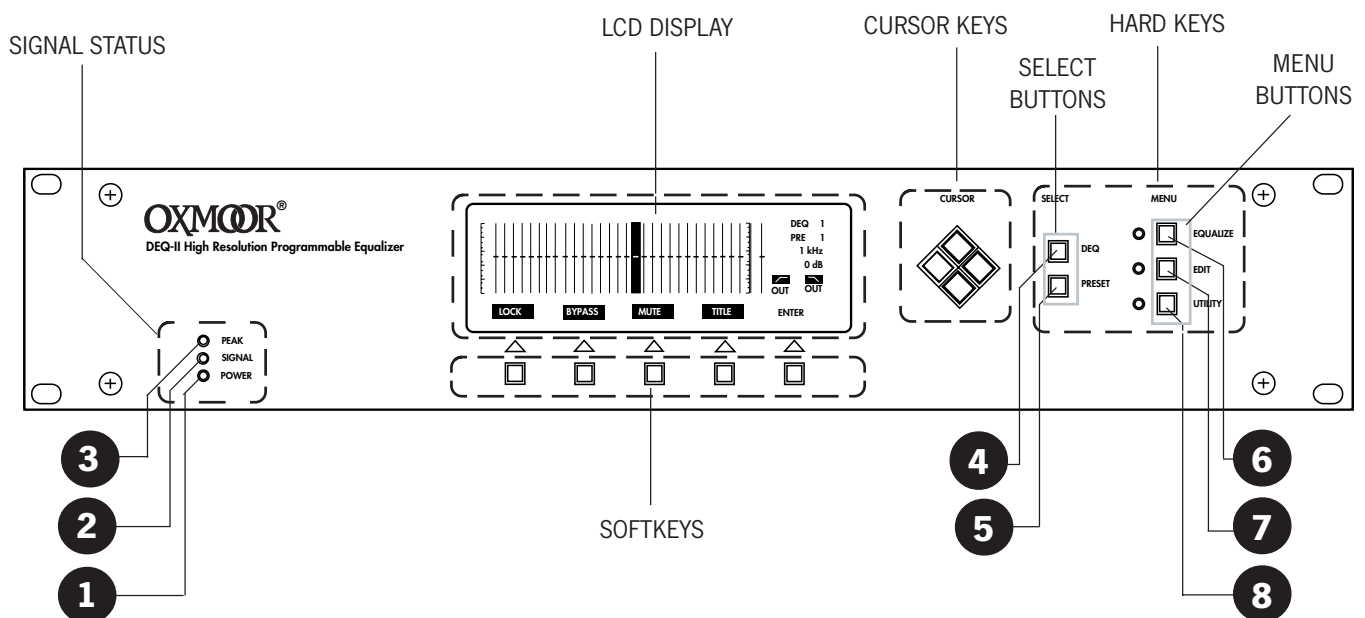


Figure 1.2: Front Panel View of DEQ-II

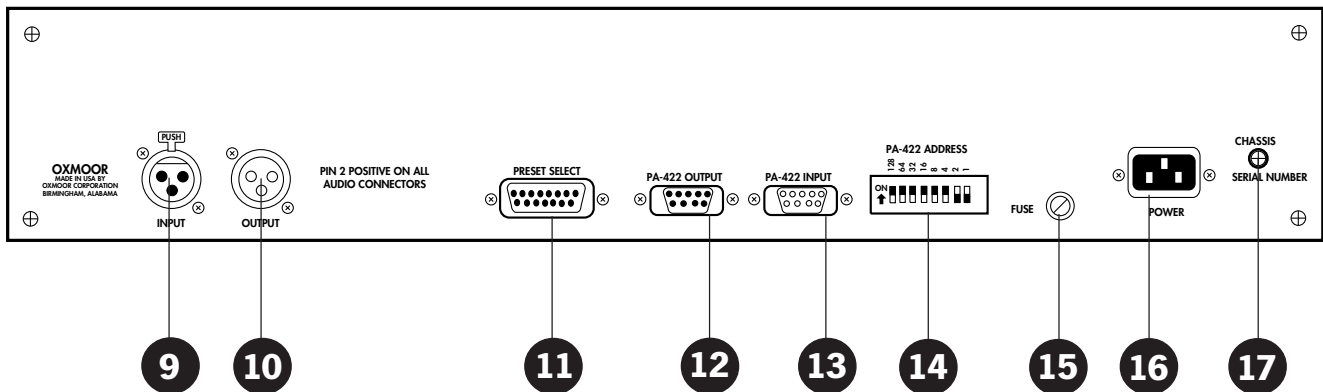


Figure 1.3: Rear Panel View of DEQ-II

DEQ-II QUICK REFERENCE (CONTINUED)

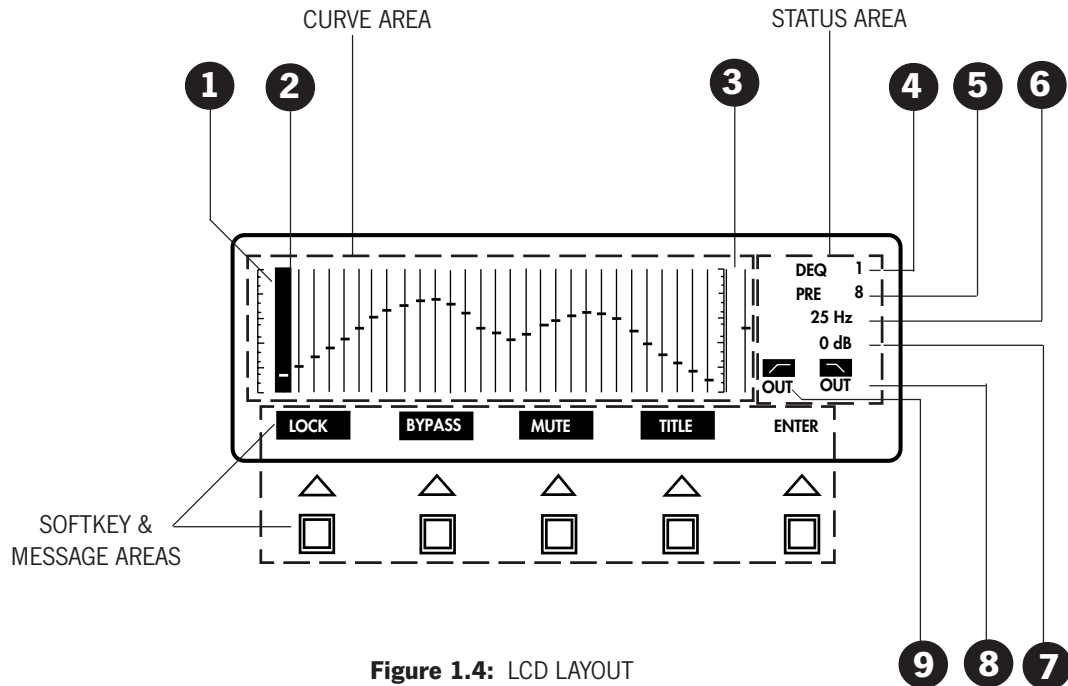


Figure 1.4: LCD LAYOUT

DEQ-II LCD DISPLAY LAYOUT

(Callouts refer to Figure 1.4)

The LCD display information is organized into three main sections, as shown in Figure 1.4. These sections are: The Softkey/Message Area, the Curve Area, and the Status Area.

SOFTKEY/MESSAGE AREA: This area is used to label the Softkeys (i.e., identify the Softkey functions) and to display messages, such as error announcements. The Softkey/Message Area is also used, depending on the action being performed, to display and allow editing of the Name, Title, or Passwords of the equalizer.

THE CURVE AREA: Gives a quick graphical view of the filter settings for the Active Preset. While the graduations allow an estimation of the actual setting for any given band, the Status Area will display the exact setting.

1. Each "slug" represents a Bandpass Filter setting. The Bandpass Filters may be adjusted in 1/2 dB steps over a ± 12 dB range.
2. This is the Band Cursor, a solid "bar" that overlaps the slider "slot" of the "Active Filter Band." It denotes the Active Filter Band.

3. This area represents the output gain slider. Adjustable in 1/2 dB steps over ± 12 dB range.

STATUS AREA: Provides information about the current operational state of the equalizer. In particular:

4. Displays the number (address) of the Active equalizer. This is the equalizer with which the controlling DEQ-II is currently communicating.
5. Displays the number of the active Preset.
6. Displays the center frequency of the Active Bandpass Filter.
7. Displays the setting of the Active Bandpass Filter, or Gain control.
8. Displays the setting of the Low-Pass Filter.
9. Displays the setting of the High-Pass filter.

NOTE: Back-light will time out; see page 18.

DEQ-II QUICK START TUTORIAL

CAUTION: If you set a Password, you must use it to address the DEQ. It is best not to set a Password until your equalization session is over.

This section allows a first-time user to quickly and efficiently begin using the basic (and more frequently used) functions of the equalizer. The procedure described below assumes that you have just one DEQ-II, and that it has not been programmed or modified since it left the factory. This ensures that none of the Presets have been Locked and no Passwords have been set. Locking Presets and setting Passwords are advanced topics that are covered in detail in later chapters.

TURNING ON THE EQUALIZER

Apply power to the unit. There is no on/off switch; simply plug the equalizer in. After a few seconds, the Oxmoor logo will be displayed. Several seconds later, the Oxmoor logo will be replaced by the **Active Preset** curve, which will have (if the equalizer has not already been adjusted) all sliders set to 0 dB. The DEQ address (shown in line 1 of the Status Area) should be 1, and the Preset number (shown in line 2 of the Status Area) should be 1. The bottom line of the display (i.e., the Softkey/Message Area) should be displaying: **PRESET:**

Since this preset currently has no Title, Figure 1.5 shows the LCD display as it should appear at this point. Note that none of the Main Menu LED indicators are lit. This is because you are not “logged on” to the unit.

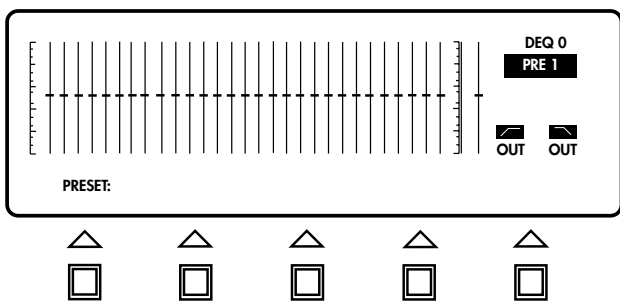


Figure 1.5: Start-Up Screen

LOGGING ON TO THE EQUALIZER

To log on to the equalizer, press any one of the three Main Menu buttons, (see Figure 1.6). Any one of the Main Menu buttons will log you on to the equalizer, but for this exercise, press the Equalize Menu button. If you inadvertently pushed the EDIT or UTILITY buttons, that's OK. Simply push the Equalize button.

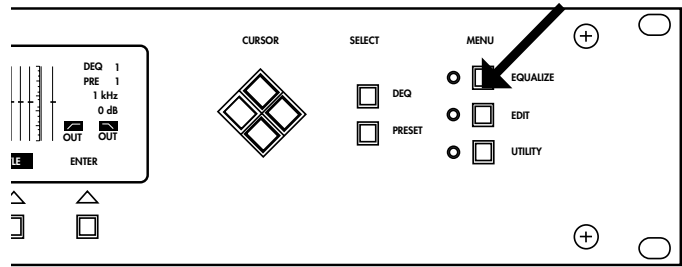


Figure 1.6: Main Menu Buttons

Figure 1.7 shows what the display should now look like. Notice that the Softkey/Message Area now displays a number of labels above the Softkey buttons. Each label defines the function that the Softkey performs. If a label is in reverse-video it indicates that the softkey under that label can be used at this time. Normal-video labels indicate functions that are currently unavailable (but may be available later in the session, depending on the action performed). At this point, the labels LOCK, BYPASS, MUTE, and TITLE are all in reverse-video and ENTER is in normal-video. Also, note that the 25 Hz bandpass filter slider is now in reverse-video and the Status Area has been updated to give the bandpass filter information. A

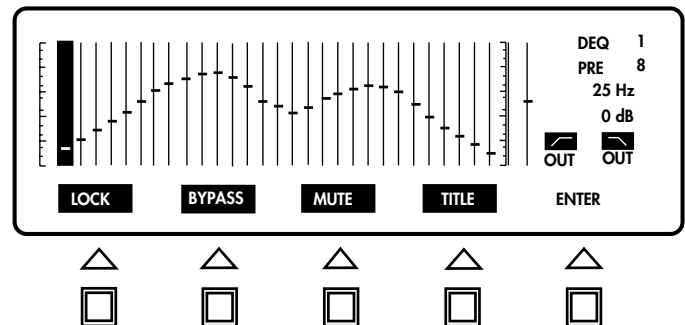


Figure 1.7: Equalize Menu Screen

slider in reverse-video, called the “Band Cursor”, indicates the **Active Filter Band**, that is, the band that can currently be adjusted. You are now logged on and may begin using the equalizer. *Note: The Preset Select connector on the rear of the DEQ is disabled when you are “logged on.”*

CHANGING MENUS

Before describing how to change the filter settings let's become a little more familiar with the menus. You should currently be in the EQUALIZE menu (the Equalize Menu LED indicator should be on). Now, change to the EDIT menu by pressing the EDIT menu key (see Figure 1.8). Notice that the Softkey/Message Area has been changed so that the menu options available in this menu are displayed.

(Continued on next page)

DEQ-II QUICK START TUTORIAL (CONTINUED)

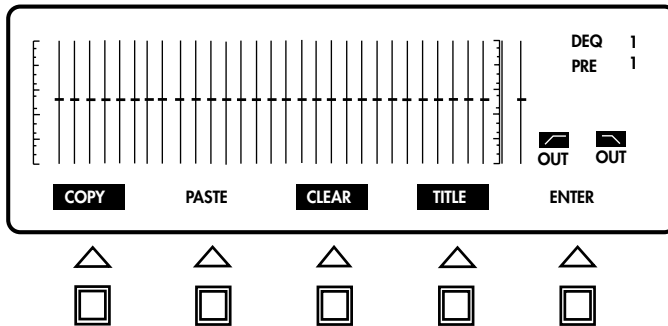


Figure 1.8: Edit Menu Screen

Also note that the LED indicator beside the Menu key you pushed is now lit, and the EQUALIZE Menu key indicator is no longer lit.

Finally, note that none of the filter sliders are now in reverse-video, and the sections of the Status Area which give frequency and setting information have been erased. This denotes that there is no Active Filter Band, hence, no band may be adjusted. Filter sliders (and high-pass and low-pass filters) may be adjusted only while in the EQUALIZE menu.

Now, change to the UTILITY menu by pressing the UTILITY menu key (see Figure 1.9). Notice that the only changes are that the appropriate Menu indicator is now lit and the Softkeys have been relabeled. Finally, go back to the EQUALIZE menu by pressing the EQUALIZE menu key. Once in EQUALIZE, you may begin adjusting the sliders.

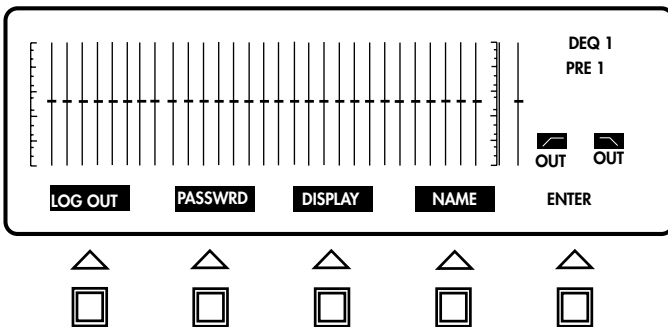


Figure 1.9: Utility Menu Screen

ADJUSTING THE SLIDERS

While in the EQUALIZE menu, it is possible to adjust the slider position. To adjust the active slider (the slider that is in reverse-video) push the UP or DOWN cursor key. Notice that each push of the button changes the level in 0.5 dB increments. If the button is held, it will begin to repeat just like a computer's keyboard.

Notice that the slug in the Active Filter Band has moved, and that the band information in the Status Area (Active

Filter Band frequency and slider position) has been updated to reflect this change. Continue pushing the UP and DOWN cursor keys to adjust the slider until you are comfortable with the action of the keys and the repeat rate. Notice that each time the UP or DOWN cursor key is pressed, the Status Area is updated. Now, let's change the slider settings in some other bands.

CHANGING THE ACTIVE FILTER BAND

To make another frequency band become the Active Filter Band, press the RIGHT cursor key. Observe that the Band Cursor has moved one position to the right, and that the Status Area has been updated. Push the RIGHT button several more times. Now push the LEFT cursor key and notice that the Band Cursor has moved back one position to the left. Each time the LEFT or RIGHT cursor key is pressed the Band Cursor moves and the Status Area is updated. Continue to use the LEFT and RIGHT cursor keys to change the Active Filter Band and make slider adjustments using the UP and DOWN keys until you feel familiar with the function. Now, move the Band Cursor until it rests on the 16 kHz frequency band. Push the RIGHT cursor key one time and notice that the Band Cursor has skipped over the right graduation and now rests on the GAIN band. The Gain slider may be adjusted exactly like the bandpass filter sliders. Now, press the LEFT cursor key once and notice that the Band Cursor again rests on the 16 kHz band. Finally, push the RIGHT cursor key one more time so that the Band Cursor again rests on the GAIN band. We may now learn how to adjust the high-pass and low-pass filters.

ADJUSTING HIGH-PASS & LOW-PASS FILTERS

The high- and low-pass filters are accessed just like the bandpass filter bands, by using the LEFT and RIGHT cursor keys to move the Band Cursor to the desired band. With the Band Cursor resting on the GAIN band, push the RIGHT cursor key one time. Notice that the line in the Status Area that displays the high-pass filter setting is now in reverse-video, which indicates that the high-pass filter is now the Active Filter Band and may be adjusted by using the UP and DOWN cursor keys. Use the Up and DOWN cursor keys to adjust the high-pass filter band. Now, push the RIGHT cursor key one time and observe that the Band Cursor now rests on the low-pass filter. Adjust the low-pass filter with the UP and DOWN cursor keys.

Push the RIGHT cursor key once and notice that the Band Cursor moves to the 25 Hz frequency band. The Band Cursor "scrolls" in this fashion in both directions. For instance, pushing the LEFT cursor key puts the Band Cursor back on the low-pass filter band.

DEQ-II QUICK START TUTORIAL (CONTINUED)

Continue practicing selecting and adjusting the filters until you are comfortable with the action of the cursor keys. If you are processing audio you will *hear* the effects of the changes as you make them.

CHANGING PRESETS

So far we have only been making adjustments to one Preset, in this case, Preset 1. This section will describe how to access the other Presets so that adjustments may be made to them.

You may change Presets from within any of the main menus. To do so, simply push the Preset Select button as shown in Figure 1.10.

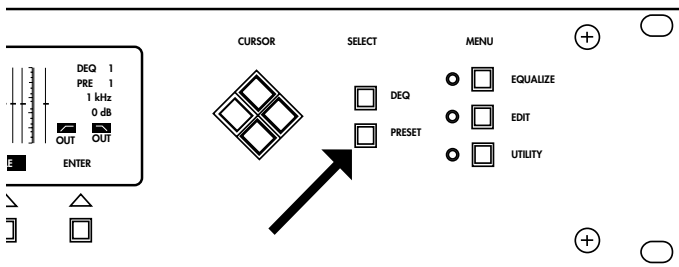


Figure 1.10: Preset Select

The LCD display should appear as shown in Figure 1.11 (if the DEQ is set to Preset 1). Note that the Softkey label for the Active Preset (Preset 1) is in normal-video while the other labels are in reverse-video. This serves as an indication of the Active Preset number (the same

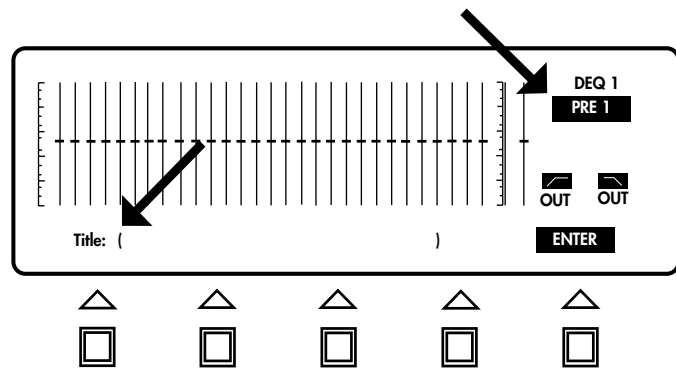


Figure 1.11: Presets 1 through 4

information is displayed in the Status Area). As usual, the Softkey labels indicate the action that will be performed if the corresponding Softkey is pressed. Press the Softkey labeled "PRE 2" now. Notice that the Active Preset is now Preset 2 as displayed in the status area (line 2). Also, notice that you have returned to the menu that you were in when you pushed the Preset Select button and that the Softkey have been given labels appropriate for that menu. Now, reenter Preset Select mode by pressing the Preset Select button. The screen should

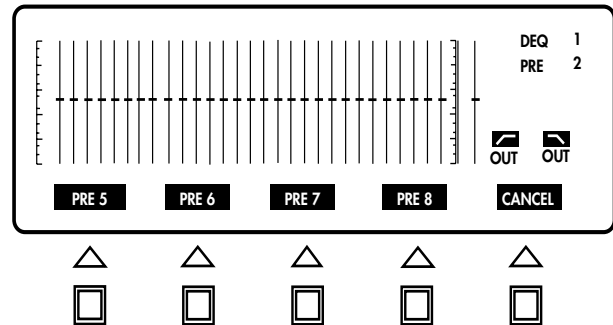


Figure 1.12: Presets 5 through 8

again appear as in Figure 1.11 except that the PRE 2 Softkey is now in normal-video indicating that Preset 2 is the Active Preset. Note that only Preset 1 through 4 are currently accessible. To access Preset 5 through 8 press the Softkey labeled MORE and note that the Softkeys have been relabeled as "PRE 5", "PRE 6", "PRE 7", "PRE 8", and "CANCEL", as shown in Figure 1.12.

If you decide not to change Presets simply push "CANCEL" and you will be returned to the menu you were in before you entered Preset Select mode.

To summarize the procedure for changing Preset:

1. Enter the Preset Select mode by pressing the Preset Select key.
2. Push the Softkey that is labeled with the number of the Preset to which you wish to change.
3. Push the Softkey labeled "MORE" to access Preset 5 through 8 and press "CANCEL" to exit Preset Select mode without changing Presets.

DEQ-II EQUALIZE MENU

TERMS USED

EQUALIZATION CURVE (or simply, CURVE):

A term describing the collection of filter settings (bandpass, high-pass, or low-pass) that completely define how the equalizer will process audio

REVERSE-VIDEO: Light characters on a dark background

NORMAL-VIDEO: Dark characters on a light background

SYSTEM PASSWORD: The password that permits the highest level of access

TITLE: The name of a Preset

EQUALIZE MENU SCREEN and EQUALIZE MENU SOFTKEY EXPLANATIONS

Described below are the functions of the Softkeys in the EQUALIZE menu. Step-by-step examples of how to use each function are included.

USING LOCK/UNLOCK

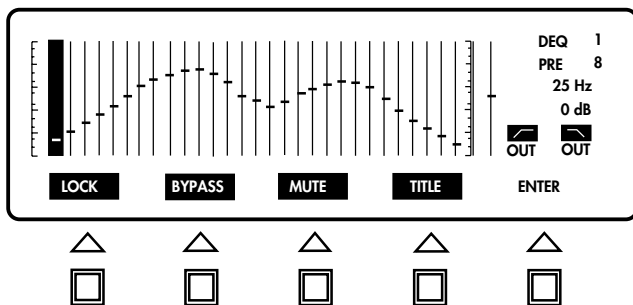


Figure 2.0: EQUALIZE Menu Screen

The LOCK/UNLOCK function allows a user with the System Password to prevent modification of selected Presets. Any number of Presets in any combination may be LOCKed, provided the user has entered the correct System Password (**If the equalizer does not have a password set, the LOCK/UNLOCK function is available to anyone**). To see how LOCK/UNLOCK is used, enter the EQUALIZE menu by pressing the EQUALIZE menu key. The Softkey labels should be LOCK, BYPASS, MUTE, TITLE, and ENTER. All but ENTER should be in reverse-video, indicating that they may be used at this time.

Now, press the LOCK Softkey. You should see that the function of the LOCK Softkey changes to UNLOCK, which means that UNLOCK is now the

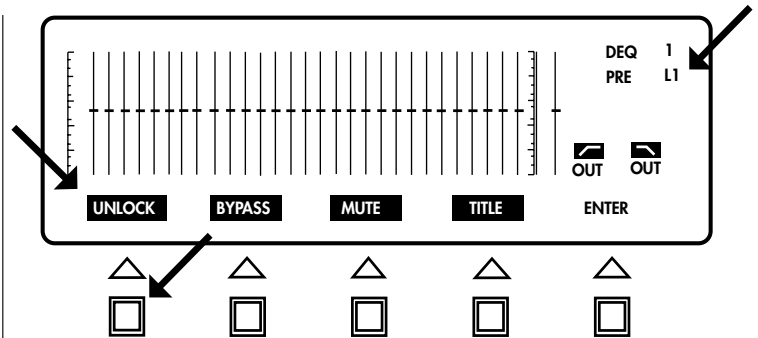


Figure 2.1: Preset Lock

action that Softkey performs (*see Figure 2.1*). Also notice that the Band Cursor has disappeared and the frequency and setting information has been erased from the Status Area to indicate that you may no longer alter this Preset. Finally, note that the letter “L” appears beside the Active Preset number in the Status Area. An “L” in this location indicates that the Preset is LOCKed and may not be modified without being UNLOCKed by someone with the proper password.

To UNLOCK a LOCKed Preset simply press the UNLOCK Softkey (provided the label for this Softkey is in reverse-video; i.e., the function is available). The Band Cursor and frequency and setting information should return and the “L” should disappear from the Status Area. Also, the function of the UNLOCK Softkey should now be LOCK. The Preset may again be modified as desired.

NOTE: If the system has been secured with passwords then you may not have access to the LOCK/UNLOCK function, depending on the level of the Password you entered when logging on (*see Chapter 5, System Security*). Only users with the System level password may lock or unlock Presets.

USING BYPASS/INSERT

It is often desirable to be able to quickly compare the sound of the system with and without equalization. That is, one would like to be able to, in effect, “remove” the equalizer from the system and “reinsert” it at the touch of a button. The BYPASS/INSERT Softkey provides this function. The BYPASS function temporarily sets all of the filters and the gain control to 0 dB (but doesn’t change the stored settings). Setting the filters to 0 dB effectively removes the equalizer from the system since no filtering is being performed. The INSERT function restores the filters to their stored settings.

DEQ-II EQUALIZE MENU (CONTINUED)

To “remove” the equalizer from the system, access the EQUALIZE menu by pressing the EQUALIZE menu key. The Softkeys should be labeled **LOCK** (or **UNLOCK**), **BYPASS**, **MUTE**, **TITLE**, and **ENTER** (labels written in boldface are in reverse-video). If **BYPASS** is not in reverse-video then the equalizer has been muted and should be un-muted before proceeding.

NOTE: EQUALIZE BYPASS/INSERT do not work when the equalizer is muted. (See below: Using MUTE/UNMUTE.)

Next, press the Softkey labeled **BYPASS**. Notice that the label of the Softkey has changed to **INSERT**, which denotes the function the Softkey now performs. Notice

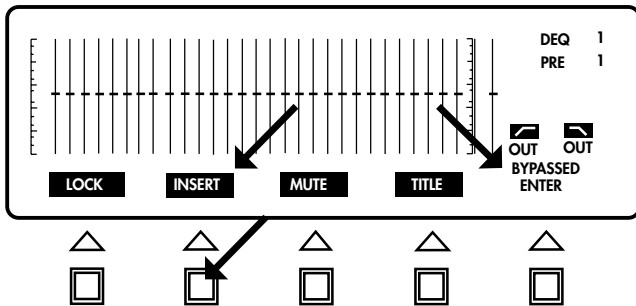


Figure 2.2: Bypassed

also that the Band Cursor and the Status information pertaining to the Active Filter Band (if there was one) have been blanked. This is because no filter adjustments may be made while the EQUALIZE is BYPASSED. Finally, the Status Area has been updated to reflect that the equalizer is in EQUALIZE BYPASS mode by displaying the message “BYPASSED” on line 7 of the Status Area (see Figure 2.2).

To “reinsert” the equalizer, access the EQUALIZE menu and press the Softkey labeled **INSERT**. Doing this changes the function of the Softkey back to **BYPASS**, restores the Band Cursor (if there was an Active Filter Band), and removes the “BYPASSED” annunciation from the Status Area. The filters may now be adjusted again.

USING MUTE/UNMUTE

Many times it may be desirable to mute the equalizer, that is, prevent it from passing audio. This is particularly useful when changing presets since you may not know the level on the new preset until changing to it. This section describes how to mute and unmute the equalizer.

To mute the equalizer, access the EQUALIZE menu by pressing the EQUALIZE menu key. The Softkey labels should be **LOCK** (or **UNLOCK**), **BYPASS** (or **INSERT**), **MUTE**, **TITLE**, and **ENTER**. Press the Softkey labeled **MUTE**. You should notice several changes in the display:

1. The **MUTE** Softkey has been relabeled **UNMUTE** to denote the new function that the Softkey performs.
2. The Status Area has been updated to show that the equalizer is mute (“**MUTE**” is displayed on line 7 of the Status Area).
3. The **BYPASS/INSERT** Softkey has been placed in normal video to indicate that it cannot be used while the equalizer is muted (see Figure 2.3).

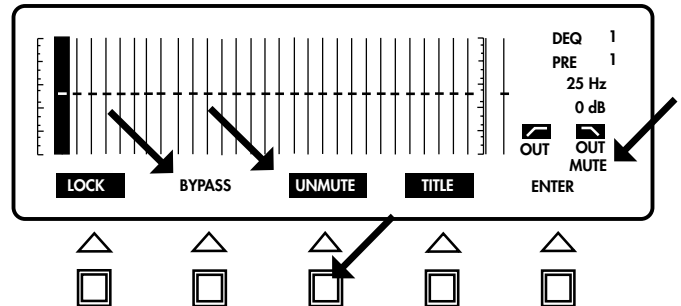


Figure 2.3: Mute

The equalizer is now muted.

To unmute the equalizer press the Softkey labeled **UNMUTE**. Several things should happen:

1. The **UNMUTE** Softkey has been relabeled **MUTE** to denote the new function that the Softkey performs.
2. The “**MUTE**” annunciation has been removed from the Status Area.
3. The EQ **BYPASS/INSERT** Softkey has been placed in reverse-video to indicate that the Softkey can be used.

Of course, were the equalizer processing audio you would also hear the effect of the **MUTE/UNMUTE** function.

DEQ-II EQUALIZE MENU (CONTINUED)

USING TITLE

Another capability afforded by the DEQ-II is the ability to name the Presets, that is, to give them Titles. While completely optional (Presets do not have to be Titled), this feature can be a great help in identifying a given curve. You might, for instance, want to give a Preset a Title based on the time and date that the curve was created, or one based on the source material for which the equalization was done (e.g., speech or music). Preset Titles may be up to 16 characters long. The procedure described below details how to go about setting and editing Preset Titles.

To Set A Preset Title:

1. From within the EQUALIZE menu, press the softkey labeled TITLE. You will note that the Softkey/Message Area has been replaced with the legend "PRESET:." If the Preset has not yet been given a Title then there will be no characters after the colon. You will also notice at the right end of the Softkey/Message Area that there are two Softkey labels: CANCEL and ENTER. And again, the Band Cursor and band status information have been blanked to

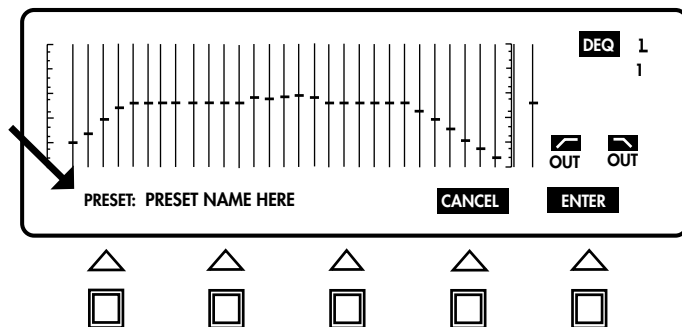


Figure 2.4: Preset

indicate that slider settings may not be adjusted. Finally, in the position immediately to the right of the colon there is a flashing cursor.

2. Titles are entered by using the UP and DOWN cursor keys to cycle through the character set and the LEFT and RIGHT cursor keys to position the cursor (see Figure 2.5). The cursor

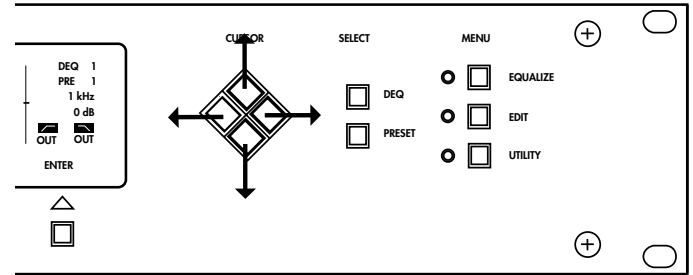


Figure 2.5: Cursor Keys

indicates which position in the Title will be changed by the UP and DOWN keys. To practice entering a Title, use the UP and DOWN keys to find your first initial (see the Character Set Chart on page 25, Appendix C, if you have any trouble finding it). Once you have found it, use the RIGHT key to move one position to the right. Note that the character you have already chosen remains in the first position. Now, use UP and DOWN to set a character for the second position. Continue using the cursor keys to move the cursor and select characters until you are comfortable with these functions. Notice that when you cycle beyond either end of the character set, the character selection scrolls to the opposite end of the character set. Also, when you attempt to move the cursor beyond the ends of the 16-character field the cursor scrolls to the opposite end of the field. Note that you erase a character by selecting the "space" character.

3. When you have entered the desired Title you can store it by pressing the ENTER Softkey. Doing so simultaneously stores the PRESET Title in nonvolatile memory (as part of the Preset) and returns you to the equalize menu. If you decide not to store the PRESET Title, simply press the CANCEL Softkey which will return you to the EQUALIZE menu without saving the Title.

The same Title may be used for more than one preset, so be careful. Existing PRESET Titles are edited in exactly the same way as new PRESET Titles are entered.

DEQ-II EDIT MENU

This chapter details the many advanced editing features of the DEQ-II.

TERMS USED

EQUALIZATION CURVE (or simply, CURVE): A term describing the collection of filter settings (bandpass, high-pass and low-pass) that completely define how the equalizer will process audio.

SOFTKEY/MESSAGE AREA: The portion of the LCD display dedicated to displaying the Softkey labels and messages.

ACTIVE FILTER BAND: The filter which may currently be adjusted.

BAND CURSOR: A solid “bar” that overlaps the slider “slot” of the Active Filter Band; denotes the Active Filter Band.

NORMAL-VIDEO: Dark characters on a light background.

REVERSE-VIDEO: Light characters on a dark background.

PRESET: A group of settings that completely configure the equalizer.

TITLE: A 16-character (or fewer) description for the name of a Preset.

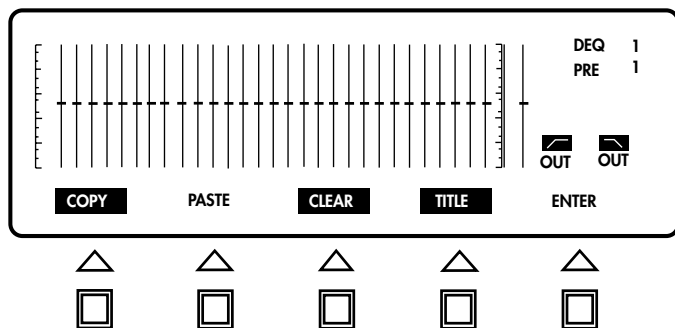


Figure 3.0: EDIT MENU SCREEN

EDIT MENU SCREEN and EDIT MENU SOFTKEY EXPLANATIONS

Described in this section are the features and functions of the EDIT menu Softkeys. Step-by-step examples aid the user in gaining rapid proficiency in using these functions.

USING COPY AND PASTE

Frequently it is desirable to make small enhancements to an equalization for comparison purposes without

changing the stored curve. You might, for example, have an equalization curve with which you are basically happy but want to experiment, without destroying the curve you like. One way to accomplish this is by selecting a different Preset and manually adjusting the faders until they are set exactly as in the curve you like. A much better way, however, is by utilizing the COPY (and PASTE) commands of the EDIT menu. Those familiar with computers may recognize these commands as being very similar to the editing functions provided by most word processor programs. COPY and PASTE may be used together to copy the curve settings from one Preset to any other Preset, or even to a Preset in a different DEQ. The following procedure describes the steps involved in copying and pasting Presets.

Step One: Access the EDIT menu by pressing the EDIT menu key. The Softkey/Message Area should now be labeled COPY, PASTE, CLEAR, TITLE, and ENTER (see Figure 3.0). Note that if the active Preset is locked you will not have access to the CLEAR function (CLEAR will be in normal-video). Note also that the Band Cursor and band status information have been blanked from the display to indicate that the faders may not be adjusted. Faders may only be adjusted while in the EQ Menu.

Step Two: Press the Softkey labeled COPY. The COPY Softkey will flash briefly and then the PASTE Softkey will be placed in reverse-video (unless the active Preset is locked: *see page 9, Using Lock/Unlock*). The flashing COPY Softkey denotes that the curve has been correctly copied into the copy buffer, and the reverse-video PASTE Softkey indicates that the copied curve may now be pasted. If the Preset is locked then the PASTE Softkey will remain in normal-video until you change to a preset which is not locked. You will need to select an unlocked Preset (or unlock the current Preset) before the PASTE Softkey is placed in reverse-video and the curve may be pasted. If you cannot remember how to change Presets, see the Quick Reference portion of this manual.

Step Three: Once you have selected the Preset to which you wish to copy the curve, press the Softkey labeled PASTE. The Softkey/Message Area should now display the query “Overwrite Preset?” and the Softkey labels CANCEL and PASTE (*see Figure 3.1*). If you decide you do not want to paste the copied curve over this Preset simply hit CANCEL and you will be returned to the EDIT menu without having pasted the curve. The curve you “copied” will still be held in the copy buffer until you copy another curve or power down the equalizer. To complete the paste operation press the PASTE Softkey. The PASTE Softkey will flash briefly to

DEQ-II EDIT MENU (CONTINUED)

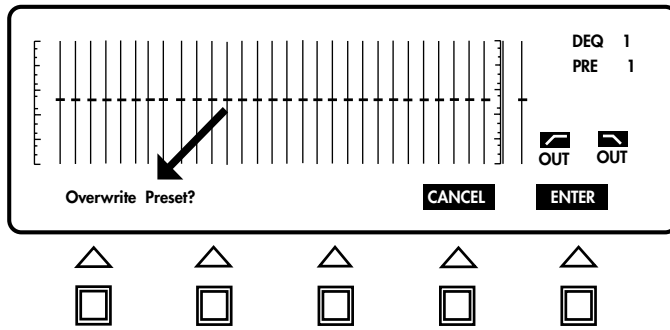


Figure 3.1: PASTE Screen

indicate that a paste is in progress. Then the copied curve is pasted into the new Preset. Finally, you are returned to the EDIT menu. Go back to the Preset that you copied the curve from and verify that the curves are identical.

Note that while modifications to locked Presets are not allowed, the curves stored in locked Presets may be freely copied to other (unlocked) Presets and adjusted in the new Preset as desired. Also, remember that you may change Presets or DEQs from within any of the main menus (EQUALIZE, EDIT, and UTILITY).

USING CLEAR

Another desirable feature is the ability to erase the settings of a given Preset to restore the Preset to its default settings. The CLEAR function provides this facility.

To clear a Preset:

Step One: Access the EDIT menu by pressing the EDIT menu key. The Softkey/Message Area should now be labeled COPY, PASTE, CLEAR, TITLE, and ENTER. **Note that if the active Preset is locked you will not have access to the CLEAR function (CLEAR will be in normal-video).** Note also that the Band Cursor and band status information have been removed from the display as an indication that the faders may not be adjusted (faders may only be adjusted while in the EQ menu). If CLEAR is not shown in reverse-video you will need to unlock the Preset before you may clear it.

Step Two: Once the CLEAR Softkey is labeled in reverse-video it may be used. Press the CLEAR Softkey. You should see the query "Clear Preset?" and the Softkey labels CANCEL and CLEAR (see Figure 3.2). To abort the clear process simply press the CANCEL Softkey and you will be returned to the EDIT menu without clearing the Preset. To complete the CLEAR process press the CLEAR Softkey. You will notice that the curve has been restored to its default settings and that you have returned to the EDIT menu. Be careful, once a preset has been "Cleared" all settings are lost.

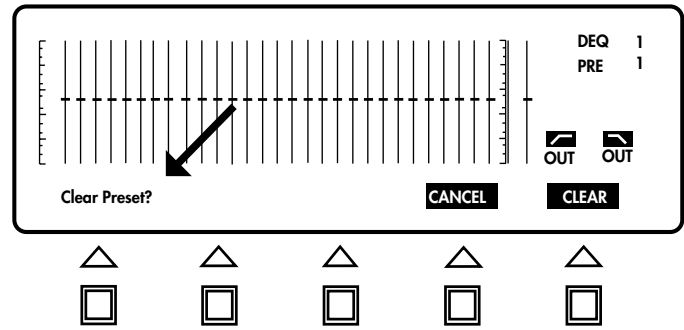


Figure 3.2: CLEAR Screen

USING TITLE

(See USING TITLE on page 11 of this manual.)

To set a Preset Title:

Step One: Press the Softkey labeled TITLE. You will note that the Softkey/Message Area has been replaced with the legend "PRESET:" with the name of the current Preset. You will notice, at the right end of the Softkey/Message Area, that there are two Softkey labels, CANCEL and ENTER. The Band Cursor and band status information have been blanked to indicate that settings may not be adjusted. In the position immediately to the right of the colon is a flashing cursor.

Step Two: Titles are entered by using the UP and DOWN arrow keys to cycle through the character set and the LEFT and RIGHT arrow keys to position the cursor. The cursor indicates which position in the Title will be changed by the UP and DOWN keys. To practice entering a Title, use the UP and DOWN keys to find your first initial. Use the RIGHT key to move one position to the right. Note that the character you have already chosen remains in the first position. Now, use UP and DOWN to set a character for the second position. Continue using the arrow keys to move the cursor and select characters until you are comfortable with their functions. Notice that when you cycle beyond either end of the character set the character selection scrolls to the opposite end of the character set. Also, when you attempt to move the cursor beyond the end of the 16th character field, the cursor scrolls to the opposite end of the field. Delete a character by replacing it with a "space" character

Step Three: When you have entered the desired Title you can store it by pressing the ENTER Softkey. Doing so simultaneously stores the Title in nonvolatile memory (as part of the Preset) and returns you to the EDIT menu. By pressing the CANCEL Softkey, you will be returned to the EDIT menu without saving the Title.

DEQ-II UTILITY MENU

This chapter describes the many miscellaneous features of the DEQ-II that make up the UTILITY menu.

TERMS USED

SOFTKEY/MESSAGE AREA: The portion of the LCD display dedicated to displaying the Softkey labels and messages.

ACTIVE FILTER BAND: The filter which may currently be adjusted.

BAND CURSOR: A solid "bar" that overlaps the slider "slot" of the "Active Filter Band"; denotes the Active Filter Band.

NORMAL-VIDEO: Dark characters on a light background.

REVERSE-VIDEO: Light characters on a dark background.

DATAWAY: The physical wiring that connects the Communications Ports of multiple equalizers to form a PA-422 network.

COMMUNICATIONS PORT: The PA-422 connector port on the back panel through which serial data communications occur.

NAME: A 16-character (or fewer) description for the name of an equalizer.

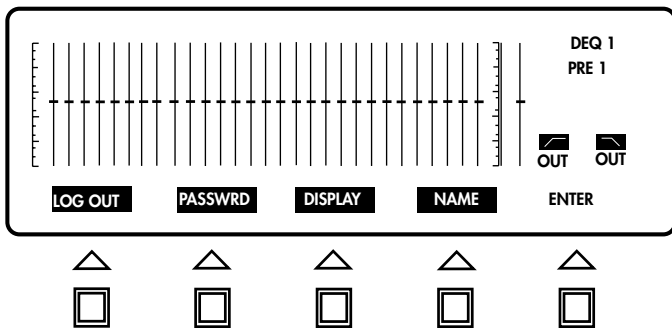


Figure 4.0: Utility Screen

UTILITY MENU SCREEN and UTILITY MENU SOFTKEY EXPLANATIONS

The following sections give step-by-step examples and descriptions of the features available under the UTILITY menu. These functions are Log Out, Password, Display and Name EQ.

USING LOG OUT

The purpose of the Log Out function is to terminate an equalization session. Log Out is used to tell the remote DEQs, if any, that they are no longer under the control of the DEQ-II you are working from.

NOTE: It is especially important to use the Log Out function if your system uses the Password Security System, as described in the SYSTEM SECURITY section of this manual.

To LOG OUT from the equalizer:

Step One: Access the UTILITY menu by pressing the UTILITY menu key. You will notice that the Softkey/Message Area is now labeled LOG OUT, PASSWRD, DISPLAY, NAME and ENTER. Also, notice that the Band Cursor and band status information have been removed from the display to denote that the sliders may not be adjusted. **If your system uses Passwords and you are not logged on with the system password then PASSWRD will be in normal-video, indicating that you do not have access to these functions.**

Step Two: Press the LOG OUT Softkey. The Softkey/Message area will now display the question "Secure Front Panel?" Answering "YES" to this question **will prevent** unauthorized persons (those without a password) from changing Presets and from accessing other DEQs. Answering "NO" **will allow** persons who don't know the passwords to select Presets (using the Preset Select button) and to access other DEQs. Note, however, that this does not allow unauthorized persons to alter any of the settings stored in those Presets or DEQs. After answering the "Secure Front Panel?" question (by pushing either the "YES" or the "NO" Softkey), you will be logged out of the DEQ and, if passwords have been set, the system will be secure.

SETTING PASSWORDS

Password security is an advanced feature that does not have to be utilized. It is provided for those who desire the added security that passwords provide. Chapter 5 gives a general explanation of the Password Security System and how it provides the desired protection without going into detail about how passwords are actually set. This section provides the necessary details for setting passwords.

NOTE: Write down any password you set.

(Continued on next page)

DEQ-II UTILITY MENU (CONTINUED)

To set a password:

Be sure that all of the DEQs in the system (that you wish to have password protection) are connected to the dataway and are turned on. This ensures that all equalizers will be set to the correct passwords, which is important because the security system depends on the passwords being stored in every unit (see *Using Passwords* section on page 17 for details). You should try to address each unit to be sure you have good communications. (See *Function* section on page 18 and the *Appendix* for interconnection details.)

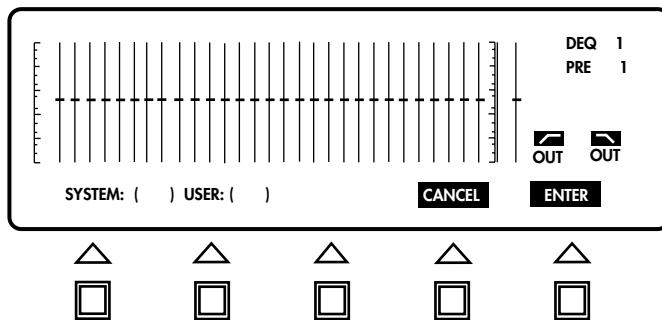


Figure 4.1: Password Screen

Access the utility menu by pressing the UTILITY menu key. You will notice that the Softkey/Message Area is now labeled LOG OUT, PASSWRD, DISPLAY, NAME and ENTER. Also, notice that the Band Cursor and band status information have been removed from the display to denote that the filters may not be adjusted.

Select the password menu item by pressing the PASSWRD Softkey. The LCD display should appear as shown in Figure 4.1. The two character fields enclosed by braces contain the current System and User level passwords. If your system does not have passwords set at this time then the fields will be blank, as shown. A flashing cursor is located in the first position of the System password field. The cursor denotes which position in the field may be edited.

Passwords are set (and edited) by using the UP and DOWN cursor keys to cycle through the DEQ character set, while the LEFT and RIGHT cursor keys are used to select the position in the field that is edited. Push the RIGHT cursor key four times. Notice that the cursor is now located in the first position of the User password field. If you use the UP and DOWN cursor keys now you will edit the character at that position. Push the RIGHT key four more times and the cursor will be at the first position of the System password field again. The LEFT key behaves in the same manner. For example, with the cursor in the first position of the System

password field press the LEFT cursor one time. Notice that the cursor is now in the fourth position of the User password field. If you the press the LEFT key four more times, the cursor will then be located in the fourth position of the System password field. Note that passwords are only four characters long. Practice using the cursor keys to set passwords until you are familiar with them. If you are already familiar with using the cursor keys to edit Preset Titles (see page 11) then you shouldn't have any problems.

If you do not wish to store the new passwords, simply press CANCEL and you will be returned to the UTILITY menu. To store the new passwords, press the ENTER Softkey. **WRITE DOWN THE PASSWORDS IN CASE YOU FORGET THEM. ONCE YOU LOG OUT OF THE SYSTEM YOU WON'T BE ABLE TO LOG BACK IN WITHOUT THE CORRECT PASSWORD.** After accepting the passwords you have set by pressing ENTER, you will notice that you have been returned to the UTILITY menu.

Remember: The next time you attempt to log on to the equalizer, you will have to enter one of the passwords you have set, or you will be denied access.

USING DISPLAY

The Display function controls the LCD display. With the DISPLAY command you can adjust the contrast of the display and you can turn the backlight on and off. The use of the Display function is described below.

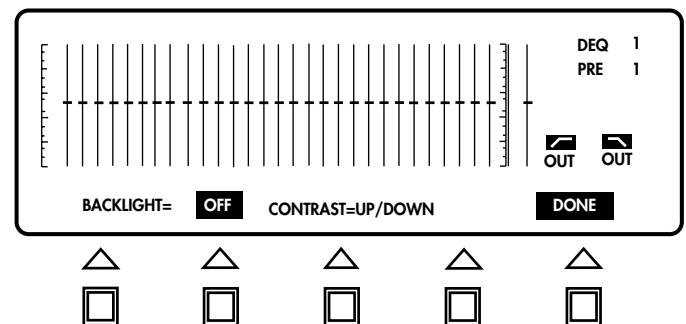


Figure 4.2: Backlight/Contrast Screen

To adjust the contrast:

Access the utility menu by pressing the UTILITY menu key. You will notice that the Softkey/Message is now labeled LOG OUT, PASSWRD, DISPLAY, NAME, and ENTER. Also, notice that the Band Cursor and band status information have been removed from the display to denote that the filters may not be adjusted.

(Continued on next page)

DEQ-II UTILITY MENU (CONTINUED)

Select the Display function by pressing the Softkey labeled DISPLAY (see Figure 4.2). Use the UP and DOWN cursor keys to adjust the contrast of the display screen for your viewing angle and lighting conditions. ENTER. Also, notice that the Band Cursor and band status information have been removed from the display to denote that the filters may not be adjusted.

Select the display function by pressing the Softkey labeled DISPLAY. To turn the backlight on or off, press the ON/ OFF softkey.

NOTE: The backlight will turn itself off automatically if there has been no activity on the front panel for five minutes. This is to extend the life of the electro-luminescent panel used as a backlight. Touching any panel key will activate the backlight for another five minutes, it is best to press the currently active menu key since this will not affect any EQ setting.

USING NAME

NAME is an advanced feature that allows you to give a specific DEQ a name up to 16 characters long. While you do not have to name the equalizer, you may find it helpful to do so, particularly if you have several DEQs in your system. If an equalizer is named, for example, LEFT channel, you know immediately what part of the system you are equalizing when you use that equalizer. Equalizer Names are set and stored in exactly the same manner as are Preset Titles. This procedure is repeated here for clarity and convenience.

To Name a DEQ:

Access the utility menu by pressing the UTILITY menu key. You will notice that the Softkey/Message is now labeled LOG OUT, PASSWRD, DISPLAY, NAME, and ENTER. Also, notice that the Band Cursor and band status information have been removed from the display to denote that the filters may not be adjusted.

Press the Softkey labeled NAME. You will note that the Softkey/Message Area has been replaced with the legend "DEQ:", (see Figure 4.3). If the equalizer has not yet been given a name then there will be no characters after DEQ:. You will also notice, at the right end of the Softkey/Message Area, that there are two Softkey labels, CANCEL and ENTER. And again, the Band Cursor and band status information have been removed to indicate that slider settings may not be adjusted. Finally, a flashing cursor appears in the position immediately to the right of DEQ:.

Names are entered by using the UP and DOWN cursor

keys to cycle through the character set and the LEFT and DOWN keys. To practice entering a Name, use the UP and DOWN keys to find your first initial (refer to the Character Set Chart if you have any trouble finding it). Once you have found it, use the RIGHT key to move one position to the right. Note that the character you have already chosen remains in the first position.

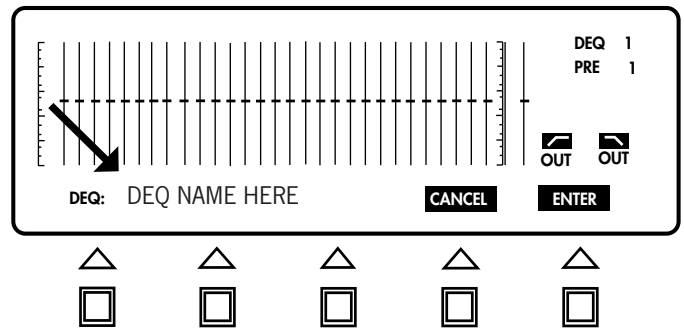


Figure 4.3: DEQ Name

Now, use UP and DOWN to set a character for the second position. Continue using the cursor keys to move the cursor and select characters until you are comfortable with their functions. Notice that when you cycle beyond either end of the character set the character selection scrolls to the opposite end of the character set. Also, when you attempt to move the cursor beyond the end of the 16th character field, the cursor scrolls to the opposite end of the field. Delete a character by replacing it with a "space" character.

When you have entered the desired name you can store it by pressing the ENTER Softkey. Doing so simultaneously stores the name in nonvolatile memory and returns you to the UTILITY menu. If you decide not to store the name simply press the CANCEL Softkey which will return you to the UTILITY menu without saving the name.

Existing names are edited in exactly the same way as new names are entered.

SYSTEM SECURITY

USING PASSWORDS

The DEQ-I and DEQ-II employ a two-level Password Security System to protect your system from unauthorized tampering. A System Administrator who wishes to use passwords has the ability to prevent access to some or all of the equalizer's functions through this Password Security System. The password system consists of two passwords, referred to as the System level and User level passwords, respectively. **A user who logs on with the System password has access to ALL of the equalizer's functions, as described in the preceding chapters.** Someone logged on with the User password has access to most, but not all, of the equalizer's functions. The User level user may not:

1. LOCK or UNLOCK Presets,
2. Set or edit Passwords, or
3. NAME an equalizer.

This scheme allows you to protect your own curves and settings while granting limited access to some personnel and entirely restricting all others.

The security system is enabled by setting system and user level passwords as described on page 14, Setting Passwords. Be sure that all equalizers in the system are connected to the dataway and powered up when you set the passwords so that the passwords will be set in each DEQ. Having the passwords stored in each unit increases system security by preventing someone using a DEQ-II or PC without passwords from tampering with your system.

Once the system is password protected, logging on to the equalizer is slightly different than was described on page 6, Logging On To The Equalizer. The log-on procedure when using passwords is as follows:

Turn the equalizer on. After a few seconds the Oxmoor logo will be displayed for a short time and will then be replaced by the standard display screen, i.e., the active curve and status information (see Figure 5.0). The Softkey/Message Area displays the Active Preset Title.

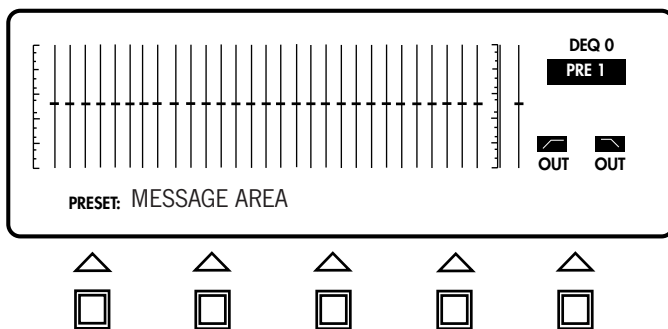


Figure 5.0: Start-Up Screen

Notice that none of the Menu LED indicators are on because you have not yet selected a Main Menu.

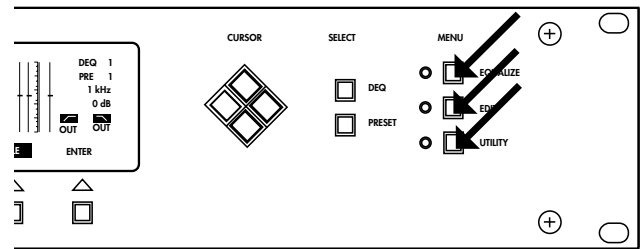


Figure 5.1: Main Menu Keys

Press one of the Main Menu keys (see figure 5.1) EQUALIZE, EDIT, or UTILITY. **Now, since passwords have been set**, the Softkey/Message Area displays the query, "PASSWORD?" along with the Softkey labels CANCEL and ENTER (see Figure 5.2). A four position character field enclosed by braces is next to the PASSWORD query, and a flashing cursor appears in the first position of this field. The equalizer is waiting for you to input a password.

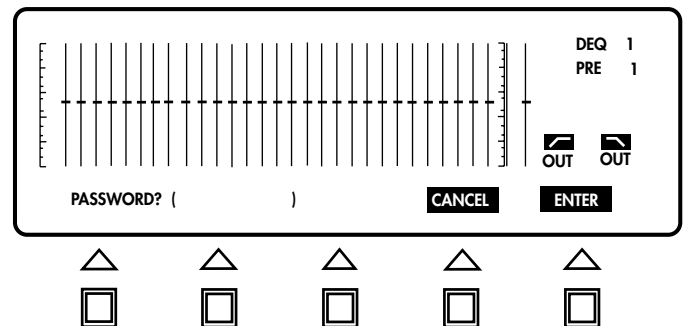


Figure 5.2: Password Entry

Use the arrow keys to select characters until the character field contains one of the passwords (**System or User**) that has been set in the equalizer. Once you have entered a password with the arrow keys, press ENTER. If the password matches one of the equalizer's passwords then you will be granted access and will be in the menu corresponding to the Main Menu key you pushed when attempting to log on. For instance, if you had pressed the EQUALIZE menu key in step 2 of this procedure, you will now be in the EQUALIZE menu. The equalizer will continue to ask for a password until you either enter a matching password or press CANCEL. Pressing CANCEL returns the equalizer to the state it was in before you pressed the Main Menu key, i.e., at its start-up screen.

Once you have access to the equalizer you may use any function allowed by your password level.

DEQ-I & II MULTI-UNIT SYSTEM

FUNCTION

One of the primary benefits of programmable devices is that several such devices may be connected together in a network and controlled from a central location. Up to 250 DEQs (in any combination of DEQ-Is and DEQ-IIs) may be connected together and controlled by controlling devices (such as PCs and DEQ-IIs) from many, different locations. This chapter describes how to connect the equalizers so that they may all be remotely controlled by the same controller.

NOTE: PA-422 requires that a device's address be between 1 and 250. Address 0, 251, 252, 253, 254, and 256 are illegal.

TERMS USED

COMMUNICATIONS PORT: The connectors on the back panel through which serial data communications occur.

DATAWAY: The physical wiring that connects the Communications Ports of two or more equalizers to form a network.

ADDRESS SELECTOR: An eight-position dip-switch which sets the address of the equalizer.

PRESET: A nonvolatile memory for storing a group of settings that completely configure an equalizer.

PRESET PORT: A 15-pin D-connector on the back panel through which Presets may be selected.

STATUS AREA: The portion of the LCD display dedicated to displaying Status information.

INTERCONNECTION SCHEME

Interconnecting equalizers to permit remote control is easily accomplished through the Communications Port.

This example system consists of two DEQ-Is and a DEQ-II which is used as the system controller. Note that the Communications Port of each DEQ consists of two nine-pin D-connectors, one marked "PA-422 IN" and the other "PA-422 OUT." Notice that the "PA-422 OUT" connector of one equalizer is connected to the "PA-422 IN" connector of another. For instance, in Figure 6.1, the "PA-422 OUT" connector of the equalizer at address 1 is connected to the "PA-422 IN" connector of the equalizer at address 2. Similarly, the "PA-422 OUT" connector of the DEQ-II is connected to the "PA-422 IN" connector of the equalizer at address 3. This interconnection process is extended when more equalizers (or PCs) are placed in the system. For example, if you added a new equalizer you could connect the new equalizer's "PA-422 OUT"

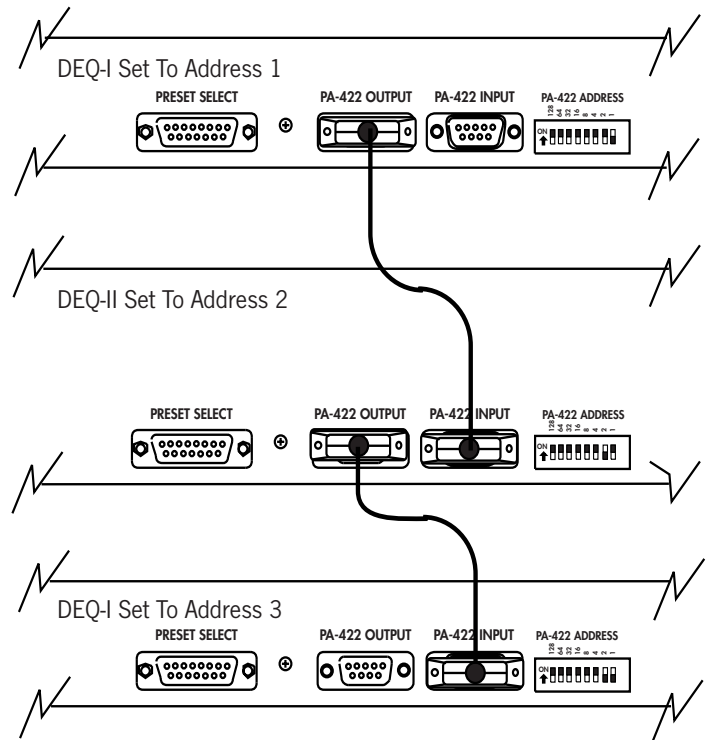


Figure 6.1: Interconnection Scheme

connector to the address 1 equalizer's "PA-422 IN" connector. Or, you could connect the new equalizer's "PA-422 IN" connector to the address 3 equalizer's "PA-422 OUT" connector. Please note that any mix of DEQ-Is and DEQ-IIs may be connected together, in any order, provided the interconnection scheme described above is followed and there are no more than 250 equalizers in the network. Also, in this example addresses 1, 2, and 3 were chosen merely for convenience; any three addresses in the range 1 to 250 could have been used.

The Appendix contains the appropriate wiring information for the Communications Port, including connector pin-outs.

SETTING ADDRESSES

NOTE: PA-422 requires that a device's address be between 1 and 250. Address 0, 251, 252, 253, 254, and 256 are illegal.

When connecting two or more equalizers together to form a network, as described in the preceding section, it is important that each equalizer be given a unique address. The Address Select dip-switch on the back panel of both models of the equalizer allows you to give each equalizer a numerical address ranging in value from 1 to 250.

DEQ-I & DEQ-II MULTI-UNIT SYSTEM (CONTINUED)

Each equalizer is set to Address 1 at the factory.

NOTE: PA-422 requires that a device's address be between 1 and 250. Address 0, 251, 252, 253, 254, and 256 are illegal.

Each of the eight switches in the dip-switch has a numerical value (see Figure 6.2). These values, reading from left to right, are 128, 64, 32, 16, 8, 4, 2, and 1. To set the address of an equalizer, place those switches whose numerical value sum is equal to the desired address in the ON position. For example, to set an equalizer to address 23, the switches should be set as follows.

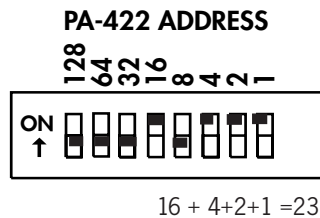


Figure 6.2: Address Switch

Additional examples are shown in Figure 6.3:

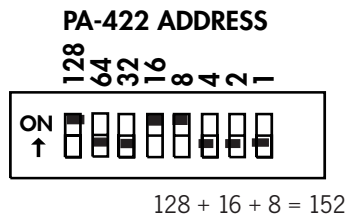
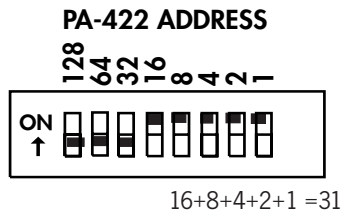


Figure 6.3: Address Switch

NOTE: It is very important that each equalizer on the dataway has a unique address. If more than one equalizer has the same address, the system will not work properly.

USING THE PRESET PORT

On page 8, we presented one way to select a different Preset. In that method, the DEQ-II's control panel was used, which means that a DEQ-II must be in the system and that you must be logged on to the system. A way to switch the equalizer to a different Preset without needing a DEQ-II (or a PC) is by using the Preset Select port. The Preset Port, a 15-pin D-connector located on the back panel,

will allow you to select a Preset by pushing momentary-contact push buttons that are connected to the Preset Port. The Preset Port will also provide a remote indication of the Preset to which the equalizer is set. The advantage of this capability is that you may configure your system so that there are no controlling devices (i.e., PCs or DEQ-IIs) yet personnel may still call up different Presets that you have programmed. For example, you may have programmed one Preset to equalize for speech and another for music and you may want to be able to switch between these two Presets. A simple pair of momentary-closure switches, appropriately connected to the Preset Port, provides this function. Three "open collector" transistors provide "tally" outputs at the Preset Select port.

These tallies, properly decoded, can be used to provide a remote indication of the active preset. Appendix F shows one possible method of decoding tally outputs.

Figure 6.4 shows a typical wiring scheme for the Preset Port. Here three DEQs are interconnected by their Preset Ports and to a "remote control panel." This control panel is simply a set of switches (and possibly an indicator to show the active Preset) which allow the selection of Presets. Although only three equalizers are shown in the illustration, any number of units (up to 250) may be connected together. These may consist of any mix of DEQ-IIs and DEQ-IIIs.

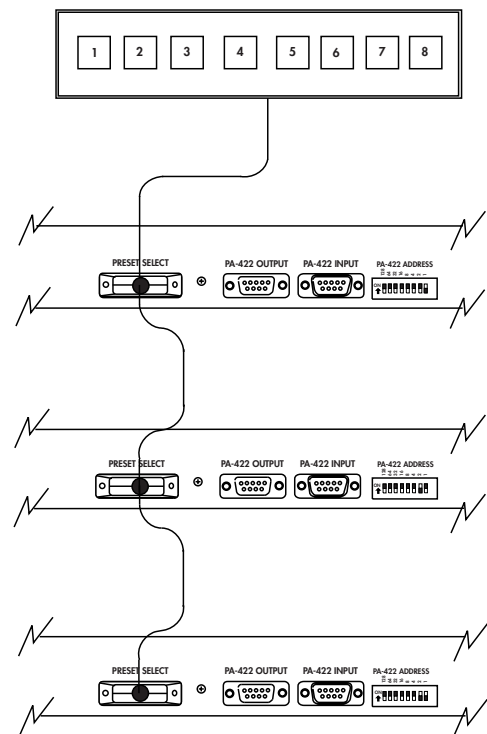


Figure 6.4: Preset Interconnection

DEQ-I & DEQ-II MULTI-UNIT SYSTEM (CONTINUED)

Of course, if the equalizers are widely separated, it may be impractical (due to conduit space or cost, for example) to interconnect the equalizers through both the Communications and Preset Ports. Yet you may still desire that the end user be able to call up the different Presets without being able to alter them. Figure 6.5 shows how you can do this. Notice that there are two DEQ-Is and a DEQ-II interconnected through their Communications Ports and that the remote control panel shown is now attached only to the Preset Port of the DEQ-II. If the system is idle, that is, no one is currently logged on and performing equalization functions, then pressing a switch on this control panel will cause the DEQ-II to switch to the appropriate Preset. At the same time, the DEQ-II tells the DEQ-Is to also change to that Preset. While this scheme requires that a DEQ-II be present in the system, it can greatly reduce the amount of wiring necessary.

Another facility provided by the Preset Select port is the ability to remotely mute all DEQs that are connected through the Preset Select port. While pin 9 of the Preset Select port is held "low" (as with a switch closure to ground) all DEQs in the chain will be muted and will not pass audio. Opening the switch will unmute the DEQs (unless they have been programed to be muted).

SETTING UP MULTI-EQUALIZER SYSTEMS

Systems with Multiple Controllers

If your system is particularly large and spread out you may find it convenient to be able to control the equalizers from multiple locations. The DEQ communication scheme allows you to have many different controlling devices (up to 250) in the network, but you may be logged on to only one controller at a time. Preventing multiple controllers from simultaneously controlling the network greatly reduces the chances of conflicts. If you attempt to log on to an equalizer and another equalizer (or PC) already has control of the dataway, the message **"Controller Already on Dataway"** will be displayed on the LCD display of your DEQ-II. You will not be able to log on to any DEQ-II in the network until the active DEQ-II or PC logs off of the network.

Programming Multiple Equalizers

When a DEQ-II is first powered up it does not know if there are any other equalizers in the system; it only knows that it can program itself. Consequently, the default active DEQ address (as shown in line 1 of the Status Area) is the DEQ-II's own address. Just as the active Preset number denotes the Preset to which the programming changes are being made, the active DEQ

address shows which equalizer is receiving programming changes. If you log on to a DEQ-II at address 2, for example, and want to program an equalizer at address 5, you must first change the active DEQ address to 5.

Changing DEQs

You may change DEQs from within any of the main menus. To do so, simply push the DEQ Select button (see Figure 6.6).

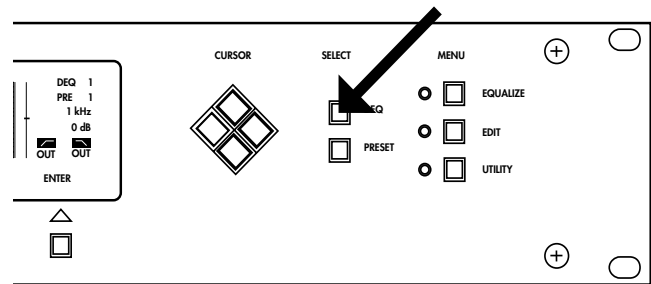


Figure 6.6: Main Menu Selection

Several changes in the display should be evident (see Figure 6.7). First, the Softkey/Message Area is now displaying the Name of the active DEQ and the CANCEL and ENTER Softkey have been placed in reverse-video. Second, the Band Cursor has been turned off (if it was on) and the Status Area has been updated to indicate that no filter adjustments may be made (the Active Filter Band frequency and setting are erased). Finally, the line in the Status Area that indicates the active DEQ has been placed in reverse-video. This indicates that the active DEQ may be changed and an underline cursor has appeared. This cursor allows you to change any of the three character positions that are valid for DEQ # 1 through 250.

The reverse-video ENTER denotes that to select the DEQ indicated in the Status Area you must push the ENTER Softkey. Pressing CANCEL returns you to the previous menu. Press the CANCEL Softkey now. The Softkey/Message Area should now indicate that you have returned to the menu you were in before you pressed the DEQ Select button. Press the DEQ Select button again to reenter the DEQ Select Mode. The DEQ number is changed with the cursor keys, UP and DOWN increments and decrements, respectively, the value of the digit underscored by the flashing cursor, while left and right position the cursor. This procedure allows you to quickly select any of the 250 addresses allowed by PA-422.

(Continued on next page)

DEQ-I & DEQ-II MULTI-UNIT SYSTEM (CONTINUED)

For example, to change from a DEQ at address 1 to a DEQ at address 201, you would move the cursor to the first digit (the 100's place), using the left cursor and then press the UP cursor twice. The DEQ number in the status area would then read 201. Figure 6.8 illustrates this procedure.

However, the curve displayed in the Curve Area has not changed. This is because you have not yet entered the new DEQ number, and the flashing cursor under the

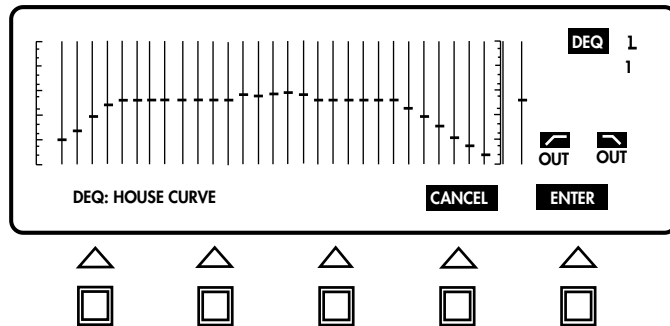


Figure 6.7: DEQ Selection

active DEQ number in the Status Area serves as a reminder that you have not done so. To select the new DEQ, push the Softkey labeled ENTER. Notice that the cursor is no longer flashing and the active DEQ label in the Status Area is now in normal video.

Also, the Softkey labels appropriate to the active menu have replaced the Name in the Softkey/Message Area. The curve now displayed in the Curve Area is the curve for the new DEQ (unless the DEQ address you have selected is not present on the network) and may be adjusted as desired by following the procedures described in the preceding sections. All subsequent commands will be sent to the DEQ that has the address

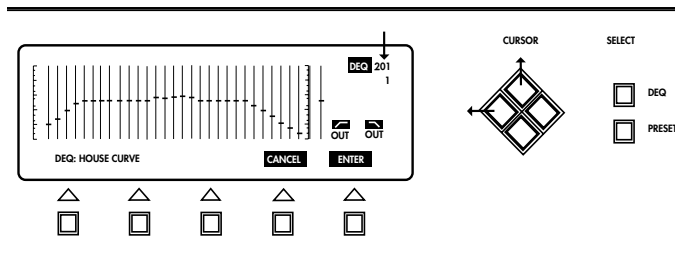


Figure 6.8: DEQ Address Selection

shown in line 1 of the Status Area. If you try to select a DEQ address that is not on the network, then the LCD display will give you a **“Device Time-out - Unit Not Responding”** message and will wait for you to acknowledge this message by pressing the CANCEL Softkey.

To summarize the procedure for changing DEQs:

1. Enter the DEQ Select Mode by pressing the DEQ Select key while in one of the main menus.
2. Use the CURSOR to select the desired DEQ.
3. Press the Softkey labeled ENTER.

One final, and very useful, function of the DEQ Select button is the Last DEQ Recall feature. This function is similar to the “last channel recall” feature of many television remote controls in that it allows you to switch between the last two active DEQs at the touch of one button. The Last DEQ Recall feature allows you to quickly move between two different equalizers without having to go through the process of selecting new DEQs.

To explore the Last DEQ Recall feature enter the DEQ Select Mode as described above by pressing the DEQ Select Button. Now, note the active DEQ number as displayed in the Status Area and use the cursor keys and the ENTER Softkey to select a different DEQ as described above.

Now, reenter the DEQ Select Mode (press the DEQ Select key). Press the DEQ Select key again and notice that the Status Area now reflects that the equalizer is set to the previous DEQ. If the curves in the two DEQs (the current DEQ and the one you were just on) are different you will also see that the Curve Area has been updated to show the new curve. Repeated pressing of the DEQ Select key will cause the equalizer’s settings to toggle back-and-forth between the last two active DEQs, just as a TV remote control’s last channel recall function toggles between the last two channels the TV was set to receive.

While in the DEQ Select Mode you may use the cursor keys, as before, to change to new DEQs and still use the Last DEQ Recall function without first having to exit the DEQ Select Mode. The equalizer always remembers the last two active DEQ addresses.

DEQ-I INTERNAL CONTROLS

FUNCTION

Unlike the DEQ-II, the DEQ-I does not have a front control panel to permit easy manipulation of its settings; the primary usage of the DEQ-I is as a “slave” being programmed by DEQ-IIs or PCs. However, there may be times when you need to change settings in a DEQ-I equalizer but do not have access to a DEQ-II, PC or a Macintosh. Therefore, a set of buttons have been provided inside the DEQ-I which allow you to manipulate its settings. The buttons are placed inside the equalizer in order to retain system security. This chapter shows you how to use the internal controls of the DEQ-I.

IMPORTANT TERMS

Slave: An equalizer (DEQ-I or -II) that is under the control of a DEQ-II, PC, or Macintosh.

Name: A 16-character (or fewer) descriptor for the name of the equalizer.

Title: A 16-character (or fewer) descriptor for the name of a Preset.

Preset: A nonvolatile memory for storing a group of settings that completely configure the equalizer.

Active Filter Band: The filter which may currently be adjusted.

Active Preset: The Preset that is currently being adjusted.

INTERNAL CONTROL LOCATIONS

The internal controls are located inside the DEQ-I. In order to use them you must first remove the top panel of the equalizer. Figure 7.0 shows the approximate locations of the internal controls.

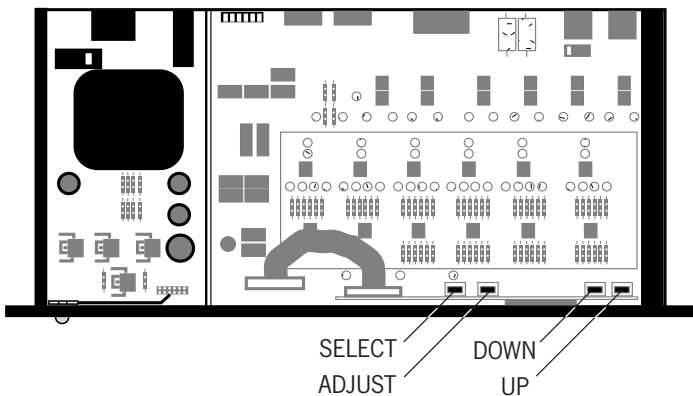


Figure 7.0: DEQ-I TOP VIEW

USING THE INTERNAL CONTROLS

Through the internal controls you may select Presets, Active (1/3-octave) Filter Bands and High- and Low-Pass Filters. You may also adjust the filter settings and overall gain. High level functions such as setting **Passwords, Names, and Titles** cannot be performed through the internal controls. Note that you do not need to know the Password to use the internal controls.

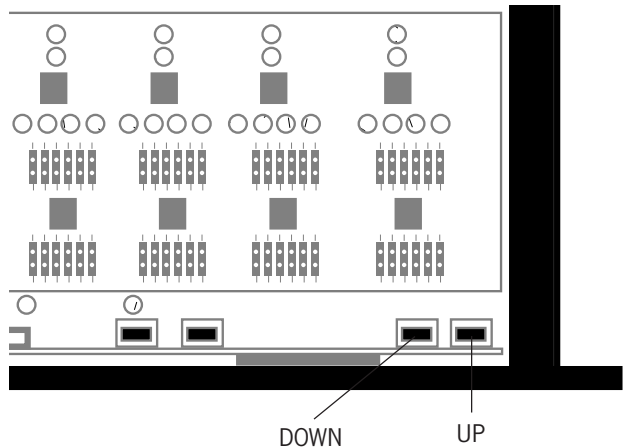


Figure 7.1: DEQ-I UP and DOWN Buttons

SELECTING PRESETS

To select a Preset use the UP and DOWN buttons (see Figure 7.1). Notice that each time you press either UP or DOWN the number shown in the 7-segment display (see page 8) changes to the next higher or lower number. If you are processing audio you will also hear the different Presets as they are selected.

(Continued on next page)

DEQ-I INTERNAL CONTROLS (CONTINUED)

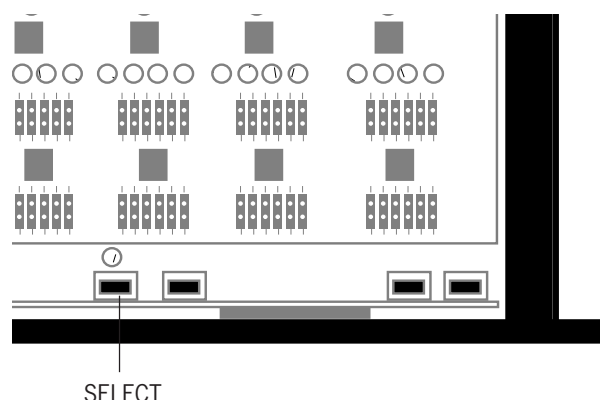


Figure 7.2: DEQ-I Select Button

SELECTING FREQUENCY BANDS

Selection of frequency bands is accomplished as follows:

1. Push and hold the **SELECT** internal control (see Figure 7.2). Notice that the 7-segment display is now showing a two-digit number instead of the single-digit number it was showing. This two-digit number is the Active Filter Band number, which denotes the filter band you are currently working with. Appendix E provides a listing of the Active Filter Band numbers and their corresponding 7-segment display codes. You will need to refer to this listing as you use the internal controls.
2. While still holding the **SELECT** internal control, push either the **UP** or the **DOWN** control and notice that the two-digit number changes to the next higher or lower number. This new number denotes the new Active Filter Band (refer to Appendix E for which frequency band the new number corresponds to). Notice that you are not adjusting the filters, you are merely selecting a new filter for adjustment.
3. When you have selected the desired frequency band, release the **SELECT** control. Notice that the 7-segment display again displays a one-digit number, which is the Active Preset number.

ADJUSTING THE ACTIVE FILTER BAND

1. Push and hold the **ADJUST** internal control button (see Figure 7.3). Notice that the 7-segment display is now showing a two-digit number instead of the single-digit number it was showing. This two-digit number is the setting of the Active Filter Band. Appendix E shows how to interpret the setting (in dB) based on the number in the 7-segment display.
2. While still holding down the **ADJUST** internal control, push either the **UP** or the **DOWN** control and notice that the new setting is displayed. If you are processing audio you may also hear the change in the audio.
3. After you are finished adjusting the frequency band, release the **ADJUST** control. Notice that the 7-segment display again displays the Active Preset number.

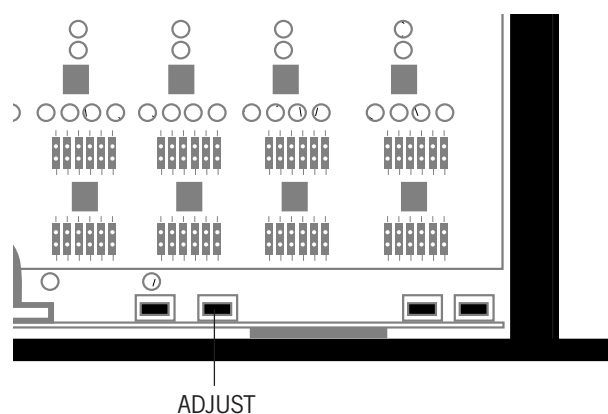
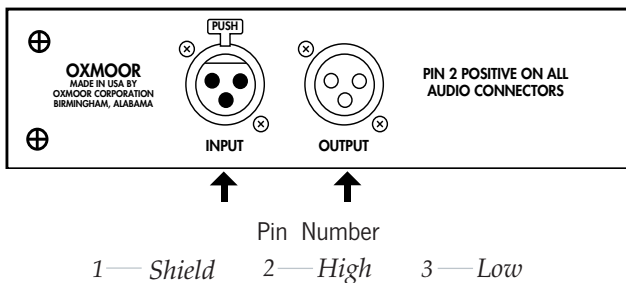


Figure 7.3: DEQ-I Adjust Button

APPENDIX A: HARDWARE INTERCONNECTION DETAILS

Figure A1: AUDIO IN & OUT CONNECTORS



The output may be set for either balanced (push-pull) or unbalanced operation. In the unbalanced configuration, pin 3 of the output connector is grounded, and the maximum output level drops by 6 dB.

To operate the output unbalanced, you must follow this procedure; Remove the unit's top lid. Locate the configuration jumper block next to the output connector. The jumper is factory-installed in the balanced position.

Observing the positions marked on the circuit board, remove the jumper and reinstall it in the unbalanced position.

On the output XLR, IN THE UNBALANCED MODE ONLY, use pin 2 as "HOT" and pin 3 as "COMMON." Pin 1 is to be used as "SHIELD."

Figure A2: PRESET SELECT CONNECTOR

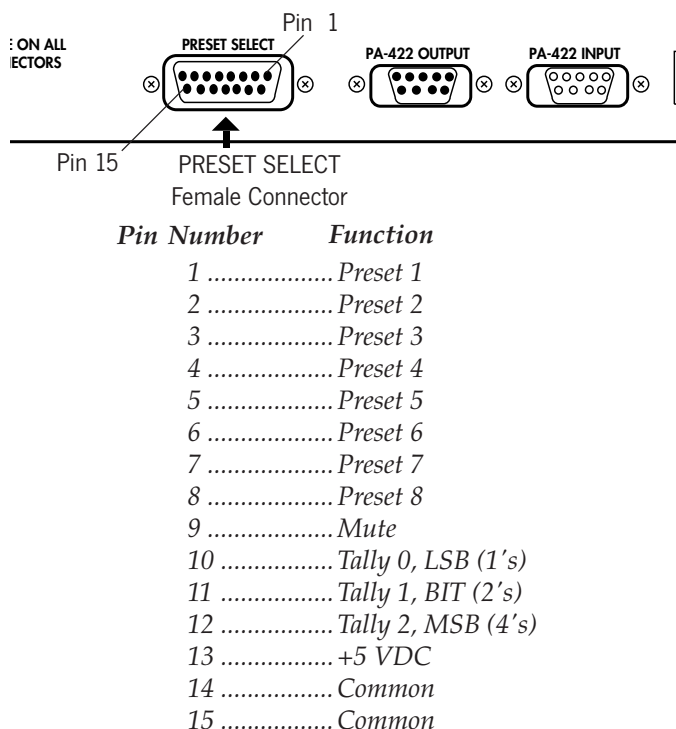


Figure A3: PA-422 IN & OUT CONNECTORS

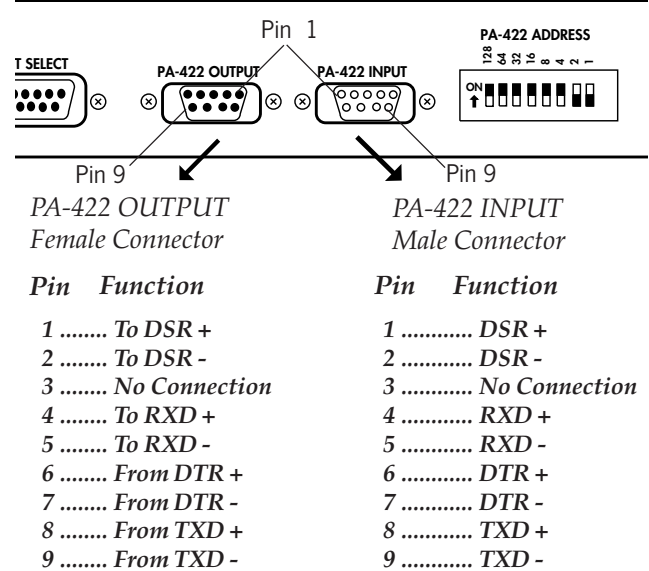
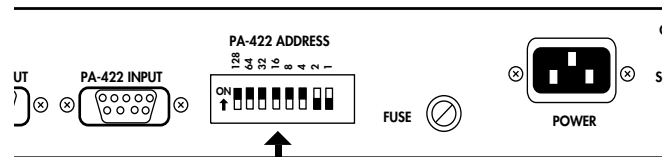
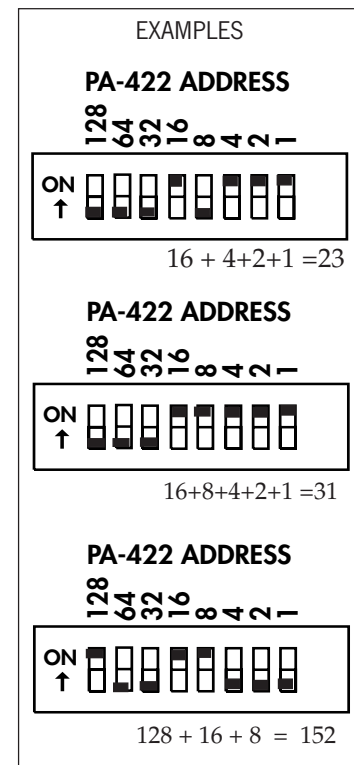


Figure A4: ADDRESS SELECT SWITCH



NOTE: PA-422 requires that a device's address be between 1 and 250. Address 0, 251, 252, 253, 254, and 256 are illegal.

FACTORY SETUP: The DEQ-I & DEQ-II are shipped from the factory with the PA-422 ADDRESS set to 1.



APPENDIX B: ERROR MESSAGES

This section lists the DEQ-II error messages with brief descriptions of their meanings and possible corrective actions.

"Com... Time-out -Device Not Responding" - The DEQ you have attempted to communicate with is not responding. Check the wiring to that unit. Make sure that the unit is ON. Make sure that the unit has the correct address.

"Illegal Device Type Returned" - The device you have tried to communicate with is not a DEQ 1/3-octave equalizer. Check the unit at that address.

"Incorrect Address ID Returned" - The remote device has returned an address that does not match the address you tried to select. Check your wiring. Make sure that each equalizer has a unique address.

"Invalid Password - Access Denied" - Your password does not match the password of the remote device. You may not communicate with this device until you know its password.

"Preset Locked - Access Denied" - The Preset you have tried to modify is locked. You must unlock the Preset before you can modify it.

"Incorrect ID Code Returned" - The remote device has returned an ID code other than Oxmoor's. This indicates that the unit you have addressed is not an Oxmoor Product. Check your address settings on the remote devices.

"Parity Error" - A parity error was present in the command or data sent to the remote device. Check your cabling and make sure that each device has a unique address.

"Bad Data Received By Remote" - The remote device has received data that is invalid. Check the wiring and addresses.

"Bad Command Received By Remote" - The remote device has received a command that is invalid. Check the wiring and addresses.

APPENDIX C: CHARACTER SET

This section lists the valid characters in the DEQ character set.

Character Number	Character
---------------------	-----------

1	SPACE
2	A
3	B
4	C
5	D
6	E
7	F
8	G
9	H
10	I
11	J
12	K
13	L
14	M
15	N
16	O
17	P
18	Q
19	R
20	S
21	T
22	U
23	V
24	W
25	X
26	Y
27	Z
28	0
29	1
30	2
31	3
32	4
33	5
34	6
35	7
36	8
37	9
38	\$
39	%
40	'
41	-
42	@
43	~
44	'
45	!
46	#
47	(
48)
49	&

APPENDIX D: GLOSSARY

This section contains a glossary of important terms.

ACTIVE DEQ - The equalizer currently under control by the master device. The address of the Active DEQ is shown on line one of the Status Area (DEQ-II).

ACTIVE FILTER BAND - The filter which may currently be adjusted. The Active Filter Band is denoted by the "Band Cursor" and the frequency of the Active Filter Band is shown on line three of the Status Area of the DEQ-II or on the seven-segment display of the DEQ-I.

ACTIVE PRESET - The Preset that is currently being adjusted. The Active Preset number is shown on line two of the Status Area of the DEQ-II or on the seven-segment display of the DEQ-I.

ADDRESS SELECTOR - An eight-position dip-switch which sets the address of the equalizer. The address is important for multi-equalizer systems.

BAND CURSOR - A solid "bar" that overlaps the slider "slot" of the "Active Filter Band". The Band Cursor denotes the Active Filter Band (DEQ-II).

COMMUNICATIONS PORT - The connectors on the back panel of the equalizer that are used for conveying serial data information.

CURVE AREA - The portion of the LCD display dedicated to displaying the "Active Preset" curve (DEQ-II).

DATAWAY - The physical wiring that connects the Communications Ports of equalizers to form a network.

EQUALIZATION CURVE (or simply, CURVE) - A term describing the collection of filter settings (bandpass, high-pass and low-pass) that completely define how the equalizer will process audio.

HARDKEY - Button on the front panel of the DEQ-II that always performs the same function.

LOCKED PRESET - A Preset that cannot be modified.

LOGGING OFF - Term which describes the act of relinquishing control of a DEQ-II and the equalizers under the control of that DEQ-II.

LOGGING ON - Term which describes the act of gaining access to a DEQ-II through its front panel; accomplished by selecting a Main Menu key and (possibly) giving a Password following power-up.

NAME - A 16-character (or fewer) description for the name of an equalizer.

NORMAL-VIDEO - A display mode in which dark characters are on a light background; typically denotes an inactive function (DEQ-II).

PRESET - A group of settings that will completely configure an equalizer.

PRESET PORT - A 15-pin D-connector on the back panel through which Presets may be selected.

REVERSE-VIDEO - A display mode in which light characters are placed on a dark background; typically denotes an active function (DEQ-II).

SOFTKEY - Button on the front panel of the DEQ-II that changes functions depending on the menu you are in.

SOFTKEY/MESSAGE AREA - The portion of the LCD display dedicated to displaying the Softkey labels and messages (DEQ-II).

STATUS AREA - The portion of the LCD display dedicated to displaying Status information (DEQ-II).

SYSTEM PASSWORD - Password that gives the highest level of access.

TITLE - A 16-character (or fewer) descriptor for the name of a Preset.

USER PASSWORD - Password that permits access to most, but not all, of the equalizer's functions.

APPENDIX E: DEQ-I DISPLAY CODES

This section lists the codes that are displayed on the DEQ-I's 7-segment display. Note that these are the standard ISO band numbers for the frequencies listed.

When selecting frequency bands the codes are:

Display Code	Active Filter Band	Display Code	Active Filter Band
14	25 Hz	31	1.25 kHz
15	31.5 Hz	32	1.6 kHz
16	40 Hz	33	2.0 kHz
17	50 Hz	34	2.5 kHz
18	63 Hz	35	3.15 kHz
19	80 Hz	36	4.0 kHz
20	100 Hz	37	5.0 kHz
21	125 Hz	38	6.3 kHz
22	160 Hz	39	8.0 kHz
23	200 Hz	40	10.0 kHz
24	250 Hz	41	12.5 kHz
25	315 Hz	42	16.0 kHz
26	400 Hz	97	GAIN
27	500 Hz	98	HP
28	630 Hz	99	LP
29	800 Hz		
30	1.0 kHz		

When selecting High-Pass and Low-Pass filters the codes are:

HP FILTER		LP FILTER	
Display Code	Band Settings	Display Code	Band Settings
0	OUT	0	2k
1	20Hz	1	2.2k
2	22.4Hz	2	2.5k
3	25Hz	3	2.8k
4	28Hz	4	3.15k
5	31.5Hz	5	3.55k
6	35.5Hz	6	4k
7	40Hz	7	4.5k
8	45Hz	8	5k
9	50Hz	9	5.6k
10	56Hz	10	6.3k
11	63Hz	11	7.1k
12	71Hz	12	8k
13	80Hz	13	9k
14	90Hz	14	10k
15	100Hz	15	11.2k
16	112Hz	16	12.5k
17	125Hz	17	14k
18	140Hz	18	16k
19	160Hz	19	18k
20	180Hz	20	20k
21	200Hz	21	OUT

When adjusting the Active Filter Band the codes are:

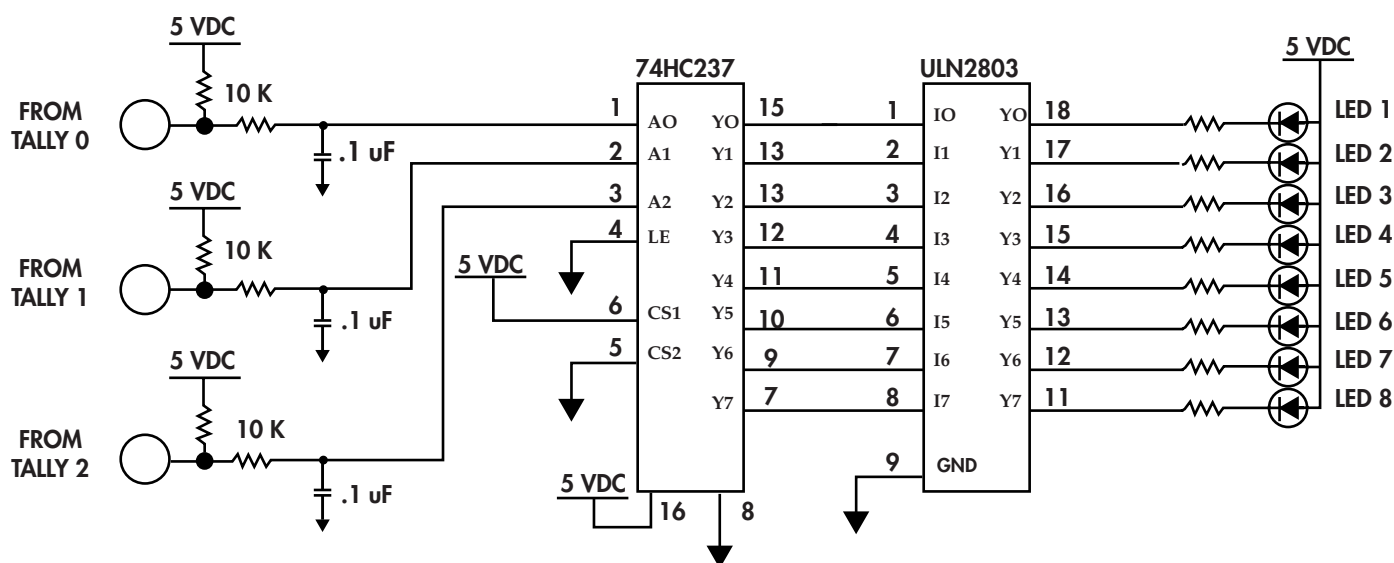
Display Code	Filter Setting
-12	-12.0 dB
-11	-11.5 dB
-11	-11.0 dB
-10.	-10.5 dB
-10	-10.0 dB
-9.5	-9.5 dB
-9.0	9.0 dB
-8.5	-8.5 dB
-8.0	-8.0 dB
-7.5	-7.5 dB
-7.0	-7.0 dB
-6.5	-6.5 dB
-6.0	-6.0 dB
-5.5	-5.5 dB
-5.0	-5.0 dB
-4.5	-4.5 dB
-4.0	-4.0 dB
-3.5	-3.5 dB
-3.0	-3.0 dB
-2.5	-2.5 dB
-2.0	-2.0 dB
-1.5	-1.5 dB
-1.0	-0.1 dB
-0.5	-0.5 dB
0	0.0 dB
0.5	0.5 dB
1.0	1.0 dB
1.5	1.5 dB
2.0	2.0 dB
2.5	2.5 dB
3.0	3.0 dB
3.5	3.5 dB
4.0	4.0 dB
4.5	4.5 dB
5.0	5.0 dB
5.5	5.5 dB
6.0	6.0 dB
6.5	6.5 dB
7.0	7.0 dB
7.5	7.5 dB
8.0	8.0 dB
8.5	8.5 dB
9.0	9.0 dB
9.5	9.5 dB
10	10.0 dB
10.	10.5 dB
11	11.0 dB
11.	11.5 dB
12	12.0 dB

APPENDIX F: PRESET SELECT TALLY

The following circuit can be used to decode the Preset Select port tallies and give an indication of the active preset. For example, if the DEQ is set to preset 1 then LED 1 will be “on” and the others will be “off.” Likewise, if the DEQ is set to preset 8 then LED 8 will be “on” and the others will be “off.” The RC networks provide protection from static shocks. Ground for the circuit should be tied to the DEQ ground through the Preset Select port (pin 14 and/or 15). The 5VDC supply can be either user supplied or can be obtained from the

DEQ Preset Select port (pin 13). Using this circuit and eight **momentary action switches** appropriately connected to the preset port (pins 1 through 8) a remote panel can be built to change presets and indicate which preset is active.

Note: If the DEQs connected together through preset port are not all on the same preset the tallies cannot properly indicate the active preset (since there is no one active preset).



[illegible]

INSTALLATION & SET-UP NOTES

[illegible]

DEQ-I & DEQ-II SPECIFICATIONS

FREQUENCY RESPONSE	20 Hz to 20 kHz +0, - 0.3 dB - 3 dB Points, Ref.1kHz 4 Hz to 60 kHz (+ 4 dBm output)
HUM AND NOISE	Ref. +4 dBm Output @ Unity Gain . - 85 dB (20 Hz to 20 kHz BW, unweighted)
DISTORTION	Ref. +4 dBm Output @ Unity Gain THD + NOISE - 80 dB/0.01% (20 Hz to 20 kHz BW) SMPTE IMD - 80 dB/0.01% (60Hz + 7kHz, mixed 4:1) Transient Intermodulation - 80 dB/0.01% (3.15kHz SQ + 15kHz probe, 30kHz BW)
1/3 OCTAVE FILTERS	Type Constant Q, minimum phase, combining Number 29 Frequencies 25 Hz thru 16 kHz Centers ISO 1/3 octave standard Bandwidth & Center Freq. Tolerance ± 5% Combining Ripple 1.5dB max
FILTER CONTROLS & GAIN CONTROL	Range ±12dB Step Size 0.5 dB Step Size Tolerance ± 0.05dB
HIGH-PASS FILTER	Slope Rate 12 dB/octave -3 dB Point Selectable on 1/6 octave spacings from 20Hz to 200Hz
LOW-PASS FILTER	Slope Rate 12 dB/octave -3 dB Point Selectable on 1/6 octave spacings from 2kHz to 20kHz
AUDIO INPUT	Type Electronically balanced (RF suppressed) Connector Female XLR Pin Out Pin 1 shield (chassis), pin 2 +, pin 3 – Input Impedance 80k ohms Nominal Input Level 0 dBu Maximum Input Level +20 dBu Common Mode Rejection Ratio 50 dB @ 1kHz
AUDIO OUTPUT	Type Electronically balanced, (unbalancing jumpers provided) Connector Male XLR Pin Out Pin 1 shield (chassis), pin 2 +, pin 3 – Source Impedance 150 ohms (75 ohms/side) Recommended Load Impedance ... 600 ohms or greater Nominal Output Level 0dBu (w/EQ flat, 0 dBu input) Maximum Output Level (Ref. 1 kHz @ Rated THD) Terminated w/600 Ohms +18 dBm Unterminated +20 dBu
PRESET SELECT PORT	Input Type Active low, internal pull-ups, diode isolation Tally Out Binary out, 3–digit encoded preset number Preset Select Logic Action Latching, mutual release; uses momentary closure Mute & Enable Logic Action Nonlatching: requires maintained closure Connector Female 15–pin Std. D-Sub w/locking screws Input Protection 1/2 max. line voltage, 12kV static Input Logic Levels (At Connector) ... Low < 3 volt, noise margin 3.8 volt min. Maximum Parallel Inputs 32 Maximum Input Sink Current Required 100mA Maximum Cable Length 600m (2000ft), #22AWG Switching Time 50ms Power Output +5VDC, ± 0.1V; 20mA, current limited, diode isolated
PROGRAMMING PORT	Serial Interface PA-422
MAINS POWER	Power Requirements 100 to 130 VAC 50 to 60 Hz; 16 watts maximum
ENVIRONMENTAL	Storage Temperature - 20° C to 60°C (- 4° F to 140° F) Operating Temperature 0° C to 50° C (32° F to 122° F) Humidity Less than 80% RH, non-condensing
MECHANICAL	DEQ-I Packaging 44 H x 483 W x 343 D mm (1.72 H x 19 W x 13.5 D in) Shipping: 6.3 Kg (14 lb) Net: 5.9 Kg (13 Lb) DEQ-II Packaging 76 H x 483 W x 343 D mm (3 H x 19 W x 13.5 D in) Shipping: 7.2 Kg (16 lb) Net: 6.8 Kg (15 Lb) Finish Textured black paint
OPTIONAL ACCESSORY	TWEEQ Software Specify TWEEQ-IBM or TWEEQ-Macintosh Includes software, PA-422 conversion box, PC - to - converter cable

OXMOOR FACTORY SERVICE

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Additional Installation & Operation Manuals are available from Oxmoor. Contact the Oxmoor Sales Department for pricing and other ordering information. Consult warranty statement for cautions concerning unauthorized service.

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