

*Mirage*TM
MIRAGE LOUDSPEAKERS

90 SERIES
MODEL 90i
MODEL 190i

OWNER'S
MANUAL

7AIM90Z Printed in Canada

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Welcome to the world of Mirage loudspeakers.

We are sure you will enjoy this superb product. The following advice is offered to facilitate proper installation of your Mirage speakers in your home.

Extensive research along with great care at every design stage has enabled Mirage to produce loudspeakers with extraordinary performance characteristics: a performance level that is equal, or superior to other speakers costing many times their price.

The finest components and materials, made with sophisticated manufacturing and quality control ensure that you will enjoy this exceptional performance for many years.

Please remember to complete and mail the enclosed warranty card to ensure proper registration.

FEATURES AND BENEFITS

Your new Mirage 90 series speakers feature state-of-the-art technologies derived from development of the flagship of the line...the world acclaimed Mirage M-1.

Models M-790 and M-990

Elegant Styling: Representing an exciting new look, these lean and elegant floor-standing models take up less than one square foot of floor space, yet their high-tech design suggests they conceal an entire stage full of musicians.

Bipolar Design: Unlike conventional front-radiating speaker, the M-790 and M-990 employ the exclusive Mirage Bipolar design the disperses sound in a 360 degree pattern imparting the depth, breadth and emotional involvement of the concert hall to your music.

Operating independently of the front radiating woofers and tweeters, the new Mirage Soundstage Enhancement transducer (MSE™) in the M-990 and M-790 radiates to the rear reproducing the range of frequencies required to achieve this lifelike Bipolar™ effect

Models M-990, M-790, M-490 and M-290

Titanium Hybrid Dome Tweeter: An ultra-light, pure titanium dome is combined with a unique cloth suspension system for minimal distortion and near perfect transient response.

Bass/Mid Drivers: Mirage 90 Series bass/mid drivers employ injection-molded polypropylene cone bodies and rubber surrounds. These new drivers provide rigid control of critical mechanical parameters, vastly improving consistency for superior deep bass extension and image stability.

Crossovers: Computer assisted crossover optimization and premium quality components provide seamless transition between all drivers.

Sculptured Ports: Aesthetically distinctive cabinet venting through unique sculptured ports significantly enhance low frequency extension and reduce unwanted vent turbulence.

Cabinet Construction: Rigid tongue and groove construction, reinforced with computer designed internal bracing and damping materials reduce undesirable structural resonances minimizing cabinet coloration. The M-990 and M-790 feature stabilizing spiked-feet to decouple the cabinet from the floor.

Model 90i: Is a vented 2-way non diffracting enclosure, comprising of a 1/2" Titanium dome tweeter and a 5 1/2" injection molded with foam surround woofer combine to provide superb performance in this bookshelf speaker. The 90i comes with a non removable grill.

Model 190i: The bigger brother of the 90i is the model 190i. Again, this is a 2-way non diffracting enclosure, comprising of a 3/4" Titanium dome tweeter and a 6 1/2" injection molded woofer with foam surround. The 190i comes with a non removable grill.

ROOM ACOUSTICS AND SPEAKER PLACEMENT

Mirage loudspeakers have been designed to provide high performance in a wide variety of domestic settings. It is important to note however, that building structure, dimensions and furnishings all play a part in the quality of sound you will ultimately achieve. Where possible the following should be taken into consideration when placing Mirage speakers in your listening room:

1. Low frequency performance (below 100 Hz) can be affected by the structure of the room. A solid floor is preferred to avoid exaggeration of low frequencies.
2. Rooms with different height, width and length are preferable for best low frequency performance.
3. Mid and high frequencies are affected by the mix of soft and hard furnishings in the room. An excess of soft items such as curtains, carpets, sofas and wall coverings can produce a dull, lifeless reproduction. The same room without any soft furnishings will produce a brighter, harder sound, so a balance of soft and hard furniture, floor and wall coverings should be your goal for optimum sonic performance.
4. Most of the sound heard from a loudspeaker has been reflected from one or more walls of the room. Usually, less than half the sound is heard directly from the loudspeaker. The remaining information you hear has been reflected from the surfaces of your room.

Reflective surfaces have individual sound absorption characteristics, and it is important for good stereo perception that frequency response be the same from both left and right channels. It is therefore important that consideration be paid to the left and right reflecting walls. First, they should be symmetrical, equally spaced from the speakers and the listeners. Secondly, they should have the same, or very similar reflective properties. Example: A curtain on one wall and a painted surface on the opposite wall will result in unbalanced reflections, which in turn affect the stereo image. Experiment with toe-in/toe-out positioning of your speakers until best results are achieved.

5. Mirage loudspeakers are designed to be free standing. They should therefore be positioned with an open space between the loudspeakers and the walls and floors of the listening room.
6. Rigid speaker stands that bring the tweeter to ear level are essential to optimize performance. Speaker stands with spiked feet will aid rigidity on carpeted floors and are thus also recommended for non-floor-standing models. Quality metal stands such as API SST-13, API SST-21, API SST-25 and API SST-26 for the M-90i and the M-190i are recommended.
7. On stands, the loudspeakers should be positioned at least 30 cm (12") from the back wall. The distance from the left and right speaker to the side walls should be equal. For best results, placement distance from the rear wall should not be the same as from the side walls. (see figure 1).

8. Floor standing models should be positioned at least 38 cm (15") from the back wall. Spiked feet are recommended for stability on carpeted floors.
9. The loudspeakers should be placed 2 to 3 meters (6' to 10') apart. The distance from loudspeakers to listener should be about 1 to 1.5 times the distance separating the speakers. (see figure 1).

SELECTION OF PROPER WIRE

We recommend the use of heavy gauge and high quality speaker wire to obtain enhanced performance from your speakers. Wire that consists of high quality copper, or silver will normally result in the best performance from your speakers. Your Mirage dealer can recommend a cable that is best-suited to the speaker model you have purchased.

The speaker wire you select should have high quality connectors with either spade lugs or dual banana plugs.

In most installations, ordinary lamp cord (16-18 gauge) has enough resistance to degrade the signal between amplifier and speakers, particularly in lengths over 3 meters (10').

If possible the speaker wires should be the same length for both channels and the shorter they are, the better the sonic performance will be.

*When connecting your speakers to your sound system make sure your amplifier is turned off, to avoid damage which could result from accidental shorting of the speaker leads.

AMPLIFIER TO LOUDSPEAKER CONNECTION

BI-AMP/BI-WIRE MODELS (M-990 and M-790)

These models can be recognized by two sets of binding posts. The upper set is for high frequencies and the lower for lower frequencies. Bi-amp/bi-wire allows three different wiring options.

- 1) Conventional - You will note shorting straps have been installed. (see figure 4) - Positive (+) to Positive, Negative (-) to Negative. Connect speaker wire from the red positive (+) terminal on amplifier to lower positive terminal on speaker. Connect black negative (-) terminal from amplifier to lower negative terminal on speaker.
- 2) Bi-Wire Hook-up - Remove shorting straps. Use two dual conductor cables; one cable for low frequencies and one cable for high frequencies. Separate connections are made between the power amplifier to the low frequencies binding posts on the speaker and from the power amplifier to the high frequency binding posts. This allows you to choose separate wires that are best suited for the low or high frequencies. (see figure 2)

- 3) Bi-Amp Hook-up - This enables the listener to use specific amplifiers for the low frequency section and high frequency section of the speaker. This dramatically improves musicality. The gains of amplifiers must be identical and the phase relationship of the amplifiers' input to output must also be the same. (see figure 3)

CONVENTIONAL MODEL HOOK-UP

Conventional models have one set of binding posts. The red (+) terminal on your amplifier must be connected to the red (+) terminal on your speaker. The same applies for the black (-) terminal. Connect one loudspeaker at a time to ensure proper connection of left and right channels. Make sure all wires are firmly fastened. (see figure 4)

**NOTE: If you notice a lack of bass, it is likely your loudspeakers have been connected improperly and are out of phase. Recheck your wiring and make the necessary corrections per the above instructions.

AMPLIFIER REQUIREMENTS

Mirage loudspeakers have been designed to be driven to high listening levels with moderate power, while at the same time being capable of handling the power output of large amplifiers.

NOTE: Most Mirage 90 Series speakers are 6 ohms and will function well with most amplifiers. If using more than one set of speakers, powered by one amplifier, please check with the amplifier manufacturer to confirm that the amplifier can handle loads of 3 ohms.

CARE OF FINISHES

Your Mirage speakers are attractively finished and should be gently wiped, clean, from time to time, with a damp cloth to remove any dust or stains.

Distortion Causes Speaker Damage

When an amplifier is "overdriven" it produces distorted output power several times greater than its rated power. All amplifiers produce high levels of distortion when they are driven beyond their rated power output and this distortion can damage any speaker. Overdriven amplifier distortion is called "Clipping".

Clipping can be identified by a fuzzy or distorted sound. If this is heard, lower the volume immediately to avoid damage to your system.

If louder volumes are desired, the only practical solution is to obtain an amplifier capable of more clean (undistorted) output power.

MIRAGE 90 SERIES SPECIFICATIONS

SPECIFICATIONS	M-990	M-790	M-490	M-290	M-190i	M-90i
SYSTEM TYPE:	Vented-QB3 Bipolar	Vented-QB3 Bipolar	Vented-QB3	Vented-QB3	Vented-QB3	Vented-QB3
TWEETERS:	1-1" pure titanium dome with cloth suspension	1-1" pure titanium dome with cloth suspension	1-1" pure titanium with cloth suspension	1-1" pure titanium with cloth suspension	1-3/4" vapor deposited titanium polypropylene dome	1-1/2" vapor deposited titanium polypropylene dome
FULL RANGE:	4.5 MSE™	4.5 MSE™				
WOOFERS:	2-6 1/2" injection-molded polypropylene cone with rubber surround	1-8" injection-molded polypropylene cone with rubber surround	1-8" injection-molded polypropylene cone with rubber surround	1-6 1/2" injection-molded polypropylene cone with rubber surround	1-6 1/2" injection-molded polypropylene cone with rubber surround	1-5 1/2" injection-molded polypropylene cone with rubber surround
FREQUENCY RESPONSE:						
On-Axis: +3 dB	35 - 22KHz	36 - 22KHz	40 - 22KHz	45 - 22KHz	48 - 23KHz	60 - 20KHz
Off-Axis: +3 dB @ 30	35 - 18KHz	36 - 18KHz	40 - 18KHz	45 - 18KHz	48 - 18KHz	60 - 15KHz
USABLE BASS RESPONSE:	29Hz	31Hz	35Hz	40Hz	42Hz	52Hz
CROSSOVER POINTS:	450Hz, 2KHz	450Hz, 2KHz	2KHz	2KHz	2.3KHz	3.5KHz
SENSITIVITY:	87dB	87dB	86dB	86dB	87.5dB	86dB
IMPEDANCE:	6 ohm nominal 4 ohm minimum	6 ohm nominal 4 ohm minimum	6 ohm nominal 4 ohm minimum	6 ohm nominal 4 ohm minimum	6 ohm nominal 4 ohm minimum	6 ohm nominal 4 ohm minimum
REC. AMP POWER:	50 - 200 watts	50 - 150 watts	50 - 150 watts	50 - 100 watts	30 - 100 watts	30 - 80 watts
MAX POWER HANDLING:	200 watts	150 watts	150 watts	100 watts	100 watts	80 watts
DIMENSIONS (H x W x D): (cm)	43 1/2" x 9 5/8" x 11 1/4" (110.6 x 24.5 x 28.6)	38 1/2" x 9 5/8" x 11 1/4" (97.9 x 24.5 x 28.6)	19 1/4" x 9 5/8" x 10 3/4" (48.9 x 24.5 x 27.3)	15 3/4" x 8 5/8" x 8 1/2" (40 x 21.9 x 21.6)	13 1/2" x 7 3/4" x 8 1/2" (54.4 x 19.7 x 12.5)	12" x 7" x 7 3/4" (30.7 x 18.5 x 19.5)
WEIGHT (EACH):	70 lbs (31.8 kg)	60 lbs (27.2 kg)	28 lbs (12.7 kg)	16 lbs (7.3 kg)	10 lbs (4.5 kg)	7 lbs (3.2 kg)
FINISH:	Black Ash	Black Ash	Black Ash	Black Ash	Black Ash/White	Black Ash/White
GRILLE COLOUR:	Slate Gray	Slate Gray	Slate Gray	Slate Gray	Black/White	Black/White

Descriptions and specifications subject to change without notice.

CONVENTIONAL HOOKUP

(FIGURE 4)

Left speaker terminals

