



# THE PROFESSIONAL SERIES LOW FREQUENCY SPEAKER SYSTEMS

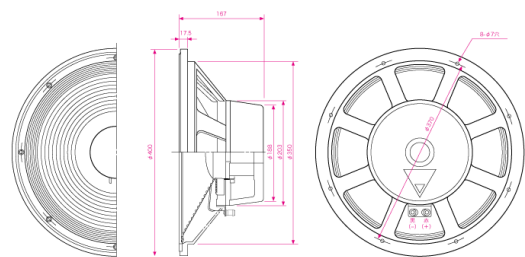
USED IN PROFESSIONAL STUDIOS AROUND THE  
WORLD.

## LOW FREQUENCY UNITS

TL-1601B



### Overview



### TL-1601b Specification

Rated Impedance: 8  $\Omega$

Frequency Range: 28-2,000 Hz

Highest Recommended

Crossover: 900Hz

Rated Input Power: 200 W

power of 500 watts. The unit is designed for professional applications including digital-recording monitoring systems and sound reinforcement systems for synthesizer music.

### **Voice Coil**

To increase the input power the unit can handle, the bobbin for the voice coil has ventilation holes which help efficiently dissipate heat. The voice coil is a long-travel type to improve sensitivity and enable a high sound pressure level of 97.5dB (1W,1m). Pure, straightforward sound is assured thanks to the use of super-low-impedance OFC (Oxygen-free Copper) wire for leads.

### **Magnetic Circuit**

Holes in the frame's opening and the magnetic circuit serve to disperse heat quickly, boosting the unit's maximum input power to 500 watts. High-quality magnetic material is used in the circuit to permit high magnetic flux density of 1.24T and increase the sound pressure level.

### **Diaphragm**

A rugged, yet lightweight cone diaphragm is supported by a corrugated cloth surround coated with special damping agent and suspended by a

Recommended Enclosure: 110 x 300 x 150 liter

Baffle Opening Diameter: 352 mm

Mounting Dimensions: 370 mm

Weight: 13 kg

Dimensions (diameter x depth): 400 x 191 mm

### **Theile-Small Parameters**

Fs: Free Air Resonance Frequency: 28 Hz

Qms: Mechanical Q Factor: 6.8

Qes: Electrical Q Factor: 0.32

Qts: Total Q factor: 0.31

BL: Force Factor: 20.5 Tm

Mms: Mechanical Mass of Diaphragm and Free Air Load: 117 g

Mmd: Mechanical Mass of

Diaphragm: 86 g

Cms: Mechanical Suspension

Compliance:  $2.76 \times 10^{-4}$  m/N

Vas: Equivalent Acoustic Volume: 0.304 m<sup>3</sup>

Sd: Effective Piston Area: 0.0881 m<sup>2</sup>

Xmax: Max Linear Peak Excursion (0-P): 8.0 mm

Max: Excursion Before Damage (P-P): 36 mm

Vd: 705 cm<sup>3</sup>

Revc: Voice Coil Resistance: 6.6  $\Omega$

Levc: Voice Coil Inductance at 1kHz - 1.7 mH

$\eta_0$ : Relative Efficiency: 2.00%

A highly rigid die-cast aluminum frame minimizes resonance and vibration. Terminals are rugged binding types that allow the use of thick speaker cables.

No Longer in Production

## TL-1603

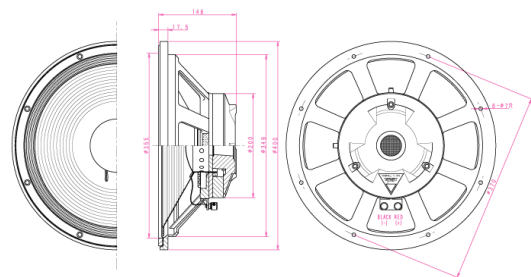


### Overview

Designed specifically to handle the increased average power that today's amplifiers deliver. In terms of sound, emphasis is placed on low distortion and low coloration.

### Voice Coil

A high maximum input of 500 watts is achieved through the use of an edgewise-wound, long-travel voice coil. Making more use of the flux within the magnetic gap, this voice coil provides



### TL-1603 Specification

- Rated Impedance: 8  $\Omega$
- Frequency Range: 28-2,000 Hz
- Highest Recommended Crossover: 900Hz
- Rated Input Power: 200 W
- Maximum Input Power: 500 W
- Sound Pressure Level: 97 dB (1W, 1m)
- Total Magnetic Flux: 2.60 x 10<sup>-3</sup> Wb
- Magnetic Flux Density: 1.18 T
- Recommended Enclosure: 113 ~ 304 liter
- Baffle Opening Diameter: 352 mm
- Mounting Dimensions: 370 mm
- Weight: 9.5 kg
- Dimensions (diameter x depth): 400 x 148 mm

made of a highly heat resistant material to permit high maximum input.

### Magnetic Circuit

Weighing 2kg (4.4 lbs.), a powerful ferrite magnet combines a high flux density of 1.18T and low distortion. This, along with a long-travel voice coil and new rear suspension design, contributes to the high operating efficiency of 97dB (1W,1m).

### Diaphragm

The rigidity and light weight of the diaphragm permits the unit to withstand high-amplitude inputs for low-distortion output. The corrugated cloth surround is coated with a damping material to make diaphragm movement more linear and discourage cone breakup.

### Housing

Warp-proof and non-resonating, the heavy die-cast aluminum frame precisely centers the diaphragm for accurate low-distortion sound reproduction.

Qes: Electrical Q Factor: 0.00

Qts: Total Q factor: 0.34

BL: Force Factor: 19.5 Tm

Mms: Mechanical Mass of Diaphragm

and Free Air Load: 117 g

Mmd: Mechanical Mass of

Diaphragm: 86 g

Cms: Mechanical Suspension

Compliance:  $2.76 \times 10^{-4}$  m/N

Vas: Equivalent Acoustic Volume: 0.304 m<sup>3</sup>

Sd: Effective Piston Area: 0.0881 m<sup>2</sup>

Xmax: Max Linear Peak Excursion (0-P): 8.0 mm

Max: Excursion Before Damage (P-P): 36 mm

Vd: 705 cm<sup>3</sup>

Revc: Voice Coil Resistance: 6.6  $\Omega$

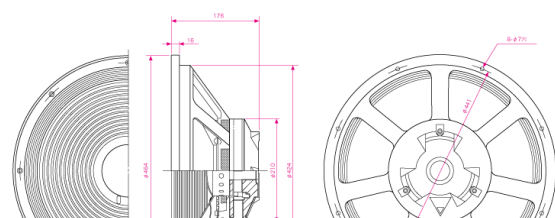
Levc: Voice Coil Inductance at 1kHz - 1.6 mH

$\eta_0$ : Relative Efficiency: 1.81%

### Diaphragm repair parts

DP-1603

TL-1801





## Overview

The TL-1801 from TAD (Technical Audio Devices) is a low-frequency speaker system featuring an 18-inch (460mm) driver. It features a high power maximum capacity of 800W, thanks to the combined use of a 100mm diameter x 23mm winding depth, edgewise-wound, oxygen-free copper voice coil, a ferrite magnetic circuit with a high flux density of 1.12T, a lightweight transducer system using a cone made of highly rigid pulp and Aramid fibers, and an advanced heat radiation design. As a result, powerful sound reproduction with a minimum of distortion is possible, even with high-power input.

The frame for the driver is made of rigid die-cast aluminum alloy to support the magnetic circuit and to allow the transducer system to reproduce powerful, accurate bass. Frame resonance is suppressed by the seven frame arms. The cone is laminated with macromolecular film, and its surface is specially treated to make it water-repellent and prevent cone breakup from degrading sound quality.

## TL-1801 Specification

Rated Impedance: 8  $\Omega$   
Frequency Range: 26-2,000 Hz  
Highest Recommended  
Crossover: 800Hz  
Rated Input Power: 200 W  
Maximum Input Power: 800 W  
Sound Pressure Level: 96.5 dB (1W, 1m)  
Total Magnetic Flux:  $2.82 \times 10^{-3}$  Wb  
Magnetic Flux Density: 1.12 T  
Recommended Enclosure: 170 ~ 500 liter  
Baffle Opening Diameter: 426 mm  
Mounting Dimensions: 441 mm  
Weight: 12.6 kg  
Dimensions (diameter x depth): 464 x 176 mm

## Theile-Small Parameters

Fs: Free Air Resonance Frequency: 26 Hz  
Qms: Mechanical Q Factor: 7.9  
Qes: Electrical Q Factor: 0.39  
Qts: Total Q factor: 0.37  
BL: Force Factor: 21 Tm  
Mms: Mechanical Mass of Diaphragm and Free Air Load: 158 g  
Mmd: Mechanical Mass of Diaphragm: 114 g  
Cms: Mechanical Suspension Compliance:  $2.37 \times 10^{-4}$  m/N

figure for its size. The large input terminal permits direct connection of speaker cables up to 14mm<sup>2</sup> (6 Gauge) in diameter.

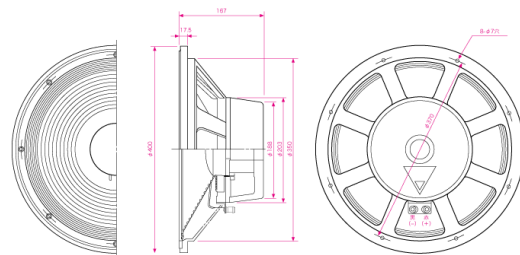
17.8 mm  
 Max: Excursion Before Damage (P-P): 40 mm  
 Vd: 914 cm<sup>3</sup>  
 Revc: Voice Coil Resistance: 6.6 Ω  
 Levc: Voice Coil Inductance at 1kHz - 2.0 mH  
 ηo: Relative Efficiency: 2.20%

**Diaphragm repair parts**

DP-1801

No Longer in Production

**TL-1601A**



**TL-1601a Specification**

Rated Impedance: 8 Ω  
 Frequency Range: 28-2,000 Hz  
 Highest Recommended Crossover: 900Hz  
 Rated Input Power: 150 W  
 Maximum Input Power: 300 W  
 Sound Pressure Level: 97 dB (1W, 1m)  
 Total Magnetic Flux: 2.60 x 10<sup>-3</sup> Wb  
 Magnetic Flux Density: 1.18 T  
 Recommended Enclosure: 113 ~ 307 liter  
 Baffle Opening Diameter: 352 mm  
 Mounting Dimensions: 370 mm

**Overview**

The TL-1601a is a low-frequency speaker system conforming to the very highest technical standards. It is specifically designed to reduce all forms of distortion and coloration to a bare minimum.

magnetic gap even during peak excursions, bass output is powerful, and distortion low, at all input levels. And since the coil makes more effective use of the flux within the magnetic gap, it provides high conversion efficiency. The voice coil bobbin and adhesive materials have high heat resistance.

### **Magnetic Circuit**

The magnetic circuit is designed for low distortion and high efficiency. Thanks to the use of a powerful alnico ring magnet (3 lbs. 10 oz, or 1.65kg), it features an extremely high-flux density of 1.18T. In combination with light moving parts and the long-travel coil, it results in exceptionally high efficiency for a unit of this size.

### **Diaphragm**

The cone diaphragm of the TL-1601a is made of a newly-developed tough and lightweight material that is capable of withstanding high amplitude levels without deformation. Corrugations are added across the cone surface to assure smooth response down to the extreme low end. The surround is coated with a damping material to ensure proper internal loss and linear excursions, and to reduce cone breakup

Fs: Free Air Resonance Frequency: 28 Hz

Qms: Mechanical Q Factor: 6.8

Qes: Electrical Q Factor: 0.36

Qts: Total Q factor: 0.34

BL: Force Factor: 19.5 Tm

Mms: Mechanical Mass of Diaphragm and Free Air Load: 116 g

Mmd: Mechanical Mass of Diaphragm: 85 g

Cms: Mechanical Suspension

Compliance:  $2.79 \times 10^{-4}$  m/N

Vas: Equivalent Acoustic Volume: 0.307 m<sup>3</sup>

Sd: Effective Piston Area: 0.0881 m<sup>2</sup>

Xmax: Max Linear Peak Excursion (0-P): 8.0 mm

Max: Excursion Before Damage (P-P): 36 mm

Vd: 705 cm<sup>3</sup>

Revc: Voice Coil Resistance: 6.6  $\Omega$

Levc: Voice Coil Inductance at 1kHz - 1.6 mH

$\eta_0$ : Relative Efficiency: 1.82%

### **Diaphragm repair parts**

DP-1601a

The TL-16U1a is mounted in a sturdy aluminum alloy diecast frame that supports the heavy magnetic circuit. The frame is essentially resonance-free.

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