CONTENTS (ENGLISH)

MARTIN AUDIO
LONDON

The Martin Experience

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.

Standards Applied	EMC	Emission	EN55103-1:1996
		Immunity	EN55103-2:1996
	Electrical Safety		EN60065:1993

1 INTRODUCTION

Thank you for purchasing a Martin Audio Wavefront Touring system. This series of products is at the leading edge of touring sound. Collectively, they make up a "toolkit" of compact touring enclosures which can be configured for any scale of touring application – from a small live club system to an arena or outdoor festival.

2 UNPACKING

Each Martin Audio loudspeaker is built to the highest standard and thoroughly inspected before it leaves the factory. After unpacking the system, examine it carefully for any signs of transit damage and inform your dealer if any such damage is found. It is suggested that you retain the original packaging so that the system can be repacked at a future date if necessary.

Please note that Martin Audio and its distributors cannot accept any responsibility for damage to any returned product through the use of non-approved packaging.

3 OVERVIEW

The products covered in this guide include the W8C, W8CT, W8CM, W8CS and WSX enclosures. The W8C, W8CT, W8CM and W8CS are compact array components whilst the WSX is a dedicated ground stacked sub-bass system. These elements are all fully horn loaded for maximum efficiency and can be configured in a variety of ways to suit each particular application.

Most medium scale and arena applications will be based on the W8C used with either the W8CS or WSX sub-bass whilst outdoor festivals will include a number of W8CM and W8CT Longthrow systems. This user's guide is intended to be an introduction to the use of Wavefront Touring systems. More detailed information on recommended setups, arraying and system control will be found in the Applications Guide (available early 2001).

3.1 W8C

The W8C is at the heart of the Wavefront Touring "toolkit". Confirming the trend for increasingly compact systems, it can be rigged quickly to deliver outstanding performance and power in smaller configurations than previously possible. It is a fully horn loaded 3-way system designed to cover the frequency band from 120Hz-20kHz. Ground-breaking horn design features a 12" (305mm) low-mid horn operating from 120-750Hz and a unique combination of 6.5" (165mm) high-mid horn and 1" (25mm) exit high frequency device. The sophisticated high-mid horn reproduces the 750Hz-3.3kHz band and has been specifically developed to overcome the power and distortion limitations of traditionally used large format compression drivers. The result is a remarkably clean, transparent sound which can produce extremely high levels without distress. The high-mid and high frequency sections of the W8C can be driven actively from separate amplifier channels, or passively using a single amplifier channel. Active or passive operation is selected by a switch on the rear panel.

3.2 W8CS

The W8CS has been specifically designed for use with the W8C compact touring system. Its unique port-assisted, folded-horn design combines the high efficiency and bass impact which is characteristic of horn design with the low frequency extension of a reflex enclosure. The W8CS can either be used as the sole source of low frequencies in a W8C system or may be used in conjunction with WSX ground stacked subwoofers in arena systems and flown as part of the main W8C array.

It features a very high power 800 watt 15" (380mm) driver with magnet structure and suspensions optimised for large linear excursion. The folded-horn loading results in acoustic efficiency typically 5dB greater than that of direct radiator bass systems. In addition, substantial output below the horn cut-off frequency is achieved by venting the drive unit chamber via a unique Linear Flow™ port which provides low frequency extension with reduced distortion and air-noise.

3.3 WSX

The WSX is a very high efficiency sub-bass horn which can deliver exceptionally high levels of bass in all applications. It is designed to be ground stacked and used in multiples to increase the mouth area of the stack and couple the horns. It features an 18" (450mm) high power bass driver loaded by a long folded horn to give maximum efficiency reproduction of the lowest octaves. Horn loading the WSX results in typically a 6dB greater output for the same input in comparison with direct radiator subs. Additional benefits of horn loading include fast transient performance and reduced driver excursion.

3.4 W8CM/W8CT Longthrow

W8CM and W8CT Longthrow enclosures combine the separate low-mid, high-mid and high frequency elements of the W8C in a vertical-in-line array format. Columns of identical horns are stacked vertically within each enclosure to increase efficency on axis and narrow the vertical coverage.

Longthrow enclosures are physically compatible with the W8C and can be used to form part of the array. They are normally used in the upper rows of the array and dedicated as a longthrow section within the array. Such a combination is extremely powerful and flexible. With an inventory of mainly W8C's plus a number of W8CM/W8CT's, touring sound companies can tackle any scale of venue and outdoor festival.

Longthrow enclosures can also be used independently. Stadium end-zone line arrays can be constructed which will project sound clearly over several hundred metres.

3.5 W8CM

The W8CM features two vertically-aligned low-mid horns. Each is powered by a 12" (305mm) driver covering the band 120Hz-750Hz. Since the W8CM can operate from 120Hz it may be used without low frequency reinforcement in speech only systems. For stadium applications requiring a throw of over 250 metres, a column of W8CM's can be easily constructed.

3.6 W8CT

Projecting high frequencies outdoors has always been difficult because the air absorbs more as the frequency rises and with increasing distance. At 200 metres air losses would require a high frequency boost of 30dB to restore the original frequency response at the source! To overcome this, the W8CT features a total of 3 x 6.5" (165mm) high-mid horns and 6 x 1" (25mm) exit HF compression drivers. All elements are closely coupled in a vertical line, with the result that an enormous amount of high frequency energy is available.

4 SAFETY FIRST

It is important that loudspeaker systems are used in a safe manner. Please take some time to review the following points concerning safe use of Wavefront Touring Series loudspeakers.

Professional loudspeakers are capable of producing extremely high sound levels and should be used with care. Hearing loss is cumulative and can result from levels above 90dB if people are exposed for a long period. Never stand close to loudspeakers driven at high level.

4.1 Stacking

Ensure that the floor or stage is level and solid.

Do not stack speakers too high outdoors where winds could topple the stack.

Be aware that speakers producing very high power levels can move or creep. To avoid this, place friction material between the floor and speaker and between each speaker.

4.2 Flying

Flying Systems should only be assembled from safety approved load-rated flying bars and fittings by trained and experienced crew, working in association with professional riggers. All arrays must be flown from secure and appropriately load rated rigging points. Seek help from architects, structural engineers or other specialists if in any doubt.

Wavefront Touring enclosures are fitted with MAN load certified flying points and are designed to be flown using either the MAN Transformer flying system or the MAN Installer/Tourer (IT) flying system. Both comply with the 12:1 safety factor as specified by the German VGB70 standard. Please refer to the Transformer or IT user guide for complete information on using these systems. It is essential that every MAN flying system user has the opportunity to read the user guide and we would strongly recommend that every user be properly trained in the safe use of the flying system before constructing and deploying the system in a working situation.

Important Note:

The W8C and W8CT are fitted with a total of four flying points to enable them to be flown either way up. Note that whichever way up the enclosure is flown, only the uppermost flying points should ever be used.
Never suspend one enclosure from the lower flying points of the enclosure above it.

5 AMPLIFICATION

Wavefront Touring loudspeakers are designed to be used with professional power amplifiers capable of producing the following power outputs into 4 ohms:

W8C	400-550W
W8CS	700-1200W
WSX	550-1000W
W8CM	550-700W
W8CT	400-550W

Care should be taken to avoid amplifier clipping. It is important to understand that a low power amplifier driven into clipping is more likely to damage a loudspeaker than a higher power amplifier used within its ratings. This is because music signals have a high peak-to-average "crest" factor. When an amplifier is severely overdriven, its output waveform is clipped (its peaks are squared off) – reducing the crest factor. In extreme cases, the waveform can approach that of a square wave. An amplifier is normally capable of producing far more power under these conditions than its undistorted rated power output.
The use of very high power amplifiers with outputs greater than those recommended is discouraged.

Care should be taken to avoid switch-on surges, which can result in momentary power peaks in excess of specified ratings. When powering up a sound system it is important to switch on the amplifiers after the mixer and control electronics have stabilised. When powering down the system, reverse the sequence and switch off the amplifiers first.

6 CONNECTIONS

The rear panels of the W8C, W8CM and W8CT are fitted with two Neutrik Speakon NL8 connectors and two EP8 female connectors. All connectors are wired in parallel.

EP8	NL8	W8C Active	W8C Passive
1	-1	Low Mid -	Low Mid -
2	+1	Low Mid +	Low Mid +
3	-2	High Mid -	High Mid/High -
4	+2	High Mid +	High Mid/High +
5	-3	High -	N/C
6	+3	High +	N/C
7	-4	N/C	N/C
8	+4	N/C	N/C

EP8	NL8	W8CM	W8CT
1	-1	Low Mid -	Link Through
2	+1	Low Mid +	Link Through
3	-2	Link Through	High Mid -
4	+2	Link Through	High Mid +
5	-3	Link Through	High 1 -
6	+3	Link Through	High 1 +
7	-4	Link Through	High 2 -
8	+4	Link Through	High 2 +

The W8CS and WSX sub-bass enclosures are each fitted with two Neutrik Speakon NL8 connectors wired in parallel. Pins –1/-2 and +1/+2 are connected internally to facilitate the use of 4 core cable to reduce power loss.

NL8	W8CS & WSX
-1 & -2	- (Cold)
+1 & +2	+ (Hot)
-3 & -4	N/C
+3 & +4	N/C

7 CABLE LENGTHS

When connecting loudspeaker systems to an amplifier, it is recommended that the return resistance of the cable used is less than one tenth of the nominal impedance of the system or systems in parallel. The table below gives an indication of the maximum permissible cable runs for various conductor cross-sectional areas.

Conductor CSA	Maximum Cable Run		
	4 ohms	8 ohms	16 ohms
1.0mm^2	11m	22m	44m
1.5mm^2	17m	34m	68m
2.0mm^2	22m	44m	88m
2.5mm^2	29m	58m	116m
4.0mm^2	44m	88m	176m
6.0mm^2	66m	132m	264m

8 SYSTEM CONFIGURATIONS

Wavefront Touring enclosures can be used with dedicated analogue controllers such as the Martin Audio MX5 which performs system specific equalisation, crossover and limiter functions. More complex set-ups will benefit from the use of a digital controller such as the Martin Audio DX1. Wavefront Touring systems can also be used with BSS and XTA digital controllers.

Whichever controller is used, it is important that it has fast attack limiter to prevent amplifiers from clipping. This requires that the controller's limiter thresholds be set to match the sensitivity of the amplifier. A system operated in this way with amplifiers having a power rating as recommended and used by experienced professional sound engineers should be sufficiently protected from overdriving. It is suggested that you refer to the controller's user guide for further information on how to set limiter thresholds.

Most medium scale and arena applications will be based on the W8C used with either the W8CS or WSX sub-bass whilst outdoor festivals will include a number of W8CM and W8CT Longthrow systems. More detailed information on recommended setups, arraying and system control will be found in the Applications Guide (available early 2001).

The nominal horizontal coverage pattern of the W8C, W8CM and W8CT is 55 degrees. This has been found to be the optimum figure to meet the requirements of both medium scale and larger scale use. The optimum horizontal inter-cabinet angle between enclosures is 35 degrees between cabinet centre-lines. With the rear edges touching, this is equivalent to a 10" (250mm) gap between cabinet fronts.

Butting up the cabinet sides is not recommended. It will reduce the horizontal splay angle to 15 degrees which, though giving increased level on-axis, will result in greater interference between adjacent enclosures. Widening the splay angle to 45 degrees will increase the overall dispersion but results in some loss of level on-axis.

Further information on the effect of horizontal splay angles will be found in the Applications Guide.

Wavefront Touring systems combined with the appropriately configured controller exhibit an essentially flat on-axis frequency response. Equalisation to compensate for a particular acoustic environment may be performed where required. Where loudspeakers are arrayed, they may benefit from a degree of equalisation to reduce the effect of the low/mid build up and tilting of the response inherent in the use of multiple arrayed enclosures.

9 WARRANTY

Martin Audio Wavefront Touring Series products are warranted against manufacturing defects in materials or craftsmanship over a period of 5 years from the date of original purchase. During the warranty period Martin Audio will, at it's discretion, either repair or replace products which prove to be defective provided that the product is returned in its original packaging, shipping prepaid, to an authorised Martin Audio service agent or distributor.

Martin Audio Ltd. cannot be held responsible for defects caused by unauthorised modifications, improper use, negligence, exposure to inclement weather conditions, act of God or accident, or any use of this product that is not in accordance with the instructions provided by Martin Audio.
Martin Audio is not liable for consequential damages.

This warranty is exclusive and no other warranty is expressed or implied. This warranty does not affect your statutory rights.

10 TECHNICAL SPECIFICATIONS

W8C

TYPE	3-way full-range trapezoid, switchable active/passive HF
FREQUENCY RESPONSE	120Hz-18kHz ±3dB
LOW FREQUENCY LIMIT	-10dB @ 100Hz
DRIVERS	1 x 12” (305mm) low-mid horn 1 x 6.5” (165mm) high-mid horn 1 x 1” (25mm) exit HF compression driver
RATED POWER	Low-mid: 300W AES, 1200W peak High-mid (/HF): 150W AES, 600W peak HF: 60W AES, 240W peak
RECOMMENDED AMPLIFIER	400-550W into 4 ohms
SENSITIVITY	Low-mid: 106dB High-mid (/HF): 108dB HF: 107dB
MAXIMUM SPL	129dB continuous, 135dB peak
IMPEDANCE	Low-mid: 8 ohms nominal High-mid (/HF): 16 ohms nominal HF: 16 ohms nominal
DISPERSION	55 degs horizontal, 30 degs vertical (-6dB)
CROSSOVER	750Hz, 3.5kHz
CONNECTORS	2 x Neutrik NL8, 2 x EP8
DIMENSIONS (inc. wheels)	(W) 562mm x (H) 799mm x (D) 925mm (W) 22.1ins x (H) 31.5ins x (D) 36.4ins
WEIGHT	71kg (156.5lbs)
SHIPPING DIMENSIONS (inc. wheels)	(W) 580mm x (H) 810mm x (D) 950mm (W) 22.8ins x (H) 31.9ins x (D) 37.4ins
SHIPPING WEIGHT	76kg (167.5lbs)

W8CS

TYPE	Compact folded bass horn, port assisted
FREQUENCY RESPONSE	45-200Hz ±3dB
LOW FREQUENCY LIMIT	-10dB @ 35Hz
DRIVERS	1 x 15” (380mm) long excursion
RATED POWER	800W AES, 3200W peak
RECOMMENDED AMPLIFIER	700-1200W
SENSITIVITY	105dB
MAXIMUM SPL	132dB continuous, 138dB peak
IMPEDANCE	8 ohms nominal
CONNECTORS	2 x Neutrik NL8
DIMENSIONS (inc wheels)	(W) 562mm x (H) 799mm x (D) 925mm (W) 22.1ins x (H) 31.5ins x (D) 36.4ins
WEIGHT	61kg (134lbs)
SHIPPING DIMENSIONS (inc. wheels)	(W) 580mm x (H) 810mm x (D) 950mm (W) 22.8ins x (H) 31.9ins x (D) 37.4ins
SHIPPING WEIGHT	68kg (149.9lbs)

WSX

TYPE	Hyperbolic folded bass horn
FREQUENCY RESPONSE	38-150Hz ±3dB
LOW FREQUENCYLIMIT	-10dB @ 28Hz
DRIVERS	1 x 18” (460mm) long excursion
RATED POWER	600W AES, 2400W peak
RECOMMENDED AMPLIFIER	550-1000W into 4 ohms
SENSITIVITY	105dB
MAXIMUM SPL	132dB continuous, 138dB peak
IMPEDANCE	8 ohms nominal
CROSSOVER	150Hz or below
CONNECTORS	2 x Neutrik NL8
DIMENSIONS (bin vertical, inc. wheels)	(W) 572mm x (H) 1066mm x (D) 1065mm (W) 22.5ins x (H) 41.9ins x (D) 41.9ins
WEIGHT	96kg (211.6lbs)
SHIPPING DIMENSIONS (bin vertical, inc. wheels)	(W) 610mm x (H) 1080mm x (D) 1080mm (W) 24ins x (H) 42.5ins x (D) 42.5ins
SHIPPING WEIGHT	96kg (211.6lbs)

W8CM

TYPE	Dedicated longthrow low-mid enclosure
FREQUENCY RESPONSE	120Hz- 750Hz ±3dB
LOW FREQUENCY LIMIT	-10dB @ 80Hz
DRIVERS	2 x 12”(305mm) low-mid horn
RATED POWER	600W AES, 2400 peak
RECOMMENDED AMPLIFIER	550-700W into 4 ohms
SENSITIVITY	109dB
MAXIMUM SPL	136dB continuous, 142dB peak
IMPEDANCE	4 ohms
DISPERSION	55 degs horizontal, 15 degs vertical (-6dB)
CROSSOVER	120Hz, 750Hz
CONNECTORS	2 x Neutrik NL8
DIMENSIONS (inc. wheels)	(W) 562mm x (H) 799mm x (D) 925mm (W) 22.0ins x (H) 31.5ins x (D) 36.5ins
WEIGHT	78kg (172lbs)
SHIPPING DIMENSIONS (inc. wheels)	(W) 580mm x (H) 810mm x (D) 950mm (W) 22.8ins x (H) 31.9ins x (D) 37.4ins
SHIPPING WEIGHT	80.5kg (177.5lbs)

W8CT

TYPE	Dedicated longthrow high-mid/HF enclosure
FREQUENCY RESPONSE	750Hz-18kHz ±3dB
DRIVERS	3 x 6.5” (165mm) high-mid horn driver
	6 x 1” (25mm) exit HF compression driver
RATED POWER	High-mid: 450W AES, 1800W peak
	HF: 360W AES, 1440W peak
RECOMMENDED AMPLIFIER	400-550W into 4 ohms
SENSITIVITY	High-mid: 113dB
	HF: 115dB
MAXIMUM SPL	High-mid: 139dB continuous, 145dB peak
	HF: 141dB continuous, 147dB peak
IMPEDANCE	High-mid: 6 ohms nominal
	HF: 2 x 6 ohms nominal
DISPERSION	55 degs horizontal, 7.5 degs vertical (-6dB)
CROSSOVER	750Hz, 3.5kHz
CONNECTORS	2 x Neutrik NL8
DIMENSIONS (inc. wheels)	(W) 562mm x (H) 799mm x (D) 925mm
	(W) 22.0ins x (H) 31.5ins x (D) 36.5ins
WEIGHT	90kg (198lbs)
SHIPPING DIMENSIONS	(W) 580mm x (H) 810mm x (D) 950mm
	(W) 22.8ins x (H) 31.9ins x (D) 37.4ins
SHIPPING WEIGHT (inc. wheels)	90kg (198.4lbs)

NOTES
Sensitivity measured in half-space conditions using band limited pink noise and scaled for 1 watt at 1 metre. SPL calculated at 1 metre using band limited pink noise.
Finish: Slate textured paint. Protective grilles: Perforated steel grey with 48% free air flow. Cabinet construction: Birch ply.

Due to our policy of continuous improvement all specifications are subject to change without notice.

Wavefront Touring Series
W8C/W8CS/WSX/W8CM/W8CT

Please Click here to return to main menu

Please Click here to visit our website

MARTIN AUDIO
LONDON

The Martin Experience

Century Point, Halifax Road, Cressex Business Park, High Wycombe, Buckinghamshire HP12 3SL, England.
Telephone: +44 (0)1494 535312 Facsimile: +44 (0)1494 438669
Web: www.martin-audio.com E-mail: info@martin-audio.com

Wavefront Touring Series

W8C/W8CS/WSX/W8CM/W8CT

User's Guide

ENGLISH

MARTIN AUDIO
LONDON

The Martin Experience