TANNOY®

iQ SERIES

USER MANUAL

iQ 10/15

CONTENTS

1. Introduction

Thank you for purchasing Tannoy PowerDual™ iQ 10/15

As part of the HDSR™ product group, the iQ range is the next generation of high intelligibility sound reinforcement loudspeakers from Tannoy. High Definition Sound Reinforcement (HDSR™) products specifically designed to provide high intelligibility audio reproduction in such locations as houses of worship, performing arts centres, auditoria, stadiums and larger music venues; in fact, any public space where high performance, high definition sound can enhance the listening experience.

Using a 250mm (10") version of Tannoy's own unique, point source and constant directivity PowerDual™ driver, the iQ 10/15 is a single cabinet full range system incorporating a 15" horn loaded bass driver. This high efficiency bass driver, functioning from 43Hz to 180kHz, has been optimally designed to acoustically match the iQ10 HF/MF section to deliver high definition sound reinforcement at low frequencies. This is mounted in the lower section of the enclosure and is horn-loaded to deliver increased efficiency and improved LF output.

The HF/MF section, covering a frequency range from 180Hz to 18kHz, uses the amalgamation of the exceptional PowerDual™ driver with the Funktion One Research patented Axhead™ horn technology to provide a controlled 60° horizontal and 40° vertical dispersion pattern. Exclusively this unique combination incorporates the High Frequency element of the PowerDual™ into the Axhead™ phase plug itself; providing not only a point source time coherent design, but a valuable reduction in overall size as no separate HF horn is necessary as in other 'phase plug' designs

This compact high power sound reinforcement solution is ideal for live or fixed installation music and speech sound reinforcement applications. The construction of the cabinet is exceptionally robust, using 18mm birch plywood throughout, and is equipped with carrying handles, extensive rigging and pull back points in order to facilitate the use of various flying options. A full-length foam-covered powder coated perforated steel grille is provided. The trapezoid angles of the enclosure facilitate the creation of optimized-coverage arrays.

The system may be installed in the standard LF and passive HF/MF bi-amp configuration or alternatively, as an option, set up in fully tri-amp mode. Comprehensive system control may be provided by the addition of the TannoyTDX1 or TDX2 digital loudspeaker management systems.

2. Unpacking

Every Tannoy iQ10/15 is carefully tested and inspected before packing. After unpacking, please inspect your iQ10 for any damage sustained during transit. In the unlikely event of any damage, would you please notify your dealer immediately and retain your shipping carton, as your dealer may ask the faulty unit to be returned for inspection.

3. Connectors/Cabling

The iQ 10/15 is fitted with two 4-pole Speakon™ connectors. Speakon™ has the following advantages over EP and XLR type connectors: All terminations are solderless, making 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 15 mm and a current rating of 30 Amps.

The pins of the Speakon™ sockets, marked input/output on the rear of the speaker, are paralleled within the enclosure.

Tannoy has adopted the following wiring standard for the iQ 10/15: -

SPEAKON™ CONNECTOR	SIGNAL
Pin 1+	LF Positive
Pin 1-	LF Negative
Pin 2+	MF/HF Positive
Pin 2-	MF/HF Negative

For a worldwide list of Neutrik distributors see http://www.neutrik.com/

*A custom termination panel is available for tri-amp operation

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 Ω	% POWER LOSS INTO 8Ω LOAD	% POWER LOSS INTO 4Ω LOAD
10	2.5 4.0 6.0	0.14 0.09 0.06	1.7 1.1 0.73	3.5 2.2 1.5
25	2.5 4.0 6.0	0.35 0.22 0.14	4.3 2.7 1.8	8.6 5.4 3.6
50	2.5 4.0 6.0	0.69 0.43 0.29	8.6 5.4 3.6	17.0 11.0 7.2
100	2.5 4.0 6.0	1.38 0.86 0.58	17.0 11.0 7.2	35.0 22.0 14.0

4. 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 +/- 0.5dB. This precaution is important to the overall system balance when only a single compressor/limiter or active crossover is being used with multiple cabinets; it is therefore recommended that the same amplifiers be used throughout.

5. Operation

For optimal performance, the iQ 10/15 has been designed to operate in conjunction with the Tannoy TDX1 & TDX2 System Controllers, and iQ18B bass unit for extended bass performance. The TDX controllers have been factory preset to provide the recommended eq, crossover points, and overall system balance. Please refer to the TDX1 & TDX2 manual for operation.

If you intend using an alternative loudspeaker management system (e.g. BSS™, KlarkTeknik™, XTA™ etc) please refer to section 12 of this manual.

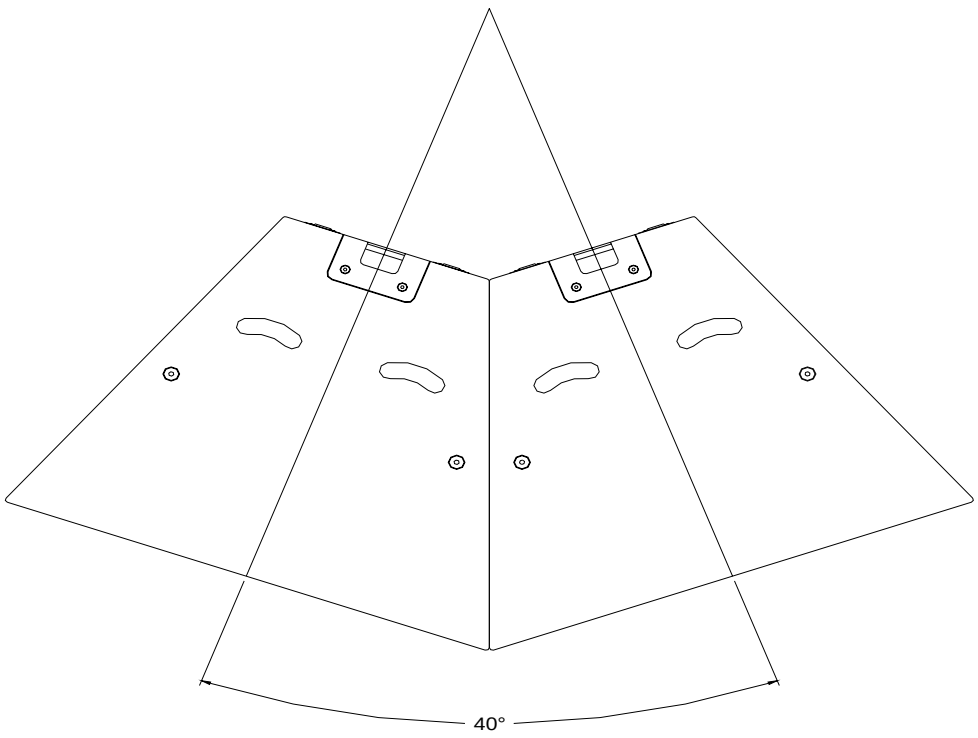
6. Equalisation

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.

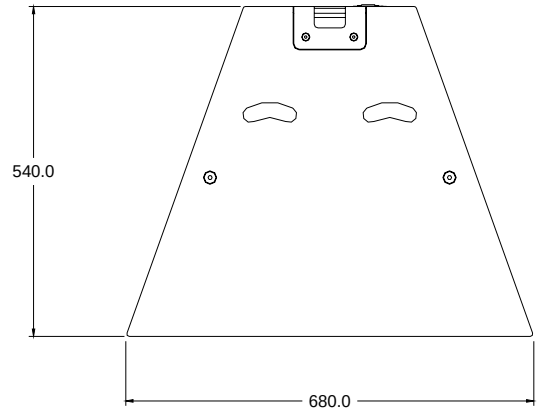
7. Arraying

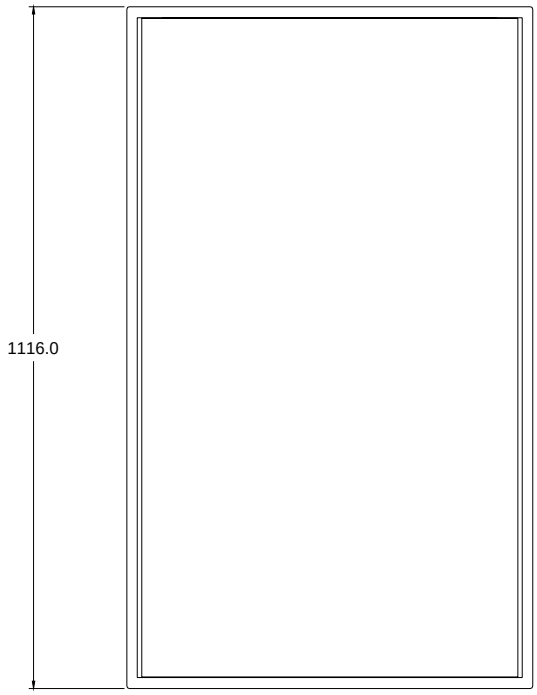
Comb filtering is a phenomenon, which cannot be cured by equalisation. Small alterations to loudspeaker positions can have the effect of minimising problematic combing frequencies. Arrays should be constructed so that the individual coverage patterns of each loudspeaker combine with minimal overlap. The design of the iQ 10/15 cabinet greatly simplifies the creation of effective arrays, allowing seamless wide (120 degree) horizontal coverage using two loudspeakers without the need for tedious experimentation.

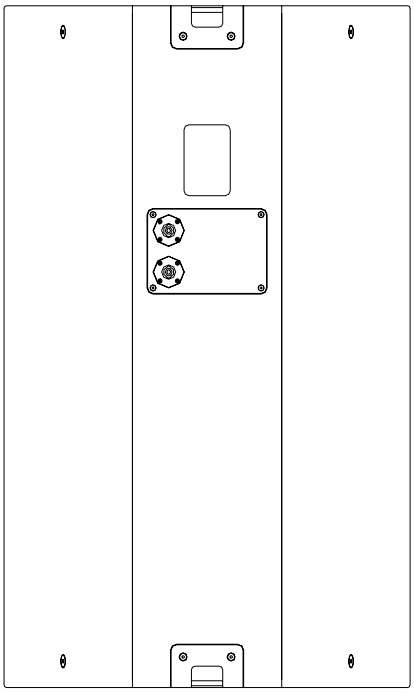
By placing the iQ 10/15 cabinets as shown in the diagram below, minimal dispersion pattern overlap is achieved, guaranteeing an extraordinarily smooth transition.



8. Dimensions







9. Rigging & Suspension

General Safety Advice

The Tannoy Professional hardware covered in this guide has been designed to offer quick, simple, cost effective and secure solutions for mounting specific Tannoy Professional loudspeakers. This hardware has been designed and manufactured with a high safety load factor for its specific role. To ensure the safest possible use of the hardware covered in this guide, it must be assembled in strict accordance with the instructions specified. The information relating to the assembly and the safe use of these accessories must be understood and followed. The installation of Tannoy Professional loudspeakers using the dedicated hardware should only ever be carried out by fully qualified installers, in accordance with all the required safety codes and standards that are applied at the place of installation.

WARNING: As the legal requirements for flying change from country to country, please consult you local safety standards office before installing any product. We also recommend that you thoroughly check any laws and bylaws prior to commencing work.

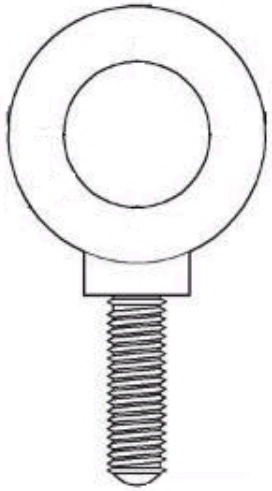
Tannoy Professional hardware has been designed for use with specific Tannoy Professional loudspeakers, and is not designed or intended for use with any other Tannoy Professional products, or any other devices. Using Tannoy Professional hardware for any purpose other than that indicated in this guide is considered to be improper use. Such use can be very dangerous as overloading, modifying, assembling in anyway other than that clearly stated in the manual, or damaging Tannoy Professional hardware will compromise safety.

The component parts of any Tannoy Professional hardware device must only be assembled using the accessory kits supplied and in strict compliance with the user manual. The use of other accessories or non-approved methods of assembly may result in an unsafe hardware system by reducing the load safety factor. Welding, or any other method of permanently fixing hardware components together or to the integral fixing points in the cabinet should never be used.

Whenever a Tannoy Professional loudspeaker is fixed to a surface using a Tannoy Professional hardware device, the installer must ensure that the surface is capable of safely and securely supporting the load. The hardware employed must be safely, securely, and in accordance with the manual, attached both to the loudspeaker and also to the surface in question, using only the fixing holes provided as standard and covered in the manual. Secure fixings to the building structure are vital. Seek help from architects, structural engineers or other specialists if in any doubt.

All loudspeakers flown in theatres, nightclubs, conference centre or other places of work and entertainment must, be provided with an independent, correctly rated and securely attached secondary safety – in addition to the principle hardware device. This secondary safety must prevent the loudspeaker from dropping more than 150mm (6”) should the principle hardware device fail.

SECUR ET – VEB Eyebolt



The Tannoy iQ 10/15 loudspeaker can be flown with high quality VEB M10 eyebolts with collar to BS4278:1984. The loudspeakers are equipped with internal steel braces, which also double as the flying points, and accept VEB M10 eyebolts.

To install the VEB M10 eyebolts remove the original M10 counter sunk screws from the locations you wish to install the VEB M10 eyebolts. Then replace these counter sunk M10 screws with the VEB M10 eyebolts. The kelping brackets on the rear of the cabinet should **only** be used for tilting the loudspeaker to the desired angle.

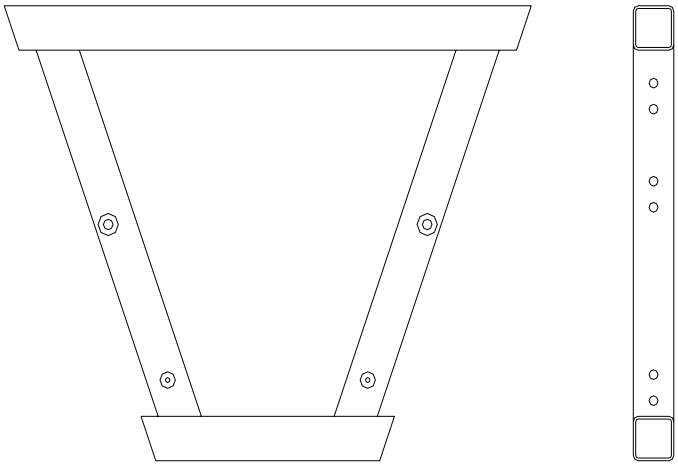
<u>Important:</u> It is imperative for safety reasons that two eyebolts linked to two independently fixed straps are used per cabinet.
Never attempt to use formed eyebolts i.e. formed from a steel rod and bent into an eye.

SINGLE iQ SUSPENSION TRUSS (By ATM™)

The iQ suspension truss is an economical solution to suspending a single purpose loudspeaker array from two or three fixed structural attachment points. The iQ Suspension Truss is designed to hold the loudspeakers at the optimum splay angle to optimize cluster performance. Most Suspension Trusses are equipped with two suspension rails with multiple attachment holes that travel from front to back across the top of the array, allowing manipulation of the center of gravity of the cluster to achieve down tilt without a pull strap.

Features:

- Optimized fixed splay angle
- Adjustable tilt
- Fast multiple enclosure rigging system
- Economical
- Low profile, clean looking array

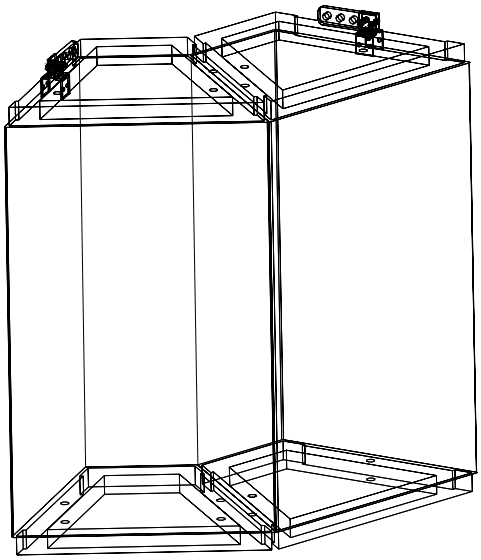


iQ Suspension Truss

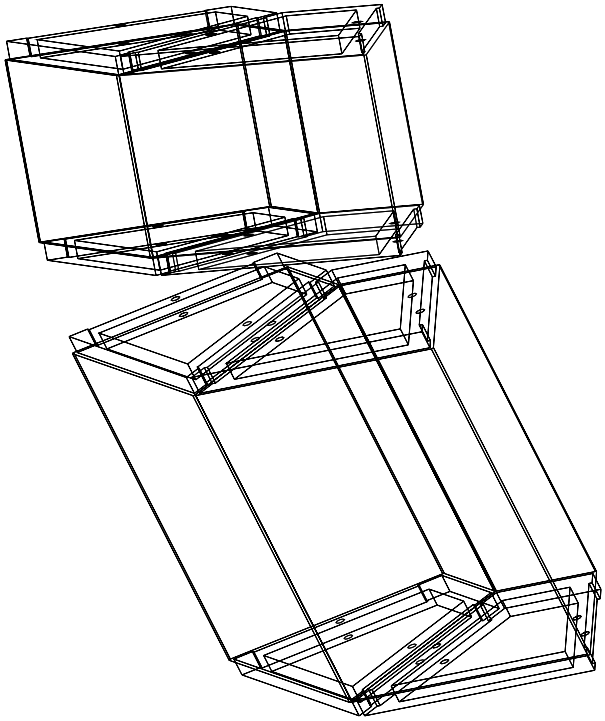
The iQ Suspension Truss is a "semi-custom" product line that is built to order. Please contact your Tannoy or ATM Fly-Ware dealer with the loudspeaker model numbers along with the array application.

Full assembly instructions for the iQ Suspension Truss accompany the product.

Typical Suspension Truss applications –



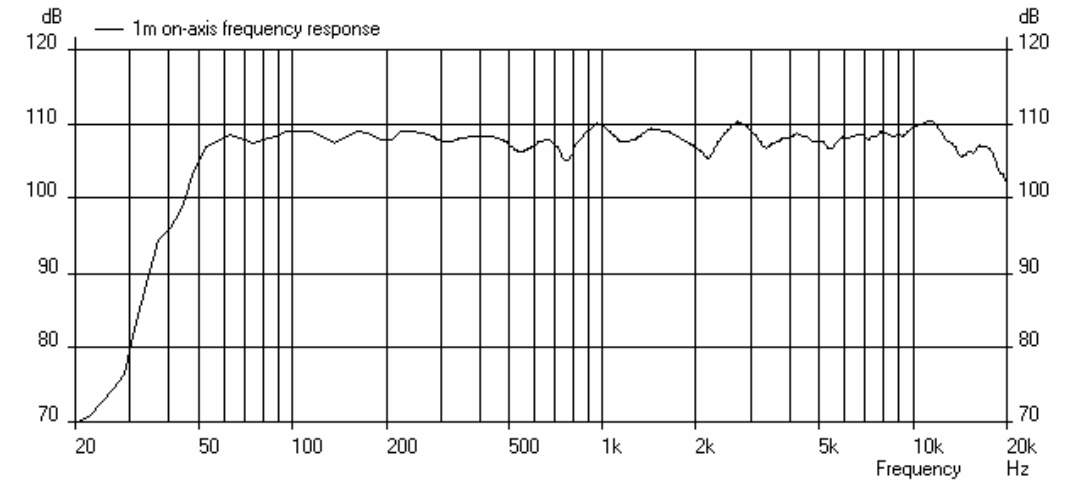
2 x iQ 10/15



2 x iQ 10C & 2 x iQ 10/15

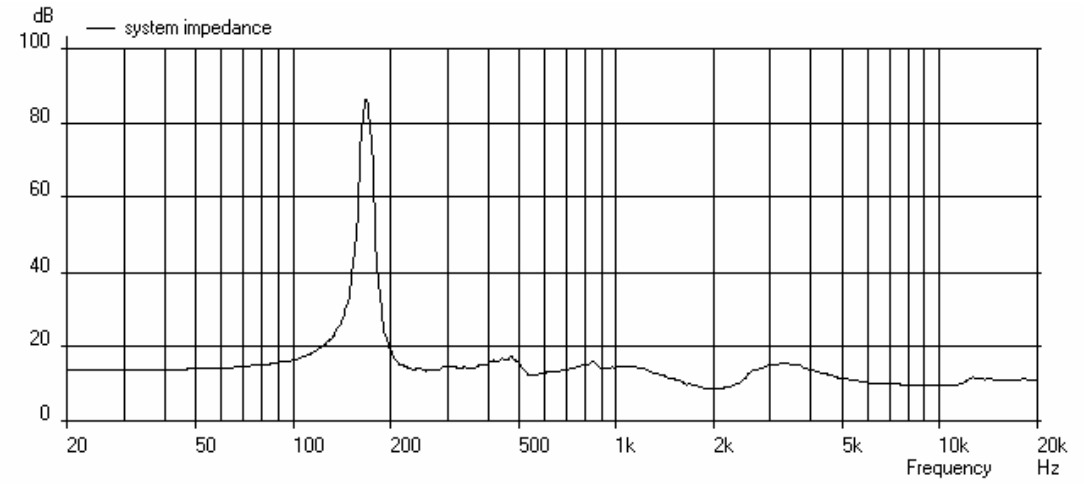
10. Performance Data

FREQUENCY RESPONSE



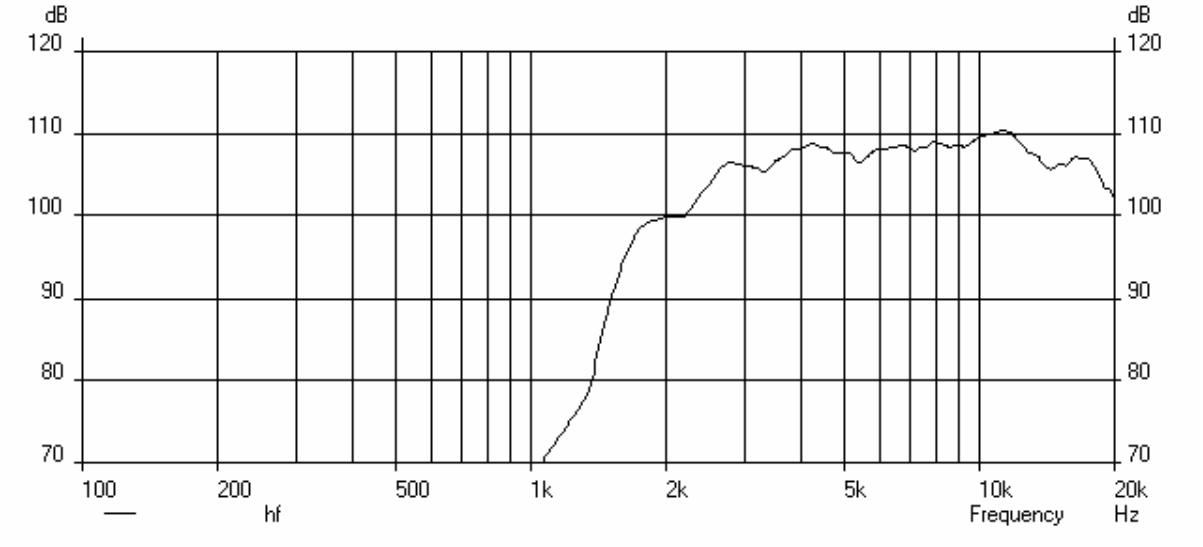
Anechoic System Frequency Response, 1 watt (MF/HF) @ 1 metre on axis

INPUT IMPEDANCE

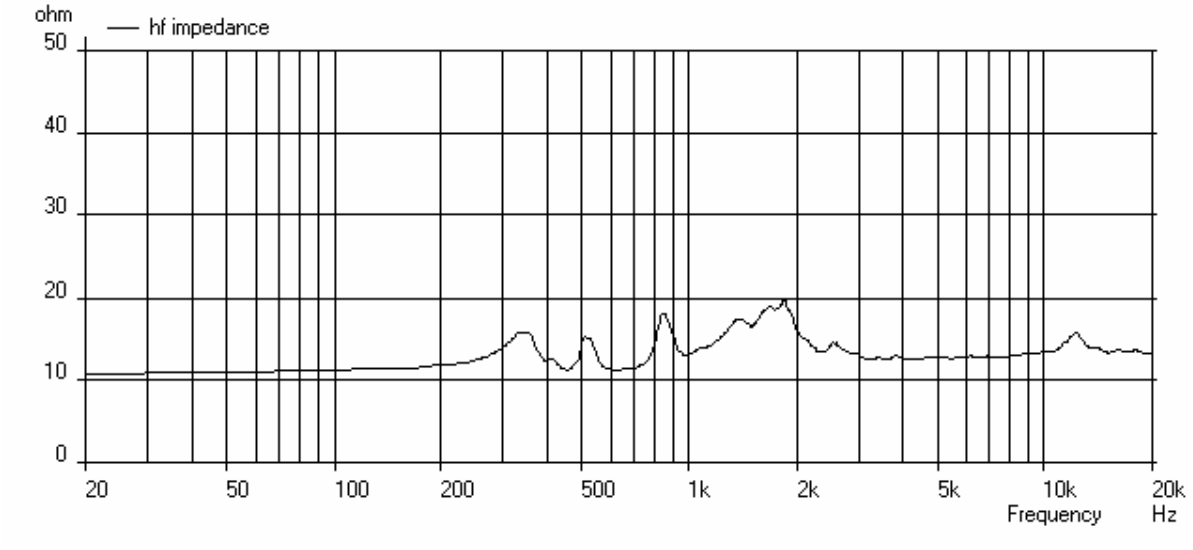


Impedance (Passive MF/HF only)

High Frequency (Tri-amp option)

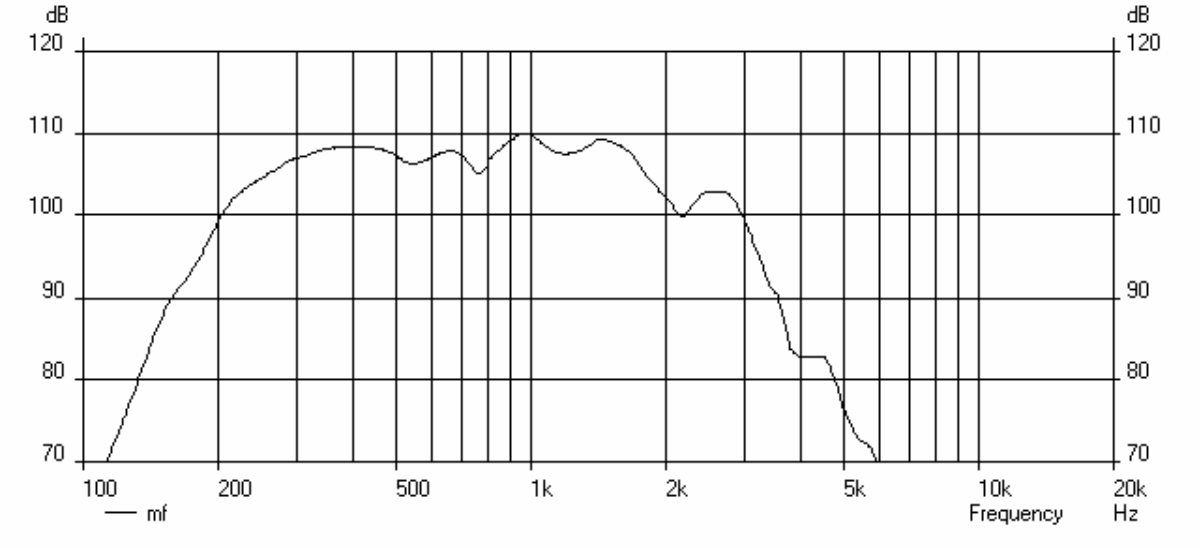


Anechoic Frequency Response, 1 watt (HF) @ 1 metre on axis

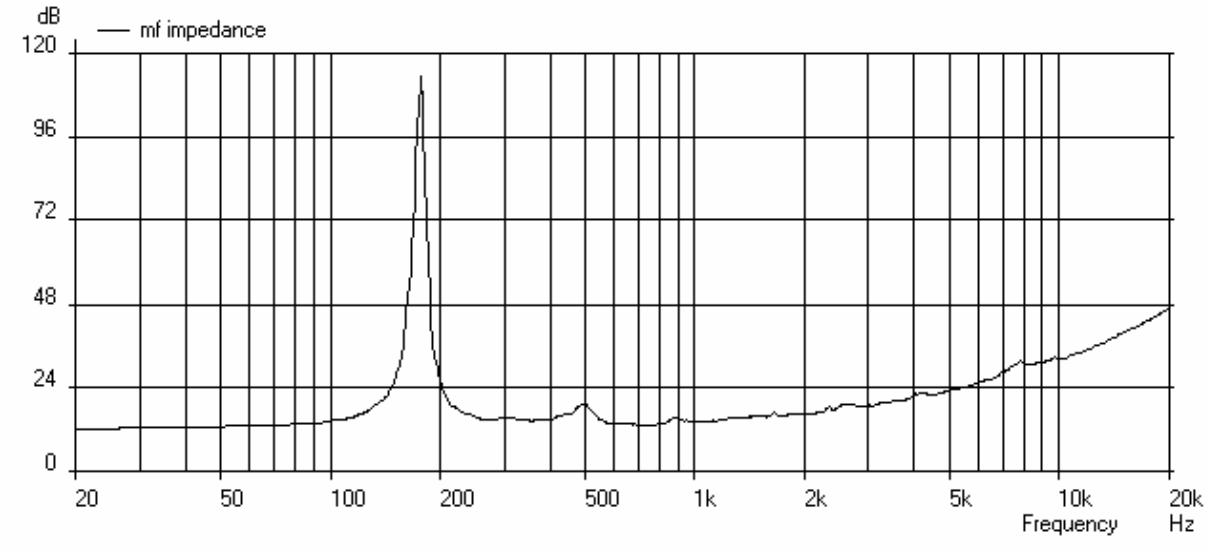


Impedance (HF only)

Mid Frequency (Tri-amp option)



Anechoic Frequency Response, 1 watt (MF) @ 1 metre on axis



Impedance (MF only)

A comprehensive range of measurements including off axis frequency response curves, oc
octave polar diagrams (single & two cabinet arrays) and beamwidth plots as well as Ease™ data can be downloaded from http://www.tannoy.com/

11. Technical Specifications

Frequency Response (1) +/- 3dB	49Hz - 19kHz
-10dB Point	43Hz
Nominal Dispersion	**60°** x 40 ° **(H x V)**
Driver Compliment	**MF/HF – 1 x 250mm (10") PowerDual™** **LF - 1 x 380mm (15")**
Configurations	**Bi-amp (standard) - LF & Passive MF/HF** **Tri-amp (optional)**

Components	**LF**	**Midrange**	**High Frequency**
Frequency Band (3)	**43Hz – 180Hz**	**180Hz – 2.77kHz**	**2.77kHz – 19kHz**
Sensitivity (1)	**101dB**	**107dB**	**110dB**
Power Handling (2)	**400W (average)** **800W (programme)** **1600W (Peak)**	**175W (average)** **350W (programme)** **700W (peak)**	**50W (average)** **100W (programme)** **200W (peak)**
Impedance	**8Ω**	**16Ω**	**16Ω**
Maximum SPL (3)	**127dB (average)** **133 (peak)**	**129dB (average)** **135dB (peak)**	**127dB (average)** **133dB (peak)**

DI Averaged (PCQ)	11.0, 500 Hz - 16 kHz
@ 1kHz (ISO)	12.6
@ 2kHz (ISO)	12.2
@ 4kHz (ISO)	9.5
@ 8kHz (ISO)	11.5
@ 16kHz (ISO)	12.3
Q Averaged (PCQ)	13.5, 500 Hz - 16 kHz
@ 1kHz (ISO)	18.3
@ 2kHz (ISO)	16.7
@ 4kHz (ISO)	8.8
@ 8kHz (ISO)	14
@ 16kHz (ISO)	16.9

Crossover	Active 180Hz, Passive 2.6kHz (standard model) 4th order high pass, 4th order low pass
Enclosure	18mm multi-ply birch plywood
Finish	Textured black paint (optional in white)
Protective Grille	Foam covered, powder coated perforated steel
Connectors	2 x Speakon NL4MP in/out (standard model) 4 x Speakon NL4MP (optional tri-amp model)
Fittings	**8 x M10 inserts & 2 pullback points** **4 x Recessed Carrying handles**
Dimensions	**1116mm x 680mm x 540mm** **(43 15/16" x 26 ¾" x 21 ¼")**
Weight	69kg (152.1 lbs)

NOTES:

(1) Average over stated bandwidth. Measured at 1m on axis.
(2) Long term power handling capacity as defined in EIA standard RS - 426A.
(3) Unweighted pink noise input, measured at 1m in an anechoic chamber

The iQ 10/15 is designed for use with the Tannoy TDX1 & TDX2 digital system controller, which provide a preset configuration of Crossover frequencies, relative output levels, and system equalization for optimum performance. Should you intend using an alternative Loudspeaker management system, these parameters can be accessed from the Tannoy website – www.tannoy.com - or can be found in this IQ 10/15 user manual.

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

Unique Funktion One Axhead Technology (UK patent number GB2270606) is incorporated into Tannoy iQ Series SuperDual™ products by agreement with Funkton One Research

12. System Configurations & OEM Controllers

Passive or Biamp?

The iQ 10/15 is supplied as standard for bi-amp operation, therefore there is no internal passive crossover network between the LF & Mid/High units. **The Bi-amp controller parameters below must be adhered to for optimum performance.** An optional iQ 10/15 (tri-amp version) can be ordered.

A loudspeaker driven in Bi-amp mode offers a number of performance advantages, such as increased system headroom. Audio program materiel is made up of many different frequencies and harmonics. In music materiel, most of the energy is in the low frequencies, with less in the highs. When both high and low frequencies are present in a signal, the stronger low frequencies can use up amp power, leaving little or no reserve for the highs, so they are more likely to cause the power amplifier to clip. In a Biamp driven system, a smaller amp can handle high frequencies, LF amp clipping is less of a factor, and less overall amplifier capacity is needed due to the efficiency improvement in the absence of a passive crossover.

Bi-amp System Parameters (iQ 10/15)

Parameter	Unit/Name	Low Section	Mid/High Section
Gain	(dB)	+5	0
Delay*	(ms)	0	0
Polarity		Positive	Positive
HPF	Freq (Hz)	39.8	180
	Slope (dB/oct)	24	24
	Filter Shape	Butterworth	Linkwitz Riley
LPF	Freq (Hz)	180	Thru
	Slope (dB/oct)	24	NA
	Filter Shape	Linkwitz Riley	NA
PEQ 1	Freq (Hz)	60.1	2000
	Level (dB)	+4	-4
	Type	Parametric	Parametric
	Q / Bandwidth	2 / 0.5	0.8 / 1.25
PEQ 2	Freq (Hz)	141.3	
	Level (dB)	-5	
	Type	Parametric	
	Q / Bandwidth	2 / 0.5	

13. iQ 10/15 Service Parts and Accessories

Part Number	Description
7900 0607	Driver Kit Type 2519 (MF)
7900 0609	Recone Kit Type 2519 (MF)
7900 0608	Driver Kit Type 0278 (HF)
7900 0610	Diaphragm Type 0278 (HF)
8001 2820	VEB – Secur ET – Eyebolts M10
8000 3630	TDX1 Digital System Controller 60-250V – UK
8000 3631	TDX1 Digital System Controller 60-250V – EUR
8000 3632	TDX1 Digital System Controller 60-250V – USA
8000 0727	TDX2 Digital loudspeaker management system 60-250V - UK
8000 0728	TDX2 Digital loudspeaker management system 60-250V - EUR
8000 0729	TDX2 Digital loudspeaker management system 60-250V – USA

14. Warranty

No maintenance of the iQ 10/15 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 is the serial number has been altered or removed. A Tannoy Professional dealer or service agent should only carry out work under warranty. 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.
Coatbridge
ML5 4TF
Scotland

Telephone:	01236 420199	(National)
	+44 1236 420199	(International)
Fax:	01236 428230	(National)
	+44 1236 428230	(International)
E-Mail:	service@tannoy.com	
Website:	www.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.

15. Declaration of Conformity

CE

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. This Equipment conforms to the requirements of the EMC Directive 89/336/EEC, amended by 92/31/EEC and 93/68/EEC and the requirements of the low voltage directive 73/23/EEC, amended by 93/68/EEC.

Details of the Apparatus:	Tannoy Contractor Loudspeaker Model Number: iQ10/15
Associated Technical File:	EMCIQ10/15
Applicable Standards:	EN 55103 –1:1996 Emission EN 55103 –2:1996 Immunity
Electrical Safety:	EN 60065:1993
Signed:	
Position:	Engineering Director – Professional Products Tannoy Professional
Date:	11/10/2004
For Tannoy Ltd	

B

Tannoy Loudspeakers are manufactured in Great Britain by:

Tannoy Ltd, Rosehall Industrial Estate, Coatbridge,
Strathclyde, ML5 4TF, SCOTLAND
Telephone: +44 (0) 1236 420199
Fax: +44 (0)1236 428230

Tannoy North America Inc, Suite 1. 335 Gage Avenue, Kitchener, Ontario, CANADA, N2M 5E1
Telephone: (519) 745 1158
Fax: (519) 745 2364

Issue 1.0 Part No. 6481 0430

GH June 27, 2004