

High Speed Switching
Power Supply
Technology Since 1982.



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We solicit your comments and suggestions.



World Series
600 & 1.2
Professional
Power Amplifiers

Owners Manual

stewartaudio.com

Congratulations! You have purchased a powerful product which will provide you with many years of reliable service. Since 1982, Stewart, committed to innovation in design and quality workmanship, has provided its customers with a unique combination of performance and reliability. This philosophy has attracted the attention and gained the respect of industry professionals around the world.

The **World 600** Professional Power Amplifier delivers more than 230 watts per channel in stereo mode, and over 500 watts when bridged for mono operation. This remarkable performance comes in a package weighing only 10 pounds while occupying just one standard rack space. Thermal concerns are minimized in the World 600 by innovative circuitry and extraordinary efficiency, making installation simpler than ever before.

The **World 1.2** Professional Power Amplifier delivers more than 420 watts per channel in stereo mode, and over 1000 watts when bridged for mono operation. This remarkable performance comes in a package weighing only 11 pounds while occupying just one standard rack space. Thermal concerns are minimized in the World 1.2 by innovative circuitry and extraordinary efficiency, making installation simpler than ever before.

We at Stewart Audio strive to bring you the finest in professional electronics, and we thank you for your choice, which we see as appreciation for our efforts.

Specifications

	World 600	World 1.2
Output Power (1kHz, 0.1%THD)	275Wx2@2? per channel 190Wx2@4? per channel	500Wx2@2? per channel 350Wx2@4? per channel
FTC Power Rating <.01%THD. 20Hz-20kHz (both channels driven)	110Wx2@8? per channel	200Wx2@8? per channel
Rated Power Output, Mono 1kHz	500Wx1@4? bridged 350Wx1@8? bridged	1000Wx1@4? bridged 700Wx1@8? bridged
Frequency Response +0dB, -0.5dB	20Hz - 20kHz	20Hz - 20kHz
Bandwidth +0dB, -3.0dB	15Hz - 45kHz	15Hz - 45kHz
Signal-to-Noise (A Weighted, 650W@4?)	>100dB	>100dB
Input Impedance	20K?	20K?
Input Sensitivity (200Wx2@8?)	1V(0dBV)	1V(0dBV)
Slew Rate	<30V/microsecond	<30V/microsecond
Damping Factor	<500	<500
Input Connectors	3-pin XLR., 1/4" TRS	
Output Connectors	6-Gauge, 5-Way Binding Post 1/4" TRS	
Voltage Gain	40x (32dB)	48.3x (38.7dB)
Power Requirements	120C AC .3.5A	120C AC 6A
Power Supply Design	High Speed Switching	High Speed Switching
Dimensions	Height	1.75 in (4.5cm)
	Width	19 in (48.3 cm)
	Depth	15.3 in (38.9 cm)
Weight	behind front panel	14.8 in (37.6 cm)
		10 lbs (4.5kg)

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For The Record

Please fill out and return the enclosed warranty card at your convenience. This information will provide proof of ownership for warranty purposes and will allow us to notify you if necessary.

In the spaces provided below, record the model and serial number located at the rear of your amplifier.

Model No. _____

Serial No. _____

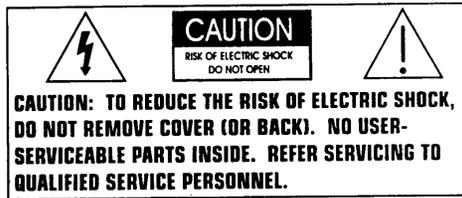
Purchase Date _____

Retain this information for future reference.

Safety

Before using your Stewart Audio Inc. Power Amplifier, please read this **Owner's Manual** carefully to ensure optimum trouble-free performance.

WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT EXPOSE THIS AMPLIFIER TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.



The lightning bolt within arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to person.



The exclamation point within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the appliance.

Important Safety Instruction – Please Read Prior to Product Installation.

1. All of the safety and operating instructions should be read before the amplifier is operated. Retain these instructions for future reference. All instructions should be followed; all warnings on the amplifier and in the operating instructions should be adhered to.
2. This amplifier should not be used near water, for example, near a bathtub, in a wet basement, near a swimming pool, etc.
3. The amplifier should be situated so that it’s location and position does not interfere with its proper ventilation. For example, the amplifier must not be placed on a rug, bed, sofa or similar surface that impedes airflow across the chassis. Airflow through the ventilation openings should be unobstructed.

Troubleshooting Reference Chart

Symptom:

No output: Power indicator LED is off (Note: there is a normal delay of up To 1 minute when amp is first plugged in or circuit breaker is reset.)

Recommended Action:

Be sure power outlet is “live”. Be sure power switches are “on”. Check circuit breaker. Wait 1 minute after plugging in cord or resetting breaker.

No output: Power indicator LED Cycles on and off.

This indicates a short-circuit Condition on the output. Disconnect speaker wires and turn amplifier power switch on. If amp stays on, the problem is in the output wiring or speakers.

Power indicator on: no output from one or both channels.

Check input level controls, input and Output cables, input signal and speakers. If operating in bridged mode, be sure connections are made to Channel 1’s inputs.

Low volume in one or both channels.

Check input level controls, input signal levels, and input wiring. Be sure both speakers are the same impedance.

Amplifier overheats and/or shuts off.

Review section on Thermal Considerations. Note that overdriving amplifier for a long period can cause thermal shutdown. Note that overdriving amplifier hard enough can cause momentary shutdown.

Distorted output.

Check signal level and signal source. Check speaker(s).

Noise on output.

Check signal source for noise. If you are running input cables of more than 30 feet, balanced lines can reduce noise levels considerably. See sections on Input and Output wiring for more information on wiring balanced lines.

Troubleshooting

If you experience difficulty in operating your World 600/World 1.2, chances are good that you will be able to remedy the problem yourself using standard troubleshooting techniques and suggestions offered in the table on the following page.

If you wire your own cable, it is imperative that all connections be made cleanly with no stray wire strands to short terminals. Keep in mind that other components in the system can cause problems which may appear to be caused by the amplifier; systematic troubleshooting will allow you to isolate the source difficulty.

If you fail to correct the problem by following the steps outlined below, **do not attempt** to open or repair the unit yourself. **Please contact Stewart Audio at (209) 588-8111 to obtain a Return Authorization (RA) Number and shipping instructions.** Once RA Number is obtained, return the unit to Stewart Audio, 14407 Cuesta Court, Sonora, CA. 95370. **Do not return any amplifier to Stewart without first obtaining an RA Number.** Refer to the enclosed Warranty Information for Terms and Conditions of Warranty.

NOTE: Upon installation of the World 600/World 1.2, there will be a turn-on delay of up to one minute after AC power is applied to the amplifier. This is a result of the initialization sequence performed by the amplifier's High-Frequency Switch Mode Power Supply. Subsequent delays will be minimal, as long as the World 600/World 1.2 remains connected to AC power.

4. Do not place the amplifier near heat sources such as radiators, heat registers, stoves, or other appliances that produce heat.
5. The amplifier should be only be connected to 120 VAC, 60 Hz power supply. Do not defeat the ground or polarization of the power plug.
6. Route power cord and other cables so that they are not likely to be walked on, tripped over or stressed. Pay particular attention to condition of cords and cables at plugs, and the point where they exit the amplifier. To prevent risk of fire or injury, damaged cords and cables should be replaced immediately.
7. Clean the amplifier with a clean damp cloth. Do not use solvents or abrasive cleaners. Never pour any liquid on the amplifier.
8. When left unused for a long period of time, the power cord should be unplugged from the outlet.
9. Damaged Amplifiers requiring service. The amplifier should be serviced by a qualified service technician when:
 - a. The power cord or AC plug has been damaged.
 - b. Objects have fallen, or liquid has spilled into the unit
 - c. The amplifier has been exposed to rain or other moisture
 - d. The amplifier does not appear to operate normally or exhibits a marked change in performance.
 - e. The amplifier has been dropped or the enclosure damaged.
10. The user should not attempt to service the amplifier beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

Special Features

The World 600 and World 1.2' are the result of many years of experience in the research, development, and manufacturing of amplifiers and other sound equipment. It is a combination of old and new, cutting-edge electronics and timeless purity of sound. As such, it represents Stewart Audio's commitment to developing the latest available technology to achieve the absolute audio quality and reliability.

Please take a few minutes to read through this section of the manual, which provides an overview of the features that make these amplifiers unique.

Low Impedance/High Current Design

The design of the World 600/World 1.2 are exceedingly conservative with regard to current capabilities. This ensures that the amplifier's output devices remain within their Safe Operating Area, even under extreme conditions. As a result, the World 600/World 1.2 runs low impedance loads safely while retaining the high impact dynamics for which they were designed.

Auto Impedance Optimization

The High-Frequency Switch Mode Power Supply and amplifier design used in the World 600/World 1.2 adapts to the demands placed upon the amplifier, enabling them to run with maximum efficiency regardless of the load impedance. Thermal management problems normally associated with amplifiers of this capacity are therefore greatly reduced. Resources otherwise applied toward dealing with thermal problems can be put to better use in higher quality active components for increased reliability and improved performance.

Mono-Bridgeable

The two channels of the World 600/World 1.2 can be bridged together to form a single channel. In this configuration the load impedance is effectively divided between the two channels so that each channel sees half the impedance of the load. This results in at least three times the power output of either single channel at the same impedance.

Bridged Operation

Operating your amplifier in Bridged (or MONO mode allows the two channels to be used together to drive a single (monaural) load at a much greater power level than is achievable using a single channel.

Special wiring requirements must be observed when operating in bridge mode. Failure to install input and output wiring as specified here risks damage to the amplifier and other system components, and could void the amplifier's warranty.

Before converting to bridged mode, be sure to turn off the amplifier's power switch, or disconnect the AC power. **Never convert from one operating mode to the other while amplifier is on.**

Set the Mono/Stereo switch to MONO position. The switch is located on the rear panel near Channel 2's input section.

Make the appropriate input connection to channel 1 input only (when the Mono/Stereo Switch is in the Mono position, the Channel 2 Input is disengaged).

Connect the positive terminal of the loudspeaker (4 ohm minimum) to the positive (red) terminal of Channel 1. **Make no connections to the "Ground" terminals.**

To simplify hookup, a dual banana plug may be used across the positive output terminals to make speaker connections in bridged mode.

Important: follow these speaker hookup instructions carefully. Failure to do so could damage your amplifier.

Channel #1 Positive (+) Terminal = Speaker Positive (+)

Channel #2 Positive (+) Terminal = Speaker Negative (-)

Channel #1 Negative (-) Terminal = no connection

Channel #2 Negative (-) Terminal = no connection

Wiring Inputs in Parallel

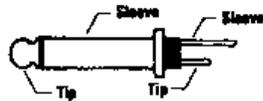
Wiring XLR and 1/4" inputs in parallel (as throughputs to other equipment) requires special consideration when combining balanced and unbalanced lines. **Connecting an unbalanced lines described above to any input will render all inputs on that channel unbalanced.** If it is necessary to combine balanced and unbalanced connections on the same channel, the unbalanced connector must not ground the Negative (-) input. In the case of the 1/4" phone input, this means using the TRS ("stereo") 1/4" phone plug and leaving the sleeve terminal unconnected. When using the XLR connector(s), pin 3 must be left unconnected (not tied to ground as described above).

Output Wiring

Outputs are available via both 5-Way Binding Posts and heavy duty 1/4" Phone Jacks. The Binding Posts will accept bare wire up to 6 AWG, spade lugs, hook lugs, and a single or dual banana plugs. When wiring speakers in stereo, red binding post is connected to the speaker's positive terminal; black is ground.

The 1/4" phone jacks are wired using the following assignments.

Tip = Positive
Sleeve = Ground



Each channel's 1/4" Phone and Binding Post output connectors are wired in parallel.

Balanced/Unbalanced Inputs

The World 600/World 1.2 incorporates XLR and 1/4" Phone input Connectors, wired in parallel. This allows throughput of the signal to additional amplifiers or other equipment such as DAT recorders, etc.

6-Gauge, 5-Way Binding Post and 1/4" Outputs

The World 600/World 1.2 binding Posts output connectors will accept banana plugs, spade lugs, or bare wire up to 6AWG. In addition, the Binding Posts are positioned to allow one standard banana plug to be used when operating the amplifier in bridged mode. 1/4" Phone output connectors are also provided, wired in parallel with the Binding Posts.

In-Rush Current Limiting

A breakthrough from Stewart, the World 600/World 1.2 unique inrush current limiting circuitry minimizes power drawn from the wall to 8 AMPS or less on plug-in. Staggered turn-on configurations for multiple-amplifier setups are now a thing of the past, as multiple amplifiers may be switch on simultaneously.

High-Frequency Switch Mode Power Supply

The World 600/World 1.2 features a radical departure from conventional power supply design: Stewart's High-Frequency Switch Mode Power Supply. Because of this pioneering use of advanced technology, some explanation is in order.

Conventional supplies operating at 60Hz (standard line frequency) recharge only 120 times per second, requiring their storage capacitors and transformer to be quite large to supply the energy needed during the intervals between cycles when power is not available from the wall. The power supply must act as a local reservoir of power from which the amplifier circuits draw. This storage function is responsible for much of the bulk, weight and cost of traditional power amplifiers.

The Stewart High-Frequency Switch Mode Power Supply fully recharges 120,000 times per second (1000 times faster than conventional supplies), requiring far less capacitance for filtering and storage. This high-speed recharging reduces power supply "sagging" common with other designs. In a Stewart amplifier, it is almost as though power is fed directly from

The wall to the speaker, with the amplifier acting only as a “valve” in-between to control its flow. This power supply’s remarkable efficiency at converting energy from the AC line to a usable form for loudspeaker applications allows many of the major components to be downsized, saving space, weight and cost.

Unlimited Dynamic Range

Most power amplifiers utilize some form of current limiting in the audio signal path. While a fairly reliable form of protection, this technique has some disadvantages in that it can reduce the impact of musical transients by prematurely limiting output current and therefore dynamics. Low frequency signals may sound weak or distorted as a result. Stewart Audio amplifiers have no current limiting in the audio path, and therefore reproduce the full dynamics of the audio signal.

Absolute Protection

Stewart Audio power amplifiers employ circuits which fully protect the amplifier while avoiding sonic compromise. For example, a unique circuit monitors the current drawn from the power supply. The amplifier’s output is not affected in any way until the load impedance drops below 2 Ω , indicating the presence of a short. Under these conditions the power supply will simply shut down until the short is removed, at which point the supply will slowly ramp up to full power, protecting the load from a surge of high energy. In the event of an amplifier malfunction this circuitry will also protect the speakers, since the power is immediately disconnected from the amplifier.

Most other amplifier designs require the presence of relatively high levels of signal in order to detect a short-circuit on the output. At low levels, these amplifiers will continue to drive a short, causing rapid heat buildup, thermal runaway, and finally amplifier failure. The current-sensing circuitry in all Stewart World Series amplifiers is capable of detecting a shorted output even at low program levels, increasing reliability under conditions which could cause other amplifiers to fail.

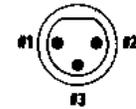
As direct boxes, tape recorders, etc.

Pinouts are standard (see diagram below), Pin 2 of the XLR and the Tip of the 1/4” phone connectors are “Hot”, or Positive.

Input connections should always be made with the amplifier’s power turned off.

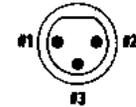
Balanced XLR Connections are made with the following pin assignments:

- #1 = Ground
- #2 = Positive (+)
- #3 = Negative (-)



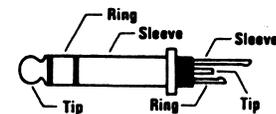
Unbalanced XLR Connections are made with the following pin assignments:

- #1 = Ground
- #2 = Positive (+)
- #3 = Ground (wire pins 1 & 3 together)



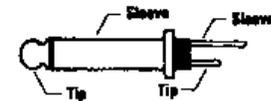
Balanced TRS 1/4” Phone Connections are made with the following pin assignments:

- Tip = Positive (+)
- Ring = Negative (-)
- Sleeve = Ground



Unbalanced TS Phone Connections are made with the following pin assignments:

- Tip = Positive (+)
- Sleeve = Ground



Open above and below the amplifier. Multiple amplifiers can be racked on top of one another leaving partial space between them so sufficient airflow is maintained to allow heat to escape. If mounted in a sealed rack, leave top and bottom spaces open to create a “chimney” effect within the rack, which will provide cooling as air is drawn in the bottom and the top. In any case, be sure that the sides of the rack (next to the amplifier) are clear of cables, power strips, etc., so that airflow is maintained around the heatsink fins.

The amount of airflow is necessary will be determined by a number of factors, including ambient temperature, the amount of heat generated by other equipment in the rack, the properties of the rack enclosure being used, and how hard the amplifier is working. For example, a World 600/World 1.2 being used by a guitar player in a loud rock band will generate more heat than the same amplifier driving nearfield monitors at low volume. Depending on the installation, it may be necessary to guarantee airflow around the heatsinks by rearranging system components or installing a cooling fan in the rack.

In a free-standing installation, in which the unit is sitting on a shelf or hard floors, the rubber feet must be mounted to the bottom of the amplifier. Under no circumstances should the amplifier be placed directly on carpeting of a similar surface.

AC Power Considerations

Your Stewart amplifier is designed to operate on 120 volt, 60Hz alternating current. Power consumption will depend on load impedance, signal level, and dynamic properties of the program material. At 8? per channel, power draw averages approximately 100 and 225 watts.

The World 600/World 1.2 is equipped with unique inrush current limiting circuitry which minimizes power drawn from the wall to 8 Amps or less on power up. Multiple amplifiers may all be switched on at once, without the need for staggered turn-on configurations.

Input Wiring

The world 600/World 1.2's sections allow the use of XLR or 1/4" phone connectors, and will accept either balanced or unbalanced input signals. Each channel's XLR and 1/4" jacks are wired in parallel, which allows throughput of the signal to additional amplifiers of other equipment such

Front Panel

Sophisticated simplicity is a design objective in the development of all Stewart Audio amplifiers. These amplifiers remain simple and intuitive to operate even while incorporating some of the most advanced technology available today.

Power On and Power Level Indicators

The front panel provides visual feed back of the amplifier's status via several LED indicators. The power switch is accompanied by a red LED which illuminates upon plug in.

Note: Upon installation of the World 600/World 1.2, there will be a turn-on delay of up to one minute after AC power is applied to the amplifier. This is a result of the initialization sequence performed by the amplifier's High-Frequency Switch Mode Power Supply. Subsequent delays will be minimal, as long as the World 600/World 1.2 remains connected to AC power.

Each channel features two additional LEDs which indicate the level of the power being produced. Green indicates a signal of -20dB, while Red indicates that the amplifier is being pushed into clipping. These level indicators are accurate at any load impedance.

Level Controls

A detented multiple-position input level control has been provided for each channel. These controls are easily accessible on the front panel of the amplifier. They operate in conventional fashion (i.e., full clockwise = maximum level).

Rear Panel

XLR Inputs

Each channel has a female XLR balanced input connector, which may also be used with unbalanced lines. See *Input Wiring* in the section on Installation (page 12) for more details. (Note: the XLR input is wired in parallel with the standard 1/4" phone jack, so that either may be used as a "through" connection to feed additional amplifiers or other equipment).

1/4" TRS Phone Inputs

Each channel has a standard female 1/4" phone input connector which may be used to either balanced or unbalanced lines (the input automatically adapts to either type of input signal). See *Input Wiring* in the section on Installation (page 12) for more details.

Circuit Breaker

A circuit breaker is provided at the rear of the amplifier. To reset simply push the button back to its normal position. **Note that the re-initialization of the World 600/World 1.2's Power Supply will cause a delay up to one minute after the circuit breaker is reset.**

5-Way Binding Post Output Connectors

Each channel incorporates a pair of heavy-duty 5-Way Binding Post output connectors. They will accept bare wire, spade lugs, hook lugs, and single or dual banana plugs. Additionally the binding posts are situated so that when the amplifier is configured for bridged operation, one dual banana plug may be inserted across the terminals. See *Output Wiring* in the section on Installation (page 14) for more details.

1/4" Phone Output Connectors

Each channel also utilizes a single heavy-duty 1/4" output connector. This connector is wired in parallel with 5-Way Binding Posts, which facilitates running multiple loads from the same amplifier channel where needed. See *Output Wiring* in the section on Installation (page 14) for more details.

Mono/Stereo Switch

The switch is used to "Bridge" the amplifier for mono operation. Maximum rated power of the World 600 is 600 watts into 4 ohms and the World 1.2 is 1200 watts into 4 ohms.

IMPORTANT: Never change the position of this switch while Amplifier is turned on. Doing so could damage your equipment.

Note: Amplifiers operating in bridge mode require different connections than amplifiers operating in stereo. See *Bridged Operation* in the section on Installation (page 14) for more details.

Installation

Mechanical Consideration

The Stewart Audio World 600/World 1.2 occupies one standard rack space and is only 15" deep and weighs just 10 and 11 pounds respectively, making it easier to install and transport than almost any other comparable amplifier. Still, some sensible precautions are in order.

Always use four screws to affix the amplifier to the rack, preferably using flat washers as well to avoid cosmetic damage to the front panel. When rack mounting your amplifier it may be necessary to remove the four rubber feet from the bottom of the unit (in freestanding installations the rubber feet must be installed). In mobile rack-mounted installations it is recommended that the rear of the amplifier be stabilized for additional support.

Thermal Considerations

Cooling of the World 600/World 1.2 is achieved convection, through heatsinks mounted on each side of the amplifier. In the event that the chassis temperature reaches 87 degrees C an internal thermostat will open, turning off the power supply until the amplifier cools down. Although the World 600/World 1.2's sophisticated thermal management system makes it less susceptible to overheating than other amplifiers, it remains necessary to provide airspace around the chassis. This may mean leaving a rack-space