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Chapter 1

Introduction

This manual explains how to use the Dolby® CP650 setup software to configure the CP650.

1.1 Related Documents

*Model CP650 Digital Cinema Sound Processor Installation Manual*, Dolby Part No. 91569

*Model CP650 Digital Cinema Sound Processor User’s Manual*, Dolby Part No. 91570

1.2 Software Description

You use the CP650 setup software to set up and configure the Dolby CP650 from a Windows® PC. You can run this software while connected to a CP650 or as a stand-alone application. In either case, you can save parameter files on your local hard drive for later retrieval and editing.

1.3 System Requirements

The CP650 Setup Software runs on Windows 98, Windows NT® 4.0, Windows 2000, Windows ME, and Windows XP. Your PC must be a 486-type or better and have at least ten MB of available disk space. Only a single instance of the application can run at one time.

Note: Chinese and Japanese versions of the setup software are supported for Windows 2000 and Windows XP operating systems only.

1.4 Connecting the Hardware

1. Connect an RS-232 serial cable (pin-to-pin) to any available serial port on your Windows computer.

2. Connect the other end to the SERIAL DATA port on the CP650 (either front or rear port).

Note: You can connect only one serial device at a time to the CP650.
1.5 Installing the Software

The CP650 setup software is provided on a CD-ROM.

Note: If an earlier release of the CP650 setup software is installed on your system, use the Windows Add/Remove Programs utility to remove the earlier version before installing the newer release. Older versions of the CP650 Setup Software may not work correctly with newer versions of the CP650 firmware.

To install the CP650 setup application, follow these steps:

1. Open the CP650 Setup folder and run CP650Setup_a_b_c_d.exe, where a_b_c_d refers to the software version number.
2. Select the desired language.
3. Follow the screen prompts until the installation is complete.

1.6 Launching the Setup Application

To launch the CP650 setup application, follow these steps:

1. Click the Start button and scroll to Programs. In the Dolby folder, select Dolby CP650 Setup.

   The Dolby CP650 Setup window appears, as shown in Figure 1-1.

![Figure 1-1 Dolby CP650 Setup Window](image-url)
2. Select **Communications Setup** in the **Action** menu, then select the desired Com port for communicating with the CP650.

3. Select **Connect** in the **Action** menu to connect to the CP650. (For more information, see Section 2.2.2).

   You may be prompted to send or retrieve the settings. (Normally, you retrieve settings.) Once connected, **External Control Active** should appear on the CP650 front-panel display.

4. Adjust the settings in the setup window on your PC.

   When you select **Connect** from the menu or toolbar, the setup application attempts to connect the selected communications port on your PC to the serial interface on the CP650. After connecting, the setup application automatically retrieves the parameter file from the processor or prompts to retrieve or send settings. If you select **Retrieve**, a prompt tells you to save the current settings (the existing parameter file in your PC) prior to retrieving settings from the CP650. If you select **Send**, the parameter file from your PC is sent to the CP650.

![Figure 1-2 Retrieve/Send Dialog Box](image)

After connecting, you can adjust the settings using the **Setup** tabs. Any changes to the settings, such as moving a slider control, are reflected immediately in the current operation of the CP650. Changes are saved to the permanent CP650 flash memory when disconnecting or exiting from the setup software. If you turn off the CP650 before disconnecting from the setup software, any parameter changes are lost.

---

**Note:** This is different from operating through the front panel of the CP650. On the front panel, you must explicitly save each change by clicking the **OK** button before exiting the screen for that setting.

When connected, the **Fader** knob on the front panel is locked out and the **Fader** slider in the setup software is enabled; the **Mute** button remains functional.

Any adjustment modifies the open parameter file, and any attempt to exit or open a different file prompts you to save the current file.
2.1 Getting Started

When you launch the setup software, the Dolby® CP650 Setup window appears, as shown in Figure 2-1. This window includes a title bar that displays the application name and the name of the current parameter file, a menu bar, toolbar, status bar, and the CP650 setup tabs.

![CP650 Setup Window](image)

**Figure 2-1 CP650 Setup Window**

The application opens with a new, untitled parameter file window. When you change a setting in the current parameter file, that file is now modified. In such a case, if you try to open a different file (new or existing) or exit, a prompt reminds you to save the current settings. You can save the file with the existing file name or, in the case of an untitled file, with a new file name. In this way, you can create files with different configurations, without connecting to a CP650.

**Note:** When connected, some of the setup tabs can change the CP650 format. This change is not reflected on the front panel of the CP650.

**Caution:** Some tab selections automatically switch audio formats or change processing behavior. We recommend that you become thoroughly familiar with the setup software before connecting to a CP650. We do not recommend connecting during a show.
2.2 Menus, Toolbar, Status Bar

Following is a description of the CP650 setup menus, toolbar, and status bar.

2.2.1 File Menu

New (Ctrl+N)

Closes the current file (you are prompted to save if that file was modified) and a new untitled file with default settings opens.

Open (Ctrl+O)

Opens an existing file on your PC, with a filter for .dby files and CP650 configuration files. When you select a file, a prompt reminds you to save the current file if it was modified.

Save (Ctrl+S)

Saves your current settings. For an untitled document, you are prompted for a file name.

Save As

Saves the current settings to a file other than the currently active file in the setup window. That file then becomes the current setup file.

Revert to Saved

Cancels any changes to the open file and reverts to the previously saved version of that file. A confirmation prompt appears. After the original file is loaded, the settings are automatically sent to the CP650 (if connected).

Previous Files

Displays a list of the most recently used files on your PC.

Exit (Alt+F4)

Disconnects the CP650 (if connected), closes the current document, prompts to save (if modified), and exits the application. This operation is canceled if you select Cancel (when prompted to save the current modified document).
2.2.2 Action Menu

Following is a description of the Action menu options.

Connect/Disconnect

Establishes a serial connection with the CP650. After connecting, this menu option changes to Disconnect. The Disconnect option severs the serial connection and restores the CP650 to normal stand-alone operation. No confirmation prompt appears when you select Disconnect. After disconnecting, Connect reappears in the Action menu.

Figure 2-2 Connecting to the CP650

If successfully connected, the prompt to either Send or Retrieve settings may appear. Pressing <Esc> cancels the connection.

Update Software (Ctrl+U)

You can update the CP650 software from a file on your PC. The CP650 automatically reboots when the software update is completed. Following the reboot, the setup software reconnects and refreshes the CP650 settings to their prior state (before the update).

One of the key functions of the setup software is updating the embedded control and DSP code in the cinema processor’s flash memory. The update is a single package that represents a complete system snapshot. This package is available as a distribution disc or from the Dolby Laboratories Extranet. When selecting Update Software, you are prompted to save the current settings before proceeding. This is not absolutely necessary, as the existing parameters are packaged with the new software. However, we recommend saving the current settings. An Open file dialog box appears where you can locate the file on your system. The software update file uses a .bin file extension. When reading this file, the Update Software dialog box appears.
Click **Update Now** to begin the uninterruptible process. An update warning appears.

**Caution:** Do not interrupt the update process. If the connection is lost during the update, reconnect the CP650 and restart the software update process.

If the software update is not completed successfully before the CP650 main power is turned off, the CP650 does not function.

**Mute (Ctrl+M)**

The same as pushing the **Mute** button on the CP650 front panel or clicking the **Mute** button on the **Setup** toolbar. This option toggles the CP650 mute status.

**Communications Setup**

Selects the communications port for serial connection to the CP650. A list of the communication ports appears. You can select only from the available ports.

**2.2.3 Signal Menu**

Selects the **Signal Generator** source, which is used for several alignment operations. Certain setup tabs force or provide their own signal selection options. The current signal selection appears in the status bar area at the bottom of the main setup window.
Program

This is the default setting for the Signal Generator. Selecting Program restores the cinema processor to the last effective format.

The CP650 provides the following test signals:
• 100 Hz sine wave.
• 1 kHz sine wave.
• 10 kHz sine wave.
• Thump, at one-second intervals. This low-frequency signal uses a phase checker to determine the speaker polarity.

2.2.4 Window Menu

Event Log

Displays the Event Log window. The Event Log window immediately receives and displays the current event log information from the cinema processor. This log includes a date/time stamp, summary, and description of each event. The source and details of each event are determined by the cinema processor control software.

The Event Log window provides options for printing the Event Log and saving it as text.

```
Cinema Processor Event Log
File    C:\Dolby\version 2.3\Event log.txt
Date    10Jun2006
Time    10:54:49

System version 2.3.3.2
Setup version  2.3.3.4

Cinema Processor Option Card:  Cat. No. 791 / Cat. No. 773
Cinema Processor DSP Version Number:  04030400040504030301010202020101
Cinema Processor MAC Address:  00 D0 46 02 0B 75

TimeSummaryDescription
--------------------
10-JUN-06 10:53:06Startup
```

Figure 2-5   Event Log Example
Network Settings

Enables the CP650 to communicate with other computers. The CP650 uses the Internet Protocol (IP) for addressing and the Transmission Control Protocol (TCP) for delivery of network communications. The network settings in Figure 2-6 specify TCP/IP over Ethernet networking.

![Network Settings](image)

**Figure 2-6** Network Settings

Following is a description of each of the network settings:

**Host Name** allows you to enter a name for the CP650 that is used by other machines for remote access.

**IP Address** identifies the CP650 on a network. The CP650 default IP address is 192.168.99.200. Each machine's address should be unique on a network.

**Subnet Mask** enables the CP650 to recognize messages that are sent to more than one CP650 or other machines on the network (broadcast messages). The default setting is 255.255.255.0.

**Gateway** address is set to the IP address of the router interface. The gateway address directs the CP650 where to send communications that are addressed to other interfaces.

### 2.2.5 Help Menu

**Help Topics**

When you select this option, a PDF version of this manual appears.

**About this Software . . .**

Displays the CP650 setup software revision number, plus copyright and license information.
2.2.6 Toolbar

Displays buttons that provide quick access to commonly used menu options, a master fader, and mute control. The toolbar is oriented vertically on the left edge of the window and displays the following buttons:

New

Closes the current document (a prompt appears to save the current document if it was modified) and a new untitled document with default settings appears.

Open

Opens an existing file on your PC. If you select a file, the current file closes and a prompt appears for saving the file (if it was modified). Cinema Processor files use the .dby extension.

Save

This option is enabled if the current document is modified. The document is saved with its current settings and the same name. For an untitled document, a prompt asks for a file name. After saving, this option is disabled, until the document is modified.

Connect/Disconnect

Establishes a serial connection to the cinema processor. If successfully connected, follow the prompt to either send or retrieve settings as necessary. After connecting, this option changes to Disconnect.

The Disconnect option severs the serial connection and restores the CP650 to normal stand-alone operation. The setup software does not prompt, save, exit, close, or otherwise alter the current parameter file when disconnecting. The Disconnect option then changes back to Connect. When disconnecting, any changes to the CP650 settings are saved to the unit's permanent flash memory.

Master Fader

Adjusts the output gain according to the Fader Law shown in Figure 2-7. As the fader increases from 0 to 4 in increments of 0.1, the gain increases from –90 to –10 dB. This translates to an increase of 20 dB per whole fader unit. As the fader increases from 4 to 10 in increments of 0.1, the gain increases from –10 to +10 dB. This translates to an increase of 3 1/3 dB per fader unit. The fader level appears on the CP650 front-panel LCD in a two-digit, seven-segment display.
Running the Setup Software

Profile Tab

Figure 2-7  Fader Law

The master fader includes a fader level display, a slider to adjust the level, and a mute button that correspond directly to the analogous display and controls on the front panel of the cinema processor. The master fader is enabled whenever the setup software is connected, except when a tab is displayed that prescribes that the master fader be fixed at 7.0 (for example, B-Chain EQ, Room Levels when Pink Noise is selected).

Mute

Controls the CP650 master mute function. When the mute function is active, the Mute key on the CP650 front panel flashes. When the unit is unmuted, the illumination extinguishes. You can set the speed of the mute/unmute functions using the Fade In Speed and Fade Out Speed control described in Section 2.13.1.

2.2.7  Status Bar

This area (at the bottom of the setup window) displays help text for menu options, the current status of the signal source, and the baud rate.

2.3  Profile Tab

This tab allows you to enter identifying information for the cinema processor, theatre, and settings file. When a new file is created (at startup or by using File > New), the Profile tab becomes the top tab, and the cursor is set to the first field for data entry.

You should use the Profile tab to record system configuration details. The information entered, along with the setup parameters, can then be saved to a file and reloaded as needed.
2.3.1 **Cinema Processor Serial Number**

In this field, enter the serial number of the cinema processor to maintain a full record of the system setup.

2.3.2 **Dolby Digital Reader 1/2 Unit Serial Numbers**

In these fields, enter the digital reader serial numbers to maintain a full record of the system setup.

2.3.3 **Cinema Processor Firmware Version Number**

The CP650 sends this information to your PC when a connection is made and displays it in this field.

2.3.4 **Cinema Processor DSP Version Number**

The CP650 sends the module version string to your PC when a connection is made and displays it in this field.

2.3.5 **Cinema Processor Option Card**

The CP650 sends information for all installed option cards to your PC when a connection is made and displays it in this field.

2.3.6 **Cinema Processor MAC Address**

Your PC reads the cinema processor MAC address and displays it in this field.
2.3.7 Additional Fields

Enter data for the remaining fields as desired: Project Name, Theatre Name, Screen Number, Projector Model Number, Automation System, and Comments. These entries, along with cinema processor serial number and reader serial number are saved to the .dby file on disk. All fields except Comments are also maintained in the CP650 flash memory.

2.4 Optical Tab

Use this tab to configure the optical settings in the cinema processor, including level and slit-loss equalization. When the Optical tab is selected, the format automatically changes to allow the appropriate adjustments. Optical adjustments require the use of Cat. No. 69T and Cat. No. 69P test films.

![Optical Tab Window](image)

**Figure 2-9** Optical Tab Window

Following is a description of the Optical Tab options.

2.4.1 Projector 1/Projector 2

Click on Projector 1 or Projector 2 to begin adjusting the respective projector.

2.4.2 Lt Level and Rt Level Adjustments

While running the Cat. No. 69T Dolby Tone Test Film, you can adjust the Lt and Rt levels individually using the respective slider until both green elements illuminate. This ensures the correct input level to the CP650. Alternately, click Auto Level to allow the CP650 to perform the adjustment.
2.4.3 **Auto Level**

Allows the CP650 to automatically adjust the Lt and Rt preamp gain levels.

![Auto Level Adjustment](image)

**Figure 2-10 Auto Level Adjustment**

2.4.4 **Slit-Loss EQ**

A unique filter that compensates for optical deficiencies resulting from slit-height variations. The curve provides a shaped high-frequency boost that compensates for these variations. The frequency at which correction is necessary may vary by reader type.

**Left and Right EQ Adjustments**

While running the Cat. No. 69P Dolby Pink Noise Film, adjust the **Left** and **Right** Slit-Loss EQ for the most extended high-frequency response without forming a peak. (Click the **Left** or **Right** slider to activate the spectrum analyzer display.)

**Auto EQ**

Allows the CP650 to perform the **Left** and **Right** slit-loss EQ adjustment. A dramatic difference between the Left and Right levels will indicate an optical problem.
2.5 Room Levels Tab

The current signal selection is maintained between setup parameters that support the Pink Noise option (B-Chain EQ, Room Levels, and Subwoofer EQ). Switching the signal mode to Pink Noise clears all the channels.

With Pink Noise on, all channels are mutually exclusive, so selecting any one clears any other selection. To select multiple channels, press <Control> while making selections. In all cases, the subwoofer channel is independent.

![Room Levels Tab Window](image)

**Figure 2-11** Room Levels Tab Window

Following is a description of the Room Levels Tab options.

2.5.1 Internal SPL Meter

Sets the room levels for each channel, if calibrated. You can connect the microphone to either the rear-panel MIC INPUT XLR connector or the MIC MUX connector in the setup control panel (located behind the front-panel access door, as described in the Dolby CP650 Cinema Processor Installation Manual).

![Internal SPL Meter](image)

**Figure 2-12** Internal SPL Meter
**Internal Calibration**

Enables microphone calibration. Pink Noise is then routed through the center-channel. An input-level meter window opens to enable microphone calibration. An ideal level is indicated when one or both green LEDs illuminate.

![Calibrate Microphone](image)

**Figure 2-13  Calibrate Microphone Input Level**

While using an external SPL meter in close proximity to the microphone, dial in the SPL reading to match what is detected in the theatre. Click **Calibrate** to calibrate the CP650 and the microphone to the SPL reading. If an error message appears, indicating the microphone level is too low or too high, check the connections, phantom power, and mic level trimpot located on the Cat. No. 772A card, accessible from the CP650 front panel.

![Error Message](image)

**Figure 2-14  Error Message for Failed Calibration**

**Note:** Full-range Pink Noise is output only to the low-frequency element regardless of Crossover mode settings during initial microphone calibration (Cat. No. 791 option card only).
2.5.2 Output Level Adjust

This parameter provides a check box, label, static value display, and slider control for each channel, as determined by the CP650 configuration. The value always displays the current channel slider setting that, when connected, always matches the setting currently in use in the cinema processor. Each increment of the displayed relative number represents approximately 0.25 dB of range adjust, from a value of 1 to 127.

**Note:** Le and Re channels require the installation of the Cat. No. 791 option card.

### Subwoofer Levels

Pressing this button displays the **Subwoofer Level** window. In this window, you can level trim the two subwoofer modes, optical and digital. Check boxes are provided to turn **Center Noise** and **Reverse Sub Polarity** on and off when you select **Optical Level**; these check boxes are disabled when you select **Digital Level**.

**Note:** The reference values do not appear on the subwoofer spectrum analyzer unless the microphone is calibrated using the **Room Levels** tab.

**Figure 2-15** Subwoofer Level Window

The initial digital subwoofer level setting is 1. The optical subwoofer level is relative to the digital level. If adjusting the **Digital Level**, be sure to check the **Optical Level** as well. Trim the **Digital Level** to +10 dB; Trim the **Optical Level** to 0 dB.

**Center Noise** and **Reverse Sub Polarity** are available only when adjusting the optical subwoofer level.

The **Center Noise** check box corresponds to the Center channel check box on the **Room Levels** tab. It is initially selected if the Center channel check box is selected on the **Room Levels** tab. If using the subwoofer spectrum analyzer, **Center Noise** should reach the 0 dB line.
The **Reverse Sub Polarity** check box is initially clear. It is used to check for subwoofer center-channel phase matching. With **Optical Level** and **Center Noise** selected, there should be some adding of the lower frequencies; with **Reverse Sub Polarity** selected, there should be some noticeable subtraction of lower frequencies. If the **Reverse Sub Polarity** check box is set when leaving the **Subwoofer Levels** window, a warning message verifying speaker connections appears and the polarity returns to normal.

### 2.5.3 Signal

**Signal Generator**

The **Signal Generator** selection is maintained between parameters that support the Pink Noise option (B-Chain EQ, Room Levels, and Subwoofer EQ). The Signal Generator default state is set to **Program** (Film Sound) and can be changed from the **Signal** drop-down menu.

**Pink Noise**

Activates Dolby level pink noise. Dolby level pink noise is a random noise across the audio spectrum 20 Hz to 20 kHz of equal amplitude that enables accurate frequency response measurements. Initial selection of this option clears all output channels. You must then manually select the channels to which to apply the noise. If you select **Pink Noise** when switching to a setup tab other than **B-Chain EQ**, **Subwoofer EQ**, or **Crossover**, the noise is turned off, and the signal output is returned to the global **Signal Generator** setting (**Program**).

### 2.5.4 Headroom Configuration

Headroom is the leftover capacity of an audio component between the signal’s normal and maximum operating level before the onset of clipping. You configure the headroom to specify how this operates. There are three options, which are described below. The **Unity Gain** option applies only when a Cat. No. 778 (digital I/O) card is installed.

![Headroom Configuration Window](image-url)
Following is a description of the **Headroom Configuration** options:

**Typical**

The default setting, which we recommend for configuring the headroom. All of the headroom is available for use by the fader and to boost equalization.

**Noise Floor Optimization**

Utilizes any available leftover capacity to improve the CP650 noise floor. Fader settings above 7.0 may clip high level signals.

**Unity Gain**

Allows a digital signal to pass through the CP650 while maintaining its original level. The B-Chain EQ is set flat to avoid inadvertent clipping. The output level trims are set to maximum. Fader settings above 7.0 or a boost in EQ may clip high level signals. This option is available when a Cat. No. 778 card is installed.

**Test**

Returns all CP650 Unity Gain settings to default settings (EQ and output level trims) to ensure true Unity Gain for a temporary confidence check. Click **OK** to return to normal operation.

![Unity Gain Test Window](image)

**Figure 2-17** Unity Gain Test Window

### 2.5.5 Le/Re

If a Cat. No. 791 Digital Crossover Card or Cat. No. 778 Digital I/O Card is installed, you can select **Le/Re** to enable the additional screen channels. You can enable Le and Re channels only in full-range or two-way mode (see Section 2.6.1).
2.5.6  Bypass

Pressing this button displays the **Bypass Level Adjust** window. This places the CP650 in Format 05 (Dolby SR). Clicking **Bypass** switches the CP650 into Bypass mode.

![Bypass Level Adjust Window](image)

**Figure 2-18**  Bypass Level Adjust Window

While running an optical soundtrack, adjust the **Bypass Level** trimpot, located on the Cat. No. 772A card, which you can access using the CP650 front-panel display. This equalizes the sound pressure level between **Bypass** and **Dolby SR**.

**Adjusting the Bypass Level**

On CP650’s running software version 2.3.x and higher, the test point signal that feeds an external RTA is enabled to assist in setting the bypass output.

![Bypass Level Adjustment](image)

**Figure 2-19**  Bypass Level Adjustment

Adjust the pot(s) until the audio level in the auditorium sounds similar when operating in Dolby SR mode.
Running the Setup Software

Crossover Tab

Note: If your CP650 is equipped with a Cat. No. 791 Digital Crossover Card, both the Main and HF bypass trimpots must be adjusted. With the RTA connected, play a pink noise test loop and adjust both trimpots for a smooth frequency response and proper level.

2.6 Crossover Tab

If the setup software detects a Cat. No. 791 option card, the Crossover tab functions are enabled. Crossover provides digital filtering that assigns frequency bands to speaker components.

It is possible to select Full Range, 2-Way, or 3-Way crossover. The Full Range choice signifies no crossover. You can enable Left Extra and Right Extra channels (Le/Re) on the Crossover tab when Full Range or 2-Way mode is selected.

Note: You should perform crossover adjustments prior to any B-Chain alignment.
Following is a description of the **Crossover** Tab options:

### 2.6.1 Mode

The default **Mode** is **Full Range**. Select **2-Way** or **3-Way** mode, as required for the installed speaker system. Changing the mode initializes crossover parameter settings; to save the existing settings, choose **File > Save** before selecting a different Crossover mode.

**Note:** Selecting from the **Presets** list (see Section 2.6.3) automatically sets the appropriate mode.

**Full Range**

Select **Full Range** when no crossover is desired. You can enable Le/Re channels in this mode.

**2-Way**

Select **2-Way** for systems that require separate low- and high-frequency speaker elements. This option is also used for three-way systems that contain a passive crossover network between the mid- and high-frequency speaker elements. In this mode, you can enable Le/Re channels.

![Figure 2-22 Two-Way Crossover Window](image)
3-Way

Select 3-Way for systems that require separate low-, mid-, and high-frequency speaker elements. You cannot enable Le/Re channels in this mode.

![3-Way Crossover Window](image)

**Figure 2-23** Three-Way Crossover Window

**Le/Re**

When selecting Full Range or 2-Way crossover, checking this box turns on the Le/Re channels, enabling B-Chain EQ and Room Levels adjustments; uncheck the box to turn the channels off. There is no crossover control for the Le/Re channels when operating in Full Range mode.

### 2.6.2 Channel Selection

Set the crossover parameters for Left, Center, and Right independently by checking the desired channel.

**Note:** You must use the same crossover mode (2-way or 3-way) for all channels.
2.6.3 Presets

We recommend selecting a preset crossover configuration. You can then modify the settings, as required for the specific installation. Preset crossover values are provided for the following speakers:

- Dynaudio M3F
- EAW CB152
- EAW CB153
- EAW CB259
- EAW CB2591
- EAW CB423M
- EAW CB423MX
- EAW CB523M
- EAW CB523MX
- EAW CSC723
- EAW CSC723X
- EAW CSC923
- EAW CSC923X
- EAW MC4953
- EAW MC4953B
- EAW MC4973
- EAW MC4973B
- EV® TS550D-LX
- EV TS550DMLXLX
- EV TS9040D-LX
- EV TS940-D-LX
- EV TS-940S
- EV TS992-LX
- EV TS993C
- EV VARIPLEX
- EV VARIPLEX-B
- EV VARIPLEXX
- JBL 3115
- JBL 3632
- JBL 3632T
- JBL 3678
- JBL 4622
- JBL 4632
- JBL 4632T
- JBL 4670 D
- JBL 4675C 4LF
- JBL 5671
- JBL 5672
- JBL 5674
- KCS S-2001 D
- KCS S-2501
- KCS S-3001
- KCS S-5001
- KCS S-6000
- KCS S-7000
- KCS S-7801
- KCS S-7802
- KCS S-7901
- KCS S-7902
- KCS S-8000
- KCS S-8500
- KLIPSCH KPT-941-T
- KLIPSCH KPT-JUBILE
- KLIPSCH
- KLIPSCH KPT-942
- KLIPSCH KPT-325
- KLIPSCH KPT-535-N
- KLIPSCH KPT-535-T
- KLIPSCH KPT-904-T
- MARTIN SCREEN2
- MARTIN SCREEN4
- MARTIN SCREEN5
- MARTIN SCREEN6
- QSC SC-412
- QSC SC-322
- QSC SC-422
- QSC SC-413- Bi-amp
- QSC SC-323- Bi-amp
- QSC SC-423- Bi-amp
- QSC SC-433-Bi-amp
- QSC SC-413-Tri-amp
- QSC SC-323-Tri-amp
- QSC SC-423-Tri-amp
- QSC SC-433-Tri-amp
- SA S 26
- SA S 27
- WSS 952
- WSS 953
- WSS 953 X2
- WSS 971
- WSS 982
- WSS 982 D
- WSS 983
2.6.4 Crossover Spectrum Analyzer

The cutoff frequencies appear on the spectrum analyzer as colored vertical dotted lines. A dark blue line represents the Cutoff frequency of the Low range. The red line indicates the High range cutoff. When you select 3-Way Mode, a green line indicates the low-end cutoff of the mid range; light blue indicates the high-end cutoff of the mid range.

![Crossover Display](image)

Figure 2-24 Crossover Display

2.6.5 Cutoff

The Linkwitz-Riley cutoff frequency is defined as the –6 dB point of the filter slope. The Butterworth cutoff frequency is defined as the –3 dB point of the filter slope.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Low</th>
<th>Mid Range Lower</th>
<th>Mid Range Upper</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Way</td>
<td>160–2,000 Hz</td>
<td>----</td>
<td>----</td>
<td>160–2,000 Hz</td>
</tr>
<tr>
<td>3-Way</td>
<td>160–800 Hz</td>
<td>160–800 Hz</td>
<td>800–3000 Hz</td>
<td>800–3000 Hz</td>
</tr>
</tbody>
</table>

2.6.6 Slope

You can manually set the Slope to 12, 18, or 24 dB/octave if Butterworth filtering is selected.

2.6.7 Filter Type

Two Filter Type options are provided: Linkwitz-Riley and Butterworth. Linkwitz-Riley, the default, fixes the lowpass slope to 24 dB/octave and the highpass slope to 18 dB/octave. The Butterworth filter allows manual selection of the slope.
2.6.8 Delay

You need to adjust the Delay settings to compensate for different physical mounting positions of the speaker drivers. You can set the Delay from 0 to 4 ms in 0.1 increments. In practice, a 1 ms delay corresponds to approximately 30 cm (1 ft) of speaker driver offset.

![Diagram of Delay]

**Figure 2-25** Speaker Position

2.6.9 Channel Level

Ch. Level adjusts the signal level of all frequencies. Changes made to the Output Level on the Room Levels tab are reflected here; similarly, changes made to the Ch. Level are reflected on the Room Levels tab.

Mid adjusts only the signal level within the mid range frequencies.

High adjusts the signal level above the highpass filter.

2.6.10 Polarity Invert

The Polarity Invert controls are diagnostic tools for testing the output response during crossover adjustment. The phase of each speaker element (low, mid, and high) can be inverted by checking the associated box. When observing the spectrum analyzer, a decrease in level at the crossover frequency should occur when the phase of an associated speaker element is inverted.

**Note:** The Polarity Invert controls are not effective during normal audio playback. The indicated polarity settings are imposed only during crossover adjustment for diagnostic purposes.

2.6.11 Signal Generator/Pink Noise

Use these buttons to select the signal source as Signal Generator or Pink Noise. The spectrum analyzer is active only when Pink Noise is selected.
2.6.12  Bypass Level

Pressing this button displays the **Bypass Level Adjust** windows. Clicking the **Bypass** check box switches the CP650 into Bypass mode. The spectrum analyzer displays the signal from the microphone input. With a Cat. No. 791 Digital Crossover Card installed, this function enables proper adjustment of the low- and high-frequency bypass trim pots. To achieve a smooth and equal sound pressure level between Bypass and Dolby SR, adjust the two Bypass Level trim pots while running a pink noise test loop. These trim pots are located on the Cat. No. 772A card, which you can access from the CP650 front-panel display (see Figure 2-20).

2.6.13  Crossover Adjustment Procedure

Before proceeding with the crossover adjustment, verify that the amplifier gain controls are set appropriately. Also verify that the microphone was calibrated and the channel levels were set properly on the **Room Levels** tab. You should adjust final room levels after completing the B-Chain alignment.

To adjust the crossover, we recommend the following procedures:

**Using Presets**

1. Select **2-Way** or **3-Way** mode to enable the **Presets** selection. (The mode changes if indicated by the speaker system selected in step 2.)
2. Select the appropriate speaker system from the **Presets** list.
3. Select **Pink Noise**.
4. Select the channel: L, C, or R.
5. Adjust the **RTA Range Adjust** until the low-frequency bands line up with the X-curve overlay.
6. Select **Mid** and adjust the slider to best match the mid-range frequencies to the curve overlay.
7. Select **High** and adjust the slider to best match the high-range frequencies to the curve overlay.
8. Return to step 4 and repeat the procedure for the remaining channels.
9. Proceed to the **B-Chain EQ** tab.
**Manual Adjustment**

1. Select **2-Way** or **3-Way** mode.
2. Select the **Filter** type: **Linkwitz-Riley** or **Butterworth**.
3. Select the **Cutoff** frequencies based on speaker characteristics.

**Note:** To determine the optimum cutoff frequencies, it may help to observe the frequency response of each separate speaker element. Individually select **Ch. Level**, **Mid**, or **High** to observe where the associated speaker frequency response rolls off naturally. You should do this with the cutoff frequencies extended slightly beyond the speaker’s characteristics. Use this information to set the cutoff frequencies.

**Caution:** Be careful not to extend the high-frequency lowpass cutoff below the high-frequency diaphragm’s recommended range.

4. If the filter type is **Butterworth**, select the **Slope** values.
5. Select the **Delay** based upon the speaker driver location (front to back).
6. Select **Pink Noise**.
7. Select the channel: **L**, **C**, or **R**.
8. Adjust the **RTA Range Adjust** until the low-frequency bands line up with the X-curve overlay.
9. Select **Mid** and adjust the slider to best match the mid-range frequencies to the curve overlay.
10. Select **High** and adjust the slider to best match the high-range frequencies to the curve overlay.
11. Adjust the **Cutoff**, **Slope**, and **Delay** settings to obtain the smoothest transition at the crossover regions on the spectrum analyzer.

![Crossover Spectrum Analyzer](image)

**Figure 2-26**  Crossover Spectrum Analyzer

12. Return to step 7 and repeat the procedure for the remaining channels.
13. Proceed to the **B-Chain EQ** tab.
2.7 B-Chain EQ Tab

Use the B-Chain EQ tab to adjust each channel’s frequency response to achieve the desired response curve. You do this by using a combination of bulk and one-third octave EQ.

![B-Chain EQ Tab Window](image)

**Figure 2-27** B-Chain EQ Tab Window

Following is a description of the B-Chain EQ Tab options.

2.7.1 Channels

The current channel name appears at the top of the B-Chain EQ tab, as selected at the bottom of the tab. The solid line on the graph represents the standard ISO 2969 X-curve. When you select one of the frequency sliders, the corresponding line segment appears in yellow. You can then adjust the slider for boost or cut.

With the cursor anywhere on the B-Chain EQ tab, click the right mouse button to display the Copy and Paste functions. You can copy frequency settings from one channel to another. You should use copy and paste functions carefully, as they may not provide an ideal EQ.

2.7.2 EQ Assist

Use this button to apply an approximation algorithm to bring the channel’s EQ close to the desired response curve. You should always adjust Bulk EQ, as well as amplifier gains, before applying EQ Assist. This function is enabled only if the Internal SPL Meter is calibrated on the Room Levels tab and Pink Noise is activated.

To prevent overcompensation for possible speaker problems, the 40 Hz, 50 Hz, 63 Hz, 12.5 kHz, and 16 kHz bands are not automatically adjusted. You must adjust these bands manually.

**Note:** For optimum results, adjust all channels to their recommended sound pressure levels (85 dB screen channels, 82 dB surround channels) prior to performing EQ Assist.
2.7.3 Flatten EQ

Returns all frequency bands and Bulk EQ to zero. A confirmation prompt appears.

2.7.4 Bulk EQ

Adjusts the bulk equalizers. It is important to adjust both the bass EQ and the treble EQ prior to adjusting the individual one-third octave bands.

Bass Level

Adjustable from –6 to +6 dB in 0.2 dB steps. Use the slider to make adjustments to match the reference curve.

Treble Level

Adjustable from –10 to +10 dB in 0.2 dB steps.

Treble Freq

The treble corner frequency can be 1, 2, 3, or 4 kHz, and applies only to the Left, Center, and Right channels. Adjust to match the reference curve as closely as possible. (The corner frequency is fixed at 2 kHz for the Surround channels.)

2.7.5 Channel Level

Adjusts the output level of the currently selected channel, as reflected on the Room Levels tab. This does not affect the overall level seen on the spectrum analyzer because the average of frequency bands 7 through 20 is always placed at 0 dB.

2.7.6 Signal Generator/Pink Noise

Specifies the signal source as either Signal Generator or Pink Noise. The spectrum analyzer is active only when you select Pink Noise.
2.8 Subwoofer EQ Tab

Adjusts the subwoofer’s parametric equalizer. The three parameters that define the equalizer are Frequency, Q, and Cut. Identify a frequency region that may contain a peak and adjust the parametric equalizer to obtain a flatter response.

Note: The vertical axis is unlabeled if the Internal SPL Meter was not calibrated using the Room Levels tab.

2.8.1 Frequency

The filter’s center frequency is adjustable from 25 to 125 Hz. The approximate corresponding band is highlighted on the real-time analyzer.

2.8.2 Q

Defines the width of the Cut band. The Q settings are 0.5, 1, 2, and 4.

2.8.3 Cut

The Cut value is applied to the frequency, as selected above, reducing the output level in the Q region. The cut-amount is adjustable between –12 and 0 dB in 0.2 dB steps.

2.8.4 Graph

When you activate Pink Noise, the graph displays the subwoofer frequency response. With 0 dB of Cut, identify the frequency region with the tallest bump. Adjust Frequency, Q, and Cut to achieve the flattest frequency response.

2.8.5 Signal Generator/Pink Noise

Specifies the signal source as either Signal Generator or Pink Noise.
2.9 Mono Tab

Sets the CP650 to Format 01. The functions on this tab apply to the center-channel while in Format 01.

![Figure 2-29 Mono Tab Window](image)

Following is a description of the Mono Tab options.

2.9.1 Mono Level Trim

Mono Level Trim adjustment can vary between –12 and 0 dB in 0.2 dB steps. This trim is an offset from the normal playback level.

2.9.2 Mono EQ

While monitoring film program material, adjust Mono EQ for preferred audio tonal quality. There are 16 steps between the low- and high-frequency Mono EQ settings.
2.10 Delays Tab

You should adjust the **Optical Surround Delay** so that sounds from the rear of the theatre (Surround channels) arrive at the listener’s ear approximately 20 ms after the arrival of sound from the screen speakers.

The **Digital Surround Delay** should be adjusted so that sounds from the rear of the theatre (Surround channels) arrive at the listener’s ear at the same time as the screen speakers.

![Figure 2-30 Delays Tab Window](image)

Following is a description of the Delays Tab options.

2.10.1 Surround Delay

**Optical**

The **Optical Surround Delay** is adjustable from 20 to 150 ms in 1 ms steps. When the **Optical** delay level is set manually, the **Digital** delay automatically changes to the same level minus 20 ms, but can be adjusted separately.

**Digital**

The **Digital Surround Delay** is adjustable from 20 to 150 ms in 1 ms steps.

2.10.2 Delay Calculation

The setup application can calculate and set both **Optical** and **Digital Surround Delay** values based on theatre measurements entered here.

**Feet/Meters**

Measurements may be made in **Feet** or **Meters**. Select the desired units.
Distance from screen to rear wall of theatre

Enter values between 0 and 200, in Feet or Meters.

Average distance between left and right Surround channels

Enter values between 0 and 140, in Feet or Meters.

Calculate

Calculates and automatically sets the Surround Delay.

2.11 Dolby Digital Tab

Selecting this tab automatically sets the CP650 to Format 10, Dolby Digital, and Format 05, Dolby SR. This unique configuration allows the adjustment of the Dolby Digital Reader delay while listening for audio synchronization.

Figure 2-31  Dolby Digital Tab Window

Following is a description of the Dolby Digital Tab options.

2.11.1 Reader Delay

Synchronizes the digital soundtrack with the analog track and the picture. You can do this by selecting the reader model or by manually adjusting the number of perforations when using the Cat. No. 1010 Sync Test Film.

Select Dolby Digital Reader Model

The specific reader model selection is shown in Table 2-2. Selecting a reader model provides an approximation of the correct reader delay. Adjust the delay using the Cat. No. 1010 Sync Test Film.
### Table 2-2  Digital Reader Models

<table>
<thead>
<tr>
<th>Reader Model</th>
<th>Perforations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other (default)</td>
<td>20</td>
</tr>
<tr>
<td>Dolby Cat. No. 699/700/701/702</td>
<td>250</td>
</tr>
<tr>
<td>BACP DSTR-20 penthouse</td>
<td>250</td>
</tr>
<tr>
<td>Ballantyne 35 penthouse</td>
<td>247</td>
</tr>
<tr>
<td>Century projector with component engineering or Kelmar basement</td>
<td>20</td>
</tr>
<tr>
<td>Century 35 mm (SA) penthouse</td>
<td>245</td>
</tr>
<tr>
<td>Century 35/70 (JJ) penthouse</td>
<td>309</td>
</tr>
<tr>
<td>China Film (Zhuhai) Cinema Service ZRS-05</td>
<td>22</td>
</tr>
<tr>
<td>Christie basement</td>
<td>26</td>
</tr>
<tr>
<td>Christie penthouse</td>
<td>250</td>
</tr>
<tr>
<td>Cinemeccanica Victoria 5 basement</td>
<td>28</td>
</tr>
<tr>
<td>Cinemeccanica Victoria 5 penthouse</td>
<td>252</td>
</tr>
<tr>
<td>Cinemeccanica Victoria 8 penthouse</td>
<td>260</td>
</tr>
<tr>
<td>Ernemann 15</td>
<td>30</td>
</tr>
<tr>
<td>Kinoton FP 30 D</td>
<td>26</td>
</tr>
<tr>
<td>Meopta Meo 5 XB1</td>
<td>20</td>
</tr>
<tr>
<td>Meopta Meo 5 XB3</td>
<td>20</td>
</tr>
<tr>
<td>Norelco/Kinoton AAll (DP70) penthouse</td>
<td>283</td>
</tr>
<tr>
<td>Proyecson PX-35 basement</td>
<td>23</td>
</tr>
<tr>
<td>Shanghai Paradise basement</td>
<td>28</td>
</tr>
<tr>
<td>Simplex with component engineering or Kelmar basement</td>
<td>26</td>
</tr>
<tr>
<td>Simplex 35 mm (XL) penthouse</td>
<td>242</td>
</tr>
<tr>
<td>Simplex 35/70 penthouse</td>
<td>298</td>
</tr>
</tbody>
</table>

**Perforations**

You can set the number of perforations to delay from 16 to 512 by using the up and down arrows. When you select a reader, the number of perforations changes automatically.
2.11.2 Auto Dolby Digital

If Dolby Digital is playing and another film format is selected, the CP650 changes to the selected format, and Auto Dolby Digital is temporarily disabled. Auto Dolby Digital is re-enabled when a non-film format is asserted and then a film format is asserted. At that time, the system is ready to change to the target format automatically when Dolby Digital audio appears.

Auto Digital Target

The Auto Digital Target may be Format 10 or Format 13 if a Surround EX™ card is installed. You can assign the Auto Digital Target to Button 01, Button 04, or Button 11.

2.11.3 Video Level

Opens the Video Level window. The Dolby Digital Reader video amplitude is indicated in the form X.X volts. The meter in this window does not replace the use of an oscilloscope for checking the waveform uniformity. For complete alignment instructions, see the Model CP650 Digital Cinema Sound Processor Installation Manual.

![Video Level Window](image)

Figure 2-32 Video Level Window

2.11.4 Reversion Mode

With Reversion mode set to Normal, the audio may revert to the analog soundtrack under certain conditions, if necessary. A setting of No Reversion retains the CP650 target format regardless of the condition of the Dolby Digital data.

![Reversion Mode](image)

Figure 2-33 No Reversion Warning
2.11.5 Auto Surround EX

The CP650 automatically switches to Surround EX mode when all of the following conditions are met:

- A Surround EX option board is installed
- Format 10 is asserted
- Surround EX is present within the Dolby Digital data
- Auto Surround EX is enabled

![Auto Surround EX Warning](image)

Figure 2-34 Auto Surround EX Warning

2.12 Formats Tab

Use this tab to enable and assign Preset Fader settings and user Formats, select a Power-on Format, and enter a Global Delay for a Dolby Digital Cinema system.

![Formats Tab Window](image)

Figure 2-35 Formats Tab Window

Following is a description of the Formats Tab options.

2.12.1 Preset Fader

Click on the desired box(es) to enable the Preset Fader for the corresponding Format Button(s). Use the up and down arrows to modify the fader setting between 0.0 and 10.0. The default fader setting is 7.0. For more information on fader settings, see Section 2.2.6.
2.12.2  Global Delay

Specifies an audio delay for a Dolby Digital Cinema system (in addition to the built-in CP650 processing latency). This function synchronizes the audio with the video. In addition, digital cinema DLP projectors add a video processing delay. Use the up and down arrows to set a Global Delay between 0–170 ms.

**Note:** Systems that use an external video scaler may launch an additional decoding delay.

User Definable Formats

You can set Format Buttons 1, 04, 11, U1, U2, and NS to any of the formats listed in Table 2-3.

<table>
<thead>
<tr>
<th>Number</th>
<th>Format</th>
<th>Number</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Mono</td>
<td>71</td>
<td>Nonsync 1 Mono Center</td>
</tr>
<tr>
<td>04</td>
<td>Dolby A-type</td>
<td>73</td>
<td>Nonsync 1 Pro Logic® Left-Center Right</td>
</tr>
<tr>
<td>05</td>
<td>Dolby SR</td>
<td>74</td>
<td>Nonsync 1 Pro Logic no subwoofer</td>
</tr>
<tr>
<td>10</td>
<td>Dolby Digital</td>
<td>75</td>
<td>Nonsync 1 Pro Logic + subwoofer</td>
</tr>
<tr>
<td>11</td>
<td>External 6-channel</td>
<td>76</td>
<td>Nonsync 2 Pro Logic + subwoofer</td>
</tr>
<tr>
<td>13</td>
<td>Dolby Digital Surround EX</td>
<td>80</td>
<td>Master Digital In¹</td>
</tr>
<tr>
<td>20</td>
<td>35 mm magnetic, 3-channel</td>
<td>81</td>
<td>Master Digital In + Surround EX¹</td>
</tr>
<tr>
<td>22</td>
<td>35 mm magnetic, 4-channel</td>
<td>85</td>
<td>5-Channel Screen²</td>
</tr>
<tr>
<td>42</td>
<td>70 mm Dolby Stereo</td>
<td>86</td>
<td>5-channel screen + Surround EX²</td>
</tr>
<tr>
<td>60</td>
<td>Nonsync 1</td>
<td>87</td>
<td>External 6-channel + Surround EX¹</td>
</tr>
<tr>
<td>61</td>
<td>Nonsync 2</td>
<td>88</td>
<td>6-channel PCM²</td>
</tr>
<tr>
<td>64</td>
<td>Public Address Center Channel</td>
<td>89</td>
<td>6-channel PCM + Surround EX²</td>
</tr>
<tr>
<td>65</td>
<td>Public Address Surround Channels</td>
<td>90</td>
<td>7-channel PCM²</td>
</tr>
<tr>
<td>66</td>
<td>Test Tone 320 Hz</td>
<td>92</td>
<td>Dolby SR (6-Channel In)</td>
</tr>
<tr>
<td>70</td>
<td>Nonsync 1 Mono Center Surround</td>
<td>93</td>
<td>Dolby SR (NS1)</td>
</tr>
</tbody>
</table>

¹ Cat. No. 790, 794, or 778 required, ² Cat. No. 790 or 778 required
2.12.3 **Power-On Format**

Specifies the audio format that is activated when the CP650 is turned on.

**Table 2-4**  Power-On Formats

<table>
<thead>
<tr>
<th>Power-On Formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last Format</td>
</tr>
<tr>
<td>Button 01</td>
</tr>
<tr>
<td>Button 04</td>
</tr>
<tr>
<td>Button 05</td>
</tr>
<tr>
<td>Button 10</td>
</tr>
<tr>
<td>Button 11</td>
</tr>
<tr>
<td>Button U1</td>
</tr>
<tr>
<td>Button U2</td>
</tr>
<tr>
<td>Button NS</td>
</tr>
</tbody>
</table>

2.13 **Misc. Tab**

Following is a description of the Miscellaneous Tab options.

![Figure 2-36  Miscellaneous Tab Window](image)

2.13.1 **Mute**

Specifies the length of time for sound to fade from normal to mute when Mute is selected. This is the Fade Out speed. The time to return from muted to normal is the Fade In speed. Both are adjustable from 0.2 to 5 seconds in 0.1 second steps using the appropriate slider.
2.13.2 Clock

Displays the current PC time and date. Use the Set CP650 Clock button to synchronize the CP650 clock to the PC time.

2.13.3 Miscellaneous Sound Checks

Noise Gating

Pressing this button places the CP650 into Noise Gating mode. Click OK to exit this mode. When in Noise Gating mode, an automation line controls the internal pink noise source. You can activate pink noise by shorting pin-to-ground (pin 12); any of the pin numbers 1 through 8 representing L, C, R, Ls, Rs, SW, all, and Bs channels, respectively. This function is provided for special applications. You can use it with specialized test equipment to perform RT-60 measurements.

Rotating Noise

Selecting Rotating Noise sends a five-second pink noise signal to each speaker sequentially. The channel currently running pink noise is illuminated in the test window, as shown in Figure 2-37. Click Pause to halt the pink noise to the current channel; click Done to exit from the Rotating Noise test.

![Rotating Noise Test Window](image)

Figure 2-37 Rotating Noise Test Window

Note: The rotating pink noise is set to 85 dB for all channels during this test.

2.13.4 Auditorium Assist

Indicates the functionality and stability of amplifiers, speakers, and room acoustics. This feature allows you to check the level and frequency response of all audio channels and compare them to reference information established after B-Chain EQ is completed. Auditorium Assist also checks and compares the ambient noise level.
Auditorium Assist Requirements

Auditorium Assist requires a Cat. No. 735 microphone that must be permanently mounted in the auditorium. The rear wall and ceiling are possible locations for this microphone, but the exact location is not critical as measurements subsequent to Set Reference are relative. Connect the microphone to the XLR connector on the rear of the CP650. If necessary, apply microphone phantom voltage by setting switch 3 behind the CP650 front panel to the up position.

You should set the reference values and perform all subsequent Auditorium Assist functions after the theatre installation of seats, carpet, screen, and room treatment are complete. The curtains and masking should be fully open, the auditorium unoccupied, and the HVAC in a known and repeatable state.

Following are instructions for running the Auditorium Assist functions.

Set Reference

1. From the Misc. tab, click Set Reference.

   The Auditorium Assist Set Reference window appears.

   ![Auditorium Assist Set Reference Window](image)

   **Figure 2-38  Auditorium Assist Set Reference Window**
2. Click **Run** to begin.

The CP650 outputs pink noise at a reference level to the center-channel for initial microphone calibration. A meter appears in the **Calibrate Microphone** window, as shown in Figure 2-39.

![Calibrate Microphone Window](image)

**Figure 2-39** Calibrate Microphone Window

3. Adjust the Mic potentiometer (see Figure 2-40), until both green indicators on the **Calibrate Microphone** meter illuminate.

4. Click **Accept Level** to continue. Do not make further adjustments to the Mic potentiometer.

![Setup Control Panel](image)

**Figure 2-40** Setup Control Panel (located behind the front panel access door)

Auditorium Assist begins recording reference information for ambient noise and all audio channels. When this is completed, click **Close**. The reference information is now saved and will be used by the CP650 for comparison to future measurements.
Check Auditorium

From the Misc. tab, click **Check Auditorium**.

The CP650 initiates readings within the auditorium and compares the read values to the reference values, as shown in Figure 2-41.

![Check Auditorium Window](image)

Figure 2-41  Check Auditorium Window

Any **Fail** indication is recorded in the event log. The event log identifies the failed channel, followed by a string of 30 numbers. The position of the numbers represents one-third octave bands beginning with 19.6 Hz and ending at 16 kHz. The value of the numbers represents the variation in dB from the reference measurement. (The value may be positive or negative and is not indicated.) If the value is greater than 9, an asterisk (*) appears.

<table>
<thead>
<tr>
<th>Time</th>
<th>Summary</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-MAY-06 10:53:35</td>
<td>Aud Assist Failure</td>
<td>Aud Noise 11 dB</td>
</tr>
<tr>
<td>23-MAY-06 10:54:03</td>
<td>R  FAIL MH</td>
<td>R : [010200001001213422102543100000]</td>
</tr>
</tbody>
</table>

Figure 2-42 Auditorium Assist Event Log Detail

**Auditorium Assist Fail Parameters**

Auditorium Assist indicates a failure when the deviation from reference equals or exceeds the values shown in Table 2-5.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Deviation from Reference</th>
<th>Scanned Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient noise</td>
<td>±10 dB</td>
<td>—</td>
</tr>
<tr>
<td>L, C, R, Ls, Rs, BsL, BsR</td>
<td>±3 dB</td>
<td>200 Hz to 5 kHz</td>
</tr>
<tr>
<td>SW</td>
<td>±5 dB</td>
<td>60 Hz to 100 Hz</td>
</tr>
</tbody>
</table>

Table 2-5  Auditorium Assist Failure
2.14 Spectrum Analyzer Tab

This tab displays the frequency response of the selected audio input. When you select this tab, the default format is **Nonsync 1**. You can select only one channel at a time.

![Spectrum Analyzer Window](image)

**Figure 2-43** Spectrum Analyzer Window

The **RTA Range Adjust** slider shifts the analyzer 20 dB window range up or down. When the slider is at the **Bus Level** marker, the 0 dB line represents the Bus Level and is indicated by text above the spectrum analyzer.

Following is a description of the Spectrum Analyzer Tab options.

2.15 Misc. Levels Tab

The **Misc. Levels** tab provides sliders for adjusting the **Optical Surround Level Trim**, **Nonsync 1 Level**, and **Nonsync 2 Level**.

![Miscellaneous Levels Tab Window](image)

**Figure 2-44** Miscellaneous Levels Tab Window
2.15.1 Opt. Surr. Level Trim

The Optical Surround Level Trim is adjustable from −3 to +6 dB in 0.2 dB steps. This applies to optical surround playback.

2.15.2 Nonsync 1 Level/Nonsync 2 Level

You adjust these levels with sliders. The number is unitless, and ranges from 1 to 127.