SPM522D
Digitally Controlled
Stereo Preamp/Mixer
Operation Manual

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INTRODUCTION

The ADVANTAGE® **SPM522D** provides five stereo line inputs, two mono mic/line inputs, and two independent stereo outputs. With complete programmability and remote control, including input source selection for each output, page-zone routing of mic/line inputs, automatic page-over ducking, and storage of 8 non-volatile memory presets, the SPM522D is ideally suited for applications such as meeting rooms, restaurants, bars, and aerobics studios. The SPM522D is extremely versatile, allowing the contractor to customize set-up for each specific application.

SPM522D features include:

- five stereo line inputs, with trim controls for level adjustment
- fifth input 30dB pad for input from distributed speaker lines
- fifth input 'override' via contact-closure or signal activation
- two balanced mic/line inputs, including inserts for processing
- 40dB trim, 30dB pad, and peak indicator on mic/line inputs
- +24 volt phantom power switchable on each mic/line input
- mic/line 'page-over' via contact-closure or signal activation
- independent stereo main & stereo zone balanced outputs
- stereo limiters with threshold control for each stereo output
- rear panel switches convert main or zone outputs to mono
- remote control selection of stereo source for each output
- remote control of tone and balance for each stereo source
- remote control of levels and muting for each mic/line input
- remote control of levels and muting for each stereo output
- four memory presets for each output, with levels and source
- 'combined' mode selectable for room combining applications
- remote control via infrared, wall-mount, and/or custom panel
- computer control and configuration via RS-232 serial port
- PC control software for Windows® 95 & serial cable included
- remote translator input for third-party 'serial' controllers
- front panel display of presets, source selections, and levels
- external remote display panels available as an option
- incorporates **AES** recommended grounding practices
- CE marked and **UL** / **C-UL** listed power source
- covered by Five-Year "Gold Seal" Warranty

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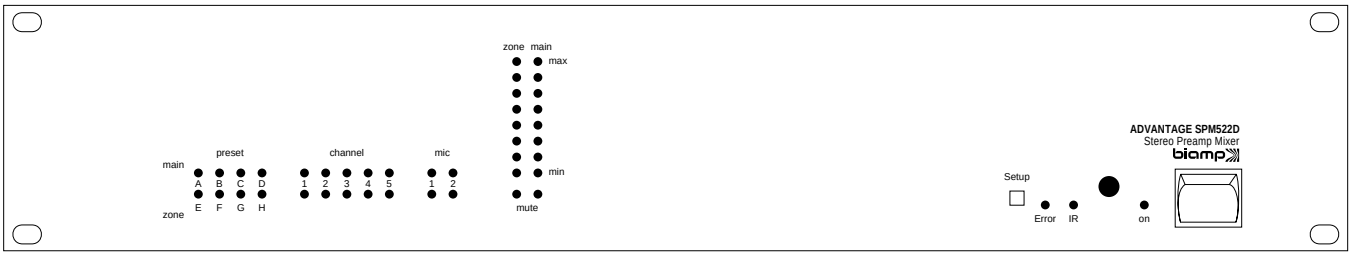
After reading this manual, if you have any questions or need technical assistance, please call Biamp Systems toll-free **1-800-826-1457**.

FRONT & REAR PANEL FEATURES



(1) **(2)(3)(4) (5) (6) (7)**

FRONT PANEL FEATURES

(1) Front Panel Display: This LED display indicates settings which affect the Main and Zone outputs. Settings are changed via Remote Controls (pg. 4), Setup (pg. 6), or Configuration (pg. 7). The Main Preset (A~D) and Zone Preset (E~H) LEDs indicate which preset is currently active for each output. A preset contains all of the source and level settings for an output, which are stored in non-volatile memory for future recall. Presets can be used to simply change inputs and levels, or to completely re-configure system operation. When the SPM522D is in 'Room-Combining Mode', only one Preset LED will be lit (Main or Zone). The Channel (1~5) LEDs indicate which stereo input channel is selected for each output. Each channel selection may include its own customized tone and balance settings. The Mic (1 & 2) LEDs indicate which mic/line inputs are assigned to each output. When a mic/line input is set for 'gated' operation, the associated LEDs will light only when the input is active (gate open). The Main and Zone (min~max) LED ladders indicate the relative level setting for each output. These are not signal level meters. Only one LED in each ladder will be on, indicating the overall level ('fader') setting for that output. The Mute LEDs indicate when either output is muted. When an output is muted, the associated level LED will also remain on. Decreasing the level setting of a muted output only reduces the level that output will return to when it is un-muted. However, increasing the level setting of a muted output will automatically un-mute that output. Similar external Remote Display Panels are optional (see Remote Controls on pg. 5).

(2) Setup Button: This momentary push-button is used to enter Setup Mode (see Setup on pg. 6). Setup Mode allows preset mixes to be defined and stored in non-volatile memory for future recall. Setup Mode may be disabled during Configuration (see Configuration on pg. 11). The Setup button is also used to return the SPM522D to factory default settings (see Setup on pg. 6).

(3) Error Indicator: This red LED indicates when unusable information has been received via remote control (see Remote Controls on pg. 4). If an error in transmission/reception of a command occurs, the Error LED will flash. The Error LED will also flash if a command is received that has been user defined as having 'no action' (see Configuration on pg. 9).

(4) IR Indicator: This red LED indicates when any information has been received via remote control (see Remote Controls on pg. 4). If the IR and Error LEDs flash simultaneously, this may be an indication of improper installation. Check location and wiring of all infrared receivers.

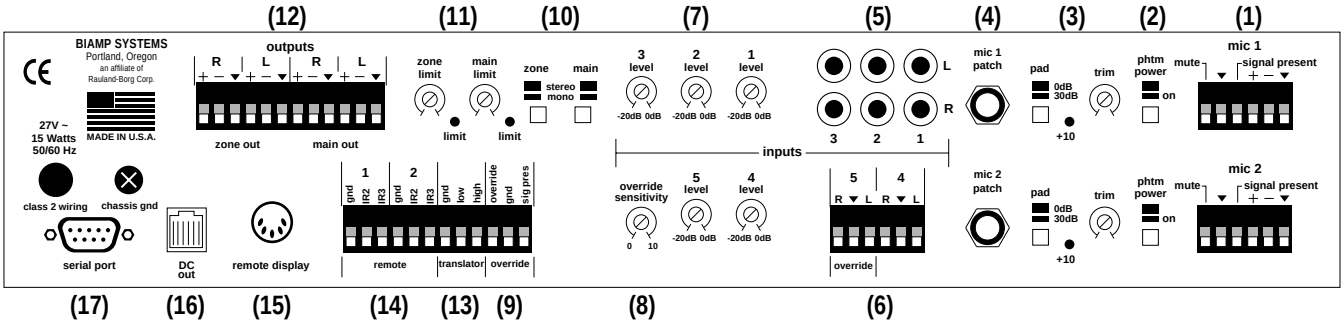
(5) Internal Infrared Receiver: This green infrared photo detector receives commands from optional hand-held Infrared Transmitters (see Remote Controls on pg. 4). A transmitter will operate up to 30 feet from the receiver. For best results, there should be an unobstructed line-of-sight from transmitter to receiver. When infrared commands are received, the IR LED will flash. If the IR and Error LEDs flash simultaneously, this may be an indication of improper installation. The Internal Infrared Receiver should not be located in direct sunlight, or pointed directly at fluorescent lighting. Internal Infrared Receiver control functions are assignable during Configuration (see Configuration on pg. 10). If desired, the Internal Infrared Receiver may be manually bypassed (see Options on pg. 6).

(6)(7) Power Switch & Indicator: When the Power switch is turned on, the Power LED will light. When power is turned off, all 'current mix' settings (presets, sources, & levels) will be stored in non-volatile memory and recalled when power is turned back on. ***NOTE:*** *The 'current mix' settings are stored only after 5 seconds of inactivity. If an adjustment to a setting is made less than 5 seconds before power is turned off, the last adjustments that were followed by a 5 second pause will be the settings stored for recall. Any adjustments made, without a full 5 second pause before power off, will be lost (not stored in non-volatile memory).* During Configuration the SPM522D may instead be set to always recall Main Preset A and Zone Preset E when power is turned back on (see Configuration on pg. 11).

REAR PANEL FEATURES

(1) Mic 1 & Mic 2: These plug-in barrier strips provide the balanced mono mic/line inputs for Mic 1 & Mic 2. For balanced input, wire high to (+), low to (-), and ground to (▾). For unbalanced input, wire high to (+), and ground to both (-) & (▾). Additional terminals are provided for 'page-over' ducking of the stereo input signals. By wiring (signal present) to (mute), automatic ducking will occur whenever signal is present at the Mic Input. Manual ducking utilizes a switch or contact-closure wired between (mute) & (▾). Mic 1 & Mic 2 functions are assignable during Configuration (see Configuration on pg. 7 and pgs. 11~13).

FRONT & REAR PANEL FEATURES



(2) Phantom Power: When depressed, these switches supply +24 Volts to the respective Mic Inputs. ***CAUTION:*** *Use only with condenser microphones. Turn levels down before switching.*

(3) Trim, Pad, & +10 Indicator: The Trim controls adjust gain at the respective Mic Inputs to compensate for different signal levels. For best performance, set Trim so the +10 Indicator is activated only by occasional peaks in signal level. Depress the Pad switch when input signal levels exceed normal operating range of the Trim control, or when line-level input is desired.

(4) Mic 1 & Mic 2 Patch: These 3-conductor 1/4" phone jacks are for connection of other Advantage products (or signal processors) to the respective Mic Inputs. Patch jacks are wired with Tip as send (output), Ring as return (input), and Sleeve as a common ground.

(5) Stereo Inputs 1~3: These RCA connectors provide the unbalanced stereo line-level inputs for Channels 1~3.

(6) Stereo Inputs 4 & 5: This plug-in barrier strip provides the unbalanced stereo line-level inputs for Channels 4 & 5. Channel 5 includes an optional internal 30dB pad (see Options on pg. 6).

(7) Level 1~5: These controls adjust gain at the respective Stereo Inputs to compensate for different signal levels. For best performance, reduce gain only on channels having higher levels.

(8) Override Sensitivity: This control adjusts the threshold level at which Channel 5 Override will occur, when being triggered by signal present at the Channel 5 Input (see Override below).

(9) Override: These plug-in barrier strip terminals provide Channel 5 Override, which is a priority selection of the Channel 5 input over all other stereo inputs. Wiring (sig pres) to (override) causes automatic override whenever signal is present at the Channel 5 Input. Manual override uses a contact-closure wired between (override) & (gnd). Override functions are assignable during Configuration (see Configuration on pg. 14).

(10) Stereo/Mono: When depressed, these switches combine the respective stereo signals into a mono sum, which is then fed equally to both the Left & Right outputs.

(11) Limit Threshold & Indicator: These controls adjust the threshold level at which the respective stereo limiters will activate. For best performance, set Limit Threshold so the Limit Indicator lights when the maximum desired output level is reached.

(12) Main & Zone Outputs: These plug-in barrier strips provide the balanced stereo line-level Main & Zone Outputs. For balanced output, wire high to (+), low to (-), and ground to (▾). For unbalanced output (-6dB gain), wire high to (+) and ground to (▾), leaving (-) unconnected. Main & Zone Outputs include optional internal 20dB pads. These pads are useful in applications where the amplifiers have no level controls. Two pair of jumpers (J6 & J7 for Main; J4 & J5 for Zone) are located on the right edge of the upper circuit board. To activate either 20dB pad, move both jumper straps backward one pin, toward the rear panel (see diagrams below). For access instructions, see Options on pg. 6.

(13) Translator: These plug-in barrier strip terminals accept certain third-party remote controls, which use the 'serial' protocol. The Low input is for controls with low idle (-15VDC ~ +2VDC). The High input is for controls with high idle (+2VDC ~ +15VDC). Translator control functions are assignable during Configuration (see Configuration on pg. 10).

(14) Remote 1 & Remote 2: This plug-in barrier strip accepts two optional remote controls (see Remote Controls on pg. 4). Remote controls may be infrared, wall-mount, and/or customized, and may be wired up to 2000 feet away from the unit. Remote 1 & Remote 2 control functions are assignable during Configuration (see Configuration on pg. 10).

(15) Remote Display: This 5-pin DIN (female) connector provides an output for optional Remote Display Panels (see Remote Controls on pg. 5).

(16) DC Out: This 6-pin Modular jack supplies ±12 VDC @ 10mA max., for powering external accessory devices.

(17) Serial Port: This 9-pin Sub D (male) connector provides an RS-232 Serial Port. PC Control Software and a serial cable are provided (see Configuration on pg. 7). The Serial Port also allows remote control via computer, or via third-party controllers which use the 'RS-232' protocol (see Computer Control on pg. 15).

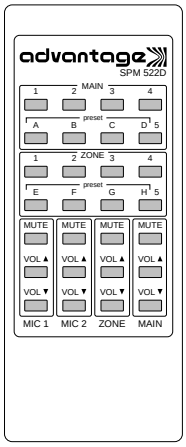
REMOTE CONTROLS

The type and quantity of remote controls is optional for the SPM522D. Remote control affects source selections, preset selection, mic/line input levels, and main/zone output levels. Remote controls may be added at any time, and do not require the SPM522D to be modified, opened, or removed from a rack. There are five types of remote controls available: The Infrared Transmitter, the Infrared Receiver, the Wall-Mount Panel, the Remote Interface Kit, and the Remote Display Panel. The SPM522D may also be controlled via computer and certain third-party controllers. **NOTE:** Remote controls come with complete instructions.

Infrared Receiver (Biamp #909-0030-00)**:** The Receiver consists of a black plastic box, containing an infrared photo detector, an LED indicator, and five screw terminals. To install Receiver, first take off front cover by removing four screws. Mount Receiver to wall or other surface, using two screw holes on back cover (screws not included). Receiver should not be mounted in direct sunlight, or pointed directly at fluorescent lighting. For best results, there should be an unobstructed line-of-sight from Transmitter to Receiver. The Receiver may be wired up to 2000 feet from the SPM522D, using 2-conductor shielded cable (not included). Route cable through access hole on bottom of Receiver. Three screw terminals inside the Receiver ("GND", "IR2", & "IR3") correspond to "Remote" terminals on rear of SPM522D. Connect cable shield to "GND" terminals at each end. Use conductors to connect "IR2" to "IR2" & "IR3" to "IR3". Replace Receiver front cover. The LED indicator inside Receiver lights when infrared information is detected. **NOTE:** The Infrared Receiver also includes two 'Remote Translator' terminals ("GND" & "XLATE"), which allow remote control of the SPM522D via third-party 'serial' controllers. Complete instructions are included with the Infrared Receiver.

External Receiver
(Biamp #909-0030-00)

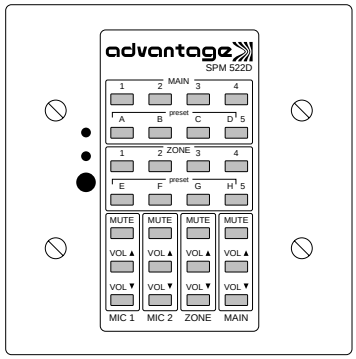
InfraRed Transmitter (Biamp #909-0064-00)**:** The Transmitter is a hand-held controller, which transmits infrared codes unique to Biamp. Therefore, the Transmitter should not affect any other infrared controlled equipment (such as TVs or VCRs). Likewise, other infrared controllers will not provide proper control of Biamp equipment. The Transmitter requires two AAA batteries, which are included with the unit (user installed). The Transmitter has twenty-eight buttons. Main (1~5) buttons select which stereo input channel (plus tone & balance settings) is routed to the Main output. Main (A~D) buttons select the desired preset for the Main output. Zone (1~5) buttons select which stereo input channel (plus tone & balance settings) is routed to the Zone output. Zone (E~H) buttons select the desired preset for the Zone output. From the factory, button D/5 (Main) and H/5 (Zone) select stereo input channel #5 to be routed to the respective outputs. However, during Configuration each of these buttons may be re-defined to instead recall the respective D & H presets (see Configuration on pg. 9). During Setup Mode the Main (A~D) and Zone (E~H) buttons are used to store the respective presets (see Setup on pg. 6). The MUTE buttons (Mic 1, Mic 2, Zone, & Main) turn off the respective mic/line input or stereo output signals. The Vol ▲ & Vol ▼ buttons (Mic 1, Mic 2, Zone, & Main) adjust the level setting of the respective mic/line input or stereo output signals. Decreasing the level setting of a muted input/output only reduces the level that input/output will return to when it is un-muted. However, increasing the level setting of a muted input/output automatically un-mutes that input/output. When a mic/line input is set for 'gated' operation, level settings can be adjusted only when the input is active (gate open). The way in which an SPM522D responds to remote control buttons may be completely re-defined during Configuration (see Configuration on pg. 9) For best results, there should be an unobstructed line-of-sight from Transmitter to receiver. The Transmitter will operate up to 30 feet from a receiver. In addition to the Infrared Receiver described above, receivers are also included on the SPM522D, the Wall-Mount, and the Remote Display Panel.



Infrared Transmitter
(Biamp #909-0064-00)

REMOTE CONTROLS

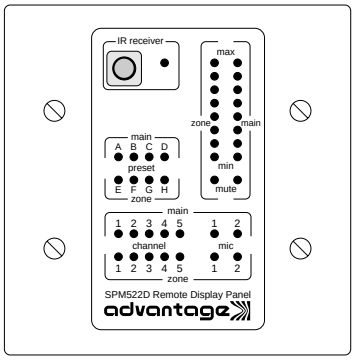
Wall-Mount (Biamp #909-0074-00)**:** The Wall-Mount is a "hard-wired" control, which is powered by the SPM522D. There are no batteries to wear out, and it is not easily lost or stolen. The wall-mount may be wired up to 2000 feet from the SPM522D, using 2-conductor shielded cable (not included). To install Wall-Mount, first remove mounting box from front panel. Route cable through "knock-out" hole on rear of mounting box. Install mounting box in wall or panel. Three screw terminals on circuit board ("GND", "IR2", & "IR3") correspond to "Remote" terminals on rear panel of SPM522D. Connect cable shield to "GND" terminals at each end. Use conductors to connect "IR2" to "IR2" & "IR3" to "IR3". Install front panel on mounting box. The Wall-Mount has twenty-eight buttons. Main (1~5) buttons select which stereo input channel (plus tone & balance settings) is routed to the Main output. Main (A~D) buttons select the desired preset for the Main output. Zone (1~5) buttons select which stereo input channel (plus tone & balance settings) is routed to the Zone output. Zone (E~H) buttons select the desired preset for the Zone output. From the factory, button D/5 (Main) and H/5 (Zone) select stereo input channel #5 to be routed to the respective outputs. However, during Configuration each of these buttons may be re-defined to instead recall the respective presets D & H (see Configuration on pg. 9). During Setup Mode the Main (A~D) and Zone (E~H) buttons are used to store the respective presets (see Setup on pg. 6). The MUTE buttons (Mic 1, Mic 2, Zone, & Main) turn off the respective mic/line input or stereo output signals. The Vol ▲ & Vol ▼ buttons (Mic 1, Mic 2, Zone, & Main) adjust the level setting of the respective mic/line input or stereo output signals. Decreasing the level setting of a muted input/output only reduces the level that input/output will return to when it is un-muted. However, increasing the level setting of a muted input/output automatically un-mutes that input/output. When a mic/line input is set for 'gated' operation, level settings can be adjusted only when the input is active (gate open). The way in which an SPM522D responds to remote control buttons may be completely re-defined during Configuration (see Configuration on pg. 9) The green LED will light when the Wall-Mount receives power from the SPM522D. The red LED will flash whenever the Wall-Mount is transmitting information. The Wall-Mount includes an infrared detector, which allows it to operate as an Infrared Receiver, as well. The infrared detector may be disabled via an internal circuit board jumper strap (labelled "IR RECV").



Wall-Mount Panel
(Biamp #909-0074-00)

Remote Interface Kit (Biamp #909-0041-00)**:** The Remote Interface Kit allows the user to create a customized control panel, using his own switches, enclosure, and panel. It can provide up to 40 buttons (12 more than standard remote controls), which are supported by the SPM522D. The Remote Interface Kit is a tested circuit board assembly, which includes two wiring harnesses. The circuit board connects to the SPM522D in exactly the same way the Infrared Receiver or Wall-Mount does, using 2-conductor shielded cable (not included), and may be wired up to 2000 feet from the SPM522D. The circuit board is 2.27"W by 2.65"H, with four mounting holes (2" centers) and #6 mounting hardware provided.

Remote Display Panels (Biamp #909-0082-00)**:** Remote Display Panels provide the same LED indicators as those found on the Front Panel Display. Remote Display Panels may be connected to an SPM522D via a separate **Remote Display Controller** (Biamp #909-0080-00). The Remote Display Controller provides power and connection for up to two Remote Display Panels. Remote Display Panels are similar to the Wall-Mount remote control in that they are hard-wired, wall-mount panels, which can be located up to 2000 feet from the SPM522D. Remote Display Panels also include an infrared detector, which can be wired separately to a Remote input on the SPM522D, and will operate as an Infrared Receiver. Remote Display Panels are wired to a Remote Display Controller using 4-conductor shielded cable (not included). To install Remote Display Panels, first remove mounting box from front panel. Route cable through "knock-out" hole on rear of mounting box. Install mounting box in wall or panel. Five screw terminals on circuit board ("POWER GROUND", "+10v", "SHIELD", "DATA+", & "DATA-") correspond to terminals inside Remote Display Controller. Connect cable shield to "SHIELD" terminals at each end. Use conductors to connect "POWER GROUND" to "POWER GROUND", "+10V" to "+10V", "DATA+" to "DATA+", & "DATA-" to "DATA-". ***CAUTION:*** *The combined resistance of the 'POWER GROUND' & '+10V' conductors must not exceed 32 ohms (16 ohms per conductor).* Install front panel on mounting box.



Remote Display Panel
(Biamp #909-0082-00)

SETUP

Setup Mode allows presets to be defined and stored in non-volatile memory, without the need to use the PC Control Software for Configuration via computer. Setup Mode may also be used to return the SPM522D to the factory default settings.

To enter Setup Mode: While power is on, press and hold the front panel Setup button for 5 seconds (until the currently lit Front Panel Display LEDs begin flashing). The Front Panel Display LEDs are the only indication that the SPM522D is in Setup Mode, and they will continue flashing as long as Setup Mode is active. ***NOTE:*** *Remote Display Panel LEDs will not flash during Setup Mode.*

During Setup Mode: The Remote Control buttons which were assigned to recall presets are temporarily re-defined to store those presets. All other Remote Control buttons will function normally. This allows a preset to be created by first adjusting the various source and level settings for the respective output, then pressing the appropriate 'store' button.

Example: From the factory, six buttons are assigned to recall presets (Main Preset A~C and Zone Preset E~G). During Setup Mode, these six buttons would become their own respective store buttons. Once the desired stereo input channel, mic/line input levels, and Main output level settings were made, pressing the Main Preset A button would store those settings. After exiting Setup Mode, those same settings could easily be recalled from the non-volatile memory by simply pressing the Main Preset A button.

To exit Setup Mode: Press the front panel Setup button momentarily. The Front Panel Display LEDs will quit flashing and the SPM522D will immediately exit Setup Mode. The SPM522D will also *automatically* exit Setup Mode after 1 minute of inactivity (no button entries).

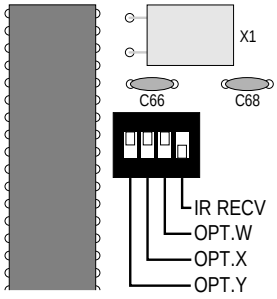
NOTE: *Configuration may be used to assign the Main Preset D and Zone Preset H buttons to recall presets (instead of selecting stereo input channel #5). Configuration may also be used to disable the Setup Mode functions described above.* *See Configuration on pg. 7.*

To return to factory default settings: While power is off, press and hold the front panel Setup button. While holding the Setup button, turn power on. Continue holding the Setup button for 2 seconds (until the Error LED flashes once). The SPM522D will begin setting all 'button definitions' to their factory defaults (see Configuration on pg. 9). If the Setup button is held another 7 seconds (until the Error LED flashes twice), the SPM522D will begin setting all "preset mixes' to their factory defaults (see Configuration on pg. 7). If the Setup button is held another 2 seconds (until the Error LED flashes three times), the SPM522D will begin setting all 'Configuration Options' to their factory defaults (see Configuration on pgs. 11~14). Whenever the Setup button is released the SPM522D will return to normal operation. The Setup button may be released at any time, depending upon which factory defaults are desired.

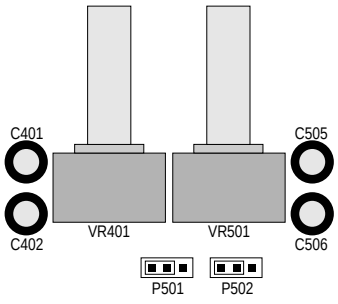
OPTIONS

NOTE: To access internal modifications, first disconnect power to the unit. Then lay the unit on a flat surface with the front panel facing forward and the top panel facing up. Remove the top panel (eight screws along the sides and rear; one screw centered behind the front panel). The following modifications occur on the lower circuit board (see diagrams below). These modifications require no soldering.

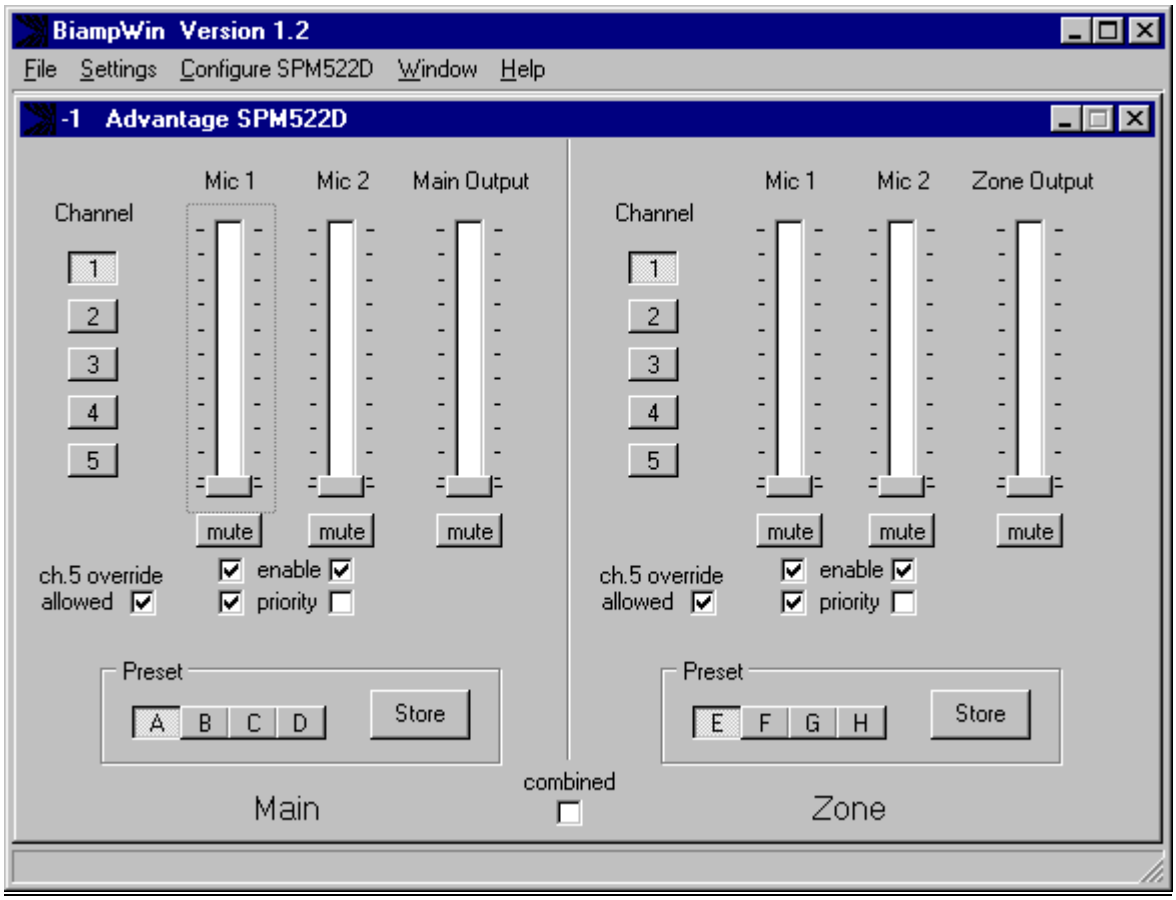
Internal Infrared Receiver Bypass: A bank of four DIP switches is located toward the right-center of the circuit board. The far right switch ('IR RECV') is used to activate or bypass the Internal Infrared Receiver. From the factory, the Internal Infrared Receiver is activated, with the switch toward the front panel. To bypass the Internal Infrared Receiver, push the switch back, toward the rear panel.



Channel 5 Internal 30dB Pad: Two jumper straps ('P501' & 'P502') are located toward the rear-center of the circuit board (underneath the upper circuit board). These jumper straps are used to activate or bypass a 30dB pad at the Channel 5 input. The 30dB pad allows Channel 5 to accept greater input signal levels, such as those produced by a 70.7V 'constant voltage' distributed speaker system. From the factory, the 30dB pad is bypassed, with both jumper straps toward the left. To activate the 30dB pad, move both jumper straps over one pin, toward the right.

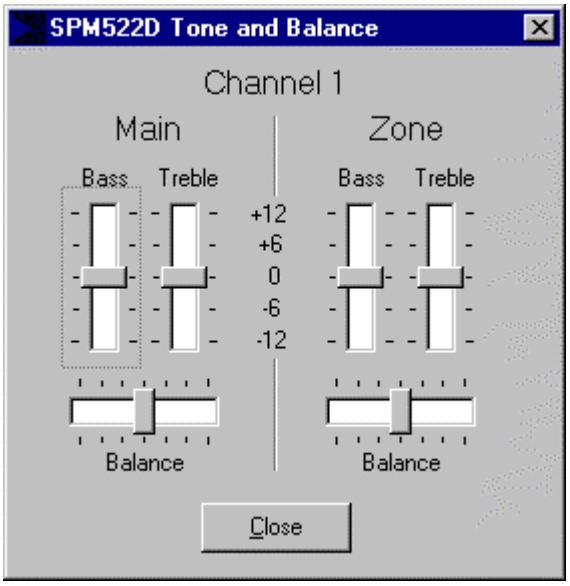


All Configuration parameters are adjustable using the Windows® 95 'PC Control Software' and serial cable provided with the SPM522D. The PC Control Software provides programs for various ADVANTAGE® products, including the SPM522D. The SPM522D program includes multiple control screens, which are described on the following pages. Factory default settings are shown on each screen. Once the software is started (and Comm Port Configuration is set), various screens are accessible through the drop-down menus at the top of the opening screen. The Mix screen appears whenever an SPM522D file is opened. Additional control screens are then available from the Configure SPM522D menu. The File menu provides functions such as open, close, save, etc. The Settings menu recalls the Comm Port Configuration screen. The Window menu arranges the active product screens. The Help menu explains the available adjustments. To install the Windows® 95 PC Control Software Package: Select '**Run**' from the Windows® 95 '**Start**' menu, then type **A:\SETUP** and click '**OK**'. System Requirements: Windows® 95 with 8M of RAM & 2M of available hard disk space (serial port required for 'on-line' operation).



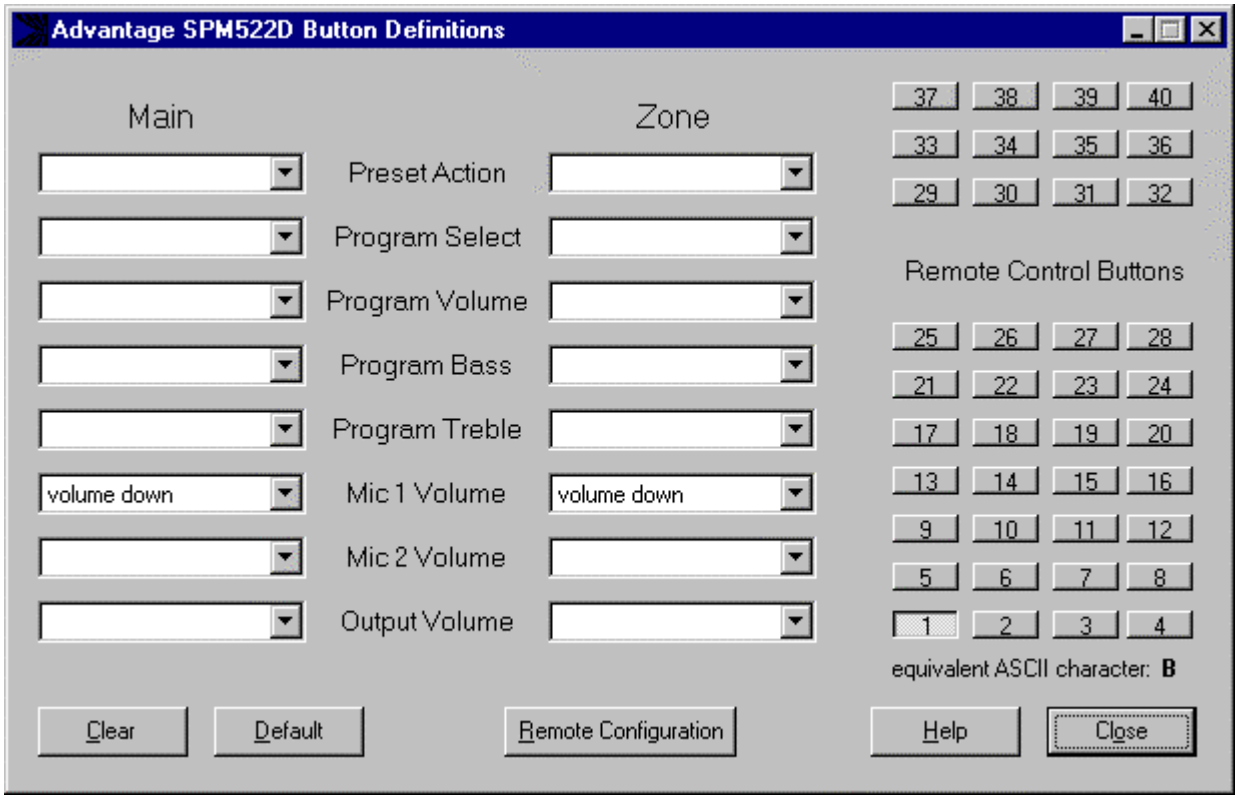
MIX SCREEN

The Mix screen is divided into two sections. The left section affects the Main Output and the right section affects the Zone Output. Adjustments are made with the computer mouse (or keyboard). Levels are adjusted by dragging the corresponding '**faders**' up or down. Each fader provides thirty-two volume steps. Output level range is -70dB~+11dB in ≈1.4dB steps (bottom step ≈40dB). Mic level range is -66dB~+11dB in ≈1.2dB steps (bottom step ≈42dB). Mic 1 & Mic 2 each have independent level adjustment to the Main & Zone Outputs. Left-clicking **mute** toggles the corresponding signal off & on. Left-clicking **enable** toggles assignment of that mic/line input to the associated output. Left-clicking **priority** toggles assignment of which mic/line input (if any) will override the other, at the associated output. Left-clicking Channel **1~5** selects which Stereo Line Input is assigned to the associated output. Left-clicking **ch.5 override allowed** toggles enabling of Channel 5 Override to the associated output (see Override on pg. 3). Left-clicking Preset **A~D** or **E~H** selects which preset is recalled for the associated output. Left-clicking Preset **Store** provides a pop-up menu for storing the current settings at that output section to any of the four associated presets. Left-clicking **combine** causes the SPM522D to enter a 'room combining' mode, where Main & Zone sections both recall Preset D, and adjustments made to either Main or Zone settings will affect both outputs. All eight presets (A~H) are available in 'room combining' mode, and each will affect both outputs. When 'room combining' is turned off, Main Preset A & Zone Preset E are recalled, and adjustments can again be made independently for each output. The title bar at the top of the Mix screen shows Device #, custom Device Name, & model of product being controlled. The PC Control Software can operate 'off-line' (no product connected) by opening a 'new' file for the desired product. The Device # for 'off-line' files is assigned sequentially as a negative number.



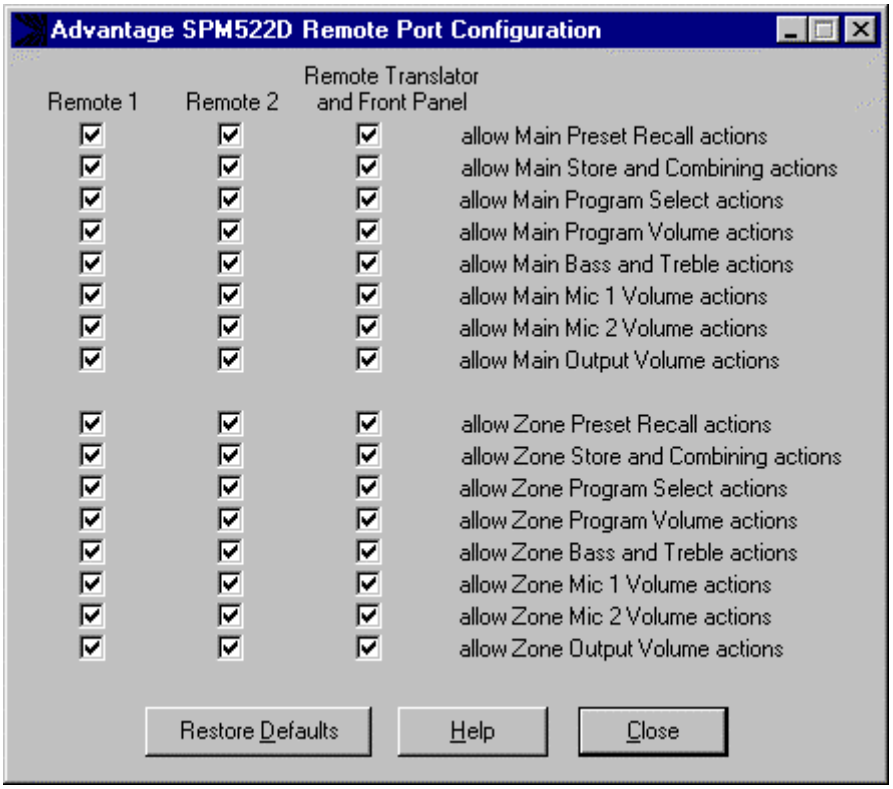
TONE and BALANCE SCREENS

Tone and Balance screens are available for all five Stereo Line Inputs. They are accessed through the Configure SPM522D drop-down menu (or by right-clicking on the Mix screen). Also, double-clicking on a Channel (1~5), within the Mix screen, will simutaneously select that channel and open its specific Tone and Balance screen. Tone and Balance screens allow each of the Stereo Line Input channels to have its own Treble, Bass, and Balance settings for the Main & Zone Outputs independently. Tone and Balance settings for each Stereo Line Input are stored in non-volatile memory, and are automatically recalled whenever that Stereo Line Input is selected for the associated output. Tone and Balance screens are divided into two sections. The left section affects the Main Output and the right section affects the Zone Output. Adjustments are made by dragging the corresponding '**faders**'. Settings are immediately stored in memory whenever any adjustment is made. Treble has a gain range of ±12dB @ 15kHz, adjustable in 2dB steps. Bass has a gain range of ±12dB @ 50Hz, adjustable in 2dB steps. Balance has a shift range of 48dB, adjustable in 2dB steps. Left-clicking **Close** will return you to the Mix screen.



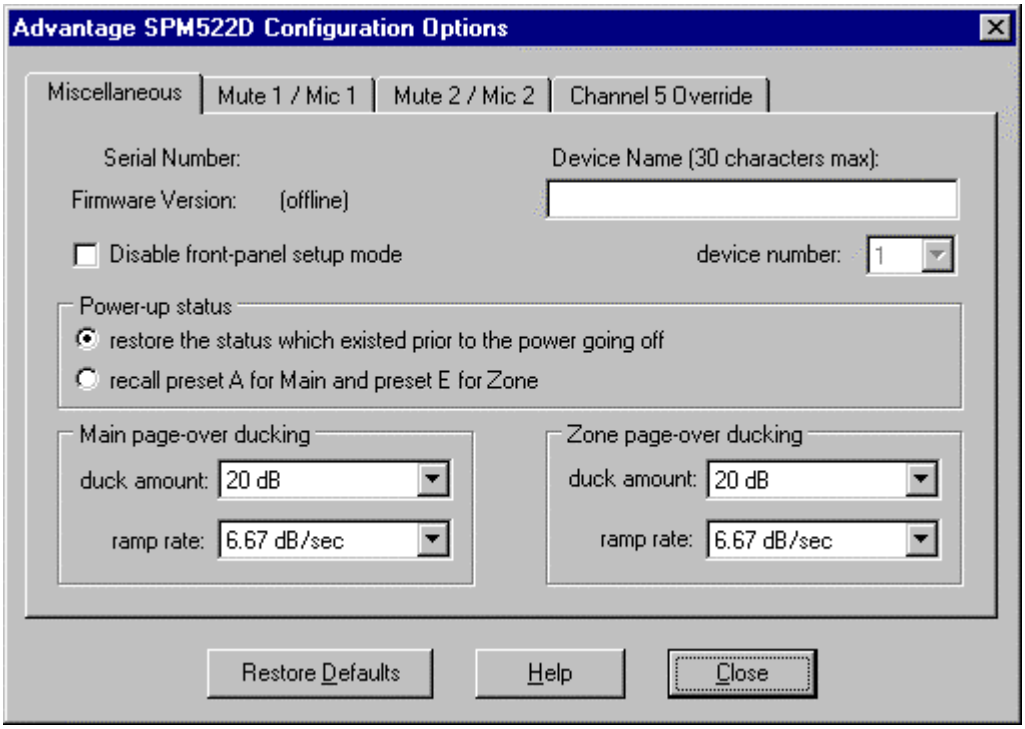
BUTTON DEFINITION SCREEN

The Button Definition screen is used to assign specific 'actions' to remote control buttons. ADVANTAGE® infrared & wall-mount remote controls have twenty-eight buttons. However, the SPM522D supports twelve additional buttons, which are only available when using Remote Interface Kit or RS-232 control (see Remote Controls on pg. 5 & Computer Control on pg. 15). From the factory, the SPM522D is programmed as follows: Buttons 1~12 provide volume up, volume down, & mute actions for Mic 1, Mic 2, Zone Output, & Main Output; Buttons 13~28 provide preset & channel select actions for Zone Output & Main Output; Buttons 29~40 provide no defined actions. However, using the Button Definition screen, each button may be assigned various, different actions (button definition). There are eight types of actions available for both the Main & Zone Outputs. Each action type allows the selection of a more specific action. A button may have one of each type of action assigned to it, thereby performing multiple functions. A button may also be assigned no actions at all, thereby making that button inoperable. This is an effective way of limiting user access to certain settings or functions. Left-clicking a **Remote Control Button** will select that button to be defined. Left-clicking on a particular type of **Main** or **Zone** action will then open a drop-down menu of the specific actions (of that type) which are available for the associated output. Left-clicking the desired action will then assign that action to the currently selected button. **Preset Actions** includes various store, recall, & combine actions. *NOTE: Preset Actions called 'temp' use the current settings for that output as a temporary preset, which will allow those settings to be restored later.* **Program Select** includes various channel select, override, & enable mic actions. *NOTE: Program Select actions called 'enable Mic' will also affect the 'page-over' ducking functions of that mic, at that output.* **Program Volume** includes various volume, mute, duck, & balance actions. *CAUTION: Program Volume actions affect the VCA which controls only the Stereo Line Input signals. This VCA also provides the 'page-over' ducking functions for Mic 1 & Mic 2, as well as a 'ramp' function for Override (see Front & Rear Panel Features on pgs. 2 & 3). To avoid conflicts, do not use Program Volume actions simultaneously with 'page-over' ducking or Override functions, at the same output.* **Program Bass** & **Program Treble** include cut, boost, & flat actions. **Mic 1 Volume**, **Mic 2 Volume**, & **Output Volume** include various volume & mute actions. Multiple actions may be assigned to a single button. Likewise, a particular action may be assigned to multiple buttons. To un-assign a particular action from a button, left-click on the blank space at the top of the drop-down menu for that type action. Left-clicking **Clear** opens a pop-up menu, which allows button definitions (actions) to be cleared from the selected button, or from all buttons. Left-clicking **Default** opens a pop-up menu, which allows button definitions (actions) to be set back to the factory default for the selected button, or for all buttons. Left-clicking **Remote Configuration** opens the Remote Port Configuration screen (see next page). Left-clicking **Help** provides additional instruction. Left-clicking **Close** will return you to the Mix screen. Factory default button definitions are those described for standard remote controls (see Remote Controls on pgs. 4 & 5). When a button is selected, its Equivalent ASCII Character appears on the screen. ASCII characters can be used via RS-232 to emulate control buttons (see Computer Control on pg. 15).



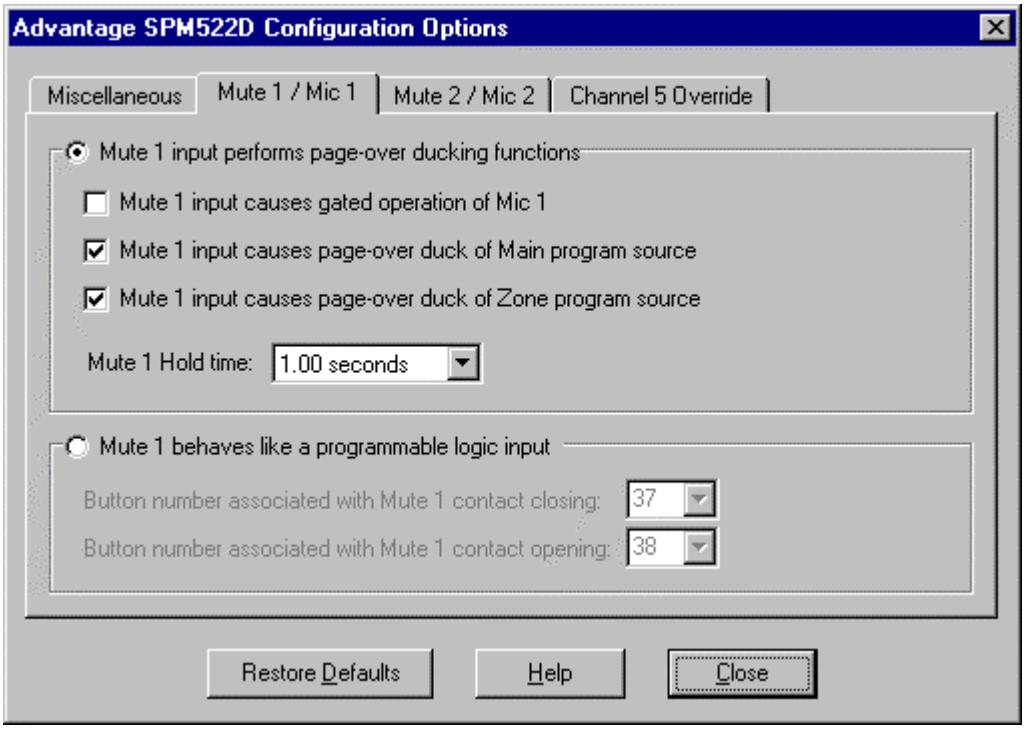
REMOTE PORT CONFIGURATION SCREEN

The Remote Port Configuration screen is accessed by opening the Button Definition screen and left-clicking on **Remote Configuration**. The Remote Port Configuration screen determines which types of actions will be recognized by each of the three possible remote control inputs on the SPM522D (see Button Definition on previous page). **Remote 1** & **Remote 2** refer to the corresponding terminals on the rear panel of the SPM522D (see Front & Rear Panel Features on pg. 3). **Remote Translator and Front Panel** refers to the rear panel Translator terminals, and the front panel Internal Infrared Receiver (see Front & Rear Panel Features on pg. 2), which are treated as if they were a single remote control input. The Remote Port Configuration screen allows the SPM522D to be customized, with regards to which functions can be controlled from different locations. For example: When the SPM522D is used in an application with two separate rooms, a remote control can be provided for each room, which has control of functions affecting only that room. Main actions could be assigned only to Remote 1, with Zone actions assigned only to Remote 2. Remote Translator and Front Panel could then be assigned 'universal' control of all actions, or no control access at all. Another example: When the SPM522D is used in an application having a central control location and a subordinate control location, 'system-wide' functions can be controlled from the central location, while only restricted control is allowed from the subordinate location. All Preset actions could be assigned to Remote 1, for system configuration from the central location. Zone Program Select actions could be assigned to Remote 2, for stereo source selection within the subordinate location. All other actions could be un-assigned, thereby limiting user access. Left-clicking on on a certain type action, for a particular remote control input, will toggle that assignment on & off. Left-clicking **Restore Defaults** re-assigns 'universal' control of all actions from all remote control inputs (factory default). Left-clicking **Help** provides additional instruction. Left-clicking **Close** will return you to the Button Definition screen.



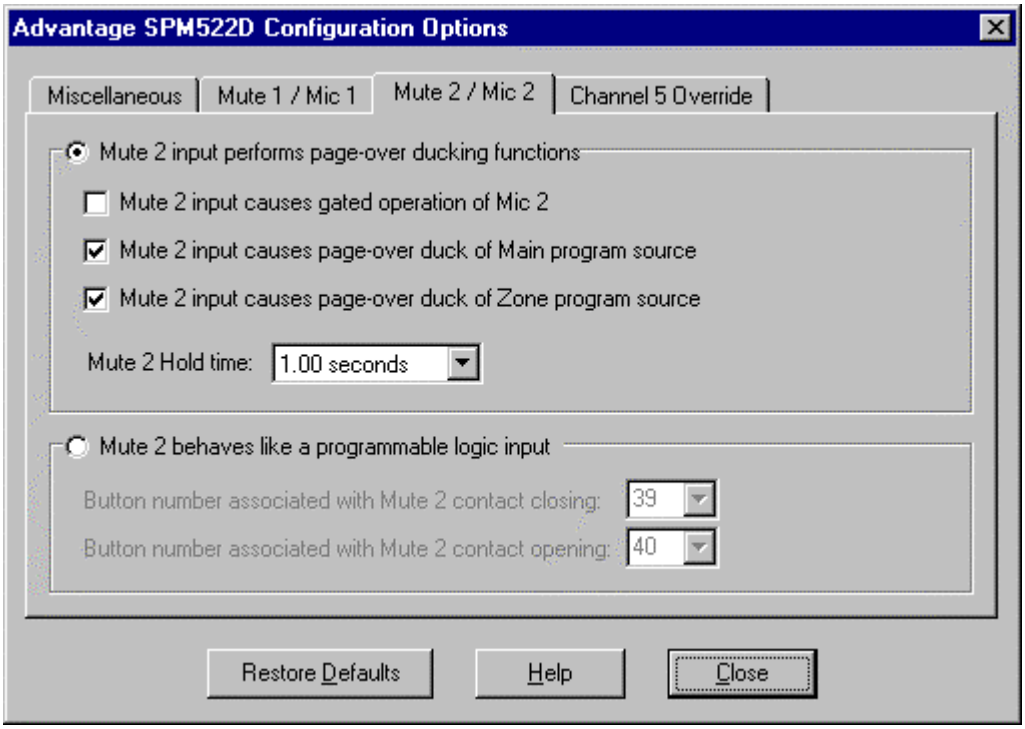
MISCELLANEOUS SCREEN

The Miscellaneous screen is accessed by opening the Configuration Options screen and left-clicking the **Miscellaneous** tab. The Miscellaneous screen is used to select options which customize the operation of the SPM522D. At the top of the Miscellaneous screen, the **Serial Number** and **Firmware Version** of the particular SPM522D will be displayed. The PC Control Software can operate 'off-line' (with no product connected) by opening a 'new' file for the desired product. The Serial Number & Firmware Version are not displayed for 'new' (off-line) files. Left-clicking **Device Name** allows a custom name to be given to the SPM522D, by entering up to 30 characters of text. The Device Name will be stored in the SPM522D memory, and will be displayed on the title bar of the Mix screen whenever that SPM522D is accessed with the software. Left-clicking **device number** opens a drop-down menu which allows assignment of an 'address' number (1~8) to the SPM522D, for computer control of multiple units. Left-clicking **Disable front panel setup mode** toggles off & on the ability to access Setup Mode (but not Factory Defaults) via the front panel Setup button (see Setup/Options on pg. 6). **Power-up status** determines what settings the SPM522D will automatically recall whenever power is turned on. From the factory, the SPM522D is set to recall the settings which existed prior to power being shut off. Left-clicking **recall preset A for Main and preset E for Zone** will instead cause the SPM522D to recall these specific presets at power-up. **Main page-over ducking** and **Zone page-over ducking** determine the amount of attenuation applied to Stereo Line Input signals, and how quickly they return to normal level, when ducking is triggered via Mic 1 & Mic 2 page-over (see Front & Rear Panel Features on pg. 2). Left-clicking **duck amount** opens a drop-down menu of 41 attenuation choices (0dB~80dB). Left-clicking **ramp rate** opens a drop-down menu of 256 return rate choices (0dB~200dB per second). *NOTE: A mic/line input must be enabled (assigned) to an output before it can trigger page-over ducking at that output.* Left-clicking **Restore Defaults** opens a pop-up menu, which allows the Miscellaneous options (or all Configuration Options) to be set back to their factory defaults. Left-clicking **Help** provides additional instruction. Left-clicking **Close** will return you to the Mix screen.



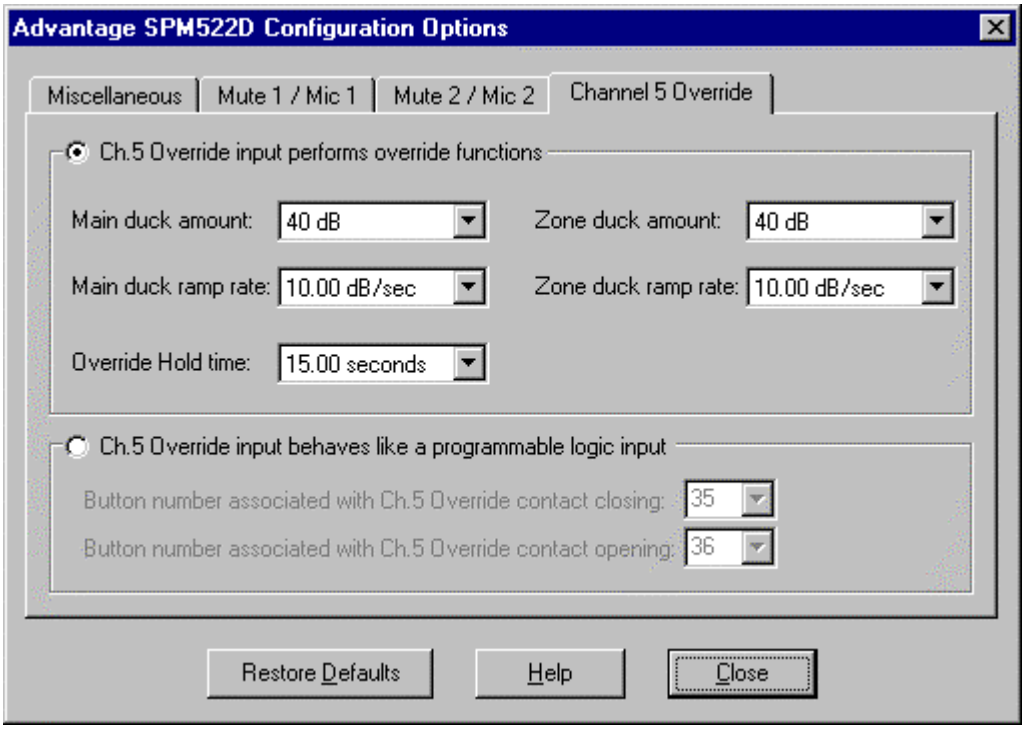
MUTE 1 / MIC 1 SCREEN

The Mute 1 / Mic 1 screen is accessed by opening the Configuration Options screen and left-clicking the **Mute 1 / Mic 1** tab. The Mute 1 / Mic 1 screen is used to select options which customize the function of the Mic 1 Mute terminal (see Front & Rear Panel Features on pg. 2). Left-clicking **Mute 1 input causes gated operation of Mic 1** toggles assignment of gating to the Mic 1 signal. Gating allows that mic/line input signal to remain off, until triggered on either manually (via contact-closure) or automatically (via signal present) at the Mute 1 terminal. Left-clicking **Mute 1 input causes page-over duck of Main program source** toggles assignment of ducking at the Main Output. Left-clicking **Mute 1 input causes page-over duck of Zone program source** toggles assignment of ducking at the Zone Output. Ducking is a temporary attenuation of the Stereo Line Input signal at that output, which is triggered manually (via contact-closure) or automatically (via signal present) at the Mute 1 terminal. *NOTE: A mic/line input must be enabled (assigned) to an output before it can trigger page-over ducking at that output.* Left-clicking **Mute 1 Hold time** opens a drop-down menu of 256 hold time choices (0~63.75 seconds). *NOTE: Hold Time determines how long mute functions remain in effect after triggering (manual or automatic) is released. Hold Time is not the same as Ramp Rate, which determines how fast a signal returns to normal after Hold Time has elapsed.* Left-clicking **Mute 1 behaves like a programmable logic input** will disable the Mute 1 functions described above, and instead allow the Mic 1 Mute terminal to be used as a logic input, which can then be programmed like a remote control button (see Configuration on pg. 9). However, a logic input can have two 'button definitions', one for when the circuit is 'closed' (activated) and another for when the circuit is 'opened' (released). Therefore, drop-down menus of the forty possible control buttons are provided for both the 'closing' & the 'opening' of the logic input circuit. The logic input can still be triggered manually (via contact-closure) or automatically (via signal present). Left-clicking **Restore Defaults** opens a pop-up menu, which allows the Mute 1 / Mic 1 options (or all Configuration Options) to be set back to their factory defaults. Left-clicking **Help** provides additional instruction. Left-clicking **Close** will return you to the Mix screen.



MUTE 2 / MIC 2 SCREEN

The Mute 2 / Mic 2 screen provides the same functions as the Mute 1 / Mic 1 screen, except that it affects the Mic 2 Mute terminal instead. The Mute 2 / Mic 2 screen is accessed by opening the Configuration Options screen and left-clicking the **Mute 2 / Mic 2** tab. The Mute 2 / Mic 2 screen is used to select options which customize the function of the Mic 2 Mute terminal (see Front & Rear Panel Features on pg. 2). Left-clicking **Mute 2 input causes gated operation of Mic 2** toggles assignment of gating to the Mic 2 signal. Gating allows that mic/line input signal to remain off, until triggered on either manually (via contact-closure) or automatically (via signal present) at the Mute 2 terminal. Left-clicking **Mute 2 input causes page-over duck of Main program source** toggles assignment of ducking at the Main Output. Left-clicking **Mute 2 input causes page-over duck of Zone program source** toggles assignment of ducking at the Zone Output. Ducking is a temporary attenuation of the Stereo Line Input signal at that output, which is triggered manually (via contact-closure) or automatically (via signal present) at the Mute 2 terminal. *NOTE: A mic/line input must be enabled (assigned) to an output before it can trigger page-over ducking at that output.* Left-clicking **Mute 2 Hold time** opens a drop-down menu of 256 hold time choices (0~63.75 seconds). *NOTE: Hold Time determines how long mute functions remain in effect after triggering (manual or automatic) is released. Hold Time is not the same as Ramp Rate, which determines how fast a signal returns to normal after Hold Time has elapsed.* Left-clicking **Mute 2 behaves like a programmable logic input** will disable the Mute 2 functions described above, and instead allow the Mic 2 Mute terminal to be used as a logic input, which can then be programmed like a remote control button (see Configuration on pg. 9). However, a logic input can have two 'button definitions', one for when the circuit is 'closed' (activated) and another for when the circuit is 'opened' (released). Therefore, drop-down menus of the forty possible control buttons are provided for both the 'closing' & the 'opening' of the logic input circuit. The logic input can still be triggered manually (via contact-closure) or automatically (via signal present). Left-clicking **Restore Defaults** opens a pop-up menu, which allows the Mute 2 / Mic 2 options (or all Configuration Options) to be set back to their factory defaults. Left-clicking **Help** provides additional instruction. Left-clicking **Close** will return you to the Mix screen.



CHANNEL 5 OVERRIDE SCREEN

The Channel 5 Override screen is accessed by opening the Configuration Options screen and left-clicking the **Channel 5 Override** tab. The Channel 5 Override screen is used to select options which customize the function of the Override terminal (see Front & Rear Panel Features on pg. 3). When Channel 5 Override is released, the previously selected Stereo Line Input for each output will again be selected. However, these signals will initially be attenuated, and will then return to their normal levels as determined by the following parameters. Left-clicking **Main duck amount** or **Zone duck amount** opens a drop-down menu of 41 attenuation choices (0dB~80dB) for the stereo line input signal at the associated output. Left-clicking **Main duck ramp rate** or **Zone duck ramp rate** opens a drop-down menu of 256 return rate choices (0dB~200dB per second) for the stereo line input signal at the associated output. Left-clicking **Override Hold time** opens a drop-down menu of 256 hold time choices (0~63.75 seconds). *NOTE: Hold Time determines how long override remains in effect after triggering (manual or automatic) is released. Hold Time is not the same as Ramp Rate, which determines how fast a signal returns to normal after Hold Time has elapsed.* Left-clicking **Ch.5 Override input behaves like a programmable logic input** will disable the Channel 5 Override functions described above, and instead allow the Override terminal to be used as a logic input, which can then be programmed like a remote control button (see Configuration on pg. 9). However, a logic input can have two 'button definitions', one for when the circuit is 'closed' (activated) and another for when the circuit is 'opened' (released). Therefore, drop-down menus of the forty possible control buttons are provided for both the 'closing' & the 'opening' of the logic input circuit. The logic input can still be triggered manually (via contact-closure) or automatically (via signal present). Left-clicking **Restore Defaults** opens a pop-up menu, which allows the Channel 5 Override options (or all Configuration Options) to be set back to their factory defaults. Left-clicking **Help** provides additional instruction. Left-clicking **Close** will return you to the Mix screen.

COMPUTER CONTROL

The SPM522D has an RS-232 compatible serial interface, which allows it to be controlled by a computer (see Rear Panel Features on page 3). In addition to the PC Control Software, the SPM522D offers two other methods of computer control.

Control Button Emulation: This method allows the computer to emulate the operation of the infrared transmitter or wall-mount control panel. Using this method, the computer outputs ASCII characters, which are equivalent to the commands generated by the standard control buttons. The SPM522D is unable to tell whether these commands come from the computer or from a standard control. However, Control Button Emulation allows the computer to utilize up to forty button definitions (unlike standard controls, which have only twenty-eight buttons). When using up to four SPM522Ds in a system, Control Button Emulation also allows the computer to designate which device or devices should react to each control button command.

Advanced Computer Control: This method provides advanced commands, which allow the computer to retrieve or edit preset mixes, retrieve or edit control button definitions, perform preset & volume actions, and a variety of other functions. The computer may also emulate control buttons. Using this method, the computer may designate up to eight devices, and may create unlimited preset mixes and control button definitions. The computer may also provide "real-time" display of various settings.

This manual only describes the Control Button Emulation method of computer control. For complete details about using the SPM522D with a computer, including Advanced Computer Control, contact Biamp Systems for manual "Computer Control of SPM522D".

Each control button on the infrared transmitter or the wall-mount control panel corresponds to one character in the standard ASCII character set. The character equivalents are summarized in the following table. This table includes all forty of the possible buttons, their button numbers, their ASCII code equivalents, and their factory default button definitions (functions).

button 01	B	Volume Down Mic 1	button 15	P	Recall Zone Preset G	button 29	^	no button definition assigned
button 02	C	Volume Down Mic 2	button 16	Q	Select Channel 5 Zone	button 30	_	no button definition assigned
button 03	D	Volume Down Zone	button 17	R	Select Channel 1 Zone	button 31	'	no button definition assigned
button 04	E	Volume Down Main	button 18	S	Select Channel 2 Zone	button 32	b	no button definition assigned
button 05	F	Volume Up Mic 1	button 19	T	Select Channel 3 Zone	button 33	c	no button definition assigned
button 06	G	Volume Up Mic 2	button 20	U	Select Channel 4 Zone	button 34	d	no button definition assigned
button 07	H	Volume Up Zone	button 21	V	Recall Main Preset A	button 35	e	no button definition assigned
button 08	I	Volume Up Main	button 22	W	Recall Main Preset B	button 36	f	no button definition assigned
button 09	J	Toggle Mute Mic 1	button 23	X	Recall Main Preset C	button 37	g	no button definition assigned
button 10	K	Toggle Mute Mic 2	button 24	Y	Select Channel 5 Main	button 38	h	no button definition assigned
button 11	L	Toggle Mute Zone	button 25	Z	Select Channel 1 Main	button 39	i	no button definition assigned
button 12	M	Toggle Mute Main	button 26	[	Select Channel 2 Main	button 40	j	no button definition assigned
button 13	N	Recall Zone Preset E	button 27	\	Select Channel 3 Main			
button 14	O	Recall Zone Preset F	button 28	]	Select Channel 4 Main			

When a control button is first pressed, the SPM522D receives the character which corresponds to that button. If the control button is pressed longer than 110 milliseconds, the SPM522D receives a "repeat code", indicating the control button is still being pressed. The SPM522D continues to receive the repeat code (approximately nine times per second) until the control button is released. The ASCII character which corresponds to the repeat code is @ (the "commercial at" sign).

The "receive data" (RxD) signal at the SPM522D Serial Port is combined with signals from any standard controls, before being sent to the main microprocessor. The computer can initiate any functions or actions that a standard control can, by simply transmitting the equivalent control button ASCII character. When interfacing the SPM522D to a computer, the computer must be aware that the SPM522D will "echo" all characters it receives (both from computer and standard controls) via the Serial Port 'transmit data' (TXD) signal.

Up to four SPM522Ds may be connected together, and addressed individually, when using Control Button Emulation. When multiple units are used, each unit should be assigned a unique "Device Number" (see Configuration on pg. 11). Normally, all of the SPM522Ds would react to control button commands. However, the computer can send commands to specific units, by preceding each command with a "device select prefix" character (see following table). Only those SPM522Ds whose Device Numbers are specified will respond to the command which follows. Those specific devices will also react to any repeat codes which immediately follow the command. If a command is not immediately preceded by a device select prefix character, then all SPM522Ds in the system will react to that command.

Select Device 1	l	Select Devices 2 & 3	q	Select Devices 1 & 2 & 4	v
Select Device 2	m	Select Devices 1 & 2 & 3	r	Select Devices 3 & 4	w
Select Devices 1 & 2	n	Select Device 4	s	Select Devices 1 & 3 & 4	x
Select Device 3	o	Select Devices 1 & 4	t	Select Devices 2 & 3 & 4	y
Select Devices 1 & 3	p	Select Devices 2 & 4	u	Select Devices 1 & 2 & 3 & 4	z

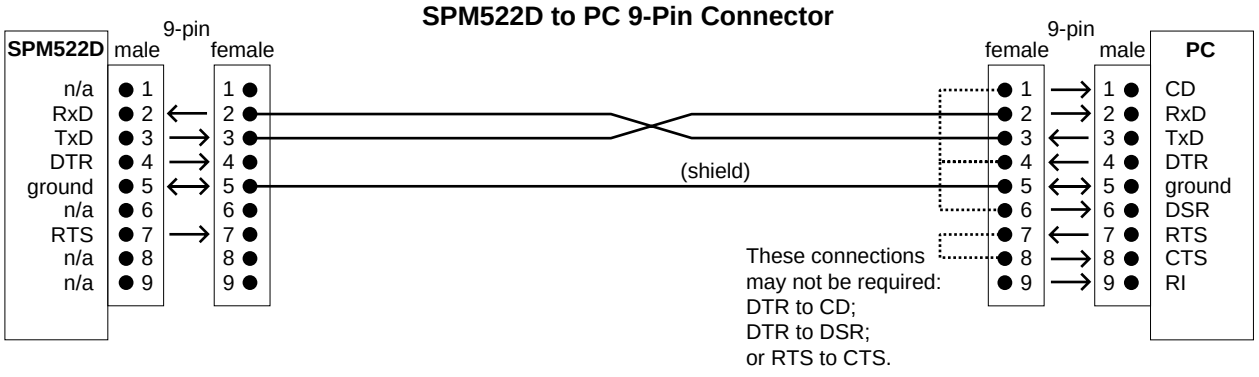
Serial Interface Electrical Connections & Cabling: The 9-pin Subminiature D (male) connector on the SPM522D rear panel provides the RS-232 compatible serial interface signals used for computer control. The SPM522D transmits serial data on pin 3 (TxD) and receives serial data on pin 2 (RxD). The serial interface ground is on Pin 5. The DTR & RTS signals are connected to the +12 Volt power supply (each through its own resistor) and are always asserted when the SPM522D power is on. Most IBM compatible PCs use either 25-pin or 9-pin (male) connectors for their serial ports. The following table summarizes the pin assignments for the SPM522D serial interface, and for the standard IBM compatible 9-pin and 25-pin serial ports.

SIGNAL NAME	DIRECTION	SPM522D 9-PIN	IBM-PC 9-PIN	IBM-PC 25-PIN
CD (carrier detect)	input	n/a	pin 1	pin 8
RxD (receive data)	input	pin 2	pin 2	pin 3
TxD (transmit data)	output	pin 3	pin 3	pin 2
DTR (data terminal ready)	output	pin 4	pin 4	pin 20
signal ground	n/a	pin 5	pin 5	pin 7
DSR (data set ready)	input	n/a	pin 6	pin 6
RTS (request to send)	output	pin 7	pin 7	pin 4
CTS (clear to send)	input	n/a	pin 8	pin 5
RI (ring indicator)	input	n/a	pin 9	pin 22

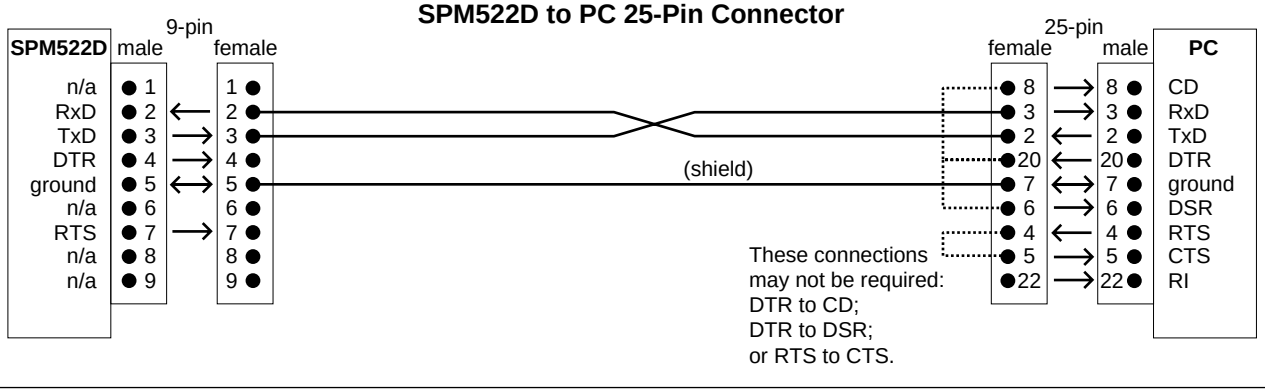
The SPM522D only requires receive data (pin 2), transmit data (pin 3), and signal ground (pin 5) to be connected for successful data communications. However, the PC may require that signals be present on the data set ready, clear to send, or carrier detect inputs, as well as the receive data, transmit data, and signal ground pins. The diagrams on the following page show cables for interfacing to a PC with either a 9-pin or a 25-pin serial port connector. In most cases, one or the other of these cables will work. However, success or failure depends entirely on the actual computer hardware and software being used. When trying to solve an interfacing problem, the most important thing to remember is that an output of one device should connect to one or more inputs of the other device, and that two outputs should never be connected together. Also, keep in mind that the RS-232 specification calls for the cable length to be no greater than 50 feet (although it is not unusual to be able to operate over distances of 150 to 250 feet), and the connectors must be of the appropriate gender (male or female) to mate properly. For best results, a shielded cable should be used, with the shield connected to signal ground. Since the SPM522D serial interface ground is also tied (indirectly) to the analog signal ground, undesirable ground loops may occur when the SPM522D is connected to a PC (if the system grounding is not carefully designed). For best performance, the PC ground and the chassis ground of the SPM522D should be at the same potential, and the PC should get AC power from the same source as the SPM522D (and any other audio equipment which is connected to the SPM522D).

Serial Interface Data Communications Parameters: The SPM522D communicates through the serial interface at a rate of 9600 bits per second, with 8 data bits, 1 stop bit, and no parity. The SPM522D utilizes a subset of the standard 7-bit ASCII character set. The eighth data bit of each character (the most significant bit) should always be 0. The computer should not echo the characters it receives. The computer should not be set for either hardware (DTR) or software (XON/XOFF) flow control. The baud rate may be changed to 2400 bits per second by means of an internal DIP switch labelled 'Opt. W' (for access instructions and switch diagram see Options on pg. 6). The 'Opt. W' DIP switch is located on the right-center of the lower circuit board, adjacent to the microprocessor (U2). To select 2400 baud rate: 1) Disconnect power from the SPM522D. 2) Remove top panel. 3) Move 'Opt. W' DIP switch towards the rear panel, to the 'off' position.

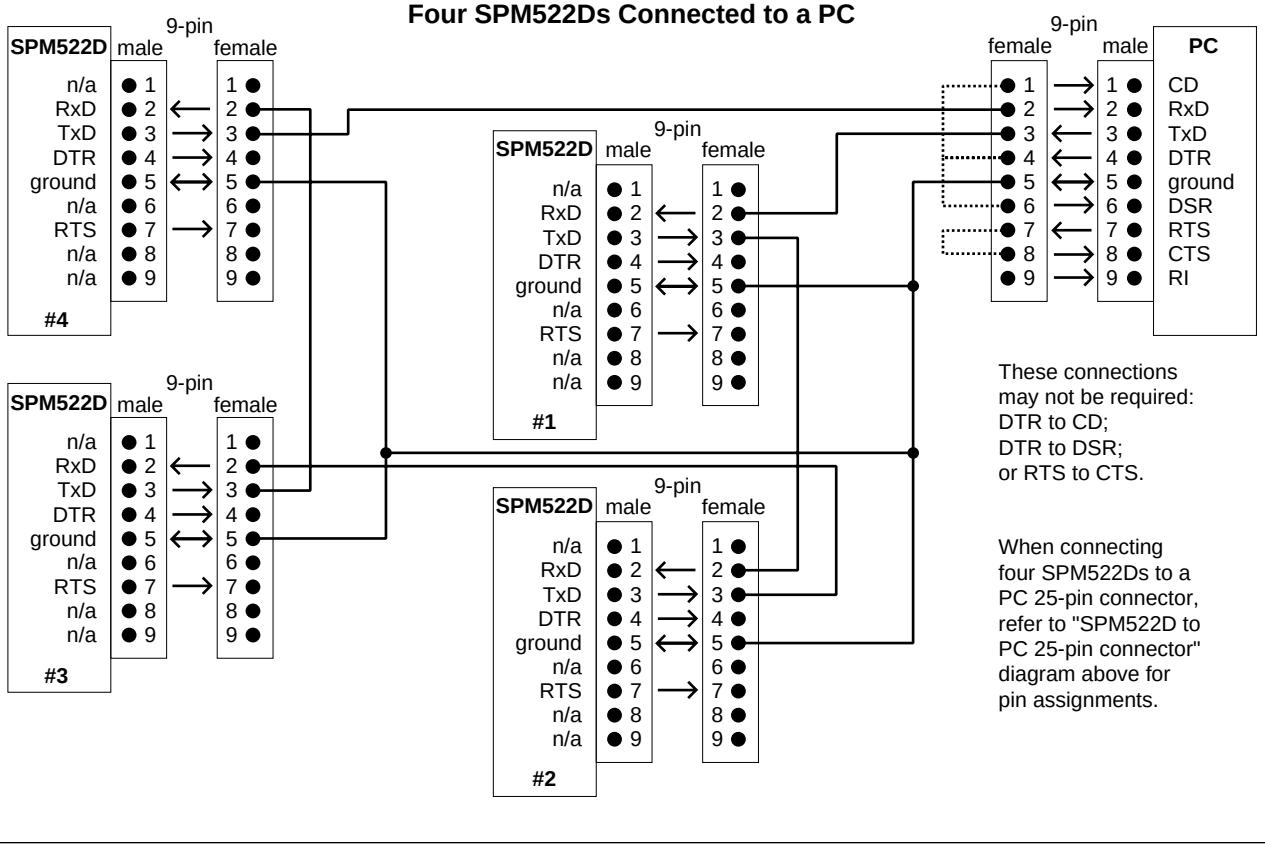
SPM522D to PC 9-Pin Connector



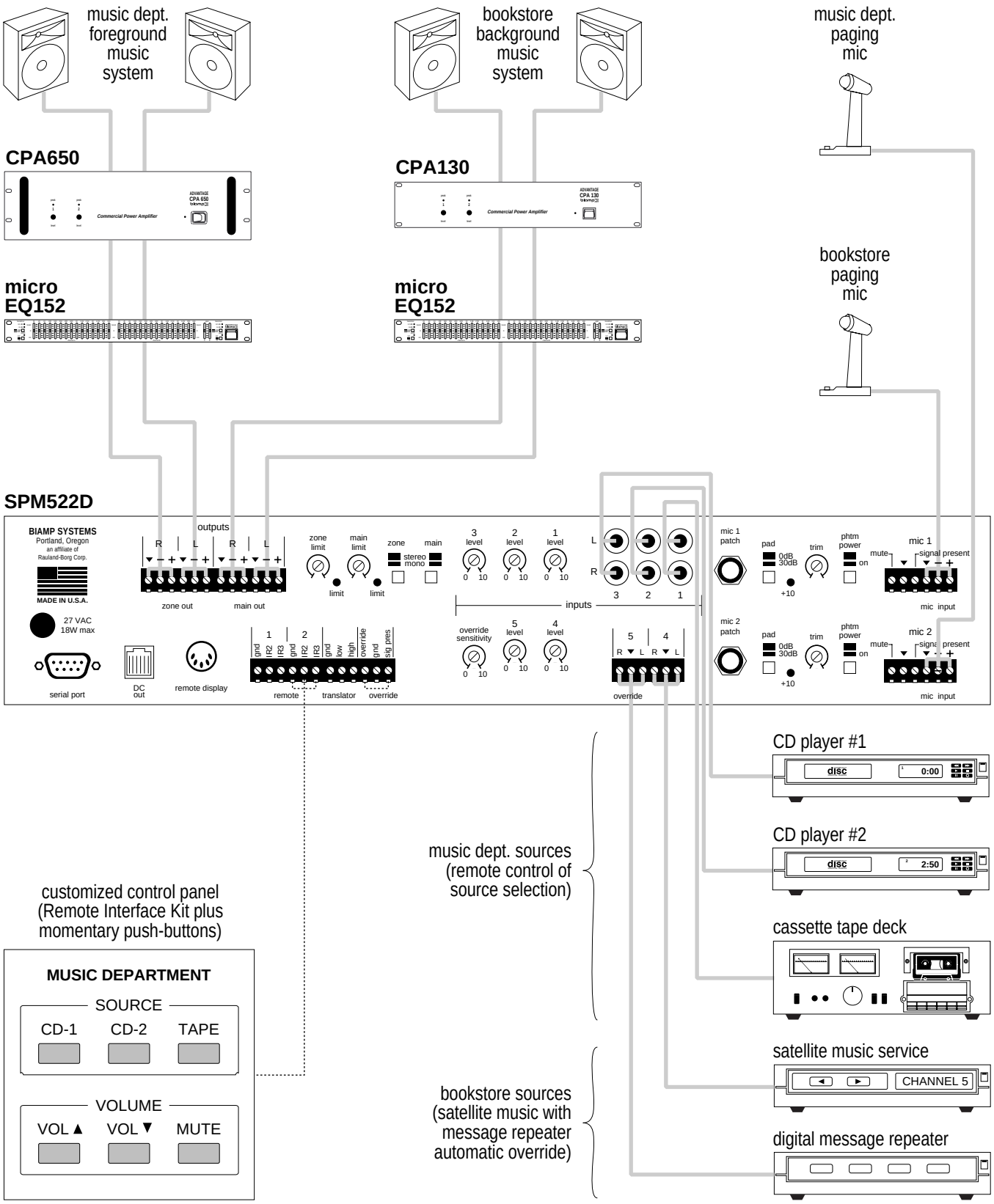
SPM522D to PC 25-Pin Connector



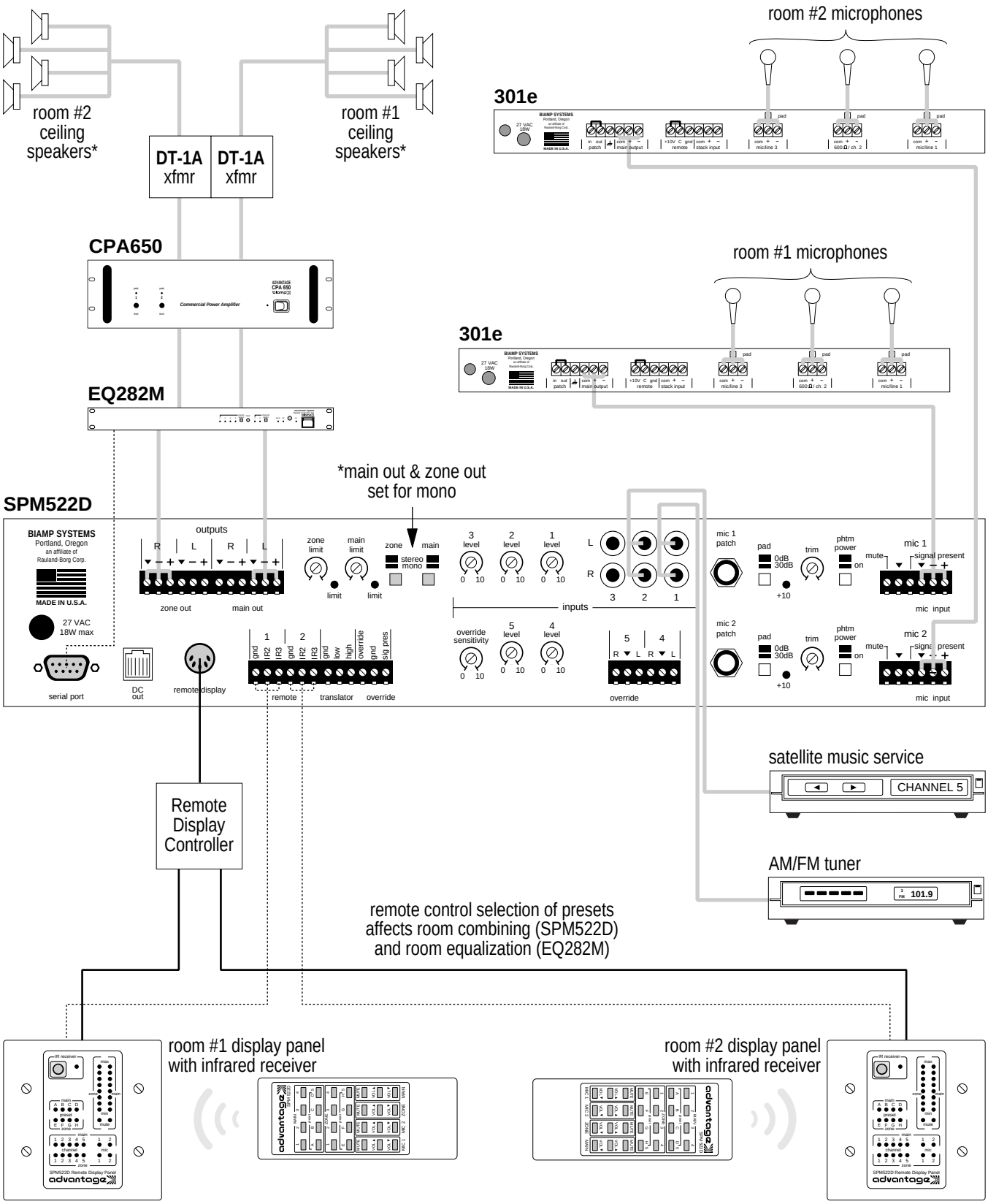
Four SPM522Ds Connected to a PC



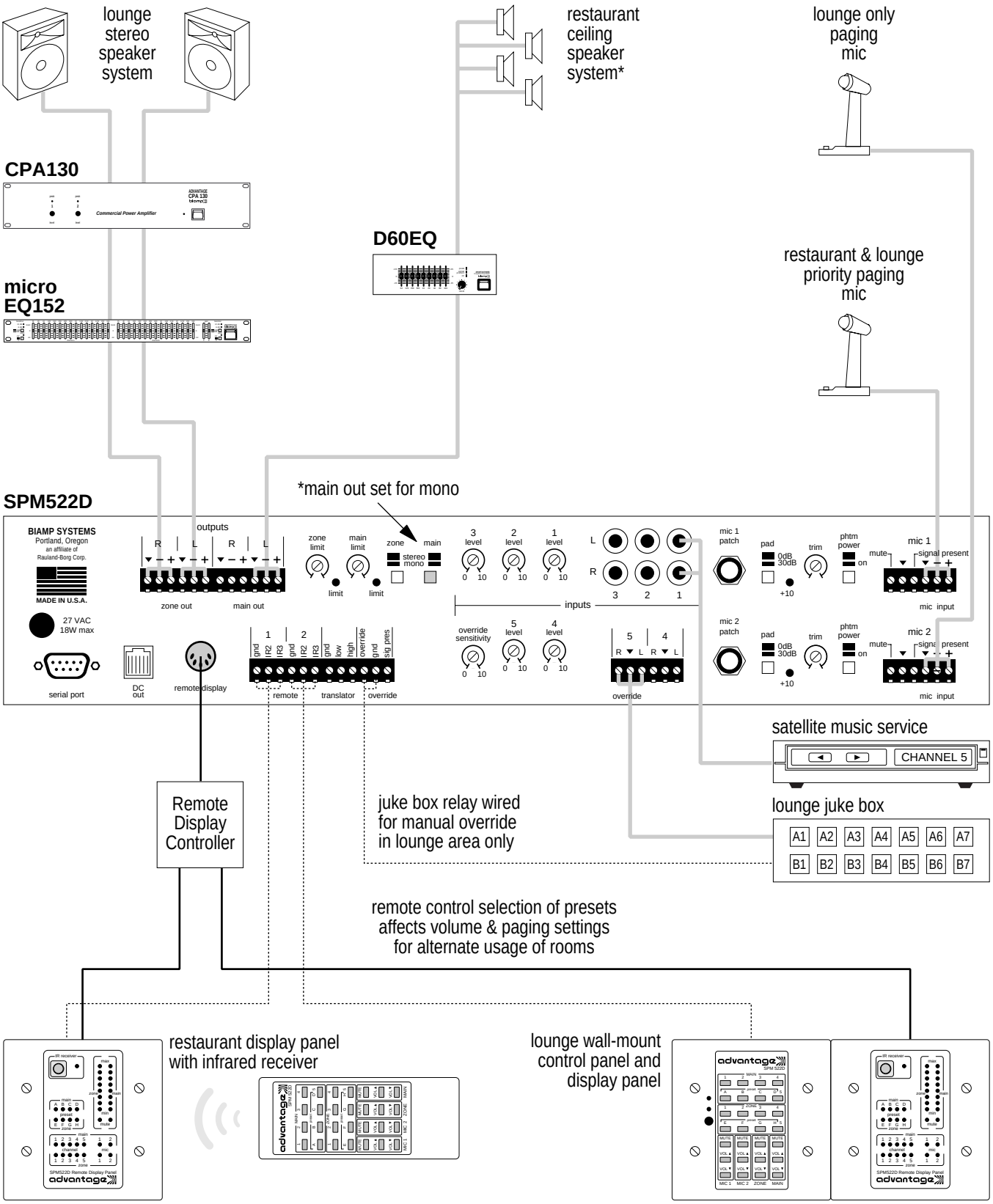
Retail Bookstore plus Music Department with Paging and Remote Control



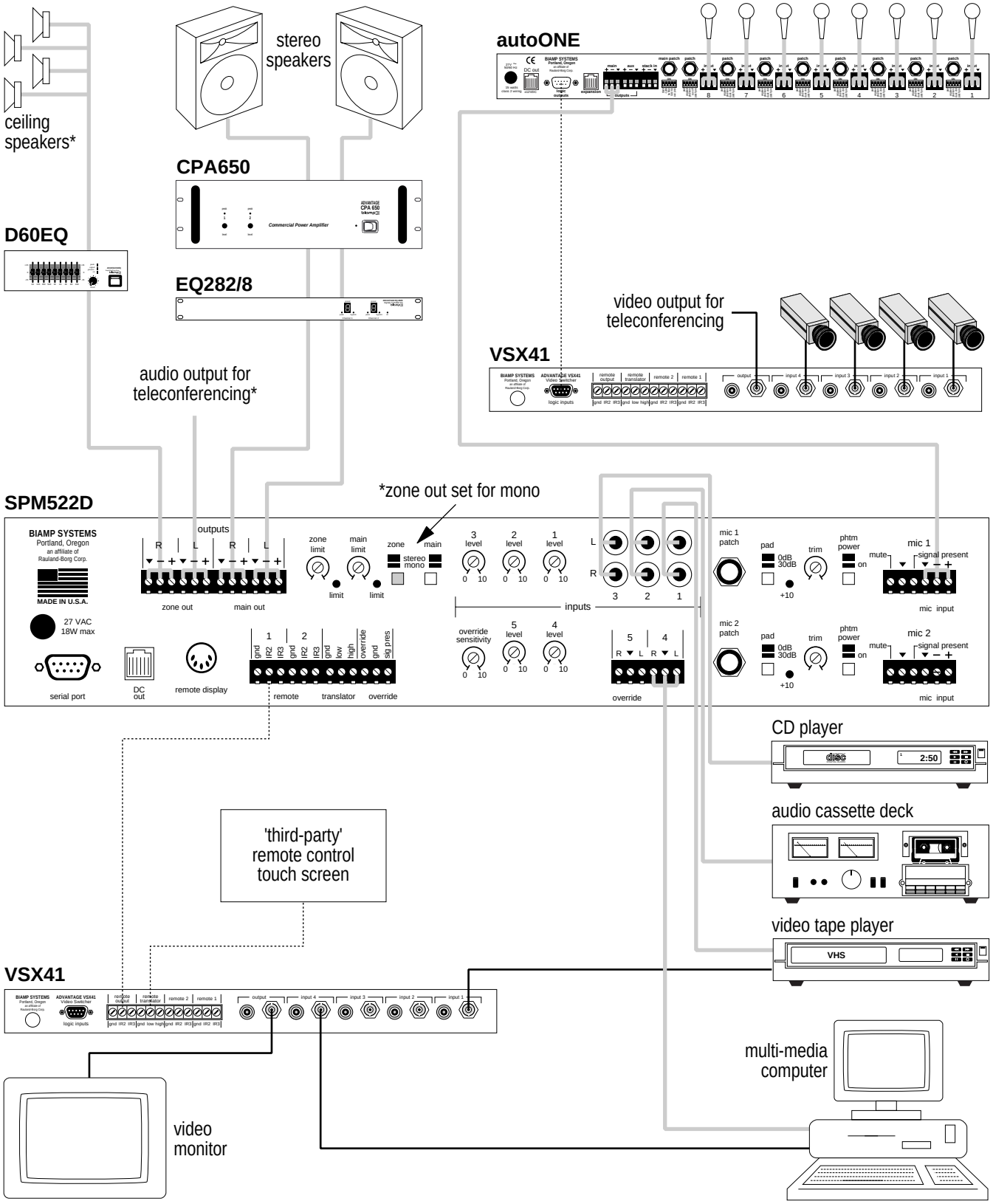
Two Hotel Meeting Rooms with Room Combining and Remote Control



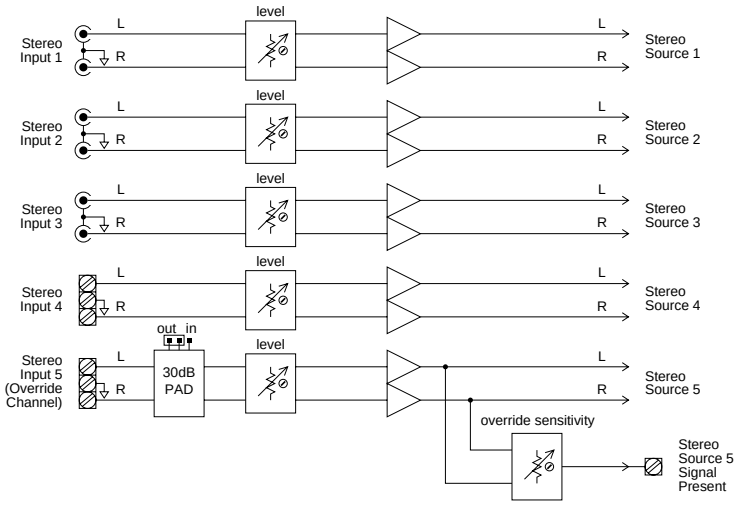
Restaurant plus Bar with Paging and Remote Control



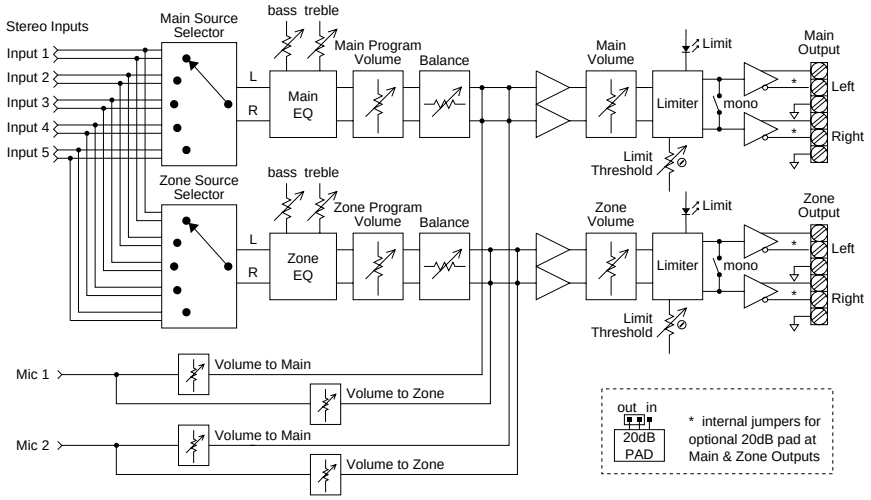
Boardroom Sound System with Teleconference Feed & Remote Control



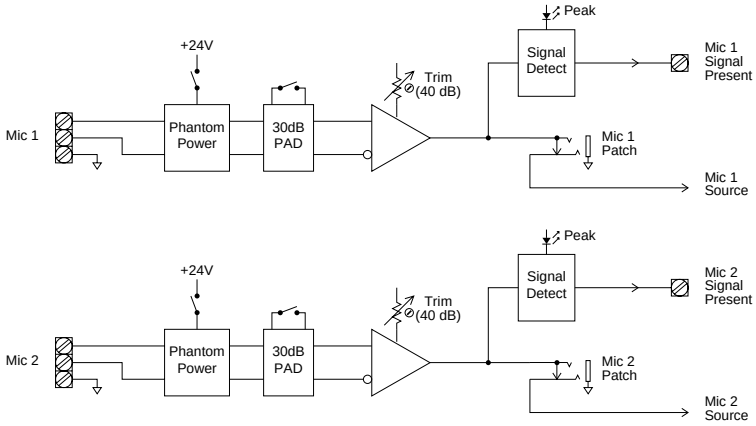
Stereo Program Inputs



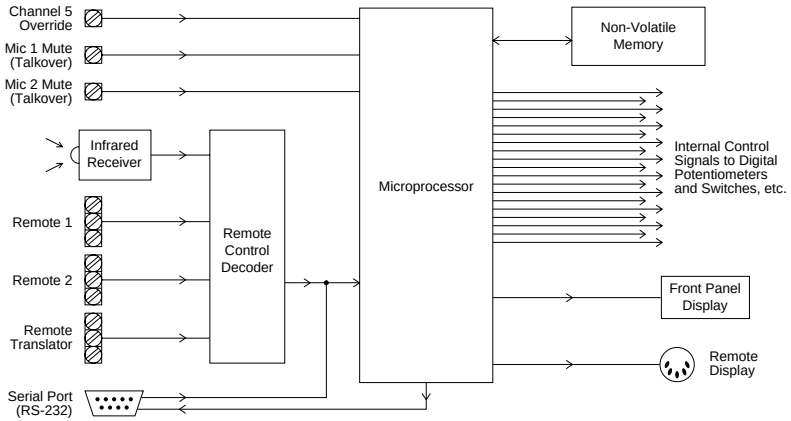
Program Source Selection & Outputs



Mono Mic/Line Inputs



CPU & Logic



SPECIFICATIONS

Frequency Response (20Hz-20kHz @ +4dBu)**:**	+0/-2dB
Total Harmonic Distortion (20Hz-20kHz @ +4dBu)**:**	< 0.05%
Output Noise (20Hz-20kHz @ nominal levels)**:**	< -75dBu
Equivalent Input Noise (20Hz-20kHz, 150Ω termination @ Mic/Line Input)**:**	-127dBu
Maximum Gain (Mic/Line Input to Main/Zone Outputs)**:**	75dB
Input Trim Gain Range:	
Mic/Line Inputs (30dB pad out)	+52dB to +14dB
Stereo Line Inputs (30dB pad out - Input 5)	+10dB to -50dB
Input Impedance:	
Mic/Line Inputs (balanced)	2k ohms
Mic Patch (unbalanced)	5.4k ohms
Stereo Line Inputs (unbalanced)	7k ohms
Stereo Line Input 5 (30dB pad in)	20k ohms
Maximum Input:	
Mic/Line Inputs (balanced)	+33dBu
Mic Patch (unbalanced)	+18dBu
Stereo Line Inputs (unbalanced)	+27dBu
Stereo Line Input 5 (30dB pad in)	+39.2dBu (70.7V)
Output Impedance:	
Main Out (balanced)	100 ohms
Zone Out (balanced)	100 ohms
Mic Patch (unbalanced)	100 ohms
Maximum Output:	
Main Out (balanced)	+24dBu
Zone Out (balanced)	+24dBu
Mic Patch (unbalanced)	+18dBu
Stereo Limiter Threshold Range (Main/Zone balanced)**:**	+24dBu to +9dBu
Phantom Power (Mic/Line Inputs only)**:**	+24 Volts DC
DC Out:	±12 Volts DC @ 20mA max.
Power Requirements:	10 Watts max.
Power Consumption:	110/240VAC 50/60Hz
Dimensions:	
Height (1 rack space)	3.5 inches (89mm)
Width	19 inches (483mm)
Depth	7.5 inches (191mm)
Weight:	8.5 lbs. (3.86kg)

WARRANTY

BIAMP SYSTEMS IS PLEASED TO EXTEND THE FOLLOWING 5-YEAR LIMITED WARRANTY TO THE ORIGINAL PURCHASER OF THE PROFESSIONAL SOUND EQUIPMENT DESCRIBED IN THIS MANUAL.

BIAMP Systems expressly warrants this product to be free from defects in material and workmanship for a period of 5 YEARS from the date of purchase as a new product from an authorized BIAMP Systems dealer under the following conditions.

1. The Purchaser is responsible for completing and mailing to BIAMP Systems, within 10 days of purchase, the attached warranty application.

2. In the event the warranted BIAMP Systems product requires service during the warranty period, BIAMP Systems will repair or replace, at its option, defective materials, provided you have identified yourself as the original purchaser of the product to any authorized BIAMP Systems Service Center. Transportation and insurance charges to and from an authorized Service Center or the BIAMP Systems factory for warranted products or components thereof to obtain repairs shall be the responsibility of the purchaser.

3. This warranty will be VOIDED if the serial number has been removed or defaced; or if the product has been subjected to accidental damage, abuse, rental usage, alterations, or attempted repair by any person not authorized by BIAMP Systems to make repairs; or if the product has been installed contrary to BIAMP Systems's recommendations.

4. Electro-mechanical fans, electrolytic capacitors, and the normal wear and tear of appearance items such as paint, knobs, handles, and covers are not covered under this warranty.

5. BIAMP SYSTEMS SHALL NOT IN ANY EVENT BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, LOSS OF USE, PROPERTY DAMAGE, INJURY TO GOODWILL, OR OTHER ECONOMIC LOSS OF ANY SORT. EXCEPT AS EXPRESSLY PROVIDED HEREIN, BIAMP SYSTEMS DISCLAIMS ALL OTHER LIABILITY TO PURCHASER OR ANY OTHER PERSONS ARISING OUT OF USE OR PERFORMANCE OF THE PRODUCT, INCLUDING LIABILITY FOR NEGLIGENCE OR STRICT LIABILITY IN TORT.

6. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. BIAMP SYSTEMS EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE REMEDIES SET FORTH HEREIN SHALL BE THE PURCHASER'S SOLE AND EXCLUSIVE REMEDIES WITH RESPECT TO ANY DEFECTIVE PRODUCT. THE AGENTS, EMPLOYEES, DISTRIBUTORS, AND DEALERS OF BIAMP SYSTEMS ARE NOT AUTHORIZED TO MODIFY THIS WARRANTY OR TO MAKE ADDITIONAL WARRANTIES BINDING ON BIAMP SYSTEMS. ACCORDINGLY, ADDITIONAL STATEMENTS SUCH AS DEALER ADVERTISEMENTS OR REPRESENTATIONS DO NOT CONSTITUTE WARRANTIES BY BIAMP SYSTEMS.

7. No action for breach of this warranty may be commenced more than one year after the expiration of this warranty.

Thank you for purchasing BIAMP SYSTEMS...
AMERICAN SOUND CRAFTSMANSHIP

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