



# FAPSUB

## Strategy Series® II In-Ceiling 70.7V / 100V / 8Ω Subwoofer System

### Features

- Tuned and Ported, Long Excursion 8" Subwoofer System Produces Amazing Extended Low Frequency Response in Ceiling Speaker System
- High Efficiency, Passive Crossover Network Eliminates the Need for Dedicated Amplifier and/or Active Crossover
- Low Crossover Point Greater Relocation (Ability of Listener to Identify the Subwoofer Location)
- Front Mounted Tap Selector for Easy System Tuning Adjustment Includes Transformer Setting for 8Ω / Direct Coupled Operation
- Easy Installation in Drop or Suspend Ceiling with a C-Ring / V-Rail Tile Bridge and "Dog Leg" Mounting System (Included)
- Uniquely Designed, Easy Access Input Panel Allows All Connections for Through Conduit Runs Using Flexible or Rigid Conduit
- Detailed, Phoenix Style, Locking, Four Pin Connectors for Easy Daisy Chain Wiring
- Attractive Stud Mount Grille Matches Aesthetics of Other Atlas Sound FAP Series  
UL Listed – 1480

### Applications

In recent years, there has been a significant increase in market demand for commercial sound systems to deliver high quality sound. Retail, restaurant, and hospitality owners and managers are finding that their customers are expecting the quality of their shopping or dining experience to be enhanced by music reproduced at nearly the same sound quality they expect in their homes and car stereos. Business owners now realize that the customer satisfaction caused by a quality audio system can turn into increased customer satisfaction. The FAPSUB, when used in conjunction with other Atlas Sound full-range speakers, provides great sounding background and foreground music reproduction suitable to these applications.



FAPSUB  
(back)



FAPSUB

### Specifications

Woofer Size:	8" (203mm)
Woofer Impedance:	8Ω Direct Coupled (Nominal)
Transformer Taps at 70.7V:	1.9, 3.8, 7.5, 15, 30, & 60 Watts
Power Handling:	100 Watts RMS
Sensitivity (1 W / 1 M):	89dB Average
Frequency Response:	45Hz – 12kHz (±10dB), 55Hz – 10kHz (Nominal)
Dispersion:	180°
Low Pass Filter:	2nd Order Design 18dB / octave @ 400Hz
Magnet Weight:	Nominal 20 (580g)
VC Diameter:	35.5mm
VC Material:	Aluminum
VC Former Material:	Kapton®
Cut-out D:	4" (355mm)
Height:	12¾" (324mm)
Diameter:	15¾" (400mm)

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## General Description

The FAPSUB consists of a highly efficient 8" subwoofer designed for optimal performance in its included enclosure system. The woofer features an extended, vented pole piece for higher excursion and better heat dissipation and a Kapton® voice coil former for increased power handling.

A highly efficient, 3-pole filtering network eliminates unwanted high frequencies from the woofer, while the 937 in<sup>3</sup>, tuned and ported, deep drawn steel enclosure provides frequency response down to 45Hz (±10dB). A specially designed rippled speaker dust cap helps eliminate nearly all frequency artifacts emanating from the center of the woofer cone.

A special low saturation 70.7V / 100V transformer is included with primary taps at 1.9, 3.8, 7.5, 15, 30, and 60 watts (@70.7V) to match and balance the subwoofer with full range speakers without the need for separate amplification. A convenient front mounted selector switch allows tap selection without the need to remove the speaker from the ceiling. This tap selector switch also includes a transformer bypass setting for 8Ω / direct coupled applications.

Mounting is simplified with Strategy Series® style "Dog Leg" tabs that allow easy installation into drop tile or drywall ceilings with the provided tile bridge assembly. The tile bridge consists of two "V" shaped formed mounting rails and a C-Ring assembly. The C-Ring can be attached to the rails with the screws provided to extend support to the T-Bar grid in suspended ceiling applications. Multiple hole locations are provided to allow the C-Ring to be positioned to the outer edge the tile if necessary.

For existing dry-wall applications, the tile bridge C-Ring and support rails can be inserted into the hole cut for the FAPSUB. For easy positioning the "V" shaped support rails match the shape of the C-Ring to ease maneuvering and location when working "blindly" above the deck.

For new construction drywall ceiling applications, the optional P82-T trim ring is available. This unit provides a marked location for dry wall installers to cut around, essentially reserving the desired location in the ceiling until final installation of FAPSUB. Mounting holes are provided to accommodate 16" or 24" OC stud / joist mounting.

A support ring is also provided on the top of the enclosure to facilitate an auxiliary support cable.

**NOTE: IT IS MANDATORY THAT THIS SECONDARY SUPPORT BE UTILIZED IN DROP CEILING REVISIONS AND SEISMIC CONSIDERATIONS.**



**C Ring / V-Rails**



**FAP82-TR**

## System Design Considerations

How many subwoofers to use, where to place them, and at what wattage to tap them will be different in almost every situation.

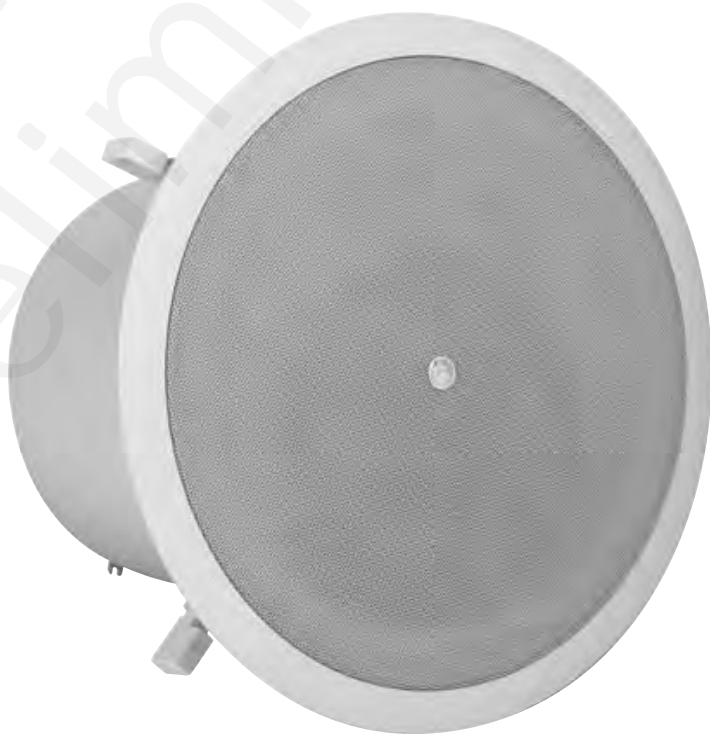
Variables include:

- Size of the Room
- Speaker Mounting (Ceiling) Height
- Ambient Noise Level
- Type of Music
- Available Speaker Locations

Generally speaking, separate electronic crossovers and amplification are not necessary for the FAPSUB. However, in high SPL situations the increased efficiency of the subwoofer and an active crossover and dedicated amplifier is beneficial. Many amplifier manufacturers offer plug-in cards to provide electronic crossover products. A very cost effective in-line electronic crossover is also available from RDL Labs (Model ST-CX1W) for use with electronic amplifiers.

For contemporary music reproduction, the minimum subwoofer level should be set to match the volume of the full range speaker. However, for some high energy music applications the maximum level could be as much as 10dB louder than the full range speaker.

Like any speaker, the output of the boundary effect will increase the output of the FAPSUB. Placing the loudspeaker within 3 feet of a wall will increase the output by 3dB. Placement within 3 corners will increase the level by 6dB (3dB + 3dB total).



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## Subwoofers and the Inverse Square Law

Even though frequencies below 200Hz are relatively omni-directional, listeners can still "localize" the subwoofer from the volume produced. To avoid "hot spots" it may be necessary to use two or more subwoofers tapped at a lower setting spread throughout the room instead of a single subwoofer tapped at maximum wattage.

## Ratio of Subwoofers to Full Range Speakers

Due to the many potential variables, it is difficult to give accurate suggestions on system design. It is important for the system designer to look at the required SPL at ear level, ambient noise in the room, speaker / transformer efficiency, and transformer insertion loss to determine the number of speakers and amplifier power required. In 70.7V / 100V systems, care should be taken so the total speaker power taps do not exceed the amplifier's 70.7V output capability.

The following "rule of thumb" information and examples are offered to provide a starting point for system design.

For "good" low frequency augmentation in a full range system (all full range speakers and FAPSUBs on the same amplifier), a single FAPSUB should be used for every four full range speakers.

For "excellent" low frequency augmentation in a full range system (all full range speakers and FAPSUBs on the same amplifier), a single FAPSUB should be used for every two full range speakers.

## Amplifier Limitations

Even with the extreme efficiency of the FAPSUB it will not overcome limitations of an underpowered system. Be sure to allow sufficient room by using basic system design parameters in choosing an

Example	Small Sports Bar
Square Feet	1,500
Ceiling Height	9'
Peak Ambient Noise Level	75 dB
Program	Digital Music

## Full Range Speakers

Eight Atlas Sound FAP42T speakers taped at 4 watts (32 watts total) will provide 90dB on axis at 3.5' elevation (15dB above ambient). 13.5' spacing between speakers provides maximum overlap coverage 4kHz.

## Subwoofers

Two Atlas Sound FAP subwoofers taped at 30 watts each (60 watts total) will fill out the frequencies a dB above the level of full range speakers. If boundary is defined into one corner of room, level will be increased 6dB (12dB above the full range speakers).

Total Wattage = 2 watts x 3 Multiplier (for headroom) = 119 watts  
 Amplifier = 20 Watts Atlas Sound A

## Amplifier Low Frequency Capability

Many 70.7V / 100V power amplifiers on the market today are from the era when business music systems extending down to only 100Hz were widely accepted. These less expensive amplifiers are not capable of driving today's high fidelity systems that require frequencies below 100Hz. When specifying the Atlas Sound FAPSUB, which operates well below 100Hz, it is VERY IMPORTANT to use a power amplifier with an output down to and below the lowest frequency going to the amp, which is often around 50Hz. An amplifier with low frequency capability is absolutely crucial whenever the system includes a subwoofer and is very important for today's high fidelity business systems.

## Architect & Engineer Specifications

The loudspeaker system shall be Atlas Sound FAPSUB or approved equal. System shall include high formance subwoofer loudspeaker, ported bass reflex enclosure and stud mount grille for conventional ceiling installation.

Frequency response for the system shall be 45Hz - 120Hz (-3dB) and the sensitivity shall be 9dB (SPL at 1W / 1M)

Loudspeaker shall be comprised of an 8" low frequency driver. Magnet shall be a minimum of 20oz (580 g) and the voice coil diameter shall be 1". Transformer shall be 70.7V with primary taps 1.9, 3.8, 7.5, 15, 30, and 60 volts. A front mount selector switch shall be included. The switch shall have a transformer bypass setting for 8Ω / direct coupling operation.

Enclosure shall be a deep depth 937mm enclosure design. To facilitate connection in conduits, enclosure shall be equipped with an access panel cover and a recessed terminal cup. This cover shall provide a combination lock (19mm side diameter) / 1" (25mm inside diameter) knock-out on the access and a top access compression fitting / strain relief fitting for conduit up to 22mm outside diameter or 1" (25mm side diameter) conduit when the compression fitting is removed.

Electrical wiring shall be accomplished via a removable, lockable wiring connector with screw-down terminals to provide both secure wire termination and rewiring capability before loudspeaker installation.

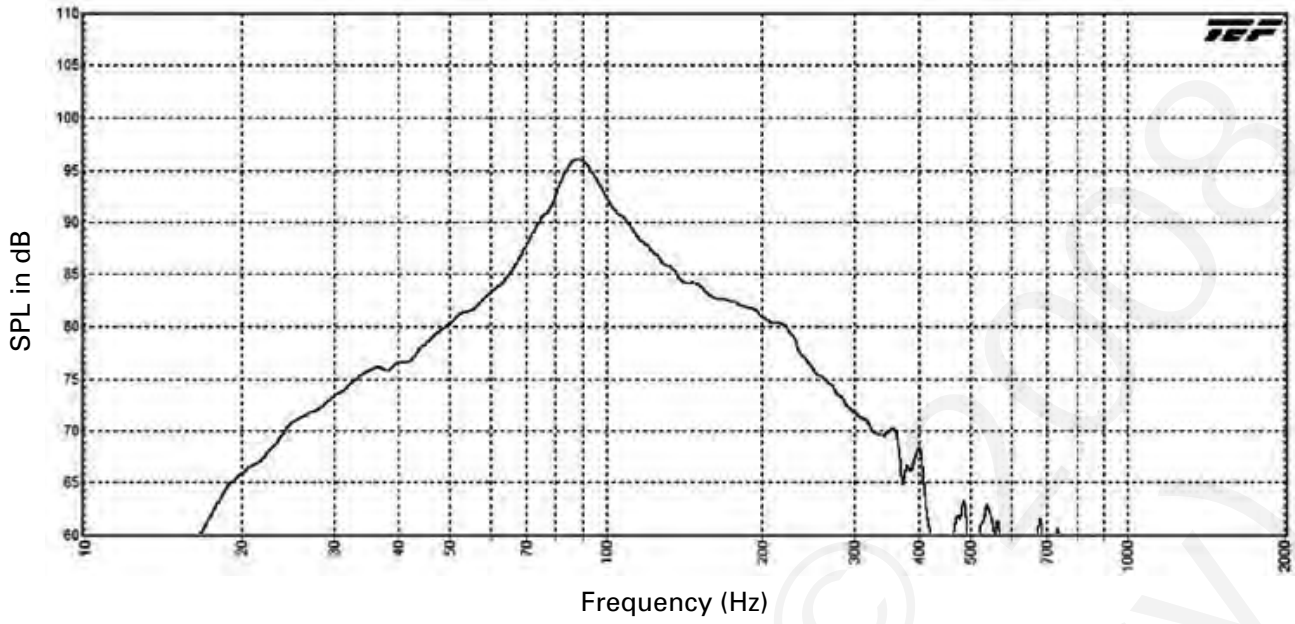
4 pole locking Phoenix Style / Euro connector shall facilitate in/out connections and shall be located in the recessed area behind the conduit access panel.

Seismic support eye shall be provided on top of enclosure for additional suspension point when used in drop tile ceilings. Construction of enclosure shall be a minimum of 18-gauge deep drawn galvanized metal.

The system shall include a support backing plate to reinforce the ceiling material and tile support rails for use on either 2' x 4' (609mm x 1219mm) or 2' x 2' (609mm x 609mm) suspended ceiling tiles. This assembly can all be installed from beneath the ceiling tile.

Overall front face diameter shall not exceed 15 3/4" (400mm); overall depth from the bottom of the ceiling shall not exceed 12 3/4" (323mm). Grilles shall be a press fit installation, manufactured 24-gauge (perforated mesh) and finished in white epoxy.

# FAPSUB Frequency Response



# FAPSUB Impedance (ms) vs Frequency

