

SMS226

Automated Speaker Management System

USER'S GUIDE



IMPORTANT SAFETY INSTRUCTIONS – READ FIRST



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure. Voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read manual.

Read instructions:

Retain these safety and operating instructions for future reference. Heed all warnings printed here and on the equipment. Follow the operating instructions printed in this user guide.

Do not open:

There are no user serviceable parts inside. Refer any service work to qualified technical personnel only.

Power sources:

Only connect the unit to mains power of the type marked on the rear panel. The power source must provide a good ground connection.

Power cord:

Use the power cord with sealed mains plug appropriate for your local mains supply as provided with the equipment. If the provided plug does not fit into your outlet consult your service agent. Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against.

Grounding:

Do not defeat the grounding and polarization means of the power cord plug. Do not remove or tamper with the ground connection on the power cord.

Ventilation:

Do not obstruct the ventilation slots or position the unit where the air required for ventilation is impeded. If the unit is to be operated in a rack, case or other furniture, ensure that it is constructed to allow adequate ventilation.

Moisture:

To reduce the risk of fire or electrical shock do not expose the unit to rain, moisture or use in damp or wet conditions. Do not place a container of liquid on it, which may spill into any openings.

Heat:

Do not locate the unit in a place close to excessive heat or direct sunlight, as this could be a fire hazard. Locate the unit away from any equipment, which produces heat such as: power supplies, power amplifiers and heaters.

Environment:

Protect from excessive dirt, dust, heat, and vibration when operating and storing. Avoid tobacco ash, drink spillage and smoke, especially that associated with smoke machines.

Handling:

To prevent damage to the controls and cosmetics avoid rough handling and excessive vibration. Protect the controls from damage during transit. Use adequate padding if you need to ship the unit. To avoid injury to yourself or damage to the equipment take care when lifting, moving or carrying the unit.

Servicing:

Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid, objects fallen into opening, or the power cord or plug becomes damaged during a lightning storm or if smoke odor or noise is noted. Refer servicing to qualified technical personnel only.

Installation:

Install the unit in accordance with the instructions printed in the user guide.

SMS226

Speaker Management System

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INTRODUCTION

The ART SMS226 is a two input, six output speaker management system with a number of advanced functions and easy setup. The unit combines mono or stereo processing, a flexible crossover with speaker protection and an automated setup facility. A graphic LCD display and LED meters allow control and monitoring of the SMS226.

The speaker processor architecture is comprised of mono/stereo linkable processing modules on the two inputs and mono processing blocks that apply to each output. Possible configurations are 2x2, 2x2 +sub, 2x3, 1x4, 1x5 and 1x6.

Input processing blocks include 1/3 octave graphic EQ, RMS compressor, noise gate, phase, feedback suppression and sub-harmonic generator.

Output processing blocks include crossover filters, delay, parametric EQ, Limiter, level and phase control.

The Graphic EQ can be set up by an Auto-EQ function utilizing the measurement mic that comes with the unit.

The output processing blocks can be set up by the auto-configuration function, where the user selects components from various manufacturers. Output Limiters can be linked in pairs for keeping stereo balance or all tied together to additionally maintain the spectral balance.

The unit is controlled by a front panel interface that includes a graphic LCD, an array of mute switches located under the LED meters for each input and output, an encoder knob and an array of switches.

The switch array allows the user access to all of the processing blocks directly. The encoder selects between parameters and values through an integral switch. The LCD display shows parameter name and value information plus a graphical representation of the value change.

Over 200 speakers and amplifiers are recallable from the setup wizard. Multiple custom speakers or entire setups can be stored and recalled. When the system setup is complete, you can run an Auto-EQ function to tweak the system using an external mic.

A PC-supported USB interface allows even quicker access to all of the functions of the device as well as providing a backup storage mechanism. Factory presets can be updated through this interface insuring that you have the latest fine tuned speaker crossover and amplifier data.

SMS226 features

- **2 inputs, 6 outputs plus a measurement mic input**
- **Configurable for 2x2, 2x3, 2x2+1, 1x4, 1x5 and 1x6**
- **Simple user interface supported with Graphics LCD, encoder and quick access menu buttons**
- **Three setup wizards (Auto-feedback, Auto-EQ, System configuration)**
- **Over 200 different factory speaker presets plus 20 user customizable speaker presets**
- **200 different factory amplifier presets plus 10 user customizable amplifier presets**
- **Store or recall up to 30 entire system presets**
- **Dual/stereo 1/3 octave graphic EQ, Compressor, and Gate on inputs**
- **Auto-EQ wizard works with optional external measurement mic**
- **Dual/stereo sub-harmonic synthesizer**
- **Dual/stereo feedback eliminator with adjustable fixed and active filters**
- **Selectable phase on all inputs and outputs**
- **Output limiters linkable for stereo or spectrum preservation**
- **3 band fully Parametric EQ on all outputs**
- **Up to 24dB/Octave crossover slopes (Linkwitz-Reiley, Butterworth, Bessel)**
- **Front panel mute switches on all inputs and outputs**
- **Selectable level/attenuation meters on all inputs and outputs**
- **Delays adjustable in either mSec or Feet.**
- **Up to 500mSec (556 ft.) delays on each output adjustable for driver alignment to cluster delay**
- **Input delays up to 600 mSec (660 ft.) for cluster alignment**
- **Security lock with one million combinations.**
- **USB interface to PC for graphical interface support**
- **Firmware updateable over PC interface**
- **Preset storage to/from PC**
- **Universal power supply (90VAC to 240 VAC 50-60Hz)**
- **Single high rack mount chassis.**

INSTALLATION

The ART SMS226 may be used in a wide variety of applications and environments. Housed in a rack-mountable, all-steel enclosure, the unit is designed for continuous professional use. Mounting location is not critical, however, for greater performance reliability, we recommend that you not place the unit directly on top of power amps, or other sources of heat and/or strong magnetic fields

AC Power Hookup

The ART SMS226 has a high efficiency universal power supply. Connect the unit to mains power of the type marked on the rear panel. The power source must provide a good ground connection, and the ground pin on the mains plug should never be defeated.

Set the ground Lift switch to GND to start for safe system operation. If you find this selection creates a ground loop in your system, you can place the switch in the LIFT position.

Analog Audio Connections

Audio connections to and from the SMS226 are all balanced with the following wiring:

Rear panel balanced inputs: [XLR] Pin 2 = Hot (+), Pin 3 = Cold (-), Pin 1 = Ground

Rear panel balanced outputs: [XLR] Pin 2 = Hot (+), Pin 3 = Cold (-), Pin 1 = Ground

Front panel balanced input: [XLR] **Use the Apex 220 measurement microphone only.**



FIGURE 1 – Rear panel

Note: When connecting the outputs to your system, the SMS226 will default to using odd numbered output channels for the "A" input and even numbered channels for the "B" input. It will also default to using CH1 for a woofer and CH3 for a tweeter. If you have chosen 2x2+1 mode, CH5 and CH6 are used for the sub-woofer connection.

You can override any of these settings manually.

USB connection

The USB connection allows access to the SMS226 using a PC. System and user preset info can be saved and restored or all of the parameters can be adjusted from the PC instead of using the front panel interface. Note that the front panel interface is disabled when using the USB interface.

BASIC OPERATION

User interface controls

The SMS226 is controlled from the front panel by a rotary encoder and a number of switches. The switches allow quick access to various functions. Pushing (also referred to as "clicking") the encoder knob will generally switch between a value or a parameter adjustment. Rotating the encoder knob will adjust the value or parameter.

When you are in the default screen mode, the encoder can act as a master volume control. Refer to the [UTILITY button](#) to see how to set this up.

Note that when editing text, pushing the encoder moves the cursor to the character to the right until all of the available characters have been addressed. Since you cannot go backwards, simply repeat the process to modify characters you missed the first time.

In case you get in trouble or lost, hitting any of the front panel menu keys TWICE will return you to the starting screen (also referred to as the "default" screen).

LED meters and mute switches

The meters can display either Level or Attenuation. Level is measured at either the input jacks (for the first two meters) or the output jacks (the last six meters).

When set to *Atten* mode, the Input A/ Input B meters switch to displaying the attenuation of the Compressor. The Output 1- Output 6 meters display the Limiter attenuation in *Atten* mode.

The switches located below the meters mute the inputs or outputs when pushed. The adjacent red LED indicates a muted channel when lit.

Graphics LCD

The LCD shows the SMS226's current state and relevant data. The default screen displays the unit's configuration graphically. Parameters that relate to frequency response changes will display parameter settings in both text and graphical form.

Configuration Wizards

Auto-setup button

The Auto-Setup function will help you configure your system and then run the Auto-EQ and Auto-Feedback wizards.

MODE parameter

The SETUP Wizard starts with configuring the Inputs and outputs. You can choose mono or stereo input operation and the number of outputs used. i.e. 2x3 means stereo input with a three way crossover using all 6 outputs. Setting the mode to 1x4 configures the unit as a mono input ("A") with 4 outputs. After this step, click on the Next parameter to advance to the next menu item.

Out 1...Out 6 parameters

The next step is to choose the stored speaker data to use for each output. Stereo operation will group the outputs into even and odd pairs (1&2, 3&4 etc).

Note: If you choose 2x2+1 mode, the Auto-setup wizard assumes that OUT5 will be used for the mono subwoofer output¹.

Note: When using a sub-woofer you will have to adjust the High Pass filter frequency and slope of the low frequency speaker to match the upper cutoff frequency of the sub-woofer.

As each speaker is assigned, it is followed up by assigning a Power Amp to the same output. After the power amps are assigned, you can re-name each output using up to 6 characters. Once you have completed the first output the process repeats for the next output until all are completed.

The unit is not actually configured until you hit Next when prompted. Since this takes some time to complete, a "Loading Please Wait" message appears in the LCD display while the unit works to retrieve the info.

When the SMS226 is fully configured, you have the option of running the Auto-EQ wizard by clicking on the Next parameter, or Exiting.

Auto-EQ button

The Auto-EQ function of the SMS226 requires an APEX 220 instrumentation mic plugged into the front panel XLR jack.

The unit generates pink noise and sends this to all of the outputs. The external mic allows the unit to measure the response of the system and to make corrections using the internal 1/3 octave EQ. This process is automatically repeated a number of times to obtain the best results.

Push Auto-EQ to start. Note that every sub-menu now offers the Exit function. Exit will return you to the Configuration screen with no changes to the EQ.

Push the encoder knob to adjust the Set EQ flat or rotate to Setup, Run, or Exit. Push the encoder knob to proceed.

Setup will allow adjustment of how the Auto-EQ operates. Most of the parameters have suitable defaults and you should not have to modify them. You should at least review the low band limit and set it to the low frequency cutoff of your system.

You can set the number of times to repeat the process (Default = 10), the Precision, the Target curve (adjust each of the 31bands \pm 4dB), the extreme bands to limit the process², and the Mode (the averaging can be set to either absolute or mean).

¹ If this is a problem, you can manually configure the unit using the output function switch.

After the parameters are set, select Next and push the encoder to proceed to the initial menu.

Selecting Run from the initial screen will drop you to the Level adjustment menu. The Back function is now available in subsequent sub-menus. This will allow you to return to previous menus to make adjustments.

Push the encoder and adjust the level. This is for mic sensitivity and the default is set to the minimum value. Increase it until you see some reflection of the pink noise from your system in the measurement mic. Next, push the encoder and then rotate to Exit, Back or Run and push the encoder to proceed.

Selecting Run changes the LCD to display the adjusted EQ settings. As this process runs, you can hear the EQ changes between each pass until the process is complete. When complete, rotate the encoder to select Exit, Repeat or Load.

Selecting Exit will leave the EQ as it was before the process started.

Selecting Repeat will return you to the initial Auto-EQ menu with the EQ settings remaining from the previous pass.

Selecting Load will save the EQ results, completing the Auto-EQ wizard and starting the Auto-Feedback wizard.

Auto-Feedback button

After running the Auto-EQ function, the Feedback eliminator can be used to kill feedback in live situations. The Feedback Eliminator monitors the incoming audio (IN A and IN B) for fixed tones and applies a notch filter.

You can set the number of "fixed" notches, the type of audio expected through the system (Speech, Low, Mid or High Music), how long to hold an "active" (or non-fixed) notch and enable/disable the active system. Once all of parameters are set, the system is updated and acts accordingly.

Active vs. Fixed notches

The number of fixed notches refers to filters that once set by the Auto-feedback system cannot time-out. You set the number of fixed notches depending on the system's characteristics that do not change (i.e. a peak in a speaker's response that is always there). You will not need more than a few fixed filters. The default setting is 0.

Active filters act to prevent feedback in case of a change in mic, environment or system gain. These are the most flexible filters as they will be applied as needed and can be reset over time. Active filters can be set to reset or "lift" from 5 sec to 60 minutes (or "OFF" in which they act more like a fixed filter after the first time they are required).

Using the Auto-feedback function

Before you activate the auto feedback function you should set the system gain levels with all of the mics on to have a small amount of feedback. Once the system has tuned out the feedback, decrease the system levels a couple of dB to ensure the best performance. The remaining active filters will act to prevent feedback.

Once the system is in use, you can use the Feedback button to tweak the parameters of the Auto-feedback system as well as reset the active filters (Clear Lift parameter) or all of the filters (Clear All parameter).

². (These parameters are very useful. Your system may not pass frequencies below 40 Hz, so there is no reason to Auto-EQ bands below this cutoff as the boosted bands simply overload the speakers in the most inefficient portion of their range.)

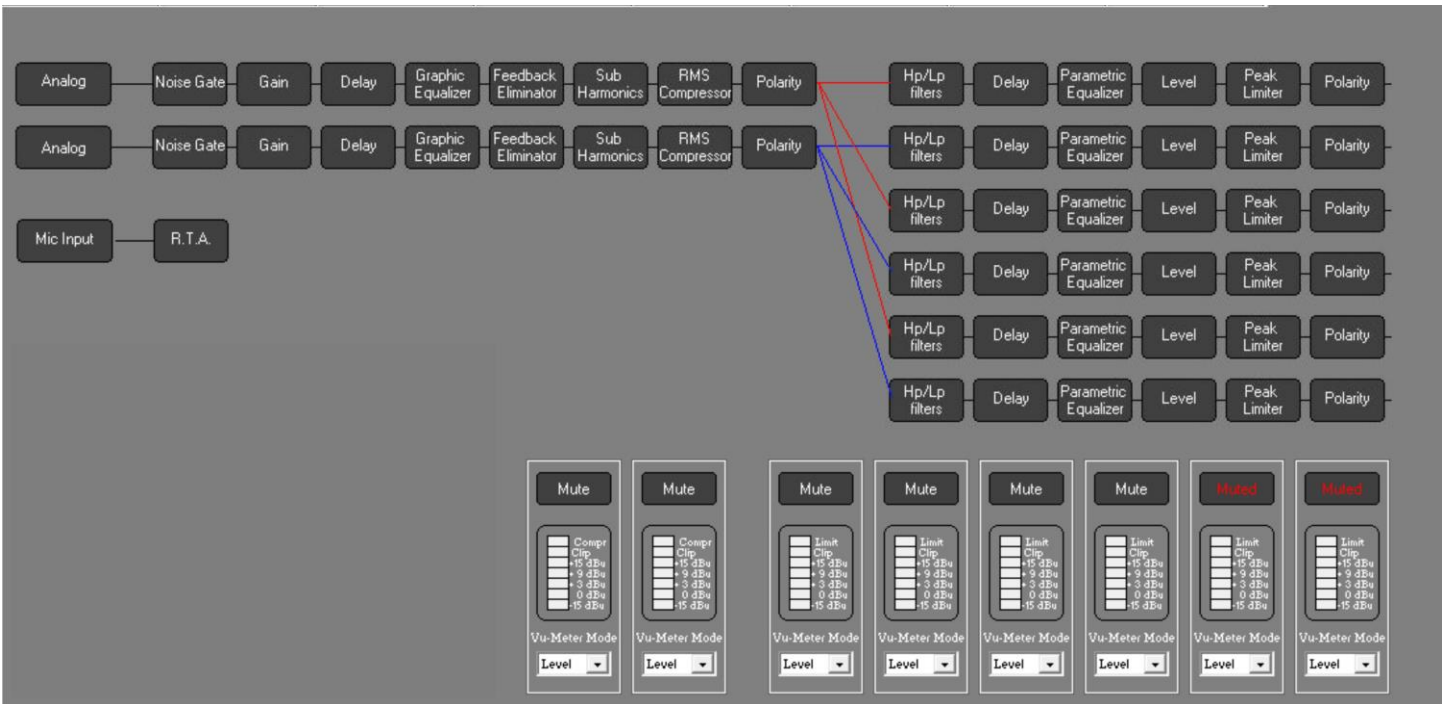


FIGURE 2 – Signal Flow Block Diagram

SYSTEM FUNCTIONS

STORE button

The Store function consists of setting the destination and name of the preset and additionally the source if the Type is set to Speaker or Power Amp. You can store up to 20 System presets (numbered 11 to 30) or 20 User Speaker or Power Amp presets (numbered 201 to 220).

Note that the lower numbered presets are Factory presets and cannot be overridden.

Exit

Clicking on the Exit parameter will return the unit to the main Store screen. If you want to return to the default screen simply hit the Store button again.

Type

The Store function allows you to save a System snapshot (default), a Speaker or a Power Amp preset. The Type parameter selects the variant to be stored.

Confirm

After setting Type, clicking the Confirm parameter reveals another menu to adjust the destination and preset name. If you have chosen to store a Speaker or Power Amp preset an additional parameter (SRC) allows you to select the output channel used as a reference for the Speaker or Power Amp settings.

Editing the Name parameter is a little unique as after pushing the encoder to edit the first character you simply push the encoder again to access the next character until the cursor returns to the Name parameter.

Save

Clicking on the Save parameter will perform the actual storage process in non-volatile memory. Since this takes some time to complete, a "Please Wait" message appears in the LCD display while the unit works to store the info.

RECALL button

The Recall function consists of setting the type of data to be recalled and the destination. You can recall up to 20 System presets (numbered 11 to 30) or 20 User Speaker or Power Amp presets (numbered 201 to 220).

Note that the lower numbered presets are Factory presets and cannot be overridden.

Exit

Clicking on the Exit parameter will return the unit to the main Recall screen. If you want to return to the default screen simply hit the Recall button again.

Type

This parameter sets the data type to recall. The choices are System (default), Speaker or Power Amp. System is an entire unit snapshot. Speaker or Power Amp applies to an individual output channel.

Confirm

After setting Type, clicking the Confirm parameter reveals another menu to select the preset to be recalled. If the Type parameter is set to either Speaker or Power Amp, an additional parameter (DeSTination) is available to select the output channel to store the preset data to.

Load

Clicking on the Load parameter will perform the actual retrieval process from non-volatile memory. Since this takes some time to complete, a "Please Wait" message appears in the LCD display while the unit works to retrieve the info.

UTILITY button

Input menu

Input

This parameter allows you to invert the phase of the indicated channel to fix input wiring or other phase issues without re-patching.

Source

This parameter allows you to invert the phase of the indicated channel to fix input wiring or other phase issues without re-patching.

Gain

This parameter allows you to invert the phase of the indicated channel to fix input wiring or other phase issues without re-patching.

Delay

The delay is used for cluster delay. Delay is adjustable in 0.208mSec (or 0.278 in.) steps up to 600mSec (or ~59 ft). You can use this to align clusters when using the unit in a 2 x 2 or 2 x 3 configuration. You can also align clusters with multiple SMS226's through this delay adjustment. When the display reads "Delay A>" you

can adjust the delay in 1mSec steps. Pushing the encoder knob again will put you in the fine adjust mode. The display will now read "Delay F>". Fine mode allows you to adjust the delay in 0.0232mSec steps.

Note that you can set the display of the delay to read out in either mSec or feet. Refer to the section titled [Delay Units](#) for adjusting how this is displayed.

Phase

This parameter allows you to invert the phase of the indicated channel to fix input wiring or other phase issues without re-patching.

VU Meters

The front panel LED meters can be set to read either the input audio level (from -15dB to +15dB) or the compressor attenuation (from 0 to -15dB). The default setting is input level (In. Level).

Mute

This parameter when ON will kill all input audio and light the front panel LED. The front panel Mute switch will toggle the mode between Muted and non-muted.

System menu

Master Volume

The Master Volume control (when enabled) allows quick access to the output level of the entire unit. The Display must be on the "home" page where the SMS226's configuration is shown.

Master Enable

You can turn the Master Volume feature on and off using the Master Enable parameter. The Off setting (default) prevents uninitiated users from accidentally adjusting the volume.

Pink Noise Level

The SMS226 has a built in Pink Noise generator used for system testing. This parameter allows level adjustment before this source is selected to prevent system damage from excessive testing volume.

Output Link modes

The SMS226 allows you to link input or output functions together.

Setting the Link ON (either Inputs or any output pair) guarantees that any settings made to one of the input channels is reflected on the other. It also links the compressor ' together to insure the stereo image is maintained.

The Link All limiters parameter will maintain the spectral image by making sure the limiter attenuation of the outputs are all the same.

Delay Units

This system function globally changes the way delay is displayed to make system setup easier. You can set this parameter to either Time (ms) or Dist. (ft). The Default setting is Time (ms), which is displayed in milliseconds.

The FEET setting assumes the speed of sound is 1128 ft/sec³.

Pink Noise level

The pink noise generator's level can be set from -46dB to +6dB using this parameter. Enabling or disabling the pink noise generator can be manually adjusted in the Input menu.

LCD contrast

The viewing angle of the LCD display can be adjusted from 0 to 15 with higher numbers corresponding to higher viewing angles.

DSP version

The version of the audio processing software is displayed by this read only parameter.

FW version

The operating system software version is displayed by this read-only parameter.

Security menu

Password

The password consists of three two number fields. The default password is 00 00 00.

Device

SMS226 access is prevented when the Device parameter is set to Locked.

New Password

The new password replaces the old password after the Device parameter is set to Locked.

³ The SMS226 does not compensate for altitude, barometric pressure and temperature so the measured delay may vary by a few percent.

INPUT MODULE DESCRIPTIONS

General settings

The SMS226 architecture consists of two inputs that can be operated in dual or stereo mode. Stereo input operation is simplified by setting the Input Link ON (under the UTILITY/System menu). When linked, both channels' parameters are identical as well as compressor attenuation.

Compressor button

The Compressor functions include *Threshold*, *Ratio*, *Knee*, *Attack*, *Release* and *MakeUp* level. The Compressor is based on a true RMS detector resulting in smooth transparent control over the input signal dynamics.

The *Knee* parameter modifies application of attenuation based on the *Ratio* setting. This smoothes the action of the compressor above the threshold. When set to 100, a lower ratio than set is applied over the first 12dB of input level change.

The *MakeUp* parameter adjusts gain after the attenuation of the compressor takes place.

The input meter can be set to monitor the compressor's action by selecting Compressor instead of In. Level in the *Vu-Meter Mode* parameter. In this mode, the top LED Lights solid to indicate the mode and the next LED lights to show that you have exceeded the threshold level and the compressor is just beginning to reduce gain. See the **System Functions** section on Input Menu/ VU Meters for more information.

Graphic EQ button

The graphic EQ covers 31Hz to 16 kHz and allows you to boost or cut each band 12dB. The frequency response of the EQ settings can be viewed in the LCD display. You can use the *EQ Flat* parameter to quickly set ALL of the bands to 0dB. The gain control covers a +6dB to -12dB range⁴. Make sure that the *Bypass EQ* parameter is not set before listening to the results of tuning the EQ.

The EQ can be automatically adjusted by using the EQ Wizard. Refer to the [SETUP PROCEDURE](#) section of this manual for more info.

Noise Gate button

The noise gate is used to eliminate unnecessary audio from the inputs. The *Attack* parameter adjusts how fast the noise gate goes from muting the audio to passing the audio. The *Release* parameter sets how fast the audio mutes after it passes below the threshold.

Sub-synth button

Use the Sub-harmonic generator to create chest-thumping low bass from audio material that lacks low-end audio. You can adjust the amount of added harmonics from 0-100%. You can also adjust the frequency band they reside in (24-36 Hz or 36-56 Hz) depending on the capability of your system.

Feedback button

The Feedback eliminator inserts notch filters to allow you to maintain or slightly increase system level while killing feedback. Twelve notch filters are available on each channel. You can tune the system leaving 0 -11 *fixed* filters and then leave the remaining *active* filters that wait to see feedback and act to reduce it immediately.

Activating the *Fbk Enable* setting turns on the Feedback Eliminator function.

⁴ You can use the Compressor's MakeUp function for more gain if required.

The *Type* parameter allows you to tailor the feedback suppressor's action for the audio's spectral content. Sometimes the room characteristics change due to temperature, humidity or even the size of the crowd present. Since even the active filters remain fixed (depending on the *Lift Live* parameter setting), you may need to reset the notch filters. You can reset just the *Live* or *ALL* filter settings using the *Clear Live* and *Clear All* parameters.

OUTPUT MODULE DESCRIPTIONS

Output button

The output parameters allow adjustment of the unique Name (up to 6 characters), Routing source, level control, phase and meter operation.

The Routing parameter (under the Output button) can be set to In A, In B or In A+B. Setting this parameter independently on each output allows you to avoid re-patching the outputs (i.e. out 1-3 can be either Left channel crossover outputs OR you can set out 1 to be left low out, out 2 to be right low output etc.)

Choose the appropriate input for the selected output. When driving a mono sub with an output, choose A+B.

Each output level has it's own control that is adjustable from -12dB to + 6dB. A separate parameter can be set to mute the output.

Crossover button

The heart of the crossover is the High and Low pass filters. Independent control over these allows the user to offset or overlap the frequencies to compensate for frequency response and phase issues of particular drivers.

Parameters include selection of 1st (6dB/Oct.) through 4th (24dB/oct.) order slopes with different "Q" /overshoot characteristics (Bessel, Butterworth or Linkwitz-Riley) and frequency.

Frequency is adjusted in coarse or fine (1 Hz) steps. You can switch between coarse and fine by depressing the encoder knob once.

Parametric EQ button

The three band Parametric EQ is used to fine-tune the frequency response of the crossover output. Each band can be independently bypassed. Use the *EQ Flat* parameter to set all of the bypass switches at once or the Bypass EQ parameter.

You can compensate for frequency or phase depending on the *Shape* parameter setting. The *Frequency* parameter is always available. Frequency is adjusted in coarse or fine (1 Hz) steps. You can switch between coarse and fine by depressing the encoder knob once.

The Shape parameter determines how the EQ is applied. Here is a list of the settings and their affect:

- Peaking EQ The EQ acts like one completely tunable band of the Graphic EQ.
- 6 HiSHF The EQ boosts/cuts **above** the frequency set with a 6dB/Octave slope.
- 12 HiSHF The EQ boosts/cuts **above** the frequency set with a 12dB/Octave slope.
- 6/12 LoSHF The EQ boosts/cuts **below** the frequency set, 6 or 12 selecting the slope.
- Q HiSHF Similar to the 6/12 HiSHF except set the slope using the Q parameter.
- Q LoSHF Similar to the 6/12 LoSHF except set the slope using the Q parameter.
- All Pass I Flat response, Boost/Cut does nothing, Frequency sets the -90 degree phase shift point
- All Pass II Flat response, Boost/Cut does nothing, Frequency sets the -180 degree phase shift point.

Delay button

The output channel delay is used for driver alignment. Delay is in 0.208mSec (or 0.278 in.) steps up to 500mSec (~555 ft).

Note that you can set the display of the delay to read out in either mSec or feet. Refer to the [SYSTEM FUNCTIONS](#) section titled Delay for adjusting how this is displayed.

Limiter button

The Peak limiter prevents excessive levels from damaging the driver connected to the output. The *Threshold* parameter sets the level above which the Limiter will act. You can set the time it takes to respond to an input transient using the *Attack* parameter. The *Release* parameter adjusts the recovery time. The entire Limiter can be bypassed using the Bypass Limiter parameter.

The output meter can be set to monitor the limiter's action by selecting Limiter instead of Level in the *Vu-Meter Mode* parameter. In this mode, the top LED Lights solid to indicate the mode and the next LED lights to

show that you have exceeded the threshold level and the limiter is just beginning to reduce gain.

You can tie the gain of one limiter to another using the Link function. Refer to the [System Functions](#) section on Link Modes for information on how to tie limiters' gains together to maintain the stereo image between adjacent channels or maintain spectral balance (by linking all limiters together).

PC INTERFACE

Overview

The PC software provides an easier, graphics based interface for the SMS226. You have access to either input, output or system overview pages allowing quicker access to all of the adjustable parameters as well as a higher resolution frequency response graph. The PC software adds a graph for the threshold characteristics of the compressor and limiters as well.

You can back up presets to the computer as well as update your unit with new ones.

The buttons controlling the wizards as well as the password lock functions and links between channels are always present.

The interface works best with displays that are 1200x800 or higher in resolution.

Installation

Insert the installation CD into your PC's internal or external drive. If it does not automatically run the installer, run the setup.exe file.

Follow all of the prompts precisely and the interface software will be installed.

USB Connection

Make sure that the SMS226 (as well as your computer) is powered ON and then connect to your computer using a "B" type connector on the front panel of the SMS226. You can use a USB 1.1 or USB 2.0 connection.

Run the interface program. You will find a button in the upper right hand corner labeled "Connect" in gray text. Clicking on this button will start the connection process. If the "Connected" button text lights RED and the graphics display on the SMS226 shows the "SMS226 - Sys Online" message the PC has successfully connected to the unit.

You may be prompted with a dialog about choosing a COM port to use for the connection. The software defaults to COM 1. If this port is being used on your PC you will have to select another port (2-15) to use. Use the Windows device manager (available from the Control Panel) to identify which port is being used by the SMS226 (identified by the "USB Serial Port (COM4)" in Figure 3 below). Select the correct port in the SMS226 COM port dialog to proceed. If you are successful the "Connect" button text will change to RED.

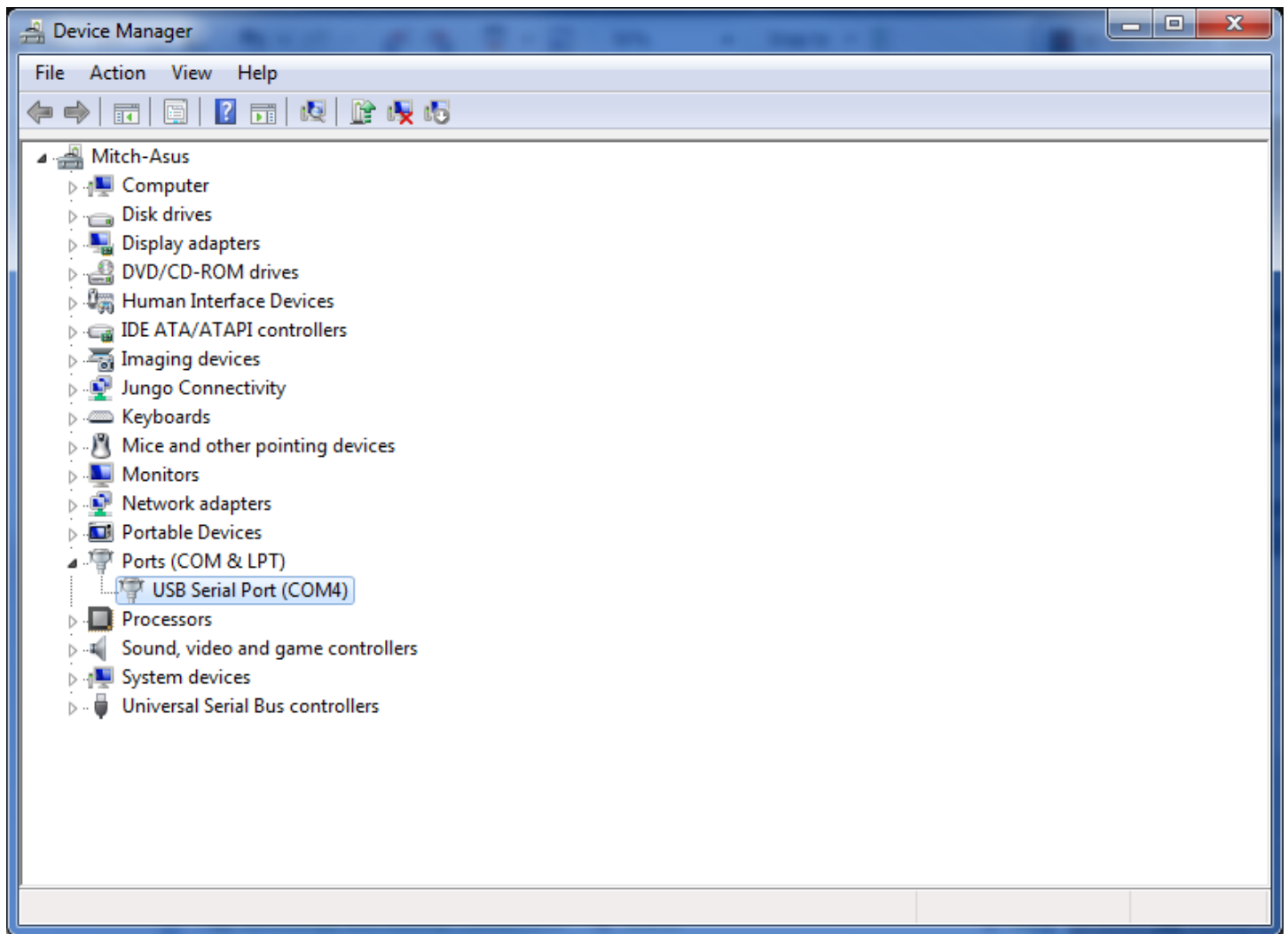


FIGURE 3 - Device manager COM4 port usage example

Operation

When the PC is actively connected to the SMS226, the front panel controls will not respond. A message "SMS226 - Sys Online" is displayed on the LCD screen during this mode.

The row of buttons across the top of the page (Save to PC, Load from PC...Connected) is present on all pages. Refer to the operation of the rest of the buttons in the [SYSTEM FUNCTIONS](#) section.

Unique to this mode are the **Save to PC** and **Load from PC** buttons. These functions store or recall the entire memory of the SMS226 to/from your PC. (The Store and Recall buttons merely save or load a single system snapshot in one of the memory locations inside the unit.)

The Overview tab

The Overview tab is used to see and adjust system parameters. It displays the input and output section processes as well as how they are connected. If you click on any of these blocks, you will be switched to either an Input or Output tab to adjust parameters.

You can adjust the function of the meters by clicking on the arrow and selecting the function below each meter. Muting a channel is done by clicking on the Mute button over the meter. When muted, the Mute text turns red.

You can adjust the Master Volume or the Pink Noise level by either clicking and dragging the slider or typing a value into the box above the slider and hitting the return key.

Clicking on any of the process blocks (i.e. Graphic Equalizer) will take you to the correct tab to adjust parameters of that process.

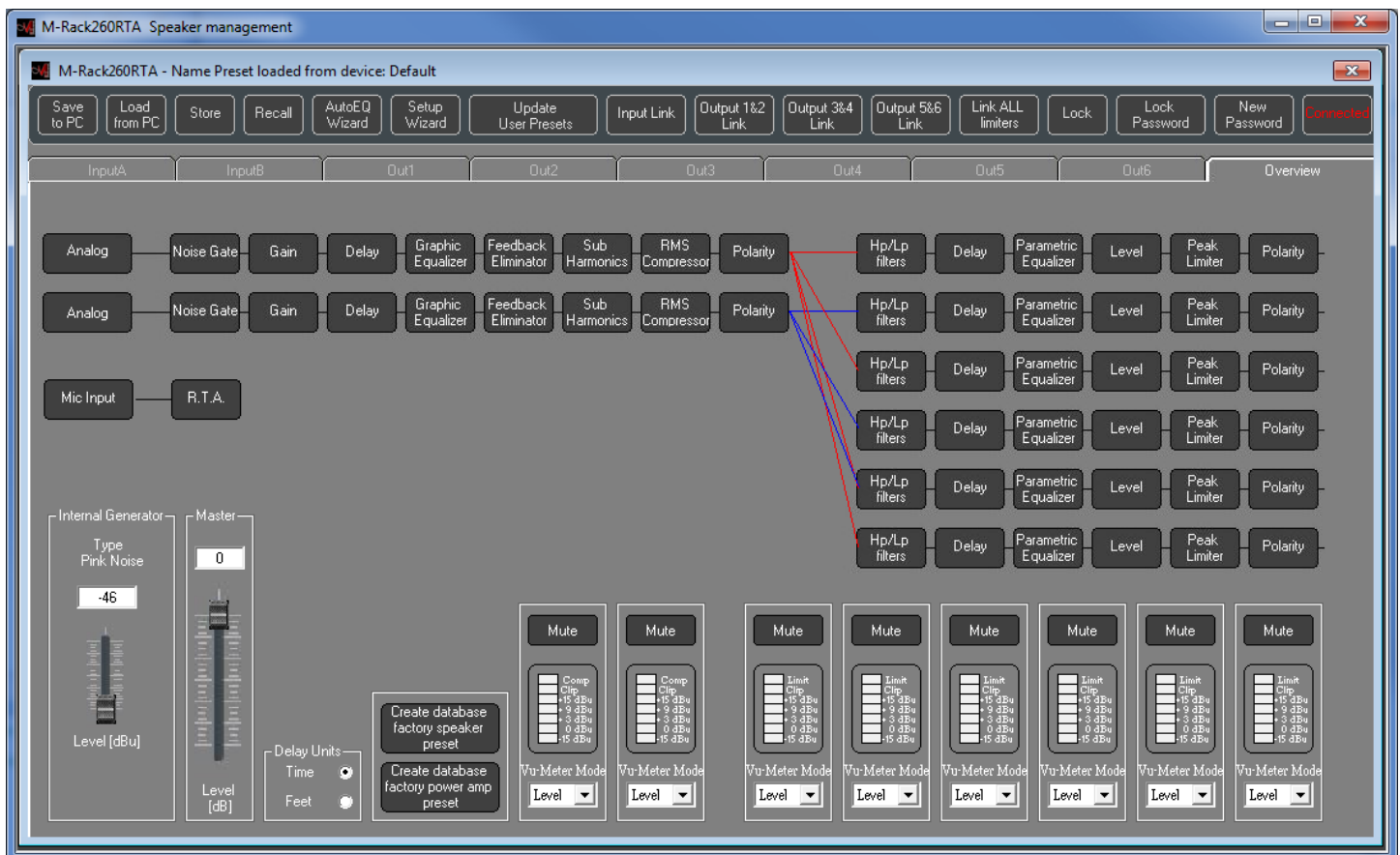


FIGURE 4 - PC Overview screen

The Input tabs

The Input tab allows access to all of the processes related to the input audio before it is routed to the outputs. This page replaces the entire upper row of buttons on the main unit (Compressor, Graphic EQ, Gate, Sub-synth, Feedback). Refer to the operation of these functions in the [INPUT MODULE DESCRIPTIONS](#) section. This page adds a graphic representation of the compressor threshold settings not available in the LCD.

A feature only available in the PC interface mode is the View Fbk button. Using the *View Fbk* function, you can see how the filters are applied and their settings.

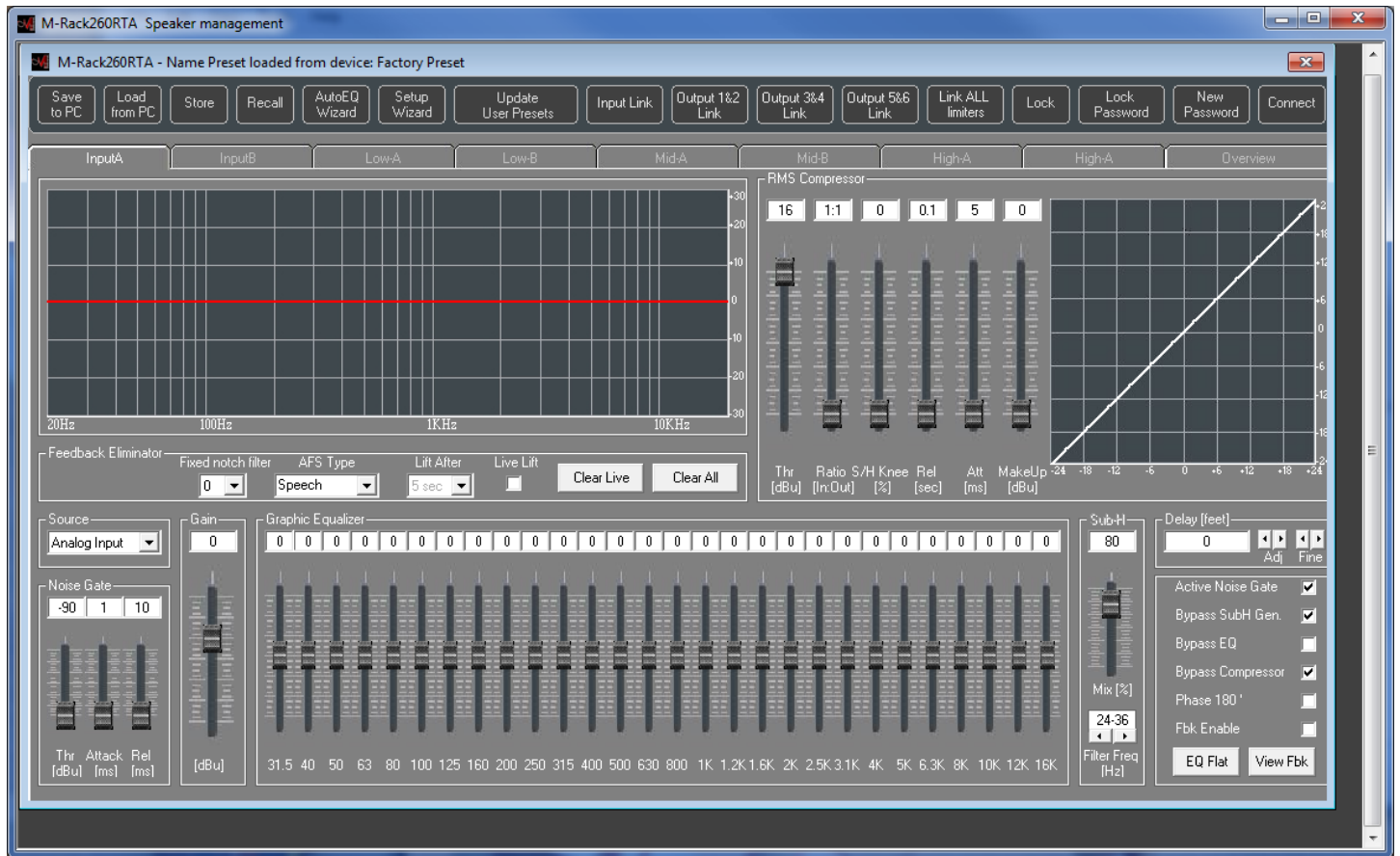


FIGURE 5 - PC Inputs screen

The Output tabs

Each output tab allows access to all of the processes related to the corresponding output. This page replaces the entire middle row of buttons on the main unit (Crossover, Parametric EQ, Delay, Limiter, Output). Refer to the operation of these functions in the [OUTPUT MODULE DESCRIPTIONS](#) section. This page adds a graphic representation of the limiter threshold settings not available in the LCD.

Note that you can create Speaker or Amplifier presets from this page. Amplifier presets consist of only the Level control setting. Speaker presets consist of all other settings on this page.

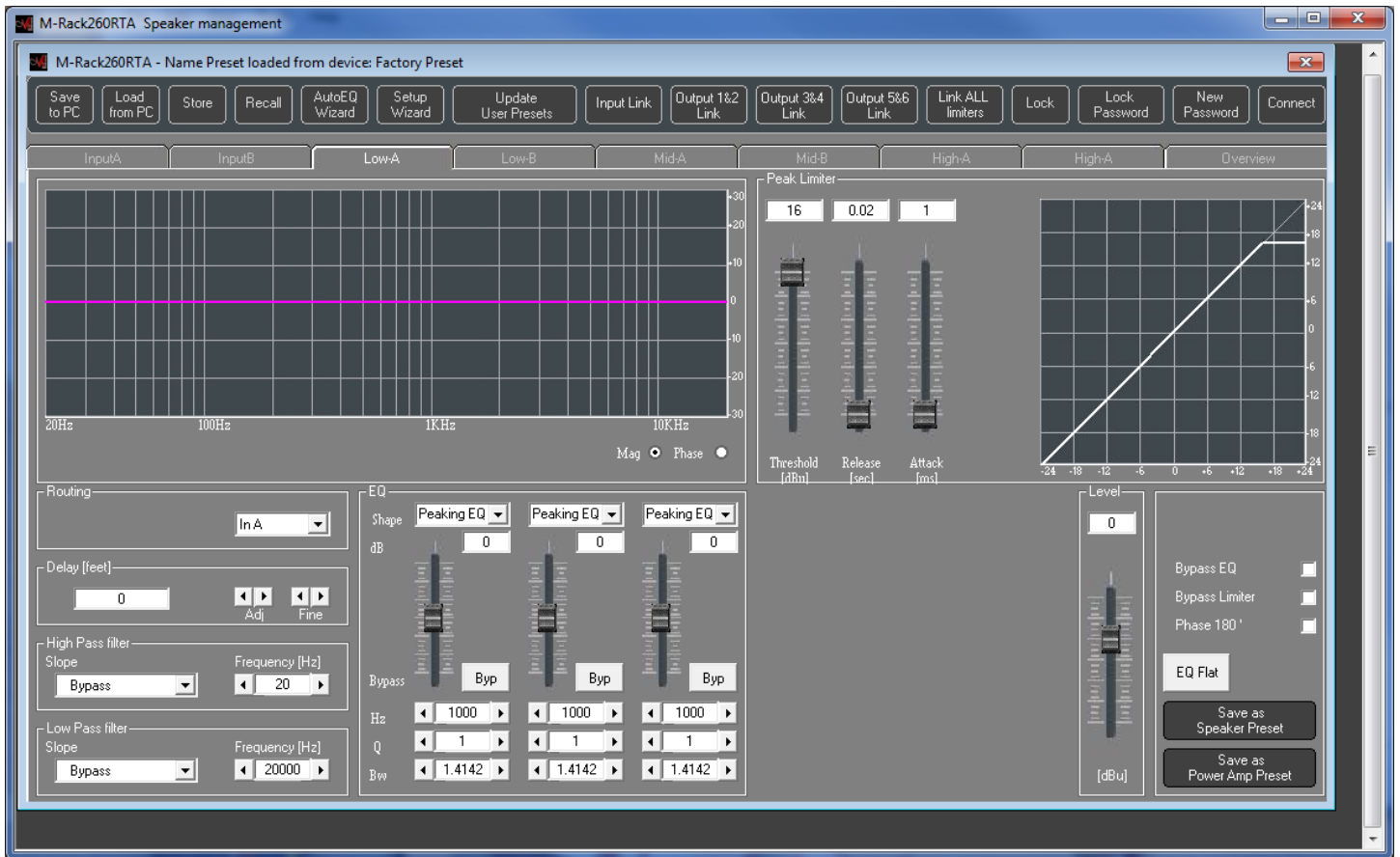


FIGURE 6 - PC Outputs screen

WARRANTY INFORMATION

Limited Warranty:

Applied Research and Technology will provide warranty and service for this unit in accordance with the following warrants:

Applied Research and Technology, (A R T) warrants to the original purchaser that this product and the components thereof will be free from defects in workmanship and materials for a period of three years from the date of purchase. Applied Research and Technology will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt.

Exclusions:

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.

A R T reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

A R T shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights and you may have other rights, which vary from state to state.

For units purchased outside the United States, an authorized distributor of Applied Research and Technology will provide service.

SERVICE:

The following information is provided in the unlikely event that your unit requires service.

1) Be sure that the unit is the cause of the problem. Check to make sure the unit has power, all cables are connected correctly, and the cables themselves are in working condition. You may want to consult with your dealer for assistance in troubleshooting or testing your particular configuration.

2) If you believe the ART unit is at fault, go to www.artproaudio.com. Select "Support", then "Return Authorization Request" to request a return authorization number.

3) If you are returning the unit for service, pack the unit in its original carton or a reasonable substitute. The original packaging may not be suitable as a shipping carton, so consider putting the packaged unit in another

4) Include, with your unit, a note with the RA number and your contact information including a daytime phone number, preferably attached to the top of the unit.

Fill in the following information for your reference:

Date of purchase _____

Purchased from _____

Serial number _____

SPECIFICATIONS

Input Impedance

Mic..... 3.4k Ohms
Input A, Input B..... 10k Ohms

THD < 0.005% @1kHz

Maximum Input +20dBu

Maximum Output..... +20dBu balanced

Bandwidth..... 10-20kHz \pm 1dB

Dimensions 3.50" H x 19.0" W x 9.17" D (88.9mm H x 482.6mm W x 232.9mm D)

Weight..... 11 lbs. (4.99 kg)

Power Requirements..... USA – 90 to 240 VAC 50/ 60 Hz.

Note: 0 dBu = 0.775 VRMS, 0 dBV = 1 VRMS

ART maintains a policy of constant product improvement. ART reserves the right to make changes in design, or make additions to, or improvements upon, this product without any obligation to install same on products previously manufactured. Therefore, specifications are subject to change without notice.

NOTES



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