



# Spectro Acoustics

## HANDBOOK OF INSTRUCTIONS



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# *Spectro Acoustics*

## THREE YEAR WARRANTY PROGRAM

SPECTRO ACOUSTICS warrants that all new power amplifiers shall be free from defects in workmanship and material under normal and proper use and service for a period of three years from date of delivery to original using purchaser, and agrees to repair or replace all parts thereof showing such defects; subject to the following provisions.

Inspection shall disclose to SPECTRO ACOUSTICS' satisfaction that the defects are as above specified and that the equipment has not been altered or repaired by other than factory approved procedures, subjected to negligence, misuse or accident, or damaged by excessive current or otherwise, or had its serial number or any part thereof altered, defaced or removed, or has been used contrary to SPECTRO ACOUSTICS Handbook of Instructions.

This warranty is expressly in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on the part of SPECTRO ACOUSTICS. No person, including any dealer, agent or representative of SPECTRO ACOUSTICS, is authorized to assume for SPECTRO ACOUSTICS any liability on its behalf or in its name except to refer purchasers to this warranty. In no event shall SPECTRO ACOUSTICS be liable for claims, demands or damages of any nature, however denominated; SPECTRO ACOUSTICS' sole warranty liability shall be to repair defective items or to supply replacement parts in accordance with the terms of this warranty.

This warranty is valid not only for the original purchaser, but any and all subsequent owners for three years from original purchase.

SPECTRO ACOUSTICS reserves the right to make changes at any time prior to delivery to incorporated therein refinements deemed appropriate, but without incurring any liability to up-date any equipment delivered previously, or to supply new equipment in accordance with earlier specifications.

# PURCHASERS' WARRANTY RECORD

Registration For SPECTRO ACOUSTICS Three Year Warranty

Model: SPECTRO ACOUSTICS Model P-202

Serial Number: \_\_\_\_\_

Purchaser's Name: \_\_\_\_\_

Address: \_\_\_\_\_

Price Paid: \_\_\_\_\_ Date Purchased: \_\_\_\_\_

Date Warranty Card Mailed: \_\_\_\_\_

The above information becomes your permanent record of a valuable purchase. It should be promptly filled in at the same time the warranty registration reply card is filled in and mailed to SPECTRO ACOUSTICS. This information provides a valuable insurance record and must also be referred to should you have any correspondence with SPECTRO ACOUSTICS.

Contents of Carton:

SPECTRO ACOUSTICS Model P-202 Stereo Power Amplifier  
Handbook Of Instructions  
Warranty Registration Reply Card

(Notices and other enclosures may also be included.)

Before leaving our factory, your SPECTRO ACOUSTICS P-202 was tested and certified to be in perfect operating condition. This manual has been prepared to help you operate your P-202 as well as keep it in perfect operating condition. Your SPECTRO ACOUSTICS Model P-202, with care befitting all fine instruments, is capable of providing a lifetime of musical enjoyment.

Should there be any questions, please contact the SPECTRO ACOUSTICS National Service Manager at SPECTRO ACOUSTICS INC., 1308 E. Spokane St., Pasco, Washington 99302 (U.S.A.)

# IMPORTANT

## AFTER UNPACKING

It will be advantageous to save all of the packing materials, cartons, fillers, cushioning, etc. The packing materials have been designed especially for the P-202, and will prove valuable in preventing damage, should it ever become necessary to transport or ship the power amplifier.

Please inspect the Model P-202 carefully for any signs of damage incurred in transit. It has undergone a very strict quality-control inspection system and tests, prior to packing; thus it left the factory in perfect operating condition. If damage is discovered, notify the transportation company without delay. Only the consignee may institute a claim with the carrier for damage incurred during shipment; however, SPECTRO ACOUSTICS will cooperate fully in such an event. Save the carton as evidence of damage for their inspection.

# INTRODUCTION

## THE SPECTRO ACOUSTICS MODEL P-202 POWER AMPLIFIER

The SPECTRO ACOUSTICS P-202 Power Amplifier has been designed and constructed to offer the true audiophile uncompromised performance and reliability at the lowest possible price. Its performance both on the test bench and in the sound room is comparable, if not superior, to any product in its power range; at any cost.

### CONSTRUCTION:

The SPECTRO ACOUSTICS P-202 is the first and only Power Amplifier to utilize Scamp\* construction. This modular construction technique consists of self contained amplifier modules, one for each stereo channel. The Scamp\* module contains all of the electronic circuitry for a complete amplifier from the balanced differential input stage right through to the rugged epitaxial silicon output devices. Each Scamp\* module contains twelve silicon transistors and twelve silicon diodes; along with an assortment of high quality 5% tolerance resistors and ceramic, mylar and aluminum electrolytic capacitors. The Scamp\* modules are designed to be fully interchangeable and can be replaced for instant action warranty service with a screwdriver as the only required tool. Should your P-202 ever fail to perform to its specifications; your dealer will be able to, in 99% of all cases, replace the defective Scamp\* module the same day, or possibly even while you wait.

### TEST SHEET:

You will notice that we have included with your P-202 an individualized final testing sheet, showing the end results of our quality assurance and testing facilities. Each Scamp\* module is individually numbered, both on your copy of the test results and on the module itself. This test sheet assures you that your particular amplifier has been fully tested, and indeed, meets or exceeds its specifications.

### VENTILATION:

The Model P-202 has been designed as a basic Power Amplifier and therefore all redundant control functions have been eliminated. AC line switching can be accomplished; if needed, by using the switched outlets on your preamplifier to power the P-202; or preferably, the P-202 may be left plugged in continuously as long as the vent slots and heatsink fins are allowed to "breathe" freely. If you have purchased the optional cabinet sleeve, this free air circulation is assured as long as the heatsink fins are not covered above by overhanging books, other equipment, or any other material. If you have chosen to use your P-202 without the optional cabinet, be sure to set the amplifier on a hard, flat surface. This insures that the vent slots on the bottom of the unit will not be clogged by carpeting, etc. All bench testing should be done without the cabinet in place.

### PRECAUTIONS:

Aside from the precaution of allowing free air circulation through

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the vents and heatsink fins, only one other warning is necessary. That is.... Never, under any circumstances should the output of either channel be connected to an active voltage source. In other words, the output of a channel should only be connected to passive loads; such as, speakers, resistors, capacitors, coils open circuits or short circuits. Never should an output be connected to another output; such as, a battery, the AC line, etc.

#### INTERNAL PROTECTION SYSTEM:

As long as these two basic precautions are heeded the P-202 is basically indestructible from the outside. A filter is provided at each input to prevent RF energy from getting into the amplifier. Each Scamp\* module has power (VI) limiters built in, which constantly monitor both the voltage across the output transistors and the current through them. Should any condition develop that would force the amplifier's output transistors into an unsafe operating area (shorted output, or improper load) these limiters instantaneously remove all drive from the output transistors until the unsafe condition is remedied. These limiters are fully automatic and require no resetting. Also included on each Scamp\* module are two fast acting fuses. These fuses safeguard the power supply components and the passive Scamp\* components should an output transistor actually fail. No attempt should be made; therefore, by the user, to replace either of these two internal fuses.

#### SPEAKER PROTECTION FUSES:

Speaker protection fuses are provided on the rear panel, directly above the output connectors. The P-202 is shipped with four ampere AGC type fuses installed. We recommend that these fuses be replaced only with the same type and current rating. However, should it be desirable to substitute a smaller current rating fuse in order to provide even greater speaker protection, this is acceptable. The fuses provided have been selected so as to allow full power sine wave operation into eight ohm loads for bench testing. The four amp fuses will also allow full power music operation into speaker loads as low as four ohms. Should it be desired make full power sine wave performance tests into four ohm resistive loads, it is permissible to use fuses rated up to 6 amps, AGC type. These higher current fuses do not provide adequate speaker protection for the typical Hi Fi speaker, however, and it is strongly recommended that the 4 amp AGC fuses or smaller remain installed for listening purposes.

#### LINE FUSING:

Also provided on the rear panel is the line power fuse, type AGC, rated 5 amperes. This fuse must be replaced only with a 5 amp AGC fuse.

#### CLIPPING INDICATORS:

The P-202 is provided with a unique and useful circuit which detects and indicates "clipping" instantaneously and very accurately. For those not familiar with the term "clipping", it is the phenomena which results

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from overdriving or saturating the amplifier. Clipping occurs when the output of the amplifier is driven either positive or negative, to a voltage which is equal to, or greater, than the power supply's available voltage. The resultant wave form has the characteristic "flat top" or clipped appearance.

During musical program material, it has been shown that peaks on the order of ten times the average power level are quite common. In other words, if using an amplifier capable of producing 100 watt levels without clipping, and using normal music program material at an average power level of ten watts, you can be assured that, during peaks, clipping is occurring in the amplifier; although, because of the masking effect associated with human hearing, very short duration clipped peaks cause no noticeable distortion. Sustained clipping, however, causes definite audible distortion and for good Hi Fi reproduction of sound should be avoided by reducing the overall level, using the preamp volume control.

The clipping indicators provided in the P-202 are instantaneous responding. For this reason, even a few microseconds of clipping will trigger the circuit and will be indicated on the front panel. Therefore, one might be surprised to see the clipping indicators activate during even medium level musical program material from time to time. This is a normal phenomena which will occur in any amplifier of equivalent power, and therefore, no cause for alarm. The P-202, with its instantaneous indicators, merely brings this fact to your attention. If, however, the indicators are constantly being turned on by every loud passage or impulse, this indicates sustained clipping, and for the best and truest reproduction, the signal level should be lowered to the point where clipping only occurs on the most explosive transients.

The indicators are meant to perform as a guide in setting maximum signal levels, as are the more common VU meters. Unfortunately, conventional VU meters are very slow responding and cannot accurately indicate overdrive or clipping in musical material. Added to this is the fact that no two speaker systems exhibit the same impedance characteristics. The clipping indicator circuitry in the P-202 automatically takes this into account and indicates at the clipping point; regardless, of variations in speaker impedances, line voltage, etc. Standard VU meters simply measure and indicate the average output voltage; whereas, clipping indicators take into account line voltage, speaker impedance and output voltage; giving an accurate indication of the status of the musical signal: Either absolutely pure and undistorted or clipping.

By the way, clipping the P-202, even continuously, is not harmful to the unit in any way, giving rise to the fact that the clipping indicators are intended as a helpful guide only. The listener's ears should be the final criterion in level setting.

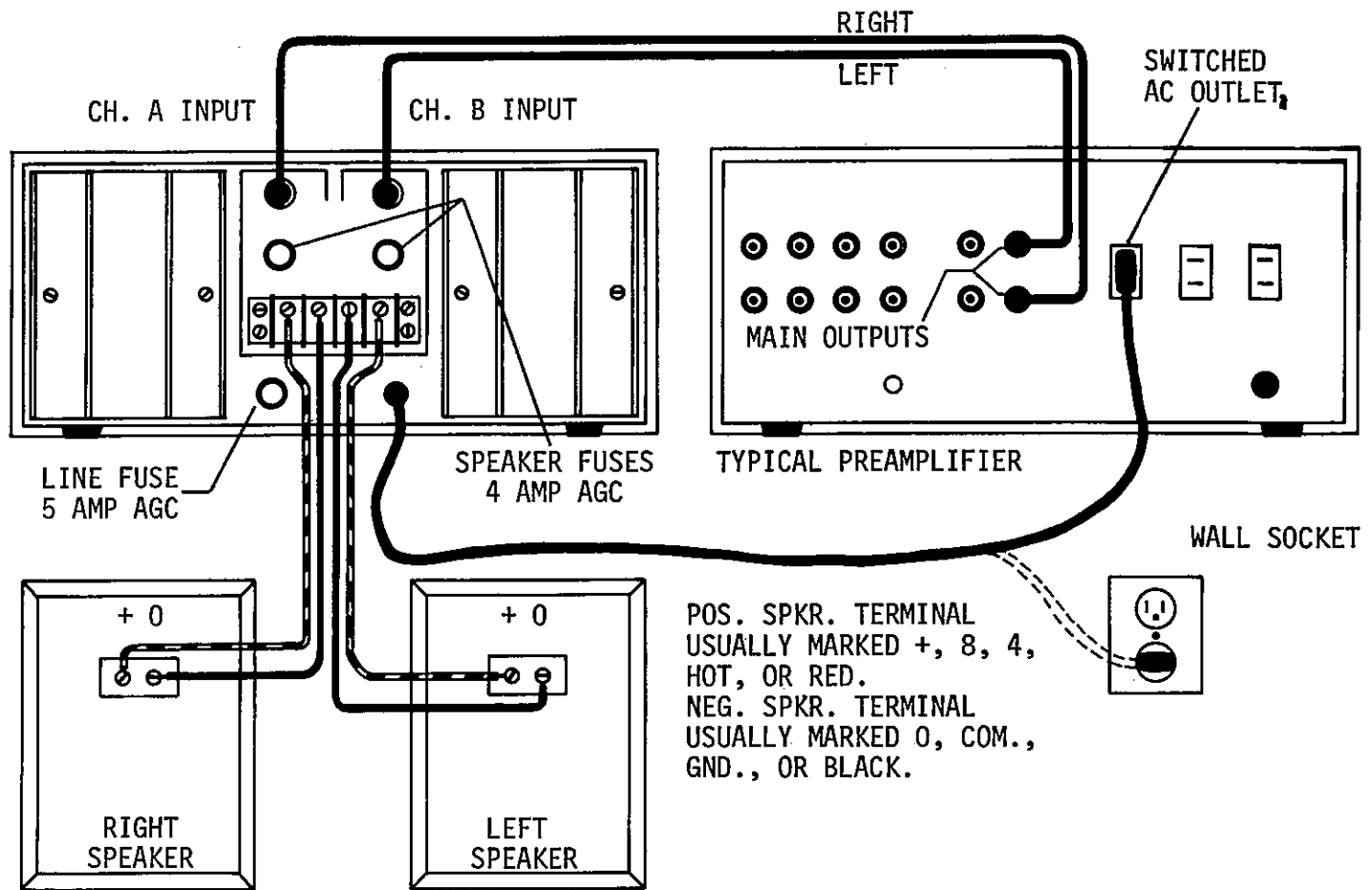


Figure I

HOOKUP PROCEDURE:

Figure I illustrates the correct method of connecting the P-202 to your speakers. Heavy duty AC line cord of 18 gauge wire is recommended for the speaker connections. Make sure all connections are made properly. Caution: As previously mentioned, never connect the output terminals of one channel in parallel with those of any other.

Correct speaker phasing must be observed when connecting the P-202 to your speakers. If the polarities of the speakers and the amplifier are not matched correctly, sound cancellation will occur at some frequencies. Proper phasing can be obtained quite simply by making sure that the ground leads from the amplifier are connected to the common or ground leads on the speakers. The positive leads to the speakers must correspondingly run to the "hot" terminals on the P-202

To connect the P-202 to your preamplifier, use standard shielded audio cables with RCA pin plugs on both ends.

As previously stated, the AC line cord may either be connected directly to a wall socket and the P-202 left on continuously; or if preferred, may be connected to any switched outlet on the back of your preamplifier.

#### INITIAL USE:

After double checking all connections, turn your preamplifier's volume control all the way down and apply power to the P-202. The front panel logo should light up in blue, and upon initial turn-on the clipping indicators should both turn on for an instant and then go off. No loud thumps or ticks should be heard from the speakers, either upon turn-on or turn-off; due to a specially designed input stage in the P-202.

Gradually turn up the preamplifier's volume control until music is heard through the speakers. Verify, by listening, that no audible distortion, oscillations or other audible malfunctions are occurring.

To verify the operation of the clipping indicators; increase the volume control setting until, on peak passages, the indicators show amplifier clipping.

Any problems encountered should be reported immediately to your dealer before filling out and returning the warranty registration card. If the P-202 has been damaged in transit; your dealer may, at his option, simply replace it with a new unit; relieving both the dealer and the factory of extra paperwork, and providing you, the user, with a new unit. This applies to problems encountered within the first ten days after purchase.

#### CLEANING:

To keep your Model P-202 Power Amplifier clean and looking like new, occasionally clean the front panel with a soft paper towel and full strength ammonia. This will remove dulling films which have a tendency to build up on the brushed finish. Cleaning of the top and back is accomplished in the same manner.

#### REPAIR FACILITIES:

Only qualified technicians should be allowed to repair your SPECTRO ACOUSTICS P-202. The SPECTRO ACOUSTICS factory and its authorized warranty stations have the personnel and equipment to repair your P-202. Should you have any troubles with your Power Amplifier, ask your dealer or write to the factory for the address of the nearest repair facility. Please include the model and serial number of the Power Amplifier, together with a description of the problem.

#### SHIPPING:

Never ship your SPECTRO ACOUSTICS P-202 in any shipping carton other than the original or a replacement supplied by SPECTRO ACOUSTICS. For a free replacement, write to the factory or see your local dealer. If the Power Amplifier is shipped in any other than the original carton; which is properly packed, all damages must be paid for by the party shipping the Power Amplifier. Ship only via a reputable carrier! DO NOT USE PARCEL POST. Insure the unit for the full value and double check to ensure the unit is properly packaged. Do not ship manuals, please.

RETURN AUTHORIZATION:

No Power Amplifier should be returned to the factory without an Authorization Return Card, which will be supplied by SPECTRO ACOUSTICS. Write to the factory, in care of the National Service Manager. Packages returned without an authorization card will not be accepted.

## SPECIFICATIONS

### POWER OUTPUT FTC:

100w RMS per channel.

(Both channels driven, 8 ohms, 20Hz to 20KHz, with less than .15% THD)

### TYPICAL POWER AT CLIPPING:

150w RMS per channel.

(Each channel driven, 8 ohms, musical program material.)

### DISTORTION:

THD - less than .15% at any frequency between 20Hz and 20KHz and at any power level from 250mw to 100w into 8 ohms.

IM - less than .15% standard SMPTE test frequencies, 60Hz & 7000Hz, mixed 4 to 1.

### FREQUENCY RESPONSE:

20Hz to 20KHz     + 0.25dB

10Hz to 40KHz    + 1.0dB

5Hz to 80KHz     - 3.0dB

Measured at 1 watt output level into 8 ohms.

### HUM & NOISE:

Better than 100dB below full output, unweighted.

### SENSITIVITY:

1 volt RMS input for 100 watts into 8 ohms.

### INPUT IMPEDANCE:

Greater than 30K ohms.

### OUTPUT CAPABILITIES:

Voltage at Clipping---35 to 24 volts RMS, depending on load and duty cycle.

Min. Recommended Load---4 ohms loud speaker per channel.

Damping Factor---150+

Stability---Unconditionally stable under any load, including electro static speakers.

### DIMENSIONS:

15" wide x 6" high x 11½" deep

### WEIGHT:

25 pounds, shipping.

