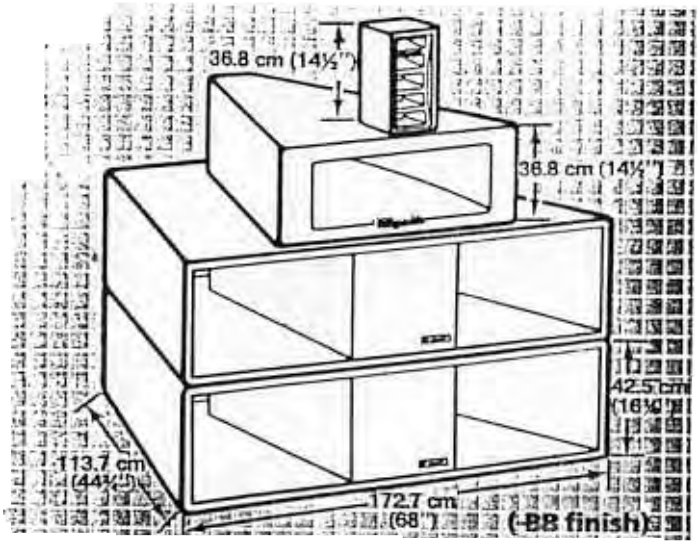
klipsch® mcm 1900™

INDUSTRIAL LOUDSPEAKER SYSTEMS



The KLIPSCH MCM 1900 Loudspeaker System is designed for use in high-level sound reinforcement, in high-fidelity reproduction systems, and performing arts applications. Relatively low values of AM and FM distortion, together with high efficiency and broad bandwith, enable this fully-horn-loaded system to supply effortless, clean sound at high output levels. Continuous output exceeding seventy acoustic watts can be generated with good articulation. The "punch" needed in semi-reverberant environments is provided with directivity appropriate for medium to long-throw applications.

The system, available in three-way or four-way configurations, consists of individual cabinets for the coverage of the various spectral regions. A 40 Hz low-frequency folded horn (MWM) with dual 15" drivers is available as a single unit or divided into halves (MWM-S) as illustrated above. A conical horn incorporating a 10" driver is optional and is usually included when maximum power-handling capability in the mid-bass region is required (MSSM). A mid-high-frequency horn (MSM) with a 1.9" throat is offered with a drive system of four 0.7" K-55 compression drivers (phenolic diaphragms) on a K-4M manifold.

Two tweeters are offered, the MTM and the MMTM. The MTM consists of five horn-loaded piezoelectric drivers. The MMTM consists of two horns, each mounted with two compression drivers. Both tweeters have a high pass 6 kHz filter. In general, the MMTM has a narrower beam-width and is suggested for medium to long-throw applications. Either tweeter may be wired in parallel with the MSM for uniform high-frequency coverage. The system may be bi-amped, tri-amped, or driven via available passive crossover networks (Type M series).

SPECIFICATIONS:

(Measured in a room of approximately 100m³ except as noted.)

TOTAL MODULATION DISTORTION: 5% maximum at 118 dB SPL at three meters (55 Hz and 400 Hz mixed for equal acoustic output under free-space conditions).

FREQUENCY RESPONSE: *(System and Individual Components.)*

Overall Response (with MTM)	
Outdoors	± 5 dB 42 Hz – 20,000 Hz
Overall Response (with MTM)	
Indoors	± 5 dB 38 Hz – 20,000 Hz
MWM	± 5 dB 38 Hz – 500 Hz
MSSM	± 2.5 dB 250 Hz – 1,100 Hz
MSM	± 3 dB 400 Hz – 6,000 Hz
MTM	± 4 dB 6,000 Hz – 20,000 Hz
MMTM	± 5 dB 6,000 Hz – 16,000 Hz

SOUND PRESSURE LEVEL: *(Nominal impedance assumed; SPL re 20 μ Pa; measured under free-space conditions at a distance of three meters.)*

1 Watt Input		
Overall	99 dB	(Av. 70 – 8,000 Hz)
MWM	99 dB	(Av. 70 – 400 Hz)
MSSM	97 dB	(Av. 350 – 1,200 Hz)
MSM	100 dB	(Av. 800 – 6,000 Hz)
MTM	98 dB	(Av. 10,000 – 18,000 Hz)
MMTM	98 dB	(Av. 7,000 – 15,000 Hz)
At Full Power		
MWM	124 dB	(Av. 70 – 400 Hz, 300 watts)
MSSM	120 dB	(Av. 350 – 1,200 Hz, 150 watts)
MSM	116 dB	(Av. 800 – 6,000 Hz, 125 watts)
MTM	112 dB	(Av. 10,000 –18,000 Hz, 30 watts)
MMTM	114 dB	(Av. 7,000 – 15,000 Hz, 40 watts)

ACOUSTIC POWER OUTPUT (maximum)

MWM	45 acoustic watts	(150 Hz)
MSSM	15 acoustic watts	(700 Hz)
MSM	10 acoustic watts	(1,000 Hz)
MTM	2 acoustic watts	(12,000 Hz)
MMTM	1.5 acoustic watts	(12,000 Hz)

ELECTRICAL POWER INPUT (maximum continuous)

MWM	300 watts	(above 35 Hz)
MSSM	150 watts	(above 250 Hz)
MSM	125 watts	(above 400 Hz)
MTM	30 watts	(above 6,000 Hz)
MMTM	40 watts	(above 6,000 Hz)

Signal peaks as high as 10 dB above stated limits are permissible so long as average over one second does not exceed the continuous power-handling ratings.

NOMINAL BEAMWIDTH: 90° Horizontal, 50° Vertical.

NOMINAL DIRECTIVITY FACTOR AND INDEX:

$R_\theta = 25$ (also known as "Q")
$D_I = 14$ ($D_I = 10 \log R_\theta$)

(The average of coverage angles from 250 Hz to 10 kHz in 1/3 octave bands is given as the nominal beamwidth value. The beam is defined by points where the sound pressure level is 6 dB below the axial level at a distance of three meters. Measurements were made outdoors near a ground plane, the absence of which would be reflected in generally broader vertical angles of coverage.) See Figures 1 and 2.

DRIVE COMPONENTS:

MWM	Two KLIPSCH 15" K-43 Low-frequency Drivers
MSSM	One KLIPSCH 10" K-41 Upper-bass Driver
MSM	Four KLIPSCH 0.7" K-55 Compression Drivers
MTM	Five horn-loaded Piezoelectric Tweeters
MMTM	Four KLIPSCH one inch K-78 Drivers

CROSSOVER: For optimum performance and flexibility, the use of active (low-level) filter devices and multiple power amplifiers is recommended. Crossover characteristics should include rolloff rates of 18 dB or more per octave at the low-frequency shoulder and low distortion with adequate "head room." Note that the MTM and MMTM tweeters include a built-in passive 6 kHz crossover network and may be driven in parallel with the MSM in bi-amped (three-way) or tri-amped (four-way) systems.

Passive crossover networks of the Type M series are designed for use only with KLIPSCH three-way or four-way MCM systems.

Crossover points:

3-way:	400 Hz		6 kHz
4-way:	350 Hz	1 kHz	6 kHz

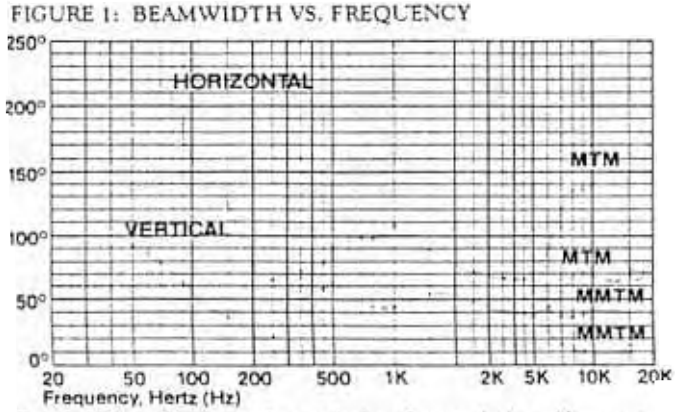
IMPEDANCE:

MWM	Nominal 8 ohms (each driver) Minimum 6 ohms (each driver)

(Connections to the two drivers are brought out individually)

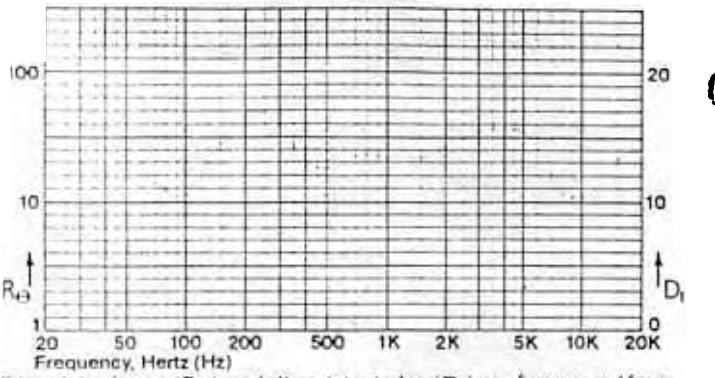
MSSM	Nominal 8 ohms Minimum 6 ohms
MSM	Nominal 16 ohms Minimum 12 ohms
MTM	Nominal 4 ohms Minimum 3 ohms
MMTM	Nominal 4 ohms Minimum 4 ohms

FIGURE 1: BEAMWIDTH VS. FREQUENCY



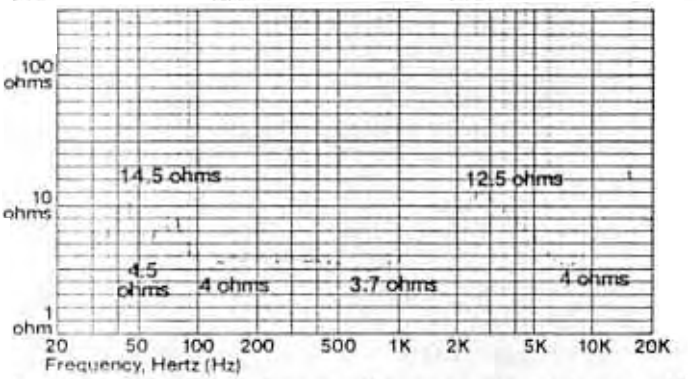
Beamwidth vs. frequency in proximity of ground plane (four-way system).

FIGURE 2: DIRECTIVITY VS. FREQUENCY



Directivity factor (R_θ) and directivity index (D_I) vs. frequency (four-way system).

FIGURE 3: IMPEDANCE MAGNITUDE VS. FREQUENCY



Impedance magnitude vs. frequency (four-way system, passive network)

CABINETS

The KLIPSCH MCM System component cabinets are available in a number of road-ready finishes: textured black paint (-BB), textured black paint with aluminum edge trim and die-cast corner protectors (-BT) and covered with 1.5 ounce fiberglass and aluminum trim (-BG).

A recessed connector panel in each unit provides "double banana" five-way binding posts for easy hook-up. Drivers in each cabinet are protected by fast-blow fuses (MWM 3 amp, MSSM 3 amp, MSM 2.5 amp, MTM 1.5 amp, or MMTM 3 amp).

Dimensions and Weight: *(Minimum size for -BG Finish)*

	Height	Depth	Width (front, rear)	Net Wt.
MWM	82.6cm 32½"	113.7cm 44¾"	172.7cm 68," 82.8cm 32½"	130.6kg 288 lbs.
MSSM	34.9cm 13¾"	92.7cm 36½"	94.0cm 37," 18.4cm 7¼"	40.4kg 89 lbs.
MSM	37.5cm 14¾"	92.7cm 36½"	94.0cm 37," 18.4cm 7¼"	42.2kg 93 lbs.
MTM	36.8cm 14½"	18.4cm 7¼"	18.4cm 7¼"	5.9kg 13 lbs.
MMTM	21.0cm 8¼"	35.0cm 13¾"	26.0cm 10¼"	11.6kg 25.5 lbs.

POWER HANDLING:

The officially accepted power test procedure for low-frequency drivers is described in the EIA RS-426 Standard. This 8-hour test uses white noise that has been filtered to obtain 6 dB/octave slopes below 40 Hz and above 318 Hz. After extensive experience with this test, we have found that while its thermal properties are adequate, white noise's mechanical stresses do not cause the fatigue associated with today's professional sound requirements.

However, at a given voltage level ($PWR = V^2/Z$), a broadband pink noise signal will result in substantially quicker mechanical fatigue than obtained by EIA noise. Also, these types of failures more closely match those experienced in today's professional installations (cone tear, rim fatigue, voice coil former tear, epoxy failure, etc.). For this reason, combined with the fact that our drivers have dramatically increased thermal properties, we have rated our loudspeaker drivers based upon pink noise power testing.

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