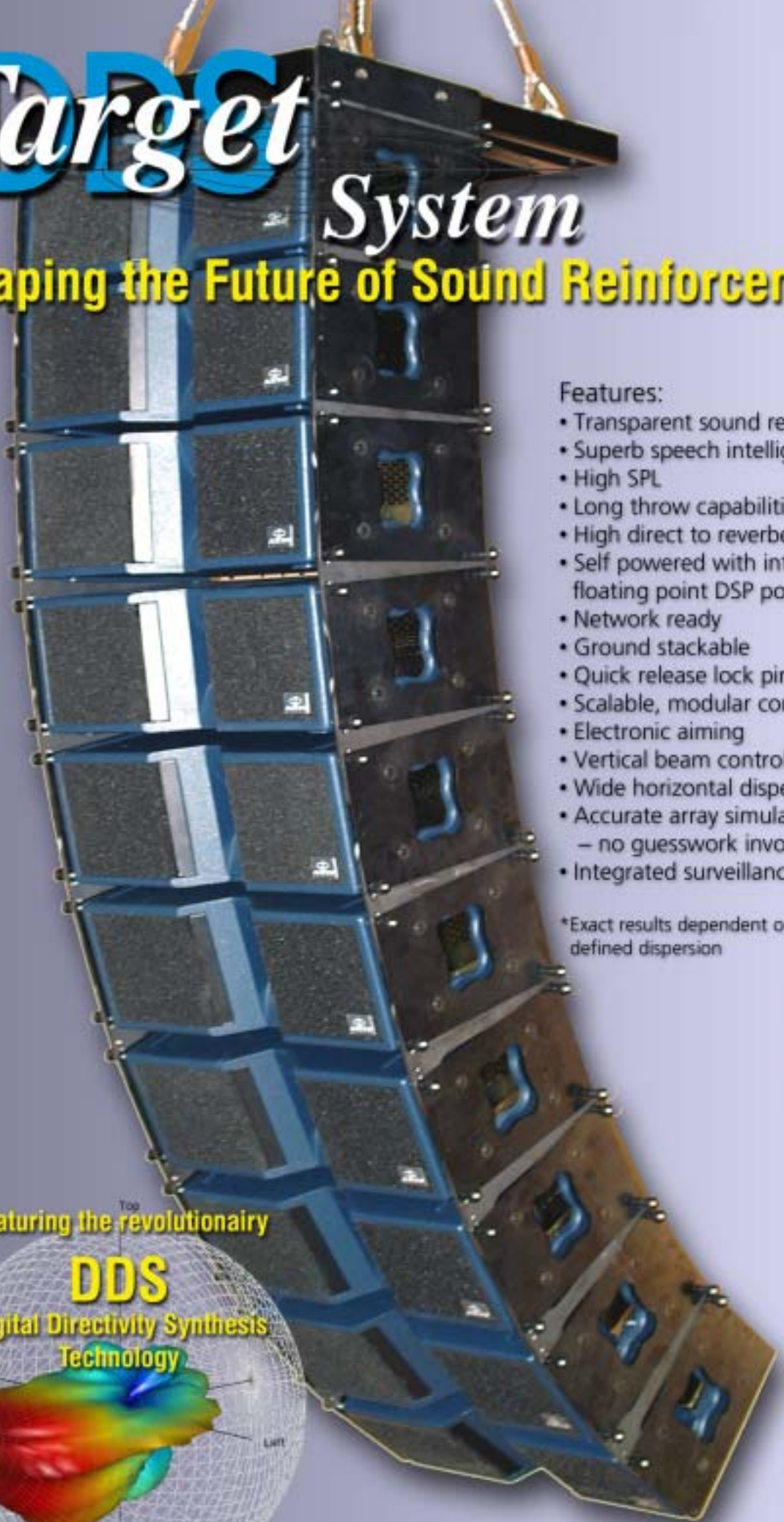
DDS Target System

Model U-16

Shaping the Future of Sound Reinforcement™



Features:

- Transparent sound reproduction
- Superb speech intelligibility
- High SPL
- Long throw capabilities*
- High direct to reverberant ratio*
- Self powered with integrated 32 bit floating point DSP power
- Network ready
- Ground stackable
- Quick release lock pin rigging
- Scalable, modular configuration
- Electronic aiming
- Vertical beam control
- Wide horizontal dispersion
- Accurate array simulation via DDA – no guesswork involved
- Integrated surveillance capabilities

*Exact results dependent on array length and defined dispersion

Featuring the revolutionairy

DDS

Digital Directivity Synthesis Technology

AXYS®

TOTAL TRANSPARENCY

AXYS® Target System U-16

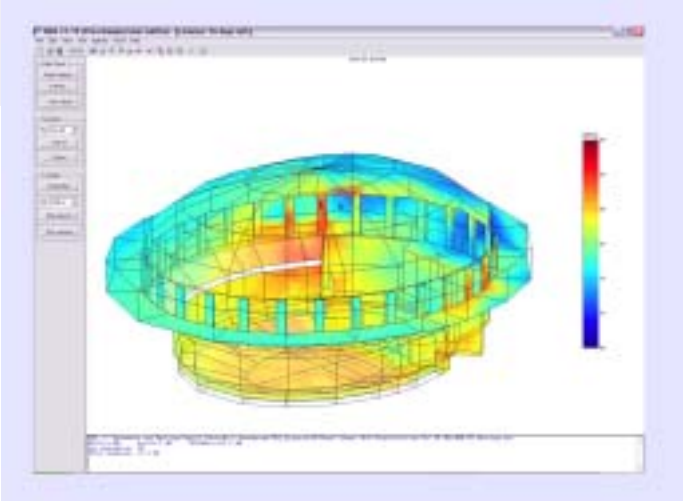
Introduction

Duran Audio, the world leader in DSP Controlled Loudspeaker Array Technology has once again set the industry benchmark in audio innovation. The company that introduced the steerable line array in the early 90's has now applied this technology to sound reinforcement. In contrast to the basic 'virtual' line-source systems offered by most manufacturers, the AXYS® Target System enables sound engineers to optimize the directivity pattern of the array through powerful proprietary DSP algorithms. Unprecedented musical clarity and speech intelligibility are now possible.

The Target System is the result of an extensive research program started in 1998 merging the development of software, hardware and electro-acoustics to create a revolutionary sound reinforcement system. The indisputable "Proof of Concept" has been provided by four years of rigorous road testing across the US and Europe. With the implementation of Duran Audio's 4th generation cutting edge DSP technology, the AXYS® Target System boasts processing power and dynamic range at a previously unattainable level and is ready to take on the world's most challenging venues.

DDS Technology

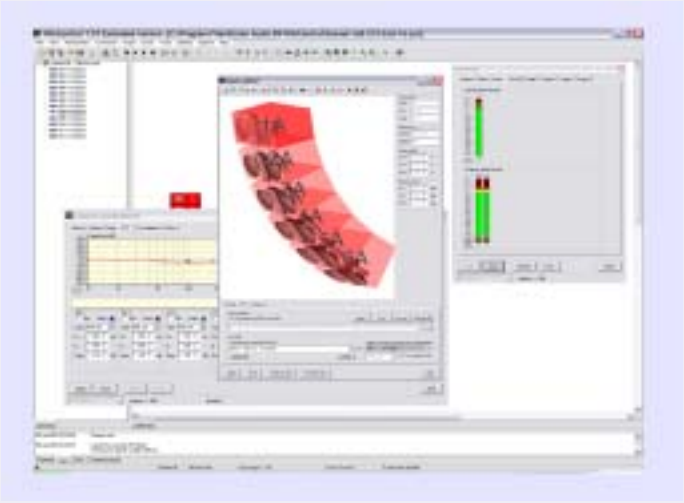
Perhaps the most revolutionary development of recent years in electro-acoustics is the AXYS® DDS (Digital Directivity Synthesis) technology. Delivering an acceptable coverage of a venue is often achieved by the empirical clustering of 'conventional line-array' elements. In order to eliminate this guesswork, Duran Audio has developed DDS technology to optimize array directivity according to room and audience area geometry. DDS is a reversed method, calculating the directivity pattern of a given array configuration starting with the desired coverage and resulting in the best possible fit with a maximum direct to reverberant ratio for any given situation. DDS not only enables to define what area to cover but also to define areas that should be avoided, minimizing unwanted reflections. This is invaluable in controlling attributes such as stage-feedback or suppressing rear walls reflections. The powerful DDS technology provides the user unrestricted electro-acoustical system control.



DDA Screen example

DDA Software

Duran Audio has developed the Digital Directivity Analysis (DDA) software package as an user interface to gain access to the powerful DDS algorithms. It offers the user an intuitive way to optimize the performance of theTarget System as well as to simulate and illustrate the results in a dynamic 3-D visualization. DDA includes statistical STI prediction as well as extensive capabilities to import room geometry and export directivity data. The DDA software optimizes the DSP coefficients for each individual transducer of any Target array configuration while simultaneously calculating the optimum cross-over transfer functions.



WinControl Screen example

WinControl Software

AXYS® Target products are supplied with WinControl, another Duran Audio in-house developed software package. This program offers the user extensive control over the many DSP features integrated into system. All Target units are addressable through the proprietary RS-485 network connection giving the user full on-site access to the system once hooked up to a PC running WinControl. WinControl interfaces seamlessly with the DDA software and imports the array configuration with the optimized parameters. After importing the DDA files, a dynamic graphical representation of the array configuration is displayed on screen allowing the user to intuitively "point and shoot" the assignment of each unit based in its physical position. This process is then finalized by uploading the appropriate DSP coefficients to each individual Target unit.

WinControl provides a wealth of control over audio processing modules executed by the DSP in each Target unit. In addition to this, WinControl also offers extensive status monitoring and logging facilities.

U-16 General Description

The U-16 is the newest and smallest member of the Target range and has been designed to cooperate with the Target B-215 arrayable subwoofer. Its extreme power to size ratio enables to fulfil unobstrusive yet powerful array applications. Although being designed as a single array element the U-16 and B-215 can even

serve as a powerful club system in a one to one configuration. This true scalability also offers a revolutionairy breakthrough in return of investment.
As with all Target models, the U-16 is equipped with the highest quality components available, including speakers, integrated amplification and DSP processing and rigging hardware.

Flying Hardware

A newly designed integrated rigging system offers flexibility, safety and ease of use. The rigging hardware is based on worldwide recognized quick release locking pins and is designed for fast, reliable and safe operation. Despite the high loading capacity, including the factor seven safety factor, the rigging hardware systems puts no mechanical stress on the loudspeaker enclosure ensuring 100% functionality regardless the mechanical condition of the enclosure itself. Predetermined vertical angles allow for easy and repeatable variation of array shapes.

Loudspeaker components

A vertical slot diffraction HF horn offers the wide horizontal and vertical dispersion that enables DDS algorithm to deliver superb even coverage and high side lobe suppression in the HF Audio band. The horn is coupled to the state-of-the-art 1"neodymium compression driver. Result: high sensitivity and extremely dynamic and transparent sound reproduction. Efficient heat-sinking ensures full power handing capability even under prolonged and severe conditions The narrow horizontal outline of the HF horn allows close spacing of the 6.5" low-mid drivers eliminating interference resulting in a smooth horizontal radiation pattern. These 6.5" drivers feature high sensitivity, extended frequency response and high power handling capacity. Proven reliability over many years of service in various other AXYS® products ensures the value of your investment.

Amplifiers

The amplifier section of the U-16 is based on the reliable module that was originally developed for the higher-powered and performance proven B-215 and T-2820 Target modules. This multi-channel amplifier unit includes a rich set of monitoring features including temperature, fan speed, open or shorted load and pilot tone detection monitoring. This fulfils the most stringent VA regulations without the need for installing additional hardware. The "whisper mode" fan control circuitry regulates the fan speed according to the temperature and the presence of audio signal in order to reduce acoustical noise to unprecedented low levels, exeeding the requirements of the most demanding concert halls.

Input section

A transformer coupled audio line input was chosen because of its bulletproof robustness and unsurpassed capability of dealing with ground noise. The recently developed twin transformer input configuration, a unique combination of two matched transformers and an electronically differential input stage, cancel the small remaining non-linear components of both transformers resulting in an unequaled high CMRR (common mode rejection ratio) and ultra low distortion figures from 20 Hz to 20k Hz.

DSP

Signal processing in the U-16 is performed by Duran Audios 4th generation DSP board. This unit is equipped with a 900 MFLOPS 32 bit floating point DSP, 24-bit AD and DA converters, a high performance Reduced Instruction Set Computer (RISC) and a vast resource of shared non-volatile program and data memory. Implementation of SDRAM for the audio data buffers extends possible delay settings in excess of 20km underlining the flexibility and universal character of the U-16. A real time clock enables extensive and precise logging of operational hours and exceptional events facilitating maintenance and rental. Balanced signal paths from DAC outputs to power amplifier inputs eliminate possible feed through of digital signals completely resulting in a clean "analogue" spectral noise floor of –130dB without audible discrete frequency components.

Network

A proprietary optical insulated RS485 network connects all Target units to a host computer to upload configuration data or perform control and surveillance functions. The efficient protocol makes use of moderate baud rates ensuring reliable operation over long cable lengths (>1000mtr) regardless of the wiring configuration, stub lengths or termination. A smart WinControl protocol automatically detects the highest possible transfer rate ensuring the fastest network response under all conditions without affecting data integrity.

SHORT FORM SPECIFICATIONS:

Target U-16

Acoustical:

Freq range	: 180 - 20k Hz (+/-3 dB / single element)
Max SPL	
Continuous	: 123 dBSPL A-weighed with pink noise
Coverage	
horizontal (fixed)	: 90 degrees
vertical (single element)	: 90 degrees
vertical (adjustable)	: Defined by DDS algorithm
Dynamic range	: 106 dB

Electrical:

Input	
Nominal level	: 0 dBu
	: max. input +18 dBu
Type	: twin tranformer balanced
Impedance (balanced)	: 32k Ω
Connector	: 3-pin XLR type + hard wired output
Power amps	
Type	: Class AB complementary matched MOSFET
Power	: 1 x 220 Wrms (8 Ω) + 1 x 380 Wrms (4 Ω)
Signal processing	
DSP	: 900MFLOPS 32bits
Auxillary processor	: 200nsec single cycle RISC
Memory	: 16Mb SDRAM + 3Mb non volatile
AD – DA conversion	: 24 bits sigma-delta 128 x oversampling
Sample rate	: determined by DSP software
Surveillance	: load monitoring on all channels (short / open)
	: pilot tone detection on line input (20kHz – 30kHz)
	: status monitoring power amplifiers
	: temperature monitoring heatsink + power reduction scheme
	: fan speed monitoring
	: DSP processing (software watchdog)
	: RISC processing (hardware watchdog)
	: real time clock including 5months power backup
Network	: full duplex RS485 galvanically isolated
Configuration	: parallel connection max 126 users per subnet
Baudrate	: 19.2k Baud to 115k Baud
Connector	: 5pin XLR type + link output
Indicators	: mains voltage switched on
	: surveillance status OK LED
	: unit identification LED (on front)
Mains	
Voltage (+5/-10 %)	: 230 V
Power consumption	: 50 VA (idle) / 500 VA (full load)
Connector	: PowerCon + link output

General:

Temperature range (ambient)	: 0 to 40 degrees C
Transducers	: 1 x 1" compression drivers
	: 2 x 6.5"
Dimensions (H x W x D)	: 200 x 475 x 300 mm
Default colour	: Dark Blue
Weight	: 20 kg (excluding rigging hardware)

YOUR LOCAL AXYS® DEALER

AXYS is a registered trademark of DURAN AUDIO

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