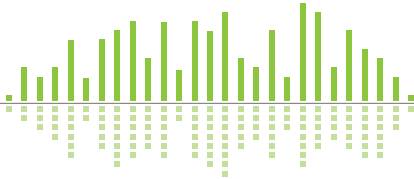


6200 Digital Voice Processor

User's Guide



What Ships in the Box

- A 6200 hardware device.
- A 6200 Designer CD-ROM (Windows).
- A detachable power cord.
- This User's Guide.

What You Need to Provide

(for optional PC GUI control only)

- A Windows PC with 300MHz or higher Pentium and:
- WIN 98SE, ME, 2000 or XP.
- 10-15 MB free storage space.
- 1024x768 graphics capability.
- 16-bit or higher colors.
- CD-ROM drive or Internet connection.
- 64MB RAM (WIN 98SE/ME), 128MB RAM (WIN 2000/XP).
- One of the following communications interfaces:
 - An available serial port with a straight-through RS-232 cable to connect the serial port of your PC to the 6200's rear RS-232 port. The 6200's RS-232 input is a female DB9 connector.
 - An available USB 1.1 port with appropriate cable to mate to your computer's or hub's USB port. The 6200 uses a female "B" type USB connector on its front panel.
- A 10/100 Base T Ethernet port with any necessary CAT-5 cabling and networking hardware.

Getting Help

6200 Designer, the Windows GUI application interface for the 6200 hardware, includes a help module which acts as a complete user's guide for the software.

If you have questions beyond the scope of this User's Guide or the help module, contact our Customer Support Group in the following ways:

Tel: +1.425.778.7728

8:00 am to 4:30 pm

Monday through Friday,

Pacific Time


Web: <http://www.SymetrixAudio.com>

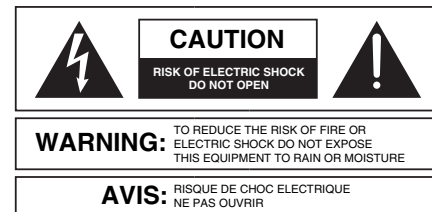
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B Digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les Exigences du Règlement sur le matériel brouilleur du Canada.

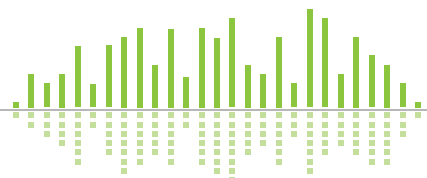
Important Safety Instructions

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water. This apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
- 6 Clean only with dry cloth.
- 7 Do not block any ventilation openings. Install only in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9 This apparatus shall be connected to a mains socket outlet with a protective earthing connection. 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 the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11 Only use attachments/accessories specified by the manufacturer.
- 12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.  When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug cord is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



SEE OWNERS MANUAL. VOIR CAHIER D'INSTRUCTIONS.
No user serviceable parts inside. Refer servicing to qualified service personnel.
Il ne se trouve à l'intérieur aucune pièce pouvant être réparée l'utilisateur.
S'adresser à un réparateur compétent.

- ◆ **The lightning flash** with arrowhead symbol within an equilateral triangle is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's 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 of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product (i.e. this Quick Start Guide).
- ◆ **CAUTION:** To prevent electric shock, do not use the polarized plug supplied with the unit with any extension cord, receptacle, or other outlet unless the prongs can be fully inserted.
- ◆ **Power Source:** This Symetrix hardware uses a switching power supply that automatically adjusts to the applied voltage. Ensure that your AC mains voltage is somewhere between 100-240 VAC, 50-60 Hz. Use only the power cord and connector specified for the product and your operating locale. A protective ground connection, by way of the grounding conductor in the power cord, is essential for safe operation. The appliance inlet and coupler shall remain readily operable once the apparatus has been installed.
- ◆ **User Serviceable Parts:** There are no user serviceable parts inside this Symetrix product. In case of failure, customers inside the U.S. should refer all servicing to the Symetrix factory. Customers outside the U.S. should refer all servicing to an authorized Symetrix distributor. Distributor contact information is available online at: <http://www.SymetrixAudio.com>.



Introduction

The AirTools 6200 Digital Voice Processor is designed to meet the increasingly sophisticated needs of broadcasters operating in both analog and digital realms featuring an optimum mix of signal processing modules and control features. The modules include: highpass, lowpass, and shelving filters, de-esser, downward expander, comp-limiter/AGC-leveler, 4-band parametric EQ and voice symmetry. The 6200 is a dual-channel unit with two discrete audio pathways capable of processing microphone or line-level sources, independently or as a stereo pair with a 24-bit/48 kHz digital signal path. Creation of voice programs and signal processing parameters may be done from the 6200 front panel or from 6200 Designer, a Windows® application

(provided). From a PC, the 6200 may be controlled via RS-232, USB or Ethernet. In lieu of computer control, real time changes of program and DSP parameters may be actuated via user supplied ESE time code, pots, encoders, switches, or MIDI devices.

Mechanical Data		
ITEM	DESCRIPTION	DETAILS
Space Required	1U (WDH: 48.26 cm x 26.6 cm x 4.369 cm / 19 in x 10.475 in x 1.72 in). Depth does not include connector allowance.	Allow at least 1 inch additional clearance for rear panel connections. Additional depth may be required depending upon your specific wiring and connections.
Electrical	100-240 VAC, 50-60 Hz, 25 Watts maximum.	No line voltage switching required.
Ventilation	Maximum recommended ambient operating temperature is 30 C / 86 F.	Ventilation should not be impeded by covering the unit with items such as newspapers, tablecloths, curtains, etc.
Weight	4.45 kg / 9.82 lbs.	

Performance Data		
Item	DESCRIPTION	DETAILS
INPUTS:		
Nominal Input Level	Analog: +4 dBu or -10 dBV line level, -36 dBu or -56 dBu mic level (software selectable) with 20 dB of headroom Digital: -20 dBFS: 100-240 VAC, 50-60 Hz, 25 Watts maximum.	NOTE: For unbalanced analog input, either reference the minus input terminal to the signal source ground (preferred) or ground the minus input to the adjacent ground terminal (tie low to ground). Using the second method deprives you of the common mode rejection inherent in a balanced input, even when coming from an unbalanced source.
Maximum Input Level	Analog: +24 dBu Digital: 0 dBFS	
Input Impedance	Analog: 20k Ohms, Digital: 110 Ohms, +/- 10	
CMRR	> 50 dB (0 dBu, 20 Hz to 20 kHz)	
Analog to Digital Conversion	24-bit delta/sigma	
OUTPUTS:		
Nominal Output Level	Analog: +4 dBu line level with 20 dB of headroom, Digital: -20 dBFS	NOTE: For unbalanced analog output, float (do not connect) the minus output terminal. Unbalanced usage results in 6 dB lower output level.
Maximum Output Level	Analog: +24 dBu, Digital: 0 dBFS	
Output Impedance	Analog: 200 Ohms balanced, 100 Ohms unbalanced, Digital: 110 Ohms, +/- 10%	
Digital to Analog Conversion	24-bit delta/sigma	
SYSTEM		
Nominal Sample Rate	48 kHz	
Sample Sync Range	48 kHz +/- 100 ppm	
Dynamic Range	Analog: > 114 dB (20 Hz to 20 kHz, A-weighted), Digital: 144 dB typical, unweighted	
Frequency Response	Analog: 20 Hz - 20 kHz, Digital: 20 Hz - 24 kHz	
THD + Noise	Analog In-to-Out: 0.0035% (20 Hz to 20 kHz, unweighted with +24 dBu output) Digital In-to-Out: > 117 dB @ 1 kHz	



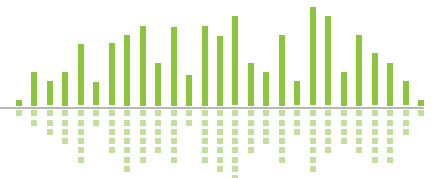
FRONT PANEL

ITEM	DESCRIPTION	DETAILS
BYPASS	Momentary button	Toggles DSP bypass state on top level menus. Toggles DSP module bypass state on individual DSP module menus.
PREV / EXIT	Momentary button	Moves to the previous menu item or exits to the top of the menu tree.
NEXT / ENTER	Momentary button	Moves to the next menu item or enters a menu tree.
HOME	Momentary button	Returns to the "HOME" top-level menu.
ADJUST	Continuous rotary encoder	Selects the menu to enter or adjusts the currently selected parameter or menu item.
DISPLAY	Monochrome	Displays status, menu or configuration information.
LOAD 1 / SAVE 1	Momentary button	Loads or saves a program for channel 1.
LOAD 2 / SAVE 2	Momentary button	Loads or saves a program for channel 2.
USB	Female "B" USB 1.1 port	Optional connection to a Windows™ PC for 6200 Designer GUI control.



REAR PANEL

ITEM	DESCRIPTION	DETAILS
POWER INPUT	IEC 3 prong jack	Accepts power from detachable IEC power cable (100-240 VAC, 50-60 Hz, 60 Watts max). Connect only to a grounded power outlet.
TC89/TC90 TIME CODE IN	Female BNC	Accepts (ESE) TC89 or TC90 time code to drive the real-time clock and Event Manager. Format and presence is automatically detected.
PROGRAM CONTROL	Male DB9	Simple program recall interface.
RS-232	Female DB9	Optional serial communications interface for 6200 Designer on the host PC.
ETHERNET (10 Base T)	RJ-45	Optional Ethernet communications interface for 6200 Designer on the host PC.
RS-485	Euroblock	Optional long distance serial communications interface for 6200 Designer on the host PC. Third party 232/422/485 converter products may be required to utilize this port.
REMOTE BYPASS	Euroblock	Allows remote software (DSP) bypass or output muting (output disconnect via relays) with simple contact closures.
ANALOG CONTROL	Euroblocks	Allows real-time control of up to two parameters per port using standard 10k Ohm INPUT 1 and 2 linear potentiometers.
MIDI/RC-1 IN	7 pin DIN	Accepts MIDI program change messages to recall programs for channels 1 and 2. Can also be used with the AirTools RC-1 remote directly. The RC-1 can also be powered from this port.
HOMERLINK	RJ-45	Transmits 4 AES-3 mono channels and receives 2 AES-3 mono channels over standard CAT-5. Used for AES digital input, to sync to an external AES clock source or to integrate with the AirTools Studio Matrix system.
AES OUT 1 and 2	Male XLR	AES-3 digital output - software selectable to carry Channel 1/2, 1/1, 2/1 or 2/2 information.
ANALOG OUT	Male XLR	2 x analog line level audio outputs with software adjustable output level.
ANALOG IN	Female XLR-1/4" combo	2 x analog mic/line level audio inputs with individually software selectable coarse gain and fine trim.

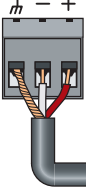


Balanced Connections

Any of these connectors can appear on either side of a balanced connection.

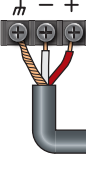
NOTE: In the case of an XLR connector, the Female attaches to an output, while the Male attaches to an input.

Euroblock [balanced]

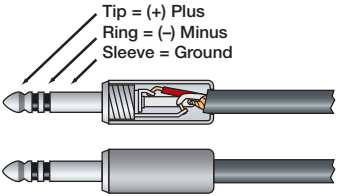


NOTE: Detachable Euroblock and Terminal Strip connectors are designed for use with bare wire. Do not tin stranded wires before inserting them into the connectors.

Terminal Strip [balanced]

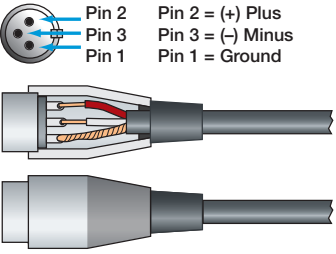


TRS 1/4" Plug [balanced]



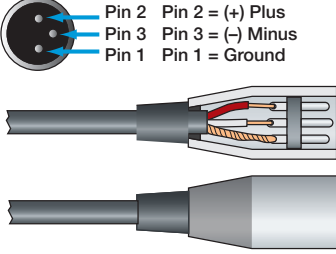
Tip = (+) Plus
Ring = (-) Minus
Sleeve = Ground

XLR Female Plug [balanced]



Pin 2 Pin 2 = (+) Plus
Pin 3 Pin 3 = (-) Minus
Pin 1 Pin 1 = Ground

XLR Male Plug [balanced]



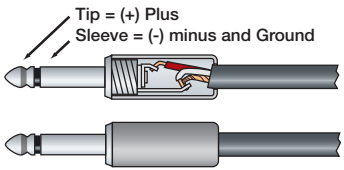
Pin 2 Pin 2 = (+) Plus
Pin 3 Pin 3 = (-) Minus
Pin 1 Pin 1 = Ground

Special Case: Female XLR connectors will ALWAYS be used coming from the OUTPUT of a device. Male connectors plug into the INPUT of a device.

Unbalanced Connections

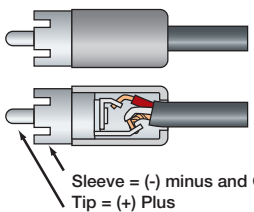
The RCA connector and the 1/4" TS connector are unbalanced connectors, wired with a single strand shielded wire and can be placed on either end of an unbalanced connection

TS 1/4" Plug [unbalanced]



Tip = (+) Plus
Sleeve = (-) minus and Ground

RCA Plug [unbalanced]



Sleeve = (-) minus and Ground
Tip = (+) Plus

! IMPORTANT NOTICE !

The wiring diagrams on these pages are included **for information purposes only**.

Symetrix can not anticipate every connector type on non-Symetrix products. **It is the user's responsibility to determine what connection is needed.**

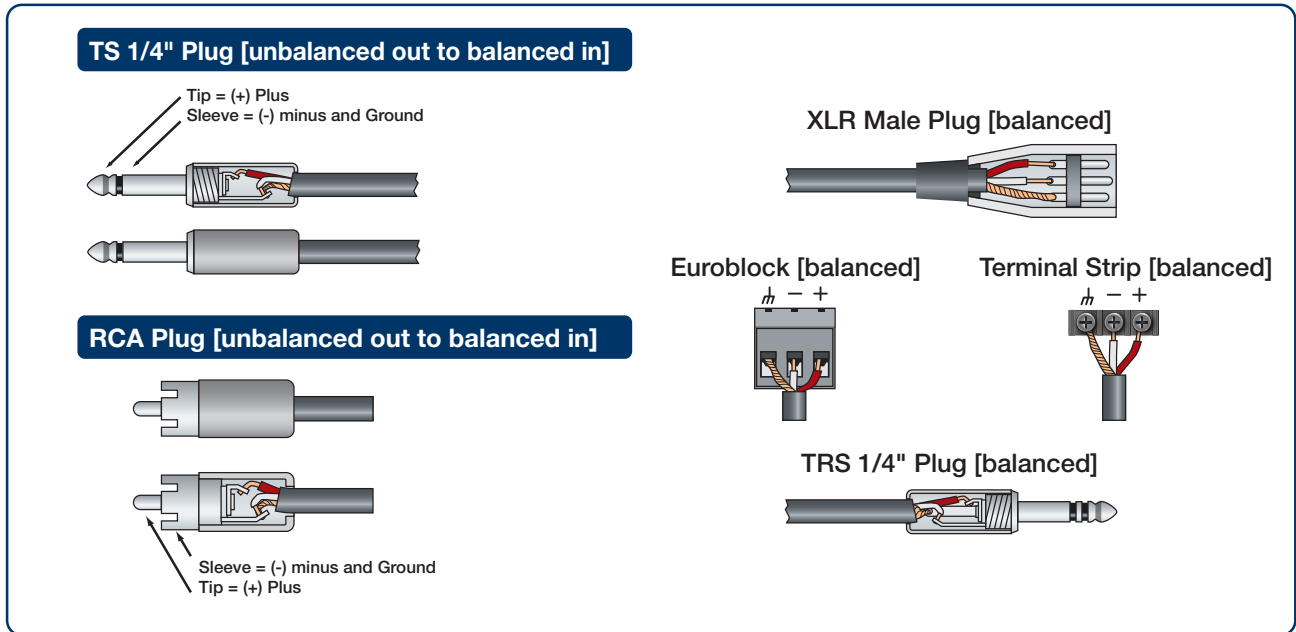
In addition, **Symetrix** accepts **no responsibility for injury or damage caused by user created wiring.**

Unbalanced Connections:

Unbalanced out to balanced in

The RCA connector and the 1/4" TS connector are unbalanced connectors. However, the wiring differs depending on if they are sending to, or receiving from a balanced connector.

In this example, the unbalanced connector is sending signal to a balanced connector. When wiring this connection, use a shielded twisted pair cable. The balanced side wires the same as a standard, balanced connection. On the unbalanced side, you wire the white (minus) wire together with the ground. This provides some common mode rejection at the balanced input.

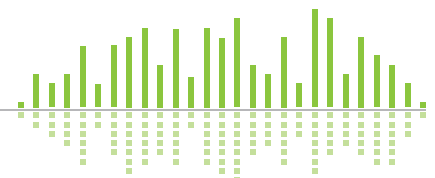
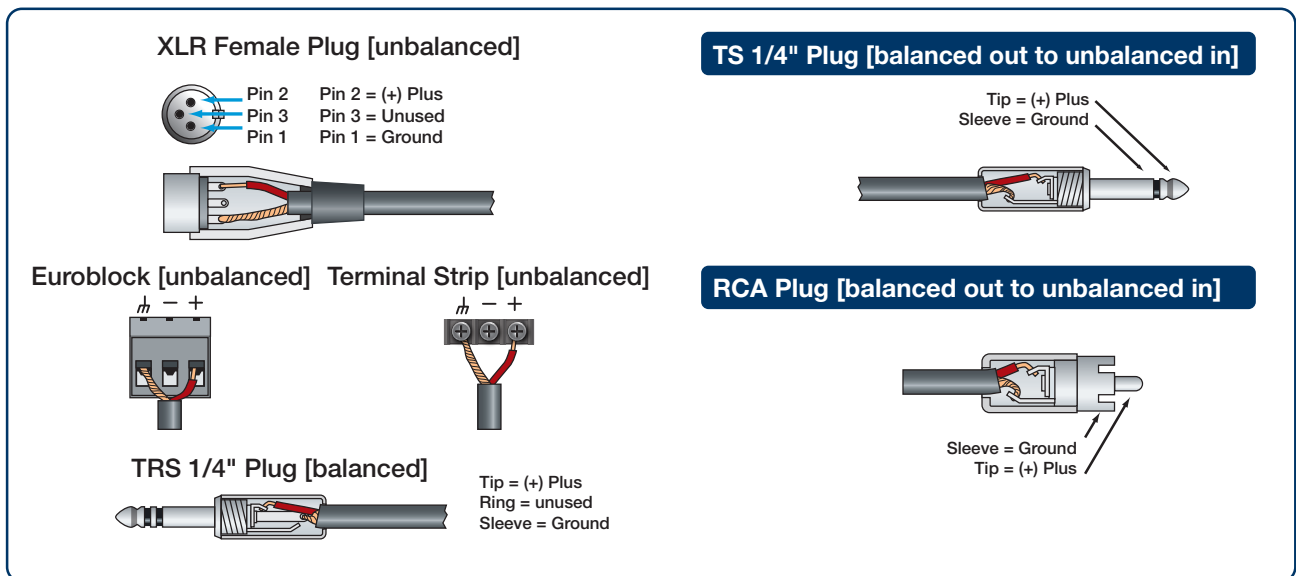


Unbalanced Connections:

Balanced out to unbalanced in

When your output requires a balanced connector, but you

are sending signal to an unbalanced input, the rules change. Use a single strand shielded wire. Wire only to the plus and ground terminals of what would typically be the balanced connector.



Basic Setup

POWER: Connect the IEC connector side of the supplied AC cord to the receptacle on the rear of the 6200. Connect the other side of the AC cable to an AC power source that is of the correct voltage and frequency (100-240 VAC, 50-60 Hz). Use only the power cord and connector specified for the product and your operating locale.

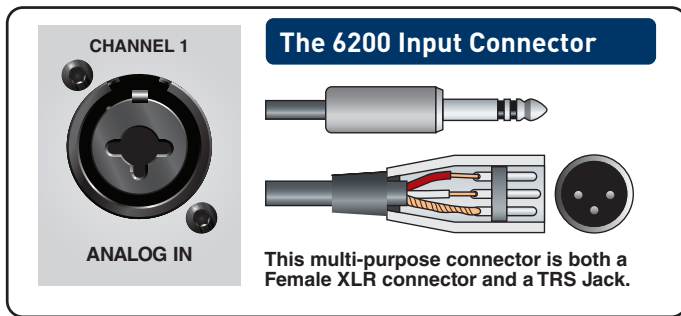


PHANTOM POWER (if required - skip this section if using a dynamic mic which does not require phantom power): All condenser microphones require some kind of electrical power. This power may be supplied by internal batteries, an external power supply that is connected to the microphone by a special multiwire cable, or through a standard microphone cable by “phantom” or “T system” powering. Phantom powering and T system powering are incompatible systems. Phantom power derives its name from its invisibility to audio signals, even though the microphone cable carries both phantom power (as direct current) and audio signals (as alternating current). Specifically, the term phantom power means a positive DC voltage sent to the microphone on both audio leads, through current-limiting resistors which also serve to isolate the audio leads from one another. Enabling phantom power applies phantom power via pins 2 and 3 of the mic input XLR connectors.

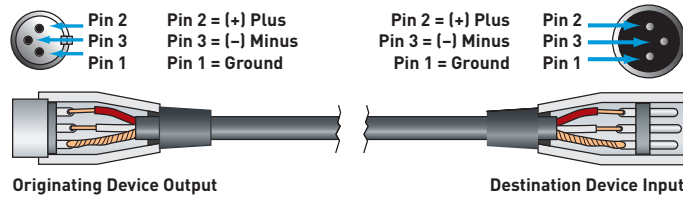
The phantom power technique uses the two signal conductors in a standard balanced mic cable to deliver the power required by the microphone, eliminating the need for internal batteries or an external power supply. Because the voltage is applied equally to both sides of a floating balanced circuit, no current flows through the microphone's transformer, or through the microphone element itself.

It is often said that the sound of some dynamic microphones is affected by phantom power and that ribbon mics cannot be plugged into an input that is phantom powered. For the most part, these are myths that grew out of difficulties created by other problems in the mic circuit:

1. When XLR connectors are mated there is no guarantee that both pins 2 and 3 will make contact at exactly the same time. It is possible that a damaging current could flow through the mic for a brief moment under these conditions. However, this is a connector problem, not a problem with the mic itself or phantom power in general.
2. In the past, it was a common practice to ground the center tap of the mic's output transformer. However, this practice should be avoided in phantom powered systems. The solution: Locate the center tap and cut the connection between it and pin 1 of the XLR connector.
3. If the mic's output transformer has developed leakage, the microphone may become noisy when phantom power is turned on. Crackling, sputtering or even humming noises may occur. The leakage, not the power, is the problem. The solutions are:
 - A. Turn off the phantom power.
 - B. Put a 1:1 low-impedance transformer between the mic and the input.
 - C. Get the mic repaired.



ANALOG IN: Using a standard microphone cable terminated with one male XLR connector and one female XLR connector, connect the male end into the CHAN 1 - ANALOG IN of the 6200 and the female end into your microphone.



- Caution 1:** When Phantom Power is engaged, do not use unbalanced microphones or mic cables.
- Caution 2:** When Phantom Power is engaged, do not use switched mics which short pin 2 and/or pin 3 to ground.
- Caution 3:** When Phantom Power is engaged, always turn down monitors/headphones before connecting or disconnecting microphones.

ANALOG OUT: Using a standard mic/line cable terminated with one male XLR connector and one female XLR connector, connect the female end into the CHAN 1 - ANALOG OUT of the 6200 and the male end into your destination device. These outputs are +4 dBu balanced line level outputs. If you need an unbalanced output, see the analog audio wiring diagrams on the previous page.

NOTE: Wiring the outputs to an unbalanced cable will typically result in an output level that is 6 dB lower than the output level achieved using a balanced cable.

The dominant remote powering system in use today is the phantom power system, which is compatible with both condenser and non-condenser microphones (dynamics, ribbons, etc.). If your microphone's specifications sheet claims that it requires phantom power, the 6200 can power it. The technical requirements for operation and/or compatibility are:

1. The microphone must have a balanced, low-impedance output.
2. The balanced output must be floating with respect to ground. If there is a center tap, it must not be grounded.

In a nutshell, here are the do's and don'ts of phantom powering:

DO: Verify that your microphone can be phantom powered (if it is a condenser mic).

Ensure that your microphone's output is low impedance, balanced and floating. This is especially important for ribbon mics.

Turn the phantom power off when connecting vintage ribbon microphones.

Mute your monitor speakers or headphones when turning the phantom power on or off. If you don't, there will be a loud, nasty pop.

Mute your monitor speakers or headphones whenever you plug in or unplug a phantom powered microphone. If you don't, there will be a loud, nasty pop.

DON'T: Plug in an A-B powered microphone without a suitable adapter.

Worry about your dynamic or ribbon microphones, as long as they are wired so that the output is balanced and floating.

Enable phantom power when connecting line-level sources, especially those that are transformerless.

Use the microphone input with unbalanced sources.

Use a direct box to feed an unbalanced source into the microphone input.

Worry about your tube condenser mics. They are compatible (although they cannot be phantom powered).

ENABLING PHANTOM POWER: If you have determined that the microphone connected to ANALOG IN - CHAN 1 requires phantom power, you now need to enable it for that input:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Channel 1 Input --".
6. Press the **NEXT** button three times and the display should read "Channel 1 Phantom, Disabled".
7. Turn the **ADJUST** knob clockwise until the display reads "Channel 1 Phantom, Enabled".
8. Press the **HOME** button when finished.
9. Repeat for Channel 2 if necessary.

MIC PREAMP GAIN: Coarse preamp gain for each channel is set in each channel's setup menu. Fine gain is set within each channel's program menu. Separating the gain settings like this allows for coarse gain (2 x line level settings and 2 x mic level settings) to be set as a global parameter corresponding to the physical device(s) connected to the 6200's input(s). The coarse gain setting is not stored in the preset programs. The fine gain setting is associated with its individual channel and is stored in the preset programs. This allows one to set up the fine gains which match specific users.

The 6200 offers 91.5 dB of overall gain (60 dB coarse gain plus 31.5 dB fine gain). Any mic output level is easy to accommodate with the 6200, regardless if it is the -60 dBV to -80 dBV levels common with ribbon mics or the near line level (-10 dBV to +4 dBu) often delivered by transformerless condenser mics. Input signals as high as +24 dBu can be handled by the 6200.

Both source level and preamp gain are directly related to the noise floor, as well as to headroom at the output. The key to using the 6200 at its optimum performance level is to:

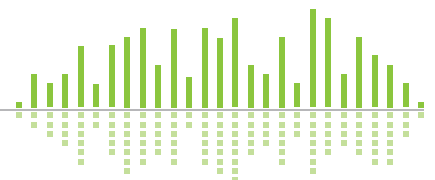
1. Use the maximum allowable source level.
2. Use only as much gain as necessary.

The combination of the highest possible input levels with the lowest possible gain always results in minimum noise and maximum headroom. Remember, the best operating position for a gain control is the minimum gain that delivers the required output level. **SETTING MIC PREAMP GAIN:**

To set the coarse preamp gain:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Channel 1 Input --".
6. Press the **NEXT** button once and the display should read "Channel 1 Gain, Hot Mic -36 dBu", if it does not turn the **ADJUST** knob clockwise or counter-clockwise until it does. This provides 40 dB of gain which assumes a nominal input level of -36 dBu. This setting should be sufficient for most microphones however, certain dynamic microphones may require more.
7. Press the **HOME** button when finished.

Provided that your monitoring path is turned on and set up properly, you should now be able to speak into the microphone and get a basic signal through the 6200. Talk into the microphone as loudly as you think you will ever talk into it. If the audio distorts, you may need to turn the gain down (try the -10 dBV setting). If the audio level is too weak, turn the gain up (try the -56 dBu setting). If you adjust the gain, repeat the process of speaking loudly into the mic and checking for distortion or weak level. We're looking for a ballpark level adjustment here. When you find the most suitable coarse gain adjustment, move on to the fine gain adjustment.



To set the fine preamp gain (for Channel 1):

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once, the display should read "Section to Edit, - Channel 1 Menu -".
3. Press the **NEXT** button once, the display should read "- Channel 1 Menu -, -- Input --".
4. Press the **NEXT** button once, the display should read "Input Gain Trim, 0.0 dB".

You can now use the ADJUST knob to dial in your fine gain setting. Talk into the microphone as loudly as you think you will ever talk into it while turning the ADJUST knob clockwise (increasing gain). Note when the audio distorts and then turn the gain back down somewhat (maybe 6 dB or so). You should now be able to talk in a normal voice with adequate level while still having enough headroom for loud passages. If you find that the audio never distorts when turning the gain up, and you reach the maximum gain of 31.5 dB provided here, you should return this gain setting to 0.0 dB and then go back to reset the coarse gain to a higher setting.

INPUT METERING:

You can monitor the input meters by viewing the "In LVL" menu accessed by pressing the HOME button once then turning the ADJUST knob clockwise once. A meter for channel 1 is displayed on the top line, channel 2 on the bottom line. Unity gain is represented as an "open square" symbol and corresponds to an input level of -20 dBFS = +4 dBu = 0 VU.

Now that we have a basic signal through the unit, we can move on to exploring the specific signal processing functions of the 6200 (EQ, Dynamics, etc.).

DSP Modules

The following are the available DSP modules available in the 6200. Each of these modules may be individually enabled or disabled. The order of the modules is fully configurable. The modules are listed in their default order.

SYMMETRY:

For broadcast applications, a switchable voice symmetry circuit helps make speech waveforms more symmetrical, which makes better use of the transmitter's output power.

Human speech, particularly male human speech, contains a great deal of asymmetry. In broadcast (especially AM broadcast), this wastes transmitter power because asymmetrical waveforms do not utilize the full power of the modulator.

Controls:

Bypassed/Enabled - When bypassed, the input is sent unmodified to the output. When enabled, the module processes the signal.

HIGH PASS FILTER:

High pass filters allow selectively modifying a signal by attenuating all signals below a specified cut-off frequency. They can be useful to remove noise or other unwanted frequencies. A high pass filter in a voice processor is typically used to reduce rumble picked up by the microphone. It can reduce boominess in a voice, noise from handling the mic, fingers tapping on a desk, etc. The 6200 offers 6 dB/octave, 12 dB/octave, 18 dB/octave and 24 dB/octave filters. Additionally, "peak" versions of each filter are provided for further flexibility and tuning. The filters with the steeper response filter more sharply.

Controls:

Bypass/Enabled - When bypassed, the input is sent unmodified to the

output. When enabled, the module processes the signal.

High Pass Frequency - Determines the cut-off frequency of the filter. All frequencies below this will be progressively attenuated. Technically, this frequency is the "3 dB down point", i.e. the point where the filter response is 3 dB lower than it is for unaffected signals.

HP Filter Slope - Determines the type of filter (slope) to use in order to select how steep or aggressive the filter is.

Technical note: This module implements Butterworth filters which are generally preferred for audio because of their flat frequency response in the pass band.

DE-ESSER:

A de-esser is a frequency-selective compressor. It is used to remove sibilance by detecting the presence of excessive "S" frequencies and then reducing those frequencies in amplitude.

Controls:

Bypass/Enabled - When bypassed, the input is sent unmodified to the output. When enabled, the module processes the signal.

De-esser (Response) - Determines the aggressiveness of the de-essing (Gentle, Normal or Aggressive). The de-esser is a dual band design. It compares the relative energy above the 2.5 kHz rollover point to the energy below and limits the upper band when the high frequency energy is greater than a threshold amount. The Gentle, Normal, and Aggressive settings determine how much relative high frequency energy is required to start the high frequency gain reduction.

Gain Reduction (Meter) - A gain reduction meter is provided so that the effect of the de-esser can be observed.

PARAMETRIC (1 through 4) EQ:

With parametric equalizers you can adjust center-frequency, gain, and bandwidth of a filter band. Parametric EQ can be used to tailor an overall sound quality or to more accurately boost/cut specific frequency ranges. The 6200 provides a four-band parametric EQ. Each of the four bands can be individually adjusted.

Controls:

Bypass/Enabled - You can selectively enable or disable a given parametric band. If a band is disabled, it has no effect on the signal, regardless of the other settings for this band.

Parametric (n) Freq - The center frequency of the equalizer band.

Parametric (n) BW - The bandwidth of the peak or dip applied to the signal, expressed as the Q factor. Q is a dimensionless (unitless) quantity used to describe bandwidth.

Parametric (n) Gain - The amount of gain or attenuation (boost or cut) applied at the center frequency.

Note: Only one set of controls is outlined. Bands 1 through 4 are identical.

SHELVING FILTER:

High Shelf and Low Shelf filters are simple filters that can be used to modify the treble or bass content of a signal. They are designed to emulate traditional analog tone or treble/bass controls. If you need to give a non-technical end user control over treble and bass, a shelf filter is the way to go. The low shelf filter can be used to boost or cut the bass from a signal. The high shelf filter can be used to boost or cut the treble from a signal. The 6200 provides one shelving filter which can be set as a low or high shelf. For a basic treble control, use a high shelf filter and set the frequency between 2 kHz and 5 kHz. For a basic bass control, use a low shelf filter and set the frequency between 200 and 500 Hz.

Controls:

Bypass/Enabled - When bypassed, the input is sent unmodified to the output. When enabled, the module processes the signal.

Shelving Frequency - Determines where the boost or cut takes place. For low shelf filters, all frequencies below this will be affected. For high shelf filters, all frequencies above this will be affected. Technically, the indicated frequency is the point where the filter has reached half of its specified dB gain. For example, for +6 dB boost with a 1 kHz frequency, the signal is boosted by +3 dB at 1 kHz.

Shelving Gain - Determines the amount of boost or cut applied.

Shelving Type - Defines the type of shelving filter in use (Low Shelf or High Shelf) and the aggressiveness of the shelf ramp (Gentle, Normal or Aggressive).

EXPANDER:

An expander reduces the gain of lower level signals thereby increasing the total dynamic range. Above a user defined threshold setting, signal levels remain unchanged. Below threshold, signals are reduced by some degree. An expander reduces the level gradually for decreasing input level. An expander can be used to reduce room noise during pauses in speech or reduce noise floor during pauses in program.

Controls:

Bypass/Enabled - When bypassed, the input is sent unmodified to the output. When enabled, the module processes the signal.

Expander Threshold - The level that the signal must exceed to open the expander (let it pass signal).

Expander Ratio - The slope of the gain curve below the threshold point. A high ratio setting begins to approximate the action of a gate.

Gain Reduction (Meter) - A gain reduction meter is provided so that the effect of the expander can be observed (present on Threshold and Ratio menus).

Expander Attack - The duration of the input signal, over threshold, required to open the expander. Faster attack times let shorter transients open the expander.

Expander Release - The amount of time required for the gain to return to the below-threshold value after the input signal falls below threshold.

COMPRESSOR:

A compressor reduces the dynamic range of signals above a user determined threshold. Signal levels below the threshold remain unchanged. A compressor can be used to tame transient spikes in audio sources as well as reducing dynamic range to control wildly varying levels while increasing intelligibility.

Controls:

Bypass/Enabled - When bypassed, the input is sent unmodified to the output. When enabled, the module processes the signal.

Compressor Sidechain - Determines the mode of the compressor module (Compressor or AGC). Certain controls are only applicable within specific modes.

Compressor Threshold - The signal level above which the compressor begins reducing the gain. Visually, the point at the knee (bend) in the input/output curve. For peak stopping, set the threshold just below the peak level that you want to stop. For dynamic range reduction, pick a threshold setting that results in a few dB of gain reduction indication with the signal levels that you are interested in.

Compressor Ratio - The ratio determines the degree of output change for an above threshold change in the input. Generally ratios under 10:1 are considered compression while those above 10:1 are considered limiting.

Gain Reduction (Meter) - A gain reduction meter is provided so that the effect of the compressor can be observed (present on Threshold and Ratio menus). It indicates the amount of gain reduction that the compressor is currently applying. This meter is pre-output gain, meaning changes to compressor output gain do not effect this meter.

Compressor Attack - The speed with which the compressor begins the gain reduction process. Although your intuition tells you that you want the fastest possible attack time, your ears will tell you otherwise. Too fast attack times strip transients of their edges, dulling the sound. Remember that momentary (brief) clipping is inaudible. Faster attack times allow shorter transients to initiate gain reduction. On the other hand, too long attack times can allow short transients to pass unchanged, which may defeat the purpose that the compressor was intended for.

Compressor Release - The release time determines the moment-to-moment gain change in the compressor. Fast release times raise the subjective level, while slow release times are more useful for keeping levels under control. Very fast release times can cause audible distortion, especially with low-frequency content.

Compressor Knee - The knee setting determines the compression ratio during the transition from linear (below threshold) to compressor operation. A soft knee makes this change gradually, while a hard knee makes an abrupt transition. A soft knee curve may require several dB of gain reduction before the actual compression ratio has reached the set value. For general compression, use the soft setting. For limiting, use the hard setting.

Compressor Makeup - The makeup gain controls the output gain of the module. If the compressor is reducing the signal level significantly, a boost in the output gain may be required to maintain perceived volume.

Sidechain High Pass - A 150, 300 or 600 Hz side chain high pass filter can be invoked in order to deter low frequency energy from triggering expander/compressor action and the resultant unwanted gain reduction.

Lookahead Delay - A lookahead delay can be enabled which allows the module to better predict changes to incoming levels and thus provide better dynamics processing. Enabling this delay results in an extra 2 ms processing delay.

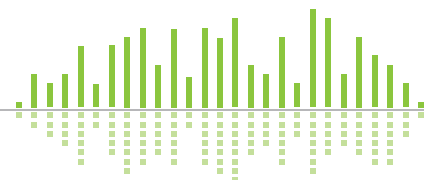
AGC:

AGC or Automatic Gain Control is a special case of a compressor with its threshold set at a very low level, moderate to slow attack times, long release times, and low ratios. It is intended to take signals of indeterminate levels up to a target level while maintaining program dynamics. Most AGCs incorporate some sort of silence detection to prevent the loss of gain reduction during silent periods. This is the single feature that separates an AGC from a common, ordinary compressor/limiter.

Use an AGC to remove some of the variation in level from a person who isn't trained on microphone control or to take some of the guesswork out of setting up dynamics control of unfamiliar input sources. When setting up the AGC, keep the attack and release times conservative (perhaps 50ms/500ms for voice and 500ms/500ms for music).

When engaging the AGC mode of the Compressor, some controls are repurposed, removed or replaced:

AGC Detector Thresh - The AGC Detector Threshold, or more accurately the AARM (Automated Attack and Release Monitor) Detector Threshold, is a fixed threshold below which the AARM circuit stops calculating changes in gain. When the input signal level is below the threshold, the AGC gain/attenuation will be locked, and therefore will not be changing. Set this threshold to a level 10-20dB above the noise floor of your input signal. It can be dangerous if the threshold is too close to the noise floor, as this could cause the noise floor to be raised in some cases. (Effective in AGC mode only).



AGC Goal - The desired output signal level to maintain. (Effective in AGC mode only).

Compressor Threshold - This parameter is disabled in AGC mode.

Compressor Ratio - This parameter is disabled in AGC mode.

Compressor Makeup - This parameter is disabled in AGC mode.

LOW PASS FILTER:

Low pass filters allow selectively modifying a signal by attenuating all signals above a specified cut-off frequency. They can be useful to remove noise or other unwanted frequencies. A low pass filter in a voice processor is typically used to limit the high frequency content sent to downstream processing or the transmitter. The 6200 offers 6 dB/octave, 12 dB/octave, 18 dB/octave and 24 dB/octave filters. Additionally, "peak" versions of each filter are provided for further flexibility and tuning. The filters with the steeper response filter more sharply.

Controls (Low Pass Filter):

Bypass/Enabled - When bypassed, the input is sent unmodified to the output. When enabled, the module processes the signal.

Low Pass Frequency - Determines the cut-off frequency of the filter. All frequencies above this will be progressively attenuated. Technically, this frequency is the "3 dB down point", i.e. the point where the filter response is 3 dB lower than it is for unaffected signals.

LP Filter Slope - Determines the type of filter (slope) to use in order to select how steep or aggressive the filter is.

Technical note: The module implements Butterworth filters which are generally preferred for audio because of their flat frequency response in the pass band.

OUTPUT:

The final "DSP Module" is the output level. The output is loosely labeled a DSP Module as the level adjustment does happen in the digital domain within the DSP and its parameters are stored within the programs, however, it can not be reordered or bypassed/enabled as the other modules can. The output level provides the final gain stage before the physical output(s) of the unit and has a range of -72.0 dB to +24.0 dB. Typically, this control would remain as close to 0.0 dB as possible using it only for level matching to downstream equipment or to compensate for gain added or subtracted by the upstream DSP modules.

If it is necessary to connect the output of the 6200 to a microphone level input, see Appendix A for information on converting the 6200's line level output(s) to mic level.

OUTPUT METERING:

You can monitor the output meters by viewing the "Out LVL" menu accessed by pressing the HOME button once then turning the ADJUST knob clockwise twice. A meter for channel 1 is displayed on the top line, channel 2 on the bottom line. Unity gain is represented as an "open square" symbol and corresponds to an output level of -20 dBFS = +4 dBu = 0 VU.

DSP MODULE WRAP-UP:

That covers the available DSP modules and their controls. For a graphic view of the menu structure, see Appendix B.

Programs

The 6200 features 256 memory locations in which mono or stereo programs may be stored. If a program is mono, it can be loaded onto or saved from either Channel 1 or Channel 2 independently. A stereo program stores information for both channels simultaneously.

Be advised:

1. When loading a stereo program onto a unit configured for dual mono operation, both channels will be overwritten with the stereo program's information.
2. When changing the unit to stereo operation from dual mono, channel 1's settings will be applied to channel 2, thus overwriting channel 2's settings.
3. Loading a mono program onto either channel when the unit is configured for stereo operation will result in the automatic configuration of the unit to dual mono mode.

Each program can be named with up to 20 characters. A program loads/saves of all settings under the Channel 1/2 menu trees (see Appendix B), including module order. Each program may be loaded manually by any of the means mentioned in the rest of this User's Guide, or automatically by time/date using the built-in Event Manager covered in the 6200 Designer's online help module.

Saving a Program

Use this process to save a program you have created or modified.

1. Press and hold the **LOAD 1/SAVE 1** button for approximately one second. The screen will read "Save to Program 1?" and the name of the program currently stored in this location will readout on the line below.
2. Turn the **ADJUST** knob to locate the program location (1-256) you wish to save to.
3. Press and hold the **LOAD 1/SAVE 1** button again for approximately one second and the screen should read "Save Mono or Stereo?".
4. Turn the **ADJUST** knob to toggle between Mono and Stereo formats.
5. Once you have chosen your format for the program, press and hold the **LOAD 1/SAVE 1** button again for approximately one second.
6. The screen should briefly display "Saving..." and then return to the home screen.

NOTE: The above steps assume you are working with Channel 1. To perform a save using the parameters on Channel 2, perform the above steps using the LOAD 2/SAVE 2 button instead.

Loading a Program

Use this process to load a program you have previously saved.

1. Press briefly the **LOAD 1/SAVE 1** button once. The screen will read "Load Mono Pgm 1?" and the name of the program currently stored in this location will readout on the line below. **NOTE:** If the program in the selected memory location is a stereo program, the text will read "Load Stereo Pgm 1?" instead.
2. Turn the **ADJUST** knob to locate the program location (1-256) you wish to load.
3. Now briefly press the **LOAD 1/SAVE 1** button again.
4. The screen should briefly display "Loading..." and then return to the home screen.

NOTE: The above steps assume you are working with Channel 1. To load a program onto Channel 2, perform the above steps using the **LOAD 2/SAVE 2** button instead.

Copying Programs

To copy a program from one location to another, perform the steps listed above for loading a program, followed immediately by the steps for saving a program.

Naming a Program

Program names are modified in the Channel 1/2 menus under the "Program Name" submenu. See Appendix B for its location. If you rename the currently loaded program, don't forget to resave it to retain your new name.

External Program Recall

Programs may be recalled externally using an AirTools RC-1 MIDI controller or a user-built 9-pin interface on the PROGRAM CONTROL port. Additionally, any generic MIDI controller which can send MIDI Program Change messages will work.



PROGRAM CONTROL:

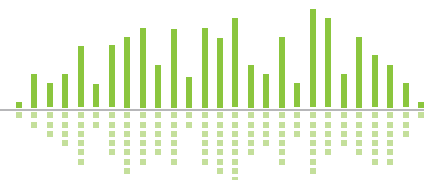
The PROGRAM CONTROL port is a standard 9-pin D-sub connector which allows program loading on each channel using standard contact closures. Interfacing with the PROGRAM CONTROL port allows the user to integrate the 6200 into a purpose-built work surface.

PROGRAM CONTROL Pinout:

	Function	Pin #
	Channel 1 Program Scroll Up	1
	Channel 1 Program Scroll Down	2
	Program Load	3
	Channel 2 Program Scroll Up	4
	Channel 2 Program Scroll Down	5
	Channel 1 Mute	6
	Channel 2 Mute	7
	Reserved	8
	Ground	9

MIDI/RC-1 IN:

The 6200 responds to MIDI Program Change messages from the AirTools RC-1 Remote or from any MIDI device capable of sending MIDI Program Change messages. The RC-1 allows direct recall of up to 11 programs as well as the ability to enable/disable the DSP BYPASS function.



Bypass

The 6200 has two bypass modes - software (DSP) and hardware (relay). The DSP (SW) bypass can be invoked a number of ways. The hardware (HW) bypass is only accessible via contact closure wired to a rear panel euroblock connector.

DSP (SW) BYPASS:

DSP (SW) Bypass mode can be invoked by several means:

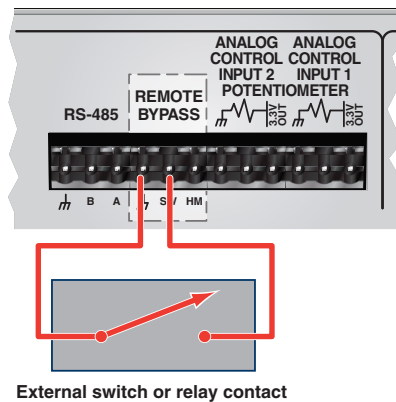
1. Pressing the BYPASS button on the front of the 6200 while in one of the top-level menus (Home, In LVL or Out LVL).
2. Pressing the BYPASS (PROGRAM 0) button on an attached RC-1 remote.
3. Pressing the DSP Bypass button in an attached (and currently "online") 6200 Designer GUI.
4. Activating a contact closure attached to the SW and Ground terminals of the rear panel REMOTE BYPASS connector.

DSP (SW) Bypass switch wiring:

The figure right shows the connection of a contact closure to the SW Bypass function of the REMOTE BYPASS connector.

NOTE: A latching switch should be used in order to hold the bypass state.

NOTE 2: The switch on the REMOTE BYPASS connector will both override and interrupt the bypass state set by methods 1 through 3 listed above.



External switch or relay contact

HARDWARE MUTE (HM):

Hardware Mute (HM) isn't a true "bypass" or "mute" but actually a relay-activated output disconnect. It is only accessible by activating a contact closure attached to the HM and Ground terminals of the rear panel REMOTE BYPASS connector.

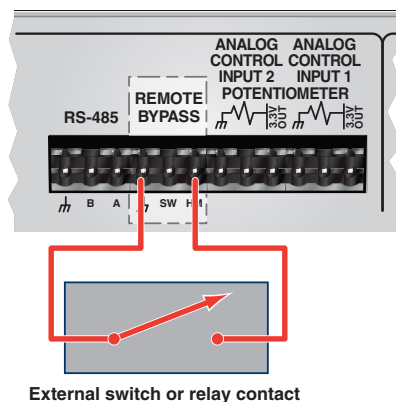
Hardware Mute (HM) switch wiring:

The figure right shows the connection of a contact closure to the Hardware Mute function of the REMOTE BYPASS connector.

NOTE: A latching switch should be used in order to hold the bypass state.

NOTE 2: Activating the Hardware Mute function invokes relays which completely disconnect all active circuitry from their associated output connections.

NOTE 3: Hardware Mute is automatically engaged upon loss of power.



External switch or relay contact

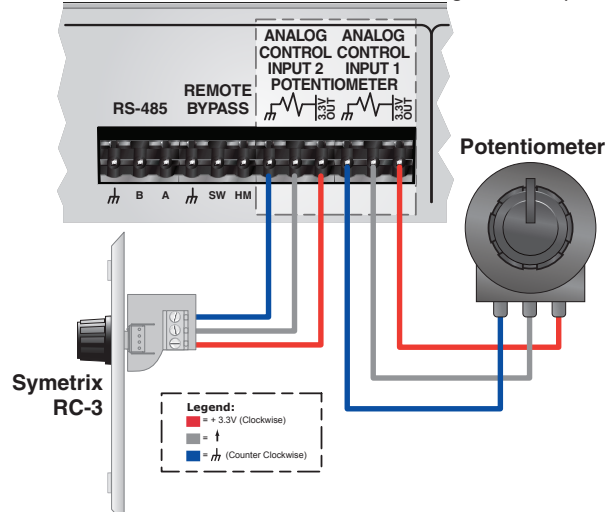
Analog Control Inputs

The 6200 features two analog control inputs which provide real-time control of up to two parameters per port using standard 10k Ohm linear potentiometers. The figure right shows the connections.

Calibrating an Analog Control Input

Once you have wired up your pot to an analog control input, it should be calibrated to ensure the full travel of the pot is read correctly by the 6200.

1. Press the HOME button to ensure we are starting from the top.



2. Press the NEXT button once.
3. The display should read "Section to Edit, - Channel 1 Menu -".
4. Turn the ADJUST knob clockwise until the menu reads "Section to Edit, - Setup Menu -".
5. Press the NEXT button once.
6. Turn the ADJUST knob clockwise until the menu reads "- Setup Menu -, -- External Controls --".
7. Press the NEXT button once and the menu should read "Lowest Cntrlr Level, ADC1: xxx Min: 000". This menu is showing you the current pot position "ADC: xxx" and the current minimum calibration setting "Min: xxx".
8. Turn your pot fully counter-clockwise and then turn the ADJUST knob so that the "Min: xxx" value is equal to the displayed "ADC: xxx" value.
9. Press the NEXT button once and the menu should read "Highest Cntrlr Level, ADC1: xxx Max: 255". This menu is showing you the current pot position "ADC: xxx" and the current maximum calibration setting "Max: xxx".
10. Turn your pot fully clockwise and then turn the ADJUST knob so that the "Max: xxx" value is equal to the displayed "ADC: xxx" value.

NOTE: The above steps assume you are calibrating ADC1 (Analog Control Input 1). Follow the same steps to calibrate ADC2 (Analog Control Input 2) substituting ADC2's menus where appropriate.

Assigning a Parameter to an Analog Control Input

Assignment of parameters to an Analog Control Input is done within 6200 Designer. Refer to the online help module within 6200 Designer for more information.

Digital (AES) Out

The 6200 features two AES format digital outputs each of which can transmit a combination of channel 1 or channel 2's content or each channel's content exclusively. Additionally, a HomerLink jack is provided as a rear panel real estate sensitive means of providing AES/EBU input as well as outputs on a single CAT-5 connection. HomerLink is a Symetrix developed format for transferring 4 channels of AES/EBU bidirectionally over a single CAT-5 cable.

AES OUT CONNECTION

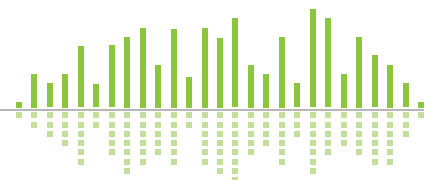
Connect the AES OUT jack of your choice to your downstream equipment's AES IN jack using a standard 110 Ohm AES cable terminated with the appropriate XLR jacks.

AES OUT MODE

Typically, an AES jack will carry two audio signals, most often a stereo Left/Right pair. However, in the case of the 6200, this could also be a 1/2 dual mono pair. Some broadcast consoles in particular would rather receive the exact same signal on one AES jack, this essentially being a 1/1 pair. The 6200's AES outputs can be configured to accommodate all scenarios. The following steps walk you through configuring AES OUT 1's output format.

1. Press the HOME button to ensure that we are starting from the top.
2. Press the NEXT button once.
3. The display should read "Section to Edit, - Channel 1 Menu -".
4. Turn the ADJUST knob clockwise until the menu reads "Section to Edit, - Setup Menu -".
5. Press the NEXT button once.
6. Turn the ADJUST knob clockwise until the menu reads "- Setup Menu, -- AES Assignment --".
7. Press the NEXT button once.
8. The menu should read "AES Out 1 Mode, Channel 1/Channel 2". This selection sends channel one out of AES-1 "L" and channel 2 out of AES-1 "R". As mentioned previously, some consoles prefer to see the exact same signal on the AES outputs "L" and "R" channels. To make this adjustment, turn the ADJUST knob to the desired setting.
9. If you turn the ADJUST knob twice clockwise, the menu should read "AES Out 1 Mode, Channel 1/Channel 1". This is the option we want to send channel 1's audio on both the AES "L" and "R" channels. Other options available are "Channel 2/Channel 1" and "Channel 2/Channel 2".

NOTE: The above steps assume you are configuring AES OUT 1. AES OUT 2 can be configured in the same manner.



AES Input

HomerLink is a data bus format designed by Symetrix which allows 4 mono bidirectional AES-3 digital audio channels to be transmitted between devices up to 100 meters apart over standard CAT-5 cable. HomerLink outputs (Pins 1, 2, 4 and 5) are exact copies of the AES OUT XLR jacks on the rear of the 6200. The content of these pins follows the content of the XLR jacks as configured in the previous section under AES OUT MODE.

AES audio or clock input.

The HomerLink sync cable is the only manner in which the 6200 can receive an AES digital input or sync to an external AES digital clock. The pinout provided below can be used to design a custom breakout box with standard XLR connectors.

Enabling AES Input

These steps walk you through setting channel 1's input source to AES.

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. The display should read "Section to Edit, - Channel 1 Menu -".
4. Press the **NEXT** button three times and the display should read "Input Signal Source, **ANALOG**".
6. Turn the **ADJUST** knob clockwise until the menu reads "Input Signal Source, **DIGITAL**".

NOTE: The above steps assume you are setting Channel 1's input source. The steps are similar for Channel 2.

NOTE 2: Incoming AES audio or clock must be 48 kHz +/- 100 ppm. See the Performance Data section for more information.

Enabling AES Clock Sync

The 6200 will automatically clock to a valid AES input source (48 kHz +/- 100 ppm, AES-3 or -11) when one is present at either of the HomerLink inputs. Symetrix has available for purchase a HomerLink sync cable, part number 810HLSY which provides an easy way to get AES digital input signal or clock source into the 6200.

NOTE: When the 6200 is locked to a digital input signal or clock source, a "D" character will appear in the lower right side of the "In LVL" and "Out LVL" menus accessed by pressing the HOME button once then turning the ADJUST knob clockwise once (for "In LVL") or twice (for "Out LVL").

6200 HomerLink Pinout		
Pin#	EIA/TIA 568B Color Scheme	DETAILS
1	White-Orange	AES-1 (1L) Out
2	Orange	AES-2 (1R) Out
3	White-Green	AES-1 (1L) In
4	Blue	AES-1 (1L) Out
5	White-Blue	AES-2 (1R) Out
6	Green	AES-2 (1R) In
7	White-Brown	Terminated (100 Ohm)
8	Brown	Terminated (100 Ohm)

TC89/TC90 Time Code In

(ESE) TC89 or TC90 time code can be fed to the 6200 in order to drive the real-time clock and Event Manager. The format and presence is automatically detected. Simply connect the output of your TC89 or TC90 master clock into the 6200's TC89/TC90 TIME CODE IN port. Refer to the help content within the 6200 Designer application for more information on the Event Manager.

NOTE: When a valid TC89 or TC90 source is connected to the 6200, a "Tc" character will appear in the upper right side of the "In LVL" and "Out LVL" menus accessed by pressing the HOME button once then turning the ADJUST knob clockwise once (for "In LVL") or twice (for "Out LVL").

More information, compatible products and support for the TC89 and TC90 time code formats can be found at:

www.es-e-web.com.

TIME/UDP (Time Protocol)

The 6200 implements the Time Protocol (RFC-868) via UDP. This is not to be confused with the "Network Time Protocol" (RFC-1305), also called "NTP". To synchronize the 6200, you will need to connect the 6200 to a network using the Ethernet port and correctly enter the IP Address, Subnet Mask and Gateway IP Address. See the Ethernet Connection section for more details. You will also need the IP address of a server that supports the Time Protocol via UDP and the ability to connect to it via UDP port 37 over the internet or to a local server providing the Time Protocol service. This may have to be allowed through a firewall when using an external server. If you have any questions regarding the integration of the 6200 into your network, consult your friendly IT/IS personnel or your network hardware's documentation.

More information and a list of public servers in the US can be found at:

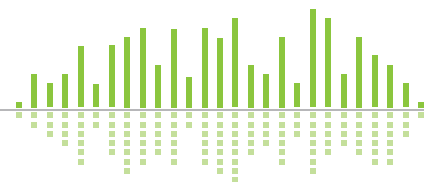
http://www.boulder.nist.gov/timefreq/service/time-servers.html or by searching for the "NIST Internet Time Service".

Entering the Time Server IP Address and Enabling Network Time Polling

1. Press the HOME button to ensure that we are starting from the top.
2. Press the NEXT button once.
3. Turn the ADJUST knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the NEXT button once.
5. Turn the ADJUST knob clockwise until the display reads "- Setup Menu -, -- Date and Time --".
6. Press the NEXT button nine times and the display should read "Time Server IP, 000.000.000.000".
8. Turn the ADJUST knob clockwise until the display reads until the first three digits of the IP address match the first three digits of the IP address for your chosen time server.
9. Press the NEXT button once and repeat step 8 to enter the next three digits of the address.
10. Repeat steps 8 and 9 two more times to complete the address.
11. Press the NEXT button once and the display should read "Network Time Polling, Disabled".
12. Turn the ADJUST knob clockwise once to enable Network Time Polling.
13. Press the HOME button when finished.

NOTE: When "NETWORK TIME POLLING" is enabled on the 6200 and a successful synchronization with a time server has occurred, an "N" character will appear in the upper right side of the "In LVL" and "Out LVL" menus accessed by pressing the HOME button once then turning the ADJUST knob clockwise once (for "In LVL") or twice (for "Out LVL").

Don't forget to configure the unit's IP settings under **Ethernet Connection** in the following section!



6200 Designer Installation

The 6200 Designer software provides real-time control and a simple drag 'n drop, point 'n click configuration interface to the 6200 from a Windows 98/2000/XP PC environment.

Use one of the following procedures to install the 6200 Designer on your computer.

From the 6200 Designer CD-ROM:

1. The software should auto run after inserting the CD-ROM into your computer's CD-ROM drive.
2. If the software does not auto run, then Click on the Start button, choose Run and type "D:\SETUP"
(If your CD-ROM drive isn't D:, then substitute its drive letter)

From the symetrix web site (www.SymetrixAudio.com):

1. Download the 6200 Designer program file.
2. From the Start button, Run the file/program that you just downloaded to start the Setup program.

The software always starts up in offline mode. Regardless, you can explore the software, experiment to your heart's content, and perhaps even get useful work done. You can save any Sites (complete with up to 256 programs) that you create to a file that can be downloaded later into an operating 6200.

If there is a 6200 hardware unit connected, you can go download to, and upload from the 6200. Once you have a unit connected, you can also work online in real time, which allows you to hear adjustments and settings as you make them. Follow the steps in the following sections to get your hardware connected to your PC.

Using 6200 Designer

Once the installation process is complete, you should have an icon on your desktop, and a program item in the Start menu. Click on the 6200 Designer icon and you're ready to begin.

6200 Designer is mostly self explanatory. The main screen represents the processing chain for each channel of the 6200 hardware. The input sections are on the left, DSP modules in the middle and output sections on the right. DSP modules can be reordered by drag 'n drop and their parameters viewed by clicking on each DSP module's icon. Hardware parameters can be setup in the Unit menu, programs can be saved and recalled from the Channel menus.

When you want to test things out or synchronize what you see on the screen with the 6200 hardware, you can "Go Online" and adjust parameters in real time provided that your communications method and settings match between the PC and 6200 hardware.

NOTE: There are a lot of useful functions available in the mouse right-click. Explore! That's the ultra-condensed version. You'll find more complete information in 6200 Designer's online help. Just choose "Help Contents (F1)" from the Help menu.

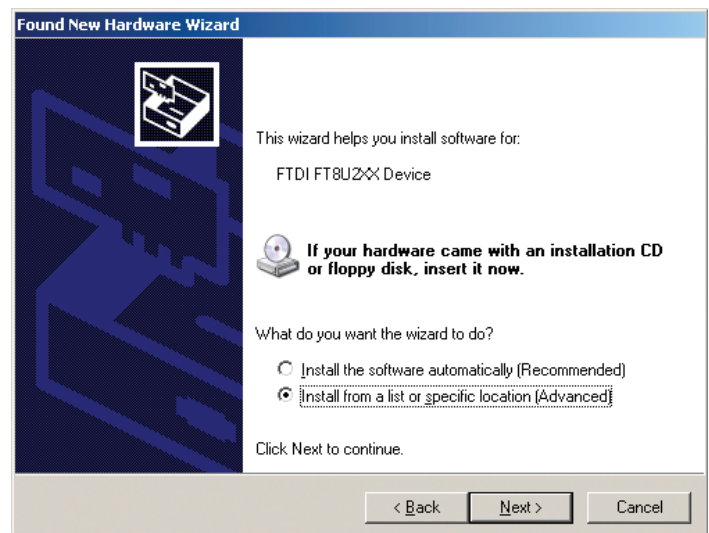
USB Connection and Driver Installation

When you install the 6200 Designer software, a USB driver for the 6200 is also installed into the 6200 Designer program directory. If you wish to control the 6200 using USB, follow the instructions below to install the USB driver.

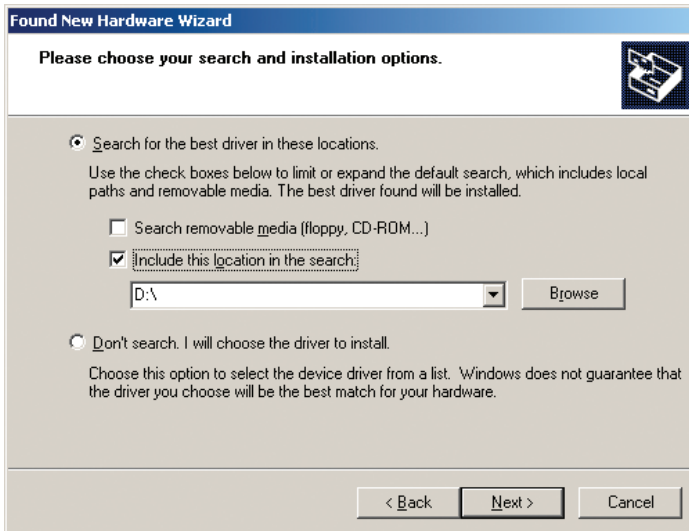
1. Install the 6200 Designer software (using one of the methods outlined previously).
2. Plug your computer into 6200 using an appropriate USB cable. The 6200's front panel USB port is a Female "B" type USB 1.1 port.
3. Your computer should automatically detect that a new USB device is present.
4. The Windows "New Hardware Wizard" should pop up.
5. When asked "Can Windows connect to Windows Update to search for software?" choose the "No, not at this time" option and click the Next button.



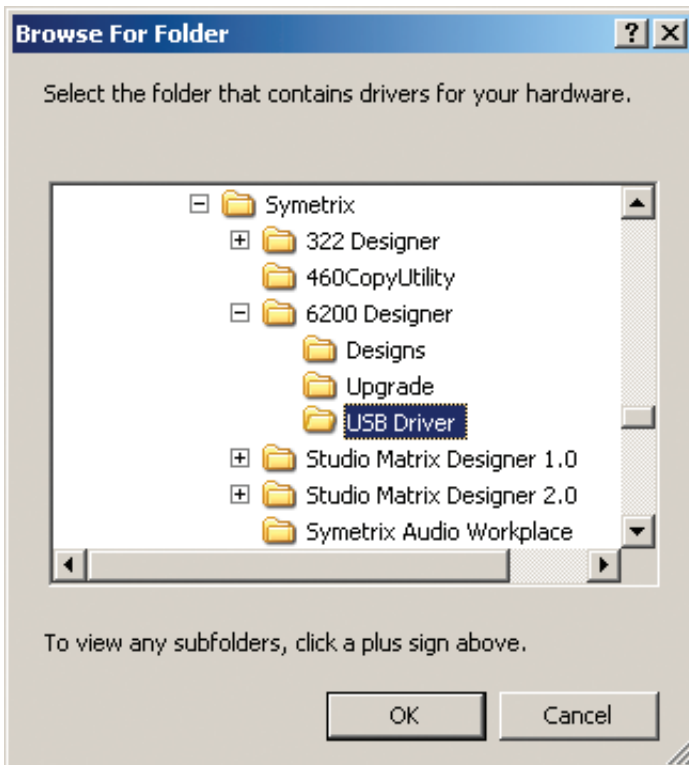
6. When prompted "What do you want the wizard to do?" choose the option "Install from a list or specific location (Advanced)" and click the Next button.



7. In the next dialog, choose the option “Search for the best driver in these locations” and check the sub-option “Include this location in the search:”.

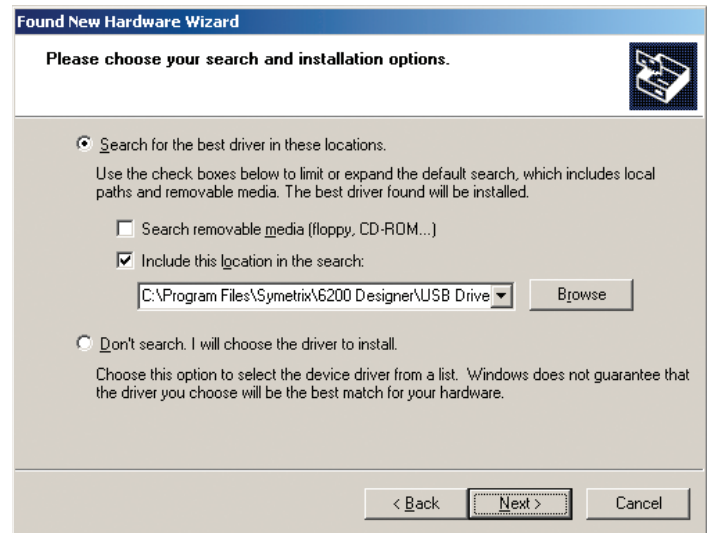


Then click the Browse button and navigate to the 6200 Designer USB Driver directory (typically “C:\Program Files\Symetrix\6200 Designer\USB Driver”).

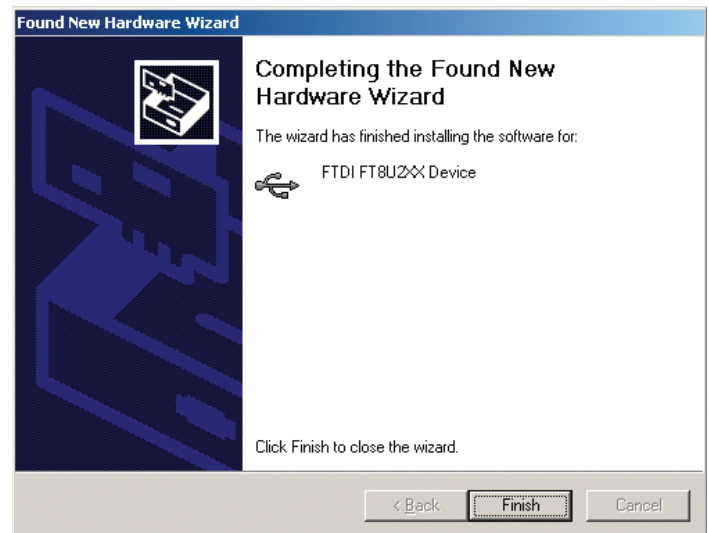


Select that directory and click the **OK** button.

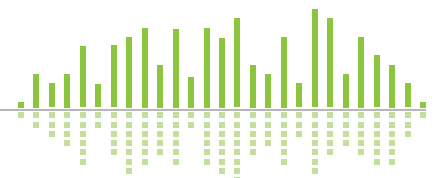
Now, click the **Next** button.



8. Windows will install and configure the driver.



Once the USB driver has been installed, you can open up the 6200 Designer application, select your unit and go online with it. Refer to the help content within the 6200 Designer application for more information.



Alternate Communications Connections

In addition to USB, the 6200 Designer application can communicate with the 6200 hardware via RS-232 or Ethernet.

RS-232

The 6200 supports baud rates of 9600 through 115,200. The baud rate is set in the hardware and the 6200 Designer's Communication Settings. The baud rates selected in both areas must match. The RS-232 port is wired as a standard straight-through with only pins 2, 3 and 5 absolutely necessary. Connect a standard RS-232 cable terminated with the proper DB-9 connectors between your PC's COMM port and the rear RS-232 port of the 6200. The 6200's RS-232 port is a female DB-9 connector. Refer to the help content within the 6200 Designer application for more information.

Setting the RS-232 baud rate:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Communication --".
6. Press the **NEXT** button three times and the display should read "RS232 Baud Rate, 115.2K". This is the default baud rate and is recommended unless your computer does not support this rate. If another baud rate is required, turn the **ADJUST** knob counter-clockwise to select a lower rate.
7. Press the **HOME** button when finished.

RS-485

RS-485 serves as a long distance version of the USB and RS-232 serial connections. It may be desirable when serial control over a long distance is required. Various companies make RS-232 to RS-485 converters which would allow you to connect your PC's RS-232 port to the RS-485 port of the 6200. NOTE: Symetrix does not make, sell or recommend an RS-232/485 converter product.

RS-485 is a multi-drop serial bus wired in a parallel fashion (A to A, B to B and Ground to Ground).

Note: Not all RS-485 chipsets are wired or labeled the same. Some manufacturers label A, B and Ground while some label Positive (+), Negative (-) and Ground. Further, not all devices are configured for A=Positive, so some experimentation may be necessary depending upon the RS-485 interface used. If you are unable to establish communications with a particular interface, try swapping A (+) with B (-).

Setting the RS-485 baud rate:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Communication --".
6. Press the **NEXT** button once and the display should read "RS485 Baud Rate, 38.4K". This is the default baud rate and is recommended unless your RS-485 interface does not support this rate. If another

baud rate is required, turn the **ADJUST** knob to select a another rate.

7. Press the **HOME** button when finished.

Setting the Unit Number:

Since RS-485 is a multi-drop bus, each unit on the bus must have some unique ID. The 6200 "Unit Number" is this unique ID. You may need to specify a certain ID for the 6200 in order for it to work with your RS-485 interface but since the RS-485 interface on the 6200 is essentially a long distance point-to-point connection, the 6200 should remain as unit 1 in 99.9% of the cases. However, if your RS-485 interface requires a different ID, the following steps detail how to adjust the unit number:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Communication --".
6. Press the **NEXT** button twenty times and the display should read "Unit Number, Unit ID: 1". This is the default and is recommended unless you must change it for your own specific purposes. An ID of 1 through 254 may be selected.
7. Press the **HOME** button when finished.

Ethernet

The 6200 has the ability to be controlled by a host computer via Ethernet. This requires the host computer to be connected to the 6200 either by an Ethernet switch or a crossover cable. It also requires that the 6200 as well as the host computer have the proper network configuration.

Note: Always choose a switch in lieu of a standard hub. This is especially important when mixing 10 Base-T and 100 Base-T devices in a data-intensive environment.

Network configuration of the 6200:

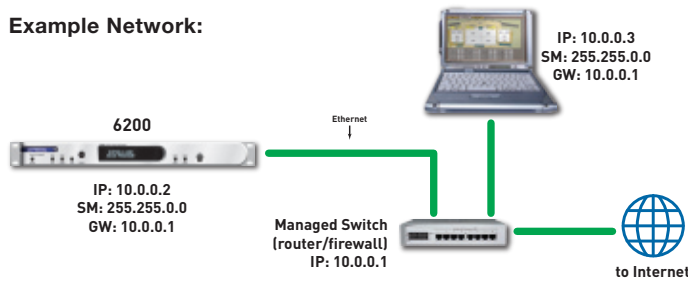
Connecting to the 6200 from a host computer on the same LAN, both the 6200 and the host computer require the following 3 items:

1. IP Address - The unique address of a node on a network.
2. Subnet Mask - Configuration that defines which IP Addresses are included in a particular subnet.
3. Gateway - The interface of a device that routes traffic from one subnet to another. (Only needed when communicating to/from a device on a different subnet).

If you are putting the 6200 on an existing network, a network administrator should be able to provide the above information. For security reasons, it is not recommended to put the 6200 directly on the internet. If you do, a network administrator or your Internet Service Provider can provide the above information. If you are building your own separate network, you may consider using an IP Address from one of the "Private-Use" networks noted in RFC-1918:

1. 172.16.0.0/12 = IP Addresses 172.16.0.1 through 172.31.254.254 and a Subnet Mask of 255.240.0.0
2. 192.168.0.0/16 = IP Addresses 192.168.0.1 through 192.168.254.254 and a Subnet Mask of 255.255.0.0
3. 10.0.0.0/8 = IP Addresses 10.0.0.1 through 10.254.254.254 and a Subnet Mask of 255.0.0.0

Example Network:

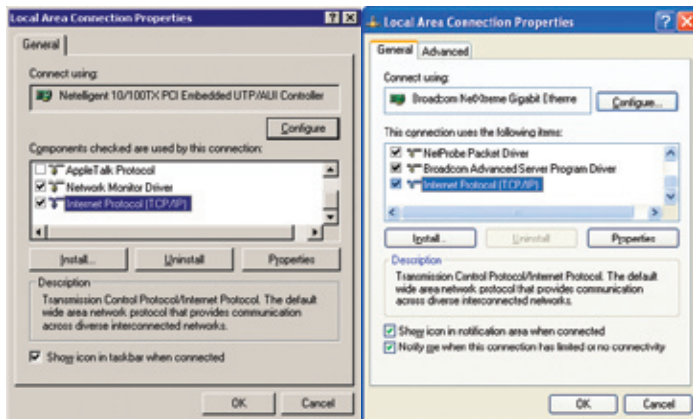


Connecting to the 6200 through a Firewall/VPN

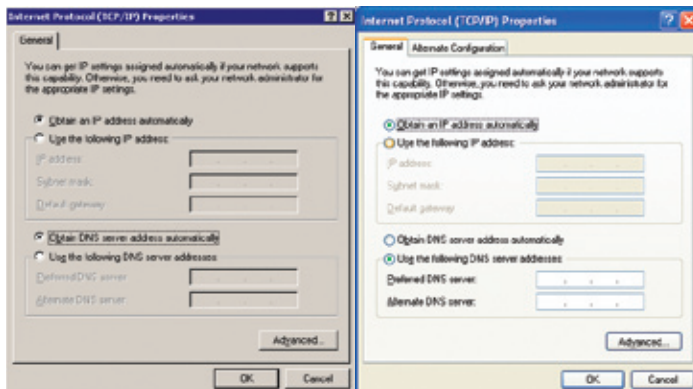
We are currently testing control of a 6200 through a firewall and VPN, but are unable to guarantee performance of these types of connections at this time. If you wish to experiment communicating with the 6200 through a firewall, note that the 6200 communicates on UDP port 6200 for network control and UDP port 6201 for auto-discovery.

Configuring your computer for a network connection (Windows 2000 and XP):

1. Select "Start->Settings->Control Panel" (Windows XP "Start->Control Panel").
2. Open the "Network and Dial-up Connections" Control Panel (Windows XP open the "Network Connections" Control Panel).
3. Right click on your "Local Area Connection" and select "Properties".
4. Under "This connection uses the following items", select "Internet Protocol (TCP/IP)" and press "Properties".



5. On the "General" tab, you may select "Use the following IP address" to enter in the appropriate information. (DNS server is not required for connection to a 6200).



6. Press OK to save and "Close" to exit out of the "Local Area Connection Properties".

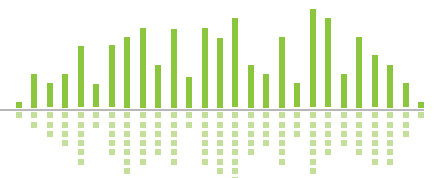
For more information about configuring the host computer, visit www.microsoft.com.

Setting the 6200's IP Address:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Communication --".
6. Press the **NEXT** button four times and the display should read "IP Address, 192.168.000.002".
7. Turn the **ADJUST** knob clockwise to increment or counter-clockwise to decrement the first three digits of the IP Address.
8. When you have the first three digits of the address correctly selected, press the **NEXT** button once and then repeat step 7 to select the next three digits of the IP Address. Repeat two more times in order to enter the full address.
7. Press the **HOME** button when finished.

Setting the 6200's Subnet Mask:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Communication --".
6. Press the **NEXT** button eight times and the display should read "Subnet Mask, 255.255.255.000".
7. Turn the **ADJUST** knob clockwise to increment or counter-clockwise to decrement the first three digits of the Subnet Mask.
8. When you have the first three digits of the address correctly selected, press the **NEXT** button once and then repeat step 7 to select the next three digits of the Subnet Mask. Repeat two more times in order to enter the full address.
7. Press the **HOME** button when finished.



Setting the 6200's Gateway IP Address:

1. Press the **HOME** button to ensure that we are starting from the top.
2. Press the **NEXT** button once.
3. Turn the **ADJUST** knob clockwise until the display reads "Section to Edit, - Setup Menu -".
4. Press the **NEXT** button once.
5. Turn the **ADJUST** knob clockwise until the display reads "- Setup Menu -, -- Communication --".
6. Press the **NEXT** button sixteen times and the display should read "Gateway Disabled, 000.000.000.000".
7. Turn the **ADJUST** knob clockwise to increment or counter-clockwise to decrement the first three digits of the Gateway IP Address.
8. When you have the first three digits of the address correctly selected, press the **NEXT** button once and then repeat step 7 to select the next three digits of the Gateway IP Address. Repeat two more times in order to enter the full address.
7. Press the **HOME** button when finished.

When all else fails...

When you're miserably lost, settings are completely out of whack or when you just want to make a fresh start, there is a factory initialization sequence. These sequence will restore the 6200 to factory defaults.



WARNING! This process will completely erase all settings and stored programs contained in the 6200. Be sure that you have backed up your programs and necessary hardware settings to a PC first! This process can also potentially erase your MAC address (the unit's unique Ethernet hardware address) which can be found on a sticker on the underside of the unit.

Factory Initializing the 6200:

1. Press and hold the **BYPASS** button while applying power to the 6200.
2. Follow the front panel prompts.
3. Re-enter any necessary settings (clock, communications, other system settings).
4. Re-download any required hardware settings files or site files containing your setup and program information.

Appendix A: Mic Level Output

Mic Level Output

If you find it necessary to connect the 6200's line level output(s) to a microphone level input, you will need to sufficiently attenuate the 6200's outputs using internal jumpers.

WARNING! Lethal voltages are present inside the chassis. Perform all service work with the unit disconnected from all AC power.

CAUTION: These servicing instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than that contained in the operating instructions portion of this manual unless you are qualified to do so. Refer all servicing to qualified service personnel.

Tools Required

1. #2 Phillips-head screwdriver

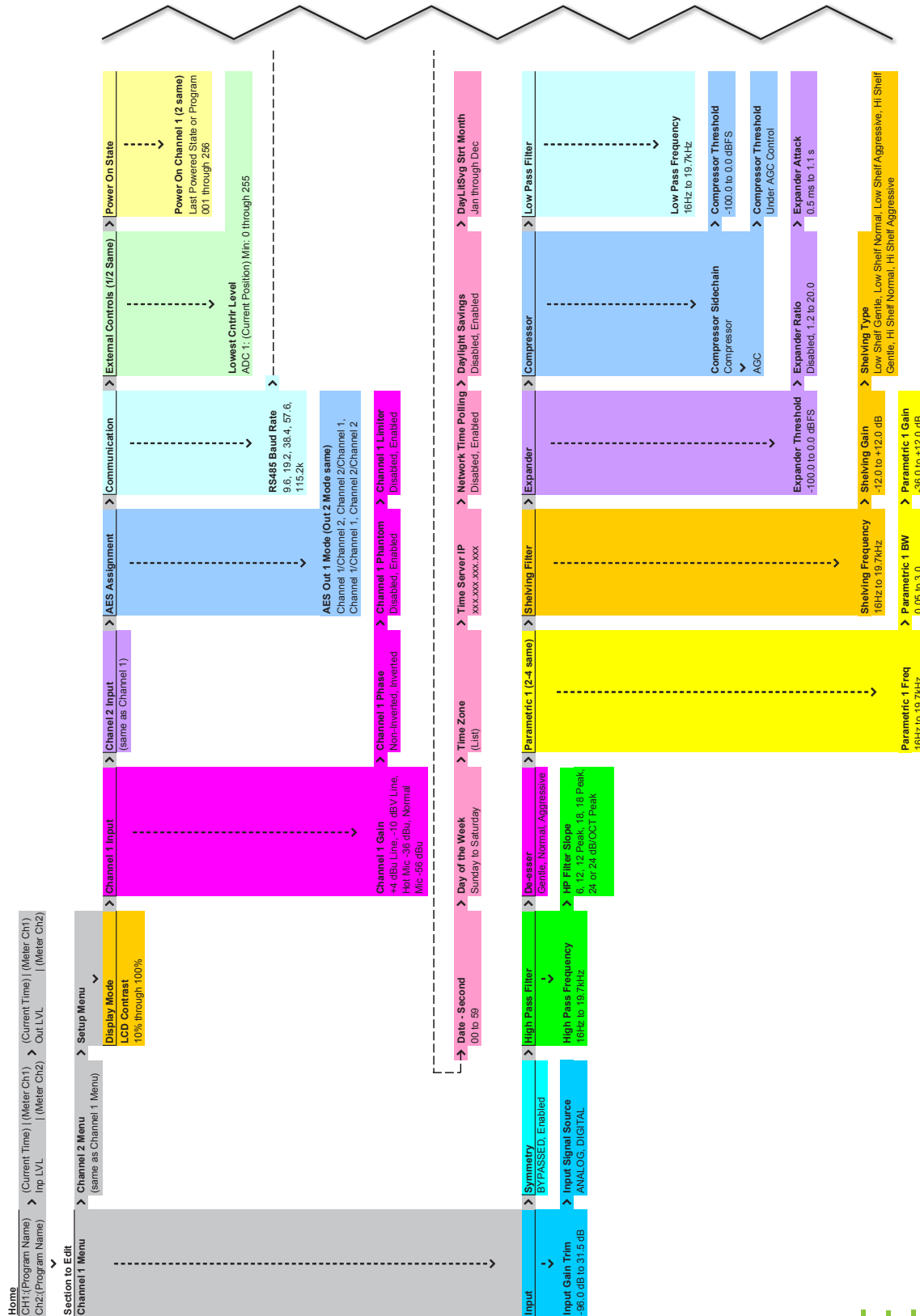
Top Cover Removal

1. Ensure that the 6200 is disconnected from the AC power source.
2. Remove seven 6-32 x 1/2 inch screws from the top panel and two 6-32 x 1/2 inch screws from each side of the chassis.
3. Lift the top cover free of the chassis.

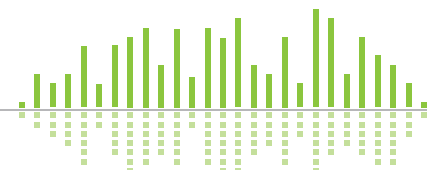
Changing the Output Level Jumpers

The 6200 ships with the outputs configured for a line level output. If you must have a microphone level output, the following steps lead you through the process of switching one or both line level outputs to microphone level (or back to line level).

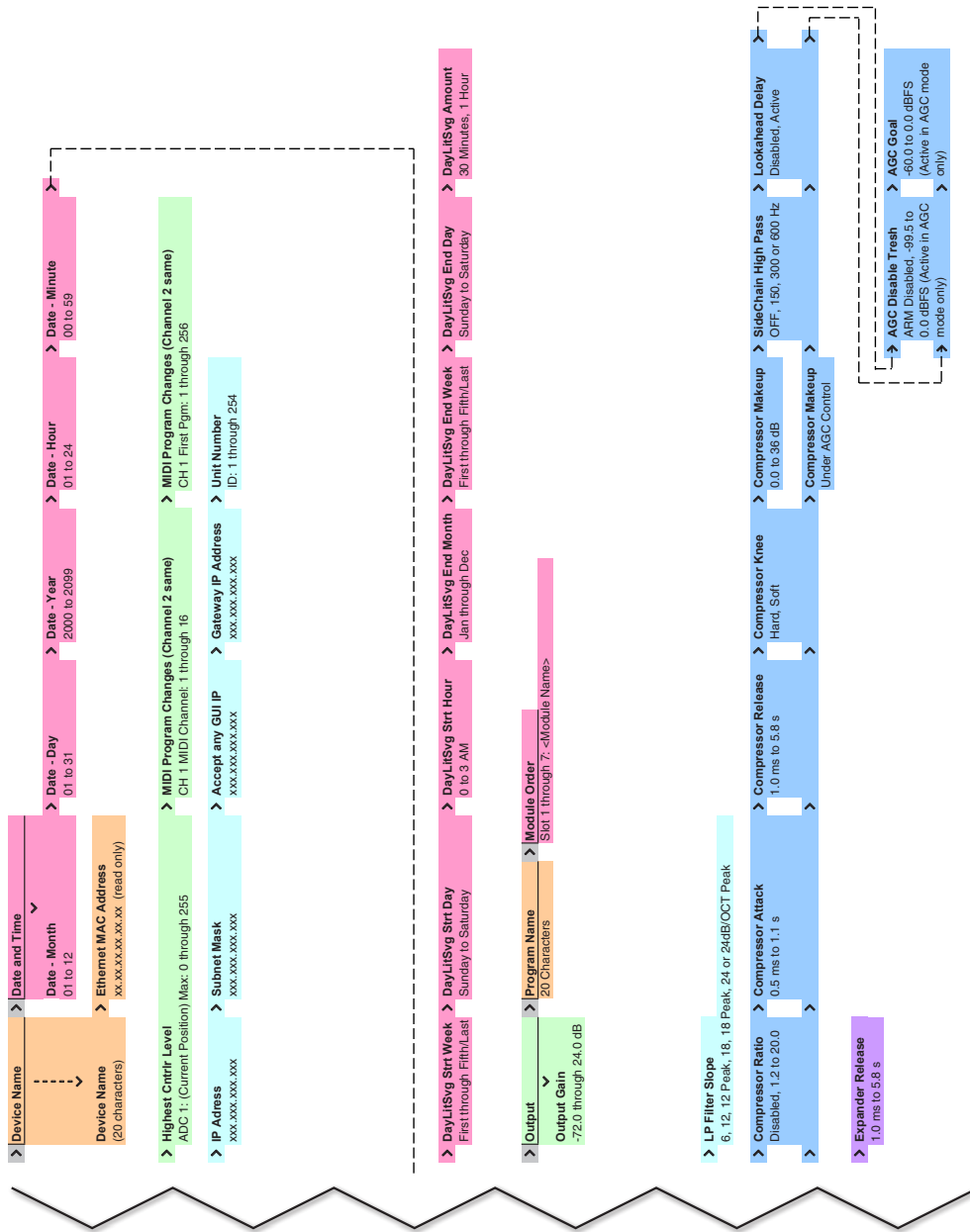
1. Remove the top cover according to the steps outlined above.
2. Locate the output level jumpers J4 and J5 next to Channel 1's Analog Out jack and jumpers J7 and J8 next to Channel 2's Analog Output jack.
3. To convert Channel 1 Analog Output to mic level, place jumper J4 in the 2-3 position and jumper J5 in the 1-2 position.
4. To convert Channel 2 Analog Output to mic level, place jumper J7 in the 2-3 position and jumper J8 in the 1-2 position.
4. Replace the top cover.
5. Reinstall the 6200 into your setup.



Continued on following page



Continued from previous page



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Symetrix, Inc. expressly warrants that the product will be free from defects in material and workmanship for eighteen (18) months from the date the product is shipped from the factory. Symetrix's obligations under this warranty will be limited to repairing or replacing, at Symetrix's option, the part or parts of the product which prove defective in material or workmanship within eighteen (18) months from the date the product is shipped from the factory, provided that the Buyer gives Symetrix prompt notice of any defect or failure and satisfactory proof thereof. Products may be returned by Buyer only after a Return Authorization number (RA) has been obtained from Symetrix. Buyer will prepay all freight charges to return the product to the Symetrix factory. Symetrix reserves the right to inspect any products which may be the subject of any warranty claim before repair or replacement is carried out. Symetrix may, at its option, require proof of the original date of purchase (dated copy of original retail dealer's invoice). Final determination of warranty coverage lies solely with Symetrix. Products repaired under warranty will be returned freight prepaid via United Parcel Service by Symetrix, to any location within the Continental United States. Outside the Continental United States, products will be returned freight collect.

The foregoing warranties are in lieu of all other warranties, whether oral, written, express, implied or statutory. Symetrix, Inc. expressly disclaims any IMPLIED warranties, including fitness for a particular purpose or merchantability. Symetrix's warranty obligation and buyer's remedies hereunder are SOLELY and exclusively as stated herein.

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If you have determined that your Symetrix product requires repair services and you live outside of the United States please contact your local Symetrix dealer or distributor for instructions on how to obtain service. If you reside in the U.S. then proceed as follows:

Return Authorization

At the Symetrix factory, Symetrix will perform in-warranty or out-of-warranty service on any product it has manufactured for a period of three (3) years from date of discontinued manufacture.

Before sending anything to Symetrix, please contact our Customer Service Department for a Return Authorization (RA) number. The telephone number is +1 (425) 778-7728. Additionally, support is available via the web site: <http://support.SymetrixAudio.com>.

In-warranty Repairs

To get your Symetrix product repaired under the terms of the warranty:

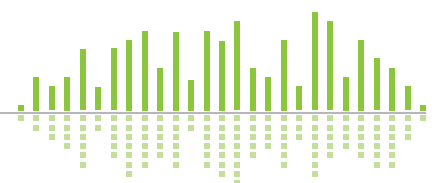
1. Call us for an RA number (have the serial number, shipping and contact information and description of the problem ready).
2. Pack the unit in its original packaging materials.
3. Include your name, address, daytime telephone number, and a brief statement of the problem.
4. Write the RA number on the **outside** of the box.
5. Ship the unit to Symetrix, freight prepaid. We do not accept freight collect shipments.

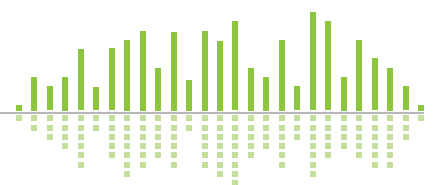
Just do these five things, and repairs made in-warranty will cost you only one way freight charges. We'll pay the return freight.

If you don't have the factory packaging materials, we recommend using an oversize box. Wrap the unit in a plastic bag, surround it with bubble-wrap, and place it in the box surrounded by Styrofoam peanuts. Be sure there is enough clearance in the box to protect the rack ears. We won't return the unit in anything but Symetrix packaging for which we will have to charge you. If the problem is due to operator misuse or error, you will have to pay for both parts and labor. In any event, if there are charges for the repair, you will pay for the return freight. All charges will be COD unless you have made other arrangements (prepaid, Visa or Mastercard).

Out-of-warranty Repairs

If the warranty period has passed, you'll be billed for all necessary parts, labor, packaging materials, and freight charges. Please remember, you must call for an RA number before sending the unit to Symetrix.





Item No. 53-0010

6200 Broadcast Audio Delay [Quick Start Guide](#)

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