

# CF1/FF1 Magnetic Speakers



## Overview

TDT Magnetic Speakers offer high output and fidelity over a bandwidth from 1 – 50 kHz. These broadband speakers have more power at lower frequencies than our electrostatic speakers, making them well suited for laboratory species with lower frequency hearing. Their high output levels and broad bandwidth also make them excellent for noise exposure studies.

These 4-Ohm magnetic speakers are available in either free-field or closed-field models. The free-field model delivers signals of over 100 dB SPL with < 1% distortion over its entire bandwidth ( $\pm 4$  V, 10 cm). The closed-field model has an internal parabolic cone designed to maximize output and minimize distortion. Its tapered tip can be inserted directly to the subject's ear or fitted with the provided tubing and used with most standard ear tips.

The FF1 and CF1 magnetic speakers can be driven using either TDT's SA1 or SA8 stereo amplifiers. The speaker input is connected via a BNC connector, which carries both bias and signal voltages from the stereo amplifier. Both models feature a rugged polymer enclosure with a stable base as well as a built-in, 1/4"-20 threaded post for positioning with laboratory mounting hardware.

### Part Numbers:

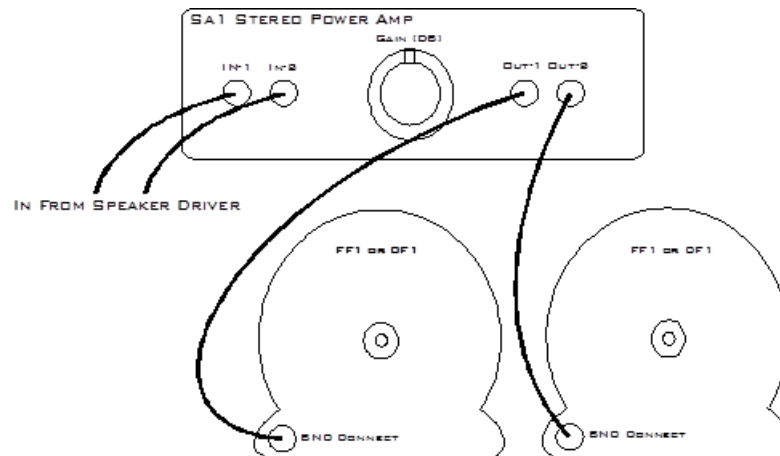
FF1—Free-Field Magnetic Speaker

CF1—Closed-field Magnetic Speaker (Provided with 6" of 1/8" O.D. PVC tubing)

## Cable Connection

Connections to the speakers are made through a BNC connector located on the back of the FF1 and CF1 housing. If using the SA1 stereo amplifier, simply connect a

BNC cable from the FF1 or CF1 to one of the output BNC connectors on the SA1 as shown in the following figure.



If you are using the SA8 See “SA8 Eight Channel Power Amplifier ” on page 16-33, for more information.

## Routine Care and Maintenance

Inspect speakers for visual damage prior to use. Exposure to high temperatures will damage the speaker. The polymer used to construct the speaker’s housing is very durable, however prolonged pressure, such as supporting the weight of the CF1 with the speaker’s parabolic cone, may alter the original structure of the cone causing possible distortion and undesirable effects.

Unlike the closed-field model the free-field model’s speaker is exposed and should be carefully handled. Sharp objects could puncture the speaker membrane causing damage to the unit.

If there is damage to the BNC connector or the speaker housing, contact TDT for an RMA for repair.



## Closed Field Speaker Design Considerations

All speaker configurations should be calibrated to your specific configuration. If you are planning to deliver tone stimuli, SigCalRP can be used to normalize the desired stimulus signals. For questions about normalizing other types of stimuli, contact TDT.

When using the CF1 speaker for experiments the provided PVC tubing will transfer the signal best when it is kept straight. Note that the speaker performance is dependent on the coupling system used and the ear of the subject. Users should

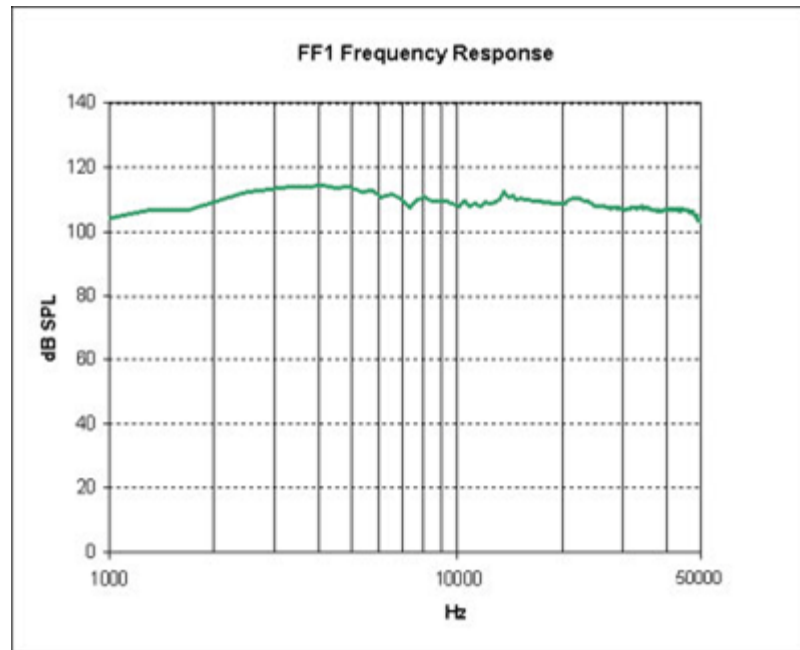
test the device under experimental conditions to ensure it meets their requirements. Technical Specifications measured under specific controlled conditions are provided for comparison purposes.

## Technical Specifications

### FF1 Technical Specifications

Crossover Frequency	500 Hz High Pass
Weight	~550 Grams
Dimensions	7.62 cm outside diameter x 3.81 cm deep
Typical Output (+/- 1 V peak input)	108 dB SPL at 10 cm from 1 kHz to 50 kHz
THD	<= 1% from 1kHz to 50 kHz
Impedance	4 Ohms

#### Free-field Frequency Response at 10 cm

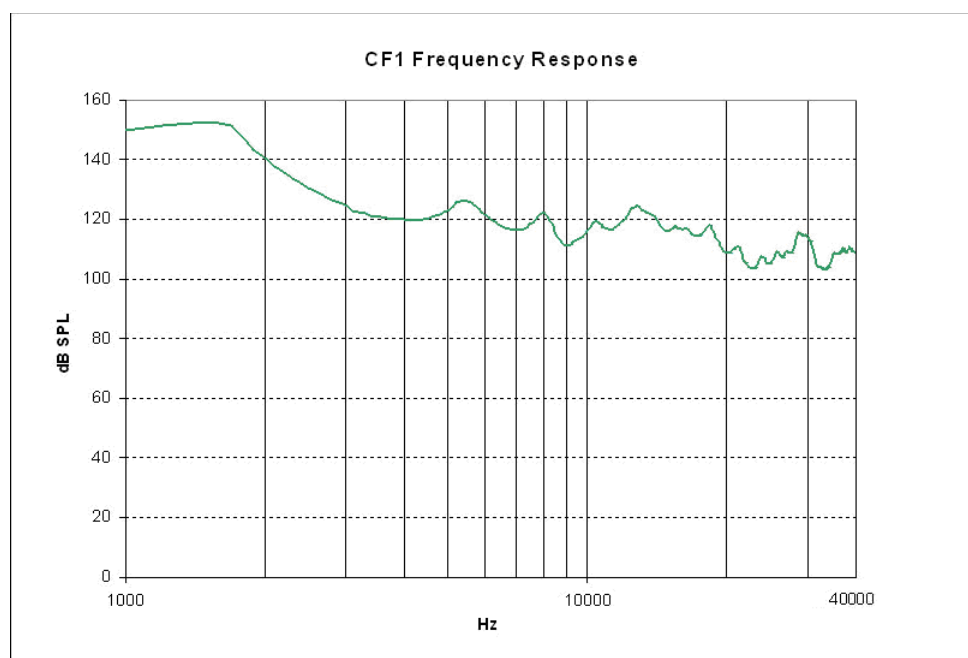


FF1 measurements typical at 10 cm using +/- 4V input.

## CF1 Technical Specifications

<b>Crossover Frequency</b>	500 Hz High Pass
<b>Weight</b>	~590 Grams
<b>Dimensions</b>	7.62 cm outside diameter x 8.89 cm deep
<b>Typical Output (+/- 1 V peak input)</b>	120 dB SPL from 1 kHz to 40 kHz
<b>THD</b>	<= 1% from 1kHz to 40 kHz

## Closed-field Frequency Response



CF1 measurements typical for approx 0.1cc pvc tube coupler using +/- 1V input.