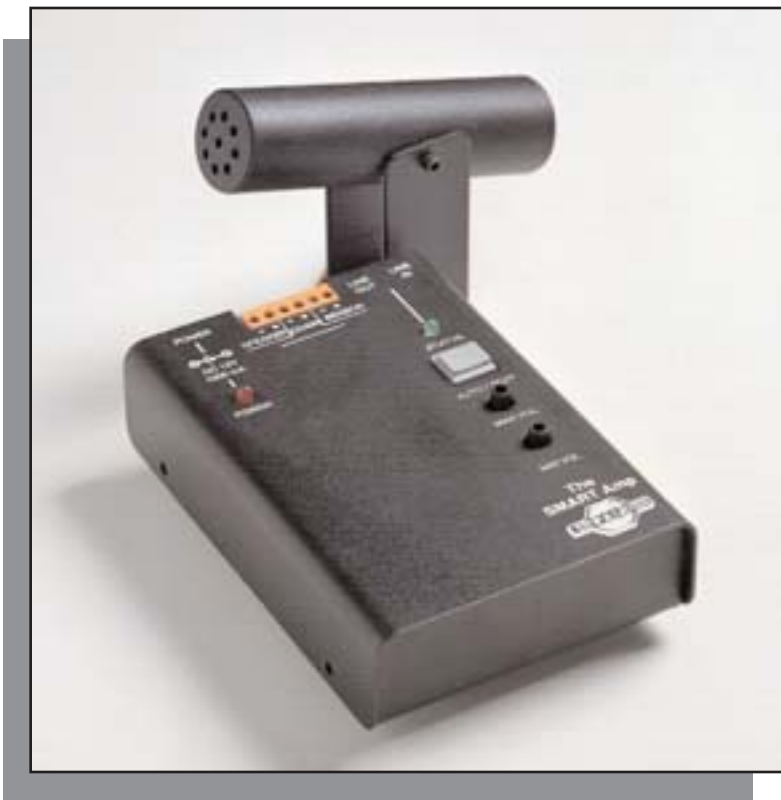


# The SMART AMP

## INSTALLATION and OPERATING INSTRUCTIONS



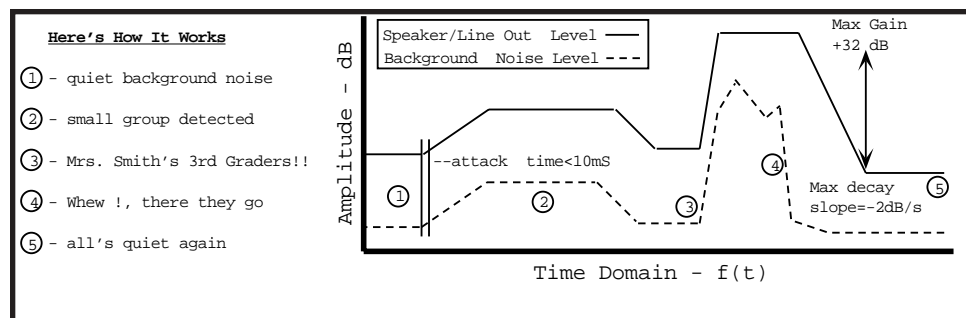
Prior to connecting your SMART AMP from Stop and Listen we strongly recommended you read through these instructions from beginning to end to familiarize yourself with the installation and operation of the device.

In order to validate the warranty, please be sure that the enclosed Warranty Registration form has been filled out.

## OVERVIEW

Thank you for purchasing the SMART Amp from Stop and Listen. As you go through this booklet we hope that we'll answer any questions you may have about the installation and operation of the device. If, on completing this booklet you still have questions, please don't hesitate to call. Our technical support staff will be able to provide you with the answers you need.

The SMART Amp is a high-fidelity monaural 8 watt 'utility' amplifier that provides automatic attenuation (volume) control. Using the supplied audio sensor, it listens to the background noise levels in your exhibit area, then adjusts the output volume to the speakers to compensate. If the area is relatively quiet, the sensor instructs the amplifier to turn the volume down (staff really like this feature). When a large group enters the area, such as Mrs. Smith's 3rd-grade history class, the sensor measures how much the speaker volume should be raised to compensate, then sends the instructions to the amplifier (visitors like this feature). The overall effect is that audio can be heard clearly at all times, while 'spillover' during quiet times is kept to an absolute minimum.



*The SMART Amp continuously adjusts output volume on a real-time basis, in order to keep current with constantly changing noise levels in the exhibit area.*

As the chart above illustrates, the SMART Amp responds almost instantaneously to sudden increases in noise levels. In this way, the audio will still be heard clearly even over occasional 'bursts' such as kid's yelling, clapping, etc. After that, the audio will subside slowly (over about 20 seconds), to minimize 'roller coaster' effects of the SMART AMP trying to follow too closely.

*It is a good idea at this point to read through the sections on Installation and Setup from beginning to end before actually proceeding with the physical wiring. This will help to eliminate any installation problems before they arise.*

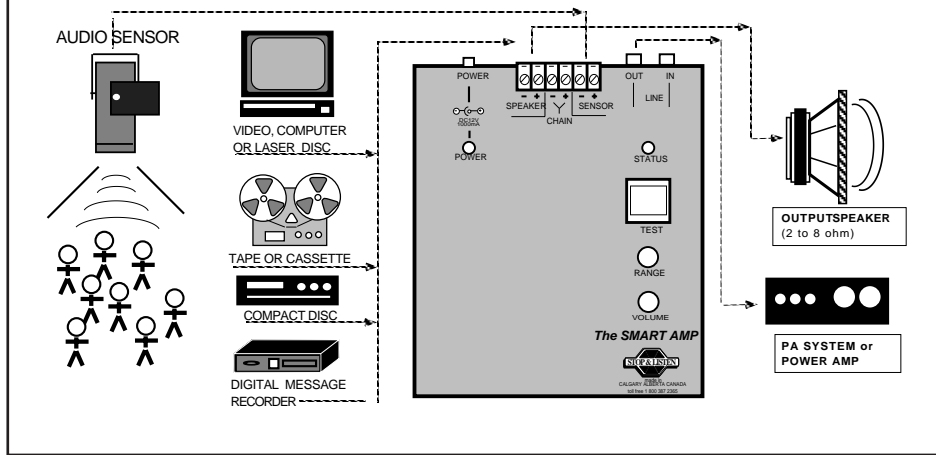
**MAKING AUDIO  
EASY...**



OVERVIEW



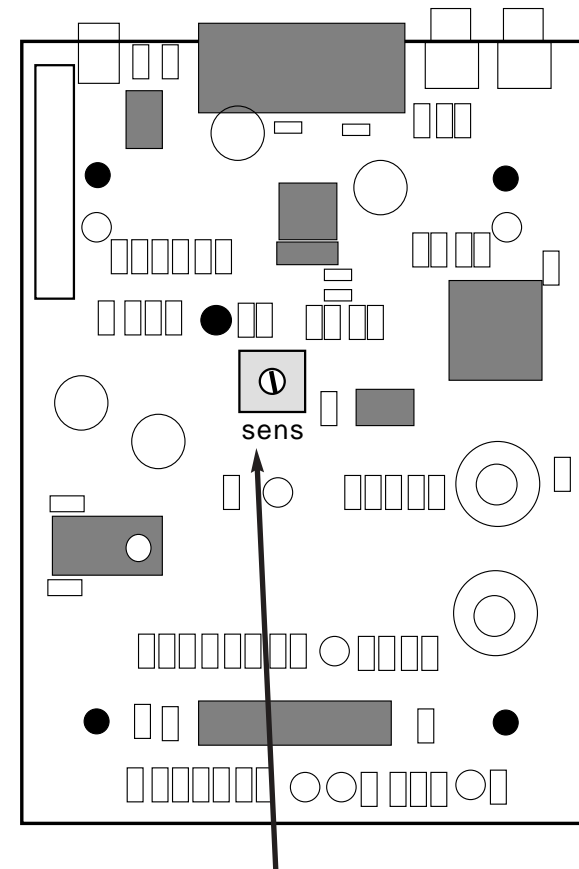
# WIRING CONNECTIONS



- POWER -** requires 12 volt DC. Use supplied wall-plug adapter or equivalent. (center pin is positive). Power indicator should light.
- SPEAKER -** Amplified audio output connection. Connect to loudspeaker or other output devices. Check and maintain polarity. Can drive loads with impedance as low as 2 ohms.
- CHAIN -** OPTIONAL - Used where more than one SMART AMP is connected to a common (shared) audio sensor - max 3 units. Parallel connection to SENSOR input of next SMART AMP unit.
- SENSOR -** connect to supplied audio sensor. Orange wire on sensor is positive, black is negative (ground). These connections provide both power output (max 14 VDC) to the sensor and accept feedback signals from the sensor. The sensor is equipped with a power LED. Use minimum 22 AWG FT4, 2-conductor stranded wire.
- LINE IN -** Line level source input, unbalanced, 10K impedance. Use included audio patch-cords to connect from Line-Out or headphone output of audio source (CD or video player, monitor, etc.)
- LINE OUT -** Line level output. Connect to input of external amplifiers etc. where desired.

# SENSOR SENSITIVITY -

The diagram below outlines the location of the audio sensor sensitivity control on the printed circuit board that can be adjusted to make the sensor either more (CW) or less (CCW) sensitive to background noise levels. A small precision screwdriver should be used. Approximate factory (shipping) setting is shown by default. Ensure power is disconnected prior to opening case.



## SENSITIVITY

Adjusts how reactive the SMART Amp is to background noise levels. Too sensitive will make the system prone to audio feedback from the speaker, ie the unit won't settle down. Not sensitive enough and the unit won't react positively to increases in background noise. Once sensitivity has been adjusted, the likelihood of have to set it again is almost zero.

WIRING CONNECTIONS

**STOP & LISTEN**

RESETTING PARAMETERS

**STOP & LISTEN**

## INSTALLATION AND SET-UP

*The initial installation and setup of the SMART Amp can be performed during non-peak hours, however it is recommended that a pre-view be conducted prior to installation to ascertain ambient vs. high-traffic background noise levels. Final level adjustments should be made under 'real' conditions.*

Find a suitable location for the sensor. See section **SENSOR INSTALLATION NOTES** below. The sensor mounting bracket can be mounted on a rigid surface using #6 screws or by using a 3/8" dia threaded bushing (available from most lamp and hardware stores) through the larger hole in the bracket. Orient the sensor towards the noise source but away from the output speakers. Alternatively, the sensor can be hung from the ceiling.

Connect the orange (positive) and black (negative) sensor wires to the SMART Amp connector block using appropriately rated cabling. (MIC cable is not required.)

Connect the audio source to the LINE IN jack of the SMART Amp using the supplied patch cords. Connect the output speaker to the connector block on the SMART Amp. If the SMART Amp is to be used with external amplifiers, PA systems, etc. connect to the SMART Amp LINE OUT jack.

Connect the power supply (supplied) to power up the system. The POWER indicator lights on both the SMART Amp unit and the sensor unit should be on.

With the audio source playing through the output speaker, press the TEST button. The STATUS indicator will come on indicating you are in TEST mode. Set the VOLUME control to the desired maximum level. This is the upper audio level that the SMART Amp will attain when the sensor detects high background noise levels.

Set the RANGE control to maximum (clockwise) to obtain the largest differential between the upper and lower audio levels. Press the TEST button again so that the STATUS indicator goes out. The SMART Amp is now in the 'RUN/AUTO' mode. The audio output level should now subside to the lower level over about 20 seconds. Make a noise in proximity to the sensor and the audio level should rise again until the noise level subsides.

If the audio fails to subside it is likely that the sensor is receiving acoustic feedback from the speaker. Cup your hand over the front of the sensor to test. It may be necessary to find a better location for the sensor or adjust the sensor sensitivity. If the SMART Amp fails to respond to the noise, it may be necessary to adjust the sensor sensitivity. Refer to the section following on SENSOR SENSITIVITY.

## INSTALLATION AND SET-UP (cont'd)

Once the system is up and running properly the RANGE control can be used to limit the difference between the upper and lower audio output levels. Turning the RANGE control counter-clockwise has the effect of raising the lower audio output level.

It will probably be necessary to make some final adjustments under 'real' operating conditions.

### SENSOR INSTALLATION NOTES

To ensure proper operation of the SMART Amp, special care and attention should be taken, particularly when finding a suitable location for the audio sensor.

The sensor is, by its nature, susceptible to two kinds of audio feedback. These can be caused by **mechanical coupling** (vibration of the mounting surface or the sensor case itself) or by **acoustic coupling** (when the sensor picks up too much energy from the audio waves transmitted in air).

To reduce the risk of mechanical coupling, the sensor has been designed with a heavy case which requires substantial amount of energy to oscillate at audio frequencies. Even so, consideration should be given to finding a suitably rigid surface. Surfaces that are also coupled with rotating equipment such as electric motors, air-conditioning equipment, or pumps are the worst offenders. A good rule of thumb is to simply feel the surface for vibration. As an extra precaution the sensor can be 'shock' mounted using dense foam rubber or similar product.

To eliminate the risk of acoustic coupling, it is advisable to find a location a suitable distance from the output speaker but where the background noise that the sensor will monitor is still representative of the noise levels to be expected in the listening or viewing area. Normally, 15 to 20 feet is more than adequate. Distances will increase or decrease according to the overall output level. It should be noted that the sensor is omni-directional, while most broadcast speakers are fairly uni-directional. Consideration should therefore be given to locating the sensor outside of the projection area of the source speaker. The sensor should NOT be mounted in the same enclosure with the speakers.

Some of the best locations for the sensor will be behind the plane of the speakers. In the case of speakers that are specifically designed to be directional, the sensor can be mounted behind or above the speaker and hence much closer to the speaker itself, particularly when the typically low output levels of this type of speaker are taken into account.

INSTALLATION and SETUP

STOP & LISTEN

INSTALLATION and SETUP

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## OTHER FEATURES

### INTERNAL FUSING

The SMART AMP is internally fused using a 1Amp Type 3AG fuse. The most common reason why the fuse trips is because either the power polarity is incorrect or there is a short-circuit in the external wiring. Replace only with same type fuse.

### POWER AMPLIFIER

Every SMART AMP from Stop and Listen incorporates protection circuitry that provides complete protection for the power amplifier. Even if the speaker output is run into a dead short, this circuitry pulls the amplifier out of circuit until the situation is corrected, eliminating costly repairs and down time.

### SENSOR FILTER CIRCUITRY

The audio sensor component of the SMART AMP incorporates bandpass filter circuitry to eliminate and reject spurious noise sources such as air conditioning and mechanical vibration, along with on-board signal amplification. For hookup, standard 2-conductor wiring is sufficient regardless of run length to connect the sensor to the SMART Amp, unlike traditional, more expensive systems that require expensive microphone cabling.

### REMOVABLE CONNECTOR BLOCK

The connector block on the SMART AMP is removable to facilitate easy changing of the unit. Use a small screwdriver to gently pry the connector towards the back of the SMART AMP. To reconnect, simply plug it back in.

### WALL MOUNTING

To wall mount the amplifier unit, simply attach angle brackets, available at most hardware stores, to the 4 chassis screws on the sides of the unit and then fasten to mounting surface.

## CARE AND CLEANING

Your new SMART Amp has been designed and constructed for the utmost in quality and durability. Because of its 100% solid-state design, the only thing you should ever have to do is dust it with a dry cloth. A cloth dampened with a mild soapy water solution can also be used. Do not immerse the unit in water.

If any of the cords become damaged or frayed they should be replaced immediately to avoid damage to the equipment or any peripheral devices.

Where the equipment may be subject to extreme humidity or free standing water, the unit should be enclosed in a water-tight and dust-proof enclosure. These can be found (typically stocked) at an electrical supply store. All connections to outside equipment should be through the bottom of the enclosure through a "gland nut" packing or equivalent water-tight connector.

Where substantial vibration is anticipated the units should be shock-mounted using appropriate fasteners and all associated wiring and connections should be well secured.

## Specifications: The SMART Amp

Monaural 8 watt Hi-Fi Audio Amplifier with built-in limiter and auto output attenuation

Frequency Response	20 Hz-20 KHz +/- 3dB
Signal/Noise Ratio	80dB @line-out @max gain
Audio Input	Line Level (200 mV to 16.0V p-p sensitivity), built-in limiter function
User Controls	Attenuation range, master volume, AUTO/TEST mode, sensor sensitivity
Indicators	AUTO/TEST Status, POWER/sensor Status
Audio Sensor	Condenser type, includes feedback suppression filters
Audio Output Connections	2 to 8ohm, 8 watts @ 4 ohms, adjustable Line in, line out, speaker out, power, sensor (via 6 pin ejection header) Chain: allows for daisy-chaining Smart Amps to a single sensor
Output Tracking	10ms attack resp., linear tracking, max 20dB atten., max decay = -2dB/s
Power Consumption	500 mA @ 12 VDC (typical, average)
Construction Standard	Industrial/Commercial, carbon steel enclosure
Operating Temp	-20°F to +130°F (-30°C to +55°C)
Dimensions, Weight	4.00"w x6.00"d x1.25h, 1.8 lb
Warranty	5 year parts and labor

### WARRANTY

This Stop and Listen Inc. product is warranted against defects in workmanship and materials. If any failure resulting from a defect in either workmanship or material shall occur under normal use within 5 years from the original date of purchase, such failure shall be corrected free of charge to the original purchaser by repair or, at Stop and Listen Inc.'s sole option, replacement of the defective part or parts. No charge shall be made for labor or services performed during said 5 year period providing the product is delivered to an Authorized Service Center. This warranty does not cover equipment which has been tampered with in any way, or damage caused by accident, negligence, alteration, or misapplication. This product must be returned transportation prepaid, properly packed and insured. This warranty applies only to the original purchaser.

NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED. STOP AND LISTEN INC. IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES.

OTHER FEATURES

**STOP & LISTEN**

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**STOP & LISTEN**