



**Belles Research Corporation**

# **OWNER'S MANUAL**

## **BELLES I Stereo Power Amplifier**

## **1:0 INTRODUCTION**

Through the purchase of your new Belles I you have solidified your commitment to quality, value and sonic excellence. We at Belles Research Corporation thank you and congratulate you on your investment.

Belles Research has engineered and crafted this product to meet our demanding requirements and expect that your Belles I will provide you with many years of trouble-free satisfaction.

We have prepared this manual in order that you may become better acquainted with the amplifier and hence, gain the most benefit from it. Please take the time to read this manual thoroughly before installing and operating the Belles I.

## **2:0 UNPACKING THE AMPLIFIER**

Carefully remove the amplifier from its carton. After removing all packing materials, carefully inspect the unit for physical damage. While we have carefully inspected the unit prior to shipment, shipping damage may occasionally occur. In the event of a problem please return the unit to your Belles dealer.

Please store all packing materials in a dry place should you ever have to ship the unit.

## **3:0 GENERAL INSTALLATION CONSIDERATIONS**

The first aspect of installation must be "where to put the amplifier". We suggest that the optimum location is in close proximity to the loudspeakers; preferably directly between them so as to minimize the adverse effects of inductance, capacitance and damping resulting from speaker wires interacting with the amplifier. If this is not practical, you should strive to locate the amp as close to the loudspeakers as is practically possible.

Your Belles amplifier is equipped with rubber "feet" which must not be removed under any circumstances. The Belles I cools itself by drawing cool air from below the chassis, passing it over the heat sinks and other critical areas and venting at the top much as a chimney functions. Since your amp has been designed with ventilation openings both below and on top of the chassis it is VERY IMPORTANT these openings are kept free from obstruction. Thus, the amplifier must be positioned on a solid surface, allowing at least six (6) inches of free space at the top.

DO NOT PLACE THE UNIT ON A PILE CARPET AND DO NOT PLACE OTHER EQUIPMENT OR OBJECTS ON TOP THE UNIT.

### 3:1 CONNECTIONS TO THE PREAMPLIFIER

NOTE: MAKE ALL CONNECTIONS WITH THE POWER CORD DISCONNECTED.

The preamplifier is to be connected to the Belles amplifier via high grade shielded audio cables having male RCA type (phono) plugs at either end.

The amplifier is equipped with two female RCA type (phono) input connectors located at the rear panel of the chassis. The right channel input connector is situated at the lower left of the panel while the left input is at the lower right (strange but true).

The center pin of the preamp cable connector conducts the signal while the outer contacts (a centrifugal ring) conducts the ground. If the connecting plug fits loosely onto the jack, uniformly crimp the outer ring of the plug a bit (with a pair of pliers) to ensure a snug fit.

### 3:2 CONNECTIONS TO LOUDSPEAKERS

NOTE: MAKE ALL CONNECTIONS WITH THE POWER CORD DISCONNECTED.

In Section 3:0 we briefly discussed the advantages of minimal speaker wire lengths. In connecting your loudspeakers to the amplifier, please make every attempt to minimize speaker cable length in order to maximize the sonic benefits of the Belles amp.

The selection of an appropriate loudspeaker cable or wire is key to the transfer of the musical signal from the amp to the speakers.

The Belles I is designed to accommodate one pair of loudspeakers. Speaker connections are made to the amplifier by means of "five-way" binding post connectors. If you are connecting bare wires to the binding post, loosen the color coded knob (red designates + and black designates -) and insert the wire firmly into the hole in the metal post. Then tighten the color coded knob for a good connection. Speaker outputs are designated "LEFT" and "RIGHT" at the rear of the amplifier.

We recommend finely stranded speaker wire having a minimum thickness of 14 gauge for best results. The American standard of wire thickness is termed "AWG". The lower the AWG number, the thicker the wire and the better the conductivity. Thus, wire rated at AWG 10 is thicker than wire rated at AWG 14. If the wire you choose to use is too thick to be accommodated by the hole in the binding post, we suggest you solder a piece of buss (solid, tinned copper) wire to the end of your speaker cables. This can be done in the following manner:

1. Insert a 3/4 inch length of buss wire into the center of the frayed end of the speaker cable.
2. Twist the strands of speaker cable together so they firmly grasp the buss wire.
3. Solder the buss wire to the speaker cable and insert the buss wire into the hole in the binding post.
4. Tighten the colored knob on the binding post.

An alternative to connecting the speaker cable directly to the binding post is to make the connection via a "banana plug", a standard laboratory connector available from your Belles Research dealer or through an electronic parts distributor. Speaker leads are screwed into the banana plug and the plug, in turn, is plugged directly into the ends of the binding posts, enabling you to quickly disconnect your speaker leads. While there is nothing intrinsically wrong with the banana plug connector, we suggest you make your speaker connections directly to the binding post to ensure the best connection.

There are available high quality audio grade banana type connectors which offer greater contact surface area, thus preventing degradation of your amplifier's damping factor and related audio quality. We suggest you consult your Belles dealer regarding the use of such connectors.

### **3:3 POWER CONNECTION**

The Belles I power cord is a two conductor cord and plugs directly into a conventional 120 volt 60 Hz AC power outlet. Units shipped from the factory for operation in countries where the standard AC power is other than the 110-120 volts 60 Hz American standard, are so labeled and are equipped with an AC power plug appropriate to the country of shipment.

If you choose to plug the amp into a convenience outlet on your preamp or other component, be sure that the convenience outlet has a power rating of at least 750 watts. BE SURE ALL OTHER CONNECTIONS HAVE BEEN MADE TO THE BELLES I BEFORE YOU PLUG IN THE POWER CORD.

### **3:4 GROUNDING**

There is no need to ground the Belles I to anything or to connect ground wires from other components to the unit. In certain cases such grounding may induce ground loops which, while doing no damage, may cause hum.

#### 4:0 FUSE

The Belles I amplifier is equipped with a 3AG type 6 amp "slow blo" line fuse for 120 volt operation and 3AG type 3 amp slow blo line fuse for 220 volt operation. The fuse will protect the amplifier in two ways:

1. The fuse will open (blow) if the incoming AC line voltage or current (and transients) exceeds the fuse rating for a sustained period of time (referenced in milliseconds).
2. The fuse will open if a short condition develops within the amplifier which poses a significant threat to user safety and amplifier operation.

The fuse is a safety device. Fuse failure is indicative of a problem. In the event of fuse failure, disconnect the amplifier and have it examined by an authorized Belles service representative.

ALWAYS REPLACE BLOWN FUSES WITH THE SAME TYPE AND VALUE FUSE AS SPECIFIED HEREIN.

The fuse is located at the rear panel of the amplifier adjacent to the power cord. To remove the fuse simply unscrew the fuse holder cap counter-clockwise and remove.

No other fuses are contained in your Belles amplifier.

#### 5:0 USE OF THE BELLES I

The Belles I has been equipped with a power switch as a convenience. Do not connect the amp to a "switched" convenience outlet on a preamp and turn the amp on via the preamp switch! When turning the system on first turn on the preamplifier, wait 10 to 15 seconds to allow any turn-on transients to dissipate, and then set the Belles I power switch to the up or "on" position. The circular red power indicator LED located directly above the power switch will glow indicating that the amplifier is, indeed, on.

When turning off your system, always turn the power amplifier off FIRST and then turn off the preamp. This procedure protects speakers from harsh transients.

You may notice, if you should turn the amplifier off while the preamp is still on and supplying an audio signal to the amp, that the amp will continue to play for a few seconds and then gradually "fuzz out". This condition is normal and is caused by the massive power supply capacitors. Since these capacitors act as a reservoir in storing electrical energy, they are merely discharging that energy, without recharging, since the amplifier has been turned off.

## 6:0 CARE OF YOUR BELLES AMPLIFIER

Since the Belles I is 100% solid state and has no moving parts, there is no maintenance procedure to be observed. Even if dust finds its way inside the unit it won't hurt anything (unless the dust buildup is so severe that it blocks air flow at the heat sink area).

About the only care the unit requires is an occasional cleaning of the black painted finish. We recommend spraying the exterior of the chassis and front panel with Windex or similar glass cleaner and wiping with a lint-free cloth. NEVER USE SOLVENTS TO CLEAN THE AMPLIFIER. You may choose to wax the finish with Pledge or similar household wax. If you should accidentally scratch the finish of the amp, a black felt tip pen serves as a good, though not necessarily permanent, touchup.

## 7:0 TROUBLESHOOTING GUIDE

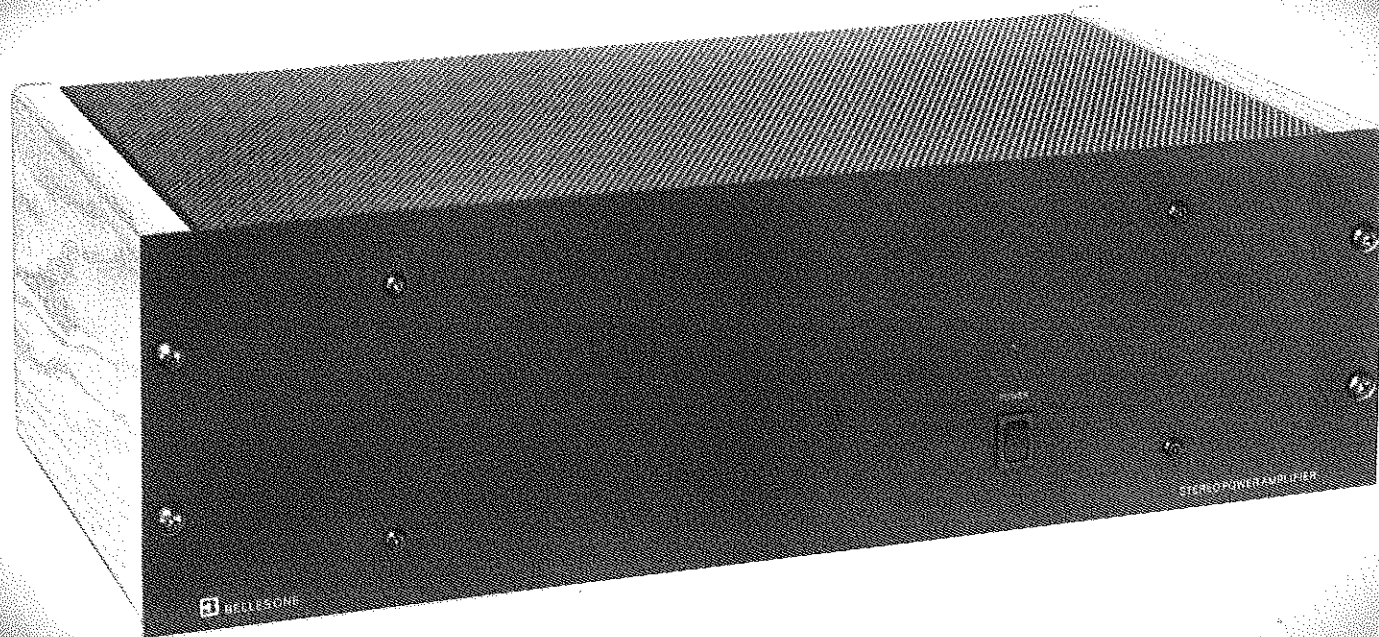
The following guide may aid you in correcting a minor fault in the amplifier or associated wiring. Further complications may indicate electronic failure and should be brought to the attention of your Belles Research dealer. This guide assumes all other components are operating properly.

<u>SYMPTOM</u>	<u>CHECK</u>
No sound. Power LED off.	1. Power cord disconnected. 2. Power switch "off". 3. AC line fuse missing or blown.
No sound. Power LED on.	1. Speaker leads disconnected. 2. Preamp leads disconnected. 3. Preamp off or controls improperly set. 4. Fuses at loudspeaker blown.
One channel out.	1. One speaker lead disconnected. 2. One preamp lead disconnected. 3. Speaker fuse at speaker blown. 4. Reverse left and right speaker leads. If same speaker is out, speaker is at fault.
Sound "directionless". Bass weak.	1. Speakers out of phase. Reverse + and - leads to <u>one</u> speaker.
Loud hum or buzz; one or both channels.	1. Ground ring or preamp cable making poor connection. See Section 3:1. 2. Open ground at cable. Replace cable.

Belles Research Corporation reserves the right to change the design, materials, specifications and prices of its products without notice or obligation. Because of our commitment to quality and better audio, it must be noted that such changes in design would be destined to improve said product.

A warranty notice has been included with your product to specify your warranty rights.

# Belles Stereo Power Amplifiers



The Belles One and Belles Two Power Amplifiers have earned a position in the market reserved only for "great amplifiers." They got there by being the best power amplifiers in their own price categories, as well as in several higher price categories. Reviewers have said that they are the best buys in high performance audio today! They say the Belles amplifiers deliver dynamic, powerful impact with a clean, open top end. Compared to competition, they say the top and bottom ends are brought out magnificently!

It's not that we haven't tried to get this response. We precision designed new circuitry and electronic component packaging to serve the signal. We used high speed transistors for instant transient response, a no-compromise massive power supply, and film resistors and capacitors. Only high quality materials and components are used and all manufacturing, including machining, circuit board assembly and testing, is done on premises under our control.

Each unit is carefully built by hand to make sure that all components fit and are not abused, unlike products that are fabricated by automatic methods. All transistors and capacitors are tested, hand selected and matched before assembly. Mechanically, all input connectors are insulated with special low-loss materials, and are made of machined nickel cadmium (rather than stamped) for ruggedness and positive contact. We use these connectors to protect the integrity of the audio signal at the point of entry into the Belles component. Each unit is carefully assembled and final tested by dedicated, skilled technicians. Belles products are handcrafted to ensure quality, reliability and performance. Belles products offer an edge over mass produced audio components.

Belles' powerful impact as produced by kickdrums and transient bass signals, and the ability to deliver cleanly the sustained low frequencies of organs, tubas and electric basses come not only from their superb dynamic-power performance, but also from their unrivaled independence from loudspeaker loading effects. (it is not commonly appreciated that the measured performance of a power amplifier driving a test-bench load resistor does not always hold up when driving a loudspeaker load.) The Belles amplifiers are able to deliver full power—and produce a square wave—with any known speaker load, however complex its reactance may be. It is this freedom from speaker loading effects that gives the Belles amplifiers the control, accuracy, and ability to sound far more powerful than their conservative power-output ratings would suggest. Aside from the audible power of the Belles amplifiers, their independence from load effects also provides a special openness and freedom from harshness and "glare."

Additional factors contributing to the Belles' superior sound quality are the smooth and stable clipping performance (with virtual absence of odd-order harmonics) and the low phase shift over both the full bandwidth and dynamic range of the amplifiers.

The importance of controlling phase shift is frequently overlooked in conventional designs, and many amplifiers alter their phase response during the shift from a soft to a loud passage. If we were dealing with a video signal and such phase shift occurred, the colors of the TV picture would become inaccurate. So too when dealing with an audio signal. Phase shift results in a change in the tonal coloration of the musical material.



# Belles Stereo Power Amplifiers

Belles eliminates another significant source of distortion by designing his power amplifiers without special protection circuits. Such circuits are notorious for partial and premature activation when faced with certain critical combinations of speaker load and signal. The result is that many amplifiers effectively run out of power long before their actual rating is achieved. Belles eliminates these problems by the use of sophisticated, thermally stable design that needs no special protection

## FEATURES

**Massive Heatsinks**—black anodized aluminum units rated beyond their requirements.

**Sturdy 5-Way Binding Posts**

**High Quality Input Jack Connectors**—chrome coated to resist corrosion with high quality dielectric insulators.

**Clear Anodized All-Aluminum Enclosure**—with 3/16" thick front panel.

**Oversized Power Transformer**—for power supply that delivers high current to the speakers when needed.

**Huge Aluminum Electrolytic Capacitors**—computer grade units in the power supply that ensure solid low frequency performance from the amplifiers.

circuits—other than the UL-mandated line fuse. The excellent thermal stability also ensures that Belles amplifiers can withstand a full hour of the FTC-mandated preconditioning heat test without cycling or shutoff. These are some of the salient reasons for the superior sound quality of the Belles power amplifiers. They represent a unique combination of cost effectiveness and quality achieved through superior design.

**Amplifier Module**—fully designed and packaged to operate independently.

**Printed Circuit Boards**—laminated to eliminate stress fractures thereby providing reliable performance.

**All 1% Metal Film Resistors**—for low noise reliability and stability.

**All High Quality Film Capacitors**—used in signal path for better sound, detail and clarity.

**Power "On and Off" Switch with LED Light**—presents red light indication of power.

**Class AB Output Circuit**—with class A drivers.

**Three Year Warranty**—expresses our confidence in our products.

## Specifications

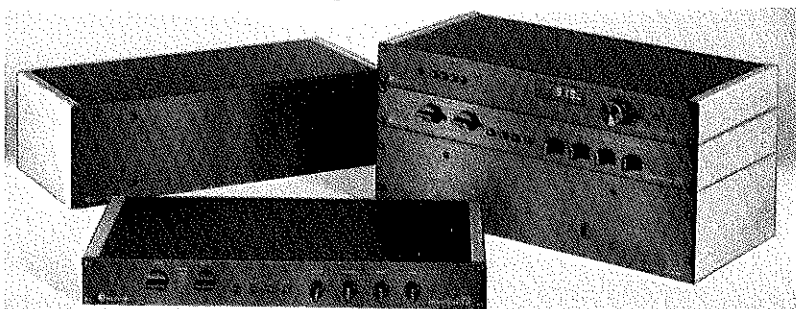
### BELLES I POWER AMPLIFIER

**Rated Power:** 20 to 20,000Hz with both channels driven 100 watts per channel into 8 ohms  
**Peak Current:** over 30 amps per channel  
**Distortion:** T.H.D. and I.M. less than 0.2% at rated power  
**Damping Factor:** greater than 150–20Hz to 20,000Hz  
**Input Sensitivity:** for rated output 1.15 volts  
**Input Impedance:** 30K ohms  
**Hum and Noise:** over 100dB unweighted  
**Crosstalk:** between channels: over 100dB  
**Frequency Response:** 3dB power, bandwidth, 0.25 to 50,000Hz  
**Dimension:** 19" x 5.5" x 10.5"  
**Shipping Weight:** 32 lbs.

### BELLES II POWER AMPLIFIER

**Rated Power:** 20 to 20,000Hz with both channels driven 50 watts RMS into 8 ohms per channel  
**Peak Current:** over 20 amps per channel  
**Distortion:** T.H.D. and I.M. less than 0.2% at rated power  
**Damping Factor:** greater than 150–20Hz to 20,000Hz  
**Input Sensitivity:** for rated output .89 volts  
**Input Impedance:** 30K ohms  
**Hum and Noise:** over 100dB unweighted  
**Crosstalk:** over 100dB  
**Frequency Response:** 3dB power bandwidth, 0.25 to 50,000Hz  
**Dimension:** 19" x 4.5" x 8.5"  
**Shipping Weight:** 18 lbs.

## The Belles Family



- The Belles One Power Amplifier—100 watts per channel
- The Belles Two Power Amplifier—50 watts per channel
- The Belles DMC Preamplifier—Discrete Moving Coil
- The Belles DMM Preamplifier—Discrete Moving Magnet
- The Belles DCA FM Tuner—Discrete Class A



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