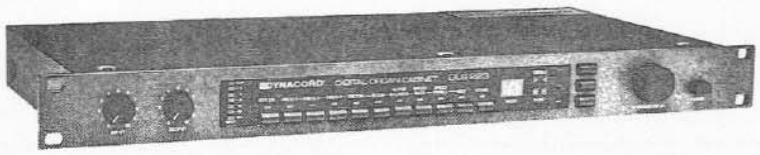
EV DYNACORD®

DLS 223

Digital Rotor Cabinet Simulator



- **Very accurate simulation of various "rotating speaker" cabinets, in stereo**
- **Realistic room acoustics can be added**
- **All performance parameters fully editable and programmable—including distortion, acceleration, crossover frequency, equalization, rotational and stop direction, and many more**
- **MIDI controllable**
- **24-bit signal processing for perfect simulation and >90-dB dynamic range and <0.03% THD**
- **Three-year parts-and-labor warranty**

SPECIFICATIONS

Conditions:

1. 0 dBu = 0.775 volts rms.
2. 120-volt ac line voltage unless otherwise noted.
3. Output levels measured with +4-dBu input at 1,000 Hz, with input level switch in the line position and input control full clockwise.

OVERALL SPECIFICATIONS

Frequency Response (direct):
20-20,000 Hz, +0/–1 dB

Frequency Response (effect):
20-20,000 Hz, +0/–3 dB

Data Format:
16-bit linear analog to digital and digital to analog; internal 24-bit processing

Total Harmonic Distortion,
Direct:
<0.003%
Effect:
<0.03%

Signal-to-Noise Ratio,
Direct:
>104 dB
Effect:
>90 dB

Channel Configuration:
Mono or stereo signals accepted; stereo signal is processed through a single converter in the digital-to-analog conversion stage and then reprocessed

Channel Separation:
>80 dB

Front-Panel Controls (see Figure 2):
Input and output level controls; 11 parameter select buttons; three buttons to control rotor simulation speed; endless rotary encoder; power switch

Front-Panel Displays (see Figure 2):
Seven-segment LED input-signal meter, switchable to read average, peak or peak hold; LED's over each of 11 parameter buttons to show function active; two-character numeric LED display to show parameter values; four LED's that are grouped to show rotor speed for the bass and treble rotors; single LED's for stop, slow and fast speed

Grounding:
Ground-lift switch disconnects ground from chassis to eliminate hum

Chassis Construction:
Painted steel

Colors,
Front Panel:
Gray with white nomenclature
Top and Sides:
Gray
Input and Bottom Panel:
Black with white nomenclature

Power Requirements:
90-250 volts, 50-60 Hz ac, switches automatically, 15 watts maximum

Overall Dimensions (see Figure 1),
Height:
43.6 mm (1.72 in.)
Width:
483 mm (19.0 in.)
Depth:
225 mm (8.86 in.)

Net Weight:
3.5 kg (7.7 lb)

Shipping Weight:
5.0 kg (11 lb)

INPUT SPECIFICATIONS

Rated Input Voltage,
Line:
1.23 volts (+4 dBu)
Instrument:
390 mV (–6 dBu)

Maximum Input Voltage,
Line:
9 V (+21 dBu)
Instrument:
390 mV (–6 dBu)

Input Impedance,
Line:
10 kilohms
Instrument:
500 kilohms

Input Connectors (see Figure 2):
Two 1/4-inch phone plugs with Hi/Lo range switch

OUTPUT SPECIFICATIONS

Rated Output Voltage,
High Range:
2.45 volts (+10 dBu)
Low Range:
730 millivolts (–0.5 dBu)

Maximum Output Voltage:
9 volts (+21 dBu)

Rated Output Impedance:
120 ohms

Output Connectors (see Figure 2):
Two 1/4-inch phone plugs with Hi/Lo range switch

MIDI Connectors:
In; out; through

DESCRIPTION

The EV/Dynacord DLS 223 is a high-quality digital signal processor designed to create very realistic simulations of the rotary speaker system sound. The DLS 223 was created by first measuring every characteristic of the original rotary speaker's performance—such as different frequency responses, rotor speeds, distortion, start-up and decay times, and many more—

FIGURE 1 — DLS 223 Overall Dimensions

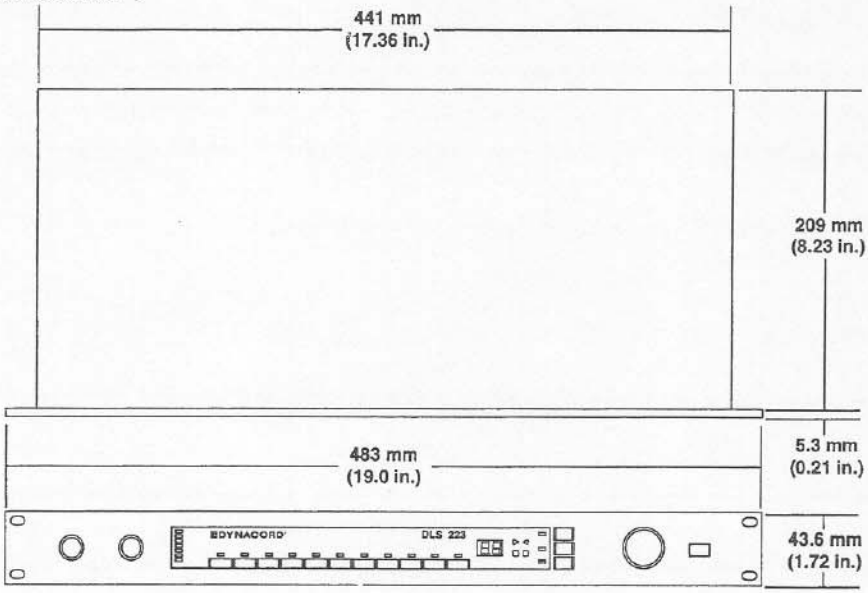


FIGURE 2 — DLS 223 Front and Rear Panels

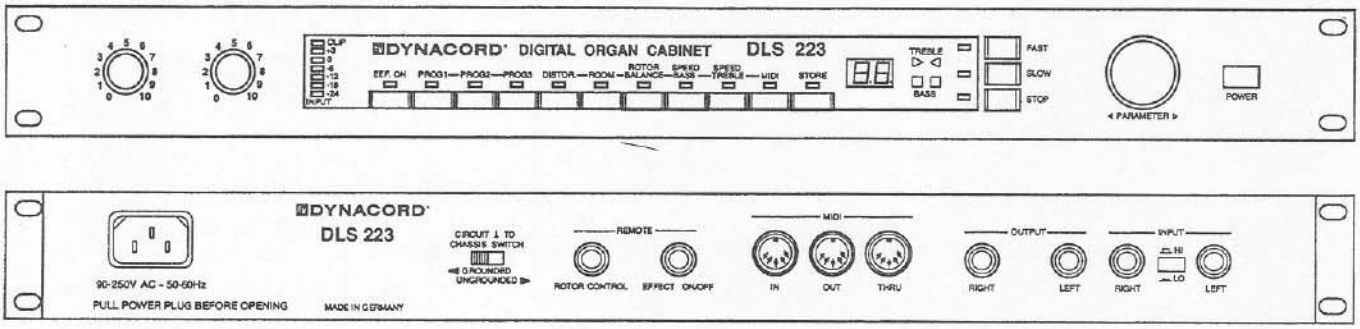
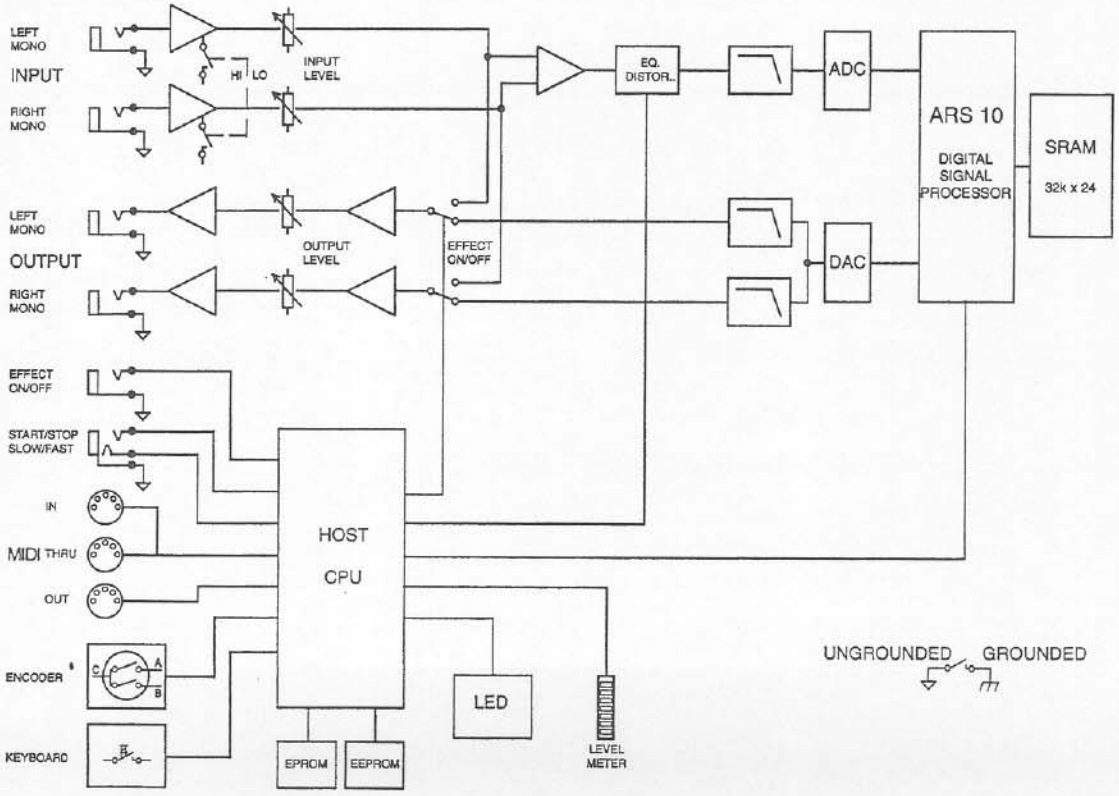


FIGURE 3 — DLS 223 Block Diagram



LIST OF OPTIONS	
FUNCTION 00	= Additional Factory Presets
PARAMETER 01	= Distortion
PARAMETER 02	= Room
PARAMETER 03	= Rotor-Balance
PARAMETER 04	= Speed-Bass
PARAMETER 05	= Speed-Treble
PARAMETER 06	= Slow-Fast Ratio Bass-Rotor
PARAMETER 07	= Slow-Fast Ratio Treble-Rotor
PARAMETER 08	= Speed-Up Bass-Rotor
PARAMETER 09	= Speed-Up Treble-Rotor
PARAMETER 10	= Speed-Reduce Bass-Rotor
PARAMETER 11	= Speed-Reduce Treble-Rotor
PARAMETER 12	= Rotate-Direction Bass-Rotor
PARAMETER 13	= Rotate-Direction Treble-Rotor
PARAMETER 14	= Frequency-Vibrato-Bass
PARAMETER 15	= Frequency-Vibrato-Treble
PARAMETER 16	= Vibrato-Edge-Bass
PARAMETER 17	= Vibrato-Edge-Treble
PARAMETER 18	= Panorama-Bass
PARAMETER 19	= Panorama-Treble
PARAMETER 20	= Front-Back-Bass
PARAMETER 21	= Front-Back-Treble
PARAMETER 22	= Room-Back-Bass
PARAMETER 23	= Room-Back-Treble
PARAMETER 24	= Crossover Frequency
PARAMETER 25	= Active Bass
PARAMETER 26	= Active Treble
PARAMETER 27	= Equalizer Band 48 Hz
PARAMETER 28	= Equalizer Band 85 Hz
PARAMETER 29	= Equalizer Band 125 Hz
PARAMETER 30	= Equalizer Band 1,500 Hz
PARAMETER 31	= Passive Bass
PARAMETER 32	= Passive Mid
PARAMETER 33	= Passive Treble
PARAMETER 34	= Output-Level
PARAMETER 35	= Comb-Delay-Bass
PARAMETER 36	= Comb-Delay-Treble
PARAMETER 37	= Comb-Depth-Bass
PARAMETER 38	= Comb-Depth-Treble
PARAMETER 39	= Comb-Direction-Treble
PARAMETER 40	= Stop Direction
PARAMETER 41	= Position-Control-Bass
PARAMETER 42	= Position-Control-Treble
PARAMETER 43	= Speedo-Control-Bass
PARAMETER 44	= Speedo-Control-Treble
PARAMETER 45	= Level-Peak-Hold-Time
PARAMETER 46	= Receive-Remote-Sysex

TABLE 1 — DLS 223 List of Options

using extremely precise measuring techniques. Our ARS-10 proprietary 24-bit digital processor was then incorporated into the DLS 223 design to calculate algorithms identical to the original performance. The result is a near-perfect simulation of the original sound, in stereo.

In addition to its realistic rotary speaker simulations, the DLS 223 can add room simulations to any program. The room-simulation feature

LIST OF FACTORY PRESETS (FUNCTION 00)		
PRESET 01	=	"Electronic Rotor"
PRESET 02	=	"Echolette Rotor"
PRESET 03	=	"Original Rotor"
PRESET 04	=	"Soft Organ"
PRESET 05	=	"Jazz Organ"
PRESET 06	=	"Rock Organ 1"
PRESET 07	=	"Rock Organ 2"
PRESET 08	=	"Clean Fast"
PRESET 09	=	"Different Speeds"
PRESET 10	=	"Top Slow Speed"
PRESET 11	=	"Stacked Rotor 1"
PRESET 12	=	"Stacked Rotor 2"
PRESET 13	=	"Club Cabinet 1"
PRESET 14	=	"Club Cabinet 2"
PRESET 15	=	"Open Air"
PRESET 16	=	"Untitled"
PRESET 17	=	"Untitled"

TABLE 2 — DLS 223 List of Factory Presets (Function 00)

calculates the reflections of the rotating speakers from the walls and adds this to the overall effect, making it much more realistic than blending in random reverb programs.

The DLS 223 offers complete control of every facet of rotary speaker performance. On its front panel are 11 buttons which give the user instant access to the most-used parameters. These include three buttons for recall of favorite programs and buttons for rotor balance, bass speed, treble speed, room simulations and distortion.

There is also an "option mode" which is accessed by pushing the bass and treble speed buttons simultaneously and holding them down for three seconds. In the option mode, 46 different parameters and 17 factory presets can be accessed by an endless rotary encoder and the parameter number viewed on the two-digit LED window on the front panel (see Table 1 for a list of options and Table 2 for a list of presets). Alterations of the parameters can be stored in one of the three program memory locations.

Four LED's show the "speed" of the rotary speakers. The DLS 223 is also equipped with MIDI (Musical Instrument Digital Interface). The unit has in/out/through sockets for integration into a MIDI system, and all programs and parameters are changeable by a keyboard, sequencer or controller via MIDI. There are also MIDI editor programs available which allow easy editing via a computer.

Another unique feature of the DLS 223 is its MIDI-learn function. The unit can be programmed to learn MIDI commands by simply pressing the MIDI button, engaging the parameter you want to change, using a MIDI control device such as a keyboard modulation wheel, and telling the unit to store the command.

The power supply of the DLS 223 adapts automatically to any voltage/frequency from 90-250 volts, 50 or 60 Hz. This helps keep "brownouts" from affecting its performance during stage use. The rear-mounted IEC connector allows easy adaption to any type of ac socket. A separate ground-lift switch ensures that any chassis-induced ac hum can be eliminated. The DLS 223 mounts in one EIA/IEC rack space.

The DLS 223 front and rear panels are shown in Figure 2. The block diagram is shown in Figure 3.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The effects processor shall be a high-quality multi-effects device capable of realistically recreating every facet of a rotary speaker system's sound including room effects. The effects processor shall have 11 electronic, two-position push-button controls that allow access to the most-used parameters, including three different simulation programs, and can be used to access 46 different performance parameters and 17 various preset cabinet simulations. The unit shall have switches to select "fast," "slow" and "stop" rotor speed and four LED's to allow the user to visually monitor the simulated rotor speed. The effects processor shall have stereo inputs switchable from line level (input voltage 1.23 (+4 dBu), 10-kilohm impedance) to instrument level (input voltage 390 mV (–6 dBu), 500-kilohm impedance). Both outputs shall be switchable from high (output voltage 2.45 V (+10 dBu) to low (730 mV (–0.5 dBu)). The maximum output voltage shall be 9 V (+21 dBu) with an output impedance of 120 ohms. Input and output connectors shall be unbalanced ¼-inch phone jacks. The unit shall have a MIDI interface and all parameters shall be addressable and editable via MIDI. The unit shall have a MIDI-learn function capable of learning a command from a keyboard, sequencer or other MIDI controller. The unit shall have a switched-mode power supply for operation at voltages from 90 V to 250 V, 50 to 60 Hz, without adjustments. The power consumption shall be 15 watts maximum. The unit shall be manufactured in accordance with all safety classes and fulfill all applicable interference suppression approvals (FCC, VDE and IEC specifications). The unit shall be rack mountable in one EIA/IEC standard rack space. Dimensions shall be 43.6 mm (1.72 in.) x 483 mm (19.0 in.) x 225 mm (8.86 in.) hwd. Net weight shall be 3.5 kg (7.7 lb).

The effects unit shall be the EV/Dynacord DLS 223.

WARRANTY (LIMITED)

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product

other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831) and/or Electro-Voice West, at 8234 Doe Avenue, Visalia, CA 93291 (209/651-7777 or 800/825-1242). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Electro-Voice and EV/Dynacord Electronics are guaranteed against malfunction due to defects in materials or workmanship for a period of three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.

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