

FLOODLIGHT® SERIES ENGINEERING INFORMATION

The TFL-760Ht 3-way medium dispersion mid/high loudspeaker enclosure achieves outstanding transient ability over twice the nominal horizontal coverage angle of a Flashlight® enclosure, thus giving rise to its name: Floodlight®.

The use of specialised cone-type transducers, in combination with unique Axehead™ technology, results in high efficiency, accuracy, very low levels of distortion, even dispersion and exceptional intelligibility, enabling it to be considered for a multitude of near and mid field applications. Floodlight is therefore available in various housings and flying configurations to meet the specific requirements of a large range of applications.

The TFL-760Ht is the trapezoidal version of Floodlight for use in light and medium-duty touring applications, and where extremely tightly-arrayed flying clusters and ground stacks are required. Flush handles, rear access panel and birch plywood construction are standard.

A comprehensive new flying system has been designed to cater for simple rigging of both touring PA clusters and fixed

installations without incurring a cost penalty for those users who have no flying requirement. All of these features combine to give a system unsurpassed in simplicity, ease and speed of handling, and long term durability.

The loudspeaker complement consists of a very powerful low-mid 12" cone loudspeaker which, combined with the Axehead™ waveguide, handles frequencies between 180Hz and 1.3kHz. The high-mid band between 1.3kHz and 8kHz is covered by a similar combination based on a specialised 6.5" loudspeaker. The remaining high frequency band, 8kHz to in excess of 20kHz, is handled by a 1" VHF compression driver. Perfect time alignment is achieved by the careful positioning of these three components and their wave guides within the enclosure.

Recommended complementary products:

TSW-718, TSW-721 bass enclosures

TSW-124 subwoofer enclosure

LMS-D6 loudspeaker management system



FEATURES

- Compact trapezoidal enclosure**
- Ultra-low distortion**
- Physically time-aligned**
- Even dispersion control**
- Superior transient response**

APPLICATIONS

- Touring sound reinforcement**
- Nightclub / discotheque**
- Corporate presentation**
- Theatre**
- Side fills**

DIMENSIONS (HxWxD)	825mm x 574mm x 510mm (32.5" x 22.6" x 20.1")																																								
NET WEIGHT	52kg (114lbs)																																								
COMPONENTS	1 x 12" (305mm) LMF driver, 1 x 6.5" (165mm) HMF driver, 1 x 1" (25mm) HF compression driver																																								
FREQUENCY RESPONSE¹	180Hz - 20kHz ±4dB																																								
NOMINAL DISPERSION²	50°H x 25°V @ -6dB points																																								
POWER HANDLING	LMF: 250 watts r.m.s., 500 watts program, 625 watts peak HMF: 100 watts r.m.s., 200 watts program, 250 watts peak HF: 50 watts r.m.s., 100 watts program, 125 watts peak Recommended amplifier power: LMF: 500 watts @ 8 ohms, HMF: 200 watts @ 16 ohms, HF: 100 watts @ 16 ohms																																								
SENSITIVITY³	LMF: 105dB 1 watt @ 1metre; HMF: 108dB 1 watt @ 1 metre; HF: 107dB 1 watt @ 1 metre																																								
MAXIMUM SPL	133dB continuous ⁴ , 139dB peak ⁵																																								
CROSSOVER	Recommended crossover points at 1k3Hz and 8kHz, 24dB/octave Linkwitz-Riley																																								
NOMINAL IMPEDANCE	LMF: 8 ohms HMF: 16 ohms HF: 16 ohms																																								
CONSTRUCTION	18mm (3/4") trapezoidal birch plywood enclosure; rebated, screwed and glued. Finished in TurboBlue™ semi-matt textured paint. Four recessed carrying handles																																								
GRILLE	Cloth/expanded steel mesh																																								
CONNECTORS	(2) 6-pin EP6 wired; pin1 LMF-; pin2 LMF+; pin3 HMF-; pin4 HMF+; pin5 HF-; pin6 HF+																																								
OPTIONS	Flying System: refer to the "Flying and Lifting" section. Optional passive high frequency filter at 8kHz (TFL-760Ht-BP)																																								
SPARES AND ACCESSORIES	<table border="0"> <tr> <td>LS-1209</td> <td>1 x 12" (305mm) LMF loudspeaker</td> <td>Flying and Lifting Hardware</td> </tr> <tr> <td>LS-6503</td> <td>1 x 6.5" (165mm) HMF loudspeaker</td> <td>SW-760 Sword</td> </tr> <tr> <td>CD-103</td> <td>1 x 1" (25mm) HF compression driver</td> <td>MB-760 Minibar</td> </tr> <tr> <td>RC-1209</td> <td>Recone kit for LS-1209</td> <td>DB-760/C Double bar close-coupled</td> </tr> <tr> <td>RC-6503</td> <td>Recone kit for LS-6503</td> <td>TB-760/C Triple bar close-coupled</td> </tr> <tr> <td>RD-103</td> <td>Replacement diaphragm for CD-103</td> <td>DB-760 Double bar standard</td> </tr> <tr> <td>MG-780</td> <td>Replacement cloth/expanded metal grille</td> <td>TB-760 Triple bar standard</td> </tr> <tr> <td>PX-760</td> <td>Internal HF protection filter</td> <td>TS-760 Tilting bridle</td> </tr> <tr> <td>PX-760/P</td> <td>Internal passive filter for optional passive HF version</td> <td>SL-760 Safety lynch-pin</td> </tr> <tr> <td></td> <td></td> <td>DC-760 Double clevis coupler</td> </tr> <tr> <td></td> <td></td> <td>ST-760 Safety tube clip</td> </tr> <tr> <td></td> <td></td> <td>CB-760/2 Double bar chain bridle</td> </tr> <tr> <td></td> <td></td> <td>CB-760/3 Triple bar chain bridle</td> </tr> </table>	LS-1209	1 x 12" (305mm) LMF loudspeaker	Flying and Lifting Hardware	LS-6503	1 x 6.5" (165mm) HMF loudspeaker	SW-760 Sword	CD-103	1 x 1" (25mm) HF compression driver	MB-760 Minibar	RC-1209	Recone kit for LS-1209	DB-760/C Double bar close-coupled	RC-6503	Recone kit for LS-6503	TB-760/C Triple bar close-coupled	RD-103	Replacement diaphragm for CD-103	DB-760 Double bar standard	MG-780	Replacement cloth/expanded metal grille	TB-760 Triple bar standard	PX-760	Internal HF protection filter	TS-760 Tilting bridle	PX-760/P	Internal passive filter for optional passive HF version	SL-760 Safety lynch-pin			DC-760 Double clevis coupler			ST-760 Safety tube clip			CB-760/2 Double bar chain bridle			CB-760/3 Triple bar chain bridle	
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Notes

¹Measured on axis

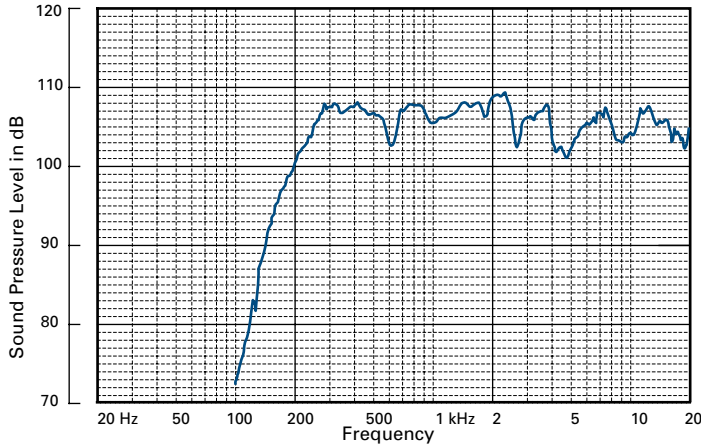
²Average over stated bandwidth

³Average over stated bandwidth

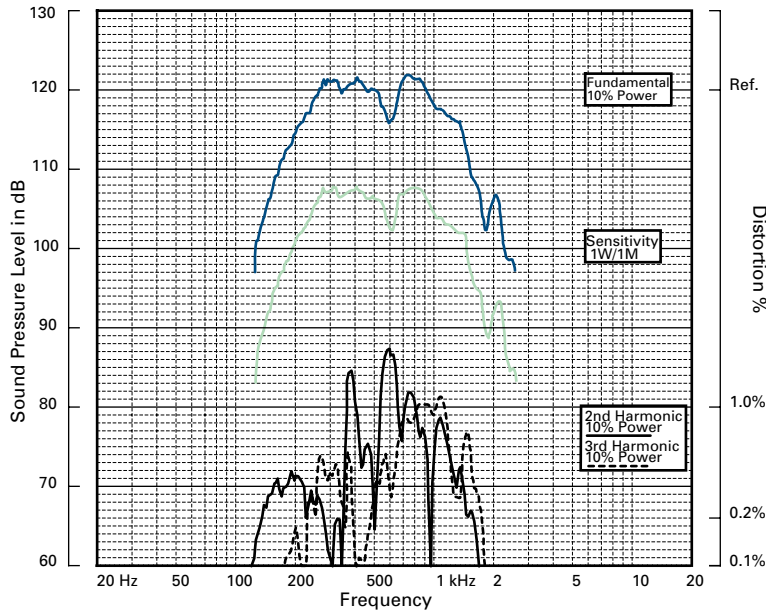
⁴Unweighted diode-clipped pink noise. Measured in a half space environment

⁵Verified by subjective listening tests of familiar program material, before the onset of perceived signal degradation

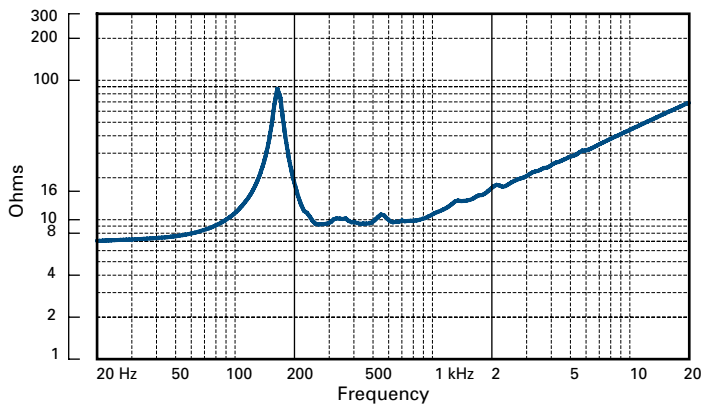
SYSTEM FREQUENCY RESPONSE



LOW-MID FREQUENCY RESPONSE



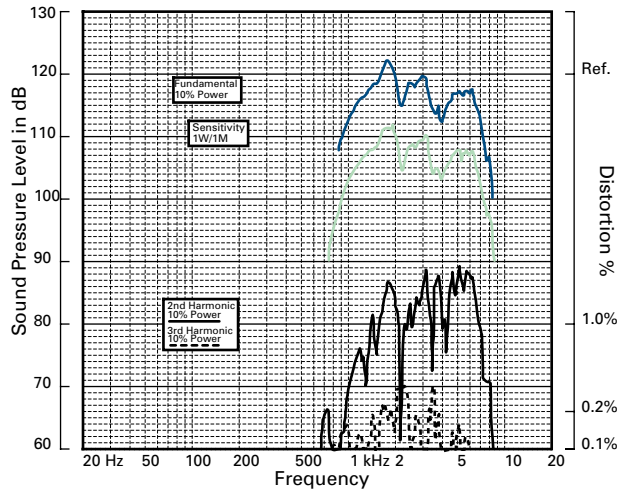
LOW-MID IMPEDANCE



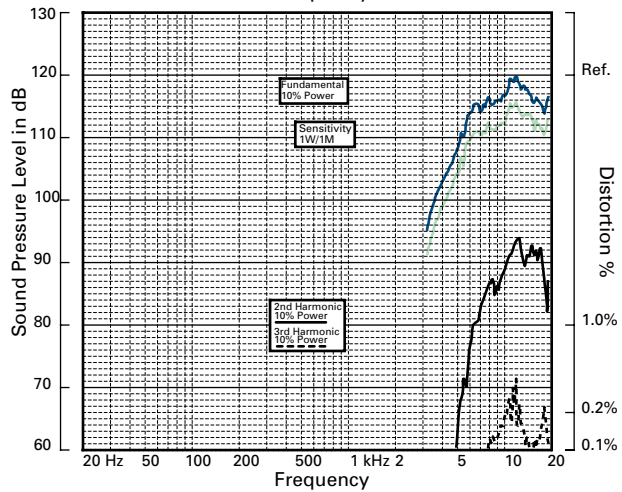
Impedance A constant current circuit was used to measure the impedance. **Frequency response** The frequency response shown was obtained by feeding a swept sine wave through the system in a half space environment. The position of the microphone was vertically on-axis at a distance of 2 metres, then scaled to represent 1 metre. **2nd & 3rd Harmonic Distortion** Distortion measurements were obtained using an Audio Precision harmonic distortion analysis system and comply with AES recommendations for enclosure measurement (AES paper ANSI S4-26-1984). **Data Conversion** All graphs were digitally generated using the APEX custom software system, designed to translate data derived from Audio Precision 'System One' test equipment into AutoCAD™. This program enables graphical information to be plotted to a high degree of accuracy.

NOTES ON MEASUREMENT CONDITIONS

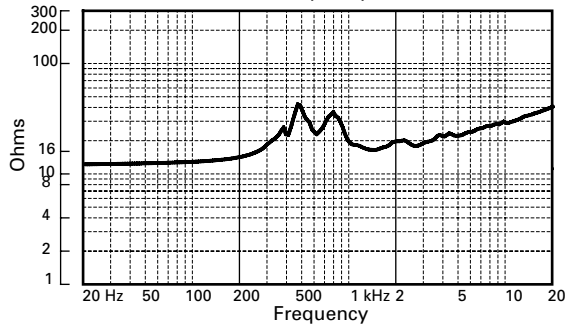
HIGH-MID FREQUENCY RESPONSE



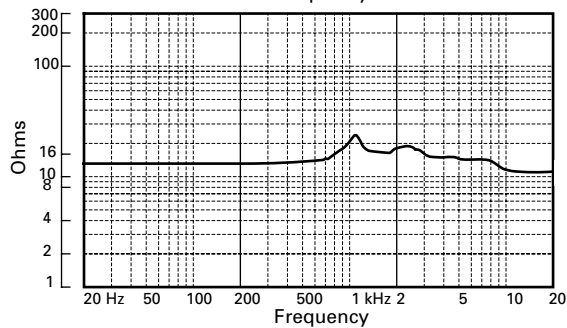
HF FREQUENCY RESPONSE



HIGH-MID IMPEDANCE



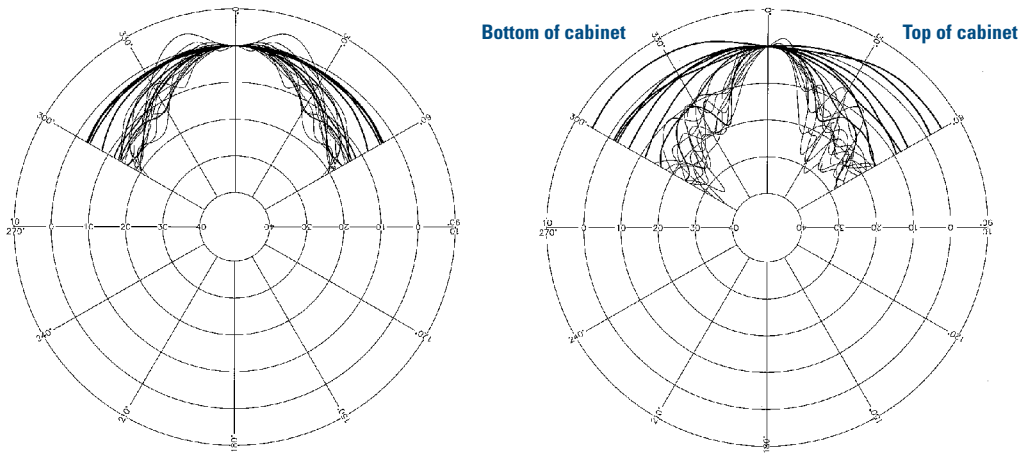
HF IMPEDANCE



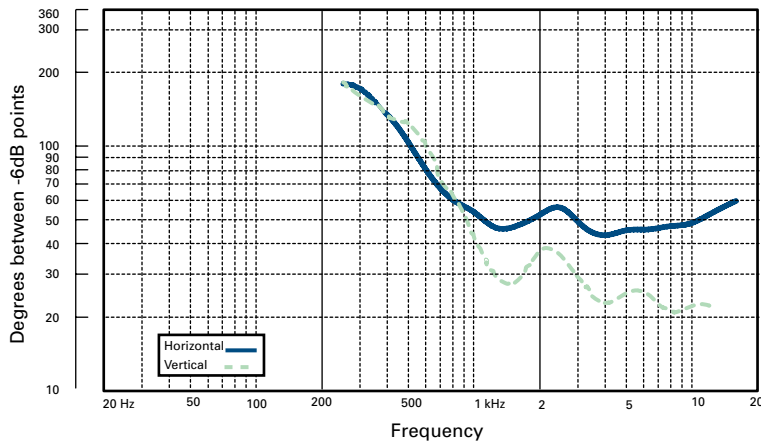
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COMPOSITE POLARS



BEAMWIDTH

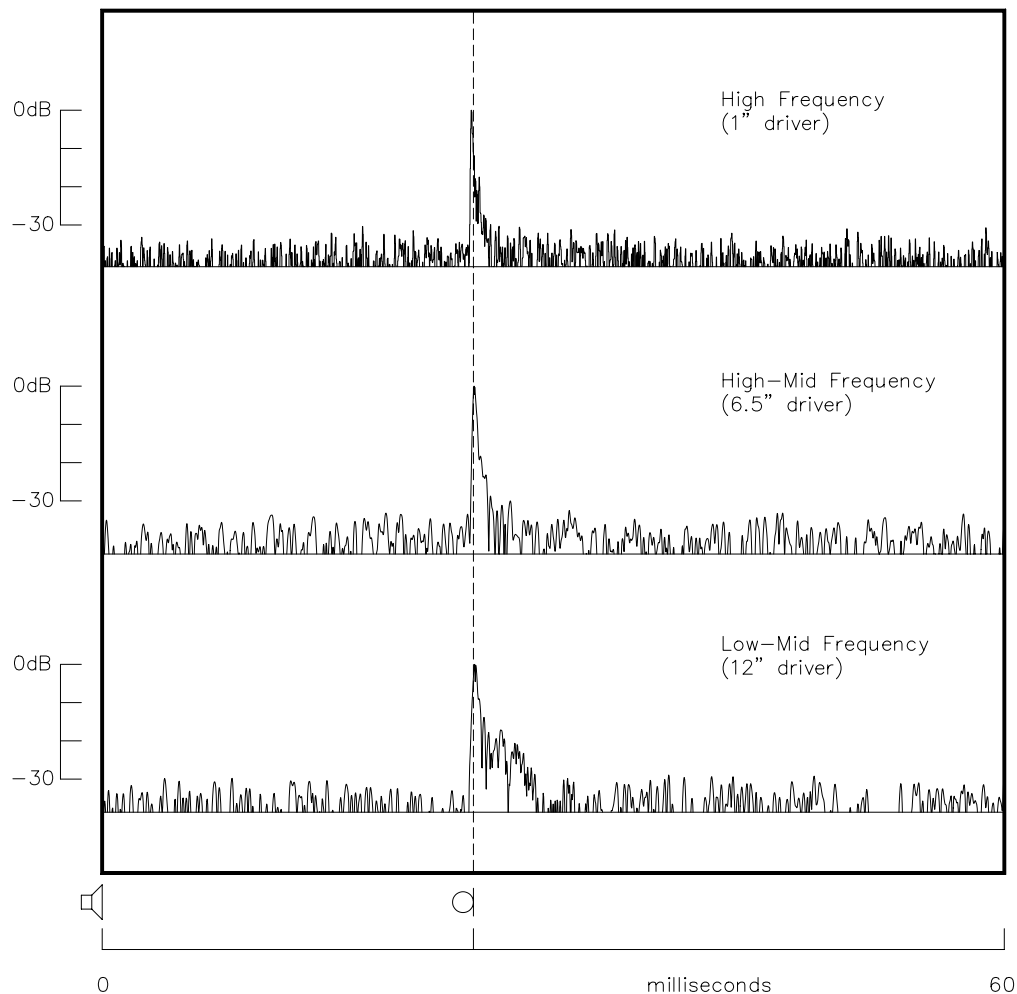


All the polar measurements were taken using calibrated MLSSA test equipment, with a microphone placed at a distance of 9 metres from the rotational axis of the loudspeaker enclosure under test. This method reduces the effect that the interaction between the MF and the HF has on the measurements.

For clarity, the polar information is displayed with progressively thinner lines from 250Hz to 15kHz in third octave steps. The beamwidth plots were computed from the third octave polars. The enclosures were measured in a half space environment. All graphs are digitally generated using the APEX custom software system, designed to translate data derived from Audio Precision 'System One' test equipment into AutoCAD™. This program enables graphical information to be plotted to a high degree of accuracy.

NOTES ON MEASUREMENT CONDITIONS

TIME DOMAIN



Time Domain information has been included because Turbosound have always regarded transient response as a crucial factor in the general perception of sound quality; particularly intelligibility. Transient response (rise/decay time) is an indication of a loudspeakers ability to follow a given input signal accurately. The human ear is capable of discerning minute increments of time, which means that a loudspeaker with poor transient ability will sound dull and certainly less intelligible. Since Turbosound's inception, transducer designs have always been based around high efficiency and excellent transient response, as can be seen on the Energy/Time (ETC) graphs above. The research and creation of Flashlight and Floodlight Systems exploits the speed of the response times to an extreme level. To maintain this level of accuracy, it is obvious that, not only should the components be good in themselves, but that the various components covering the different frequency bands must also be critically time-aligned with respect to each other. All transducers in the TFL-760Ht are physically time-aligned with each other.

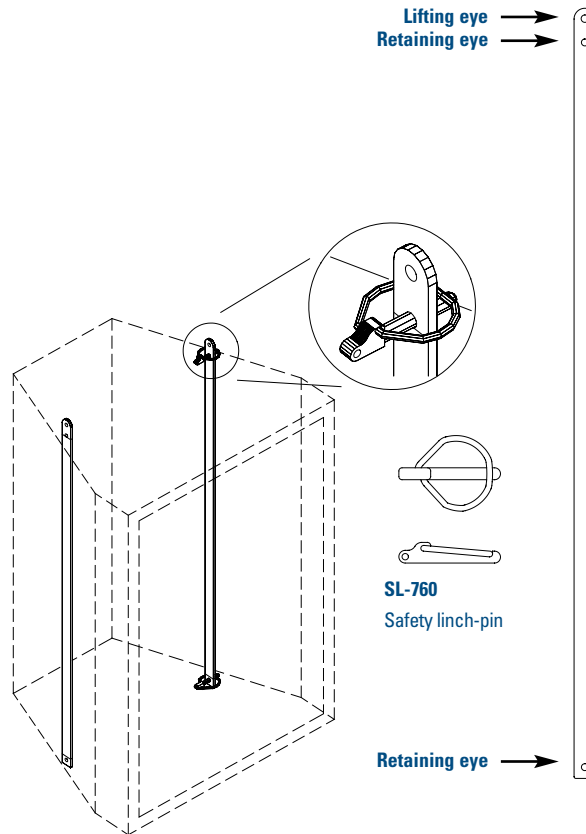
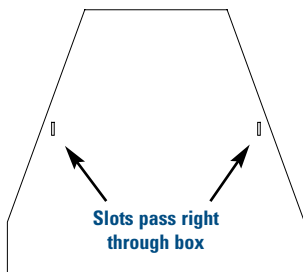
NOTES ON
MEASUREMENT
CONDITIONS

Time Domain measurements were taken using the MLSSA system in a half space environment. All graphs were digitally generated using the APEX custom software system, designed to translate data derived from Audio Precision 'System One' test equipment into AutoCAD™. This program enables graphical information to be plotted to a high degree of accuracy.

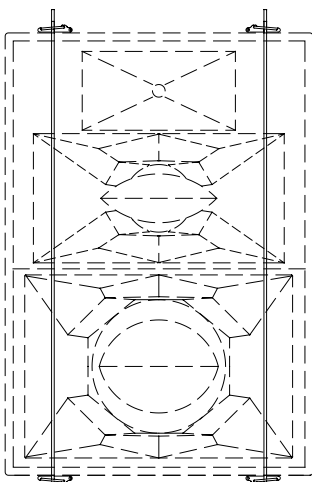
A simple and cost-effective flying system has been developed for install and light touring use with the trapezoidal Floodlight enclosure as a complement to the heavy duty Flashlight flying system, based around the use of steel bars (or 'swords') which slide through slots machined in the enclosure, and are held captive with 7.5mm safety linch-pins through holes in the swords. The flying system eliminates the need for flying hardware as integral parts on the enclosure, thereby not penalising users who have no flying requirements. The resulting system will allow for all flying, including clusters, by employing various configurations of basic parts. The steelwork maintains continuity right through all cabinets such that the cabinet plays no structural part in the flying.

INSTALLATION
HARDWARE

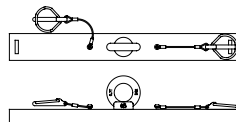
The steel bars ('swords') slide right through slots in the box and are held captive with 7.5mm safety linch-pins through the retaining eyes as shown BELOW and RIGHT



Two lift points

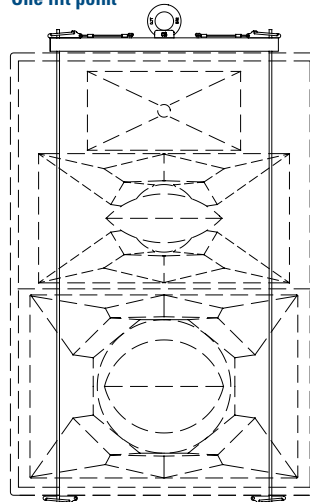


LEFT: this is the simplest way to hang a cabinet; using two points. If a single point is required, then an **MB-760 Minibar** can be added (RIGHT)



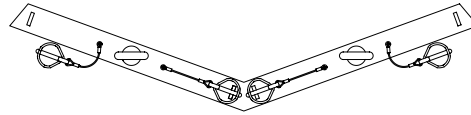
ABOVE: **MB-760 Minibar** plan and elevation showing captive fittings

One lift point

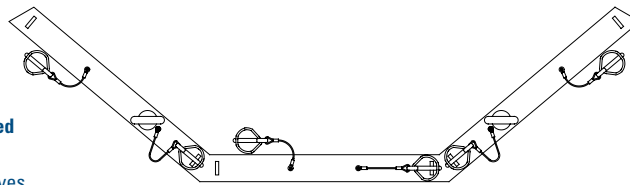
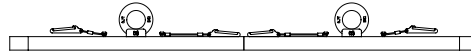


**INSTALLATION
HARDWARE**

Twin and triple bars for close-coupled boxes are also available



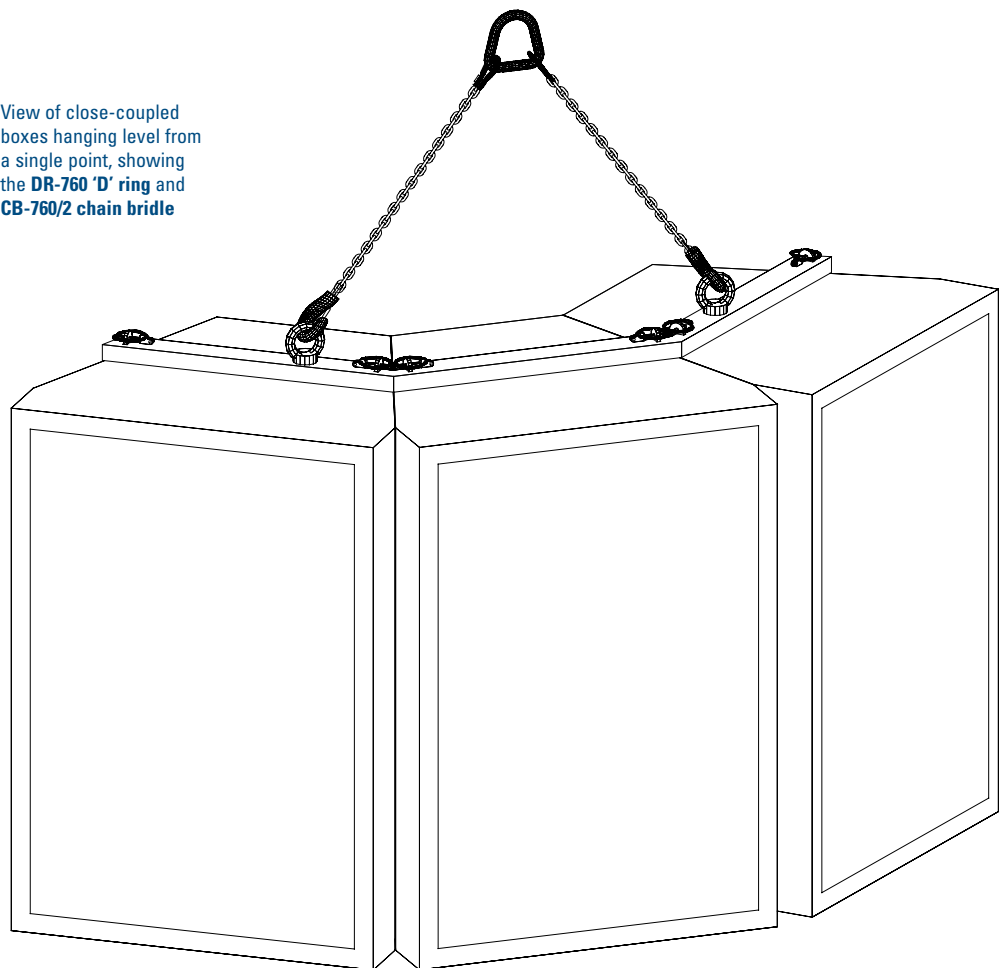
**DB-760/C Close-coupled
Double Bar**
complete with lifting eyes



**TB-760/C Close-coupled
Triple Bar**
complete with lifting eyes
and captive fittings



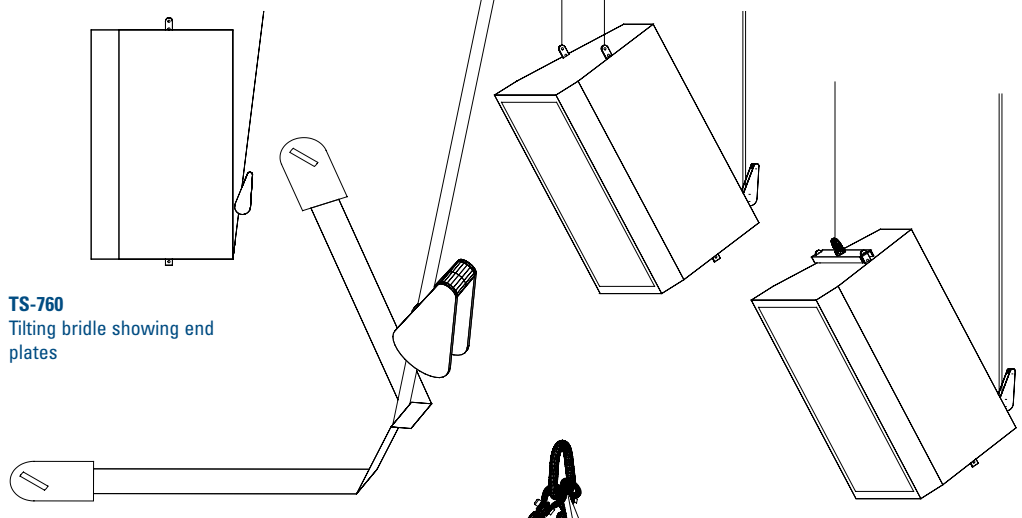
View of close-coupled boxes hanging level from a single point, showing the **DR-760 'D' ring** and **CB-760/2 chain bridle**



**INSTALLATION
HARDWARE**

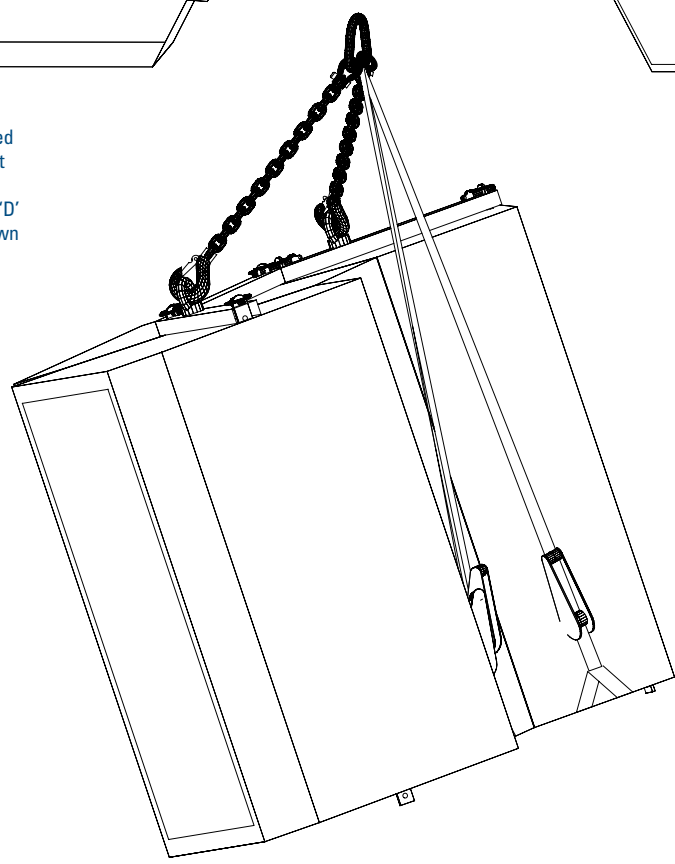
For tilting, a 1" ratchet strap with integral bridle and two special plates is fitted to the bottom of the 'swords' on assembly

This allows tensioning to a convenient point in the roof or truss for a three or (with a Minibar) two point pickup



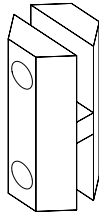
TS-760
Tilting bridle showing end plates

For tilting a close-coupled cluster individual ratchet straps are fitted to each box and taken up to the 'D' ring of the bridle as shown

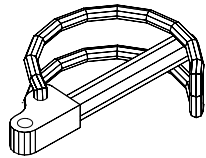


**INSTALLATION
HARDWARE**

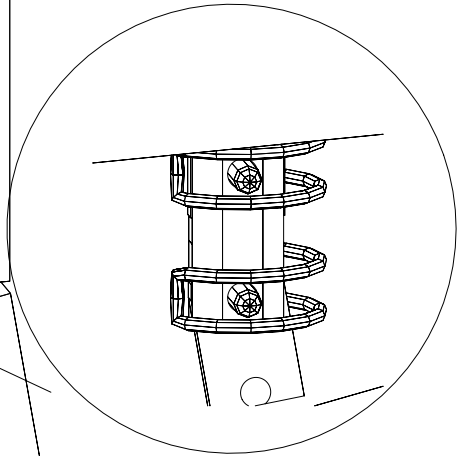
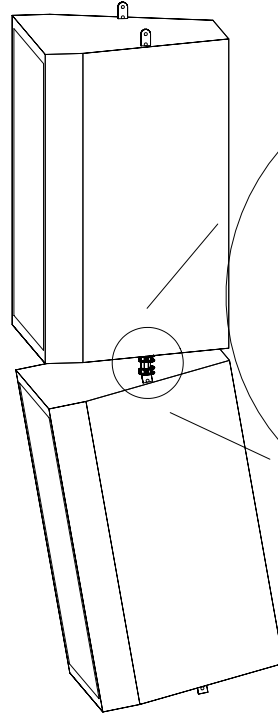
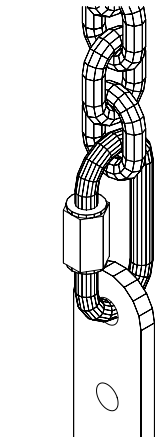
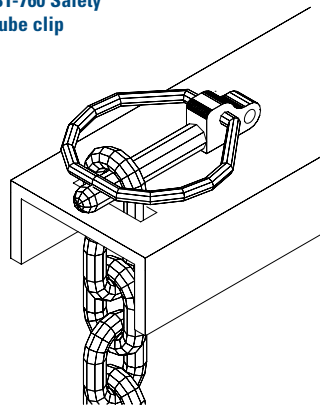
For hanging one box under another, a double clevis and tube clips are used to join the 'swords' together



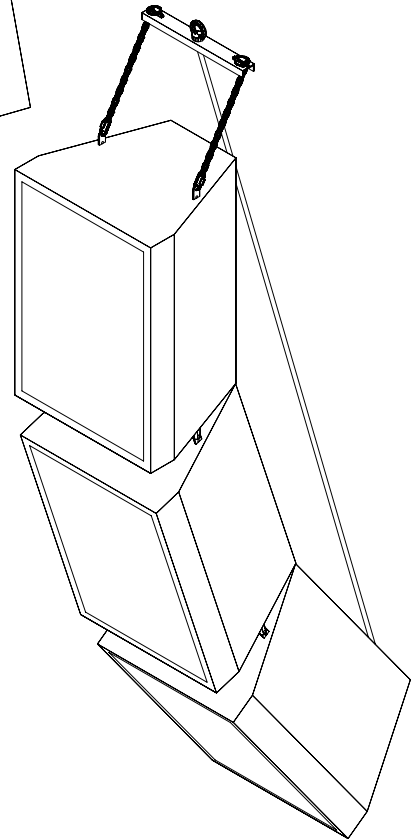
DC-760 Double clevis coupler



ST-760 Safety tube clip



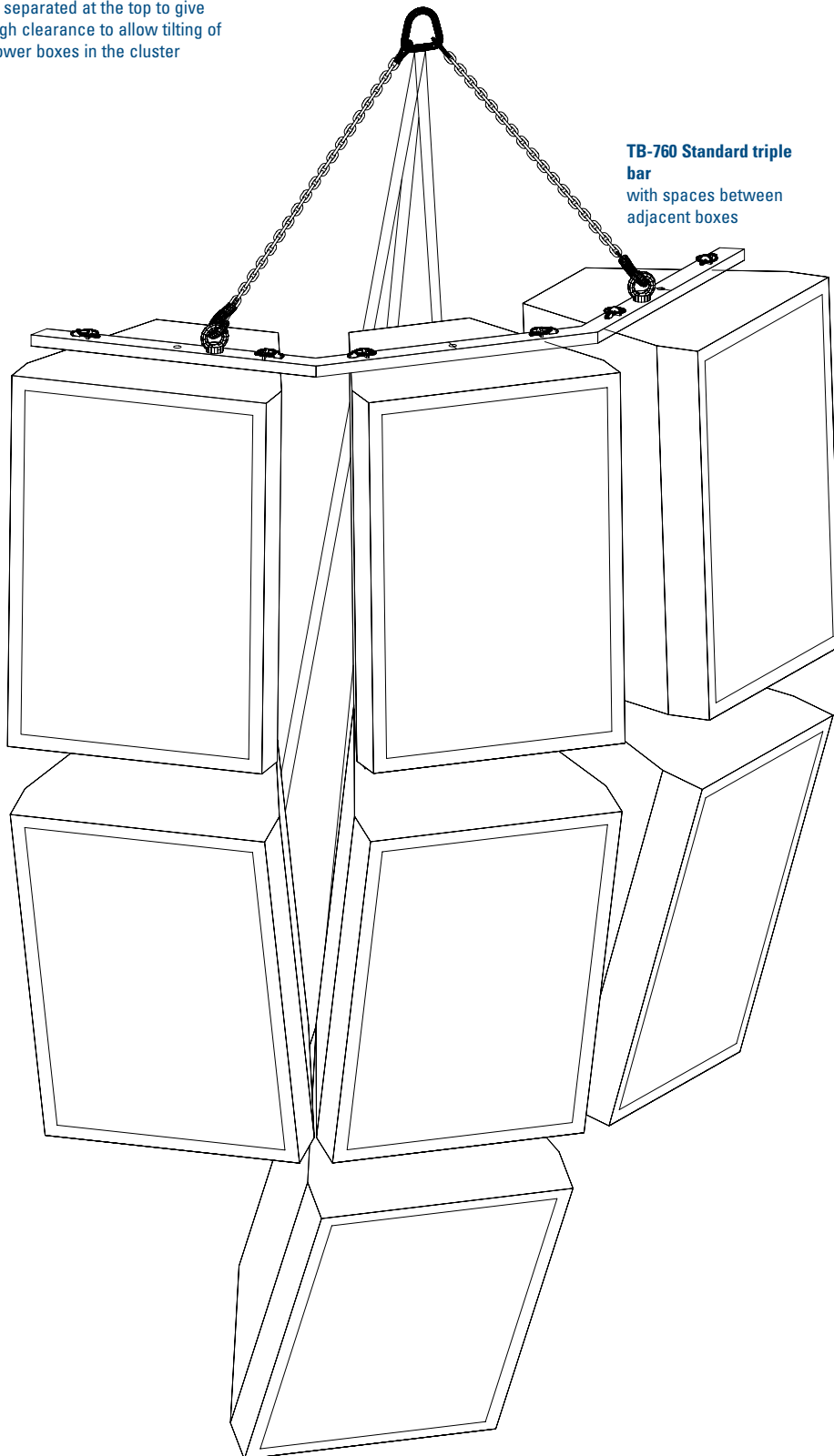
RIGHT: 3 deep single column with extension chains, shown flying from a single point



Single columns may be hung from a single point by interposing a length of chain at the connection between flying bar and swords using a stainless steel quicklink to connect the top of the sword with the chain and the captive safety linch-pin directly through the last link of the chain

For larger clusters, the boxes need to be separated at the top to give enough clearance to allow tilting of the lower boxes in the cluster

**INSTALLATION
HARDWARE**



TB-760 Standard triple bar with spaces between adjacent boxes

**ARCHITECTURAL
& ENGINEER'S
SPECIFICATIONS**

The loudspeaker system shall be of the tri-amped, three way active trapezoidal type consisting of one 305mm (12") low-mid frequency loudspeaker loaded with an Axehead™ device, one 6.5" (165mm) high-mid frequency loudspeaker loaded with an Axehead™ device, and one 1" (25mm) high frequency compression driver. Performance specifications of a typical production unit shall meet or exceed the following: Frequency response, measured with swept sine-wave input, shall be flat within ± 4 dB from 180Hz - 20KHz. Nominal dispersion, at -6dB points, shall average 50°H x 25°V. Nominal impedance shall be low-mid: 8 ohms, high-mid: 16 ohms, high: 16 ohms. Power handling shall be low-mid: 250 watts r.m.s., 500 watts program, 625 watts peak; high-mid: 100 watts r.m.s., 200 watts program, 250 watts peak; high: 50 watts r.m.s., 100 watts program, 125 watts peak. Average enclosure sensitivity measured with 1 watt input at 1 metre distance on-axis, mean-averaged over stated bandwidth, shall be 108dB. Maximum SPL (peak), measured with music program input at stated amplifier power, shall be 139dB. Dimensions: 825mmH x 574mmW x 510mmD (32.5" H x 22.6" W x 20.1" D). Weight: 52kg (114 lbs). The loudspeaker system shall be the Turbosound TFL-760Ht [TFL-760Ht-BP]. No other loudspeaker shall be acceptable unless submitted data from an independent test laboratory verify that the above combined performance/size specifications are equalled or exceeded. A complete flying and arraying hardware system shall be available, comprising a range of load-certified components. The system shall be modular and have the facility of installing a single enclosure up to a 360° point-source array.

DIMENSIONS

