

TOA SPEAKER SYSTEM

CEILING MOUNT 3-WAY SPEAKER SF-60



DESCRIPTION

The TOA SF-60 3-way speaker is designed for permanent installation in high-level professional applications. Its trapezoidal cabinet and component design allow arrays to simulate a single source.

The SF-60 is driven by a 2-way multi-amplifier (bi-amplified) system, where one amp drives the low frequency transducer and the other drives the mid/high combination. Correction for time-offset, phase and frequency response is provided by internal circuitry.

The SF-60 accurately reproduces transient responses in the low frequencies, using a high-quality 12" woofer with a large concentrated-geometry magnet. The SF-60 uses a powerful HFD-651 compression driver for the mid/high frequencies. Its LE Series constant directivity horn ensures optimum performance and uniform sound dispersion. Very high frequencies are reproduced by an HT-371 super tweeter that handles only frequencies over 10kHz, for precise sonic tracking. TOA's SW-38UL or SW-46UL2 ultra-linear superwoofers can be used with the SF-60 for high-level extremely low frequency response.

Sixteen T-nut holes, screw-type input terminals and carrying handles are provided.

FEATURES

1. 3-way vented system driven by 2-way multi-amplifier (bi-amplifier).
2. High power capacity of 120 watts continuous pink noise for low frequency and 80 watts for mid/high frequency.
3. 12" (30cm) woofer using a larger magnet.
4. HFD-651 type high power driver with LE Series Constant directivity (CD) horn (90° horizontal by 40° vertical).
5. Exponential horn tweeter.
6. Built-in passive circuit to correct time, phase and frequency response for multi-amplifier driving.
7. Passive crossover between the driver and the tweeter set to highest 10kHz.
8. High frequency level control for the tweeter.
9. Fixing nuts for ceiling suspension provided on top, bottom and both sides of the enclosure.
10. The fixed baffle, the horn and the tweeter can be turned.
11. Recessed type carrying handles provided on both sides of the enclosure.
12. Removable punched metal front grill.

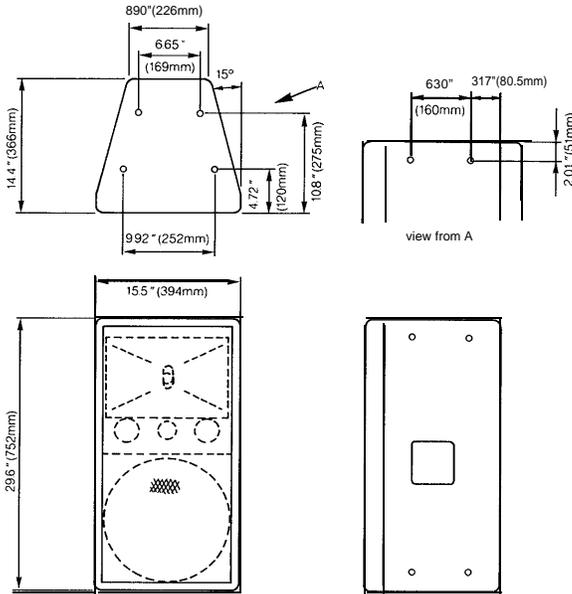
SPECIFICATIONS

Enclosure	Bass-reflex type
Speaker	12" (30cm) dia. cone speaker
Low Frequency	CD horn (90° horizontal by 40° vertical) plus compression driver
Mid Frequency	Horn type
Nominal Impedance	Low frequency: 8 ohms Mid/High frequency: 16 ohms
Sensitivity	Low frequency: 98dB (1W/1m) Mid/High frequency: 106dB (1W/1m)
Frequency Response	60Hz ~ 20kHz
Crossover Frequencies	Low to Mid frequency (Frequency dividing network): 1kHz, -12dB/octave (Butterworth) Mid to High frequency (built-in passive network): 10kHz

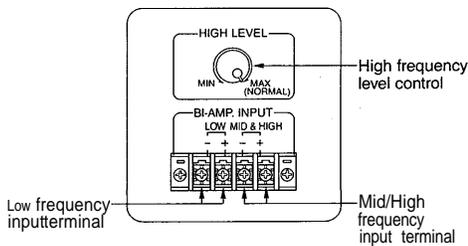
Box Tuning Frequency	65Hz
High Frequency Level Control	0 ~ -10dB (with an OFF position)
Power Handling Capacity	Continuous pink noise: 120 watts RMS (Band-limited 50Hz ~ 1kHz) Continuous program: 360 watts
Low Frequency	Continuous pink noise: 80 watts RMS (Band-limited 1kHz ~ 20kHz) Continuous program: 240 watts
Mid/High Frequency	
Input Connector	4P screw terminal
Weight	86 lb (39kg)
Finish	Polyester in gray color

Specifications are subject to change without notice.

APPEARANCE AND DIMENSIONAL DIAGRAM



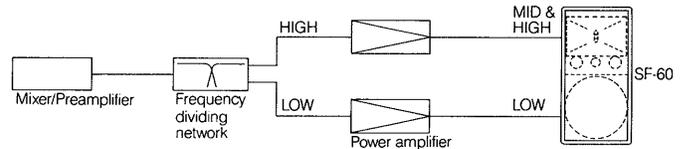
INPUT PANEL



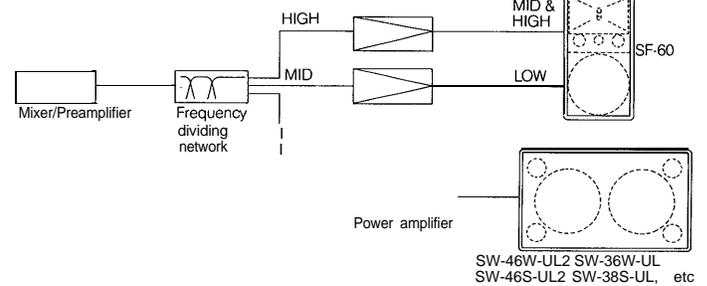
- Input terminal of the SF-60 is divided into Low and Mid/High frequencies as the SF-60 is a 2-way multi-amplifier driving system. Be sure to connect polarities (+, -) of each amplifier output cord to the speaker terminals correctly.
- Make the level setting according to the environmental conditions, although almost flat frequency response is obtainable as long as the High frequency level control is set to NORMAL.

CONNECTION DIAGRAMS

- SF-60 single system (2-way multi-amplifier driving system)



- Combination system with the super-woofer (Sway multi-amplifier driving system)



FREQUENCY DIVIDING NETWORK

Set each mode of the frequency dividing network as per the following tables. Best frequency response is ensured, as time and phase are corrected with the built-in passive circuit.

- SF-60 single system (2-way multi-amplifier driving system)

	LOW	HIGH
Level	0dB	-5dB ^{*1}
Phase	Normal	Normal
Crossover frequency	1kHz	
Slope	-12dB/octave (Butterworth)	

^{*1} - 5dB stands for a standard value when connected to the same amplifiers for LOW and HIGH frequencies. Make the level setting according to the environmental conditions at installation.

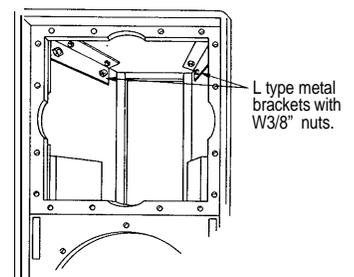
- Combination system with the super-woofer (3-way multi-amplifier driving system)

	LOW	MID	HIGH
Level	depending on the system	0dB	-5dB
Phase	Reverse ^{*2}	Normal	Normal
Crossover frequency	80 ~ 125Hz ^{*2}		1kHz
Slope	-12dB/octave ^{*2}	-12dB/octave	

^{*2} The crossover between LOW and MID frequency range stands for a typical one. When Slope characteristics are changed, best characteristics are obtainable by changing phase of LOW frequency range to normal. Decide the final change at the time of measurement or test listening.

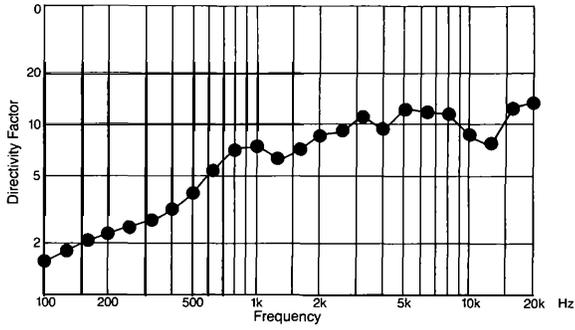
INSTALLATION

L type metal brackets with W3/8" nuts are provided at four corners inside the enclosure as shown in the figure. Nuts are located just at back side of the fixing holes of the enclosure. Utilize these fixing holes according to the speaker location. Refer to appearance diagram on the fixing holes.

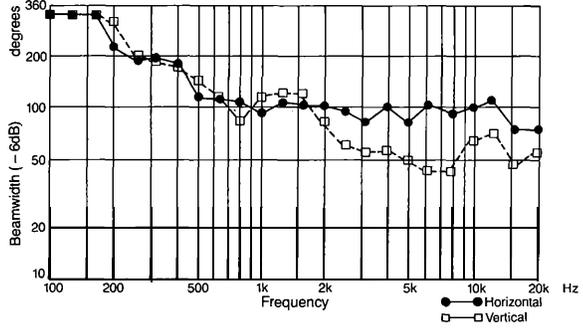


CHARACTERISTICS DIAGRAMS

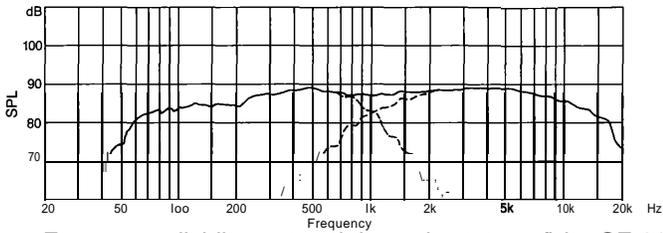
Directivity Factor vs Frequency



Beamwidth vs Frequency



Frequency Response (1W/1m: 1/3 Octave Pink Noise)



Frequency dividing network is set in status of the SF-60 single system.

Polar Response (1W/4m: 1/3 Octave Pink Noise)

