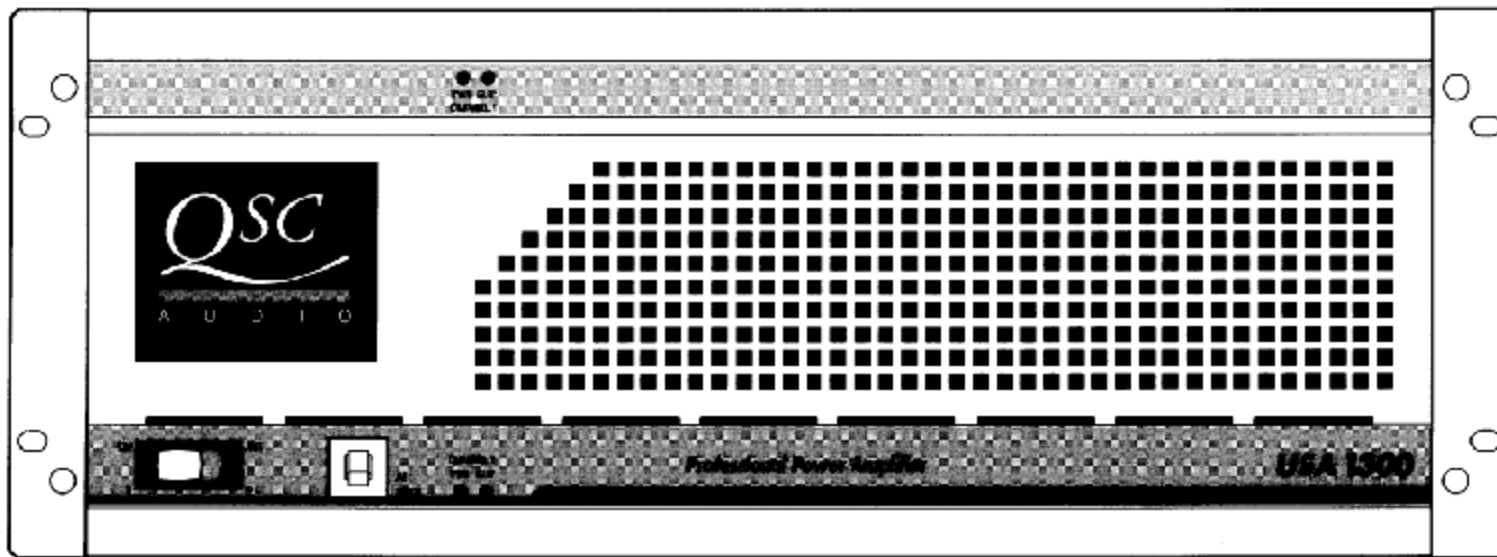
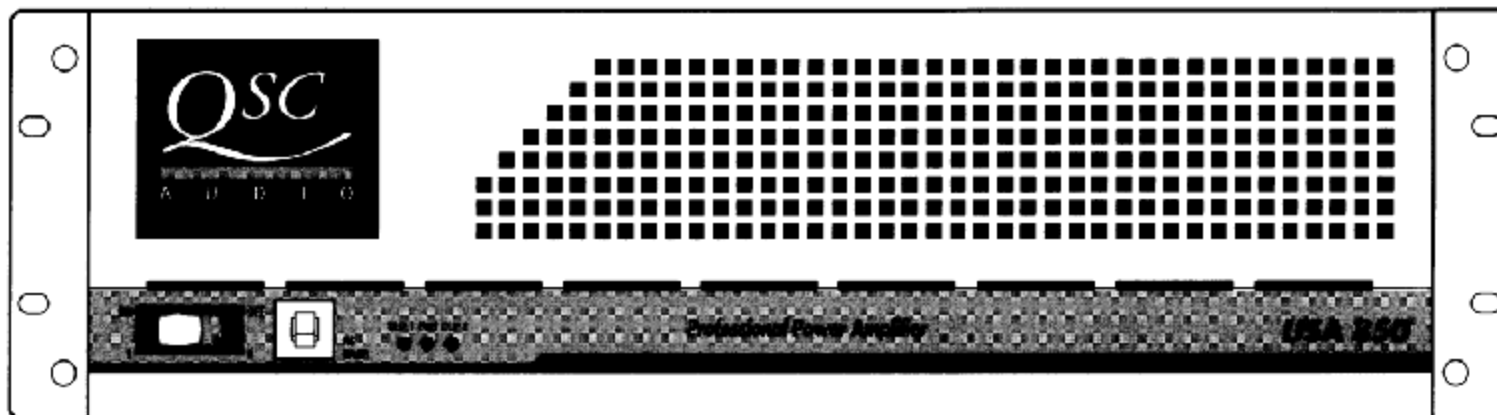
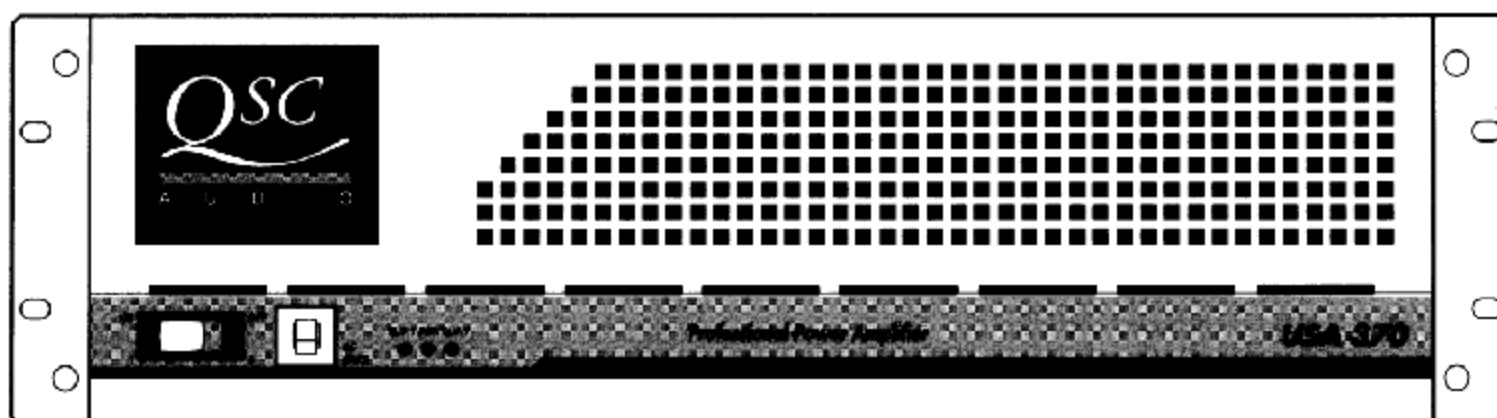




USA 370 • USA 850 • USA 1300
Power Amplifier Operation Manual



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Power Amplifier

Operation Manual

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CAUTION: To prevent electric shock, do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

ATTENTION: Pour prévenir les chocs électriques, ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.



Explanation of Graphical Symbols

The lightning flash with 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 electric shock to humans.



The exclamation point within an equilateral triangle is intended to alert the users to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



Explication Des Symboles Graphiques

Le symbole éclair avec point de flèche à l'intérieur d'un triangle équilatéral est utilisé pour alerter l'utilisateur de la présence à l'intérieur du coffret de "voltage dangereux" non isolé d'ampleur suffisante pour constituer un risque d'électrocution.



Le point d'exclamation à l'intérieur d'un triangle équilatéral est employé pour alerter les utilisateurs de la présence d'instructions importantes pour le fonctionnement et l'entretien (service) dans le livret d'instruction accompagnant l'appareil.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
WARNING: TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.



AVIS
RISQUE DE CHOCK ELECTRIQUE
NE PAS OUVRI



ATTENTION: POUR EVITER LES RISQUES DE CHOCK ELECTRIQUE, NE PAS ENLEVER LE COUVERCLE. AUCUN ENTRETIEN DE PIECES INTERIEURES PAR L'USAGER. CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE.
AVIS: POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, N'EXPOSEZ PAS CET ARTICLE A LA PLUIE OU A L'HUMIDITE.

Safeguards

Electrical energy can perform many useful functions. This unit has been engineered and manufactured to assure your personal safety. Improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards, observe the following instructions for its installation, use and servicing.

Precautions

L'énergie électrique peut remplir de nombreuses fonctions utiles. Cet appareil a été conçu et réalisé pour assurer une sécurité personnelle entière. Une utilisation impropre peut entraîner des risques d'électrocution ou d'incendie. Dans le but de ne pas rendre inutiles les mesures de sécurité, bien observer les instructions suivantes pour l'installation, l'utilisation et l'entretien de l'appareil.

Section 1 INTRODUCTION

This manual contains important information on the proper installation and use of the amplifier. Please read it carefully in order to obtain the best performance from your new equipment.

Do not hesitate to call your QSC dealer for assistance with questions about installation, use, or servicing of the amplifier.

THE AMPLIFIERS

The USA 370, USA 850 and USA 1300 amplifiers are intended for professional sound reinforcement and studio monitoring applications. They are also useful in distributed sound reinforcement and paging applications. These are all two-channel amplifiers, differing primarily in terms of output power. The USA 370 produces 185 watts per channel at 4 ohms; the USA 850 produces 425 watts per channel at 4 ohms; and the USA 1300 produces 650 watts per channel at 4 ohms (all values are RMS, both channels driven).

The USA 370 is passively cooled; the higher powered USA 850 and USA 1300 have dual-speed fans.

Each channel in an USA series amplifier is isolated by separate power transformer secondary windings, each feeding its own balanced bipolar power supply. Balanced or unbalanced inputs can be made with screw lugs to the barrier strip, or with 1/4-inch plugs (ring-tip-sleeve for balanced inputs). Speaker connections are made with five-way binding posts.

The chassis includes integral rack mounting ears. The recess in the front panel houses the AC switch, circuit breaker, and LED indicators for clipping, power on, and protect mode. The gain controls are mounted on the rear panel.

Complete protection is provided for open circuit, short circuit, and mismatched loads. The amplifier will shut down temporarily if it overheats, and a front panel AC circuit breaker protects the power supply against unusual overloads.

All protection systems except the main circuit breaker will reset automatically as soon as safe operation is assured. Internal circuitry protects the user's loudspeakers from unexpected damage by muting the amp during turn-on and turn-off and by blocking DC faults (uncontrolled power breakdown, whether caused by the amplifier or preceding components).

More detailed explanations are found on subsequent pages.

PRECAUTIONS

BACKGROUND — Speakers have several limits which should not be exceeded for reliable operation. It is the user's responsibility to determine these limits and operate the amplifier accordingly. We offer protection against many types of anomalies, but you must still select speakers of the appropriate type and power capacity.

DC Fault Protection — All QSC Audio Products, Inc. amplifiers protect the speakers against amplifier faults, so no special protection is required for full range loudspeakers. The USA series amplifiers limit the response below 20Hz to protect the amp and load from possible damage caused by large subsonic transients such as breath pops, dropped microphones, etc.

User Responsibility — Remember that your amplifier is very powerful, with extra peak power (dynamic headroom) in reserve. Observe the hookup and operating precautions. QSC Audio Products, Inc. is not liable for any damage to loudspeakers caused by overpowering, wrong frequency operation or electronic faults.

Section 2 INSTALLATION

UNPACKING AND INSPECTION

All USA series amplifiers are carefully inspected before shipment from the factory. Despite the protective carton and rugged amplifier design, damage in transit is always a possibility. Check for obvious carton damage while unpacking the unit, and check the amp for loose internal parts, broken control knobs, or other physical damage.

If shipping damage is evident, notify the transportation company immediately. Only the consignee can file a claim with the carrier for shipping damage. Be sure to save the carton for the shipper to inspect.

Please retain the carton. It is the best and safest means of packing the amplifier if it needs to be shipped to the factory for repair. QSC does not warranty against damage resulting from the shipment by you of improperly packaged amplifiers.

IMPORTANT PRECAUTIONS

The power must be OFF when making any connections. If you connect plugs with the power on, especially in dry environments, static sparks or bad cables can cause pops or hums that damage speakers.

When first powering up the amp, have the amplifier gain controls all the way off, in case of defective cables or hookups. Turn the gain controls up gradually until normal operation is verified.

Check the AC voltage printed on the serial number label. Make certain it matches the AC voltage supplied in your area before plugging the unit in.

CONNECTION TO A VOLTAGE SOURCE OTHER THAN THE ONE SPECIFIED WILL IMMEDIATELY DAMAGE THE AMP.

Never connect the speaker terminals (red binding posts) for two channels together on any power amplifier. The two channels will fight each other and possibly fail. Do not connect the speaker ground terminals (black binding posts) to chassis or signal grounds, as the resulting ground loop could cause ultrasonic oscillations. Keep all speaker wiring separate for each channel, and separate from input wiring.

Do not remove the amplifier cover, as there are dangerous voltages inside. Do not expose to rain or moisture. Refer all servicing to qualified personnel. Please call the factory for service center information.

High voltages can be present on the speaker terminals. Always connect speaker terminals with the power off, and use heavy gauge cable with no frayed strands or damaged insulation.

Power amplifiers have high power circuitry inside. There is an electrical shock hazard, and a potential for fire in the event of a short circuit or other electrical malfunction. Never plug in a damaged amplifier until the condition of the internal insulation is checked. If a circuit breaker blows quickly when turning the amplifier on, the equipment is defective and should not be restarted until repaired by a competent technician, or replaced. Failure to observe these precautions could lead to fire or electrical shock.

Power amplifiers are heavy and may become hot after use. Provide adequate support and be careful how you hold the amplifier when handling it.

Section 3 OPERATION

QUICK INSTRUCTIONS

Stereo Operation — These instructions cover the normal use of the amplifier in two-channel or stereo applications.

AC Power — Connect the AC cord to a standard outlet only. The amplifier will operate satisfactorily over a $\pm 10\%$ range of voltages, but full rated performance will be achieved only at the rated voltage.

Floating Chassis Ground — There is no provision for lifting signal ground relative to chassis ground on these amplifiers. Electronic balanced inputs are provided for hum rejection. Use balanced input cables to avoid hum and interference. For safety reasons do not remove the ground pin on the AC cord.

Input Connections — The input polarity is as follows —

¼ inch plug — Tip is minus or inverting, Ring is plus or non-inverting, Barrel is ground (as always).

Barrier Strip — GND is circuit ground, + is the plus input, - is the minus input.

When making unbalanced connections, the unused terminal must be grounded for proper response. Unbalanced ¼ inch plugs will work automatically. When connecting an unbalanced input to the barrier strip, connect the signal wire to “+” the shield to “-,” and the “-” to GND.

Speaker Connections — You may connect banana plugs, spade lugs, or bare wire ends to the five-way binding posts. Observe correct polarity (red/black terminals) so all speakers move in the same direction.

Power Up — When first powering up, start with the gain controls off until proper operation is verified. Upon turning on the AC switch, the Power LED should come on. After two seconds the muting will stop and sound will be heard. In case of difficulty refer to Section 4.

Operation and Indicators — Gain should be kept in the upper half of its range for full performance. Each channel has a red Clip indicator that will show any distortion in the amplifier. The mute circuit will cut the sound off as soon as you turn off the amp, and mute for two seconds before restoring power to the speakers. This blocks turn-on and turn-off thumps.

Cooling — The USA 370 is passively cooled. In the USA 850 and USA 1300, an internal fan forces air across heatsinks. Air flow is from the rear and warm air is exhausted to the front. This prevents the recirculation of heated air and reduces rack temperatures. Be sure that plenty of inlet space is allowed in the rack for free air flow.

When installing a USA series amplifier that has a fan in the same rack with passively cooled amps or fan cooled amps that exhaust into the rack, locate the USA fan cooled amp on the bottom. This will assure the coolest air for all amps

INPUT CONNECTIONS

Input Circuit — An electronic balanced input is standard. For best performance in the balanced input mode, the source should have equal impedances for both signal conductors, so that the loading effect on each leg will be the same for common mode (noise) signals. Minor mismatches will result in slight loss of common mode rejection, but will still provide much greater noise rejection than unbalanced inputs.

Balanced Inputs — For proper balanced line operation, the cable shield must be kept separate from both signal conductors. The cable shield is connected to the barrel of a ¼ inch plug, or to the GND terminal of the barrier strip.

Unbalanced Inputs and Polarity — Since the input circuit responds to the difference between the plus and minus signals, if only an unbalanced (single-ended) signal is available the unused input terminal needs only be grounded for normal operation, without loss of gain. The ability to reject cable induced hum and noise is lost, but this may not be significant in well shielded environments with short distances between audio components.

We have used the safest or most stable assignment (inverting) for the input polarity of the ¼ inch plug. Unbalanced ¼ inch plugs can simply be fully inserted in the ¼ inch jack without special concern.

You can wire to the - input of the barrier strip for stability, or the + input for non-inverting polarity, and ground the unused input and the cable shield to the central GND terminal.

NOTE — You can always reverse the red-black polarity to all the speakers to restore correct polarity even when using the more stable inverting mode. In any case, be sure to use the same polarity for all of the speakers so they work together.

Cross Connecting Both Channels — You can always connect the inputs of two or more channels to the same signal, but NEVER CONNECT TWO CHANNELS TO THE SAME SPEAKER. Connect separate speakers to each channel to avoid amplifier damage.

Rather than using a Y cable, jumper wires at the barrier strip can be used. This connects the input jacks for Channel 1 and Channel 2 in parallel making it easy to cross patch to as many channels as desired. Bring the input signal into Channel 1. Connect jumpers between the “+” terminals of Channel 1 and Channel 2, and also between the “-” terminals. This will send the signal from Channel 1 to Channel 2. Then you may connect another cable from Channel 2 of the first amp to Channel 1 of the next amp. By using the same procedure in each amp, you can loop through to as many amps as desired. Each channels gain control will affect only that channel, not the signal reaching the other channels.

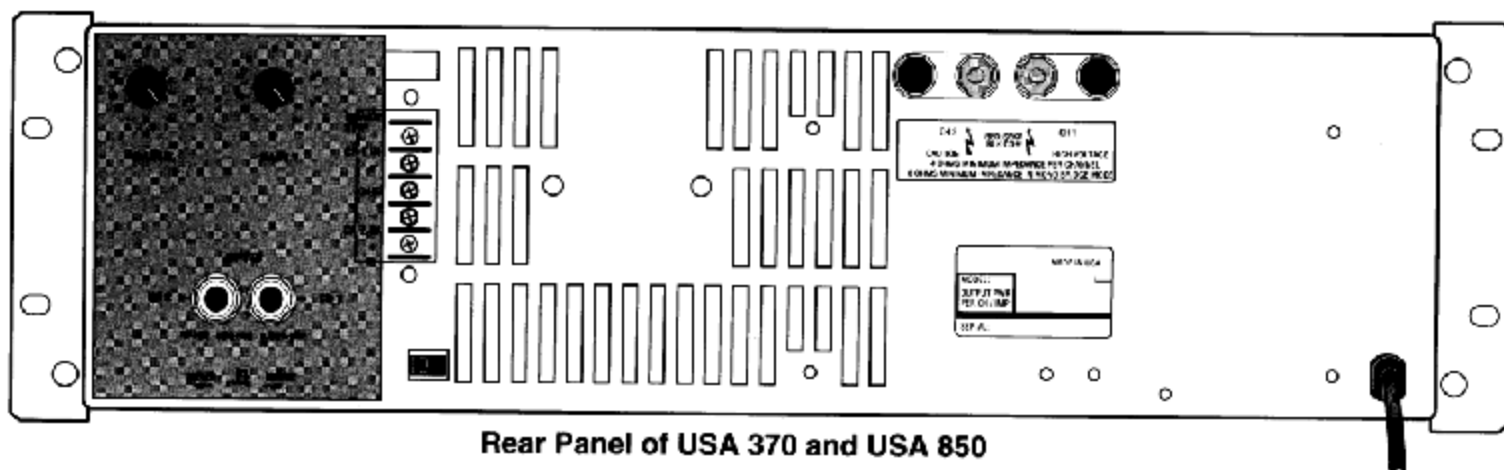
NOTE 1 — For balanced line operation, you must maintain balanced cables all the way through. Any unbalanced cables will unbalance the whole network.

NOTE 2 — The power of a given amplifier channel will not be increased by connecting additional channels. You must connect additional, separate speakers to each additional amp channel to multiply your total power rating. See below for a discussion of mono bridging, which is a partial exception to this rule.

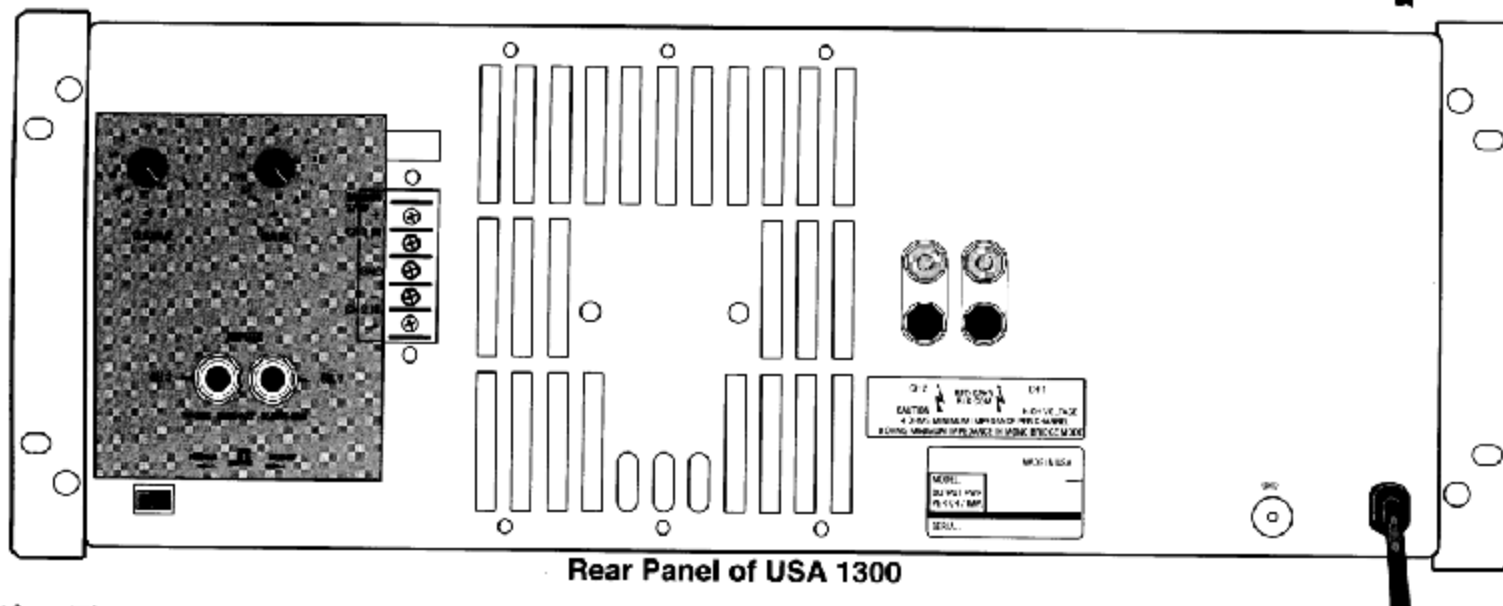
Mono Bridging — To engage the bridged mono mode, there is a separate slide switch located below the barrier strip inputs on the rear. Follow the directions on the label to engage the switch in the “Bridge” position. Connect the amplifier input to Ch. 1 only, and use only the Ch. 1 Gain control, which now controls the entire amplifier. Do not feed another input into Channel 2. The Ch. 2 Gain should be kept off for safety. A 4, 8, or 16 ohm speaker load can be connected across the two red speaker terminals, using the red binding post of Channel 1 for “+” or hot.

Mono Bridge Precautions

- Minimum load impedance is 4 ohms, which will be the equivalent, to the amp, of 2 ohms per channel. Be sure the speakers can handle the high power ratings (see specifications, page 8). The power supply is unable to support a 2 ohm load in this bridging configuration, because bridging in this manner attempts to draw four times the power from the



Rear Panel of USA 370 and USA 850



Rear Panel of USA 1300

amplifier. This exceeds the rated output capacity, and would cause severe overheating.

- Both sides of the speaker cable are hot or active. Do not connect any other circuit to either speaker conductor.
- With a 4 ohm load, the amp will be working at its rated limit (2 ohms per channel). Assure adequate cooling and AC power. Do not expect continuous full power operation without tripping the thermal protection circuits.

SPEAKER CONNECTIONS

Speaker Terminals — Red and black five-way binding posts, on standard $\frac{3}{4}$ inch centers, are located on the rear of the chassis. All speaker labels are shown in red.

Terminal Polarity — The red binding post carries the positive or hot speaker output. The black binding post is the ground return for the speaker. Do not ground the speaker common to other parts of the chassis as this might cause audio ground loops and oscillations.

Speaker Voltage — Because of the amplifier's high power capability there is a possibility of shock hazard at the speaker terminals. Always make connections with the power off, and observe good wiring practice and avoid stray wire strands.

Speaker Cables — In order to obtain the full benefit of the high power and high damping factor, use the heaviest gauge, finest stranded wiring possible. 12 gauge speaker cable is available, and heavier gauge specialty cable is sold by audio dealers.

Cable Polarity — Be sure to observe correct polarity at both the speaker and amplifier end.

The USA series amplifier has adequate current capability to fully drive loads down to two ohms. However, many high performance 8-ohm loudspeakers, especially multi-way

systems with passive crossovers, have impedances at some frequencies which are far lower than the average rating.

An impedance minimum of 2 ohms or less is not uncommon. For this reason, speaker impedance curves should be consulted before connecting speakers in parallel.

We would expect the amplifier to do an outstanding job with any 8 ohm, full range speaker system, and we expect equally outstanding performance when driving 4 ohm loads without passive crossovers (as part of a bi- or tri-amped system, for instance). Two ohm loads should be approached with caution, as there is no further margin for impedance dips.

Two ohm operation will not damage the amp, but high power operation into reactive 2 ohm loads may result in overheating or excessive AC current consumption, causing shutdowns. In addition, some power may be lost at those frequencies where the impedance dips below 2 ohms. For these reasons, operation with 2 ohm loads should be tested thoroughly before being put into use.

Power Ratings for Direct-Connected Constant Voltage Speaker System Wiring

Model	25 Volt	70 Volt	100 Volt
USA 370	150 W/Ch	200 W Bridged	(unable)
USA 850	(not recom.)	600 W Bridged	(unable)
USA 1300	(not recom.)	(not recom.)	1000 W. Bridged

Constant-Voltage Distributed Sound Systems — The USA 370 is well suited to driving 25V lines directly in stereo mode (one zone per channel). Do not connect both channels to the same zone! The USA 850 and USA 1300 will drive 70 volt lines in bridged mode (one zone connected to the two red output terminals), and in this mode the USA 1300 can

also drive 100 volt lines. An alternative for driving 70 or 100 volt lines is to use an output autotransformer. Refer to the chart for power output information with CV lines.

PROTECTION FEATURES

Short Circuit Protection — Patented QSC Output Averaging™ short circuit protection continuously monitors the actual load impedance. The result is full performance into rated loads, ability to handle normal program peaks into marginal loads, and good protection into short circuits. At no time will the circuit cause abnormal distortion spikes or loss of sound.

Thermal Protection — If the heat sink temperature rises to about 90°C, muting will be triggered, permitting the circuit to rest until temperatures fall to safe levels. The power indicator will still be lit but no sound will come through. Reset should occur within a minute or two. If thermal problems occur, check for blocked ventilation, proximity to a heat source, short circuit, or improper load (too many speakers). If the Power indicator goes out, this means the amplifier's circuit breaker has tripped and must be reset.

DC Fault Protection — The USA series amplifiers have an AC coupled output with inherent DC protection. Output transistor failures will not pass DC to the load.

Turn-On/Turn-Off Muting — The USA series amplifiers use solid state circuitry for muting. There will be a two second muting interval after turn on. After turn off, or loss of power for any reason, the amp will mute within a quarter of a second.

Input/Output Protection — The amplifier inputs are isolated by 10KΩ resistors, which are part of the balanced input circuit. This protects the inputs from burnout due to extremely high input signals or RF interference. The amplifier output is isolated from capacitive and inductive loads by an ultrasonic network that decouples the speaker terminals slightly at frequencies above about 50kHz.

Indicators — A green Power LED shows when AC power is applied. A red LED accurately shows signal clipping distortion for each channel. If distortion is heard without clip indication, check for extremely low input gain or distortion in other parts of the system.

Section 4 TROUBLESHOOTING

This section contains troubleshooting hints. There are no user serviceable parts inside the amplifier. This information is for use by qualified service personnel only.

A problem can usually be isolated using a step-by-step evaluation, comparing the function of both channels, and using one channel to check the inputs and outputs of the other.

PROBLEMS WITH SOUND

NO SOUND

Power LED does not come on: No AC power. Check AC plug, AC switch, AC circuit breaker, and AC outlet with another device. Reset the circuit breaker, if tripped.

Power LED comes on: Input or output is not connected, or the channel is faulty. If one channel is working, use it to test the inputs and speaker wires from the bad channel.

If there is still no sound, trace those connections back to the preceding unit and speaker to isolate the fault. If the good channel works using the bad channel's cables, then the fault is somewhere in the bad channel. Check the input jacks, trying an alternate type jack if possible, and check the speaker binding posts for looseness. Is the volume control turned up?

WEAK BUT CLEAR SOUND

Usually indicates lack of input signal or incorrect gain adjustment at some point. If the other channel is working, try swapping the connections. If the sound is very thin or muffled, suspect that one driver in a multi-way speaker has failed.

WEAK AND DISTORTED SOUND

The amplifier clip light comes on during the distortion: There is a shorted speaker cable, the speaker is blown out, or the amplifier channel is defective.

The clip light does not show during the distortion: The distortion is happening outside the amplifier. Check for misadjusted or defective units before the amplifier, or bad speakers on the affected channel. Verify that amplifier Gain is in the normal range (halfway up or higher) to prevent input overload.

SOUND CUTS IN AND OUT

Generally caused by a bad connection somewhere. To test, shake the amp or the input/output connectors. An intermittent connection to one side of the balanced input can cause a 6dB fluctuation of input level.

If the sound stops for a minute or two, and then resumes by itself, check the amp for overheating.

SOUND HAS BAD TONE

(poor treble or bass)

The amplifier itself is very unlikely to develop a frequency response problem without more serious effects. Therefore, lack of frequency range must be traced to the speakers or preceding units, such as crossovers and equalizers.

LACKS POWER

A common but indefinite complaint.

If the volume level diminishes without the Gain control having been touched, the problem may be with the speakers, rather than the amplifier. As speaker voice coils heat up, their resistance increases, and the amount of power they draw decreases. Volume will return when the speakers cool down. Some loudspeakers are more susceptible to this type of power compression than others.

In a multi-speaker system, be sure all of the speakers are still working. Your ears get used to high sound levels, and as the room fills with people more of the sound will be absorbed. Only a sound level meter, used with a standard signal level and at a standard distance from the speaker, can establish whether proper output levels are being produced.

PROBLEMS WITH NOISE

HUM

Defined as a fairly rounded 60 cycle tone. Severe hum usually is caused by broken cables, jacks with disconnected ground (shield), or corroded connectors (especially ¼-inch types). A mild hum, often with a little more "tone" or harmonic content, is usually the result of ground loops. This problem is caused by 60 cycle magnetic fields, which radiate from power transformers including those in the amplifier. Try repositioning the cables away from the various components.

Note — Tape recorder heads, phono cartridges, and electric guitar pickups are especially sensitive to this type of interference, and must be kept away from high power electronics.

BUZZ

Defined as a very "razzy" kind of hum. This is usually caused by interference from solid-state light dimmer circuits. Follow the same precautions shown above, and make sure the electronics are not connected to an AC outlet that has a dimmer control.

HISS

Defined as a smooth "shhh" noise. This is always a problem with sensitive electronic inputs, and usually starts at the point of weakest signal. In a properly designed system, this will be the initial microphone, phono, or tape source. There is a noise "floor" caused by random atomic vibrations. This limits the signal-to-noise ratio of the original signal.

The goal of a proper system is to have a quiet pre-amp which immediately amplifies the input signal to a standard "line level", well above the noise floor, so that further degradation does not occur. The idea is to maintain a fairly constant signal level after the initial pre-amp. To isolate the source of unwanted hiss, start at the amp and work backwards, reducing and then restoring gains. You should hear a reduction of hiss and audio together at each point. When you find a control which lowers the audio volume, but not the hiss level, you know the hiss is coming in after that stage. Assuming that the hiss has not always been there, this indicates defective electronics. Certain special effects units are rather noisy, so compare with other users.

CRACKLES

Defined as a "popcorn" noise. If the crackle persists during pauses, this indicates defective electronics, and must be traced down using the above procedure. Crackles that occur during audio peaks or when the electronics are vibrated usually indicate bad connections.

Section 5 SERVICING

USER MAINTENANCE

There are no periodic adjustments required. The amplifier should provide stable performance until parts fail from age.

Internal servicing must be referred to qualified personnel.

The amplifier may be inspected for loose screws on the outside. If any loose parts rattle around on the inside, please have the amplifier serviced immediately, as a loose part could lodge in a dangerous place and cause further damage or a shock hazard.

Cleaning — The faceplate and chassis can be cleaned with a soft cloth and mild non-abrasive cleaning solution. Avoid cleaning powders or scrubbing pads, as these will scratch and dull the paint. Be sure to unplug the unit prior to cleaning. Dampen the cloth with the cleaning solution and wipe gently. You may wish to buff the surface lightly with a dry soft cloth.

Dust Removal — After prolonged use, especially in dusty environments, the heat sinks may become clogged with dust. This will interfere with cooling, leading to higher temperature operation and reduced life. Some dust can be removed by directing an air jet in the fan intake on the rear. Severe buildups will require qualified service personnel to remove the top cover for thorough dust removal.

OBTAINING SERVICE

If the amplifier isn't working properly, please consult the troubleshooting chart in Section 4. If proper operation cannot be restored, the amplifier requires service. This must be performed by qualified technical personnel, to avoid shock hazard or improper repairs. To obtain the location of the nearest authorized Service Center, please contact your QSC dealer.

WARRANTY

QSC Audio Products, Inc. warrants this product to be free from defective material and/or workmanship for a period of three years from date of sale. We will replace defective parts and repair malfunctioning products under this warranty when the defect occurs under normal installation and use, provided the unit is returned to our factory or authorized servicer via prepaid transportation.

The returned product must, in our judgment, have a manufacturing or material defect. This warranty does not extend to any product that has been subject to misuse, neglect, accident, improper installation, alteration, unauthorized service, or where the serial number has been removed or defaced.

QSC Audio Products, Inc. shall not, under any circumstances, be responsible for any direct, indirect, incidental or consequential damages, including but not limited to damage to the audio equipment or to any accessories used with the audio equipment.

Some jurisdictions do not allow the exclusion or the limitation of incidental or consequential damages, so this limitation may not apply to you.

Section 6 SPECIFICATIONS

Characteristic	USA 370	USA 850	USA 1300
OUTPUT POWER* 4 Ω , 1 kHz, 1% THD 8 Ω , 1 kHz, 1% THD 8 Ω , 20Hz - 20 kHz, .1% THD	185 watts 125 watts 110 watts	425 watts 270 watts 240 watts	650 watts 400 watts 365 watts
2 Ω , 1 kHz, 1% THD (typ., single channel driven)	250 watts	550 watts	1000 watts
OUTPUT POWER (bridged mono) 4 Ω , 1 kHz, 1% THD \pm 1 dB 8 Ω , 1 kHz, 1% THD	500 watts 350 watts	1100 watts 850 watts	2000 watts 1300 watts
POWER BANDWIDTH	5 Hz to 60 kHz	5 Hz to 65 kHz	5 Hz to 70 kHz
DISTORTION (8Ω): THD, 20Hz - 20 kHz, at rated power output	Under 0.1%	Under 0.1%	Under 0.1%
IMD, SMPTE method	Under 0.025%	Under 0.025%	Under 0.01%
SENSITIVITY (@ max Gain)	1.12 Vrms for rated 8 Ω power. 29 dB voltage gain.	1.16 Vrms for rated 8 Ω power. 32 dB voltage gain.	1.13 Vrms for rated 8 Ω power. 34 dB voltage gain.
DIMENSIONS:			
Height	5.25" (13.3 cm) /3 RU	5.25" (13.3 cm) /3 RU	7" (17.8 cm) /4 RU
Width	19" (48.3 cm)	19" (48.3 cm)	19" (48.3 cm)
Depth	9.5" (24.1 cm)	9.5" (24.1 cm)	10.8" (27.4 cm)
WEIGHT:			
Net	24 lbs (10.9 kg)	34 lbs (15.4 kg)	54 lbs (24.5 kg)
Shipping	28 lbs (12.7 kg)	37 lbs (16.8 kg)	57 lbs (25.9 kg)
FREQUENCY RESPONSE (1 watt, balanced and unbalanced, noninverting or 10k unbalanced inverting)	20 Hz - 20 kHz, \pm 1 dB	20 Hz - 20 kHz, \pm 1 dB	20 Hz - 20 kHz, \pm 1 dB
DAMPING FACTOR (8Ω)	Greater than 200	Greater than 200	Greater than 200
NOISE (A weighted)	100 dB below full output	100 dB below full output	100 dB below full output
INPUT IMPEDANCE	20k Ω balanced and unbalanced noninverting, or 10k Ω unbalanced inverting	20k Ω balanced and unbalanced noninverting, or 10k Ω unbalanced inverting	20k Ω balanced and unbalanced noninverting, or 10k Ω unbalanced inverting
POWER REQUIREMENTS	120, 220-240 Vac, 50/60 Hz	120, 220-240 Vac, 50/60 Hz	120, 220-240 Vac, 50/60 Hz
POWER CONSUMPTION	4.4 A at 120 Vac	8.6 A at 120 Vac	12 A at 120 Vac

* Typical, both channels driven, unless otherwise noted. Specifications are subject to change without notice.

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