OWNERS MANUAL

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 persons.

Intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CAUTION: Risks of electrical shock — DO NOT OPEN

CAUTION: To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer Servicing to qualified service personnel.

WARNING: TO PREVENT ELECTRICAL SHOCK OR FIRE HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. BEFORE USING THIS APPLIANCE, READ THE OPERATING GUIDE FOR FURTHER WARNINGS.
**FEATURES**

- Automatic two-speed fan cooling system/tunnel
- Independent channel thermal/fault protection
- Transient free turn-on/off operation (relay)
- One recessed crossover "island" socket for plug-in modules
- Two recessed balanced input transformer sockets for PL-2's
- Single XLR & dual phone plug inputs each channel
- Phone plug inputs are QUASI-ELECTRONIC BALANCED
- XLR input can be QUASI-ELECTRONIC BALANCED (push switch out, no PL-1 module)
- XLR input can be transformer balanced (push switch in, PL-1 module)
- Dual phone plug and 5 way binding post outputs each channel
- DDT™ activation LED & power LED each channel
- Calibrated/detented input attenuator control each channel
- Rear panel DDT™ defeat & bridge mode select slide switches

**DDT™ ACTIVE LED (1)**
Illuminates when DDT™ Compression is taking place. With the ENABLE/DEFEAT switch in the DEFECT position, the LED indicates when clipping distortion is occurring.

**POWER LED (2)**
Illuminates when AC power is being supplied to the amp, and the associated channel is operational. Illumination is delayed slightly during the power-up cycle due to the transient suppression/thermal/fault circuitry. If either channel were to experience fault conditions or to exceed the safe operating temperature limits, then that channel will shut down, and the associated power LED will go out, indicating such conditions exist. Also whenever the BRIDGE mode is selected, the power LED on channel B is defeated (OFF), just as if there were a fault condition on channel B. This provides a positive indication that the CS-400 is in bridge mode.

**INPUT SENSITIVITY (3)**
Maximum input gain (minimum sensitivity rating) is achieved at the full clockwise setting. A setting of less than full clockwise will yield lower system noise at the expense of headroom. Calibration indicates sensitivity in dBV necessary to attain full available output.

**POWER SWITCH (4)**
Depress to "On" position to turn on.

**CHANNEL A**
**HIGH Z INPUT JACKS (5)**
Two parallel (bridged) input jacks are provided. This allows for one to be used as a conventional input, and simultaneously the other to be used as a "line out" (Y-cord) to connect to another input jack on this amplifier or other amps/equipment. These ¼" jacks are not "chassis grounded" and when used will provide a QUASI-BALANCED input capability due to our unique "ground loop" elimination circuitry associated with the input. This feature will normally allow "hum free" operation when relatively short ¼" cable patches are made between the various jacks on this amp and other jacks on various other equipment that share the same rack with this amp. This QUASI-BALANCED capability is automatic and it can not be removed from the system's circuitry.
LOW Z INPUT (6)
A conventional three-pin, female XLR input jack is provided and may be used as the channel A input. When the (PL-2) line-balancing transformer is not used, this XLR input becomes QUASI-BALANCED with pin #3 as the positive input (connecting to the tip of the XLR input jack), pin #2 as the negative input (connecting to the floating sleeve of the XLR input jack), and pin #1 going to chassis ground. When the (PL-2) line-balancing transformer is used, this XLR input becomes fully TRANSFORMER-BALANCED (Pin #3 positive, pin #2 negative, pin #1 ground). (See the PL-2 SELECTOR SWITCH section for details on related settings)

PL-2 SELECTOR SWITCH (7)
This switch is to be used in conjunction with the PL-2 transformer to allow the LOW Z INPUT to function with or without a PL-2 module being inserted in the receptacle. A similar function was performed by using a PL-1 module inserted in the PL-2 receptacle on older amplifier models. The "OUT" position of this switch selects the QUASI-BALANCED mode of operation for the LOW Z INPUT (XLR jack), and routes the input signal directly to the HI Z INPUT JACKS. In this position the HI Z INPUT JACKS may be used as outputs after the LOW Z INPUT to allow patching this signal to another input on this amp. Normally, in this switch position, a (PL-2) transformer is not present ("OUT") in the transformer receptacle, however, if one were "IN" the receptacle, the LOW Z INPUT would still be QUASI-BALANCED. It becomes TRANSFORMER-BALANCED only when the IN switch position is selected. Notice this is a very effective means to "test" for the necessity of a line-balancing transformer. The "IN" position of the switch routes the input signals from the XLR jack through the (PL-2) line-balancing transformer thus selecting the TRANSFORMER-BALANCED mode of operation for the LOW Z INPUT. In this position the HI Z INPUT JACKS may be used as outputs after the line-balancing transformer to patch the signal to another input jack on this amplifier or other amp/equipment. If the "IN" position is selected without a (PL-2) line-balancing transformer "IN" the receptacle, the LOW Z INPUT will be rendered inoperable.

TRANSFORMER RECEPTACLE (8)
This receptacle only receives the optional (PL-2) line-balancing transformer. When conditions exist that demand the usage of a TRANSFORMER-BALANCED XLR INPUT at the input of channel "A", the (PL-2) transformer must be put here, and the selector switch must be in the "IN" position.

SPEAKER OUTPUTS (9)
Two ¼" jacks and 5 way binding post speaker output terminals are provided. All these outputs are in parallel, hence the speaker connection cables can be terminated with ¼" phone plugs, banana plugs, or stripped wires for use in the binding post terminals. For sustained high power applications, the use of the binding post terminals is recommended, however care must be exercised to assure correct speaker phasing. Regardless of what connections are used, the minimum parallel speaker load should be limited to 4 ohms. Operation at loads above 4 ohms and even open circuit conditions can always be considered safe, however sustained operation at loads below 4 ohms could result in temporary channel shutdown due to the thermal limits and/or the amp internal fault circuitry.

CHANNEL B
NOTE: On this channel a crossover module "ISLAND" has been provided to allow a PL-MODULE ELECTRONIC CROSSOVER to be used to perform a "BIAMP" function. Associated with this island are dual crossover input jacks, high and low output jacks, and a crossover receptacle. These will be discussed further in following sections but please note that the Channel B patches are somewhat different from those of Channel A.

HIGH Z INPUT JACKS (10)
Two parallel input jacks are also provided in this channel, allowing the flexibility of the Y-cord capability here as well. These jacks are also not chassis grounded and will provide a QUASI-BALANCED input capability. Both of these input jacks are "switching" type, where usage of either of these jacks disables the signal feed from the LOW Z INPUT circuitry associated with this channel. This is necessary to allow this input to be patched from the appropriate electronic crossover output jack & then use the LOW Z INPUT circuitry as the input for the electronic crossover. This feature prevents these jacks from being used as outputs from the LOW Z INPUT circuitry, as was possible with the Channel A input jacks.

LOW Z INPUT (11)
A conventional three-pin, female XLR input jack is also provided here, and it can be used as the channel B input, provided the HI Z INPUT jack is not being used. When the (PL-2) line-balancing transformer is not used, this XLR input becomes QUASI-BALANCED with the exact same pin-out arrangements as discussed for channel A. When the (PL-2) line-balancing transformer is used, this XLR input becomes fully TRANSFORMER-BALANCED, again with the same pin polarities as those presented for channel A. (See the PL-2 SELECTOR SWITCH section for details on related settings). The output of this low Z circuitry is always connected to the CROSSOVER INPUTS and thus this low Z feature can be used as the input for the crossover module if the application demands the use of an XLR connector.

PL-2 SELECTOR SWITCH (12)
The function of this switch is identical to that of channel A function. The "OUT" position of this switch selects the QUASI-BALANCED mode of operation for the LOW Z INPUT (XLR jack), and routes the input signal directly to the HI Z INPUT jacks, if these jacks are not in use. In this mode, the input jack is isolated from the CROSSOVER INPUTS and thus the signal source is not patched through the CROSSOVERS. Similarly, the "IN" position of the switch routes the input signals from the XLR jack over the (PL-2) line-balancing transformer thus selecting the TRANSFORMER-BALANCED mode of operation for the LOW Z INPUT. In this position the CROSSOVER INPUTS may be used as outputs after the line-balancing transformer to patch the signal to another input jack on this amplifier or other amp/equipment. Again selecting the "IN" position without a (PL-2) line-balancing transformer IN the receptacle will render the LOW Z INPUT inoperable and this switch can be used to test the "effectiveness" of TRANSFORMER BALANCING.

TRANSFORMER RECEPTACLE (13)
This receptacle only receives the optional (PL-2) line-balancing transformer. When conditions exist that demand the usage of a TRANSFORMER-BALANCED XLR INPUT at the input of channel "B", or at the input of the PL-MODULE ELECTRONIC CROSSOVER when BIAMPING then the (PL-2) transformer must be put here, and the selector switch must be in the "IN" position.
CROSSOVER INPUTS (14)
These are the HI-Z INPUTS for the ELECTRONIC CROSSOVER when installed. Two parallel input jacks are again provided at this point, allowing the flexibility of the Y-cord capability here as well. These jacks are also not chassis grounded and will provide a QUASI-BALANCED input capability to minimize potential ground loops. Again, this feature is automatic. As mentioned, the output of the low Z input circuitry of channel B is always connected to these inputs, which allow the LOW Z INPUT to be used as the ELECTRONIC CROSSOVER input if desired. These inputs then can be used as the FULL RANGE outputs allowing additional patching capability.

CAUTION: When a full range signal is patched into either the XLR input or the crossover inputs on channel B to feed the crossover module itself. This full range signal is also routed to the channel B input. The final patching from the crossover output to the channel B input disconnects this full range signal feed to the channel B input & instead is patched to the appropriate crossover-over signal. This occurs because the channel B input jacks are switching type. If you were to inadvertently disconnect the cable which is routing the crossover-over signal to the channel B input, the switching arrangement will feed a full range signal to that channel and could possibly destroy the transducer that is connected to this channel output. Always reduce levels before attempting to patch.

CROSSOVER MODULE RECEPTACLE (15)
This receptacle only receives the PL-MODULE ELECTRONIC CROSSOVERS. The PL-MODULES are optional accessories and are available in many different crossover frequencies. Some modules contain special equalization and special padding for a particular Peavey speaker enclosure. Always be sure to select the correct module for your speaker system. Other special purpose modules are also available for usage in this receptacle. As such this receptacle supplies both the input and output patch facilities and the power supply "feeds" for these active electronic devices.

CROSSOVER LOW OUTPUT (16)
This jack supplies the crossed-over low frequency output from the installed PL-MODULE ELECTRONIC CROSSOVER. This output must be patched to the appropriate power amp input jack to "create" an operational biampl system. On some special purpose modules, this output jack is not used.

CROSSOVER HIGH OUTPUT (17)
This jack supplies the crossed-over high frequency output from the installed PL-MODULE ELECTRONIC CROSSOVER. This output must also be patched to the appropriate power amp input jack to create an operational biampl system.

SPEAKER OUTPUTS (18)
Same function and comments as channel A.

MODE SWITCH (19)
This switch is used to select either STEREO or BRIDGE mode of operation.

DDT™ SWITCH (20)
This switch is used to either ENABLE or DEFEAT the DDT™ compressor.

FUSE (21)
The fuse is located within the cap of the fuseholder. If the fuse should fail, IT MUST BE REPLACED WITH THE SAME TYPE AND VALUE IN ORDER TO AVOID DAMAGE TO THE EQUIPMENT AND TO PREVENT VOIDING THE WARRANTY. If the amp repeatedly blows fuses, it should be taken to a qualified service center for repair.

WARNING: THE FUSE SHOULD ONLY BE REPLACED WHEN THE POWER CORD HAS BEEN DISCONNECTED FROM ITS POWER SOURCE.

MAINS POWER SOURCE (120V products only) (22)
The CS-400 is fitted with a single heavy duty #14 AWG, 3 conductor line cord and a conventional A.C. plug with a ground pin. It should be connected to an independent circuit capable of supporting at least 10 AMPS continuously or greater. This is particularly critical for sustained high power applications. If the socket used does not have a ground pin, a suitable ground adapter should be used and the third wire grounded properly. Never break off the ground pin on the CS-400. The use of extension cords should be avoided, but if necessary, always use a three-wire type with at least a #14 AWG wire size. The use of lighter wire will severely limit the power capability of this amplifier. Always use a qualified electrician to install any necessary electrical equipment. To prevent the risk of shock or fire hazard, always be sure that the amplifier is properly grounded.

INSTALLATION AND CONNECTION:
The Peavey CS-400 commercial series power amplifier is designed for durability in commercial installations and the quality of performance required in studio and home applications. The unit is a standard rack-mount configuration, 5¼" high and is cooled by an automatic two-speed internal fan. All input and output connections are on the back panel. The front panel contains LED indicators for power & DDT™ activation, detented/calibrated sensitivity controls, and a mains power switch.

INDUSTRIAL AND COMMERCIAL INSTALLATIONS
For commercial and other installations, where sustained high power operation is required, the amplifiers should be mounted in a standard 19" rack. It is not necessary to leave rack space between each amplifier in the stack, since the fan pulls air in from the rear and exhausting the hot air out the front. An adequate "COOL" air supply must be provided for the amplifier when rack-mounted. The internal fan must have a source of air that is not preheated by other equipment. The amplifier will start up in "LOW SPEED" fan operation, and will normally stay at low speed operation unless sustained high power operating levels were to occur. Then as the amplifier "HEAT SINKS" heat up, the automatic thermal sensor circuitry will cause high speed operation to occur. Depending upon signal conditions and amp loading, high speed fan operation may continue, or it may cycle continuously between high and low. This situation is quite normal. If cooling is inadequate due to preheated air, or a reduction of air flow occurs due to blockage of the amplifier inlet/outlet ports or if the amplifier is severely overloaded or short circuited, then the amplifier thermal sensing system may cause temporary shutdown of that particular channel. This is indicated by the channel power LED on the front panel ceasing to illuminate. Depending upon available cooling air, operation should be restored in that channel relatively quickly, and the power LED will be illuminated. In any event corrective action should be taken to determine the cause of the thermal shutdown. If the amplifier is not severely overloaded or shorted, and air flow is normal in and out of the amplifier, then steps should be taken to provide a cooler environment for all the amplifiers. As a general rule, the cooler electronic equipment is operated, the longer its useful service life. You have invested in the finest equipment that money can buy, and a little care will insure long and reliable operation.
STUDIO AND HOME INSTALLATION:
In most low to medium power applications, the power amplifier can be mounted in any configuration. It is desirable that, if at all possible, the power amplifier be located at the top of an equipment stack. This will prevent possible overheating of sensitive equipment by the hot air rising from the power amplifier. As a general rule, most home and studio requirements will never cause high speed fan operation. If it does however, this may indicate that you have not taken the necessary steps to provide adequate cooling. Remember...closed up in a cabinet; the CS-400 will have severe cooling problems, even at low power levels. Again, inadvertent short circuit or sustained overload usage could also cause temporary thermal shutdown. Also, most home wiring and electrical circuits are only 15 AMPS. Two CS-400's could cause 15 AMP circuit breakers to trip if a severe overload occurs.

BRIDGE MODE:
The bridge mode on stereo amplifiers is often misunderstood as to the actual operation and usage. In basic terms, when a two-channel amplifier is operated in the BRIDGE mode, it is converted into a single-channel unit with a POWER RATING equal to the sum of both channel’s "CONTINUOUS" power ratings, at a LOAD RATING of twice that of the single channel rating. For the CS-400 then, the BRIDGE RATINGS are 400 watts RMS (continuous) into 8 ohms (minimum load). Bridge mode operation is accomplished by placing the mode switch in the ‘BRIDGE’ position, connecting the load between the RED binding posts of each channel, and using channel A as the input channel. All the functions of channel B as an input are defeated, and they serve no purpose now.

Although this arrangement could now be used to drive a single 8 ohm enclosure, the real purpose for BRIDGE mode operation is to drive sound distribution systems in very large public address applications. In this mode, the CS-400 can actually drive 70 volt systems directly without using matching transformers. 70 volt distribution systems are very common in domestic applications where large numbers of relatively small loudspeakers are used for BACKGROUND MUSIC AND PAGING. Such systems require the use of 70 volt TRANSFORMERS at each loudspeaker. Subwoofer enclosures containing “two” to “four” speakers are excellent applications for bridge mode, but the enclosure impedance must be 8 ohms.

BRIDGE MODE
FULL RANGE STEREO

DDT™ Compression Should be Enabled for System Protection

Mode Switch Must be in "Stereo" Position

RIGHT OUTPUT FROM MIXER

LEFT OUTPUT FROM MIXER

NOTE: WHEN TRANSFORMER BALANCED INPUT IS NOT NECESSARY, HIGH Z INPUTS MAY BE USED

TO RIGHT SPEAKER

TO LEFT SPEAKER

BIAMPED MONO

DDT™ Compression Should be Enabled for System Protection

Mode Switch Must be in "Stereo" Position

NOTE: FOR TRANSFORMER BALANCED INPUT, INSTALL PL™2 AND PUSH SWITCH TO "IN" POSITION

FROM MIXER

INSTALL PL-MODULE CROSSOVER HERE

TO LOW FREQUENCY SPEAKERS

TO HIGH FREQUENCY SPEAKERS

BIAMPED STEREO

DDT™ Compression Should be Enabled for System Protection

Mode Switch Must be in "Stereo" Position

RIGHT OUTPUT FROM MIXER

LEFT OUTPUT FROM MIXER

NOTE: FOR TRANSFORMER BALANCED INPUT, INSTALL PL™2 AND PUSH SWITCH TO "IN" POSITION

INSTALL PL-MODULE CROSSOVER HERE

TO RIGHT LOW FREQUENCY SPEAKER

TO RIGHT HIGH FREQUENCY SPEAKER

NOTE: FOR TRANSFORMER BALANCED INPUT, INSTALL PL™2 AND PUSH SWITCH TO "IN" POSITION

INSTALL PL-MODULE CROSSOVER HERE

TO LEFT LOW FREQUENCY SPEAKER

TO LEFT HIGH FREQUENCY SPEAKER
b. Ship the defective item, prepaid to:

PEAVEY ELECTRONICS CORPORATION
Internal Service Center
Highway 80 East
MERIDIAN, MS 32301

including therewith a complete, detailed description of the problem, together with a legible copy of the original PROOF OF PURCHASE and a complete return address. Upon Peavey's receipt of these items:

if the defect is remedied under these limited warranties and the other terms and conditions expressed herein have been complied with, Peavey will provide the necessary warranty service to repair or replace the product and will return it, freight collect, to you, the purchaser.

Peavey's liability to the purchaser for damages from any cause whatsoever and regardless of the form of action, including negligence, is limited to the actual damages up to the greater of $500.00 or an amount equal to the purchase price of the product that caused the damage or that is the subject of or is directly related to the cause of action. Such purchase price will be that in effect for the specific product when the cause of action arose. This limitation of liability will not apply to claims for personal injury or damage to real property or tangible personal property alleged caused by Peavey's negligence. Peavey does not assume liability for personal injury or property damage arising out of or caused by a non-Peavey alteration or attachment, nor does Peavey assume any responsibility for damage to interconnected non-Peavey equipment that may result from the normal functioning and maintenance of the Peavey equipment.

UNLESS OTHERWISE STATED, Peavey Will NOT BE LIABLE FOR ANY LOST PROFITS, LOST SAVINGS, ANY INCIDENTAL DAMAGES OR ANY CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, EVEN IF Peavey HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

These Limited Warranties are in lieu of any and all warranties, express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular use, provided, however, that the other terms and conditions necessary to the existence of the EXPRESS, LIMITED WARRANTIES, as hereinabove stated, have been complied with, implied warrants are not disclaimed during the applicable one-year or ninety-day period from date of purchase of this product.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may NOT APPLY TO YOU. THESE LIMITED WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

These Limited Warranties are the only EXPRESS WARRANTIES on this PRODUCT, and NO OTHER STATEMENT, REPRESENTATION, WARRANTY OR AGREEMENT BY ANY PERSON SHALL BE VALID OR BINDING UPON Peavey.

In the event of any modification or disclaimer of express or implied warranties, or any limitation of remedies, contained herein conflicts with applicable law, such modification, disclaimer or limitation, as the case may be, shall be deemed to be modified to the extent necessary to comply with such law.

Your remedies for breach of these warranties are limited to those remedies provided herein and Peavey Electronics Corporation gives this limited warranty only with respect to equipment purchased in the United States of America.

INSTRUCTIONS — WARRANTY REGISTRATION CARD

1. Mail the completed WARRANTY REGISTRATION CARD to:

PEAVEY ELECTRONICS CORPORATION
POST OFFICE BOX 2698
MERIDIAN, MISSISSIPPI 32302-2698

2. IMPORTANT: Add the following information:

- Warranty Card 
- Customer Name
- Address
- Phone Number
- Serial Number

3. Keep a copy of the Warranty Registration Card and keep it with your equipment.

4. Please have the Peavey product name and serial number available when communicating with Peavey Customer Service.

Features and specifications subject to change without notice.

Peavey Electronics Corporation / 711 A Street / Meridian, MS 39302-2986 / U.S.A. / (601) 483-5365 Telex: 504115 / Fax: 484-4278
©1989 Printed in the U.S.A.