Sim audio

MOON AV Series
Owners manual

ATTRACTION
5.1 Channel surround sound processor
&
Audiophile D to A convertor

DIGITAL dts SURROUND

HDCD

Simaudio Ltd.
3275, 1 ière rue, Unit #1
St-Hubert, Québec
Canada
J3Y 8Y6

Tel.: (450) 445-0032 Fax: (450) 445-6626
Email: info@simaudio.com
Web site: www.simaudio.com

Congratulations . . .

on your purchase of MOON Attraction—the most revolutionary home theater product of the decade. The MOON Attraction incorporates cutting-edge technology not found in any other D-to-A converter or surround sound processor. These technological innovations, combined with consummate quality components and meticulous attention to detail, provide unprecedented sonic performance with richness of detail, dynamic contrasts, soundstaging and musical realism previously unattainable from a digital source.

The MOON Attraction is specially engineered to provide years of trouble-free performance. Its modular design and advanced, software-driven user interface offer ease of upgradability to prevent obsolescence and to ensure years of musical and home theater enjoyment.

Read this Manual!

A multi-channel surround sound processor is a sophisticated component requiring careful setup. Fortunately, setup is easy if you follow the step-by-step instructions in this Manual.

To set up and get started quickly, Chapters II, III, IV and VI are essential (about 20 pages, total). However, to obtain full performance from your MOON Attraction, you should also familiarize yourself with the advanced features described in Chapters VII and VIII as quickly as possible.

Send in your Warranty/Registration Card!

Please fill out and send in the enclosed Warranty/Registration Card to qualify for Simaudio's extended two-year warranty and to ensure notification of free design upgrades and other design enhancements.

Contents

1. MOON ATTRACTION PERFORMANCE FEATURES

- **HDCD®:** The High Definition Compatible Digital® (HDCD) process is a sophisticated dynamic-range-expansion and frequency-resolution enhancing algorithm used when recording and playing back a CD, allowing much greater resolution and dynamic range than previously possible. As much as 20 bits of musical resolution can be achieved with the HDCD process, rivaling the highest-quality analog master tapes.

  Developed by Pacific Microsonics, the HDCD process was designed to match the ultimate resolving power of the human ear, while maintaining compatibility with the existing 16-bit CD format. Moreover, even non-HDCD discs are played back with exceptional clarity, because the HDCD hardware acts as an ultra-high-quality digital filter when a non-HDCD disc is played.

- **Six precision Burr Brown PCM1702 20-bit DACs** provide excellent low-level linearity and dynamic range.

- **AccuLinear®** analog circuitry provides superior reconstruction of the musical waveform. This advanced technology incorporates discrete components within a single chip wafer to provide greater speed and accuracy than either discrete or conventional integrated designs can provide. This results in reduced transient distortion in the critical current-to-voltage stage—a principal cause of harshness, glare and stridency commonly associated with CD sound.

- ***Digital Flywheel*™** reclocking circuitry is a state-of-the-art, proprietary, dual time constant phase locked loop, utilizing *two* precision, voltage-controlled crystal oscillators (VCXOs)—for both 44.1 kHz and 48 kHz. The electronic equivalent of a massive rotating flywheel, *Digital Flywheel* smooths out instantaneous time-base fluctuations (i.e., jitter), achieving up to a thousand-fold reduction in high-frequency jitter. This unrivaled jitter performance is especially crucial in achieving the ultimate musical resolution and soundstage focus made possible by DTS and by the HDCD process.

- **Balanced stereo outputs** utilize separate DACs for + and - polarity to achieve lowest possible THD and greatest signal-to-noise ratio.

- **Remote volume control** utilizes switched resistive array for ultimate transparency. Volume adjustable in 0.2 dB steps.

- **Six precision Burr Brown PCM1702 "Series K" 20-bit DACs** provide exceptional low-level linearity and dynamic range, with a *guaranteed* THD and noise level below -96 dB.

- **State-of-the-art precision 20-bit CS5390 5th order delta-sigma A-to-D converter** provides exceptional transparency when using analog inputs.

- **Teflon analog circuit board** ensures maximum transparency with minimal "dielectric signature".

- **Ultra-premium passive components,** including 0.1% precision Vishay resistors.

II. Installation and Hookup

A. Unpacking

Your MOON Attraction package should include the following items:

1. MOON Attraction D-to-A converter and 5.1-channel surround-sound processor
2. Backlit LCD touch-screen/push-button Smart Remote Control.
3. Three AAA alkaline batteries for the remote control.
4. Setup microphone
5. AC power cord
6. Warranty/Registration Card
7. Owner's Manual

Save all original packaging materials.

After unpacking your MOON Attraction, check to see that the AC voltage checked on the unit (100-120 Volts or 200-240 Volts) is appropriate for your national standard. **WARNING: FAILURE TO CONFIRM THE APPROPRIATE VOLTAGE SETTING CAN RESULT IN DAMAGE TO THE UNIT.**

Fill out and send in the enclosed Warranty/Registration Card to qualify for Simaudio's extended two-year warranty and to ensure notification of free design upgrades and new products as they become available.

B. Associated equipment

For operation, your MOON Attractionmust be connected to a suitable digital source [e.g., a CD transport, DVD transport, video laserdisc transport, digital tape (DAT) player, or satellite receiver equipped with an SPDIF digital audio output], or a line-level analog source [e.g., a tuner, tape deck or VCR].

For Dolby Digital (AC-3) 5.1-channel surround-sound playback from a laserdisc transport, the laserdisc transport must be equipped with an AC-3 RF output. In addition, Simaudio's *SmartCable* or similar RF demodulator is needed to convert the RF signal to the SPDIF digital format before connecting to one of MOON Attraction digital inputs.

For home-theater 5.1-channel surround-sound playback, ideally five matched full-range speakers [left and right front stereo speakers (LF and RF), center dialog speaker (CTR), and left and right surround speakers (LS and RS)], plus a dedicated low-frequency/effects channel subwoofer ("LFE" subwoofer).

If cost and/or space considerations prohibit five full-range speakers, MOON Attraction is equipped with internal crossovers to direct bass information from any selected speakers to the subwoofer (or to the front stereo speakers, for systems lacking a dedicated LFE subwoofer). MOON Attractionr's high-order digital crossovers are exceptionally clean, without the veiling typically associated with complex multi-pole analog crossovers. The crossover frequency is user-selectable. In addition, MOON Attractionis equipped with "Phantom" and "3Stereo" modes for systems lacking a CTR speaker or lacking LS and RS surround speakers, respectively (see Chapter III: B,C).

The front stereo speakers (LF and RF) must be full range—capable of *accepting* without damage, if not actually reproducing, full bandwidth bass information.* (This is because HDCD playback requires that full bandwidth information be sent to the LF and RF speakers during stereo playback.) The bass response of these speakers may be *augmented* by the LFE subwoofer using MOON Attractionr's internal crossover networks. These crossovers will duplicate the deep bass information and send it to the subwoofer, but will not roll-off the front stereo speakers during stereo playback in order to preserve HDCD playback.

**These stereo speakers may consists of two full-range speakers or a satellite-subwoofer system. Such a satellite-subwoofer system logically substitutes for two full-range stereo speakers in this manual: it is distinct from the dedicated LFE subwoofer. This satellite subwoofer, together with the left and right speakers, will be driven by the MOON Attraction's LF and RF stereo outputs,* not *the output labeled SUB, which is reserved for the LFE subwoofer. For systems without full-range stereo speakers (or a satellite-subwoofer system), an HDCD override option is described in Chapter III: "G. Configuring Crossovers".*

All six speakers require power amplification. A pre-amplifier is not required, and is not recommended. To ensure adequate volume, we recommend that the power amplifier gain (in dB) plus speaker sensitivity (in dB) should sum to 110 dB or more.

Modern-day movie soundtracks usually incorporate a low-frequency effects (LFE) channel. This signal should ideally be connected to a special, heavy duty subwoofer. **This LFE subwoofer requires more gain and more power-handling capability** than the other channels. This is because the LFE effects channel must compete sonically with five other channels of sound. As much as 10 dB of extra gain and power-handling capability is therefore recommended, especially if other speakers are being crossed over to the subwoofer. (In this latter case, the subwoofer has to handle the bass load from as many as six separate channels.) One easy way to achieve this gain is by using a powered subwoofer with its own gain control.

C. Hookup

Position your LF and RF speakers for good stereo soundstaging. Position the center dialog speaker (CTR) above, below, or behind the viewing screen, as appropriate. Position the rear surround speakers (LS and RS) somewhat behind the listening position, pointing towards the listener. The LFE subwoofer position is less critical, but should be within the listening area.

Connect the six speakers (five, if there is no LFE subwoofer) to six channels of power amplification, taking care to observe correct polarity. (The LFE subwoofer may be self-powered.)

Place the MOON Attraction within interconnect reach of your power amplifiers. **It should be placed in a well ventilated area, with nothing blocking the top or side cooling vents on the MOON Attraction cover.**

Connect the six MOON Attraction outputs (LF, RF, CTR, LS, RS, SUB) appropriately to the six power amps.* The balanced stereo outputs are recommend for power amps equipped with balanced inputs.

inputs to the analog or digital Tape/Mon output, as appropriate. The outputs from the tape deck/signal processor should be connected to a digital or analog input on the MOON Attraction (See Chapter VII: "I. Taping a source", and Chapter III: "E. Programming a tape/monitor lock-out".)

Video hookup *:*
Connect your video sources (i.e., DVD player, video laserdisc player, satellite receiver, or VCR) to the composite and/or S-video inputs on the MOON Attraction as appropriate.* It is not necessary to coordinate video inputs with audio inputs (e.g., to associate a DVD player with digital audio input #1 and with S-video input #1), since MOON Attraction's A/V linking feature allows you to program-link any video input with any audio input. [See Chapter III: "F. Programming Audio/Video links".]

Connect the MOON Attraction's composite and S-video outputs to the video inputs on your projector or TV monitor. To view composite video inputs, you will need to select "composite video" on your projector/TV monitor. To view S-video inputs, you will need to select "S-video" on your projector/TV monitor.* Refer to your projector/TV monitor for instructions.

**S-video inputs will yield superior performance with video sources that are inherently of the S-video type (i.e., have separate Y and C signals). Such video sources include DVD, Super-VHS (SVHS), and digital satellite (e.g., DSS). For sources, such as laserdisc, that are inherently composite, then either the composite or S-video inputs may yield the best results, depending upon whether the video source or the video monitor has the superior composite-to-S-video converter (comb filter). For such composite sources, the user is encouraged to experiment to determine whether S-video or composite video gives the best results.*

Remote control of video screen:
Some video screens can be raised or lowered remotely using a 12-Volt control signal. The MOON Attraction has a switched 12-Volt screen control output for this purpose. To use this feature, connect your video screen remote control line to the jack labeled "Screen" on the MOON Attraction rear panel. To lower the screen, press the octagonal icon button on page 1 of the remote control's *MOON Attraction* device (see page 15). To raise the screen, simply press the same button again.

III. Setup Preliminaries: System Configuration

Setup procedures only need to be performed once. The settings are stored in non-volatile EEPROM memory, and are preserved even during AC power shut-down. Settings can be updated at any time by repeating any portion of the setup procedure.

The following setup procedures are performed mainly with the remote control's* Setup 1 *and* Setup 2 *devices. Turn on the remote by pressing any of the rubber buttons. Main Menu should appear. If it does not, press the device header (between the "M" and ⓘ buttons. There are two pages of Main Menu. Use the large arrow buttons on the LCD to select one page or the other.

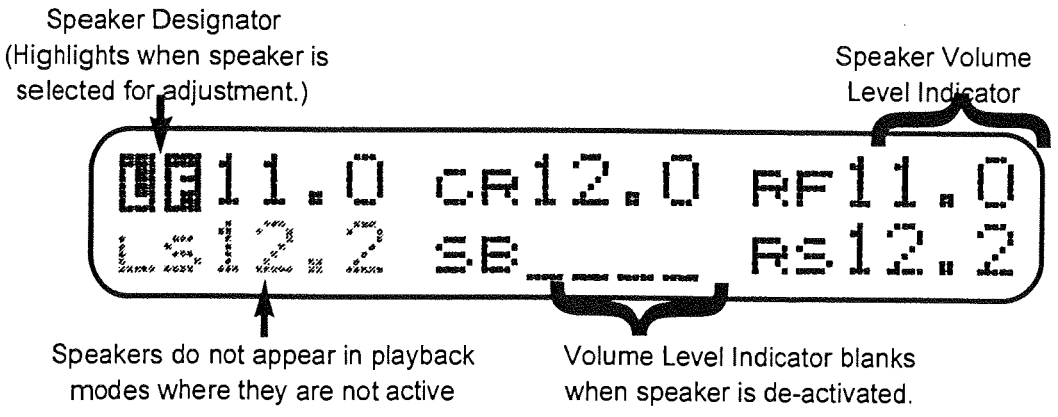
Turn your power amplifiers off.* Switch on AC power to the MOON Attraction using the rear panel AC power switch. The MOON Attraction's front-panel LCD display will illuminate momentarily, and then dim as it enters standby.** Switch your power amplifiers back on.

**The MOON Attraction is extremely well-behaved during AC power-up and power-down. Nevertheless, to prevent the possibility of turn-on transients that could damage your speakers, it is good practice to power down your amplifiers and/or powered subwoofers before powering up or powering down your MOON Attraction, pre-amplifier, or similar components connected to your power amplifiers.*

***Be careful not to press the MOON Attraction's rear-panel Power/Mute switch until the display goes dim. Doing so will put the MOON Attraction into its special IR Leaning mode, which is used for reprogramming 3rd-party remote control systems (see Chapter IX: "IR Learning Remotes"). If this happens, switch off AC power, and start over.*

A. Disabling the LFE subwoofer *(For systems with NO dedicated LFE subwoofer)*:

Enter the Speaker Adjustment Screen (shown below) by pressing **Adjust** on page 2 of the remote's *Setup 1* device. (*Note:* The device page number appears at the bottom of the remote's LCD. Use the arrow keys to either side of the page number to select one of four pages.) Select the subwoofer for adjustment by pressing **SUB**. The subwoofer designator letters "SB" will highlight on the MOON Attraction display. Now disable the subwoofer by pressing **CH-**. [The subwoofer is disabled when the subwoofer's volume indicator is blanked—see figure.] Disabling the subwoofer redirects bass information to the LF and RF speakers. (The subwoofer can be re-enabled by pressing **SUB** followed by **CH+** in this same Speaker Adjustment Screen.) Exit the Speaker Adjustment Screen by pressing ⏎ on the remote control.



Speaker Adjustment Screen

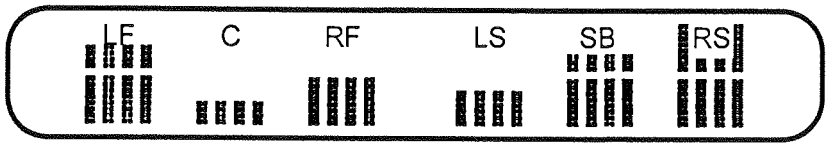
MOON Attraction LCD Display Screens

(Accessible from page 4 of the remote's *MOON Attraction*device, by pressing **DISP** t. Return to Main Screen from any screen by pressing ⇦ or ↵,* or scroll up by pressing **DISP** s.)

These two screens can also be accessed with the **Main Screen ⇔ VU Meter** button, on page 1 of the remote control's MOON Attraction device.

Chap. VI

Main Screen

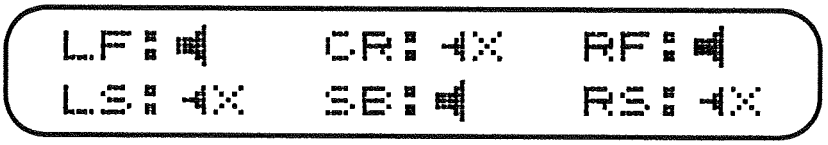


Chap. VII

Output VU Meter

Chap. III-V

Speaker Adjustment Screen



Chap. III

Bass Management Screen

Chap. IV-V

Speaker Distances Screen

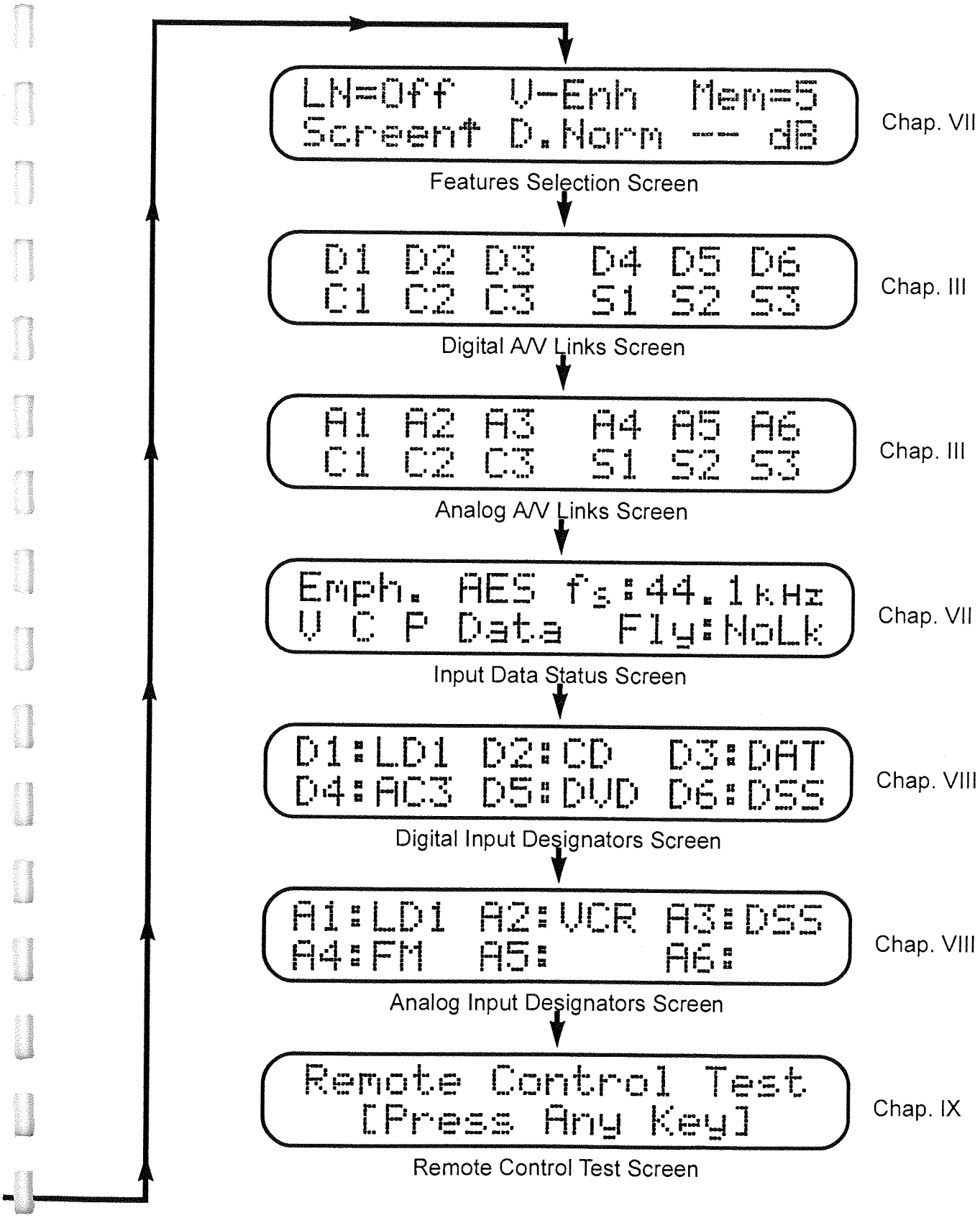
Chap. VI

Analog Input Attenuation Screen

Chap. III

System Configuration Screen

*The ↵ key can be used to exit any screen, except for the Output VU Meter screen, where the ↵ key has special significance (see Chapter VII: "A. Front-panel VU meter").


LN=Off V-Enh Mem=5
Screent D.Norm -- dB
Chap. VII
Features Selection Screen
D1 D2 D3 D4 D5 D6
C1 C2 C3 S1 S2 S3
Chap. III
Digital A/V Links Screen
A1 A2 A3 A4 A5 A6
C1 C2 C3 S1 S2 S3
Chap. III
Analog A/V Links Screen
Emph. AES fs:44.1kHz
V C P Data Fly:NoLk
Chap. VII
Input Data Status Screen
D1:LD1 D2:CD D3:DAT
D4:AC3 D5:DVD D6:DSS
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Digital Input Designators Screen
A1:LD1 A2:VCR A3:DSS
A4:FM A5: A6:
Chap. VIII
Analog Input Designators Screen
Remote Control Test
[Press Any Key]
Chap. IX
Remote Control Test Screen

B. Phantom mode:

For systems without a front center (CTR) speaker, MOON Attraction provides a "Phantom" mode, which re-directs center channel information to the LF and RF speakers.* To invoke Phantom mode, simply disable the CTR speaker (similar to disabling the subwoofer, above) by pressing **CTR** followed by **CH-** while in the Speaker Adjustment Screen (go to page 2 of the remote control's *Setup-1* device and press **Adjust**. Exit by pressing the ⏻ button on the remote control when done).

**Although the Phantom and 3Stereo modes were originally intended to be used in "starter" systems having fewer than the normal number of loudspeakers, in high-end systems these modes are sometimes used to remedy a particular source problem or a particular listening requirement (e.g., listening to Dolby Surround-encoded music, which often sounds better in Phantom mode).*

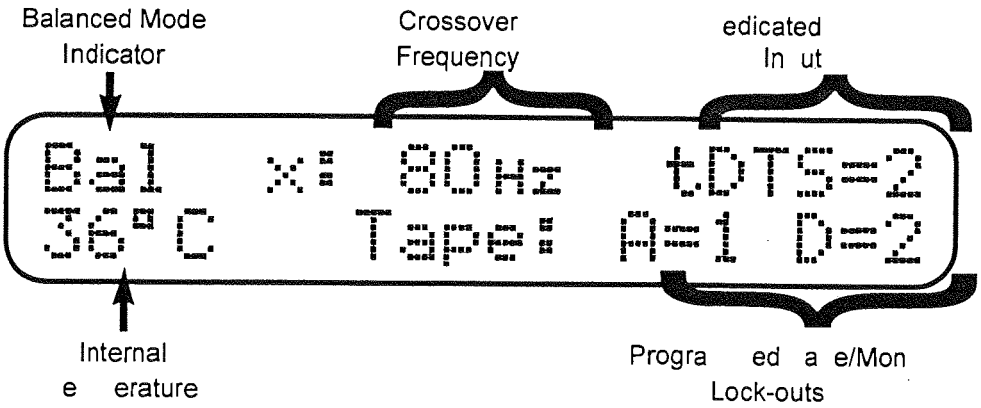
C. 3Stereo mode:

For systems without rear surround (LS and RS) speakers, MOON Attraction provides a "3Stereo" mode, which re-directs surround-sound information to the LF and RF speakers. To invoke 3Stereo mode, simply disable the surround speakers (similar to disabling the subwoofer, above) by pressing **LS** (or **RS)** followed by **CH-** in the Speaker Adjustment Screen (go to page 2 of the *Setup-1* device on the remote control and press **Adjust**. Exit by pressing ⏻ on the remote control when done).

D. Activating balanced outputs :

It is recommended to use the MOON Attraction's balanced stereo outputs in systems with power amplifiers equipped with balanced inputs. If balanced outputs are used, it is important to activate Balanced mode on the MOON AttractionThis is accomplished by pressing **Bal Y/N** on page 1 of the remote control's *Setup-2* device, which momentarily brings up the System Configuration Screen, shown below. In this screen, Balanced mode can be toggled on and off by further pressings of the **Bal Y/N** button, while in this screen.

**Balanced mode activates the MOON Attraction balanced outputs. It also ensures that when switching*



System Configuration Screen

back and forth between stereo and multi-channel playback modes, there is no sudden change in volume.

E. Programming a tape/monitor lock-out:

If a tape deck or equalizer/signal processor is connected to the MOON Attraction's digital or analog Tape/Mon outputs, feedback could result if this same tape deck/signal processor is selected as the Tape/Mon input. This situation can be avoided by teaching MOON Attraction *not* to accept the tape deck/signal processor as the Tape/Mon input. This is accomplished by pressing **F - TapMon - Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6** where the numbers correspond respectively to the digital and analog inputs on the MOON Attraction connected to the tape deck/signal processor's outputs.* *This feature can be defeated by pressing* **F - TapMon - 0** *or* **F - TapMon - Analog - 0**, *as required.* **These keys are grouped together on page 1 of the remote control's *Setup-2* device.** Pressing these key sequences momentarily brings up the System Configuration Screen, where the programmed analog and digital Tape/Mon lock-outs are displayed (see figure, page 18).

Here and throughout this manual, a remote control key sequence of the form "A - B**" means that the* B *key should follow the* A *key within a 2-second "time-out" period. A remote control key sequence of the form A-A means "double-click" the* A *button—i.e., press* A *twice within a 0.8-second "time-out" period.*

F. Programming Audio/Video (A/V) links:

MOON Attraction provides automatic switching of video inputs whenever audio inputs are switched.* To program this automatic switching of video inputs, it is necessary to teach the MOON Attraction which video inputs correspond with which audio inputs.

To accomplish this, go to page 4 of the remote control's *Setup-1* device (first go back to the Main Menu by pressing the device header at the top of the current remote control page, then press **Setup 1**). Next, select a desired digital audio input by pressing **Inp 1, Inp 2, Inp 3, Inp 4, Inp 5 or Inp 6**, or a desired analog audio input by pressing **Analog - Inp 1, Inp 2** or **Inp 3**.* Alternatively, you may press **NEXT** input or **PREV** input until the desired audio input is reached.

The next step is to select the desired, corresponding composite video source by pressing **Video - Inp 1, Inp 2** or **Inp 3**, or S-video source by pressing **Video - Inp 1 - Inp 1, Inp 2 - Inp 2,** or **Inp 3 - Inp 3**. (I.e., double-clicking the video input selection bottons is the technique for selecting S-video.)

Finally, once the desired audio and video inputs have both been selected, go to page 4 of the remote control's *Setup 1* device, and press press **Link A/V**. MOON Attraction will beep to confirm. This programs the MOON Attraction to select this video input whenever this audio input is selected. Repeat this process until all the desired video links are programmed. (To change any of these programmed A/V links, simply repeat the above process for a particular input.)

Pressing **Link A/V** (found on page 4 of the remote's *Setup 1* device), with a digital (or analog) input momentarily brings up MOON Attraction's Digital (or Analog) A/V Links Screen, allowing the user to review all the current, programmed A/V links. [This and any other screen can also be accessed at any time by pressing **DISPt** on page 4 of the

remote control's *MOON Attraction* device, which scrolls through the various screens shown on page 17.]

G. Configuring crossovers:

The MOON Attraction uses 4th-order, audiophile-grade digital crossovers, implemented in their own, fully-dedicated high-speed signal processor. These internal crossovers provide ultimate system flexibility without the coloration caused by conventional analog crossover circuitry.

A word of advice concerning crossovers: they should not be used indiscriminately. Crossovers are necessary in order to redirect bass frequencies away from speakers that lack full-range playback capability. But from a high-end standpoint, they have their own shortcomings:

1. They introduce phase shifts in the vicinity of the crossover frequency that can potentially compromise precise stereo sound-staging.
2. Crossing over more than one channel to a single subwoofer can yield less than perfect balance of bass and treble frequencies.*
3. Crossing many speakers over to a single subwoofer places significant power handling requirements on that subwoofer.

*For example, if bass from two channels occurs in phase, this information adds electronically in the subwoofer, resulting in high bass output volume. But if this same bass information were instead reproduced by the two separate speakers, the sound from the two speakers would also reinforce each other, though not as completely. This is because in real-world listening environments, such acoustic reinforcement (called "constructive interference") is less perfect than electronic constructive interference. Thus a single subwoofer can sound somewhat bass-rich during monophonic (in-phase) bass content and/or bass-lean on stereophonic (out-of-phase) bass content.

Simaudio's unique solution to the first of these pitfalls is to allow the user to direct bass information from a given speaker (called the "source speaker") to the subwoofer, *without* rolling off the bass from that speaker. This technique allows a source speaker with limited bass response to function as transparently as possible, while augmenting its bass output with the subwoofer. Use of this feature requires that the source speaker be capable of *accepting* (without damage or degradation of its performance), if not actually reproducing, full-range bass information. Since the bass information is present in *both* the subwoofer and the source speaker, it is best to pick a crossover frequency that matches the natural roll-off of the source speaker, so that the bass frequencies are not duplicated, resulting in too much bass.

MOON Attraction provides this option by allowing the user to distinguish between speakers being crossed over to the subwoofer, and speakers being rolled off.

Choosing speakers to be rolled off:
Speakers which could be damaged by deep bass frequencies must be rolled off at the low frequency end of the audio spectrum. This is accomplished by pressing **Bass RolOff** on page 3 of the remote control's *Setup-1* device. This will bring up MOON Attractionr's Bass Management Screen (see figure).

Once in this screen, pressing **Bass RolOff - LF** (or **RF**), **CT,** or **LS** (or **RS**) rolls off the low frequencies to the LF and RF, CTR, or LS and RS speakers, respectively. These

rolled off speakers are indicated by a small speaker symbol. This setting would normally be used with small speakers having limited bass-handling capability. Removal of the bass roll-off is accomplished by pressing **Bass RolOff** (or **RF**), **CT**, or **LS** (or **RS**) again.

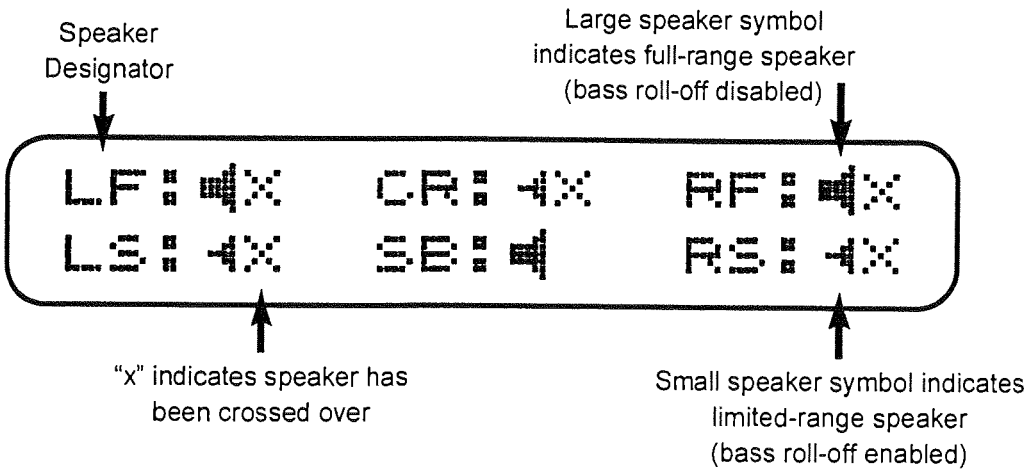
Before leaving this screen by pressing ⇦, please read the following subsection entitled "Choosing speakers to be crossed over".

Warning! *To preserve HDCD playback compatibility, roll-off of the LF and RF speakers is automatically disabled in Stereo and Matrix playback modes. (Roll-off of these speakers would modify the data streams seen by the HDCD digital filters, and would thereby prevent proper HDCD decoding.) Therefore, as stated previously, it is essential that the LF and RF speakers be capable of accepting without damage, if not actually reproducing, full bandwidth bass information. If such full-range speakers are not available, then the* ***HDCD override DIP switch*** *(DIP switch #5) on the motherboard can be turned ON (switched to the back direction).* ***This must be performed while the MOON Attraction disconnected from AC power****, using a flashlight and a long, narrow screwdriver, inserted through the left top-cover cooling vents. Switching this switch will allow roll-of of the LF and RF speakers in all listening modes, including Stereo and Matrix, and thereby protect the LF and RF speakers from bass information. However, rolling off the LF and RF speakers using this HDCD override switch precludes HDCD playback. (See Chapter VII: "E. HDCD".)*

Choosing speakers to be crossed over:
Speakers selected for roll-off are automatically crossed over to the subwoofer (or to the LF and RF speakers, for systems with no LFE subwoofer—see page 13). This is indicated by an "x" (for "x-over") next to the speaker on the Bass Management Screen.

However, as explained above, you may also wish to cross over additional speakers to the subwoofer—speakers that do not *need* to be rolled off, but whose bass response could nonetheless benefit from augmentation by a subwoofer. This is accomplished by the following:

Access the Bass Management Screen by pressing **Bass X-Over** (or **Bass RolOff**) on page 3 of the remote control's *Setup 1* device. Choose speakers to be crossed over by pressing **Bass X-over - LF** (or **RF**), **CR**, or **LS** (or **RS**). Removal of bass cross overs is accomplished by pressing **Bass X-Over - LF** (or **RF**), **CR**, or **LS** (or **RS**) again. Exit this screen



Bass Management Screen

by pushing the ⏎ button.

Note: *You cannot de-select a speaker to be crossed over that has been rolled off. Doing so would lead to the loss of important bass information for that channel. You also cannot roll off or cross over the LF and RF speakers when the subwoofer is disabled—see page 13).*

Choosing a cross-over frequency:
Choosing a crossover frequency is accomplished by pressing **SUB** on page 2 of the remote control's *Setup 1* device. This will bring up the MOON Attraction's System Configuration Screen (see figure, page 18). While in this screen, the cross-over frequency, shown as x:____Hz on the MOON Attraction front panel display, can be raised or lowered by pressing **CH+** or **CH-** on the remote control. Exit this screen by pressing the ⏎ button.

Generally, it is good to choose a crossover frequency that is low, but well within the frequency range of the source speaker (the high-frequency driver). Popular choices are 50, 80, 100 and 125 Hz. The factory default setting is 80 Hz.

If the LFE subwoofer has its own internal crossover network with an adjustable crossover frequency, it is good to set this crossover frequency as high as possible (or set to "flat") so it does not interfere with the MOON Attraction's crossovers. (Since the MOON Attraction already low-pass filters the information from the source speakers before sending it to the subwoofer, it is not necessary or desirable that the subwoofer low-pass this information again. This could produce a "hole" in the frequency spectrum.)

Alternatively, you can pick a MOON Attraction crossover frequency that is much higher than the subwoofer's internal crossover frequency, and let the subwoofer crossover network do all the work. ***This approach can only be used if the source speakers are being crossed over but not rolled off. Otherwise a "hole" in the frequency response will result.***

Technical Note: The defacto standard for professional active crossovers is the 4th-order (24 dB/octave slopes) Linkwitz-Riley (LR-4) design. Consisting of cascaded 2nd-order Butterworth filters, the LR-4 represents a vast improvement over the previous 3rd-order (18 dB/octave) Butterworth standard. The audiophile grade digital crossover filters used in the MOON Attractionbass management circuit implementing the LR-4 design with a degree of accuracy and consistency unobtainable in conventional analog active filter designs. Particular attention to numerical precision; the MOON Attraction's low-pass filter stages, for example, use 48-bit extended double precision to ensure maximum accuracy of the output signal.

IV. MOON Attraction Speed Setup

The following speed setup procedure assumes that you have already properly configured the MOON Attraction for your system, as described in the previous Chapter.

A. *AutoSetup*™ using the setup microphone:

Before listening to music, you should ensure that your various speaker volumes are balanced properly and, for optimum soundstaging, that your speakers are properly time-aligned and properly phased. For this purpose, your MOON Attraction is equipped with ***AutoSetup***™**,** Simaudio Designs' unique automated setup software, that comprises three proprietary technologies, called *AutoLevel*™, *AutoDelay*™, and *AutoPhase*™. By providing *automatic* speaker level balancing, *automatic* calibration of speaker delays, and a readout of absolute and relative speaker phase, this remarkable software breakthrough eliminates three of the most time-consuming chores in home theater installation.

Correct speaker level, time-alignment (i.e., delay), and phase is important to ensure optimal holosonic imaging. In two-channel stereo systems, this imaging subtends a little more than the angle between the speakers, say 90°. In discrete multi-channel surround sound systems, the imaging extends 90°, or right around the listener. This is achieved by ensuring that similar sound waves launched from the loudspeakers arrive at the listening position as "equal-loudness coincident wavefronts". The older method of compensating for miss-matched speaker distance by adjusting the level balance is no longer adequate for today's high-resolution digital surround sound systems.

The MOON Attraction achieves the first two requirements for optimal imaging through *AutoLevel* and *AutoDelay*. These adjustments are achieved through a series of pink noise bursts and "pops".

The third requirement for optimal imaging is achieved through a variation on *AutoDelay,* called *AutoPhase.* Adjustment of phase is necessary, because even if the volume levels and delays are all equalized, the speaker drivers may not all be moving in the same direction together. One or more drivers out of phase (a fancy term for going-the-wrong-way) will significantly degrade the imaging properties of the surround sound system. *AutoPhase* employs a highly sophisticated, propreitary "smart sonar" algorithm, which is more than 99% accurate with most types of speakers and rooms, even when complex multi-driver speakers are used. While absolute phase is more subtle in its effects than relative speaker phase, correct absolute phase is needed to achieve the most realistic sound-staging and life-like musical presence. Even though we as listeners don't have much control over the signal phases in a multi-miked recording, at least we can ensure that the playback equipment is working in an optimal fashion. In our experience, the best sounding recordings tend to be those where due care was exercised throughout the whole recording and playback process.

In the past, achieving correct speaker phases was a matter of "hit or miss". We estimate that about 40% of speakers and 25% of amplifiers invert phase! The old method of placing stereo speakers close together, facing each other, and switching the polarity of one of the speaker for maximum bass, is not practical for surround sound systems containing multiple loudspeakers, and certainly does not deal with the issue of *absolute* phase. Without *AutoPhase*, the liklihood of achieving correct phase for a given loudspeaker is at

best 50%; the liklihood of getting five loudspeakers phased correctly is less than 7%!

As a consequence, 5.1-channel home theater systems—which often use different speaker models for front, center and rear speakers, and which frequently employ different models of power amplifiers—**are almost always out of phase!**

AutoPhase automatically detects, and displays the phase of each loudspeaker, with particualr emphasis on the mid frequency range, where the ear is most sensitive. This allows the user to reverse one or more of his or her speaker wires, if necessary, to achieve correct phase. The MOON Attraction ***is the only home theater product***

Brief Instructions for Using AutoSetup™

Plug in themicrophone at the rear of the MOON Attraction press **POWER** ⏻ on the remote's device to bring it out of standby (the AC power switch must have already been turned on), and press the remote control button labeled **Auto-Setup** (page 1 of the *Setup 1* device on the remote). Hold the microphone at the listening sweet spot, facing upwards. When AutoSetup has finished, inspect the MOON Attraction's front panel display, which will show speaker distances in meters, and "+" and/or "-" signs. All speakers showing a "-" need to have their polarity reversed. Do this either at the speaker or the amplifier—*but not both!*

that offers the customer the certainty of a correctly phased system. Note that* AutoSetup *can only be used if all five speakers, LF, CTR, RF, LS, RS are present in your system.

To use ***AutoSetup***:

1. Plug the MOON Attraction calibration microphone into the rear-panel MIC jack.
2. Hold the microphone in the center listening position, facing upward.
3. Press the **Auto-Setup** button on page 1 of the remote control's *Setup-1* device.
4. Keep quiet! Background noise and conversation should be kept to a minimum during the ***AutoSetup*** procedure.

The MOON Attraction will now use *AutoLevel* to adjust speaker levels automatically, using a series of pink noise bursts. During this calibration process, the Speaker Adjustment Screen (see figure, page 16) will be displayed. Once the speaker volumes are balanced, *AutoDelay* and *AutoPhase* use a series of "pops" to measure the distances between each speaker and the center listening position, and whether the speaker drivers move forward (+ absolute phase) or backward (- absolute phase) when driven with a positive-going impulse. During this latter procedure, the Speaker Distance Screen (see figure, page 16) will be displayed. If all the speakers are in + absolute phase, the "m" symbols shown in the figure will be replaced by "+". Speakers with incorrect phase will be shown as "-". If one or more phases are incorrect, the speaker wires for thise speakers should be reversed at the speaker terminals *or* at the power amplifier—*but not both!*

If you have to reverse any of the speaker leads, re-run ***AutoSetup*** to ensure correct speaker distances, and to double-check that the speaker phases are now correct.

This is all it takes to enjoy the benefits of correct speaker phase, not to mention totally automatic setup of speaker level and delay!

MOON Attraction will beep twice to indicate that the ***AutoSetup*** procedure has been successfully completed. If a warble tone is heard instead of the double beep, this indicates that the ***AutoSetup*** procedure has failed. (This could happen, for example, if the microphone is not stationary, if there is excessive background noise, or if one of the power amplifiers is switched off.) If repeated attempts at ***AutoSetup*** fail, you can set the speaker levels manually using the noise sequencer or static noise generator modes. (See Chapter V: "Manual Setup").

Following successful completion of ***AutoSetup***, adjust the subwoofer level through the procedure described below. (This step is not necessary in setups with no LFE subwoofer.)

Notes:
1. The ***AutoSetup*** procedure can be aborted at any time by pressing ⏻ on the remote control.
2. If no microphone is plugged in, ***AutoSetup*** will automatically abort.
3. To use ***AutoSetup***, all five speakers (LF, CTR, RF, LS, RS) must be present. For systems with fewer speakers, please see Chapter V: "Manual Setup".
4. Occasionally one can obtain a speaker phase result that is surprising. For example, identical speakers (e.g., those used for the front left and right stereo speakers) wired to different channels of the *same* power amplifier should yield the same phase. If they do not, first carefully check the wiring (with a continuity tester, if necessary) to verify that correct polaroty has been observed.
5. If everything appears normal and the phases *still* appear to be wrong, then it is possible that *AutoPhase* is mistaken—which is rare but could conceivably happen under circumstances of unusual or strong room reflections. In such cases, go with what you know is right. Once in a blue moon, a driver inside a speaker box may be wired with reverse polarity, so keep this in mind.
6. You can experiement with *AutoPhase* by moving the microphone to a different region of the room and repeating AutoSetup. Always finish up by repeating ***AutoSetup*** with the microphone in the sweet spot to ensure correct speaker distances.

B. Setting the subwoofer level:

The only really reliable way of setting the main subwoofer volume level is to adjust it to your personal preference while listening to program material. (The pink noise generator used by ***AutoSetup*** cannot be used to accurately set the subwoofer level.) If the front stereo speakers (LF and RF) are being crossed over to the LFE subwoofer, 2-channel stereophonic music will generally afford the most suitable program material for accurately setting the subwoofer volume. Otherwise, you will need to adjust the subwoofer volume during multi-channel playback, such as Dolby Digital or DTS 5.1-channel program material.

Enter the Speaker Adjustment Screen (see figure, page 16) by pressing **Adjust** on page 2 of the remote control's *Setup 1* device. While in this screen, select the subwoofer for adjustment by pressing the **SUB** button on the remote control. The subwoofer designator letters "SB" will highlight on the MOON Attraction's display. Adjust the subwoofer volume by pressing **VOL+** or **VOL-** on the remote control.

For ideal system balance, it is important that the subwoofer volume level displayed on

the Speaker Adjustment Screen be roughly similar (within about 10 dB) to the center speaker level (marked "CR"). If the "SB" level is grossly different from the "CR" level, this could indicate that the volume control on the active subwoofer (if you have an active subwoofer) is set too high or too low. If this is the case, use the MOON Attraction subwoofer adjustment procedure described above to raise or lower the subwoofer "SB" level to be approximately equal to the "CR" level. Then, adjust the subwoofer volume control on your active subwoofer so that the subwoofer volume is approximately balanced with the rest of your speakers. Then, the MOON Attraction subwoofer adjustment procedure described above can be used to fine tune the subwoofer adjustment.

Exit the Speaker Adjustment Screen by pressing ⧉. *(Note: To save your setup, see section IV: E.)*

C. "Tweaking" the System:

AutoSetup balances all five speaker precisely to the same level. However, the MOON Attraction also allows for easy "tweaking" of the speaker volume levels to accomodate user preferences. For example, some listeners might feel that many movies are mixed too soft in the center chaneel to permit clear audibility of dialog, or are too soft in the surround channels. This situation can be remedied easily by boosting the center channel and/or surround channels by a few dB. To cutomize you setup in this way, the following steps can be performed at any time while listening to appropriate souce material:

1. Enter the Speaker Adjustment Screen by pressing **Adjust** on page 2 of the remote's *Setup 1* device.
2. Select the desired speakers to be adjusted by pressing the corresponding buttons
   on the remote control (e.g., **CTR** for center, or **LS** for left surround).* The selected speakers will be highlighted.
3. Adjust the volume of the selected speakers by pressing and holding **VOL+** or**VOL-** on the remote control, as desired.
4. Exit the Speaker Adjustment screen by pressing ⧉. **(To save your setup, see section IV:E).**

Note that pressing* **LS *activates both LS and RS, or pressing* **LF** *activates both LF and RF. To preserve stereo left-right balance, these speakers can only be selected in pairs. To alter your left-right balance, see Chapter V: "B. Manual setup using the Static Noise Generator".*

(D. Dipole Surrounds:)

If you are using Lucasfilm Home THX® dipolar surround speakers, then ***AutoSetup****'s* automatic delay calibration procedure may give erroneously large distances for the surround speakers. Home THX requires that the "null" in the polar radiation pattern of the surround speakers be aligned with the listening area. As a consequence, in the absence

of a loud-enough direct sound, the microphone will measure the arrival time of the first room reflection. (Unfortunately, a similar situation occurs when listening to stereo imaging to the sides and rear: if the surround channels are diffused by nulling out the direct sound, then the correct phase/amplitude information needed to reconstruct a clear holographic image of the original soundstage is lost. While you save up your cash for new surrounds that match your front speakers, a workable setup solution is as follows:

1. Perform the full ***AutoSetup***™ procedure described above to obtain the correct volume level calibration.
2. Rotate each of the rear surround speakers so that they point toward the microphone position (this requires an approximately 90° rotation).
3. Perform an automatic speaker delay calibration, using the ***AutoDelay*** procedure described in Chapter V: "Manual Setup". This will recalibrate the surround channels for the correct speaker-to-microphone distance.
4. Restore the surround speakers to their correct orientation.

The above situation underscores the desirability of using point-source (or line-source) loudspeakers arranged to give maximum sound intensity at the "sweet spot". This most readily complies with the SMPTE® 5.1 standard for sound reproduction, which specifies coincident wavefronts at the preferred central listening position, delivered ideally by matched full-range front and surround speakers. It is only by conforming to this standard that a seamless 360° holographic soundfield will be easily achieved in the near-field home theater environment.*

Save Your Setup:

E. Saving Your Setup:

Now that your MOON Attraction is properly configured for your system and balanced for your home-theater environment, save these settings by pressing **STO - Mem 1** on page 3 of the remote control's *MOON Attraction* device [i.e., by pressing **STO** followed (within 2 seconds) by **Mem 1**]. MOON Attraction will beep twice to confirm the memory storage.*

This must be done before disconnecting MOON Attractionfrom AC power or shutting off the rear-panel AC power switch, or you will lose your settings!

These saved settings can be recalled at any time by pressing **RCL - Mem 1**. They can also be updated (i.e., over-written) at any time by pressing **STO - Mem 1** again. In fact, up to 10 different settings can be stored by pressing **STO - Mem 1, Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9 (and also Mem 0 for those remote controls that have a Mem 0 key)**. Any of these setups can be recalled at any time by pressing **RCL - Mem 1, Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9, etc.** (See Chapter VIII: "Customizing Your System: Storing Multiple Setups".)*

What gets stored separately in each storage location is speaker volume levels (including master volume) speaker configuration, and bass configuration (including crossover frequency). Memory no. 1 is the defaultconfiguration, and bass configuration (including crossover frequency). Memory no. 1 is the default memory on cold AC power-up, **so be sure that the master volume in memory no. 1 is set to a comfortable listening level.*

(V. Manual Setup)

This Chapter describes manual setup of the speakers and speaker delays, for customers who lack a setup microphone or who are having technical difficulties with the **AutoSetup™** *procedure. This Chapter can be skipped by readers who have successfully accomplished* **AutoSetup**.

A. Manual setup using the Noise Sequencer:

Press the **Noise Sequencer** key on page 1 of the remote's *Setup 1* device. MOON Attraction's internal noise sequencer will begin cycling pink noise through the six speakers. You should hear this noise. (If no noise is heard out of one or more speakers, check the speaker connections to those speakers and verify that the power amps are switched on.)

If ***no*** setup microphone is plugged into MOON Attraction's rear-panel MIC jack, the Speaker Adjustment Screen will be displayed. As the noise sequencer rotates among the various speakers, the corresponding speaker will highlight.

Adjust the volume on the active speaker by pressing **VOL+** or **VOL-**. The noise sequencer will pause on a given speaker while adjustments are being made to that speaker.

Note that the LF and RF speakers can only be adjusted simultaneously, in order to preserve left-right stereo balance. The same holds for the LS and RS surrounds. To alter these left-right channel balances, see "B. Manual setup using the Static Noise Generator", below.

For optimal system balance, all 5 speakers (LF, CTR, RF, LS, and RS) should be adjusted to equal sound pressure levels, which can be determined either by ear or by use of a sound pressure meter. (See, however, Chapter IV: "C. Tweaking the system".)

When the setup microphone is plugged in, activating the noise sequencer automatically brings up MOON Attraction's Calibrated SPL Meter Screen. This screen can be used in place of an SPL meter to achieve accurate speaker balance. Hold the microphone in the center listening position, pointing upward. Background noise and conversation should be minimized during speaker calibration.

When the desired speaker balance is achieved, exit by pressing ⊡ on the remote control.

***After completing this procedure, perform the automatic speaker delay calibration described below, and then adjust the subwoofer level following the procedure described in Chapter* IV: "B. Setting the subwoofer level".**

B. Manual setup using the Static Noise Generator:

You might find in your system that your LF and RF speakers do not have the same apparent loudness. If they don't, it could mean that your front speakers or power amplifiers have different gains/efficiencies, or that your room acoustics are asymmetrical. In

this case, you may wish to adjust your left-right channel balance. This can be accomplished using the "Static Noise Generator".

The Static Noise Generator provides a more flexible and, in some ways, more convenient manual setup procedure. To activate the static noise generator, press the speaker icon on page 2 of the remote control's *Setup 1* device.

If ***no*** setup microphone is plugged into the MOON Attraction's rear-panel MIC jack, the Speaker Adjustment Screen will be displayed. Press the **LF**, **CTR**, **RF**, or any other speaker key on the remote control. This will direct pink noise to the selected speakers only. The selected speakers will highlight. Adjust the volume on these speakers by pressing and holding **VOL+** or **VOL-**.

Caution: *In this mode, you can adjust the LF and RF volumes independently, providing a means to adjust left-right channel balance. To preserve left-right channel balance throughout this setup procedure, activate both LF and RF speakers, and adjust their volumes simultaneously. If you wish to restore left-right balance at any time, select both the LF and RF speakers in this static noise generator mode, go to* page 3 *on the* MOON Attraction *device and press* **F - x - x** *(wher* ***x - x*** *is a two-digit number signifying the number of dB below full output,* **F - 0 - 0**, *or 0 dB) to set both speakers to the same volume level. Similar comments apply to LS and RS. Then go back to page 2 of the* Setup 1 *device to continue.*

Press the selected speaker again to de-select that speaker. Use this procedure to adjust all five speakers (LF, CTR, RF, LS, and RS) to equal sound pressure levels, which can be determined either by ear or by use of a sound pressure meter. (See, however, Chapter IV: "C. Tweaking the system".) The subwoofer volume must be handled separately—see Chapter IV: "B. Setting the subwoofer level".

When the setup microphone is plugged in, activating the Static Noise Generator automatically brings up the MOON Attraction Calibrated SPL Meter Screen. This screen can be used in place of an SPL meter to achieve accurate speaker balance. Hold the microphone in the center listening position. Background noise and conversation should be center listening position, pointing upward. Background noise and conversation should be minimized during speaker calibration.

Exit the Static Noise Generator by pressing on the remote control.

***After completing this procedure, perform the automatic speaker delay calibration described below, and then adjust the subwoofer level following the procedure described in Chapter* IV: "B. Setting the subwoofer level".**

C. Manual speaker delay calibration:

For customers who lack a setup microphone or who are having technical difficulties with ***AutoDelay***, time alignment of the speakers can be accomplished manually.

To achieve this, first measure the distances (in meters) from the center listening position to the center speaker (CTR), front speakers (LF or RF), and surround speakers (LS or RS). Following these measurements, bring up the Speaker Distances Screen by repeatedly pressing **DISPt** on page 4 of the remote's *MOON Attraction* device (see figure, page 16).

Once in the Speaker Distances Screen, go to page 2 of the remote's *Setup 1* device. Then select a desired speaker by pressing the corresponding speaker buttons on the remote control. This speaker will highlight. [Note that the front speakers (LF and RF) and surround speakers (LS and RS) can only be selected in pairs.] Now increase or decrease the speaker distances displayed to match your measured distances by pressing **CH+** or **CH-**. To exit and store these distances, press ⊡ .

Save Your Setup:

D. Saving your setup:

Now that your MOON Attraction is properly configured for your system and balanced for your home-theater environment, save these settings by pressing **STO - Mem 1** on the remote control. ***This must be done before disconnecting MOON Attraction from AC power or shutting off the rear-panel AC power switch, or you will lose your settings!***

These saved settings can be recalled at any time by pressing **RCL - Mem 1**. They can also be updated (i.e., over-written) at any time by pressing **STO - Mem 1** again.*

In fact, up to 10 different settings can be stored by pressing **STO - Mem 1, Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9 (and with some remotes, also Mem 0)**.
Any of these setups can be recalled at any time by pressing **RCL - Mem 1, Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9 (and with some remotes, also Mem 0)**. (See Chapter VIII: "Customizing Your System: Storing Multiple Setups".)*

What gets stored separately in each storage location is speaker volume levels (including master volume), speaker configuration, and bass configuration (including crossover frequency). Memory no. 1 is the default memory on cold AC power-up, **so be sure that the master volume in memory no. 1 is set to a comfortable listening level.*

VI. Basic Operation

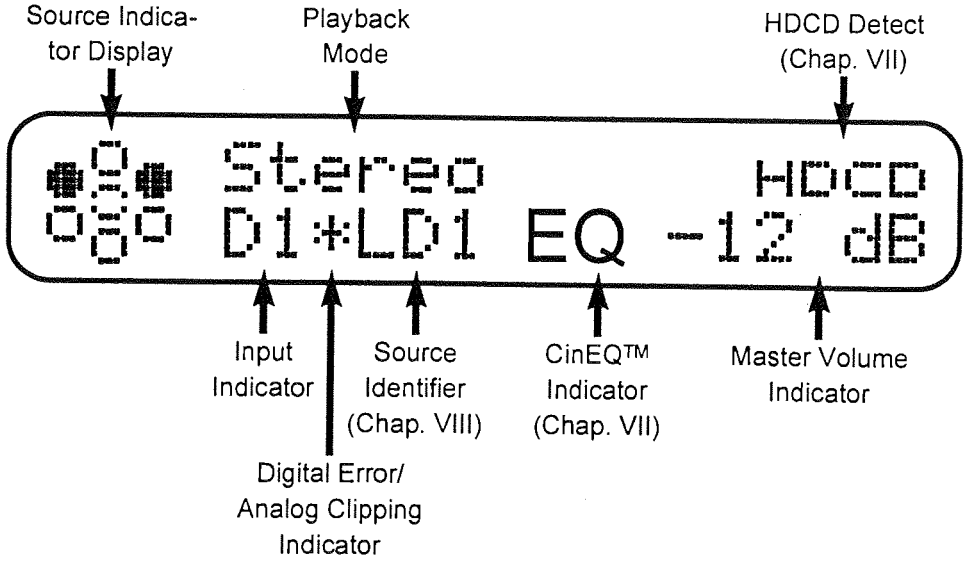
A. Power-up:

Bringing the MOON Attraction out of Standby is accomplished by pressing the **POWER** button (⏻) on the remote control, or pressing the front-panel Power/Mute switch.* Double-clicking the **POWER** button (or pressing the **off** button in some remotes) take the MOON Attraction back to standby again.Another way to go to standby is to double-click the **POWER** button, or double-click the MOON Attraction's front-panel Power/Mute switch.

The first time you come out of Standby after cold AC power-up, a list of performance features will be displayed. You may exit from these features screens at any time by pressing the* **POWER *key again. Double-clicking the remote's* **POWER** *button may be easier to achieve if the remote's "beep" is turned off (press the speaker icon in the ⓘ screen).*

B. Selecting a digital input:

Selecting a digital input can be accomplished in two ways. One is to press the desired input button, **Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6** on page 1 of the remote's *MOON Attraction* device. The other way is to repeatedly press the **NEXT** input or **PREV** input buttons on the lower part of the remote control, until the desired digital input is reached. The MOON Attraction's digital input circuitry will automatically lock onto the selected input, and the "(No Lock)" indicator on the MOON Attraction's Main LCD display screen, shown below, will disappear. *[If the (No Lock) indicator continues to show, confirm that you have an active digital source connected to this input.]*



Main Screen

C. Selecting an analog input:

Selecting an analog input is accomplished in two ways. One is by pressing **Analog** followed by **Inp 1, Inp 2** or **Inp 3** on the remote control. Multiple key press sequences, such as this one, require that the second key entry (in this case, **Inp 1, Inp 2** or **Inp 3**) follow the first key press (in this case, **Analog**) within a time-out period of two seconds.

By default, MOON Attraction's analog inputs accept voltages up to 2 Volts rms without clipping. If you are experiencing distortion on loud passages, this may mean that your analog source voltage exceeds the industry-standard 2 Volts rms.* If you cannot easily turn down the volume of your analog source, you can program MOON Attraction to attenuate this analog input by -6 dB, so that it will accept up to 4 Volts rms without clipping.

This is accomplished by pressing **Analog Input Gain – -6dB** on page 2 of the remote control's *Setup 2* device (press the **Analog Input Gain** button, and within two seconds, press the **-6dB** button). The Analog Input Attenuation Screen (see figure, page 16) will display momentarily, confirming your selection. This attenuation is stored permanently, input by input, until it is over-written by pressing **Analog Input Gain – 0dB** while in a chosen analog input. ***Only perform this attenuation if it is needed.***

At any time, you can review which analog inputs have been set to -6 dB attenuation. To do this, bring up the Analog Input Attenuation Screen by repeatedly pressing the DISPt button on page 4 of the remote's *MOON Attraction* device (see page 16).

D. Selecting a tape/monitor or 2nd audio zone input:

Choosing a digital source for your DAT recorder, recordable CD, or equalizer/signal processor attached to the MOON Attraction's digital Tape/Mon output is accomplished by pressing **Tape/Mon. - Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6**. In addition, selecting an analog source for your analog tape deck or VCR connected to the analog Tape/Mon outputs is accomplished by pressing **Tape/Mon. - Analog- Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6**. A Tape/Mon source can be the same source selected as the main program material, or it can be different, making it possible to tape one program (indeed *two* programs—one analog and one digital) while listening to a third.

E. Selecting a video input:

Once your Audio/Video (A/V) links have been programmed (See Chapter III: "F. Programming Audio/Video links", video inputs are selected automatically whenever audio inputs are selected. However, video inputs can also be switched "manually".

For composite video inputs, this is accomplished by pressing **Video - Inp 1, Inp 2** or **Inp 3** in page 4 of the remote's *Setup 1* device. For S-video inputs, it is accomplished by pressing **Video - Inp 1-Inp 1, Inp 2-Inp 2,** or **Inp 3-Inp 3**. (I.e., pressing **Video** and then *double-clicking* **Inp 1, Inp 2, etc.** is the technique for selecting S-video inputs.)

To view composite video sources, you will need to select "composite" on your projector/TV monitor.* To view S-video sources, you will need to select "S-video" on your projector/TV monitor. Refer to your projector/TV monitor for instructions.

Some video sources offer both composite and S-video outputs. In this case, S-video will yield superior results for video sources that are inherently of the S-video type (i.e., have Y and C signals). Such video source include DVD, Super VHS (S-VHS), and digital satellite (e.g., DSS). For sources, such as laserdisc, that are inherently composite, then either the composite or S-video outputs may yield the best results, depending upon whether the video source or the projector/TV monitor has the superior composite-to-S-video converter (comb filter). For such composite sources, the user is encouraged to experiment to determine whether composite or S-video gives the best results.

F. Choosing a playback mode:

1. **"Normal" PCM digital or analog source material** (non DTS or Dolby Digital):
   Choosing a playback mode (e.g., Pro Logic, Matrix, Mono-Enhanced, or Stereo) is accomplished by pressing **Surround**, **Matrix, Stereo**, or **Mono**, respectively, on page 2 of the remote control's *MOON Attraction* device.

   The **Surround** button initiates Dolby Pro Logic surround-sound decoding, and is intended for use with source material that is surround-sound encoded. (You may not always know whether a given program is surround-sound encoded or intended to be played back in normal stereo. Experimentation will determine which sounds best.)

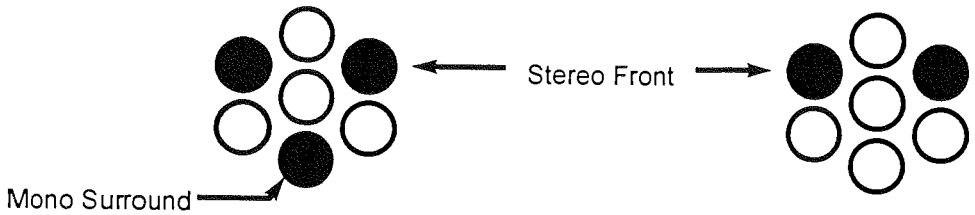
   When Dolby Pro Logic decoding is selected using the **Surround** button, the bottom-most circle on the source indicator (daisy pattern) will illuminate. This bottom circle indicates the presence of a mono surround signal. This pattern distinguishes Dolby Pro Logic decoding from normal stereo, and from Dolby Digital sources that have stereo surrounds. (See section "2. Dolby Digital source material" below).

   The **Matrix** button is designed to provide enhanced enjoyment of stereo source material. Matrix mode implements a standard Hafler matrix for the surround speakers (LS = L-R, RS = R-L). In addition, a small amount of delay is added to the surrounds. This mode is able to extract the sound field ambiance that is naturally embedded in a great many stereo recordings, particularly those recorded with a single stereo microphone. It can also be desirable on some multi-tracked music material and for stereo movies not recorded in Dolby Surround. Matrix mode is compatible with HDCD playback. *(Note: Matrix mode cannot be selected in "3Stereo" mode, in which the surround speakers have been de-activated.)*

   The **Stereo** button is intended for music and other stereophonic source material. With a digital source, in Stereo mode, MOON Attraction functions as an ultra-high-performance, audiophile D-to-A converter. *B*alanced stereo outputs are enabled, and HDCD source material is automatically detected and decoded.

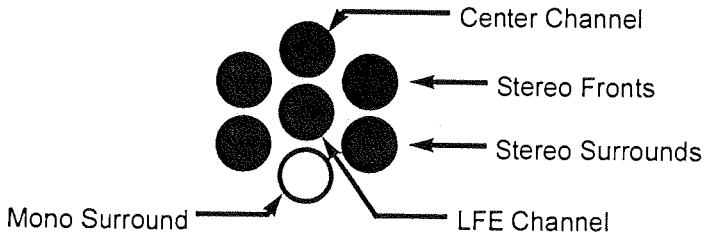
   The **Mono** button activates "Enhanced-Mono" mode, designed for enhanced enjoy-

ment of monaural music and soundtracks. Enhanced-Mono mode directs monophonic information to the Center speaker (so that dialog sounds like it is coming from the screen), and generates synthesized stereo information through the left and right stereo speakers in order to create additional room ambiance. *(Note: Enhanced-Mono mode cannot be selected in "Phantom" mode, in which the center*



Dolby Pro-Logic

Stereo



Dolby Digital 5.1

speaker has been de-activated.)

2. Dolby Digital source material:

Dolby Digital decoding is enabled automatically whenever a digital input is selected with an active AC-3 data stream. "Dolby Digital" will be displayed on the MOON Attraction's main LCD display screen (see page 29).

When a Dolby Digital 5.1-channel soundtrack is present on a laserdisc, this soundtrack will provide far superior surround-sound effects than the conventional Pro Logic soundtrack. Therefore, be sure to select the Dolby Digital soundtracks on a laserdisc whenever possible (by choosing the digital input connected to the AC-3 RF demodulator).

Most DVD discs are recorded in Dolby Digital. However, it may be necessary on some DVD players to select Dolby Digital (or "AC-3") either with the DVD player's remote control or with a rear-panel switch on the DVD player. If there is such a switch, set this switch permanently in the Dolby Digital (AC-3) position.

When Dolby Digital 5.1-channel source material is present, the stereo front, center dialog, and stereo surround circles on the source designator (daisy pattern) will all illuminate (see figure, above). However not all Dolby Digital programming is recorded in 5.1-channel surround. For example, some Dolby Digital programming is recorded in two-channel (matrix-encoded) Dolby Surround, in normal stereo, or monaural. In each of these cases, an LFE subwoofer soundtrack may or may not be present. MOON Attraction will detect this automatically, and will display this information by changing the pattern of circles on the source indicator to most accurately depict the type of signal.

In any of these Dolby Digital modes, the **Stereo** button can be used to provide a two-channel stereo downmix suitable for recording on a VCR or other two-channel recording device. If the source material is surround-sound encoded (i.e., either 5.1-channel or Pro Logic), then this two-channel downmix will be also be surround-sound ("matrixed L_t/R_t") encoded. The original Dolby Digital playback mode can be restored simply by pressing the **Surround** button.

In the case of a Dolby Digital *stereo* signal, MOON Attraction also allows you to override the automatic Stereo playback mode. This is achieved by pressing the **Matrix** or **Surround**keys to give Matrix mode or Pro Logic decoding, respectively. (All such user-selected overrides are flagged on the Main Screen with a ":", e.g., ":Mat", or ":ProL".) These surround-sound modes can greatly enhance the sound of some stereo soundtracks.* The user is invited to experiment.

**Some early Dolby Digital Pro Logic soundtracks may not be properly flagged as Pro Logic. These soundtracks will be displayed as "Dolby Digital Stereo" soundtracks on the Main Screen. For such soundtracks, Dolby Pro Logic decoding is the preferable playback mode.*

In the even rarer case of a Dolby Digital monaural soundtrack, MOON Attraction allows the user to activate Mono-Enhanced playback mode by pressing the **Mono** button. This provides the same benefits as for a PCM digital or analog monaural source.

3. **DTS:**

Simaudio is pleased to add DTS™ decoding capability to the MOON Attraction's reference quality Dolby Digital and Pro Logic surround-sound capabilities. Digital MOON AttractionSystems™ (DTS) surround-sound technology provides ultra-high resolution 5.1-channel playback suitable for both movie *and* audiophile-quality multi-channel music playback.

Using DTS decoding is simple. Simply place a DTS-encoded disc in your CD, DVD or laserdisc transport connected to a digital input on the MOON Attraction and play as any other disc. The presence of a DTS soundtrack will be detected by the Theater-Master, and multi-channel DTS playback will commence automatically.

***WARNING!* In order to play a DTS-encoded DVD, your DVD player must have the DTS logo on the front. Playback of these discs is fully automatic but may require your DVD player's setup to be configured for DTS bitstream output. On the other hand, the earlier DTS-encoded CD format will play on most CD, DVD,**

or laserdisc transports. The same goes for DTS-encoded laserdiscs, which will play on most laserdisc players equipped with a digital output. Note that playing back DTS-encoded CDs or LDs on these transports may result in a "burst" at the start of playback. You should experiment with DTS at low listening levels to determine of this is a problem. If a DTS-encoded CD or LD is paused for more than ten seconds, or when scan-forward or scan-backward are exercised aggressively.

Dedicating a DTS input: To avoid noise bursts, digital inputs on the MOON Attraction can be dedicated as DTS inputs, either temporarily or "permanently". Thereafter, DTS discs will play through these inputs without the aforementioned DTS artifacts.

To temporarily dedicate a DTS input, simply power up the MOON Attraction from Standby by pressing the desired digital input (**Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6**) on page 1 or the remote's *MOON Attraction* device (do not use the **POWER** button ⏻ to do this). This input will remain dedicated to DTS until the MOON Attraction is returned to Standby. (Non-DTS sources will not play through this input.)*

Or, digital input number **2** can be "permanently" dedicated as a DTS input by switching DIP switch #2 on the motherboard ON (switched to the back direction). **This must be performed while the MOON Attractionis disconnected from AC power,** using a flashlight and a long, narrow screwdriver, inserted through the left top-cover cooling vents.

When an input **x has been dedicated temporarily as DTS, the System Configuration Screen (see figure, page 18) will display "tDTS=**x**".*

Pressing the **Stereo** button during DTS playback provides a Dolby Pro Logic compatible (matrixed L_t/R_t) two-channel mixdown, suitable for recording on a VCR or other two-channel recording device.

4. **MPEG2 audio:**

Playback of MPEG audio requires dedicating an MPEG input on the MOON Attraction either temporarily or "permanently".

To temporarily dedicate an MPEG input, power up the MOON Attraction from Standby by pressing **F - Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6** on page 1 of the remote's *Setup 2* device, where the number corresponds to the desired digital input. This input will remain dedicated to MPEG until the MOON Attraction is returned to Standby.* (Non-MPEG sources will not play through this input.)

Or, digital input number **4** can be "permanently" dedicated as an MPEG input by switching DIP switch #4 on the motherboard ON (switched to the back direction). **This must be performed while the MOON Attraction is disconnected from AC power,** using a flashlight and a long, narrow screwdriver, inserted through the left top-cover cooling vents.

With MPEG audio, it is up to the user to determine whether a given soundtrack is stereo or surround-sound encoded. For surround-sound encoded MPEG soundtracks, selecting Pro Logic decoding by pressing **Surround** will provide the best results. For stereo MPEG soundtracks, the **Stereo** or **Matrix** modes generally provide

the best results.

MPEG2 audio (including MPEG1 and MPEG-5.1) are sonically inferior to Dolby Digital and to DTS. The user is encouraged to seek DTS and/or Dolby Digital DVDs whenever possible, through whatever legal means are available.

When an input **x has been dedicated temporarily as MPEG, the System Configuration Screen (see figure, page 18) will display "tMPG=**x**".*

G. Raising and lowering the volume:

Raising and lowering the master volume is accomplished by pressing **VOL+** or **VOL-** on the remote control. Or, if you have a preferred, known listening level, you can press **F-X-X (F followed by a two-digit number),** wich will set the volume to xx decibels (DB) below the full rated output (0 db). The volume can be directly set this way on page 3 of the remote's *MOON Attraction* device (Note: since there is no numeral zero on this screen, volumes louder than 11 dB cannot be set this way). The master volume level is displayed on the Main LCD display screen (see figure, page 16).

If the various speaker volumes are set to different levels (which is typically the case after setup), then the master volume displayed on the Main LCD display screen refers to the front stereo speakers—or to the *loudest* front stereo speaker if these are set to different levels (see Chapter V: "B. Manual setup using the Static Noise Generator").

After turning up the volume, you may observe that the volume indicator on the main display screen starts to blink. This means that one or more speakers have exceeded their maximum output level (0 dB). Further increases in master volume are still possible, but those speakers that have reached full volume will not go up any further. Turning up the volume under these circumstances results in temporary loss of inter-channel volume balance. Balance is restored when the volume is turned down.

If this happens frequently, or occurs at normal listening levels, it means that certain speakers have been set too high relative to other speakers during setup. This can happen if one speaker has insufficient sensitivity or amplifier gain, and most commonly occurs with the LFE subwoofer, which requires greater gain and power handing capacity than the other speakers. Correct this situation by turning up the gain control on a powered subwoofer, or by increasing amplifier gain or speaker efficiency.

A preferred volume level can be stored by pressing **STO - Mem 1**, on page 3 of the remote's *MOON Attraction* device. *This information becomes part of your setup memory #1, so that on cold AC power-up, the volume will automatically reset to this level.*

H. Adjusting individual speaker volumes:

The user may wish to raise or lower the volume of individual speakers (i.e., adjust the balance of the system) . This procedure is straightforward, and is described in ChapterIV:tweaking the system. Generally, once MOON Attraction is setup properly, it should not be necessary to repeatedly adjust the balance of the system.

However, listening preferences may change, or may be different in different modes (e.g., stereo playback of music vs. 5.1-channel movie soundtracks). For this purpose, MOON Attraction allows storage of multiple setups, and customization of setups for different playback modes. Please refer to Chapter VIII: "Customizing your System: Storing Multiple Setups".

I. Muting the output:

The MOON Attraction output can be temporarily muted by pressing the **mute** button on the remote control, or by pressing the front-panel Power/Mute switch. During mute, the highlighted circles on the source indicator (daisy) blink slowly. Pressing **mute** again restores normal output.

J. Standby mode:

When not in use, it is recommended that MOON Attraction be switched to Standby by double-clicking the **POWER** button ⏻ while the MOON Attraction device is slected, or by double-clicking the front-panel Power/Mute switch. If your remote supports it, a single click of the **off** button may also be used, while the MOON Attraction device is selected. Standby mode maintains power to certain key analog components, but reduces power consumption and disables all digital signal processing, thereby preventing any possibility of RF interference to other appliances due to RF radiation. Pressing the **POWER** button ⏻ in Standby mode, or pressing the front-panel Power/Mute switch, powers up the MOON Attraction again.

When leaving the MOON Attraction for periods of a day or more, we recommend disconnecting it from AC power or turning off the rear-panel AC power switch to prevent risk of damage due to electrical power surges.

VII. Advanced Features

A. Front-panel VU meter:

MOON Attraction provides a front-panel Output VU Meter Screen (see figure, page 16). This screen allows the user to monitor activity in the left and right front channels (LF and RF) during Stereo playback, and in all six channels during surround-sound playback To access this screen, simply press the **MainScreen⇔VU Meter** button, on page 1 of the remote's *MOON Attraction* device., or **DISPt** or **DISPs** on page 4 of the same device.

This VU Meter is calibrated to read full scale at full rated output. Each pixel below full scale represents a level decrement of -6 dB, down to a minimum level of -90 dB.

While in this screen, pressing ↵ will momentarily display speaker labels. To return to MOON Attraction's Main Screen, simply press the **MainScreen⇔VU-Meter** button again (or **DISPt** or **DISPs**).

B. High-frequency equalization (CinEQ™ 5-channel cinema equalization):

Some movies mixed for movie theaters can seem overly bright when played back through a true, full-range, high-end sound system. For this reason, The Moon Attraction offers CinEQ™ — a proprietary, high-quality digital high-frequency roll-off filter for such overly bright material. This high-frequency equalization is activated or deacitivated by pressing **CinEQ** on page 4 of the remote's *MOON Attraction* device. CinEQ is remembered input-by-inpu, and it is cancelled automatically by going to Standby mode. When CinEQ is active, "EQ" is displayed on MOON Attraction's Main Screen (see figure, page 31).

Note: *Unlike the Lucasfilm Home THX Re-Equalization® curve, Simaudio's CinEQ™ cinema equalization is applied to all* <u>five</u> *full-range channels. (THX re-equalizes only the front channels, which israther ineffective for 5.1 channel soundtracks and musical recordings.) CinEQ is disabled in Stereo and Matrix playback modes to prevent possible incompatibilities with HDCD. To enable CinEQ in these playback modes, the HDCD override DIP switch #5 must be turned ON. (See Chapter III: "G. Choosing speakers to be rolled off".)*

C. Late night compression:

There are occasions when the large dynamic range characteristic of modern movies can be problematic: if the volume is set loud enough to hear the dialog, then very loud scenes can be inappropriately loud for some listening circumstances, as in late night viewing. Dolby Digital therefore provides a compression function that allows the softer scenes to remain audible, while attenuating loud climaxes. MOON Attraction offers four levels of this compression:

0. No compression ("off")
1. Mild compression ("low")
2. Moderate compression ("med")
3. Maximum compression ("high")

You may cycle through these three levels of late night compression by repeatedly pressing the **LatNit** button on page 4 of the remote's *MOON Attraction* device. Pressing **LatNit** momentarily, brings up the Features Selection Screen, where the degree of compression is displayed as: "LN=off, low, med or high". Late-night compression is only active in Dolby Digital, and is automatically cancelled by going to Standby.

D. Dialog normalization:

Different Dolby Digital programs can be recorded at widely different volume levels. Movies with large dynamic range are generally recorded softer, reserving a lot of headroom for occasional loud scenes. At the other extreme, television commercials have limited dynamic range, hence little need for headroom, and are intentionally recorded loud. Dolby Digital provides a "dialog normalization" function that automatically lowers the volume on some programs, so that all programs have subjectively similar loudness. Dialog normalization during digital playback is automatic. The ammount of dialog normalization applied is shown on the MOON Attraction's Features Selection screen (see page 17). To reach this screen from the MOON Attraction's Main screen, press **DISP**t (located on page 4 of the remote's MOON Attraction device) seven times.

E. HDCD :

Playing back and HDCD-encoded CD is as easy as playing any other CD. HDCD detection and decoding is fully automatic. When an HDCD disc is played, the HDCD indicator on the Main Screen will highlight, indicating that HDCD decoding is active.

HDCD decoding will only occur in Stereo and Matrix playback modes. Selecting Pro Logic or Mono-Enhanced playback by pressing the **Surround** or **Mono** buttons, respectively, on the remote control will disable HDCD decoding.

CinEQ™ 5-channel cinema equalization is disabled in Stereo and Matrix modes, because it would interfere with HDCD decoding. For the same reason, rolling off the LF and RF stereo speakers is also disabled in Stereo and Matrix modes. For users without full-range LF and RF speakers, and who therefore need to roll off their stereo speakers, an HDCD override switch is provided. (See Chapter III: "G. Choosing speakers to be

rolled off" for instructions.) When this switch is ON, roll off of the LF and RF speakers is allowed in Stereo and Matrix modes, as is CinEQ. However, when either of these features are active, HDCD decoding is disabled and the Main Screen HDCD indicator will not highlight.

F. Controlling VFD brightness:

The brightness of the front-panel vacuum fluorescent display can be toggled between 100% and 25% by pressing ⌟ - **DISP**s or ⌟ - **DISP**t, on page 4 of the remote's *MOON Attraction* device.

G. Twelve-Volt Trigger:

Some video screens can be raised or lowered, and some amplifiers turned on and off, remotely using a 12-volt control signal. MOON Attraction has a switched 12-Volt screen control output for this purpose. To use this feature, connect your video screen remote control line to the jack labeled "Screen" on the MOON Attraction rear panel. To toggle the 12-volt trigger on or off, press the octagonal icon with the double-ended arrow, on page 1 of the remote control's *MOON Attraction* device. [The status of this output (screen s = off, or screen t = on) is displayed in the Feature Selection Screen.]

H. Taping a source:

Digital recording of digital sources:
To facilitate digital recording of a digital source, MOON Attraction is equipped with a digital tape/monitor output. This digital "Tape/Mon" output can be used to tape a source which can be different from the main, selected program material.

Connect your digital recording device's (i.e., DAT player or recordable CD) digital input to the MOON Attraction's digital Tape/Mon output. Select any desired digital input for recording by pressing **Tape/Mon - Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6** on page 4 of the remote's *Setup 1* device. (***Caution.*** See Chapter III: "E. Programming a tape/monitor lock-out".) Pressing **TAPE** again at any time will cause the currently-selected Tape/Mon input to flash up on the Main Screen.

Analog recording of analog sources *:*
To make analog recordings of analog sources, connect the source's analog audio outputs directly to the recording device (analog tape deck or VCR).

Connect your analog recording device's (i.e., tape deck or VCR) analog inputs to the MOON Attraction's analog Tape/Mon outputs. Select any desired analog input for taping by pressing **Tape/Mon - Analog - Inp 1, Inp 2, Inp 3, Inp 4, Inp 5** or **Inp 6** on page 4 of the remote's *Setup 1* device. (***Caution.*** See Chapter III: "E. Programming a tape/monitor lock-out".)

Analog recording of digital sources:
To make analog recordings of digital sources (e.g., CD player, laserdisc player, DVD or

DAT), you can either:

1) Connect the source's analog audio outputs (if so equipped) directly to the analog recording device; *or*

2) Connect your analog recording device to the MOON Attraction's analog outputs. If you are using the balanced stereo outputs for your power amplifier, then connect your recording device to the unused single-ended RCA outputs. If you are using the single-ended outputs for your power amplifier, you can create an adapter to connect your recording device to your balanced outputs.)

Then, to record, select Stereo playback mode by pressing **Stereo** on the MOON Attraction page of the remote control. This will ensure the proper two-channel down-mix (either stereo or matrixed L_t/R_t surround-sounded encoded), suitable for recording on a two-channel recording device. Set the MOON Attraction volume to an appropriate level for recording.

The latter method (2) has the disadvantage that you need to adjust your MOON Attraction volume to a level suitable for recording—which may not be a comfortable listening level. However, it has the advantage of providing a higher quality signal than is generally available from the source's analog outputs.

Note: *To record a movie soundtrack from a Dolby Digital (AC-3) encoded laserdisc, best results are obtained by selecting the Dolby Surround (linear PCM) soundtracks and choosing Stereo listening mode, as described in 2), or by using the laserdisc player's analog audio outputs, as described in 1).*

Recording Video *:*
Connect the video signal from your video source (e.g., DVD, laserdisc, or satellite) to your VCR. This can be accomplished in at least two ways:

1) Many video sources have multiple video outputs, so that one video output can be connected to the MOON Attraction, and a second connected to the VCR. This will allow you to record a program while viewing it through the projector/TV monitor connected to the MOON Attraction's video outputs; *or*
2) Connect one of the MOON Attraction's video outputs to the video input of your VCR, and connect the VCR's video output to your projector/TV monitor. This will allow you to view the program while your VCR is recording it.

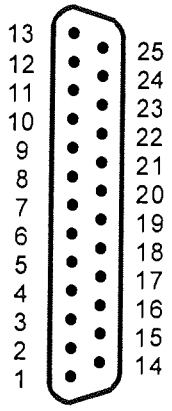
Note that the currently selected Tape/Mon inputs remain active during Standby mode in order to facilitate taping while in Standby mode.

For conventional VCRs with no S-video input, the composite video outputs from your video source AND from the MOON Attraction must be used. However, when recording on a Super-VHS (S-VHS) VCR equipped with an S-video input, best results will generally result from using the S-video outputs of video sources equipped with such outputs. If a source has no S-video output, then the source's composite video output must be used TOGETHER with the MOON Attraction's Tape/Mon composite output. (The MOON Attraction has no separate Tape/Mon comb filter.)

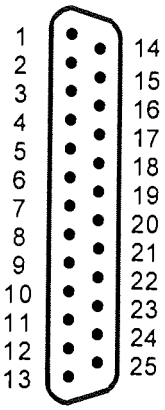
I. RS-232 control:

All MOON Attraction functions can be controlled via the RS-232 port on the rear panel. For detailed information concerning the MOON Attraction's RS-232 control codes, please refer to Simaudios' Web site at **http://www.simaudio.com**.

The physical pinouts on the MOON Attraction's RS-232 rear-panel DB-25 connector are (MOON Attraction rear view):



MOON Attraction equiped with male RS-232 connectors



MOON Attraction equipped with female RS-232 connectors

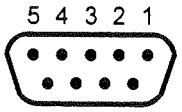
The pin assignments are as follows:

1. n.c.
2. RS-232 Tx
3. RS-232 Rx
4. n.c.
5. tied to 6,8,20
6. tied to 5,8,20
7. ground
8. tied to 5,6,20
9. +9 Volts
10. -9 Volts
11. IR-Rx pulse
12. n.c.
13. n.c.
14. n.c.
15. n.c.
16. n.c.
17. n.c.
18. n.c.
19. n.c.
20. tied to 5,6,8
21. n.c.
22. n.c.
23. n.c.
24. +5 Volts
25. n.c.

The +5 Volt, +9 Volt, and -9 Volt signals are included to provide power to any optional 150 MegaHertz professional-grade video switcher. (See Chapter XI: "Options".) The IR-Rx pulse line can be used to connect the MOON Attraction to an optional IR extender. The remaining pinouts conform to the RS-232 standard.

When the video switcher is installed, it connects to MOON Attraction's RS-232 connector. In this case, the video switcher's RS-232 port can be used to connect both the MOON Attraction and the video switcher to an external system controller. The physical pinouts for the video switcher's standard DB-9 female connector are:

The pin assignments are as follows:



1. tied to 4,6,8
2. RS-232 Rx
3. RS-232 Tx
4. tied to 1,6,8
5. ground
6. tied to 1,4,8
7. n.c.
8. tied to 1,4,6
9. n.c.

J. Input Data Status Screen:

The Input Data Status Screen (see next page) provides a useful diagnostic tool. It can be accessed from page 4 of the remote's *MOON Attraction* device by pressing **DISP**t. The Input Data Status Screen displays:

1. The current sampling frequency (32 kHz, 44.1 kHz or 48 kHz). If no frequency is displayed, then the frequency is not specified in the incoming bit stream.

2. Whether a digital recording has been recorded with pre-emphasis. (If so, MOON Attraction automatically decodes the recording using digital de-emphasis.)

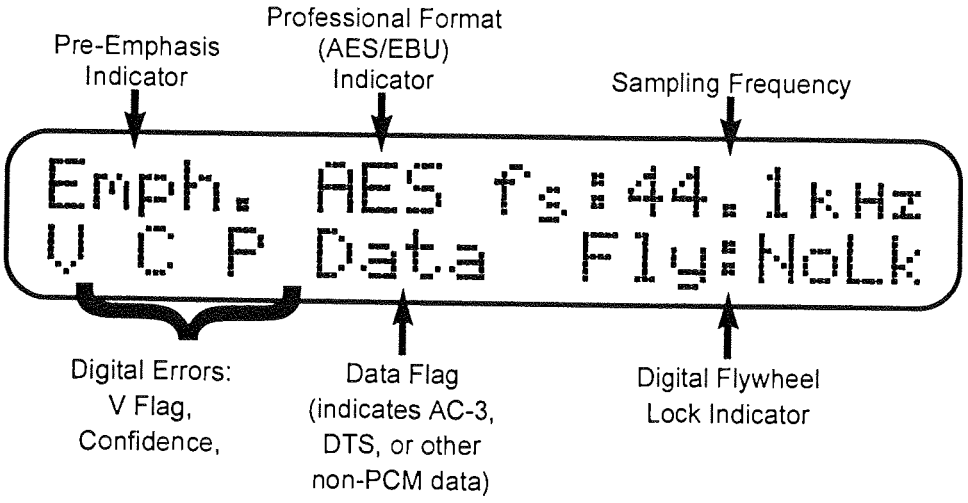
3. If the selected digital data stream is non-standard audio data (indicated as "Data"), such as AC-3, DTS or CD-ROM.

4. Whether a digital program has been recorded using the normal "consumer" or the professional AES/EBU digital format (displayed as "AES").

5. Whether MOON Attraction's *Digital Flywheel*™ reclocking circuitry is properly locked onto a digital source. "Fly:Lock" should be displayed with all normally functioning 44.1 kHz (i.e., CD or laserdisc) or 48 kHz (i.e., DVD or DAT) transports. If "Fly:NoLk" is displayed, it could indicate that your transport is malfunctioning or out-of-spec.

6. The nature of any digital errors detected in the incoming data stream:

The MOON Attraction's Main Screen includes a digital source error indicator. Errors in



Input Data Status Screen

the incoming digital data stream are indicated by an asterisk "*" appearing next to the digital input. (This is in the same position as the analog input clipping indicator—see Chapter VI: "C. Selecting an analog input".) If the error indicator asterisk flickers or illuminates while listening to a digital source, the Input Data Status Screen (above) can help to diagnose the problem. (Such flickering during "Pause", "Skip Forward", etc., is normal.)

These digital errors consist of three types: V-flag (or "transport") errors, Confidence errors, and Parity (and/or Bi-phase Coding) errors:

V-flag (also called "transport" or "disk read") errors, indicated by a "V", are relatively rare—most CDs* should play with no uncorrected disk read errors. If multiple errors occur, try carefully cleaning the disk. If such errors appear on many discs, try a different transport. If this solves the problem, refer the original transport to qualified personnel for servicing. (Note that some transports initiate V-flag errors during pause or search modes. This is not a problem.)

*With DVDs, however, the V-flag indicator normally illuminates when playing compressed digital audio formats, such as AC-3 and MPEG. This simply indicates a non-PCM digital data stream.

Confidence errors, indicated by a "C", are caused by timing inaccuracies in the digital data stream. They are typically caused by poor quality or damaged coaxial or optical interconnects, or by substandard performance of the digital transmitter in the CD transport. In such cases, adjustment or replacement of the digital interconnect or repair of the CD transport's digital output is recommended.

Parity and/or Bi-phase Coding errors, indicated by a "P", are extremely rare. More than occasional occurrence can signal serious electrical failure of the transport. Before servicing, check to see that the digital interconnects are securely connected. An ungrounded or misconnected interconnect may give rise to Parity or Bi-phase Cod-

ing errors.

MOON Attraction can detect digital errors far below the threshold of audibility. Occasional errors generally present no cause for concern.

Exit the Input Data Status Screen by pressing ↵ or ⏎ .

L. Temperature readout:

As a useful diagnostic, MOON Attraction's System Configuration Screen contains a calibrated temperature readout (see figure, page 16). If the MOON Attraction's internal operating temperature becomes too hot (which could happen in extremely warm, unventilated environments), this could cause the microprocessor to "lock up" or display other intermittent behavior.

If you are experiencing any such symptoms, check the temperature readout on the System Configuration Screen, by repeatedly pressing **DISP**t on page 4 of the remote control's *MOON Attraction* device. If the temperature readout exceeds about 55 degrees Celsius (about 130 degrees Fahrenheit), take steps, such as rearranging components or adding system ventilation, to prevent such excessive heat build-up.

M. DIP switch settings:

The following page presents a summary of all the MOON Attraction DIP switch settings, together with their functions:sion is displayed as: "LN=off, low, med or high". Late-night compression is only active in Dolby Digital, and is automatically cancelled when one goes to Standby Mode.

DIP SWITCH SETTINGS

DIP Switch	Function	OFF (default) (towards front)	ON (towards back)
1	Language	English	Japanese
2	Permanent DTS dedication	Digital input 2 operates normally	Digital input 2 dedicated to DTS
3	Permanent AC-3 dedication	Digital input 3 operates normally	Digital input 3 dedicated to AC-3
4	Permanent MPEG dedication	Digital input 4 operates normally	Digital input 4 dedicated to MPEG
5	HDCD Override	Normal (no roll-off of LF,RF speakers and no CinEQ in stereo & matrix modes)	Override (HDCD decoding disabled by roll-off of LF,RF speakers and by CinEQ)
6	Video Switcher download	Normal	Video Switchersoftware download (see upgrade instructions)
7	Stereo VU meter mode	2-channel	6-channel
8	VU meter setting	Calibrated to output (scales with volume setting)	Calibrated prior to volume attenuation
9	Reserved	Leave OFF*	N/A
10	Reserved	Leave OFF*	N/A

CAUTION: *DIP switches must be changed only while the MOON Attraction is switched OFF at the rear panel AC power switch. In this state, the light-emitting diodes on the motherboard are all OFF. Use a flashlight and a long, narrow screwdriver, inserted through the left top-cover cooling vents.*

**MOON Attraction may be damaged if DIP switches 9 and 10 are changed by user.*

VIII. Customizing Your System: Storing Multiple Setups

A. Labeling your analog and digital inputs:

MOON Attraction allows you to label each analog and digital input with an up-to-3-character label (e.g., "CD", "DVD", "VCR", or "LD" for laserdisc). Thereafter, MOON Attraction's front-panel LCD will display these labels whenever that input is selected. This can be very helpful in remembering what analog or digital source is connected to what input on the MOON Attraction.

To assign a label to the currently selected analog or digital input, repeatedly press ⌟ - **CH-** or ⌟ - **CH+**, on page 4 of the remote's MOON Attraction device, to scroll through the available labels. Repeat this same procedure for your other analog and digital inputs, as desired.

The status of all the input labels are displayed in the Analog and Digital Input Designator Screens, which are accessed by repeatedly pressing **DISPt** on page 4 of the remote control's *MOON Attraction* device (see figure, page 18). Exit the Analog or Digital Input Designator Screens by pressing the ⌟ button by itself, by pressing the exit ⍈ button .

B. Storing multiple setups

Many MOON Attraction users have different listening preferences for different types of program material—e.g., stereophonic music vs. Dolby Digital 5.1-channel movie soundtracks. For example, some owners with full-range, high-quality front stereo speakers choose to disable the subwoofer during stereo music playback, but want to re-enable the subwoofer for movie soundtracks. Some owners, who like to listen to music in Matrix mode, find their rear surrounds (LS and RS) too loud for music if they have been setup for surround-sound playback of Pro Logic soundtracks.

Fortunately, MOON Attraction is easily able to accommodate such diverse listening preferences. MOON Attraction remembers up to *ten* different setups. To take advantage of this great flexibility most easily:

1. Start with a known setup. For example, in Chapters III and IV, the MOON Attraction was configured, and speakers balanced, for your system. You may recall that this setup was stored in memory location #1 by pressing **STO - Mem 1**. Recall this setup now by pressing **RCL - Mem 1** on page 3 of the remote's *MOON Attraction* device.

2. Make the desired adjustments to this setup. For example:
   a) Raise or lower individual speaker volumes, as desired. This is best done in the Speaker Adjustment Screen (see figure, page 16) while listening to program material. To access the Speaker Adjustment Screen, press **Adjust** on page 2 of the remot'e *Setup 1* device. (For more details, see Chapter IV: "C. Tweaking the system".)
   b) Disable or re-enable your LFE subwoofer, as desired, while in the same Speaker Adjustment Screen, by pressing **SUB** followed by **CH-** or **CH+**, respectively. (For more details, see Chapter III: "A. Disabling the LFE subwoofer".)
   c) Activate "Phantom" mode or "3Stereo" mode, if desired, by pressing **CTR** followed by **CH-** or **LS** followed by **CH+**, respectively, while in the Speaker Adjustment

Screen. (Phantom mode can yield excellent results with Pro Logic encoded music, especially in systems with dubious-quality center speakers.)

3. Store this new setup by going back to page 3 of the remote's MOON Attraction device, andpressing **STO - Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9** (and in some models of the remote control, **Mem 0**).

Note: *Memory location #1 remains your default memory location on cold AC power up. You might therefore wish to ensure that the master volume level stored in memory location #1 is set at a comfortable listening level.*

Certain setup parameters are "global"—i.e., they are common across all memory locations #1 - #0. These are parameters, such as speaker distances, that do not depend on the type of program material or choice of playback mode. Whenever the user changes or updates these parameters, they are overwritten globally. Global parameters are:

- Speaker distances
- Balanced (ON or OFF)
- Programmed Tape/Mon inputs
- Programmed A/V links
- Digital input designators
- Analog input designators
- Analog input attenuations
- Video enhancer (ON or OFF)
- Screen (UP or DOWN)
- VFD display brightness (100% or 25%)
- HF-EQ (ON or OFF) (defaults to OFF on Standby)
- Late-night compression (off, low, med, or high) (defaults to OFF on Standby)

Other parameters are "memory-specific"—i.e., they are stored in specific memory locations (#1 - #0) by pressing **STO - Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9** (and in some models of the remote control, **Mem 0**). These are parameters, such as speaker volume levels, that one may wish to adjust differently for different program material or for different playback modes. Memory-specific parameters are:

- Speaker volume levels
- Speakers disabled (i.e., LFE off, Phantom, or 3Stereo modes)
- Speakers rolled off
- Speakers crossed over
- Crossover frequency

These memory-specific parameters are recalled by pressing **RCL - Mem 2, Mem 3, Mem 4, Mem 5, Mem 6, Mem 7, Mem 8, Mem 9** (and in some models of the remote control, **Mem 0**)

C. Restoring factory defaults:

MOON Attraction's factory default settings can be recalled by pressing **F - RCL** while in Standby mode (this is best done from page 3 of the remote's *MOON Attraction* device). **Warning: Although F - RCL does not overwrite your memory-specific settings**

stored in memory locations #1 - #0, it will overwrite all global parameters, causing you to lose your A/V links, input designators, and other global settings.

Alternatively, pressing **F - RCL - F** in Standby mode restores the factory default settings, ***and also clears all the memory locations #1 - #0.*** **Warning: This procedure clears all global and memory-specific parameters. It is intended mainly for owners seeking to restore their MOON Attraction to pristine factory condition.**

The MOON Attraction's factory defaults are:
- All speakers enabled
- All speaker outputs (LF ,RF, CTR, LS, RS and SUB) set to -40 dB
- All speakers distances set to 3.0 meters (~10 feet)
- All speakers (LF, RF, CTR, LS and RS) are crossed over to the LFE subwoofer
- The CTR, LS, and RS speakers are rolled off (assumes small speakers)
- The subwoofer crossover frequency is set to 80 Hz
- Analog input attenuation is set to 0 dB for all inputs
- CinEQ 5-channel cinema EQ disabled for all inputs
- Late-night compression is turned OFF
- Main stereo outputs are set for single-ended operation (i.e., Balanced = OFF)
- No programmed Tape/Mon lock-outs
- A/V links default to those shown on page 17
- No digital input designators
- No analog input designators
- Vertical enhancer turned OFF
- VFD display brightness set to 100% (maximum)
- Screen UP

IX. IR Learning Remotes

A. The SRC-2000 Smart Remote Control:

MOON Attraction are now being shipped with a unique combination back-lit, touch-screen/push-button learning remote. It is called the *Smart Remote Control* due to its ability to recall the factory programming, should this ever be necessary. Individual keys can be reprogrammed, without losing the ability to restore an entire device at will. Due to the use of user-overridable automatic sequencing, even the learning process is enhanced over normal types of learning remote. This new remote is described fully in an addendum to this manual.

B. MOON Attraction IR Learning mode:

Intended for use with remote control systems other than the SRC-2000, the MOON Attraction can itself generate a wide variety of IR control codes for controlling its various functions. These codes are grouped into three categories: *MOON Attraction, MOON Attraction Setup*, and *Special.* Custom installers will find a lot of useful discrete ON and OFF codes in the Specials group.

To access the MOON Attraction's list of built-in IR codes, follow these steps:

1. Switch OFF the MOON Attraction's AC power switch on the rear panel.
2. Switch ON the AC power switch, *and then press the MOON Attraction's front-panel Power/Mute button within 1 second (before the VFD turns ou).* This will put the MOON Attraction into the special IR learning mode. In this mode, it will transmit a continuous sequence of IR commands that can be taught to various IR remote control systems.
3. Align the learn window of the IR remote that will be receiving the commands with the IR window on the MOON Attraction front panel. The directions of maximum intensity are at ±45° from the front panel, not perpendicular to the panel.
4. The MOON Attraction's front-panel VFD will display the name of the particular key on the remote that is to be programmed. Press the corresponding key on the remote control.
5. Proceed to the next key by pressing MOON Attraction's front-panel Power/Mute switch. The front-panel VFD will now display the name of the next key on the remote that is to be programmed. Press the corresponding key on the remote control.
6. You may access the previous IR code by double-clicking the MOON Attraction's front panel button. The codes are arranged in a circular list, with the Specials appearing last.
7. Switch OFF the MOON Attraction's AC power switch to exit the special IR remote control programming mode.

C. Verification of IR programming:

To verify that the IR codes have been properly programmed, access the MOON Attraction's Remote Control Test Screen by repeatedly pressing **DISP**t on page 4 of the remote's *MOON Attraction* device (see figure, page 17). Once this screen is displayed, you can verify operataion by pressing remote control keys. If the key is properly programmed, then the name of that key will appear steadily (without any delay or hesitation) on the MOON Attraction's VFD.* If there is no response, or if the wrong name appears, this indicates that this key

XIII. Specifications

Digital Frequency Response:	DC to 20 kHz ± 0.1 dB
Analog Frequency Response:	10 Hz to 20 kHz ± 1 dB
Signal to Noise Ratio:	120 dB (typical)
Dynamic Range:	110 dB (typical)
THD+Noise:	92 dB (typical)
Stopband Attenuation:	120 dB
Passband Ripple:	0.0001 dB
Phase Linearity:	±0.1° (20 kHz)
Maximum HF Jitter:	10 picoseconds rms (at 20 kHz)
ADC Precision Dynamic Range:	95 dB
THD+Noise:	88 dB
Stop Band Attenuation:	80 dB

X. Upgrades

Simaudio is committed to maintaining its current leadership position in digital playback technology. We are constantly researching more advanced analog and digital circuit designs.

From time to time, as advances in digital technology allow, Simaudio will notify registered MOON Attraction owners of the availability of software or hardware upgrades. We feel that this upgrade policy, combined with Simaudio's commitment to high-quality service and maintenance, will protect the owner's investment for many years to come.

Designed for the audio purist, MOON Attraction provides truly breathtaking transparency, unprecedented musical realism and dynamic contrasts—uncompromised audiophile performance previously available in a home theater system.

For information, speak to your SIMAUDIO dealer, or speak to an SIMAUDIO customer representative at 450.445.0032.

XI. Servicing

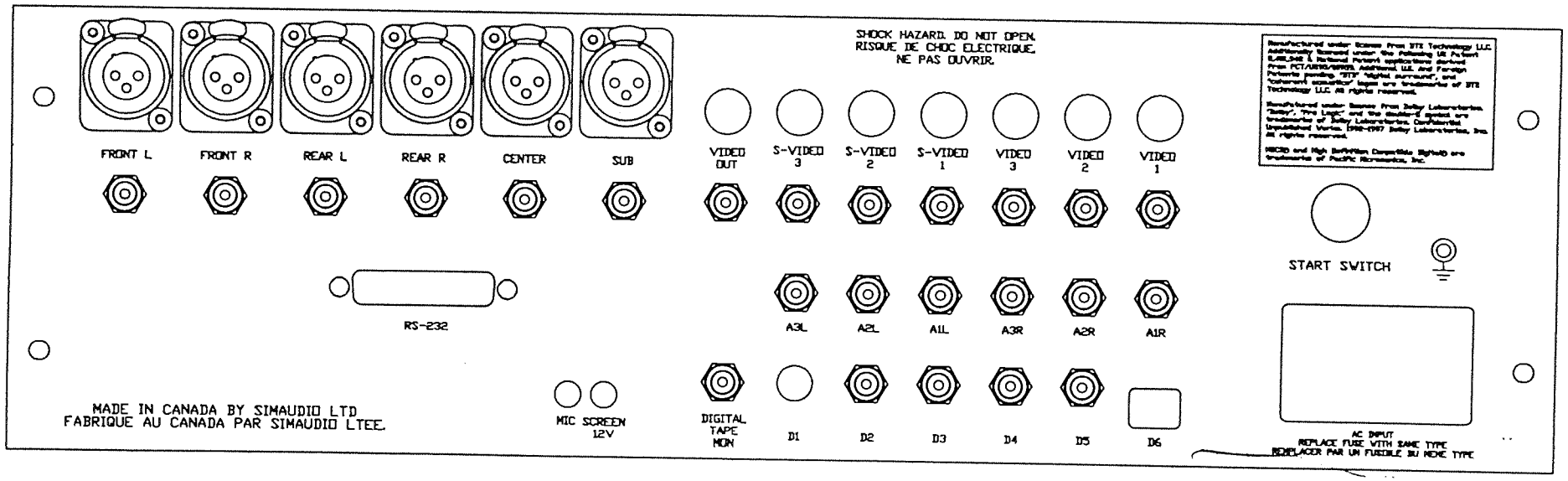
MOON Attraction contains no user-serviceable parts. Refer all servicing to SIMAUDIO or to its authorized representatives. Setting of internal DIP switches, and other minor adjustments described in this manual, should be performed with the cover on. Do not remove the cover due to risk of electric shock. Removing the cover also exposes static-sensitive circuitry that is highly susceptible to damage, and could void the warranty.

MOON Attraction is inherently a low-maintenance component which should provide years of trouble-free performance. Should servicing become necessary, SIMAUDIO will make every effort to promptly repair or replace the MOON Attraction, as necessary. Malfunctions due to parts and/or workmanship are generally covered by SIMAUDIO's limited two-year warranty.

XII. Warranty

The MOON Attraction is guaranteed for two years against defects due to parts and/or workmanship. If the MOON Attraction is found to be defective, Simaudios will, at its option, repair or replace the defective unit. This warranty extends to the original, ***registered*** owner of the MOON Attraction purchased from an authorized SIMAUDIO dealer or representative. This warranty does not extend to cosmetic damage caused by normal wear and tear or to damage caused by accidental or intentional misuse.

Digital Inputs and Outputs	Bi-phase Mark Code, 32-48 Khz;
AES/EBU	Consumer Standard SPDIF Professional Standard 16- to 24-bit linear PCM Dolby AC-3 bitstream DTS 5.1 bitstream MPEG2 bitstream HDCD-encoded linear PCM
Coax:	75 Ohm, 0.4 Volt p-p (input) 75 Ohm, 0.8 Volts p-p (output)
TOSLINK Optical Input:	EIAJ Standard CP-340 Digital Audio Interface; RC-5720 connector; Wavelength 660 nm (typical); Cable length 0.2 - 10 meters
Analog Input Sensitivity	2 Volts rms (0 dB) 4 Volts rms (-6 dB)
Analog Output Voltage (0 dB)	Single Ended: 8 Volts rms Balanced: 4 + 4 Volts rms
Analog Output Impedance	
Single Ended: Balanced:	50 Ohms 110 + 110 Ohms
Power Consumption	20 Watts
AC Power Fuse	400 mA 250 Volt "slow blow"
Physical Dimensions	17" x 11" x 4"
Net Weight	20 lbs


FRONT L
FRONT R
REAR L
REAR R
CENTER
SUB
SHOCK HAZARD. DO NOT OPEN.
RISQUE DE CHOC ELECTRIQUE.
NE PAS OUVRIR.
VIDEO OUT
S-VIDEO 3
S-VIDEO 2
S-VIDEO 1
VIDEO 3
VIDEO 2
VIDEO 1
START SWITCH
RS-232
A3L
A2L
A1L
A3R
A2R
A1R
MADE IN CANADA BY SIMAUDIO LTD
FABRIQUE AU CANADA PAR SIMAUDIO LTEE.
MIC SCREEN
12V
DIGITAL TAPE MON
D1
D2
D3
D4
D5
D6
AC INPUT
REPLACE FUSE WITH SAME TYPE
REMPLACER PAR UN FUSIBLE DU MEME TYPE