



AFX-2 • AFX-3

ACTIVE CROSSOVER NETWORK

OWNER'S MANUAL

INTRODUCTION

We are proud to welcome you as a new owner of Mirage LFX-Series active crossover. The LFX-Series active crossovers are the result of extensive research into the interaction of subwoofers with a variety of loudspeaker types. They represent the leading edge in active crossover design and performance.

The finest components and materials combined with sophisticated manufacturing and quality control procedures ensure many years of exceptional performance and listening pleasure.

Please take time to read all of the instructions contained in this manual to make certain your system is properly installed and functioning correctly.

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GENERAL DESCRIPTION OF LFX-2 AND LFX-3 ACTIVE CROSSOVERS

The Mirage LFX-2 and LFX-3 active crossovers are designed to work in conjunction with Mirage BPSS-Series subwoofers, providing all crossover functions as well as remote control of subwoofer power status. The LFX-Series of active crossovers will also be effective with other brands of powered subwoofers.

The LFX-2 is intended primarily for use in stereo applications where a two channel- Left and Right- active crossover is required, providing all crossover functions required to drive either one monophonic (L+R) subwoofer or two stereo subwoofers (separate L and R). The LFX-2 may also be used in "Home Theater applications where no center channel is used.

The LFX-3 is intended for use in "Home Theater" Applications where a three channel - Left, Center, and Right- active crossover is required, providing all crossover functions required to drive either one monophonic (L+C+R) subwoofer, two stereo subwoofers (L + one half of C) and (R + one half of C) or three separate subwoofers one for each channel (L,C,R). Separate crossover points may be selected for the center channel and the left and right stereo pair.

In addition, the LFX-3 features a unique set of controls for adjusting the center channel image when used in "Home Theater" applications.

The LFX-3 is also recommended for use in stereo applications where future expansion into "Home Theater" is a possibility.

OVERVIEW OF FRONT PANEL CONTROLS

The front panel of the LFX active crossover may be divided into three functional groups: A, B, and C. See Fig. [1]

- A. BYPASS/ON/OFF switch, STATUS indicator LED, MODE switch, PHASE switch, and master LEVEL control.
- B. Center channel controls (LFX-3 only)- FREQUENCY, LOW PASS (LP) SHAPE, HIGH PASS (HP) SHAPE, IMAGE, and LEVEL.
- C. LEFT & RIGHT channel controls - FREQUENCY, LOW PASS (LP) SHAPE, HIGH PASS (HP) SHAPE.

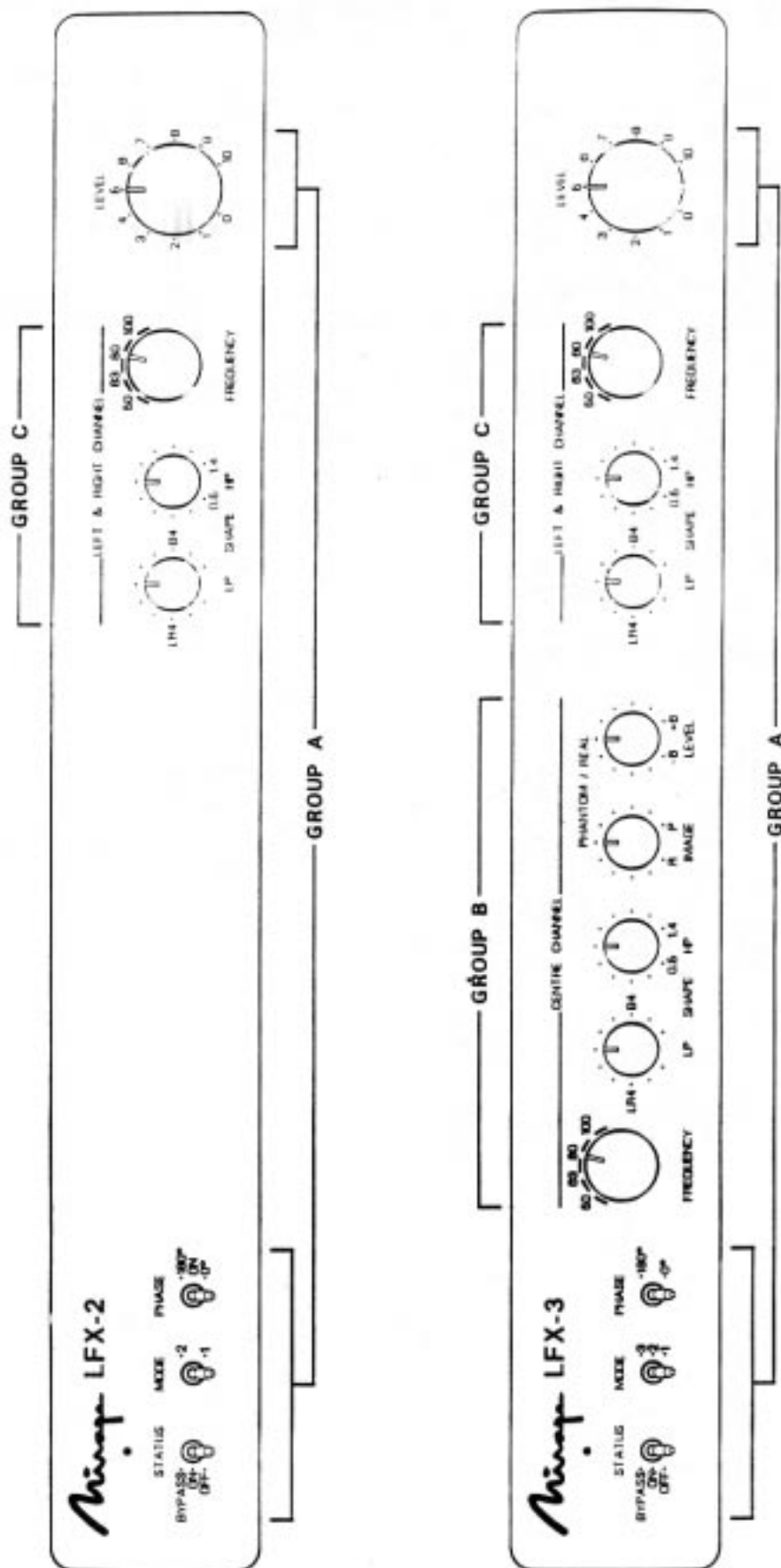


Fig. [1]

Control Group A (LFX-2 and LFX-3)

BYPASS/ON/OFF SWITCH

This switch turns power on or off to the LFX crossover and automatically switches the mode of the BPSS-Series subwoofer from "Standby" to "On". The BYPASS position defeats all crossover functions including the subwoofer output(s), and sends a full range signal to all other speakers.

STATUS LED

The red STATUS LED indicates the power status of the LFX crossover. Unlit indicates "Off", flashing indicates the LFX is in the "auto-initializing" stage. If flashing continues for more than ten seconds, there is an improper connection to the BPSS-Series subwoofer(s). Solid "On" indicates proper operation of the LFX crossover when used with Mirage BPSS-Series.

NOTE: If you are using the Mirage LFX crossover with another brand of subwoofer, the STATUS LED will continue flash after auto-initialization, however, your system is ready to operate.

MODE SWITCH

LFX-2: The MODE Switch sets the LFX-2 for operation with one or two subwoofers. **NOTE:** The crossover will appropriately sum the L and R low frequency signals depending on the position of the MODE Switch.

LFX-3: The MODE switch sets the LFX-3 for operation with one, two, or three subwoofers. **NOTE:** The crossover will appropriately sum the L,C,R low frequency signals depending on the position of the MODE Switch.

PHASE SWITCH

The PHASE switch is used to switch the phase of the subwoofer output(s) relative to the other speakers (0° or 180°). You will determine which position produces the best blend between the subwoofer(s) and other speakers.

LEVEL CONTROL

The level control adjusts the output level of the subwoofer(s) relative to all main speakers. Once set no further adjustment should be required.

Control Group B (LFX-3 only)

All controls in Group B relate to the center channel speaker and its associated subwoofer.

FREQUENCY SWITCH

Selects the crossover frequency between the center channel and its associated subwoofer. Frequency choices are 50Hz, 63Hz, 80Hz, and 100Hz.

LOW PASS (LP) SHAPE

Provides user adjustment of the "knee" of the LFX low pass crossover. This allows you to properly blend the subwoofer with the center channel speaker(s). See Fig. [2]

HIGH PASS (HP) SHAPE

Provides user adjustment of the "knee" of the LFX high pass crossover. This allows you to properly blend the center channel speaker(s) with the subwoofer. See Fig. [3]

IMAGE

Allows user adjustment of the center channel acoustic image, allowing custom blending of "REAL" and "PHANTOM" signal information.

LEVEL (center)

Allows adjustment of center channel level to account for different speaker efficiencies Left & Right versus Center. See section ? for setup instructions.

Control Group C (LFX-2 and LFX-3)

All controls in Group C relate to the left and right channel speakers and their associated subwoofer(s). All adjustments are made to both Left and Right channels simultaneously.

LOW PASS (LP) SHAPE

Provides user adjustment of the "knee" of the LFX low pass crossover. This allows you to properly blend the subwoofer(s) with the left and right channel speakers. See Fig. [2]

HIGH PASS (HP) SHAPE

Provides user adjustment of the "knee" of the LFX high pass crossover. This allows you to properly blend the left and right channel speakers with the subwoofer(s). See Fig. [3]

FREQUENCY SWITCH

Selects the crossover frequency between both left and right channels and their associated subwoofer(s). Frequency choices are 50Hz, 63Hz, 80Hz, and 100Hz.

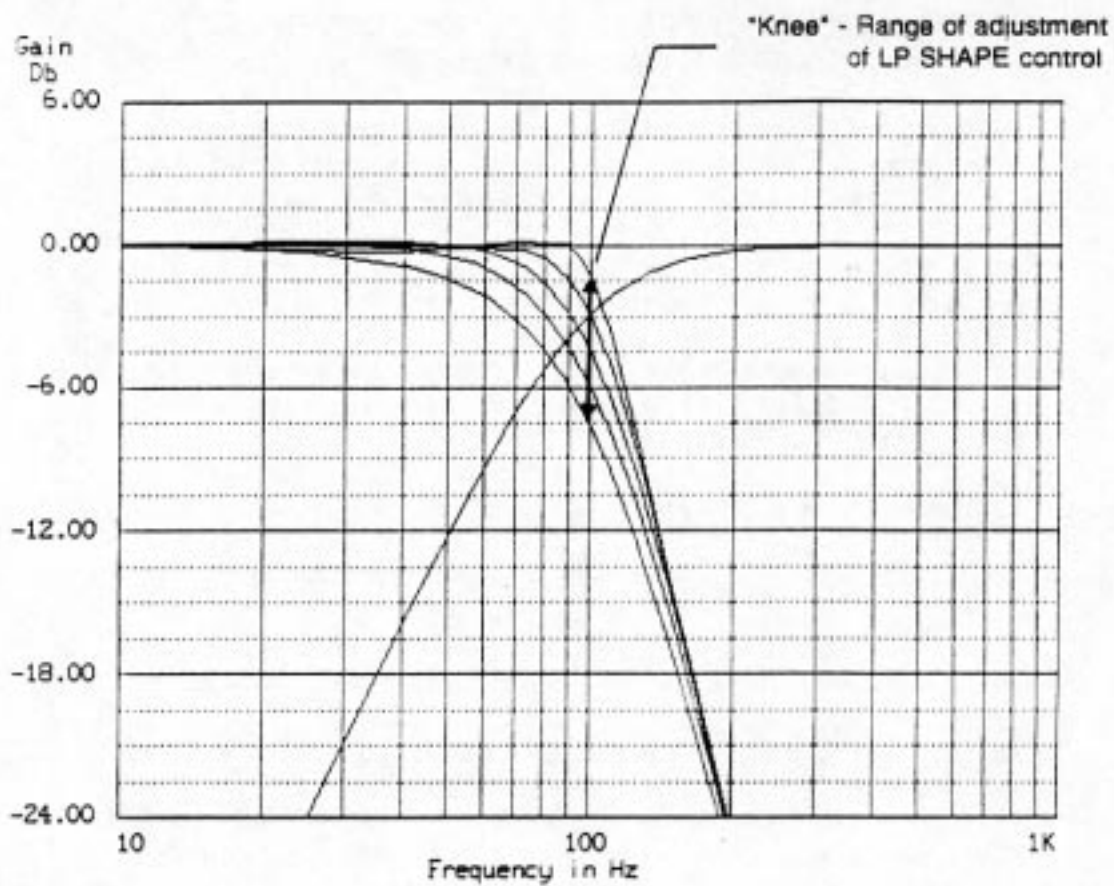


Fig. [2]

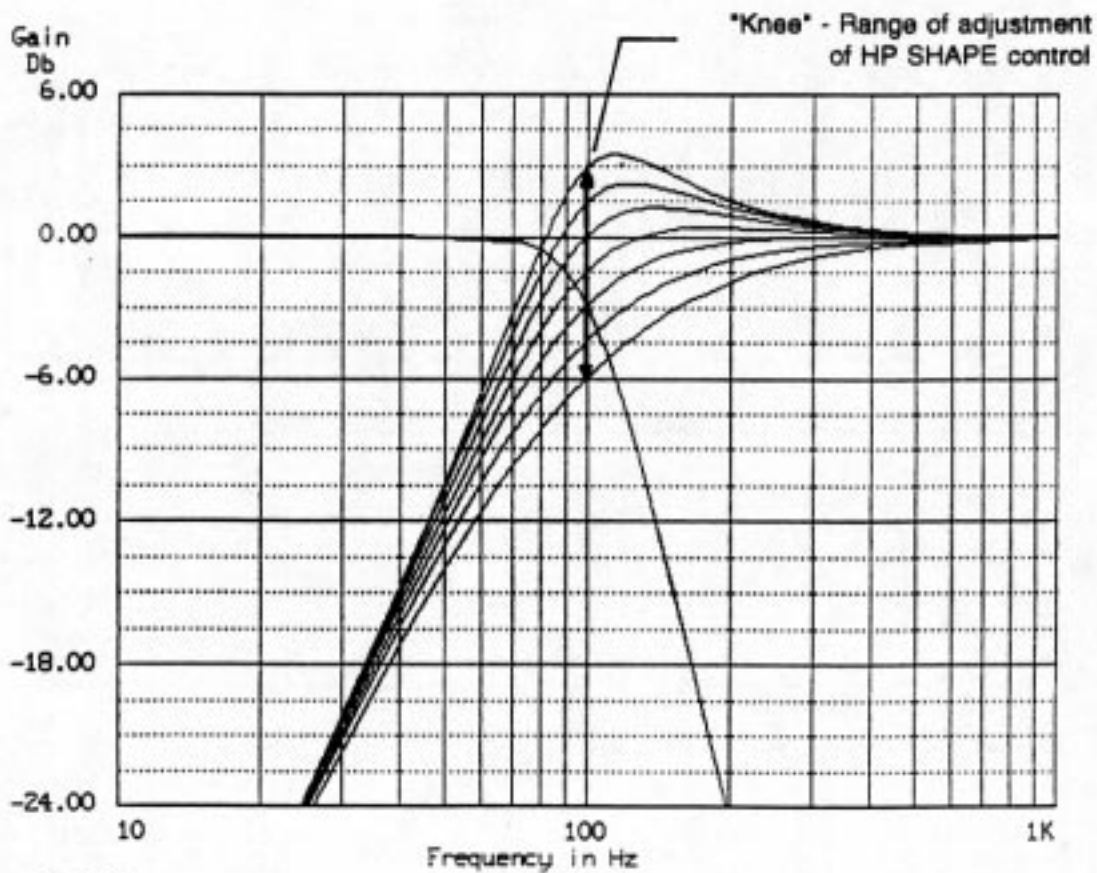
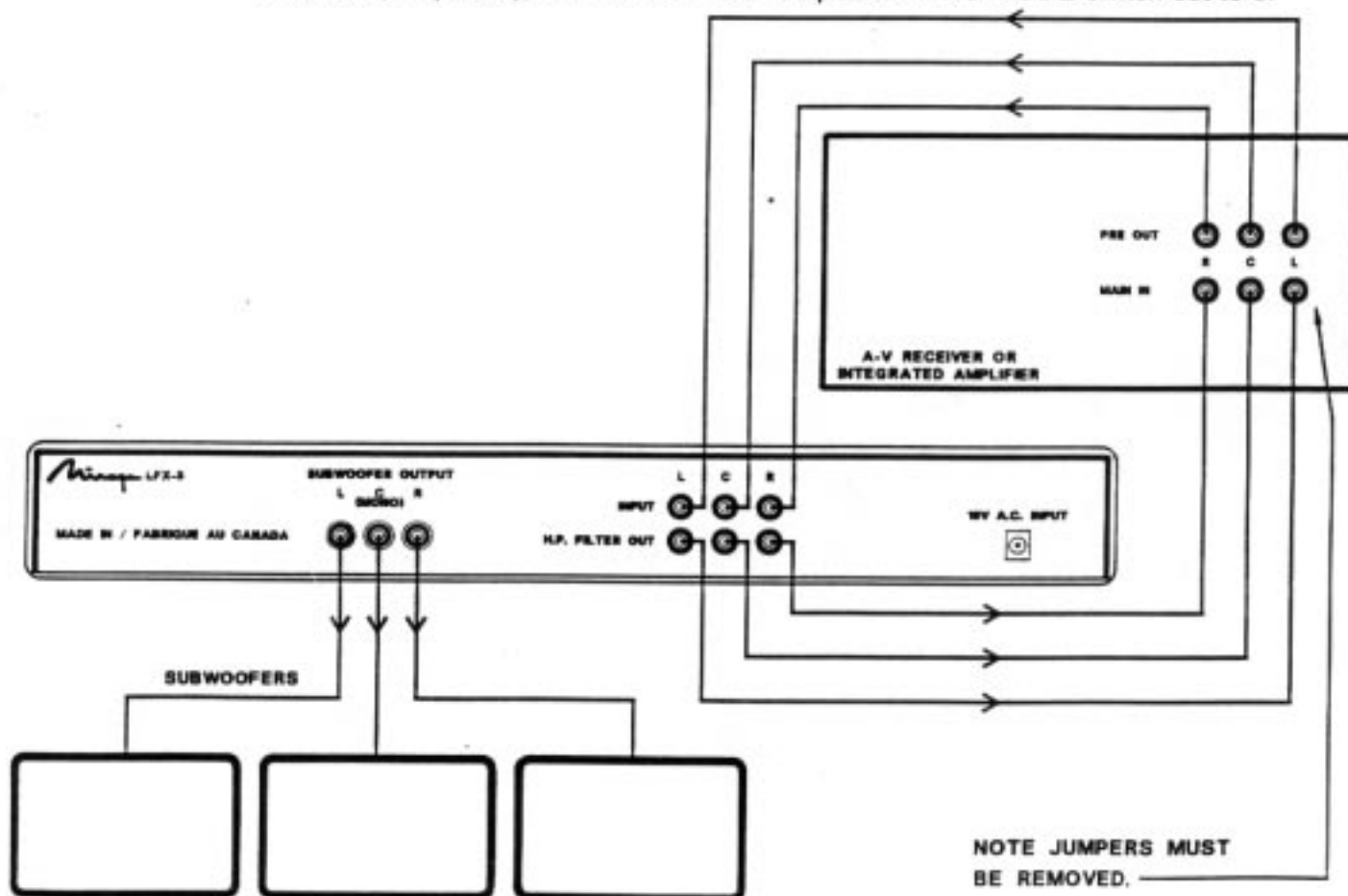


Fig. [3]

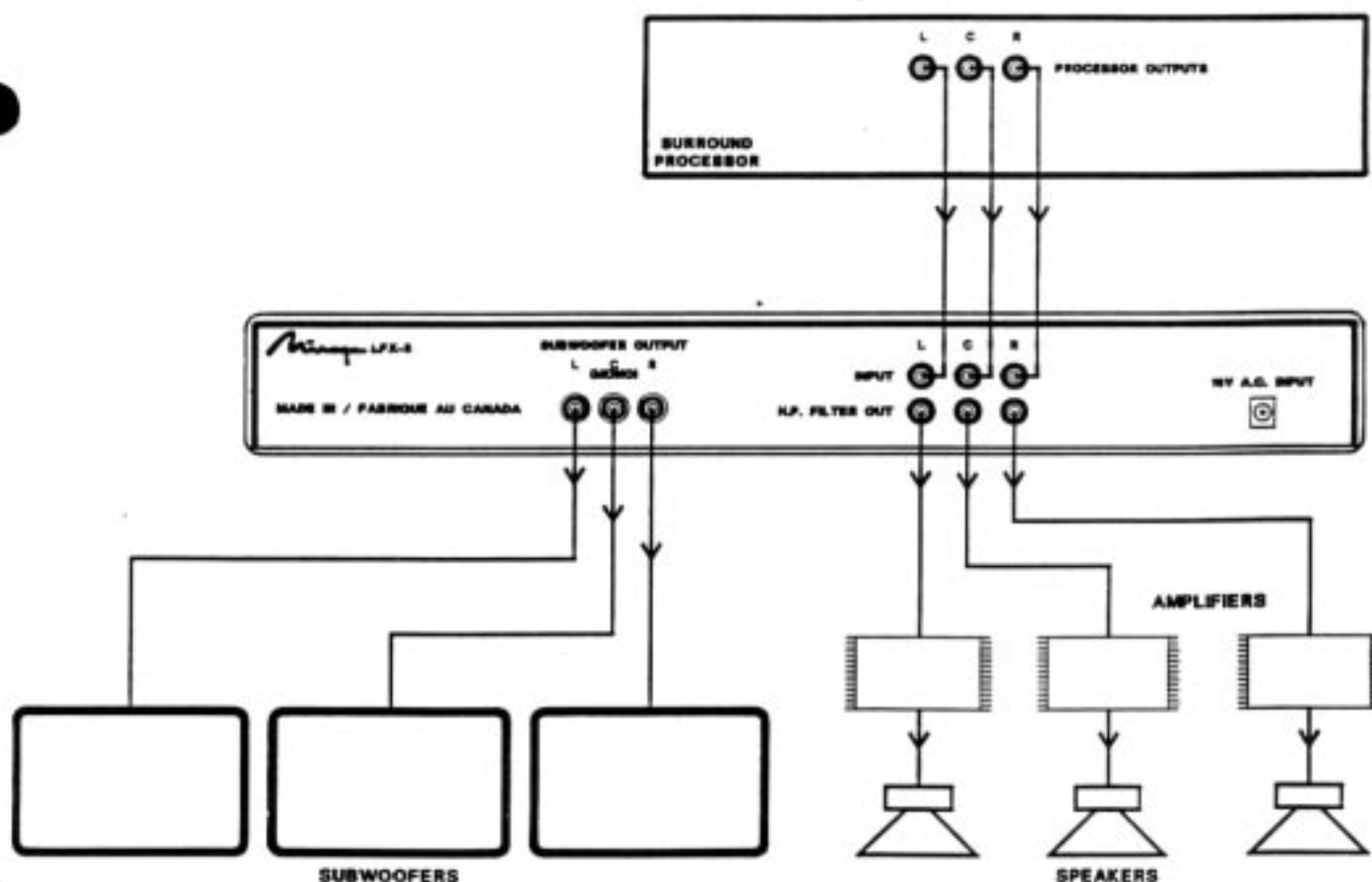
CONNECTION OF THE LFX-3 TO A/V RECEIVERS OR INTEGRATED A/V AMPLIFIER

1. NOTE: Your A/V receiver must have L,C,R low level preamplifier outputs and corresponding main amplifier inputs to allow proper connection of the LFX-3 crossover. Use high quality interconnects with RCA terminations.
2. Remove the shorting jumpers between the preamplifier outputs and the main amplifier inputs of Left, Center, and Right channels located on the rear of your A/V receiver.
3. If your surround receiver has provisions for THX™ the internal L,C,R 80Hz crossover must be switched "OFF". The most probable switch designation would be "CROSSOVER ON/OFF" or "SUBWOOFER ON/OFF".
4. Connect the A/V receiver's L,C,R preamplifier outputs to the LFX-3 L,C,R inputs.
5. Connect the LFX-3 L,C,R H.P. filter outputs to the A/V receiver's L,C,R main amplifier inputs.
6. Connect the LFX-3 subwoofer outputs to the BPSS-Series subwoofer input(s).
 - When using ONE BPSS-Series subwoofer it should be connected to the LFX-3 C(mono) subwoofer output and the MODE switch set to 1.
 - When using TWO BPSS-Series subwoofers they should be connected to the LFX-3 L and R subwoofer outputs and the MODE switch set to 2.
 - When using THREE BPSS-Series subwoofers they should be connected to the LFX-3 L, C(mono), and R subwoofer outputs and the MODE switch set to 3.



CONNECTION OF THE LFX-3 TO SEPARATE SURROUND PROCESSOR AND POWER AMPLIFIER(S)

1. If your surround processor has provisions for a THX™ processing mode the internal L,C,R 80Hz crossover must be switched "OFF". The designation of the appropriate switch varies among processor brands. The most probable designations would be "CROSSOVER ON/OFF" or "SUBWOOFER ON/OFF". Use high quality interconnects with RCA terminations
 2. Connect the processor L,C,R outputs to the LFX-3 L,C,R inputs.
 3. Connect the LFX-3 L,C,R High Pass filter outputs to the power amplifier L,C,R inputs.
 4. Connect the LFX-3 subwoofer outputs to the BPSS-Series subwoofer input.
- When using ONE BPSS-Series subwoofer it should be connected to the LFX-3 C(mono) subwoofer output and the MODE switch set to 1.
 - When using TWO BPSS-Series subwoofers they should be connected to LFX-3 L and R subwoofer outputs and the MODE switch set to 2.
 - When using THREE BPSS-Series subwoofers they should be connected to the LFX-3 L, C(mono), and R subwoofer outputs and the MODE switch set to 3.



ADJUSTMENT OF LFX-3 FOR USE WITH SURROUND DECODER OR A/V RECEIVER

IMPORTANT NOTE: If your surround processor or A/V receiver is equipped with a subwoofer on/off switch it must be switched to the "OFF" position (see surround processor owner's manual). This will allow a full range signal to be fed to the input of the LFX-3 and hence, all crossover functions will be controlled by the LFX-3.

One of the many unique features found on the LFX-3 is its ability to adjust the type of center channel image provided by your surround sound system. Two controls are included under the Phantom/Real heading for this purpose, IMAGE and LEVEL. Once the LEVEL control is set properly, as described in the steps below, any type of center channel image may be produced from a hard "Real" through partial "Real"/partial "Phantom" to full "Phantom" by adjusting the IMAGE control.

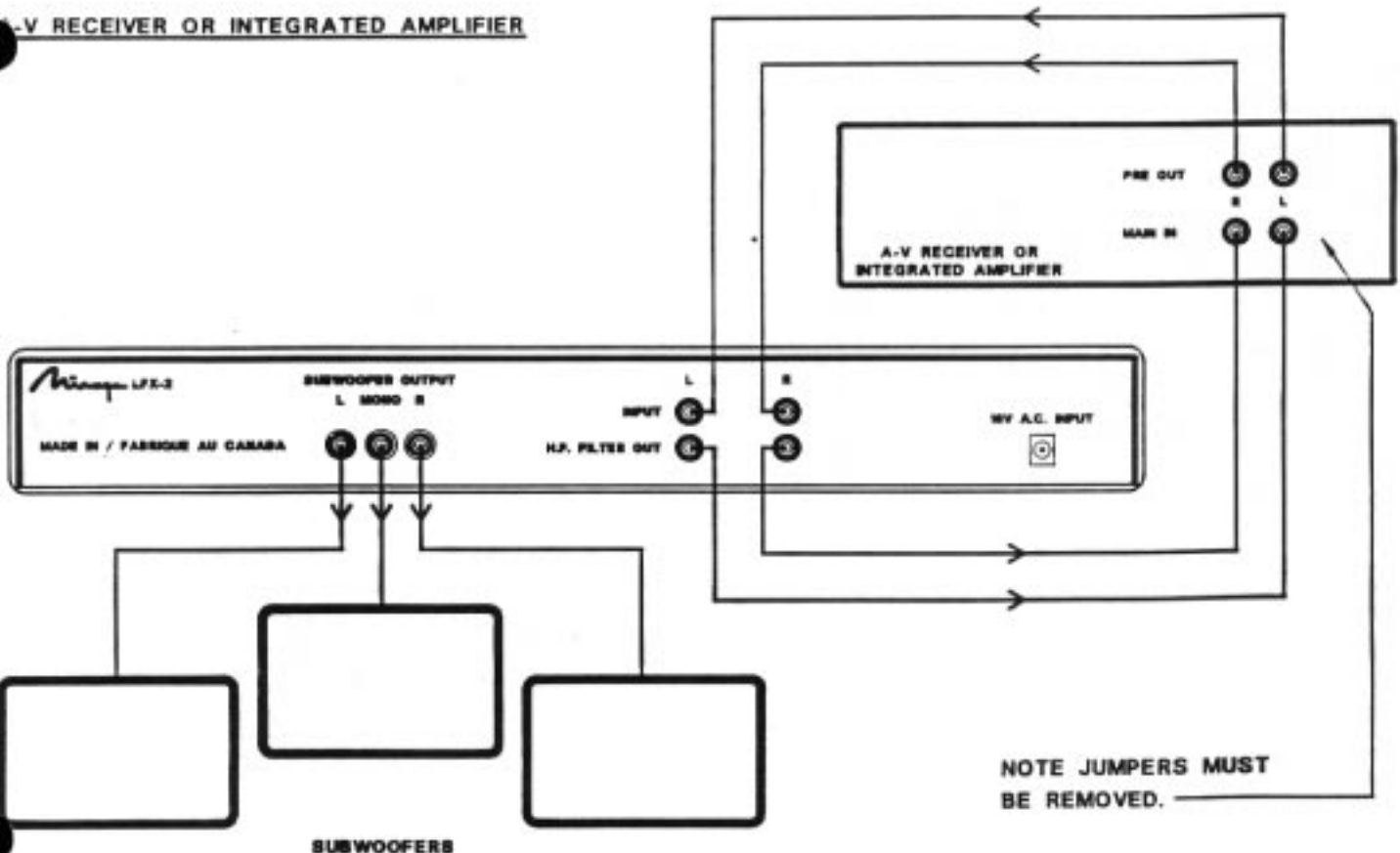
NOTE: If you are not using a center channel speaker set the "IMAGE" control to the 11:00 o'clock position.
If a center channel speaker is used follow the following steps.

1. Set the IMAGE control to its extreme counter clockwise position (R).
2. Using the test noise and level adjustments provided by the surround decoder, follow the instructions provided with the decoder to balance left, center, right, and surround channels for equal level.
3. Set the IMAGE control to its extreme clockwise position (P).
4. As in step number 2 use the test noise provided by the surround decoder to adjust the level of the "Phantom" center channel by adjusting the LFX-3 center channel LEVEL control only.
5. Now that the LFX-3 center channel LEVEL control is properly set, no further adjustment should be required except when system components are changed.
6. Using a video soundtrack with dialogue as a signal source, adjust the IMAGE control for the most realistic sonic presentation. The eleven o'clock position is a good starting point.

CONNECTION OF THE LFX-2 TO A STEREO RECEIVER OR INTEGRATED STEREO AMPLIFIER

1. **NOTE:** Your stereo receiver must have L and R low level preamplifier outputs and corresponding main amplifier inputs to allow proper connection of the LFX-2 crossover. Use high quality interconnects with RCA terminations.
2. Remove the shorting jumpers located on the rear panel of your stereo receiver. They are connected between the L and R preamplifier outputs and the L and R main amplifier inputs.
3. Connect the stereo receiver L and R preamplifier outputs to the LFX-2 L and R inputs.
4. Connect the LFX-2 L and R H.P. filter outputs to the stereo receiver's L and R main amplifier inputs.
5. Connect the LFX-2's subwoofer outputs to the BPSS-Series subwoofer input(s).
 - When using ONE BPSS-Series subwoofer it should be connected to the LFX-2 mono subwoofer output and the MODE switch set to 1.
 - When using TWO BPSS-Series subwoofers they should be connected to the LFX-2 L and R subwoofer outputs and the MODE switch set to 2.

A-V RECEIVER OR INTEGRATED AMPLIFIER

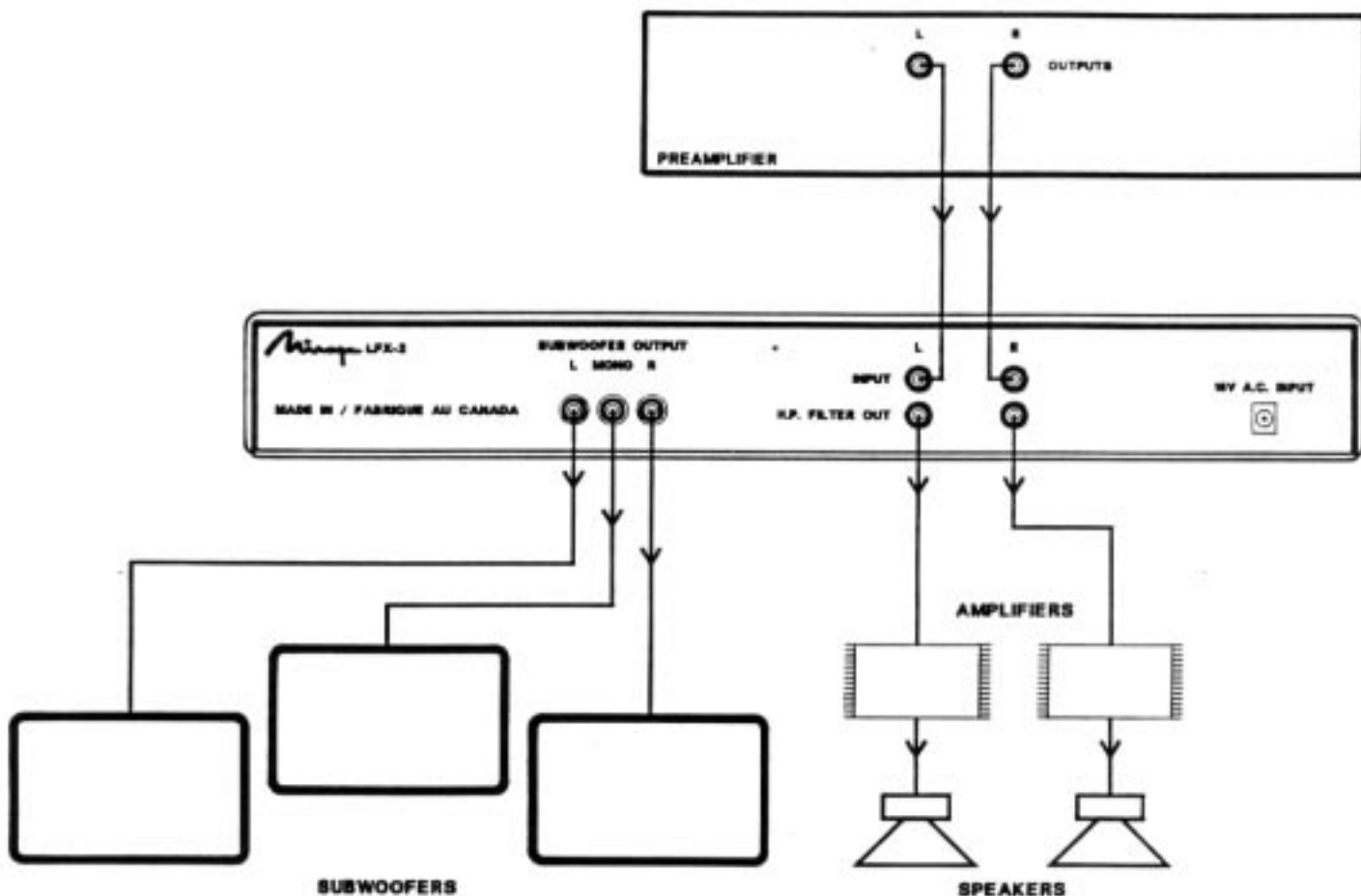


CONNECTION OF THE LFX-2 TO A PREAMPLIFIER AND AMPLIFIER COMBINATION

1. Using High quality interconnects with RCA terminations connect the preamplifier L and R outputs to the matching LFX-2 L and R inputs.
2. Using High quality interconnects with RCA terminations connect the LFX-2 L and R H.P. filter outputs to the matching main amplifier L and R inputs.
3. Using High quality interconnects with RCA terminations connect the LFX-2's subwoofer outputs to the BPSS-Series subwoofer input(s).

NOTE: When using ONE BPSS-Series subwoofer it should be connected to the LFX-2 mono subwoofer output and the MODE switch set to 1.
When using TWO BPSS-Series subwoofers they should be connected to the LFX-2 L and R subwoofer outputs and the MODE switch set to 2.

PREAMPLIFIER AND AMPLIFIER



NOTES RELATED TO THE CHOICE OF CROSSOVER FREQUENCY

The LFX series of crossovers are designed to accurately blend BPSS-Series subwoofers with any type of "satellite" loudspeaker. Satellite speakers refer to the other speakers used in your sound system in conjunction with the BPSS-Series servo-subwoofer. For best performance, the satellite speakers in your sound system should have low frequency (bass) capabilities down to at least 100Hz. In other words, the satellite speaker's low frequency cut-off should be equal to or less than 100Hz.

With the purchase of your new Mirage BPSS-Series subwoofer(s), you are about to enter a new world of virtually distortion-free low frequency reproduction. Conventional, non-servo, powered or passive subwoofers can produce up to 30% of unwanted distortion.

The advanced technology of Mirage BPSS-Series subwoofers reduces distortion to less than 1%. First time users will tend to turn the main LFX subwoofer level control higher than necessary to compensate for this lack of familiar distortion. However, you will soon learn, after 20 to 30 minutes of listening, that this is undesirable and that the level control should be set lower for proper low frequency balance.

It is important to choose the proper crossover frequency to ensure a proper blend between your "satellite" speakers and your BPSS-Series subwoofer(s). The correct choice of crossover frequency setting on the LFX crossover will depend on the low frequency capabilities of the "satellite" speaker(s) used. Below is a table to assist in the selection of an appropriate crossover frequency for the "satellite" speakers in your system.

SATELLITE SIZE	LOW FREQUENCY -3dB	LFX CROSSOVER POINT
LARGE FLOOR STANDING	LOWER THAN 40Hz	50Hz or 63Hz
BOOKSHELF	LOWER THAN 60Hz	63Hz or 80Hz
SMALL SATELLITE	60Hz OR HIGHER	80Hz or 100Hz

TABLE [1]

LFX-2 AND LFX-3 CROSSOVER ADJUSTMENT

LEFT & RIGHT CHANNEL ADJUSTMENT:

This section take you through a step by step set-up for both Left & Right channels using either the LFX-2 or LFX-3 active crossovers.

IMPORTANT: For the following steps 1 through 12 set your A/V receiver, stereo receiver, preamplifier or surround processor to the STEREO mode only. DO NOT SELECT DOLBY PRO LOGIC™, THX™, OR ANY OTHER SPECIAL PROCESSING MODES.

- 1 Set the MODE switch (GROUP A) to coincide with the number of BPSS-Series subwoofers connected to the LFX crossover.
- 2 Set the Left & Right (GROUP C) crossover frequency, using the FREQUENCY control, based on the recommendations provided in Table (1).
- 3 Set the LP SHAPE and HP SHAPE controls (GROUP C) to the 11 o'clock position as a starting point.
- 4 Turn the main subwoofer LEVEL control (GROUP A) fully counter clockwise to the 0 position.
- 5 Make sure all subwoofers are connected and in the "standby" mode as indicated by a red LED indicator on the front of the BPSS-Series subwoofer black high gloss trim panel.
- 6 Turn the LFX crossover on by placing the BYPASS/ON/OFF switch (GROUP A) to the ON position.

NOTE: this is the middle position of the three position switch.

Once turned on, the LFX red STATUS LED will flash for approximately 10 seconds, while initializing, and will remain on, indicating proper connection to all subwoofers. When the LFX STATUS LED stops flashing all indicators on the BPSS-Series subwoofer(s) will change from RED (standby) to GREEN (on).

- 7 To adjust the bottom end of the "satellite" speaker's response, use a program source with middle-bass content such as male vocal. Adjust the HP SHAPE control (GROUP C) to minimize any "chestiness" in the sound from the "satellite" speakers. Turn the control counter-clockwise to decrease the "chesty" characteristic. Turn the control clockwise to add "warmth". Remember that, at this point in the setup, only the "satellite" speakers will be playing.
- 8 Using a program source with deep bass content, such as a music synthesizer, drums or movie special effects; adjust the main subwoofer LEVEL control (GROUP A) clockwise from 0 until a pleasing balance is achieved between the subwoofer(s) and "satellite" speakers.
- 9 To adjust the top end of the subwoofer's response use the LP SHAPE control (GROUP C). Turn control clockwise for more bass impact and counter-clockwise for less.

10 The final adjustment is to set the PHASE switch (GROUP A). The positioning of this switch to either 0° or 180° will depend on speaker placement, crossover frequency and the SHAPE control settings. Choose the setting that gives the warmest or fullest middle-bass.

11 If, at this point, there is too much middle-bass, repeat steps 5 and 7 to achieve the balance that suits your taste.

This completes the Left & Right channel set-up procedure for either the LFX-2 or LFX-3 active crossover.

CENTER CHANNEL ADJUSTMENT (LFX-3 ONLY):

IMPORTANT: For the following steps 1 through 4 adjust your A/V receiver or surround processor by setting the MONO/STEREO switch to MONO and select either the Dolby Pro Logic™ or THX™ processing mode. With some components, you may need to use the tuner input - see your owners manual.

1. Set the Center channel (GROUP B) crossover frequency, using the FREQUENCY control, based on the recommendations provided in Table (1).
2. Set the LP SHAPE and HP SHAPE controls (GROUP B) to the 11 o'clock position as a starting point.
3. To adjust the bottom end of the center channel speaker's response, use a program source with middle-bass content such as male vocal. Adjust the HP SHAPE control (GROUP B) to minimize any "chestiness" in the sound from the center channel speaker(s). Turn the control counter-clockwise to decrease the "chesty" characteristic. Turn the control clockwise to add "warmth". Remember that, at this point in the set-up, only the center channel speaker(s) will be playing.
4. To adjust the top end of the subwoofer's response use the LP SHAPE control (GROUP B). Turn the control clockwise for more bass impact and counter-clockwise for less.

SPECIFICATIONS

▪ CROSSOVER	LFX-2	LFX-3
▪ TYPE	ACTIVE 2 WAY 2 CHANNEL	ACTIVE 2 WAY 3 CHANNEL
▪ CROSSOVER FREQUENCIES	50, 60, 80, 100 Hz	50, 60, 80, 100 Hz
▪ LOW PASS SLOPE	ASYMPTOTIC 24db/OCT	ASYMPTOTIC 24db/OCT
▪ ATTENUATION AT CROSSOVER FREQUENCY	VARIABLE -7.5dB TO -1.5dB	VARIABLE -7.5dB TO -1.5dB
▪ VOLTAGE GAIN LOW PASS	VARIABLE UP TO +12db	VARIABLE UP TO +12db
▪ HIGH PASS SLOPE	ASYMPTOTIC 12db/OCT	ASYMPTOTIC 12db/OCT
▪ ATTENUATION AT CROSSOVER FREQUENCY	-6.0dB TO +3.0dB	-6.0dB TO +3.0dB
▪ VOLTAGE GAIN HIGH PASS	0dB	0dB
▪ INPUT IMPEDANCE	100k OHMS	100k OHMS
▪ MINIMUM LOAD IMPEDANCE	10k OHMS	10k OHMS
▪ DIMENSIONS	17" x 9" x 2.5" 43cm x 23cm x 6.3cm	17" x 9" x 2.5" 43cm x 23cm x 6.3cm
▪ WEIGHT	6.4 lb 2.9kg	6.4 lb 2.9kg
▪ POWER SUPPLY	EXTERNAL 16 Vac	EXTERNAL 16 Vac

LIMITED WARRANTY PROTECTION

LIMITED WARRANTY COVERAGE:

Mirage warrants this product to the retail purchaser against any failure resulting from original manufacturing defects in workmanship or materials. The Limited Warranty is in effect for a period of one (1) year from date of purchase from an authorized Mirage dealer and is valid only if the original bill of sale is presented when service is requested.

The Limited Warranty does not cover damage caused during shipment, by accident, misuse, abuse, including use other than normal home audio/video applications, neglect, unauthorized product modification, failure to follow the instructions outlined in the owner's manual, failure to perform routine maintenance, damage from unauthorized repairs or claims based upon misrepresentations of the warranty by the seller.

NOTE: This **LIMITED WARRANTY** is valid for Canada and the United States. Contact your local Mirage dealer for other warranty information which may be applicable based on the local laws in your country.

WARRANTY SERVICE:

If you require service for your Mirage subwoofer at any time during the 1 year Limited Warranty period, please contact 1) the dealer from whom you purchased the product, 2) Mirage National Service, 203 Eggert Road, Buffalo, N.Y. 14215, Tel. (716)-896-9801 or 3) Mirage Loudspeakers, 3641 McNicoll Avenue, Scarborough, Ontario, Canada, M1X 1G5, Tel (416)-321-1800. You will be responsible for transporting the product in adequate packaging to protect it from damage in transit and for the shipping costs to an authorized Mirage service center or to Mirage Loudspeakers. If the product is shipped prepaid for repair to Mirage Loudspeakers in Buffalo or Scarborough, the costs of the return shipment to you will be paid by Mirage, provided the repairs concerned fall within the terms of the Limited Warranty.

Mirage's Limited Warranty is limited to repair or replacement of Mirage products. It does not cover any incidental or consequential damage of any kind. If the provision in any advertisement, packing cartons, or literature differ from those specified in this Limited Warranty statement, the terms of the Limited Warranty prevail.

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