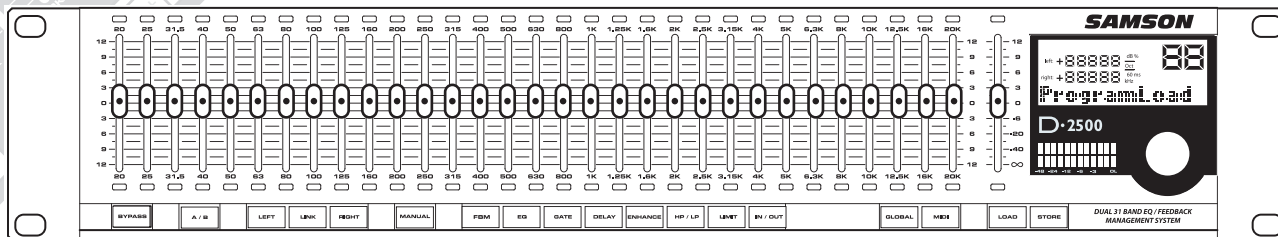


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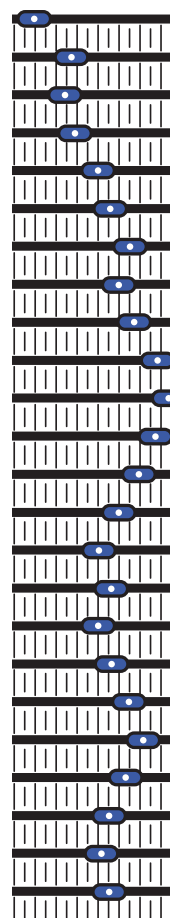
Dual 31 Band
Equalization System



DIGITAL DUAL 31 BAND EQUALIZATION SYSTEM

Owners Manual

SAMSON
A U D I O



Safety Instructions/Consignes de sécurité/Sicherheitsvorkehrungen/Instrucciones de seguridad



WARNING: To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture. To reduce the hazard of electrical shock, do not remove cover or back. No user serviceable parts inside. Please refer all servicing to qualified personnel. The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons. The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Important Safety Instructions

1. Please read all instructions before operating the unit.
2. Keep these instructions for future reference.
3. Please heed all safety warnings.
4. Follow manufacturers instructions.
5. Do not use this unit near water or moisture.
6. Clean only with a damp cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturers instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. When the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on and pinched particularly at plugs, convenience receptacles and at the point at which they exit from the unit.
11. Unplug this unit during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified personnel. Servicing is required when the unit has been damaged in any way, such as power supply cord or plug damage, or if liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.

ACHTUNG: Um die Gefahr eines Brandes oder Stromschlags zu verringern, sollten Sie dieses Gerät weder Regen noch Feuchtigkeit aussetzen. Um die Gefahr eines Stromschlags zu verringern, sollten Sie weder Deckel noch Rückwand des Geräts entfernen. Im Innern befinden sich keine Teile, die vom Anwender gewartet werden können. Überlassen Sie die Wartung qualifiziertem Fachpersonal. Der Blitz mit Pfeilspitze im gleichseitigen Dreieck soll den Anwender vor nichtisolierter "gefährlicher Spannung" im Geräteinnern warnen. Diese Spannung kann so hoch sein, dass die Gefahr eines Stromschlags besteht. Das Ausrufezeichen im gleichseitigen Dreieck soll den Anwender auf wichtige Bedienungs- und Wartungsanleitungen aufmerksam machen, die im mitgelieferten Informationsmaterial näher beschrieben werden.

Wichtige Sicherheitsvorkehrungen

1. Lesen Sie alle Anleitungen, bevor Sie das Gerät in Betrieb nehmen.
2. Bewahren Sie diese Anleitungen für den späteren Gebrauch gut auf.
3. Bitte treffen Sie alle beschriebenen Sicherheitsvorkehrungen.
4. Befolgen Sie die Anleitungen des Herstellers.
5. Benutzen Sie das Gerät nicht in der Nähe von Wasser oder Feuchtigkeit.
6. Verwenden Sie zur Reinigung des Geräts nur ein feuchtes Tuch.
7. Blockieren Sie keine Belüftungsöffnungen. Nehmen Sie den Einbau des Geräts nur entsprechend den Anweisungen des Herstellers vor.
8. Bauen Sie das Gerät nicht in der Nähe von Wärmequellen wie Heizkörpern, Wärmeklappen, Öfen oder anderen Geräten (inklusive Verstärkern) ein, die Hitze erzeugen.
9. Setzen Sie die Sicherheitsfunktion des polarisierten oder geerdeten Steckers nicht außer Kraft. Ein polarisierter Stecker hat zwei flache, unterschiedlich breite Pole. Ein geerdeter Stecker hat zwei flache Pole und einen dritten Erdungsstift. Der breitere Pol oder der dritte Stift dient Ihrer Sicherheit. Wenn der vorhandene Stecker nicht in Ihre Steckdose passt, lassen Sie die veraltete Steckdose von einem Elektriker ersetzen.
10. Schützen Sie das Netzkabel dahingehend, dass niemand darüber laufen und es nicht geknickt werden kann. Achten Sie hierbei besonders auf Netzstecker, Mehrfachsteckdosen und den Kabelanschluss am Gerät.
11. Ziehen Sie den Netzstecker des Geräts bei Gewittern oder längeren Betriebspausen aus der Steckdose.
12. Überlassen Sie die Wartung qualifiziertem Fachpersonal. Eine Wartung ist notwendig, wenn das Gerät auf irgendeine Weise, beispielsweise am Kabel oder Netzstecker beschädigt wurde, oder wenn Flüssigkeiten oder Objekte in das Gerät gelangt sind, es Regen oder Feuchtigkeit ausgesetzt war, nicht mehr wie gewohnt betrieben werden kann oder fallen gelassen wurde.

ATTENTION: Pour éviter tout risque d'électrocution ou d'incendie, ne pas exposer cet appareil à la pluie ou à l'humidité. Pour éviter tout risque d'électrocution, ne pas ôter le couvercle ou le dos du boîtier. Cet appareil ne contient aucune pièce remplaçable par l'utilisateur. Confiez toutes les réparations à un personnel qualifié. Le signe avec un éclair dans un triangle prévient l'utilisateur de la présence d'une tension dangereuse et non isolée dans l'appareil. Cette tension constitue un risque d'électrocution. Le signe avec un point d'exclamation dans un triangle prévient l'utilisateur d'instructions importantes relatives à l'utilisation et à la maintenance du produit.

Consignes de sécurité importantes

1. Veuillez lire toutes les instructions avant d'utiliser l'appareil.
2. Conserver ces instructions pour toute lecture ultérieure.
3. Lisez avec attention toutes les consignes de sécurité.
4. Suivez les instructions du fabricant.
5. Ne pas installer cet appareil près d'une source liquide ou dans un lieu humide.
6. Nettoyez l'appareil uniquement avec un tissu humide.
7. Veillez à ne pas obstruer les fentes prévues pour la ventilation de l'appareil. Installez l'appareil selon les instructions du fabricant.
8. Ne pas installer près d'une source de chaleur (radiateurs, etc.) ou de tout équipement susceptible de générer de la chaleur (amplificateurs de puissance par exemple).
9. Ne pas retirer la terre du cordon secteur ou de la prise murale. Les fiches canadiennes avec polarisation (avec une lame plus large) ne doivent pas être modifiées. Si votre prise murale ne correspond pas au modèle fourni, consultez votre électricien.
10. Protégez le cordon secteur contre tous les dommages possibles (pincement, tension, torsion, etc.). Veillez à ce que le cordon secteur soit libre, en particulier à sa sortie du boîtier.
11. Déconnectez l'appareil du secteur en présence d'orage ou lors de périodes d'inutilisation prolongées.
12. Consultez un service de réparation qualifié pour tout dysfonctionnement (dommage sur le cordon secteur, baisse de performances, exposition à la pluie, projection liquide dans l'appareil, introduction d'un objet dans le boîtier, etc.).

PRECAUCION: Para reducir el riesgo de incendios o descargas, no permita que este aparato quede expuesto a la lluvia o la humedad. Para reducir el riesgo de descarga eléctrica, nunca quite la tapa ni el chasis. Dentro del aparato no hay piezas susceptibles de ser reparadas por el usuario. Dirija cualquier reparación al servicio técnico oficial. El símbolo del relámpago dentro del triángulo equilátero pretende advertir al usuario de la presencia de "voltajes peligrosos" no aislados dentro de la carcasa del producto, que pueden ser de la magnitud suficiente como para constituir un riesgo de descarga eléctrica a las personas. El símbolo de exclamación dentro del triángulo equilátero quiere advertirle de la existencia de importantes instrucciones de manejo y mantenimiento (reparaciones) en los documentos que se adjuntan con este aparato.

Instrucciones importantes de seguridad

1. Lea todo este manual de instrucciones antes de comenzar a usar la unidad.
2. Conserve estas instrucciones para cualquier consulta en el futuro.
3. Cumpla con todo lo indicado en las precauciones de seguridad.
4. Observe y siga todas las instrucciones del fabricante.
5. Nunca utilice este aparato cerca del agua o en lugares húmedos.
6. Limpie este aparato solo con un trapo suave y ligeramente humedecido.
7. No bloquee ninguna de las aberturas de ventilación. Instale este aparato de acuerdo a las instrucciones del fabricante.
8. No instale este aparato cerca de fuentes de calor como radiadores, calentadores, hornos u otros aparatos (incluyendo amplificadores) que produzcan calor.
9. No anule el sistema de seguridad del enchufe de tipo polarizado o con toma de tierra. Un enchufe polarizado tiene dos bornes, uno más ancho que el otro. Uno con toma de tierra tiene dos bornes normales y un tercero para la conexión a tierra. El borne ancho o el tercero se incluyen como medida de seguridad. Cuando el enchufe no encaje en su salida de corriente, llame a un electricista para que le cambie su salida anticuada.
10. Evite que el cable de corriente quede en una posición en la que pueda ser pisado o aplastado, especialmente en los enchufes, receptáculos y en el punto en el que salen de la unidad.
11. Desconecte de la corriente este aparato durante las tormentas eléctricas o cuando no lo vaya a usar durante un periodo de tiempo largo.
12. Dirija cualquier posible reparación solo al servicio técnico oficial. Deberá hacer que su aparato sea reparado cuando esté dañado de alguna forma, como si el cable de corriente o el enchufe están dañados, o si se han derramado líquidos o se ha introducido algún objeto dentro de la unidad, si esta ha quedado expuesta a la lluvia o la humedad, si no funciona normalmente o si ha caído al suelo.

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Introduction

Congratulations! You just purchased one of the most innovative and useful audio tools available to sound engineers today, the D2500 Digital Equalizer from Samson Audio! The D2500 is a dual channel, 1/3 Octave, 31 Band Digital Graphic Equalizer featuring cutting edge DSP and analog-to-digital conversion technology, together with a simple to use, traditional analog user interface. The D2500's robust, 2 rack-space steel and aluminum extruded chassis design is not only road worthy, but it also provides a large front panel layout which is extremely easy to use and already familiar to audio engineers. The beauty of the D2500 Graphic Equalizer is that it has 31 bands of real hands-on faders! You may forget that that you are using a digital EQ; just press the MANUAL button and "look mom, I'm equalizing the system!" And, with the high-end 24 Bit AD and DA converters and 96K sampling rate, you'll enjoy pristine audio quality. Thanks to the powerful DSP engine and clever software, the D2500 is capable of producing EQ curves with more accurate and precise filters, far exceeding the capabilities of even the best analog equalizers. What you won't get is the accumulating additive hiss noise that you get from an analog equalizer when you push up the high frequency bands.

In addition to being a simple to use digital equalizer, the D2500 is packed with all the goodies including HIGH & LOW PASS FILTER, NOISE GATE, LIMITER, ENHANCER, DELAY and FEED BACK MANAGEMENT. All these digital effects are programmable and their associated parameters can be stored, and recalled, as part of the 99 available user pre-sets. The HIGH and LOW PASS FILTERS allow you to quickly apply an EQ contour for rolling off the high and low end frequencies, for example, when equalizing vocal monitors. The D2500's NOISE GATE allows you to set a threshold level in order to mute any system hums and buzzes during silent sections keeping your system super clean. With the D2500's LIMITER you can control the level that you are sending to your power amplifiers to help you insure good protection for your loud-speakers. The onboard ENHANCER will actually add high frequency to the system when there is program material at those frequencies, adding extra sparkle to the mix. The ENHANCER will also automatically turn down the high frequencies when there is no high frequency signal content, which, by eliminating system noise and hiss, making the D2500 a very effective noise reduction system. In addition, the D2500 also offers on onboard DELAY for time aligning speakers. Another powerful feature of the D2500 is feedback suppression. The D2500's feedback management system can be set to AUTO which will automatically find the frequency that's feeding back and lower the associated filter. Or, you can use the feedback management system in MANUAL mode where the D2500 will automatically find, and then display, the frequency that's feeding back, showing which fader you should pull down manually. All settings and parameters for the equalizer and digital effects can be stored in 99 pre-set locations. Using the large, easy to read, LCD display and convenient data wheel, it's possible to save your favorite equalization curves and recall them in the future. Or, when using the D2500 together with the D 1500 Real Time Analyzer, you can auto-correct the room to a flat response, and then apply your favorite system curve on top. In addition, the powerful LOAD MASK allows you to recall certain effects or EQ curves from any preset independently, so you can add pre-set effects settings with real time changes.

The D2500 features standard MIDI implementation and Samson's D-Net, enabling device-to-device linking for creating larger audio systems, for interfacing to a personal computer. When linking the units you see the full power of the D-class system. With a basic MIDI connection, the fader positions of the D-2500 digital EQ can be displayed the D1500 Real Time Analyzer, giving you the power of digital processing with a unique analog feel. For systems using many D class units, the D2500 can be fitted with the DN1 D-Net network card. Samson's D Net is a high-speed communication protocol for connected multiple D class units, like the D2500 digital equalizer, D1500 RTA or D3500 feedback management system. In addition to being 10 times faster than MIDI, the error rate is so close to zero, it's difficult to measure. All settings and parameters can be stored in any of the 99 preset locations providing instant recall of your favorite setups. Like all D class models, the D2500 features an advanced 32-bit point floating processor DSP interface to high quality converters with 24-bit audio resolution and sample rates up to 96kHz for pristine audio quality. You can even upgrade your D class units to premium Analog-to-Digital and Digital-to-Analog I/O (Input/Output) converter boards, keeping your D class system up to date with the best technology and sound, far into the future.

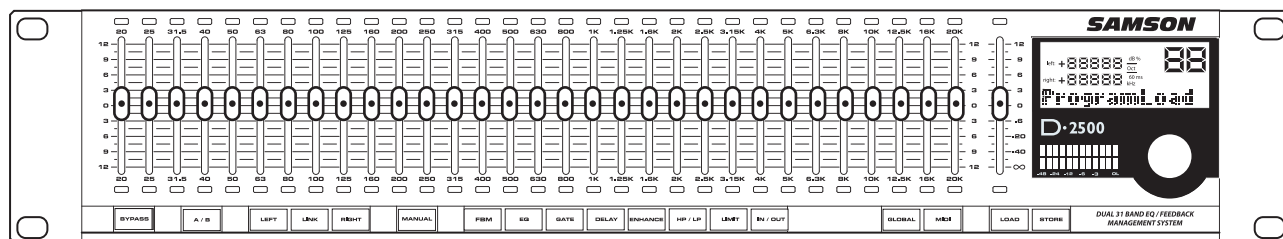
The D2500 is perfectly at home in the studio or on the road. The fact is, you would use the D2500 equalizer for its precise filtering and superb audio quality alone, but you get the power of all the features, and then some, expected from a high quality digital equalizer. Whether you are a recording or a live sound engineer you'll get a better sound using the D2500 Digital Equalizer!

Although this product is designed for easy operation, we suggest you take some time out first to go through these pages so you can fully understand how we've implemented a number of unique features. In this manual, you'll find a more detailed description of the features of the D2500, as well as a guided tour through the front and rear panels, step-by-step instructions for using the unit and suggested applications set-ups.

Serial number: _____ Date of purchase: _____

Should your unit ever require servicing, a Return Authorization number (RA) must be obtained before shipping your unit to Samson. Without this number, the unit will not be accepted. Please call Samson at 1-800-3SAMSON (1-800-372-6766) for a Return Authorization number prior to shipping your unit. Please retain the original packing materials and if possible, return the unit in the original carton and packing materials.

D2500 Features

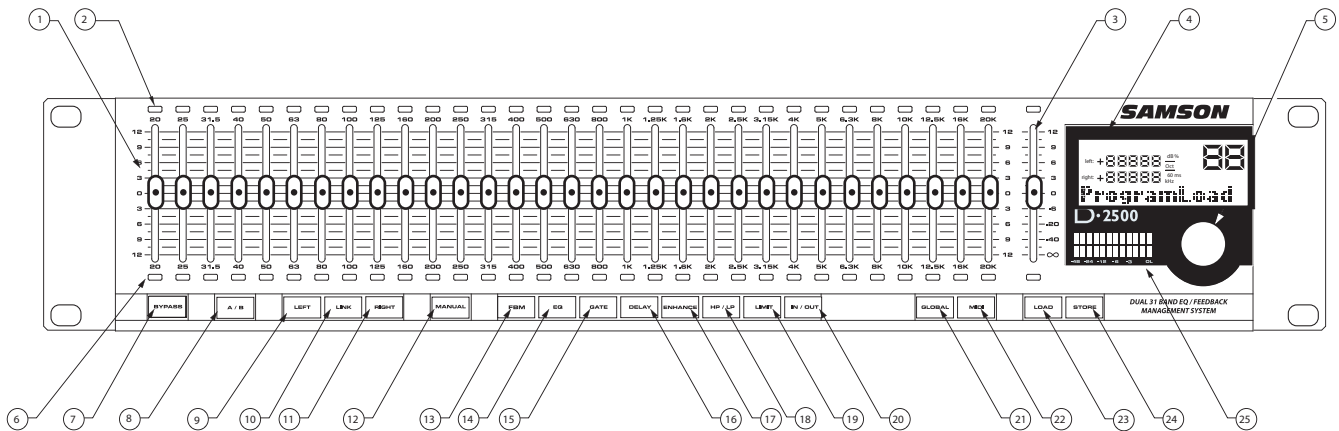


The Samson D2500 Digital Graphic Equalizer utilizes state-of-the-art, DSP and filtering technology for precise tonal control. Here are some of its main features:

- The D2500 is a stereo or two channel digital equalizer with each channel providing 31 bands of equalization, each frequency band representing 1/3 of an octave, on ISO standards, in the 20 Hz to 20 kHz range.
- The front panel provides 32 analog 45mm LED faders for instant filter adjustment and true analog feel.
- Custom Liquid Crystal Display is easy to read and provides critical parameter information.
- Advanced 32 bit floating point DSP with high-end, 24 Bit 96K sample rate Analog-to-Digital and Digital-to-Analog converters provides a pristine sound quality with low distortion and wide dynamic range.
- Variable Q Filters with programmable bandwidth (1/4, 1/3 and 1/2 octave) ensures that the filter of the selected frequency area stays the same even when approaching maximum boost or attenuation. Plus, Auto Bandwidth allows individual filters to have different filter cues. As a result, the frequency response of the D2500 will be as close as possible to your faders settings.
- Automated Feedback recognition, indication and suppression (Manual or Auto mode) with Automated Filter Restoration.
- The D2500's fader can be set for either 3, 6 or 12 dB of gain and attenuation for each of the frequency bands.
- An onboard programmable Delay is included for time aligning speakers.
- The D2500 offers programmable High and Low Pass Filters for setting contour curves or for removing low-end stage rumble.
- To help keep the overall system noise level low, the D2500 includes a programmable Noise Gate with variable threshold control.
- An added layer of speaker protection is accomplished by using the D2500's programmable *brick wall* Limiter.
- The programmable Enhancer can be used to add extra highs or as a noise reduction system by lowering the high frequency bands when no high end content is present.
- Equalization curves plus all digital effects can be stored or recalled using the 99 Preset Locations.
- Configure larger systems using multiple D class units which communicate over standard MIDI, or with Samson's optional high-speed D-Net interface card.
- Electronically balanced XLR inputs and outputs.
- Internal power supply ensures reliability and trouble-free operation.
- Standard 19", 2 rack-space design for easy integration into any traveling or fixed installation audio system.
- Aluminum extruded front panel and steel chassis makes the D2500 eminently road-worthy.
- Three year extended warranty.

Controls and Functions

Front Panel Layout



- 1 FADER** – 45mm LED fader for each of the 31 frequency bands, which can be software set for +/- 12 dB or +/- 6 dB, or +/- 3 dB of cut and boost.
- 2 ABOVE NULL LED** – Red LED indicating the fader is below the null (matching) point. *Note: the null point is the exact location where the fader's physical position matches the level of the digital filter.*
- 3 MASTER FADER** - 45mm LED fader for the Main Output level, which can be software set for +/- 12 dB or +/- 3 dB or +/- 6 dB of cut and boost, as well as +12/- 120 dB or +6/- 120 dB or +3 dB /- 120.
- 4 LCD DISPLAY** – Backlit display that shows the various parameters under control by the operating system.
- 5 DATA WHEEL** – Rotary encoder for entering parameter values.
- 6 BELOW NULL LED** - Green LED indicating the fader is above the null (matching) point. *Note: the null point is the exact location where the fader's physical position matches the level of the digital filter.*
- 7 BYPASS switch** – When the red LED is on, the digital equalizer, as well as all the on-board digital processing effects, are defeated.
- 8 A / B switch** – Used to switch between the your actual modified program, to the last program that has been loaded or stored into memory.
- 9 LEFT switch** – Assigns the Left (CH1) digital equalizer to the physical controls.
- 10 LINK switch** – Used to control the left and right (CH1 and CH2) equalizer simultaneously with the one set of physical controls.
- 11 RIGHT switch** - Assigns the Right (CH1) equalizer to the physical controls.
- 12 MANUAL switch** – When engaged, the left and right equalizers are linked to the physical faders.
- 13 FBM switch** – Used to access the automatic Feedback control parameters. When selected, the amber LED will illuminate and the associated values will be displayed in the LCD window.
- 14 EQ switch** -- When engaged, the amber LED will illuminate indicating that the EQ parameters are under control and displayed in the LCD window.
- 15 GATE switch** - Used to access the automatic GATE control parameters. When selected, the amber LED will illuminate and the associated values for the digital noise gate will be displayed in the LCD window.
- 16 DELAY switch** - When engaged, the amber LED will illuminate indicating that the DELAY parameters are under control and displayed in the LCD window.
- 17 ENHANCER switch** - When engaged, the amber LED will illuminate indicating that the DELAY parameters are under control and displayed in the LCD window.
- 18 HP / LP switch** – LED switch used to access the automatic HI PASS and LOW PASS control parameters. When selected, the amber LED will illuminate and the associated values for the high and low pass filters will be displayed in the LCD window.

Controls and Functions

19 LIMITER switch – This switch is used to page through the LIMITER parameters. When selected, the amber LED will illuminate and the LIMITER parameters will be displayed in the LCD window.

20 IN / OUT switch – The LED switch is used to engage the EQ, FEEDBACK, GATE, DELAY, ENHANCER and LIMITER effects. When one of the above effects switch is selected, (for example FEEDBACK), that effect is turned on when the IN / OUT amber LED is illuminated.

21 GLOBAL switch – When engaged, the red LED will illuminate indicating access to the unit's GLOBAL parameters.

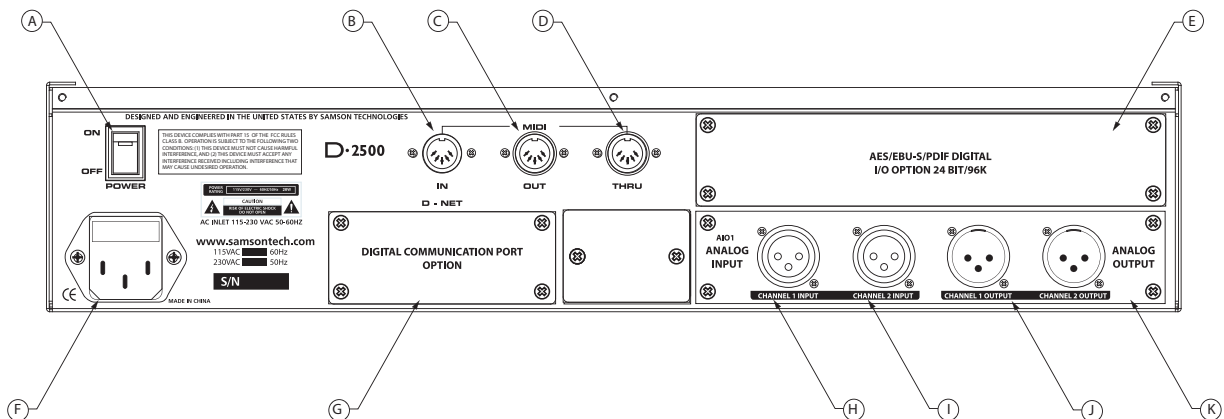
22 MIDI switch - This switch is used to page through the MIDI parameters. When selected, the red LED will illuminate and the MIDI parameters will be displayed in the LCD window.

23 LOAD switch – Used to load one of the 100 programs from the internal memory.

24 STORE switch - Used to store one of the 100 programs into the internal memory.

25 Level Meter - Twelve segment LED meter display the input level.

Rear Panel Layout



A POWER SWITCH – When set to the ON position the D2500 is powered up and ready for operation.

B MIDI IN DIN connector – The D2500 receives standard, or system exclusive, MIDI data here.

C MIDI OUT DIN connector - The D2500 transmits standard, or system exclusive, MIDI data here.

D MIDI THRU DIN connector - The D2500 passes standard, or system exclusive, MIDI data here.

E I/O Accessory Blank Panel – removable blanking panel accesses option bay for adding additional Analog-to Digital or Digital Input/Output boards.

F AC input fuseholder - Connect the supplied heavy gauge 3-pin “IEC” power cable here.

G D-NET Accessory Blank Panel – removable blanking panel accesses option bay for adding the D-NET interface card for control multiple D class units.

H CH1 Balanced XLR jack input - Electronically balanced XLR jack input.

I CH2 Balanced XLR jack input - Electronically balanced XLR jack input.

J CH1 Balanced XLR jack output - Electronically balanced XLR jack output.

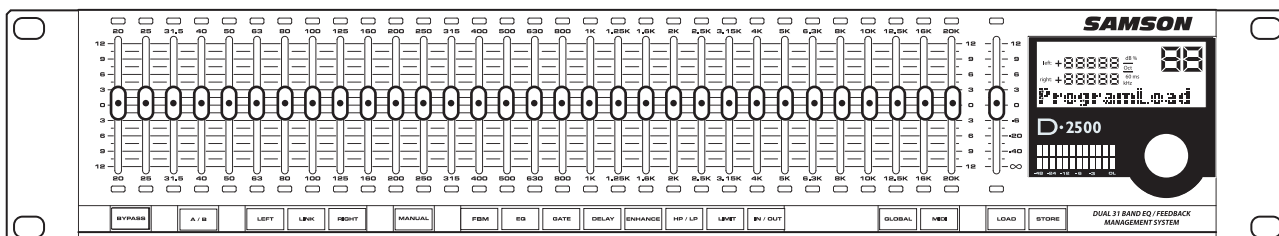
K CH2 Balanced XLR jack output - Electronically balanced XLR jack output.

D2500 Quick Start

SETTING UP THE D2500 to work in MANUAL mode

The D2500 is simple to use. In fact, you can use it just like a standard analog graphic equalizer by simply setting the unit to MANUAL mode. Setting up your D2500 Graphic Equalizer to run in MANUAL mode is a simple procedure which takes only a few minutes:

1. Remove all packing materials (save them in case of need for future service) and decide where the unit is to be physically placed—it can be used free-standing or mounted in a standard 19" rack.
2. Make sure the power to all mixers and amplifiers in your audio system is off. On the rear panel of the D2500, place the Power switch to it's OFF position and set the Main Level slider, located on the front panel, to it's bottom-most "OFF" setting.
3. Set all Equalizer sliders to their flat ("0") center detented position.
4. The D2500 can be used either as an "in-line" device, as an insert device (in conjunction with mixer insert points), or in an effects send-return loop. The illustrations on pages 20 - 22 show each of these typical configurations. Choose the configuration that is best for your application and then begin by making the D2500 input connections, using the XLR connectors on the rear panel.
5. Next, make the D2500 output connections to your power amp or active speakers, using the XLR connectors on the rear panel.
6. Plug in the supplied AC cord and connect it to any standard AC socket.



D2500 Quick Start

SETTING UP THE D2500 to work in MANUAL mode (continued)

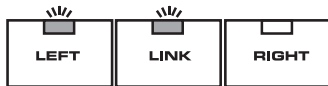
7. Press the rear panel Power switch to turn on the D2500.

Note, if you are using the optional AI02 analog I/O board, the audio signal will be muted for approximately five seconds until the relay power-on circuitry is activated (at which time you'll hear a click and the audio signal will be unmuted).

8. If you are using the D2500 for the first time, the unit should be set to that factory defaults, however, in case the unit's parameters have been modified, it's a good idea to load in a default program. So, press the LOAD switch, turn the Data Wheel to 00 and press LOAD again to recall the program.

9. Since this example assumes that you are running a stereo sound system, be sure that LINK is selected to be sure that the D2500's hardware controls will operate both the left and right side. Press the LINK switch so that the LED becomes illuminated.

Actually, you really don't have to press LINK because the hardware controls are always linked in Manual mode.



However, it may help you remember that you are editing both the left and right sides.

10. Next, pull the Master Fader all the way down.

11. Now, simply press the MANUAL switch and the D2500 will operate like a standard graphic equalizer.



12. Apply an input signal to the D2500 (if sending signal from a mixer output bus, drive the mixer's output meters at approximately 0 VU). While the input signal is present, slowly raise the front panel main level slider to its center detented "0" point. For the best signal-to-noise ratio, the main level slider should be at or near the "0" point during normal operation. However, if the input signal is weak, use the main level slider to slightly boost the volume (to a maximum of 12 dB). Conversely, if the signal causes the front panel OL (Over Load) LEDs to light, you must attenuate the volume of the input source as necessary. In normal operation, the OL LEDs should not light at all; if they do, lower the volume of the output signal so that it does not light at all (clipping not only sounds awful, it can also damage speakers!).

13. Experiment by moving each of the Equalizer sliders up and down, carefully listening to the audible result on the audio signal. Bear in mind that the very lowest and highest frequency areas may have little or no effect on some signals. As you work with the various EQ filter faders, press the front panel BYPASS switch in and out from time to time in order to compare the effect of the equalization curve you are creating with the original input signal.

Now that you have a feel for the D2500 working in Manual mode, move ahead and explore the powerful features of the internal D class DSP.

Operating the D2500

Navigating the D2500 Controls

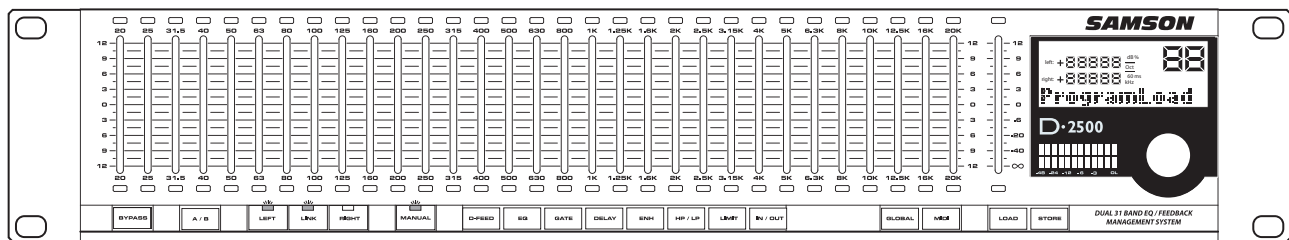
Before you move ahead into the many D2500 onboard features, you should become familiar with the front panel controls and the various parameters that they can set. The D2500's front panel switches are set up in groups related to the function or parts of the operating system they control. Some switches are placed individually, since they are dedicated to a single function, and other switches are arranged in groups since their functionality is related. The D2500 function switch sections are arranged on the front panel as follows; First, is the BYPASS switch that enables you to turn the equalizer and all effects on or off. Next is the A/B switch that lets you

GLOBAL

The GLOBAL control allows you to set up the various system parameters including the input, the equalizer filter bandwidth, filter range and the range of the Master Fader.

The Global Switch Has Five Clicks!

Click	Menu	Function	Value
1	Inp.	Input	Opt 1, Opt 2
2	Md.	Mode	Stereo, Dual
3	F.Bw	Filter Bandwidth	1/4, 1/3, or 1/2dB & Auto
4	F.R.	Fader Range	+/-3dB, +/-6dB, +/-12dB
5	M.F.	Master Fader Range	-12dB, -120dB



compare the actual modified program to the last program loaded or stored. Then you will find a group of switches including LEFT, LINK and RIGHT which are used to assign the D2500's hardware controls to operate the Left, Right or Left and Right EQ channels. MANUAL is the next switch and it allows you to operate the unit just like a standard analog graphic equalizer. The next section is where you will find the D2500's powerful onboard digital effects, which are controlled by the FEEDBACK, EQ, GATE, DELAY, ENHANCE, HP/LP, LIMITER and IN/OUT switches. GLOBAL gives you access to the overall system settings, and MIDI lets you set up the device-to-device communications including Samson Audio's high-speed, D-Net protocol. Finally, in order to save and retrieve your favorite settings, the D2500's LOAD and STORE switches allow you to access the 100 on-board presets. The following sections of this manual will detail each of the switches and their associated parameters. Instead of going from left to right, we'll switch up the order a bit for a more logical flow through the system.

You should know this !

Some switches are capable of accessing more than one parameter, so as you press the switch you will page through the available parameters. These include the FBM, GATE, HP/LP, Limiter, GLOBAL and MIDI. For example, the FBM switch has five clicks to page through the parameters, Feedback Management On/OFF, Sensitivity, Feedback MAX, Feedback HOLD and Feedback RELEASE. You can change the parameters of any of these functions by using the large Data Wheel located by the main LCD display.

Selecting the Input

The D2500 accepts inputs from any of the installed I/O (Input/Output) boards including the standard AI01, optional DIO1 Digital I/O or AIO2, or premium audio converter I/O board. To access the input follow these steps:

- Press the GLOBAL control switch a few times until you see the: Inp.
- Use the Data Wheel to select OPT 1 or OPT2.

NOTE: Once you make an edit to the Global set-up, the red GLOBAL LED will flash indicating that a change has been made to the original set-up. You will also see that the red STORE LED is illuminated.

- To keep the new changes, press the STORE button and you will exit the GLOBAL mode and both the STORE and GLOBAL LED's will turn off.



Operating the D2500

Selecting the Filter Bandwidth

Thanks to the powerful onboard DSP, the D2500 has the ability to program the equalizer filter bandwidth for either 1/4, 1/3, 1/2 of an octave, or to AUTO, which will allow each of the 31 filters to be set to an individual bandwidth calculated by the onboard DSP. To access the Filter bandwidth settings follow these steps:

- Press the GLOBAL control switch a few times until you see the F.B.W. .
- Use the Data Wheel to select 1/2, 1/3 or 1/4 of an octave, or to AUTO.



- To keep the new changes, press the STORE button and you will exit the GLOBAL mode and both the STORE and GLOBAL LED's will turn off.

Selecting the Fader Range

It is also possible to change the fader range of the equalizer filters from 3dB, to 6dB or 12dB. To change the Frequency Range, follow these steps:

- Press the GLOBAL control switch a few times until you see the F.R.
- Use the Data Wheel to select +/-3dB, to +/-6dB or +/-12dB.



- To keep the new changes, press the STORE button and you will exit the GLOBAL mode and both the STORE and GLOBAL LED's will turn off.

Setting the Range of the Master Fader

You can set the D2500's Master Fader can be set to operate in the following ranges; +12/-12dB, or +12/-120dB. The Master Fader attenuation range is always either the same as the filter faders, or it can be set to -120dB. The Master Faders boost range will always be equal to the boost range of the filter faders.

To change the Master Fader's attenuation range follow these steps:

- Press the GLOBAL control switch until you see the M.F..
- Use the Data Wheel to select the operating range of Master Fader.
- To keep the new changes, press the STORE button and you will exit the GLOBAL mode and both the STORE and GLOBAL LED's will turn off.



Selecting the Operating Mode

The D2500 can be used as a stereo device with 31-bands of filters and the right and left side, or as a dual mono with 31-band equalizer for each of the mono signals.

It is also possible to change the operation of the equalizer from Stereo to Dual (two times mono). To change the Operating Mode, follow these steps:

- Press the GLOBAL control switch a few times until you see the Md.
- Use the Data Wheel to select Stereo or Dual
- To keep the new changes, press the STORE button and you will exit the GLOBAL mode and both the STORE and GLOBAL LED's will turn off.

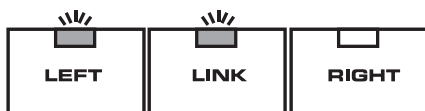
Operating the D2500

Using the Left, Right and Link Control Switches

Since the D2500 is a two-channel unit, you can use it as a stereo, or dual mono equalizer if you are running two monitor mixes. Depending on the operating mode you set up in the Global menu, you may want to have the left and right channels operate together, or individually. The LEFT, RIGHT and LINK switches will help you operate the D2500 easily and give you the control you need to quickly make changes and control either one or both sides. The state of these switches will determine which of the left and right signals are affected by the hardware control surface.

Using the LINK switch

If you want to set the D2500 so that the physical hardware controls and all the parameter controls adjust both the Left and Right side, press the LINK switch so that the green LED is lit. Now, when you operate any of the controls, either the EQ faders or the digital effects, you will be making the same change on the left and right sides.



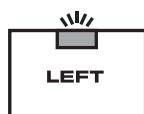
If you want to use the D2500 as a dual mono equalizer and control the Left and Right sides individually, keep the LINK switch OFF so that the green LED is not lit.

Controlling the Right Channel signal

If you want to control the EQ faders and the effects for the right channel individually make sure the LINK switch is OFF. Now, press the RIGHT switch to assign the hardware control surface to the signal connected to the right channel. With the RIGHT switch selected on and the LINK switch off, the D2500 controls will edit just the right channel filters and right channel parameters, when accessing the various menus.

Controlling the Left Channel signal

If you want to control the EQ faders and the effects for the right channel individually, make sure the LINK switch is OFF. Now, press the LEFT switch to assign the hardware control surface to the signal connected to the left channel. With the LEFT switch selected on and the LINK switch off, the D2500 controls will edit just the left channel filters and left channel parameters when accessing the various menus.



Using the D2500 in MANUAL Mode

The D2500 can be used as a stand-alone basic digital signal processor using any stored or recalled memory parameters when set to MANUAL mode. If you want to use all the power processing of the D2500, but you don't want to recall or save any presets, you can operate the unit in Manual mode. When you press the Manual switch, the D2500 equalizer and effects section are all available, however they will be in the state that they were last left in.

While Manual is selected, the EQ faders automatically become reset to their physical positions so the equalizer



works the same as a standard analog graphic equalizer. You can also engage any of the onboard effects processors. For more information on the built-in digital effects see the section "Using the D2500 onboard effects" later in this manual. Keep in mind that the Left and Right channels automatically become linked in MANUAL mode.

Operating the D2500

Working with the D2500 Faders

Unlike menu driven, black box devices, the D2500 is a digital equalizer with standard 45 mm analog faders for the 31 filter bands, plus the Master level fader for true analog control. If you are operating the D2500 in Manual mode, the faders work exactly like you would expect on a standard analog graphic equalizer. However, since the D2500 is able to recall and save EQ curves in its internal memory, the physical fader for any, or all of the EQ filter bands, may not be in the same positions as they were when they were saved into the memory preset. This means that the hardware faders can be at a different physical position, compared to the actual setting for the filter band that's in memory. The D2500 offers an easy to use system for matching, or nulling out, the EQ faders to the memory positions using the above and below fader Null, or matching LED's.

Note: The null point is the exact location where the fader's physical position matches the level of the digital filter.

The D2500 lets you match, or null, the fader to the memory location by using two Null LED's, one red, placed above the fader, and green, placed below the fader. The following example shows you how to work the faders with their associated over and under matching, or Null LED when loading a preset.

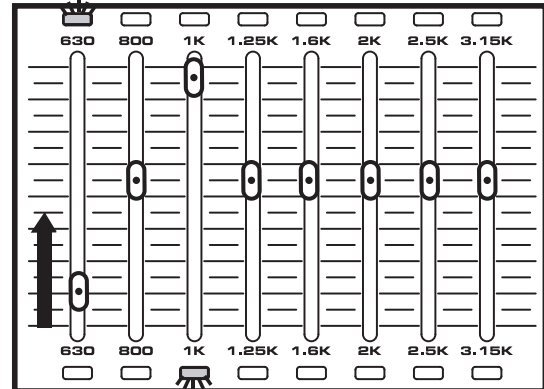
Note: In this exercise you will be loading in preset 00. If you are not very familiar with working with the presets, just stay on preset 00. Preset 00 can not be overwritten, so don't worry about erasing anything.

- Press the MANUAL button to deselect MANUAL mode (LED OFF).
- Set all the faders to their center detent position.
- Press the LOAD switch.
- Now, use the Data Wheel to dial up preset 00. Pre set 00 contains a default setting with all faders set to zero.
- Next, press load again. Now you have loaded in preset 00.

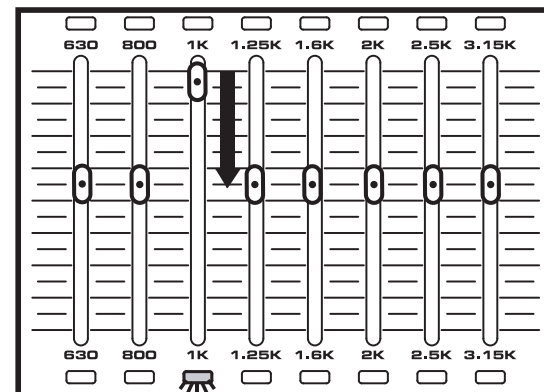
At this point all the EQ faders will be lit, except the one assigned to the LCD, and none of the over and under Null LED's should be lit.

- Now, push several of the faders up and down to random positions.
- Press the LOAD switch.
- Now, use the Data Wheel to dial up preset 00. Pre set 00 contains a default setting with all faders set to zero.

At this point you should notice that the red and green, null LED's are now lit above and below the faders that have been moved. This LED indication is telling you that the EQ faders need to be moved if you want to null, or match, them to the original saved positions.



- Choose an EQ fader that has the red Null LED lit and push the fader up slowly until the red Null LED goes off. Now the physical hardware EQ fader is set to the same position as the EQ filter band in memory.



- Choose an EQ fader that has the green Null LED lit and push the fader down slowly until the green Null LED goes off. Now the physical hardware EQ fader is set to the same position as the EQ filter band in memory.
- Press all the EQ faders to the center, zero mark.
- Press the LOAD switch.
- Use the Data Wheel to dial up preset 00.
- Press the LOAD switch to reload preset 00.

Operating the D2500

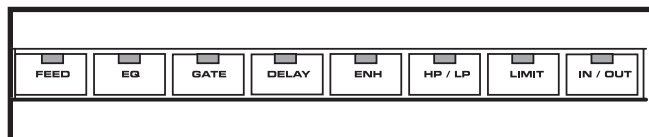
Using the Process Switches

In addition to being a great sounding, clinically precise, digital equalizer, the D2500 provides a host of useful digital effects, which have been designed to make an audio engineer's job easier and project sound better. Don't look for reverbs and chorus effects here, just solid digital effects processors designed for loudspeaker management. The EQ switch gives you access of the digital filters in the LCD screen so you can view an accurate measurement of any of the 31 EQ bands, as well as the Master Fader. The D2500's FEEDBACK Management processor provides an automatic feedback management system to clean up live PA and monitor systems. The GATE effect allows you to eliminate annoying buzzes and hums. The DELAY effect is perfect for phase aligning speakers systems using multi-transducers and for delaying speaker arrays in large venue installations. The D2500's unique ENHANCER effect will help reduce the over all system noise, while at the same time, sweeten-up the high end of any speaker. To set the over-all low or high-end frequency contour, the D2500 features multi-pole Hi-pass and Low-pass filters. Speaker protection is handled with the D2500's digital brick wall LIMITER.

The Navigation buttons located in the center of the unit under the faders, along with the Data Wheel, control the various parameters used to set-up these powerful effects. Remember, some of the effects may have several pages, which are accessed by pressing through the effects switches.

You should know this!

The D2500 processing effects can be individually selected



on or off, using the IN / OUT switch located at the end of the row of process switches. Also, remember to make sure the LINK switch is lit, if you want to make changes to the processing effects on the left and right channel simultaneously.

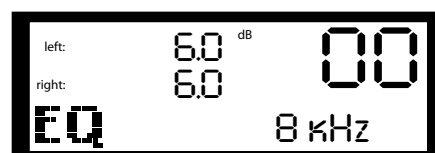
Using the EQ section

When the EQ switch is selected, the D2500's various parameters for the 31 equalizer filters, as well as the Master Fader filters are displayed in the LCD window. You can use the Data Wheel to scroll through the frequencies and display the filter levels in the main LCD window. It is easy to see which fader is assigned to the display by watching the LED in the fader caps of each filter band. The D2500 uses an inverse highlight to display the active filter band. When the LED is off, the fader is selected. If you move a physical fader you will see the fader cap LED go off indicating that the information for that fader is now being displayed in

the LCD. For more information on the physical faders and how they work with presets, see the previous section, "Working with the D2500's Faders".

To use the EQ section follow these steps:

- Press the EQ switch until the yellow LED is lit.
- Now while the EQ switch is lit, engage the equalizer by pressing the IN / OUT switch until the yellow LED lights.
- To monitor the current EQ points, use the Data Wheel to scroll through the EQ filters.
- In order to change any EQ filter, simply grab the fader and move it up to boost the frequency or down to cut the frequency.



Using the FEEDBACK Management Function

The D2500 has an intelligent automated system to help reduce the chance of feedback in any live sound situation. You can use the Feedback Management System to automatically scan the sound system, identify the frequency bands that are feeding back, and then, attenuate those bands. You can also use the Feedback Management System in MANUAL mode in which the D2500 will scan the system for feedback, and then display the frequency bands that are feeding back by lighting the red LED over the fader. Once you see the fader feeding back you can simply lower the fader band yourself using the hardware fader.

The FBM Switch Has Five Clicks!

Click	Menu	Function	Value
1	FBM	Mode	Off, On, Auto
2	Sensitivity	Sensitivity	0 - 10
3	FB Max	Maximum Cut	- 0.5 dB - -12dB
4	FB Hold	Filter Hold Time	5 - 300 milisec.
5	FB Rel	Filter Release Time	20 - 300 milisec.

You can operate the Feedback Management System by following these simple steps.

- Press the FEEDBACK switch until you see the screen FBM: OFF.



Operating the D2500

- Press the FBM switch and use the Data Wheel to and select FBM: ON.
- Now, engage the effect by pressing the IN / OUT switch until the yellow LED lights.
- To access the Feedback Sensitivity parameter, press the FBM switch until you see the menu, Sensitivity. The Feedback Sensitivity is used to set the threshold that the D2500 uses to recognize feedback. Now you can select a Sensitivity of 0 – 10.
- To access the Feedback Hold Time parameter, press the FEEDBACK switch until you see the menu, FB Hold. The D2500's Feedback management system uses HOLD time to keep a filter cut after the system identifies feedback. Now you can select a Hold time of 5– 300 seconds.
- To access the Feedback Release Time parameter, press the FEEDBACK switch until you see the menu, FB Rel.. Now you can select a Release time of 20 – 300 seconds. If the feedback is temporary, the D2500 will attempt to restore the fader back to the original position. The Release time, is the time the D2500 takes to return the fader back to the original level.

Using the Internal Noise GATE

The D2500 digital effect section includes a digital noise gate that can be very useful in eliminating the system hums and buzzes that may occur, especially when you move your system from venue to venue. A noise gate is a powerful dynamics processor that works like an automatic mute. Simply put, when the desired signal is present, the gate is open and the sound can be heard. When the signal is soft, like when the music stops, and all you hear are the hums, buzzes and system noise floor, the gate is closed. The D2500 GATE has variable control over Threshold and Release time. Threshold is the level you set at which the noise gate will close (mute the sound). You want to set a level in between the noise floor and the normal operating level of your program. Release Time is the amount of time the D2500's Gate takes to return the signal to the original level after the signal rises above the Threshold level.

The Noise Gate Switch Has Two Clicks!

Click	Menu	Function	Value
1	Gate Rel.	Release Time	50 - 100 %
2	Gate Th.	Threshold Level	0 - -100 dB

To operate the D2500 digital noise GATE, follow these simple steps:

- Press the GATE switch so that the yellow LED is lit.

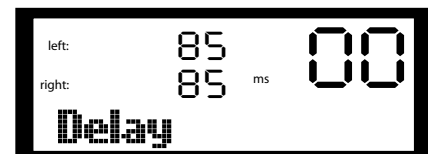
- Now, engage the effect by pressing the IN / OUT switch until the yellow LED lights.
- To access the Threshold parameter, press the GATE switch once or twice until you see the menu, Gate Th. The Gate Threshold can be set from –100 dB to 0 dB.
- To access the Release parameter, press the GATE switch until you see the menu, Gate Rel. The Gate Release time can be set from 50 to 100 %, which is the equivalent to 2 to 15 seconds.



Using the Internal DELAY

The D2500 offers an on board Digital Delay to time align speakers for phase correction and for setting up delay clusters in large venue sound systems. The Delay can be set from 0 to 85 milliseconds. (Optional memory can be added for longer delay times.) Setting the delay is a simple procedure which can be accomplished by following the next few steps:

- Press the DELAY switch so that the yellow LED is lit.
- Engage the effect by pressing the IN / OUT switch until the yellow LED lights.
- Now, use the Data Wheel to select the correct delay time for your application.



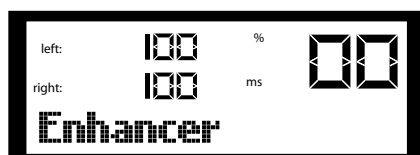
Using the Internal ENHANCER

The D2500 has unique digital Enhancer, which can help sweeten a sound system, and at the same time, reduce unwanted noise. The D2500's Enhancer uses several powerful algorithms to analyze the signal content and then decide how to enhance the signal; based on that content. If the D2500 Enhancer senses that there is music playing with good high frequency content, it will slightly boost these frequencies creating sweet and airy top-end response. When the D2500 Enhancer sees that there is little or no high-frequency content, it will slightly reduce the high-frequency response of the system. This can be especially useful since often when the high-frequency content is very low, or off, the only thing you hear is system hiss. The Enhancer will recognize the noise and reduce it by cutting the associated EQ filters automatically.

Operating the D2500

Once the highs return, the Enhance releases automatically. Of course the D2500 let's you dial up just the right amount of Enhancer for your project, so follow the steps below to activate the Enhancer.

- Press the ENHANCER switch so that the yellow LED is lit.
- Engage the effect by pressing the IN / OUT switch until the yellow LED lights.
- Now, use the Data Wheel to select the correct Enhancer setting , from 0 to 100%, that's right for your application.



Setting up and Using the High Pass and Low Pass Filters

The D2500 includes digital High-pass and Low-pass filters for creating quick equalization curve contours. A Hi-pass filter, (sometimes called a low-cut filter), is used to attenuate the frequencies below a certain point. The HP filter passes the highs, but cuts the lows. A Low-pass filter, (sometimes referred to as a high-cut filter), is used to attenuate the frequencies above a certain frequency point. The LP filter passes the lows, but cuts the highs.

You can use the High and Low pass filters for a variety of applications. Using the High-pass filter can be especially useful in removing the low frequencies that can sometimes cause stage rumble. If you have a lot of high frequency system noise and hiss, you can use the Low-pass filter to roll-off the high-end of your system. When equalizing a monitor system, you may use both the HP and LP filters to roll-off the high and lows for a vocal eq contour.

Any good high and low-pass filter will allow you to choose the cut-off frequency, and also, the order, or slope, at which the filter will attenuate. The D2500 lets you set the frequency at which the HP or LP filters cut from, as well as, a slope of either 6, 12 or 18 db per octave.

The HP / LP Switch Has Four Clicks!

Click	Menu	Function	Value
1	Highpass	low Cut Filter	20 Hz - 200 Hz
2	HP-Order	Filter Slope	0, 6, 12, 18 per Octave
3	Lowpass	low Cut Filter	2 kHz - 20 kHz
4	Lp-Order	Filter Slope	0, 6, 12, 18 per Octave

- Press the HP / LP switch so that the yellow LED is lit.
- Engage the effect by pressing the IN / OUT switch until the yellow LED lights.
- To set the High-pass filter press the HP / LP switch until the LCD display reads; High-pass.
- Now, use the Data Wheel to set the frequency from 20 Hz to 200 Hz.



- Press the HP / LP switch again and you will see the menu to set filter Order, or slope. The menu will read HP-Order.
- Use the Data Wheel to choose a slope of either 6dB, 12dB, or 18 dB.
- To set the Low-pass filter, press the HP / LP switch until the LCD display reads; Low-pass.
- Now, use the Data Wheel to set the frequency from 20 kHz to 2 kHz.
- Press the HP / LP switch again and you will see the menu to set filter Order, or slope. The menu will read LP-Order.
- Use the Data Wheel to choose a slope of either 6dB, 12dB, or 18 dB.

Using the Internal LIMITER for Basic Speaker Protection

In order to help you protect your speaker system, the D2500 employs a digital Limiter. The D2500's Limiter is a brick wall type with a very fast attack time and a very slow release time. When engaged, the digital Limiter will prevent signals from reaching outputs levels over a desired point. The D2500's Limiter has a variable Threshold level, which is the point the limiter circuit begins to attenuate the system. The Limiter also has a variable Release time, which is the time the limiter circuit takes to return the signal to the original level.

The LIMITER Switch Has Two Clicks!

Click	Menu	Function	Value
1	Lim. Thr.	Threshold	0 to -100 dB
2	Lim. Rel.	Release Time	50 to 100 %

To operate the D2500 digital LIMITER follow these simple steps.

- Press the LIMITER switch so that the yellow LED is lit.
- Now, engage the effect by pressing the IN / OUT switch until the yellow LED lights.
- To access the Threshold parameter, press the LIMITER switch until you see the menu, Lim. Th. The LIMITER Threshold can be set from -100 dB to 0 dB.



- To access the Release parameter, press the LIMITER switch until you see the menu, Lim. Rel. The LIMITER Release time can be set from 50 to 100 %, which is the equivalent to 2 to 15 seconds.

Using the A/B Feature

The A/B switch lets you compare the actual, modified program to the last program recalled or stored in memory. After you load a preset you may want to make some changes to the equalization curve or perhaps to one or more of the digital effects. Once you make some changes you may want to compare the edit with the original preset saved in memory. You can compare the current set with the preset that is stored in memory by using the A/B switch. Try the A/B function to compare and preset to an edit by following these steps:

- Press the LOAD switch and select any preset, then press LOAD again to recall the preset into memory.
- Play some music through the D2500.
- Now change the position of the faders so you can hear the equalization curve change.
- At this point you will notice that the green LED on the A/B switch is lit, indicating that there has been a change to the original preset.
- Now, press the A/B switch again and the green LED will flash indicating that the D2500 has now returned all the EQ faders and effects parameters back to the positions that were saved in the presets. You can continue to press the A/B switch to toggle back and forth between the saved preset and the new sound.

If you like the new edited preset you can use the STORE function to save the new preset either under the current memory location or a new one.

Operating the D2500

Storing Programs in the D2500

The D2500 has 99 memory locations (labeled 01-99) for storing user presets. You can save the equalization curve, as well as all the parameters for the routing and the onboard effects that may be active. Saving the preset is a simple procedure which is accomplished with the following easy steps.

- Press the STORE button and the LED will begin to flash indicating that the D2500 is ready to store the current set-up into one of the 99 memory locations.
- Now, you need to decide if you want to save the set-up in the current memory location, or if you want to choose a new memory location. If you want to use the current location go on to the next step. If you want to choose a new memory location, use the Data Wheel to scroll through the 99 preset numbers until you reach the number you want to save under.
- Once you select the program number to save under, simply press the STORE button again and your set up is saved and can be easily recalled using the LOAD function.



Loading Programs in the D2500

You can load presets with stored equalization curves, as well as all the parameters for the routing and the onboard effects that may have been used. Loading a preset is a simple procedure, which is accomplished with the following easy steps.

- Press the LOAD button and the LED will begin to flash indicating that the D2500 is ready to load one of the 99 memory locations.
- Now, you need to decide if you want to load the set-up in the current memory location, or if you want to choose a preset saved in a different memory location. If you want to use the current location go on to the next step. If you want to choose a new memory location, use the Data Wheel to scroll through the 99 preset numbers until you reach the number you want to recall into memory.

- Once you select the program number to load, simply press the LOAD button again and your preset is loaded into memory.



Using the Load MASK function

The D2500 allows you to mask certain saved parameters when loading in a preset. This is a powerful feature that allows you to create a new preset by merging different saved equalization curves with other saved effects set-ups. When you get deeper into the features of the D2500, there may be many parameters to set to create your final sound. A "hidden" feature in the D2500 is the Set Mask function. This allows you to load other programs and "Mask Out" (retain) certain parameters.

Example:

In your overall setup, you have a delayed stack of speakers on the left side with a setting of 40mS. You have your limiter set to +2dB to not overdrive your amps, and your subs are being crossed over to a different amplifier. So from 80Hz on down, you set a High Pass filter so that the Bass is not passing through the D2500 to the delayed stack.

Lets say you want to load program #2 one hour into the show, (a slightly hotter EQ curve that you stored in memory location #2 before the show began for use when the room fills up).

You want to change the EQ curve but you do not want to load in the program #2's Delay, HP, and Limiter settings.

- Press and hold Store.



FBM, EQ, GATE, DELAY, ENHANCE, HP/LP, LIMITER, AND IN/OUT will light.

- Press Delay, HP/LP, and Limiter and their respective LED's will go out.
- Now when you load any other program, you will retain your Delay, HP/LP, and Limiter settings. Only the Parameters not "Masked" will load from the second program loaded..

Operating the D2500

MIDI and D Net

For expanded system control, the D2500 uses standard MIDI, as well as Samson's D Net communication protocols, to transmit and receive digital control information to and from additional D class units, other MIDI devices, or personal computers. You can use standard MIDI cables for IN, OUT and THRU to configure a system using traditional MIDI protocol. For critical applications where higher speed communication is needed, you can install the optional DN1, D-Net interface cards and use standard XLR cables to configure a high-speed, bi-directional data hook-up using Samson D-Net protocol. The MIDI and D-Net control parameters are configured by accessing the various menus with the MIDI switch, located on the D2500's front panel.

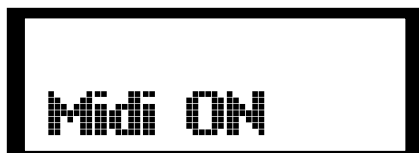
You can use MIDI for controlling one D2500 with a Samson D1500 RTA, but in larger systems, the D2500 and other D class units should be configured with an optional DN1 D-Net interface card for high-speed and bi-directional communications. For ease of use, D-Net follows a similar user interface as MIDI, but in reality they are very different. The beauty of the D net interface is, not only is it 30 times faster than MIDI, but both Send and Receive are covered using a single standard XLR cable making it possible to daisy chain several D class units together without the needs for hubs or external mergers.. Also, the super fast D-Net bus is fast enough to easily communicate with an external PC for Real Time Analysis and display on an external monitor. Plus as an added bonus, the error rate on the D-Net is virtually zero, guaranteeing reliable performance during critical applications.

When you press the MIDI switch several times you will be paging through the various MIDI setup menu items including MIDI enable, Channel, Omni, System Exclusive and Program. The following section details each of these modes and their associated parameters.

Setting the D2500 to Transmit and Receive MIDI

To enable the D2500 to send and receive MIDI data follow these steps:

- Press the MIDI switch until that LCD reads Midi: Off.
- Use the Data Wheel to select Midi ON.



NOTE: Once you make a edit to the MIDI set-up, the red MIDI LED will flash indicating that a change has been made to the original set-up. You will also see that the red STORE LED is illuminated.

- To keep the new changes, press the STORE button and you will exit the MIDI mode and both the STORE and MIDI the LED's will turn off.

Setting the D2500 to Transmit and Receive Data Using D-Net

In larger systems, the D2500 and other D class units can be configured with an optional DN1 D Net interface card for high-speed communications. D Net follows a similar protocol as MIDI, only at a much higher data rate. As mentioned in the previous section, the beauty of the D net interface is, not only is it 30 times faster than MIDI, but both send and receive are covered using a single standard XLR cable.

To enable the D2500 to send and receive D-Net data follow these steps:

- Press the MIDI switch until that LCD reads: Midi ON.
- Use the Data Wheel to select D. Net.
- Press Store.



Now that you have enabled the D2500 for D-Net, as described in the previous section, you can select additional MIDI parameters that may be necessary for your exact application or system set-up. The D2500's MIDI has three basic modes of operation Channel, Omni and System Exclusive. The D2500 can operate in any of these three MIDI modes.

One of the most used MIDI modes is Channel MIDI, which allows you to assign up to sixteen different devices to individual MIDI channels 1 through 16.

Selecting a MIDI Channel

You can program the D2500 to receive MIDI messages on a specific MIDI channel by following the next steps.

- Press the MIDI switch until the LCD reads: M. Channel 1.



- Use the Data Wheel to select: M. Channel 1 - 16.
- To keep the new changes, press the STORE button and you will exit the MIDI mode and both the STORE and MIDI the LED's will turn off.

Operating the D2500

Selecting MIDI Omni mode

You can program the D2500 to receive MIDI messages in Omni mode by following the next steps.

- Press the MIDI switch until that LCD reads OMNI.
- Use the Data Wheel to select Omni ON.



- To keep the new changes, press the STORE button and you will exit the MIDI mode and both the STORE and MIDI the LED's will turn off.

Selecting MIDI System Exclusive Mode

You can program the D2500 to receive or transmit MIDI System Exclusive messages. Program the D2500 for System Exclusive operation by following these simple steps:

- Press the MIDI switch until that LCD reads: SysEx. Off: to access the MIDI System Exclusive menu.
- Now, select one of the transmit and receive modes.
- If you want the D2500 to transmit system exclusive messages, use the Data Wheel to select: SysEx. Tr.
- In order to set the D2500 to receive system exclusive messages, use the Data Wheel to select: SysEx. Rc.
- If you want the D2500 to receive and transmit system exclusive messages, use the Data Wheel to select: SysEx. T + R.



- Use the Data Wheel to select: SysEx OFF and the D2500 will not transmit or receive any system exclusive messages.
- To keep the new changes, press the STORE button and you will exit the MIDI mode and both the STORE and MIDI the LED's will turn off.

Selecting MIDI Program Change

You can program the D2500 to receive or transmit MIDI Program messages. Program the D2500 for MIDI Program Change operation by following these simple steps:

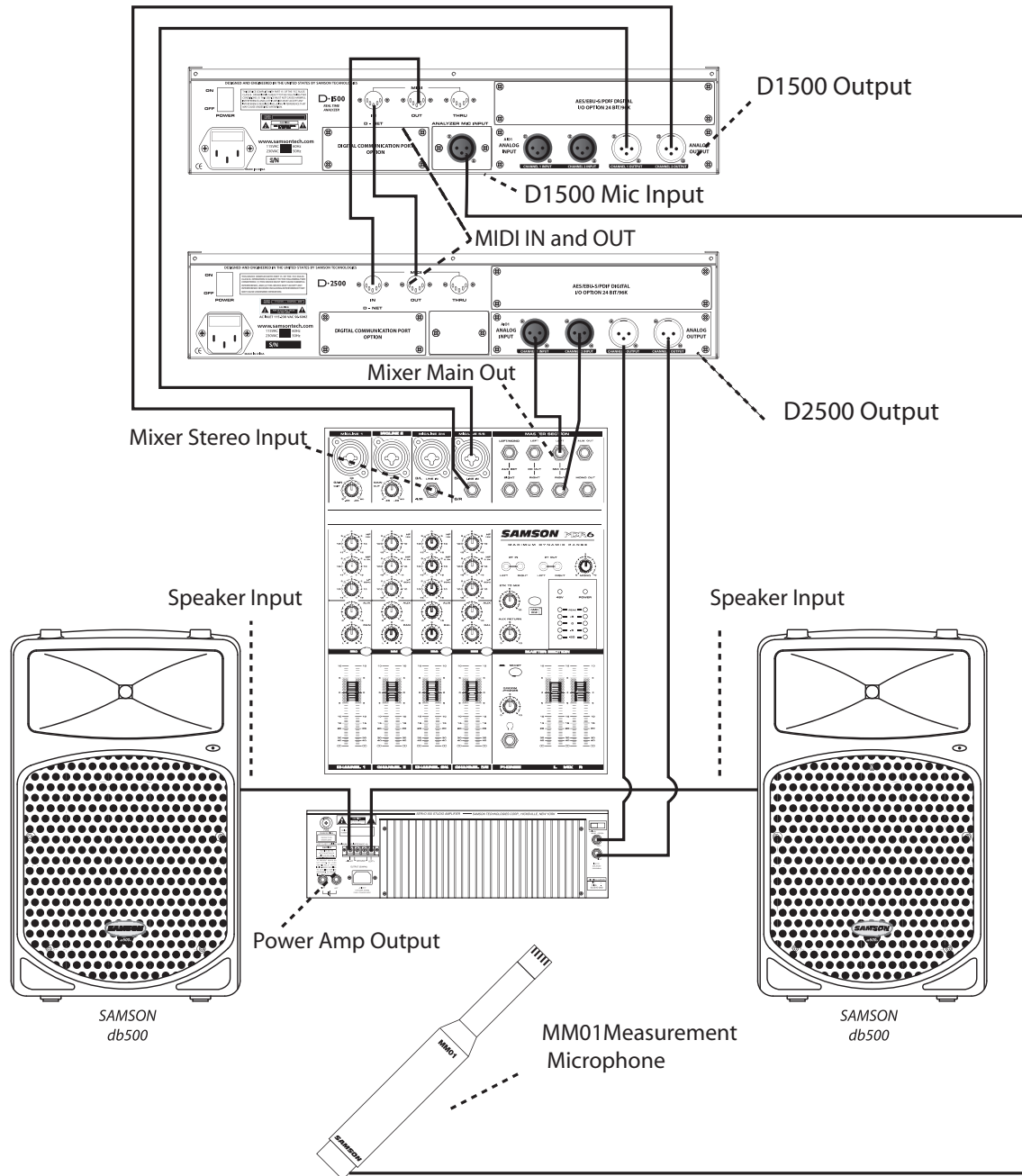
- Press the MIDI switch until that LCD reads: Pgm Ch. to access the MIDI Program Change menu.
- Now, select one of the transmit and receive modes.
- If you want the D2500 to transmit system exclusive messages, use the Data Wheel to select: Pgm Ch. Tr.
- In order to set the D2500 to receive system exclusive messages, use the Data Wheel to select: Pgm Ch. Rc.
- If you want the D2500 to receive and transmit system exclusive messages, use the Data Wheel to select: Pgm Ch. T + R.
- Use the Data Wheel to select: Pgm Ch. OFF and the D2500 will not transmit or receive any system exclusive messages.



- To keep the new changes, press the STORE button and you will exit the MIDI mode and both the STORE and MIDI the LED's will turn off.

Operating the D2500 with the D1500 RTA

When you use the D1500 RTA and the D2500 digital EQ together they combine to create a powerful automatic equalization system. You simply connect the two units using D-Net or MIDI, and then the D1500's AUTO EQ feature to let the onboard DSP's measure your system response and adjust the equalizer for a flat response, or for any EQ response curve that you may have saved in memory.



The diagram above shows a typical set up for using a D1500 RTA with a D2500 digital equalizer to auto-equalize the loudspeaker system.

Operating the D2500 with the D1500 RTA

Using AUTO EQ with the D2500 Digital Equalizer

When you use the D1500 RTA and the D2500 digital EQ together they combine to create a powerful automatic equalization system. You simply connect the two units using D-Net or MIDI, connect a high quality measurement microphone, like the Samson MM01, and then use the D1500's AUTO EQ feature to let the onboard DSP's measure your system response and adjust the equalizer for a flat response, or for any EQ response curve that you may have saved in memory. Follow the steps below to use the AUTO EQ feature.

Setting up Your Test Mic

- Using a standard XLR microphone cable, plug a high quality measurement microphone, like the Samson MM01, into the Mic Input located on the D1500's rear panel.
- Position your measurement microphone approximately 10 feet from your loudspeaker array, halfway between the low and high frequency drivers.
- Next select the MIC input by pressing the GLOBAL button until the display reads "Inp." And use the DATA WHEEL to choose "Mic".
- Now, you may need to adjust the microphone input gain so press the Global switch again until you see "MG" and select +30dB to start. Press STORE.

NOTE: You may need to come back to this to make the final mic gain adjustment once you start generating the PINK NOISE at the desired operating level.

AUTO EQ YOUR SYSTEM

Once you have the Mic Input and Generator GAIN set you can easily set the equalization curve for any loudspeaker or system at the press of the single button. Just follow these simple steps.

- Connect the MIDI OUT of the D1500 to the MIDI IN of the D2500, and connect the MIDI OUT of the D2500 to the MIDI IN of the D1500.
- Load program 00 on the D2500.
- With the measurement microphone in position, press the AUTO EQ button. The display will read "Start: no". Turn the data wheel to select "Start: yes". Press STORE and the Auto EQ process begins.
- Now watch, and listen, as the D1500 actually measures the system frequency performance and adjusts the filters on the D2500 for a flat response. You can see the D2500's EQ filters being automatically set on the D1500's large LED display.
- You'll see on the D1500 that the D2500 curves are changing and that the equalizer filters are being set.
- Press RTA on the D1500.

After a few minutes you'll notice that the frequency bands are at same approximate levels.

- Now, press AUTO EQ again and the AUTO EQ switch will stop flashing and you will see the new equalization curve displayed on the D1500.

Operating the D2500 with the D1500 RTA

Using the D1500 with the D2500

In order for the D1500 and D2500 to communicate with each other it is necessary to configure the MIDI parameters so that the units are communicating properly. Follow the steps below to configure the MIDI parameters for communication between one D1500 RTA and one D2500 Digital EQ. Let's start with the D1500:

- Press the MIDI switch until you get to the "MIDI" screen and use the DATA WHEEL to select "ON."

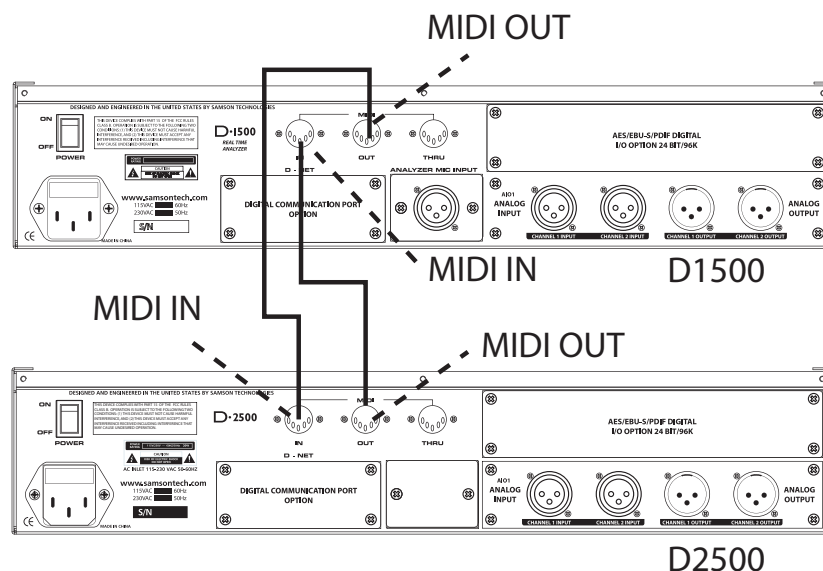
NOTE: You may notice the MIDI light flashing which is indicating that you are editing the MIDI set up.

- Now, press the MIDI again and set the MIDI CHANNEL number to "1".
- Press the MIDI switch once again and use the DATA WHEEL to set the "OMNI" mode to "OFF".
- Next, you need to configure the D1500 to transmit and receive MIDI System Exclusive messages, so press the MIDI switch again and use the DATA WHEEL to set the SysEx to select "T+R".
- Press the MIDI switch once again and use the DATA WHEEL to set the "Pgm Ch." (MIDI Program Change) to "OFF".
- Once you have all the parameters set, press the STORE button to save the changes to the MIDI set up.

- Now, Let's set up the D2500.
- Press the D2500's Global switch a few times until the display reads: F.R.
- Now, turn the Data Wheel until the display reads +/-12 dB.
- Press the D2500's Global switch a few times until the display reads: F.Bw.
- Then, turn the Data Wheel until the display reads 1/3 Oct.
- Press STORE to confirm the Global changes.
- Press the MIDI switch until you get to the "MIDI" screen and use the DATA WHEEL to select "ON."

NOTE: You may notice the MIDI light flashing which is indicating that you are editing the MIDI set up.

- Now, press the MIDI again and set the MIDI CHANNEL number to "1".
- Press the MIDI switch once again and use the DATA WHEEL to set the "OMNI" mode to "OFF".
- Next, you need to configure the D1500 to transmit and receive MIDI System Exclusive messages, so press the MIDI switch again and use the DATA WHEEL to set the SysEx to select "T+R".
- Press the MIDI switch once again and use the DATA WHEEL to set the "Pgm Ch." (MIDI Program Change) to "OFF".
- Once you have all the parameters set, press the STORE button to save the changes to the MIDI set up.



The diagram above shows the MIDI connections for using a D1500 RTA with a D2500.

Operating the D2500 with the D1500 RTA

Using the D1500's EQ Display

The D1500 can be used to display the equalization curve from 1, or up to 15, D2500 Digital Equalizers using the standard MIDI or optional D-Net interface.

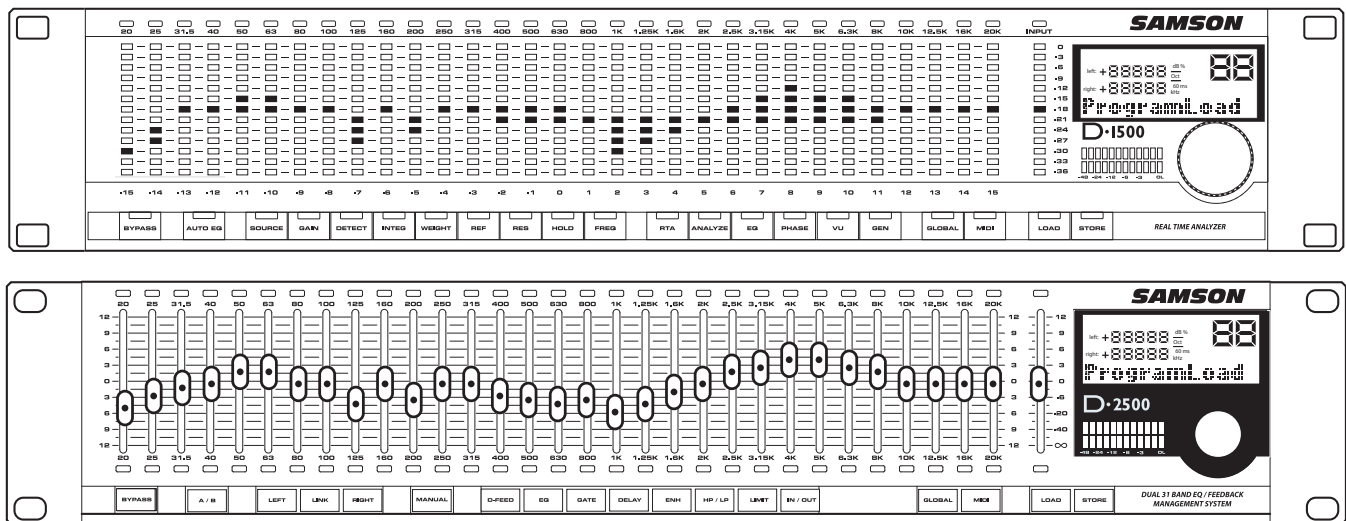
Before you get started using the EQ display feature, press and hold the EQ switch for about two seconds and take notice of the parameters that can be adjusted while using the Generator. You'll notice that the SOURCE and RES are illuminated indicating that these parameters can be edited.

- Connect the MIDI OUT of the D1500 to the MIDI IN of the D2500, and connect the MIDI OUT of the D2500 to the MIDI IN of the D1500.
- Now, press the D1500's EQ switch.

- Press RES and use the Data Wheel to select 2.0 dB, which will correspond to the D2500 provided that the Frequency Range (Global Menu) of the D2500 is set to the default +/- 12 dB setting.
- Press the SOURCE switch and choose the MIDI channel number that corresponds to the D2500 you want to display on the D1500. Since the D2500 is a stereo equalizer there is a left and right selection for each equalizer assigned to a MIDI channel, select CH 1L for the left side.

Note: If MIDI OMNI ON is selected, the RTA will respond to the D2500 that has most recently been changed.

- Now when you load in an EQ curve or move a fader on the D2500 you will see the corresponding position of each frequency band displayed on the D1500.



The diagram above shows a D1500 RTA displaying the fader positions of a D2500 digital equalizer.

Operating the D2500 with the D1500 RTA

Using the signal Generator

The D 1500's internal Signal Generator can be used to produce Pink Noise, White Noise or a tunable Sine Wave.

You can use the Generator for a variety of applications including using the Pink Noise signal to flatten the response curve of a speaker system with an analog equalizer, or using the Sine Wave to output a sine wave for tuning a crossover at a specific frequency.

Before you get started using the Generator, press and hold the GEN switch for about two seconds and take notice of the parameters that can be adjusted while using the Generator. You'll notice that the SOURCE, GAIN, REF and FREQ are illuminated indicating that these parameters can be edited.

The following example outlines a typical application for using the D1500's RTA and Pink Noise Generator to flatten a loudspeaker system in a small to medium size venue using a traditional analog graphic equalizer.

- Connect your mixer, equalizer and power amplifiers as you normally would and confirm that you have normal output by playing a signal like that from a mic, MP3, or CD player. It's a good idea to set the system to the same level that you will be ultimately using during normal operation. Once you get the system up and running mute the mic/MP3/CD, but keep set up so you can use it to set the measurement mic level.
- Connect a measurement microphone like the Samson MM01 to the D1500 rear panel MIC INPUT. Place the microphone on a stand and position it about ear level, approximately 3 meters, or 10 feet, from your speaker.

Note: *The proper spot to position the measurement microphone will vary depending on the size of the space the loudspeaker system is operating in.*

- Press the Global switch once or twice until you see Inp in the LCD display, then select Mic and press STORE
- Press Global again, and use the Data Wheel to set a Mic Gain of +20 dB to start. Press STORE. You may need to adjust the Mic GAIN up or down depending on your exact situation.

- Now run your mic, MP3, or CD player signal, press RTA on the D1500 and check the LCD Meters on the D1500.
- While the D1500 is set to RTA, you may need to adjust the GAIN to set the reference point of the display.

Once you confirm that the system is operating normally and that the RTA can read the system response with the test mic, you can move ahead and generate the Pink Noise to help you flatten the system.

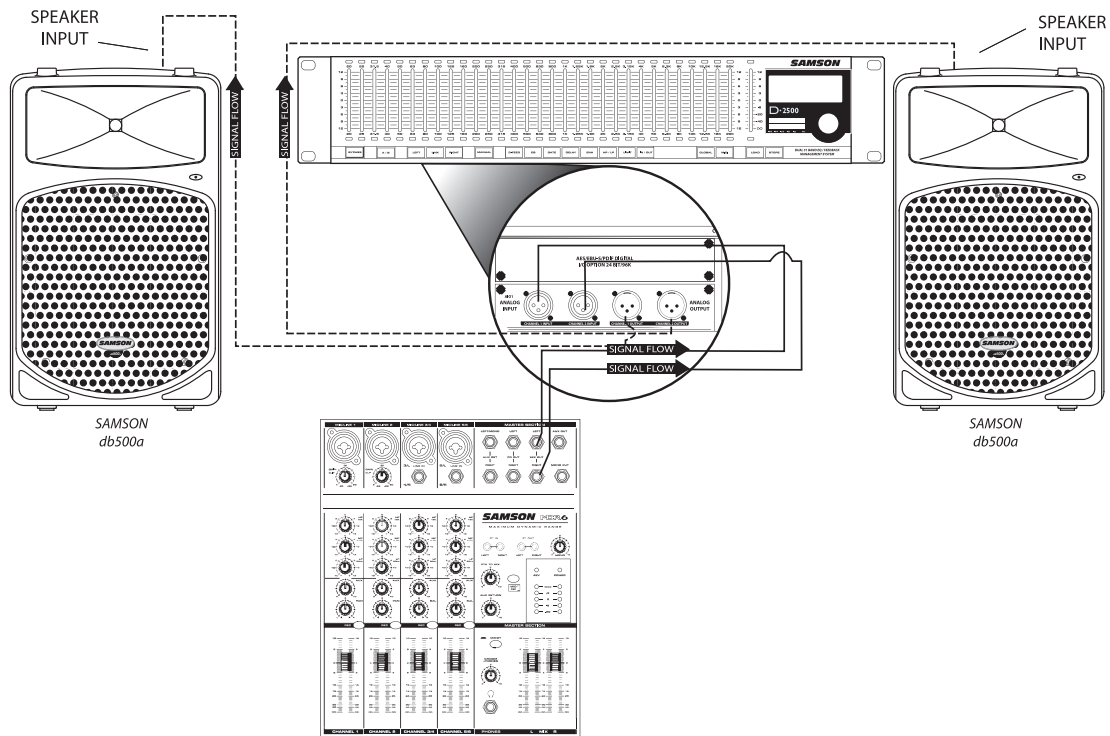
- Connect the D1500 Left and Right Outputs to a pair of inputs on your mixing console.
- Now make sure that the input gain controls and faders on the inputs on your mixers have the D1500 outputs connected and turned up to about 0dB.
- Press the GEN switch on the D1500.
- To change the operating level reference scale press the REF switch and use the Data Wheel to make the change.
- To be extra safe with your gear (this may get really loud! really!), start with a very low signal level by selecting the GAIN switch and turning the Data Wheel counter-clockwise all the way to -98dB.
- Next, press the SOURCE switch and turn the Data Wheel until the display reads: SRC: PINK.
- To turn up the Pink Noise signal, make sure that GEN is still selected and then press the GAIN switch and turn the Data Wheel clockwise until you hear the level of the pink Noise get about as loud as the system was when you played your mic, MP3, or CD player signal,
- Now, press the RTA switch and you should see the various frequency meters bouncing along.

If the LED meters read very low on the display, or the you don't see them at all, you will need to do one, or a combination, of the following:

- 1 Press Global and use the data wheel to select MG (Mic Gain). Next, turn the Data Wheel clockwise to increase the Mic Gain in 10 dB steps. Press the STORE switch to accept the change. Repeat this step until the LED indicators are operating in a range approximately halfway up the display.
- 2 Press the RTA switch and then the GAIN switch. Turn the Data Wheel clockwise until the LED indicators are operating in a range approximately halfway up the display.

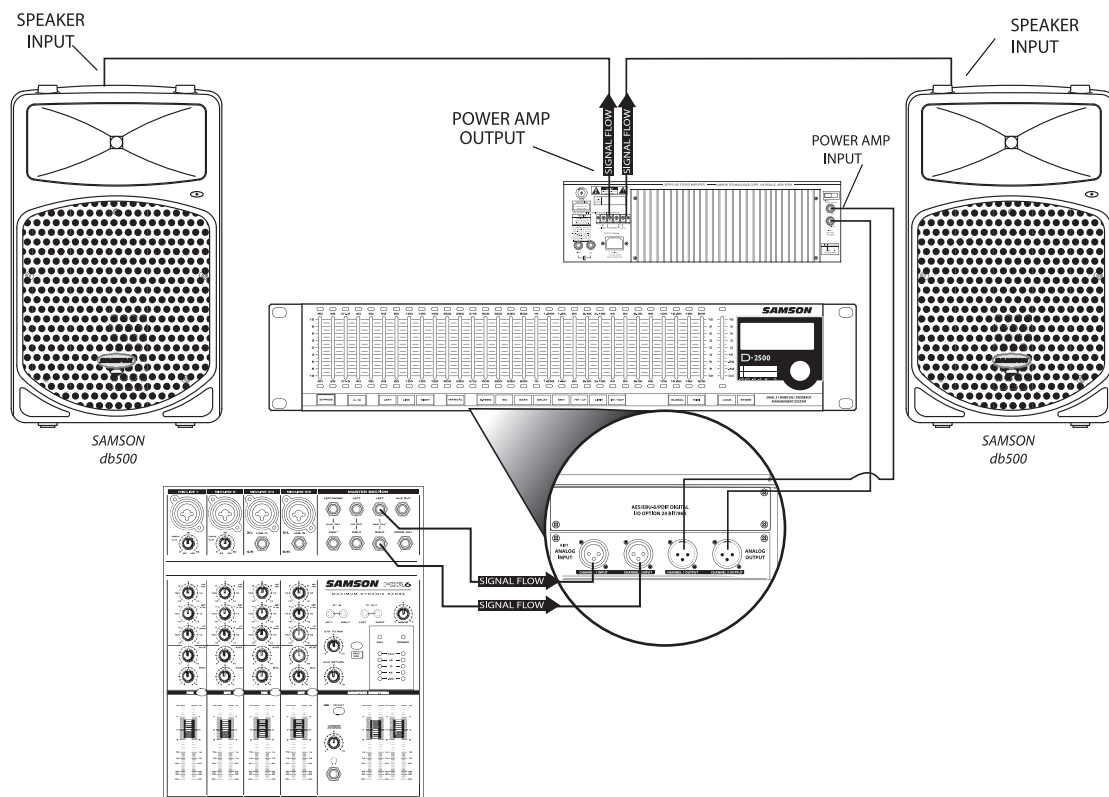
System Configurations

Using the D2500 with Active Speakers



In this example, the mixer's stereo output is connected to the D2500's inputs. Then, the D2500's outputs are connected to the inputs of each active (self-powered) loudspeaker.

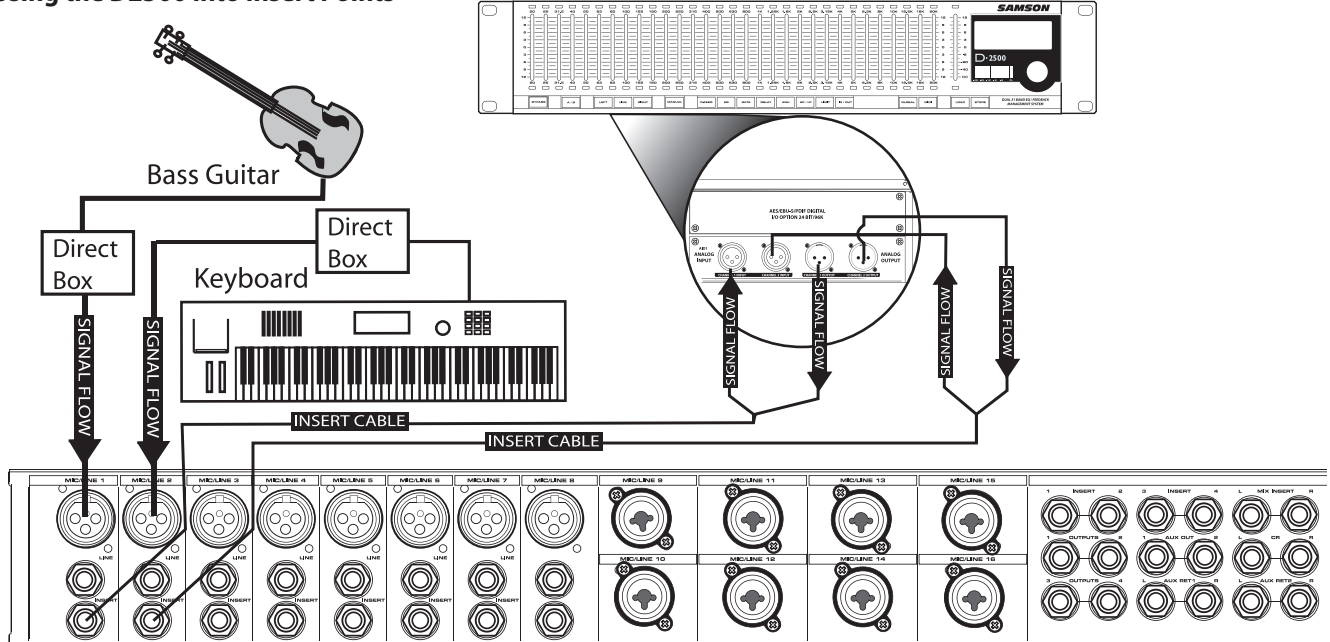
Using the D2500 with Passive Speakers



In this example the mixer's stereo output is connected to the D2500's inputs. Then, the D2500's outputs are connected to the input of a 2-channel power amp. Next, the power amplifier's outputs are connected to the passive (non-powered) loudspeakers.

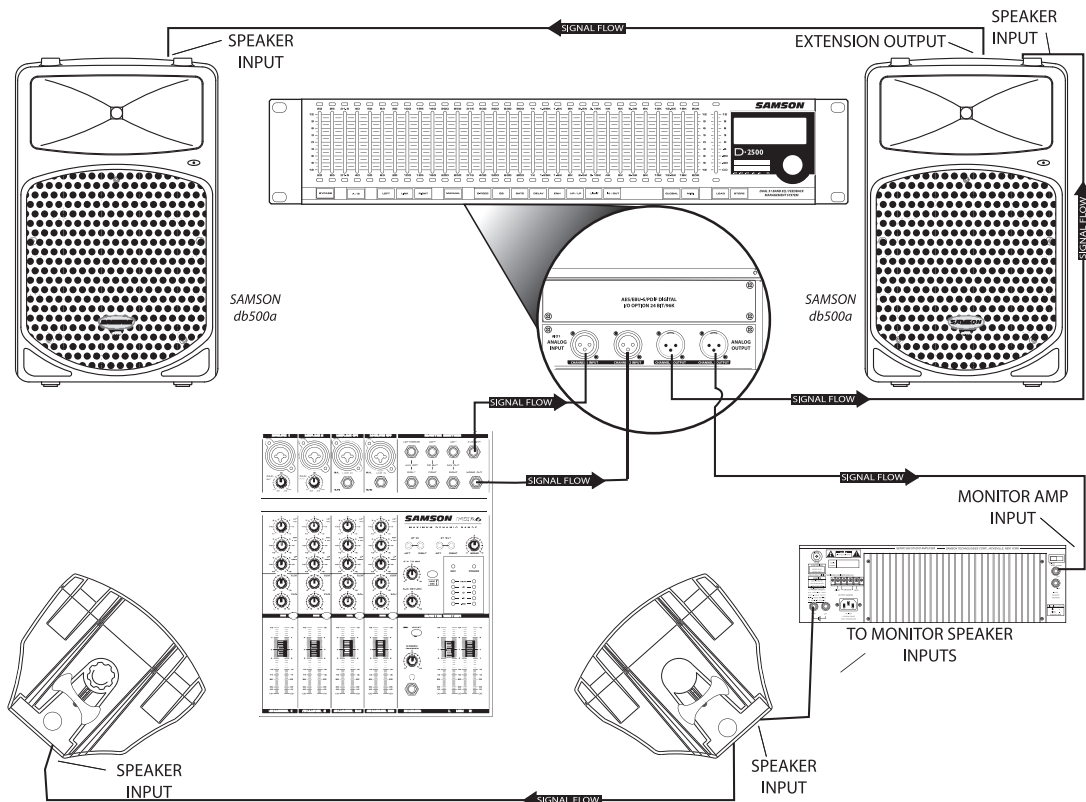
System Configurations

Using the D2500 into Insert Points



You can use the D2500 in your mixer's insert points if you want to equalize two mono channels individually in the mix. In this example the D2500's Channel 1 INPUT and OUTPUT are inserted on a bass guitar channel using a 1/4-inch TRS to 2 x XLR "Y" cable, and the Channel 2 INPUT and OUTPUT are inserted on a keyboard channel using the same type of cable. For more information on cable wiring see the D2500 Wiring Guide page 27 in this manual.

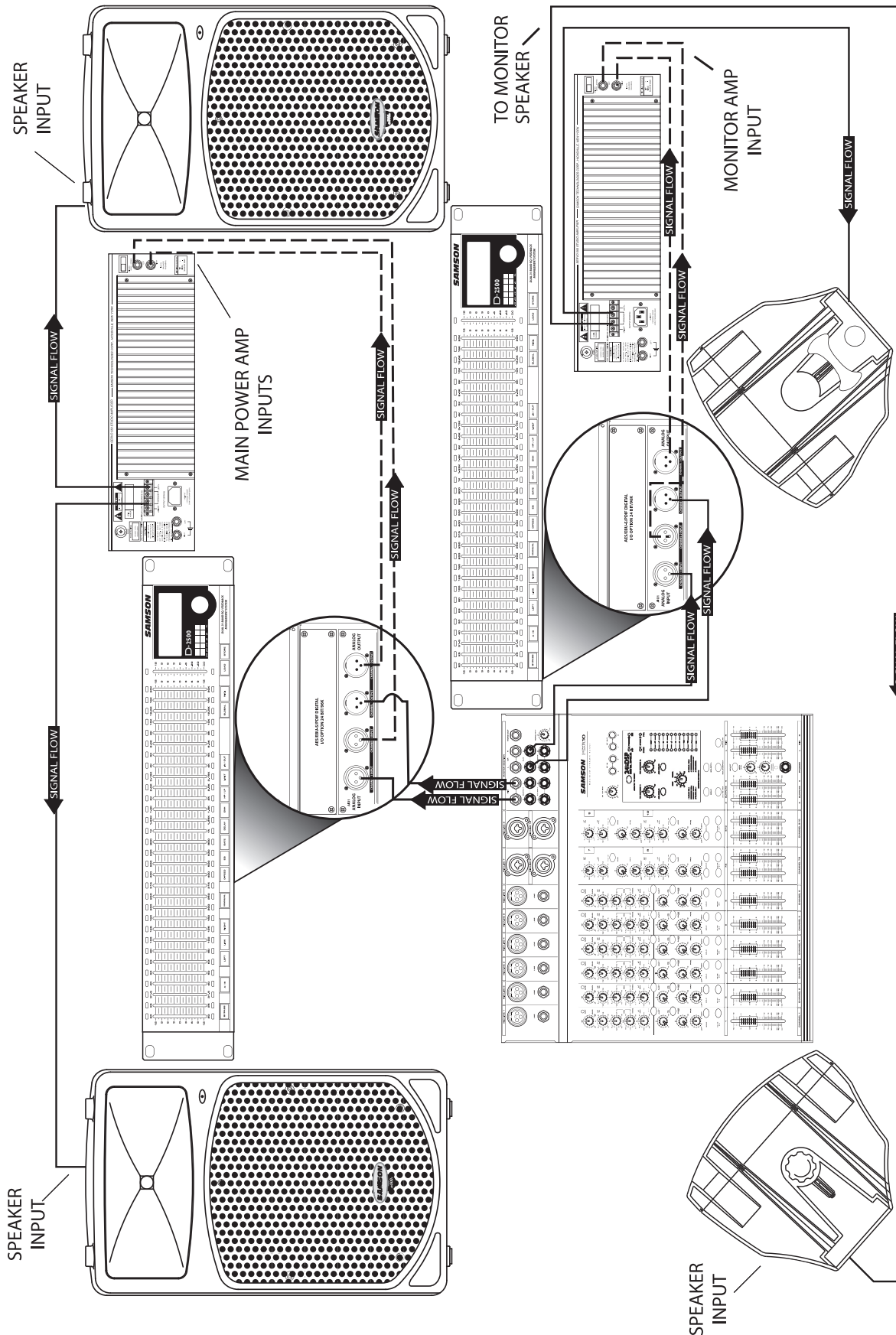
Using the D2500 for Mains and Monitors



In this example, an D2500 is used for both the main PA speakers running a mono mix, and for the monitor mix, also in mono. For the main PA, the mixer's MONO output is connected to the D2500's Channel 1 input. Then, the D2500's output is connected to the input of the right main PA active (self-powered) loudspeaker. The left main PA speaker is connected by "daisy-chaining" from the right. For the monitor mix, the mixer's AUX output is connected to the D2500's Channel 2 input. The D2500's Channel 2 output is connected to the input of the monitor power amplifier operating in bridge mode. Finally, the power amplifier's outputs are connected to the passive (non-powered) monitor loudspeakers. (See the owners manual for your specific power amplifier for the proper bridge mode operation.)

System Configurations

Using Two D2500's for Mains and Monitors



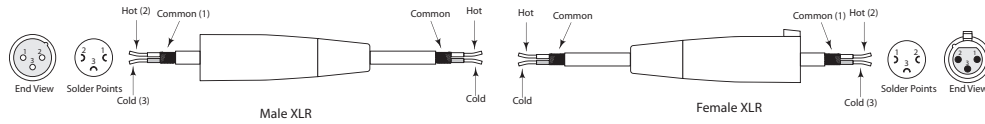
In this example, two D2500's are used for the stereo main and for the 2-channel monitor mix. The mixer's left and right outputs are connected to the first D2500's inputs for the main PA speakers. Then, the outputs are connected to the inputs of the power amplifier connected to passive loudspeakers. For the monitor mix, the mixer's AUX1 output is connected to the second D2500's channel 1 input and AUX2 output is connected to the channel 2 input. Then, the second D2500's channel outputs are connected to the inputs of the 2-channel power amp. Finally, the power amplifiers outputs are connected to the passive (non-powered) monitor loudspeakers.

D2500 Wiring Guide

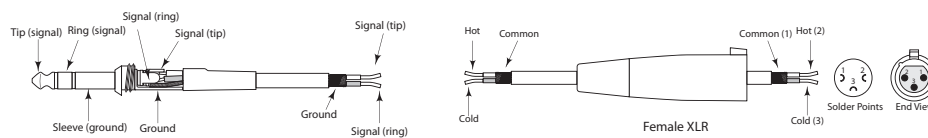
D2500 Wiring Guide

There are several ways to interface the D2500, depending on your exact monitoring set-up. Follow the cable diagrams below for connecting your monitor system.

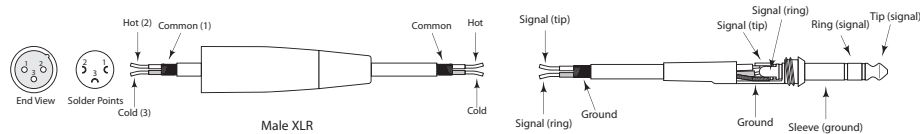
Balanced - XLR to XLR Cable



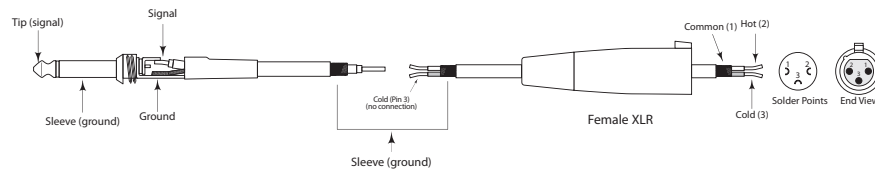
Balanced - 1/4" to FEMALE XLR Cable



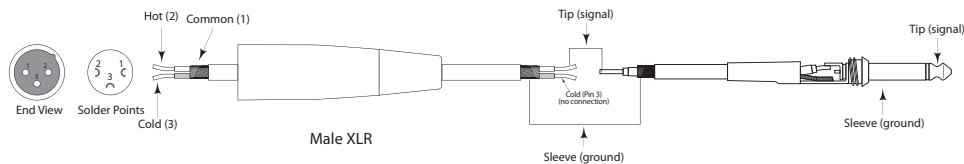
Balanced - MALE XLR to 1/4" Cable



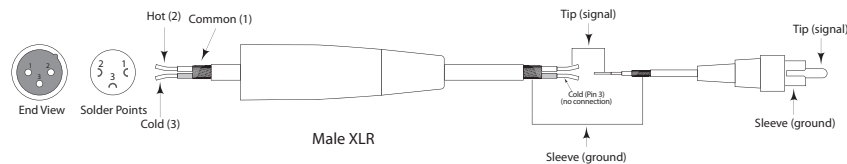
Unbalanced - 1/4" to FEMALE XLR Cable



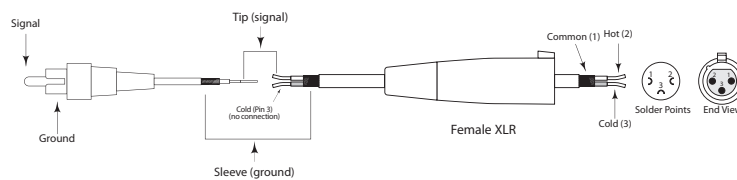
Unbalanced - XLR to 1/4" Cable



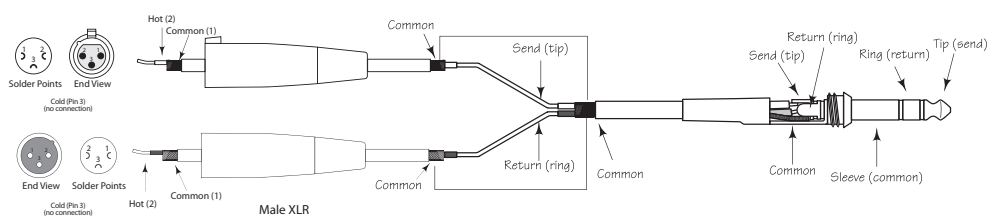
Unbalanced - MALE XLR to RCA Cable



Unbalanced - RCA to FEMALE XLR Cable



XLR Insert Cable



Specifications

Inputs

Type	electronically balanced
Connector	XLR
Impedance	22 k Ω at 1 kHz
Max. input level	+22
AIO1:	+14dBu
AIO2:	+20dBu

Outputs

Type	electronically balanced
Connector	XLR
Impedance	100 Ohms at 1 kHz
Max. output level	
AIO1:	+14dBu
AIO2:	+20dBu

Frequency Response

10 Hz to 35 kHz (-1dB)
@ 96 kHz sampling rate

Signal-to-noise-ratio

AIO1:	Noise floor (unweighted) < -92 dBFS (-78 dBu) Noise floor (A-weighted) < -100 dBFS (-86 dBu)
AIO2:	Noise floor (unweighted) < -106 dBFS (-86 dBu) Noise floor (A-weighted) < -112 dBFS (-92 dBu)

THD

0.005 % typ. @ +4 dBu, 1 kHz,
unity gain

Digital Processing

Converter	24-bit Delta-Sigma, 64/128-oversampling
Sample rate	32, 44.1, 48, 64, 88.2, 96 kHz
AIO1 & AIO2	96 kHz
DIO1	Type digital 31-band equalizer
Frequency range	20 Hz to 20 kHz, 31 bands on ISO standard frequencies

Display

Custom LCD for parameter control

Type

Memory

Presets	100 memory locations, 99 user programmable
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Midi interface

Type	5-pin. DIN jacks In/Out/Thru
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Power supply

Mains voltage	115 V, 60 Hz, 230 V, 50 Hz
Power consumption	20 W typ.
Fuse	T 630mA for 100- 120 Volt / T315mA for 220 - 240 Volt
Mains connector	Standard IEC receptacle

Dimensions

19 in. (w) x 10.5 (d) x 3.5 (h)
482 mm (w) x 267 (d) x 89 (h)
5.1 lb.(2.31 kg)

Weight

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES CLASS B. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MUST NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION. SUITABLE FOR HOME OR OFFICE USE.

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