

**B950**  
**USER MANUAL**

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## 1. Introduction

The Tannoy B950 is a dedicated subwoofer designed for high definition sound reinforcement at low and ultra-low frequencies. It will extend the power bandwidth of SuperDual sound reinforcement systems to below 30 Hz, making it ideal for effects in club, theatre and concert sound reinforcement. Where ultra-low frequency enhancement is required with increased system headroom and maximum impact, combined frequency overlap is possible with cabinets like the B400. The B950 is intended for use on the ground and can be close stacked, while the main system is flown. This powerful loudspeaker is capable of delivering high sound pressure levels with extremely low distortion while maintaining a uniform frequency response throughout its dynamic range. This makes the speakers capable of consistent intelligibility and tonal quality at any listening level. The B950 comprises two 18-inch high efficiency bass units housed in a heavily braced optimally vented enclosure. Ruggedly constructed from multiple-ply hardwood the B950 features carrying handles and inserts for castors.

## 2. Unpacking

Every Tannoy product is carefully inspected before packing. After unpacking your B950 please inspect for any exterior physical damage, and save the carton and any relevant packaging materials in case the loudspeaker again requires packing and shipping. In the event that damage has been sustained in transit notify your dealer immediately.

## 3. Connectors/Cabling

The B950 is fitted with 4-pole Speakon™ connectors. Speakon has the following advantages over EP and XLR type connectors: All termination's are solderless, this makes life easier at the time of installation or when field servicing is required. Contacts will accept 6 sq. mm wire with an outside diameter of up to 15mm and a current rating of 30 Amps. The pins of the 2 Speakon sockets identified input/output on the rear of the input panel are paralleled within the enclosure. Tannoy have adopted the following wiring standard for all Superdual products :-

SPEAKON CONNECTOR	SIGNAL
Pin 1+	Passive Full Range + Active Low/Mid + Low/Sub +
Pin 1-	Passive Full Range - Active Low/Mid - Low/Sub -
Pin 2+	Active High +
Pin 2-	Active High -

Should you encounter any problems obtaining Speakon connectors, please contact Neutrik or its distributors directly on the following numbers:-

UK: NEUTRIK MARKETING: 0171 792 8188  
USA: NEUTRIK USA INC.: (201) 901 9488

For a worldwide list of distributors, please contact Neutrik directly: -

NEUTRIK AG: +41 7529666

Cable choice consists mainly of selecting the correct cross sectional area in relation to the cable length and the load impedance. A small cross sectional area would increase the cables series resistance, inducing power loss and response variations (damping factor).

Connectors should be wired with a minimum of 2.5 sq. mm (12 gauge) cable. This will be perfectly satisfactory under normal conditions. In the case of very long cable runs the wire size should exceed this, refer to the following table for guidance:-

CABLE RUN (m)	C.S.A. OF EACH CONDUCTOR (mm)	CABLE RESISTANCE $\Omega$	% POWER LOSS INTO 8 $\Omega$ LOAD	% POWER LOSS INTO 4 $\Omega$ LOAD
10	2.5	0.14	1.7	3.5
	4.0	0.09	1.1	2.2
	6.0	0.06	0.73	1.5
25	2.5	0.35	4.3	8.6
	4.0	0.22	2.7	5.4
	6.0	0.14	1.8	3.6
50	2.5	0.69	8.6	17.0
	4.0	0.43	5.4	11.0
	6.0	0.29	3.6	7.2
100	2.5	1.38	17.0	35.0
	4.0	0.86	11.0	22.0
	6.0	0.58	7.2	14.0

#### 4. Polarity Checking

It is most important to check the polarity of the wiring before the speaker system is flown. A simple method of doing this without a pulse based polarity checker for LF units is as follows: Connect two wires to the +ve and -ve terminals of a PP3 battery. Apply the wire, which is connected to the +ve terminal of the battery to the speaker cable leg, which you believe to be connected to pin 1+ of the speaker connector and likewise the -ve leg of the battery to pin 1-.

If you have wired it correctly the LF drive unit will move forward, indicating the wiring is correct. All that remains now is to connect the +ve speaker lead to the +ve terminal on the amplifier and the -ve lead to the -ve terminal on the amplifier. If however the LF driver moves backwards, the input connections need to be inverted.

If problems are encountered, inspect the cable wiring in the first instance. It should also be noted that different amplifier manufacturers utilise different pin configurations and polarity conventions, if you are using amplifiers from more than one manufacturer, check the polarity at the amplifiers as well as the loudspeakers.

## 5. Amplification & Power Handling

As with all professional loudspeaker systems, the power handling is a function of voice coil thermal capacity. Care should be taken to avoid running the amplifier into clip (clipping is the end result of overdriving any amplifier). Damage to the loudspeaker will be sustained if the amplifier is driven into clip for any extended period of time. Headroom of at least 3dB should be allowed. When evaluating an amplifier, it is important to take into account its behaviour under low impedance load conditions. A loudspeaker system is highly reactive and with transient signals it can require more current than the nominal impedance would indicate.

Generally a higher power amplifier running free of distortion will do less damage to the loudspeaker than a lower power amplifier continually clipping. It is also worth remembering that a high powered amplifier running at less than 90% of output power generally sounds a lot better than a lower power amplifier running at 100%. An amplifier with insufficient drive capability will not allow the full performance of the loudspeaker to be realised.

It is important when using different manufacturers amplifiers in a single installation that they have very closely matched gains, the variation should be less than  $\pm 0.5\text{dB}$ . This precaution is important to the overall system balance when only a single active crossover is being used with multiple cabinets, it is therefore recommended that the same amplifiers are used throughout.

## 6. Crossovers

The complete range of Tannoy Professional contractor products can be used in conjunction with the B950 utilising TX1, TX2 & TX3 crossover/controllers (see product literature for correct TX controller)

For active operation the TDX1 digital loudspeaker management system is also available (late '98). If you intend using an alternative loudspeaker management system (i.e. BSS™, Klark Teknik™, XTA™ etc) please contact Tannoy for the correct parameter settings or refer to the recommended crossover points in the technical specifications section of this manual.

## 7. Equalisation

The B950 loudspeaker is designed to need no equalisation or correction to overcome system limitations. As a result, it will only need equalisation to compensate for difficult acoustic environments.

Over equalisation can reduce system headroom, and introduce phase distortion resulting in greater problems than cures. If equalisation is required then it should be applied gently and smoothly. Violent equalisation will be detrimental to the overall sound quality.

## 8. Positioning

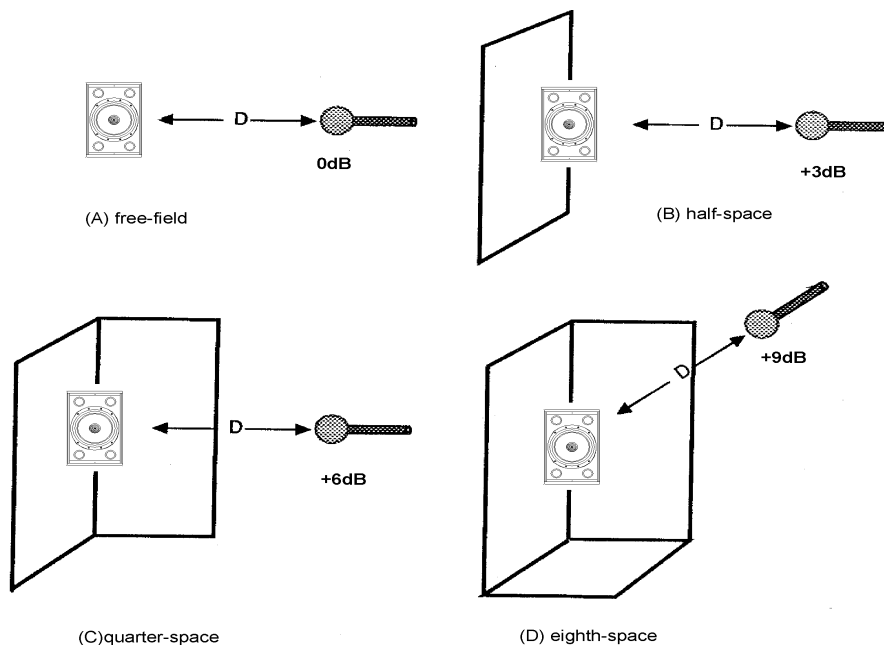
When a bass loudspeaker is used in an environment with boundary surfaces, its placement affects its frequency response. When such effects are properly understood, they can be used to great effect in producing the desired sound quality without the aid of additional amplification.

Consider fig (a) in the diagram below, here we see a loudspeaker in free field or anechoic conditions. We measure its sound pressure level at a distance  $D$ , and refer to this as our reference level, or 0 dB SPL.

If we now place a large reflective surface (i.e., a wall, ceiling or floor) next to the loudspeaker, see fig (b), the sound that is radiated towards the boundary is reflected. As a result, the sound pressure level can increase by as much as 3 dB (effectively doubling the available amplifier power). The loudspeaker is radiating its power into half as much space, this is known as *half space loading*. For each additional boundary the SPL can increase by 3dB. Corner placement or eighth space loading can increase a bass speaker's efficiency by up to 9dB.

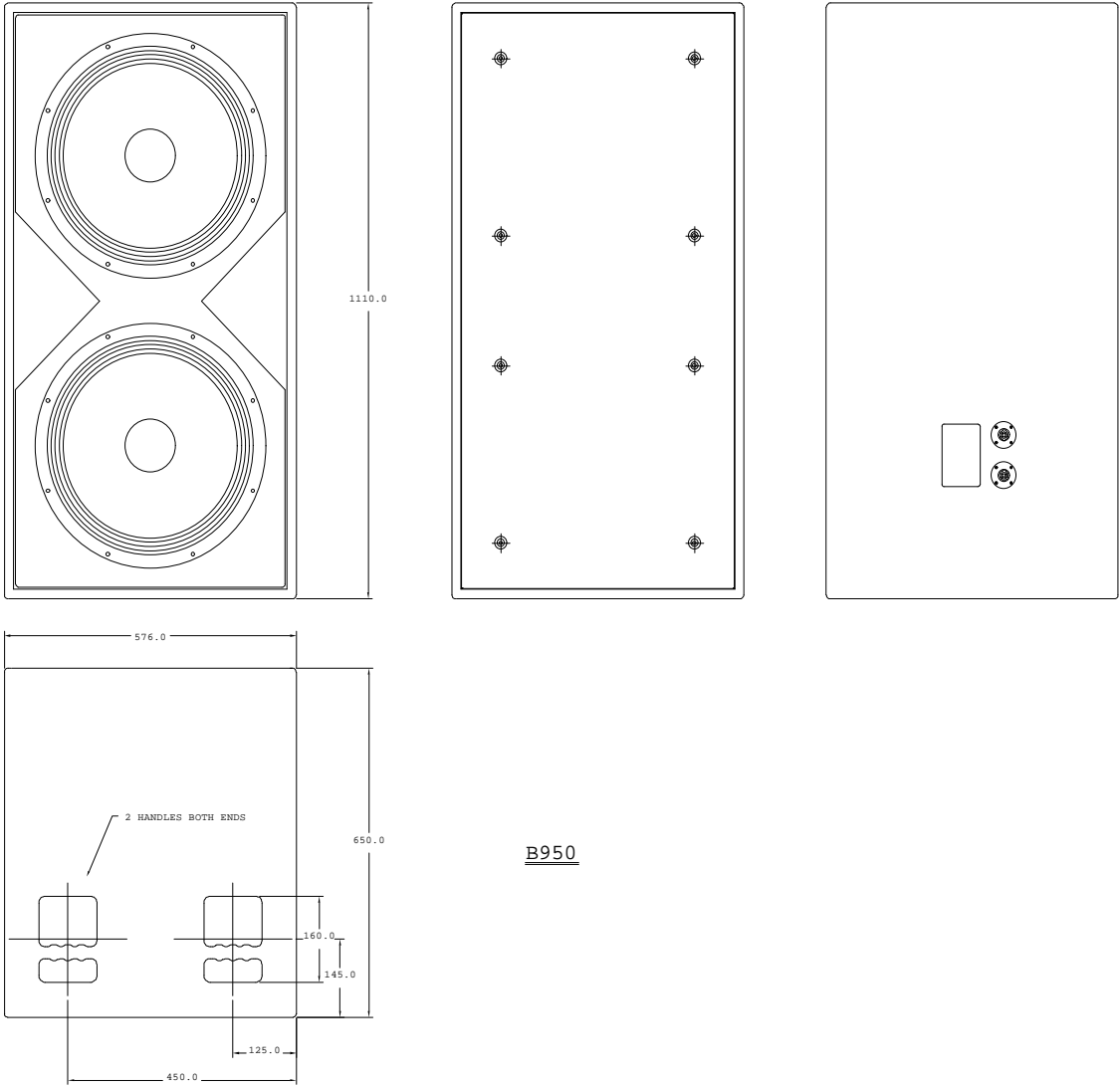
This effect is not the same at all frequencies. Loudspeakers are only essentially omnidirectional at low frequencies (where the wavelength is large in comparison to the loudspeaker). At high frequencies sound radiates in a more directional manner. We can position full range loudspeakers next to a boundary in order to boost the lower frequencies while the highs remain unchanged.

Coupling, or placing bass cabinets together will also increase bass output.

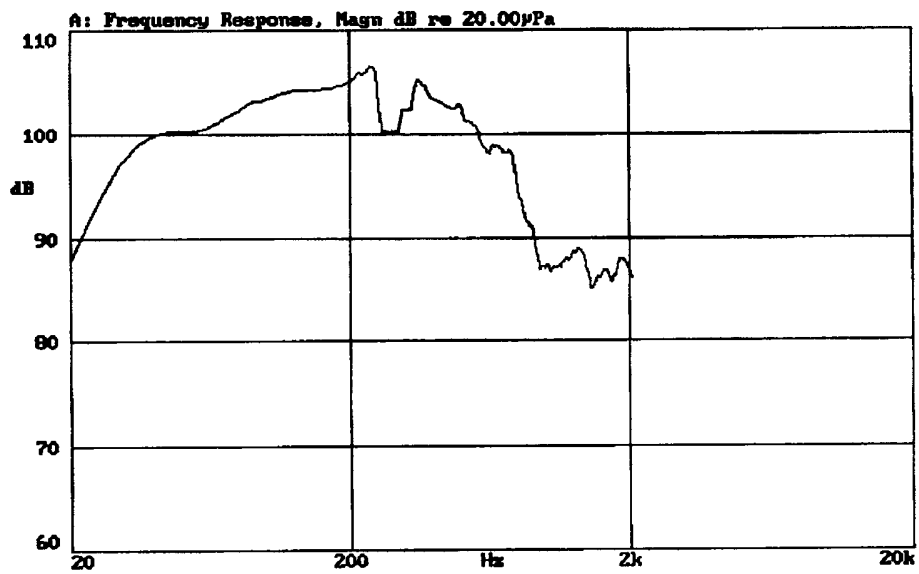


How SPL Increases Due To Boundary Effects

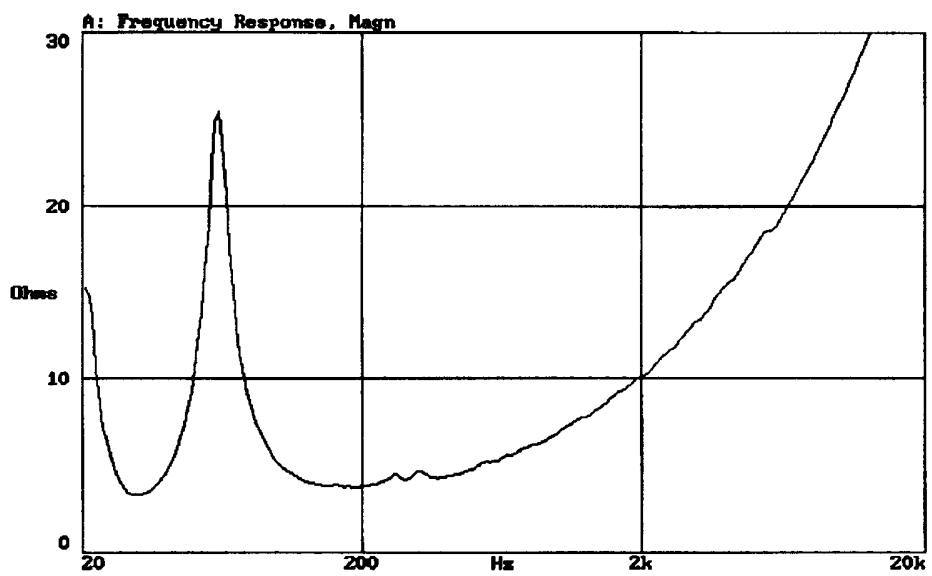
9. Dimensions



10. Performance Data



Anechoic Frequency Response, 2.83 V @ 1Metre



Mode: Impedance

Impedance





## 11. Technical Specifications

<b>Frequency response (1) +/- 3dB</b>	28Hz -240 Hz		
<b>Recommended Amplifier Power</b>	800 - 2000 watt / 4 ohm		
<b>Power Handling</b>	Average(2)	Programme	Peak (10ms)
	600 watt	1200 watt	2400 watt
<b>Sensitivity (1)</b> <b>2.83 volt @ 1m</b>	101 dB		
<b>Maximum SPL (3)</b> <b>@ 1m</b>	RMS	Peak	
	129 dB	135 dB	
<b>Impedance</b>	Nominal	4 ohm	
	Minimum	3.9 ohm	
<b>Distortion</b>		<b>2nd Harmonic</b>	<b>3rd Harmonic</b>
<b>0.1 Full Power</b>			
<b>100 Hz</b>		0.20%	0.12%
<b>250 Hz</b>		0.14%	0.10%
<b>0.01 Full Power</b>			
<b>100 Hz</b>		0.18%	0.09%
<b>250 Hz</b>	0.12%		0.10%
<b>Driver Compliment</b>	2 x 18" High efficiency Bass Units. Type Number 4501		
<b>Crossover Point</b>	Active: Recommended points 70 - 240 Hz, 24dB/octave, Linkwitz - Riley (dependant on application)		
<b>Enclosure</b>	337.5 litre (11.914cu.ft.) vented, 18mm multi-ply birch plywood		
<b>Finish</b>	Textured black\grey paint		
<b>Protective Grille</b>	Perforated steel, black with 50% free air flow		
<b>Connectors</b>	2 x Speakon NL4MPR IN/OUT		
<b>Rigging/Fittings</b>	4 x Recessed carrying handles Inserts for castors		
<b>Dimensions</b>	576mm(H) x 1110mm(W) x 650mm(D) 22.7ins(H) x 43.7ins(W) x 25.6ins(D)		
<b>Weight</b>	76 Kg (167.2 lbs)		

### **NOTES:**

(1) Average over stated bandwidth. Measured at 1m on axis using , in an anechoic chamber.

(2) Long term power handling capacity as defined in EIA standard RS - 426A.

(3) Unweighted pink noise input, measured at 1m

Tannoy operate a policy of continuous research and development. The introduction of new materials or manufacturing methods will always equal or exceed the published specifications which Tannoy reserve the right to alter without prior notice. Please verify the latest specifications when dealing with critical applications.

## 12. B950 Service Parts & Accessories

Part Number	Description
7900 0390	Driver Kit - 4501
7900 0497	Recone Kit - 4501
7900 0442	Paint - Touch up Black-Grey
7900 0400	Padded protective transit cover
8000 0717	TannoyTX3 Active System Controller/2-way Stereo Crossover <b>UK 220/240V</b>
8000 0718	TannoyTX3 Active System Controller/2-way Stereo Crossover <b>EUR 220/240V</b>
8000 0719	TannoyTX3 Active System Controller/2-way Stereo Crossover <b>AUS 220/240V</b>
8000 0720	TannoyTX3 Active System Controller/2-way Stereo Crossover <b>USA 100/120V</b>
8000 0721	TannoyTX3 Active System Controller/2-way Stereo Crossover <b>JAP 100/120V</b>
8000 0722	TannoyTX3 Active System Controller/2-way Stereo Crossover <b>HK 220/240V</b>
8000 0727	Tannoy TDX1 Digital loudspeaker management system <b>UK 220/240V</b>
8000 0728	Tannoy TDX1 Digital loudspeaker management system <b>EUR 220/240V</b>
8000 0729	Tannoy TDX1 Digital loudspeaker management system <b>AUS 220/240V</b>
8000 0730	Tannoy TDX1 Digital loudspeaker management system <b>USA 100/120V</b>
8000 0731	Tannoy TDX1 Digital loudspeaker management system <b>JAP 100/120V</b>
8000 0732	Tannoy TDX1 Digital loudspeaker management system <b>HK 220/240V</b>

## 13. Warranty

No maintenance of the B950 loudspeaker is necessary.

All Tannoy professional loudspeaker products are covered by a 5 year warranty from the date of manufacture subject to the absence of misuse, overload or accidental damage. Claims will not be considered if the serial number has been altered or removed. Work under warranty should only be carried out by a Tannoy Professional dealer or service agent. This warranty in no way affects your statutory rights. For further information please contact your dealer or distributor in your country. If you cannot locate your distributor please contact Customer Services, Tannoy Ltd at the address given below.

Customer Services  
Tannoy Ltd.  
Rosehall Industrial Estate  
Coatbridge  
Strathclyde  
ML5 4TF  
Scotland  
Telephone: 01236 420199 (National)  
+44 1236 420199 (International)  
Fax: 01236 428230 (National)  
+44 1236 428230 (International)  
E-Mail: [prosales@tannoy.com](mailto:prosales@tannoy.com)

DO NOT SHIP ANY PRODUCT TO TANNOY WITHOUT PREVIOUS AUTHORISATION

Our policy commits us to incorporating improvements to our products through continuous research and development. Please confirm current specifications for critical applications with your supplier.

**EASE™** Data for Tannoy Professional products available on request.

## Declaration of Conformity

The following apparatus is/are manufactured in the United Kingdom by Tannoy Ltd of Rosehall Industrial estate, Coatbridge, Scotland, ML5 4TF and conform(s) to the protection requirements of the European Electromagnetic Compatibility Standards and Directives relevant to Domestic Electrical Equipment. The apparatus is designed and constructed such that electromagnetic disturbances generated do not exceed levels allowing radio and telecommunications equipment and other apparatus to operate as intended, and, the apparatus has an adequate level of intrinsic immunity to electromagnetic disturbance to enable operation as specified and intended.

Details of the Apparatus:

Tannoy Contractor Loudspeaker  
Model Number: B950

Associated Technical File:

EMCB950

Applicable Standards:

EN 50081-1 Emission  
EN 50082-1 Immunity

Signed:



Position:

Technical Manager  
Tannoy Professional

Date:

16<sup>th</sup> July 1998

For Tannoy Ltd


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**Tannoy Loudspeakers are manufactured  
in Great Britain by :**

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TGI/Tannoy, 300 Gage Avenue, Kitchener, Ontario, CANADA, N2M 2C8  
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