XM-R3™

SATELLITE AUDIO RECEIVER

INSTALLATION AND USER'S MANUAL

XM-R3 SATELLITE AUDIO RECEIVER

040	Rock		PRS
074	Jazz & Blues		CAT
043			DIR

ELAN

THREE TIMES THE SATELLITE RADIO.

ELAN
HOME SYSTEMS™

Preface

Purpose of This Manual

This manual provides step-by-step installation instructions and connection examples, along with basic user information for installation and ongoing use of the XM-R3 Satellite Audio Receiver. This manual is written for the installer and user of this equipment.

Organization

The following information is contained in this manual:

Chapter 1	Provides an introduction to ELAN Home Systems' XM-R3™ Satellite Audio Receiver, along with a system description and equipment specifications.
Chapter 2	Presents step-by-step instructions for installing the XM-R3 Satellite Audio Receiver, XM Antenna and in-line amplifiers, and XM Radio activation information, along with system connections such as IR, RS232, Digital Out and Audio.
Chapter 3	Describes front panel and hand-held remote control operations, along with IR and RS232 control using ELAN Kepads and VIA! Touch Panels.

Safety Information

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE TOP COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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⚠ ⚡ **WARNING** ⚠
RISK OF ELECTRIC SHOCK
DO NOT OPEN

Water and Moisture—To reduce the risk of electric shock or fire, these appliances should not be used near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.

Power Cord Protection—Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

Telephones—Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning. Do not use a telephone to report a gas leak if the leak is in the vicinity of the ELAN electronic equipment because of risk of fire or explosion.

Cleaning—Unplug the apparatus from the power outlet before cleaning. Use only a dry cloth to clean the apparatus.

Power Lines—An outdoor antenna should be located away from power lines. When installing an outside antenna system, extreme care should be taken to avoid touching power lines or circuits, as contact with them may be fatal.

Outdoor Antenna Grounding—If an outside antenna or cable system is connected to these audio products, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the U.S. National Electrical Code, and Section 54 of the Canadian Electrical Code, provide information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See the grounding diagram (right).

Overloading—Do not overload wall outlets and extension cords, as this could result in fire or electric shock. Object and Liquid Entry—Never insert objects of any kind through the openings of these appliances, as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Care should be taken so that objects do not fall and liquids are not spilled into the appliance through openings in the enclosure.

Servicing—Do not attempt to service these appliances yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Damage Requiring Service—These appliances should be serviced by qualified service personnel when:

- A power supply connection or a plug has been damaged or
- If liquid has been spilled into the appliance or objects have fallen into the appliance or
- The appliance has been exposed to water or moisture or
- The appliance does not appear to operate normally or exhibits a marked change in performance or
- The appliance has been dropped or the enclosure damaged.

Replacement Parts—When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
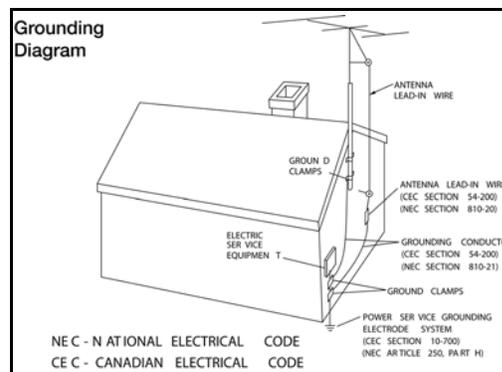
Safety Check—Upon completion of any service or repairs to this audio product, ask the service technician to perform safety checks to determine that the audio product is in proper operating condition.

Lightning Storms—Unplug this apparatus during lightning storms or when unused for long periods of time.

Attachments and Accessories—Use only attachments/accessories specified by the manufacturer.

Cart, Stand, Tripod, Bracket or Table—Use only with a cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip over.

Disconnect Device—Where the mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain operable.

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CHAPTER 1: Introduction

Introduction

Thank you for choosing the world's finest high-fidelity, three zone satellite audio receiver. The XM-R3™ Satellite Audio Receiver uses the revolutionary XM® Satellite Radio technology.

*There's a world beyond AM and FM, it is XM Satellite Radio. Over 150 channels of music, news, sports, comedy, talk, and entertainment. The ELAN XM-R3 Satellite Audio Receiver lets you select from a variety of commercial-free music channels, 24 hours a day, 7 days a week. Hear today's hits, R&B oldies, to classical masterpieces, from authentic country and real bluegrass, to cool jazz, hot Latin, reggae, rock, dance, new age and even kid's music. Now enjoy all the advantages of XM Satellite Radio throughout your home with the ELAN XM-R3 Satellite Audio Receiver. Designed to integrate into any multi-room entertainment system, the XM-R3 allows you to stream three XM radio channels simultaneously to any room in your house. The XM-R3 installs quickly and easily. Once installed, you have immediate access throughout your home to hundreds of channels of the most dynamic programming available anywhere. For more up to date channel listings, visit XM RADIO at http://www.xmradio.com.

The XM-R3 also gives you instant access to world-class news, sports, talk and entertainment from CNN, BBC World Service, CNBC, ABC News & Talk, Bloomberg News, ESPN, and FOX Sports, **Major League Baseball: Every team, all season long — XM Satellite Radio is the Official Satellite Radio Network of Major League Baseball, ***NASCAR: XM Satellite Radio is the Official Satellite Radio Service of NASCAR, E! Entertainment and 21 dedicated Channels of XM Instant Traffic & Weather powered by Traffic Pulse and The Weather Channel. Your kids will enjoy the XM-R3, too, with Radio Disney, and wacky original content.

> *NOTE:*   **   All XM programming is subject to change without notice.*
>   ***   Major League Baseball trademarks and copyrights are used with permission of Major League Baseball Properties, Inc.*
>   **** NASCAR® is a registered trademark of the National Association for Stock Car Auto Racing, Inc.*

Figure 1-1 XM-R3 Satellite Audio Receiver

Features

The XM-R3 Satellite Audio Receiver provides the following features:

- **Multi-Zone Display**—A wealth of information from the XM-R3 single display front panel, including instant status of the receiver in the setup, category list, parental lock, as well as full title, track, and artist information.

- **Multi-Zone Presets**—Store 10 presets for each of the XM-R3 three radio channels. That's 30 presets in all.

- **Parental Control Locks**— The XM-R3 is a parent's dream, offering you the ability to block channels you don't want your children to hear. If you forget the parental control code, use the master password reset function to re-gain channel access.

- **Channel Skip Control**—Want XM-R3 to play only the channels you like best and skip others? This feature allows you to designate the channels you want to hear, and exclude those you don't, all the while retaining the ability to scan through all channels using regular channel commands.

Hardware and required $12.95 monthly subscription sold separately. To subscribe, phone 1-800-XMRADIO (OR 1-800-967-2346) Other fees and taxes, including a one-time activation fee may apply. Subscription fee is consumer only. All fees and programming subject to change. Channels with frequent explicit language are indicated with an XL. Channel blocking is available for XM radio receivers by calling 1-800-XMRADIO. Subscriptions subject to Customer Agreement available at xmradio.com. Only available in the 48 contiguous United States. ©2005 XM Satellite Radio Inc. All rights reserved. All other trademarks are the property of their respective owners.

Specifications

Table 1-1   Specifications

General	Description
Power Requirement	120 VAC, 60 Hz
Power Consumption	50 W
Operating Environment	32-104°F (0-40°C)
Input Impedance	50 ohms
Input Frequency	2.33-2.35GHz
Audio Outputs	3 pair of Analog RCA Phono Jacks 3 Digital Optical
IR Input	3.5 mm Jack
RS-232 Control Port	9-Pin D-SUB
Antenna Input	75 ohm SubMiniature version B (SMB) connector
Input Frequency	2.33-2.35GHz
Dimensions (W x H x D)	17-1/4" x 3 1/2" x 12-1/2" 438 mm x 89 mm x 317 mm
Weight (net)	10 lbs (4.5 kgs)
Standard Accessories	1 Remote Control Unit 2 Rackmount Ears 1 Satellite Audio Antenna w/20ft cable 1 Power Cord
Agency Approval	ETL

CHAPTER 2: Installation

Installing the XM-R3 Satellite Audio Receiver

The XM-R3 and satellite audio antenna should be installed by an authorized ELAN dealer. Instructions are presented here for reference purposes only.

Antenna and Amplifier Positioning

The satellite audio antenna comes with a 20 ft. cable. If the antenna is mounted more than 20 ft. from the XM-R3 Satellite Audio Receiver, an in-line amplifier for every 100 feet of cable is needed to boost the received satellite signals to acceptable levels. ELAN provides antenna extension kits and amplifiers to achieve this.

- For best reception, the satellite audio antenna should be mounted in an outside location facing south, see *Figure 2-1*.

- If using multiple satellite audio antenna amplifiers, they should be connected together in-line within 20 ft. of the antenna itself.

SRA-KIT

The SRA-KIT is a satellite audio antenna amplifier/Cable Kit that is needed in order to extend your satellite audio antenna run beyond its 20 ft. lead. An in-line amplifier allows you to place the antenna up to 100 ft. away from the XM-R3 Satellite Audio Receiver using RG-6 coaxial cable.

Included in the SRA-KIT:

- 1 SRA-100 In-line Amplifier

- 1 BNC-to-Antenna cable (2 meter)

- 1 F Male to BNC Connectors

- 1 F Female to BNC Connector

- 1 SMB to F Male Connector

SRA-100

The SRA-100 is an add-on antenna amplifier which allows you to go an additional 100 ft. via RG-6 coaxial cable. A maximum of three (3) SRA-100 amplifiers can be connected together in-line for a total of 300 ft. To put it another way, you can add up to two (2) more SRA-100 amplifiers to the SRA-KIT to achieve a total distance of 300 ft. over a single run of RG-6.

Included in the SRA-100:

- 1 SRA-100 In-line Amplifier
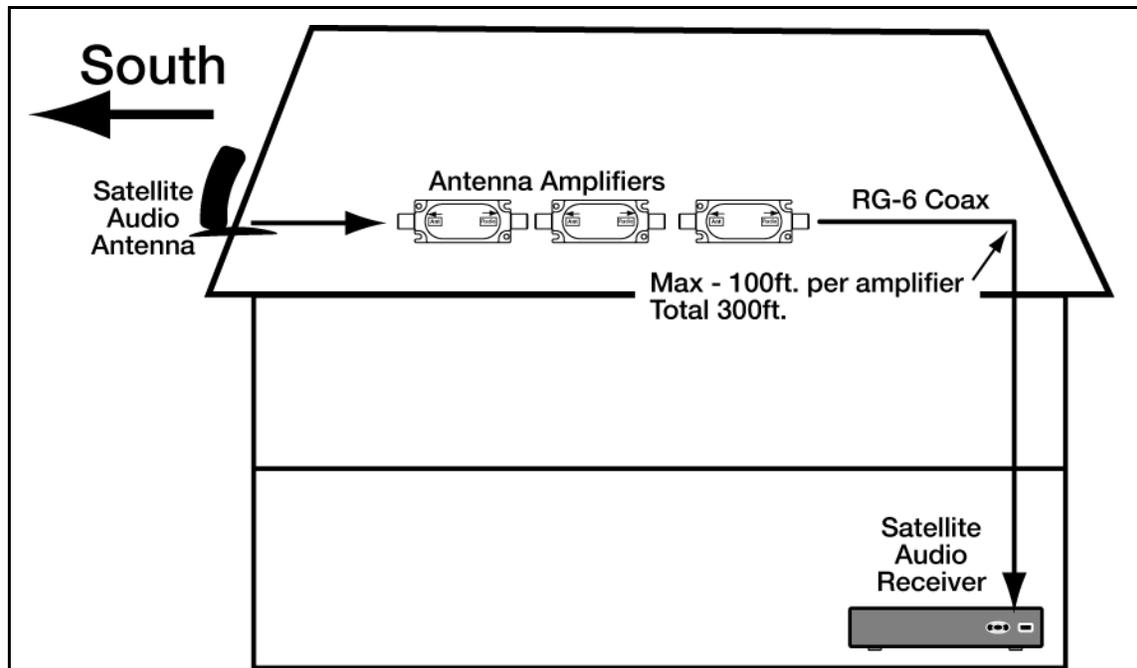
- 1 F Male to F Male Connector

Figure 2-1 Typical Antenna Layout

Determining the Number of Amplifiers

An amplifier kit or multiple amplifiers are needed for distances greater than twenty feet between the antenna and the XM-R3 Satellite Audio Receiver, see *Table 2-1* to determine the number of amplifiers needed.

1. Decide where the antenna will be located.
2. Determine the RG-6 wire run distance from the head-end to the satellite audio antenna.
3. Determine the number of antenna amplifiers that will be needed.

Table 2-1   Coaxial Cable Lengths vs. Amplifiers

RG-6 Wire Run	# of Amplifiers
Up to 100 ft.	1
Up to 200 ft.	2
Up to 300 ft.	3

NOTE: If no in-line amplifiers are needed connect the antenna cable to the "Antenna" input of the XM-R3.

Installations Using a PS12 Precision Panel

The PS12 Precision Panel is a convenient trim-out solution for the System 12 multi-room A/V Controller. With more sources, more zones and more built-in features than any other ELAN multi-room controller to date, the number of wire runs and system connections needed to get everything up and running smoothly makes the PS12 a necessity.

1. Connect one amplifier module to the cable extending from the satellite audio receiver antenna using the SMB-to-F male connector. Ensure that the "ANT" jack on the in-line amplifier is connected to the antenna output.
2. Connect the RG-6 coax cable routed from the head-end location to the "RADIO" output of the in-line amplifier.
3. Connect the other end of RG-6 coax to the antenna input located on the PS12 Precision Panel.
4. Connect the BNC-to-antenna cable to the PS12 Precision Panel using the F male-to-BNC connector.
5. Connect the other end of the BNC-to-antenna cable to the "**ANT**" input of the XM-R3 see *Figure 2-2*.
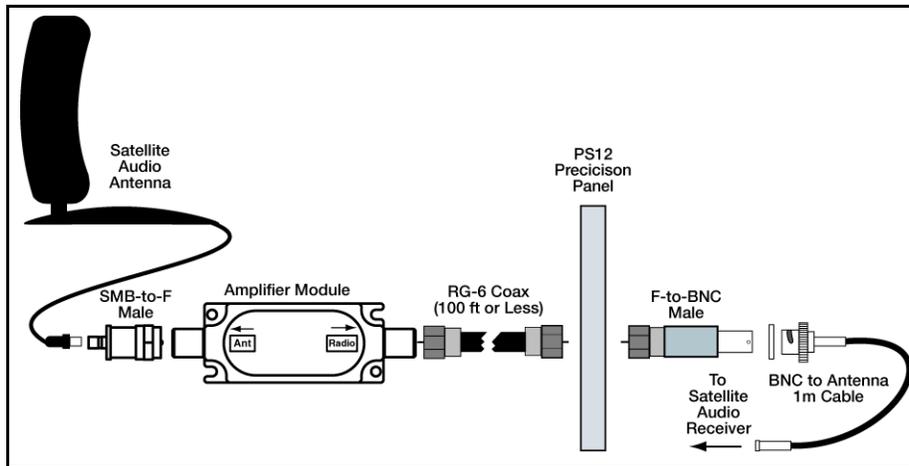
Figure 2-2 Connections With a PS12 Precision Panel

Installations Without a PS12 Precision Panel

Install the in-line amplifier(s) between the antenna and the XM-R3 Satellite Audio Receiver, see *Figure 2-3*.

1. Connect one amplifier module to the cable extending from the antenna using the SMB-to-F male connector. Ensure that the "ANT" jack on the in-line amplifier is connected to the antenna output.
2. Connect the RG-6 coax cable routed from the head-end location to the "RADIO" output of the in-line amplifier.

Figure 2-3 Connections Without a PS12 Precision Panel

3. Connect the other end of RG-6 coax to the BNC-to-antenna cable using the female F-to-BNC connector.
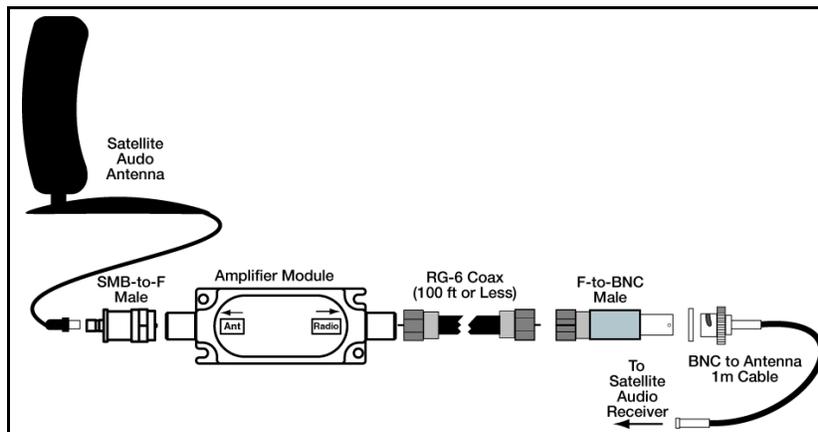4. Connect the other end of the BNC-to-antenna cable to the "Antenna" input of the XM-R3.
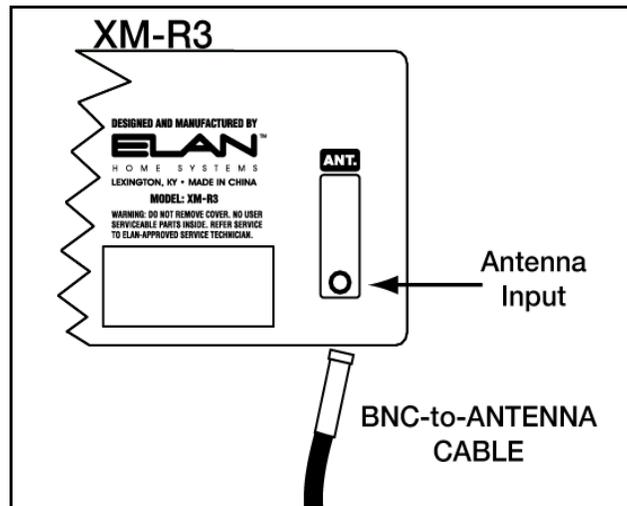
Figure 2-4 XM Antenna Input Connection

Add any additional SRA-100's to the SRA-KIT by daisy-chaining the amplifiers together using the provided male F-to-F connector as shown below. Once all connections are made, check reception by carefully following the instructions in the Channel 1 Verification Test located below. Tighten the antenna mount securely once all adjustments are completed.
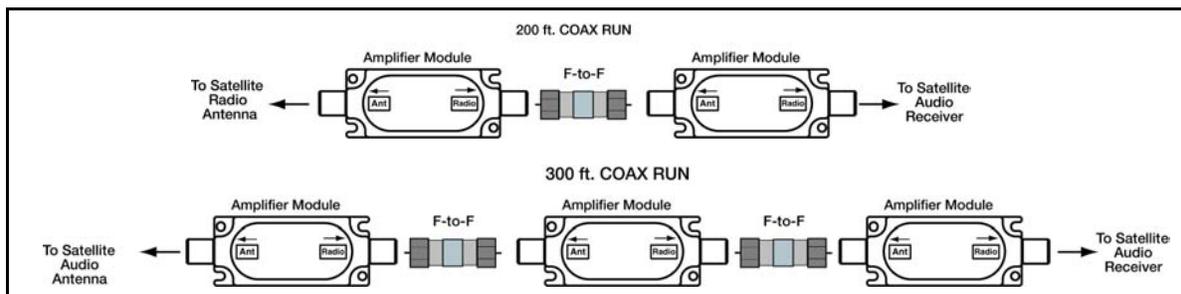

Figure 2-5 Multiple In-line Amplifier Examples

After mounting the antenna, connect the audio cables (or optional TOSLINK), IR, and RS232 control interfaces to the other components in the system, see *Connections*, then perform the Channel 1 Verification Test.

Channel 1 Verification Test

Tune to Channel 1, a free preview channel, by pressing 0-0-1 on the front panel numeric buttons. If the system is working, you will hear XM programming and can proceed to activating the unit. If the front panel display reads "No Signal" or "Check Antenna," reposition the antenna until you hear music playing.

1. Power on the XM-R3 to make sure the unit has power. You should see a startup screen with ELAN and XM-R3 logos, followed by the default display (similar to that shown in *Figure 2-6*).
2. If connections have not been completed, power down the XM-R3, and connect audio cables, IR and RS232 control interfaces, see *Connections*.
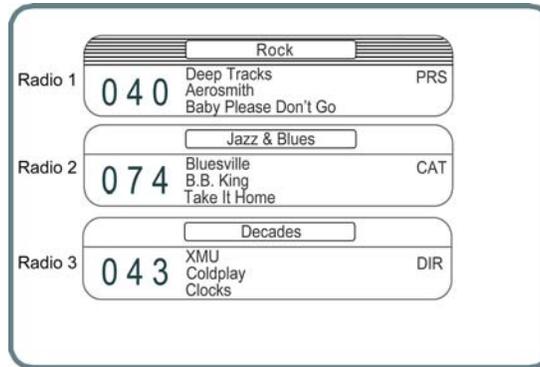
Figure 2-6 Default Screen Example

3. For indoor installations, align the Antenna as follows:
   a.) Set the antenna base on a flat horizontal surface.
   b.) Adjust the base of the antenna so that the XM logo is facing to the south if you are in the eastern half of the U.S. and to the south/southeast if you are in the western half.
   c.) Use the "Signal Strength" screen, *Figure 2-7*, to optimize antenna tilt angle and position.
   d.) If necessary, experiment with different locations near a south-facing window or outside.

> *NOTE: The antenna can also be attached vertically to an external or internal wall if it is more convenient than placing it on a horizontal surface outdoors.*

4. For outdoor installation or indoor wall mounting:
   a.) Holding the antenna up, find a wall location that ensures a strong signal.
   b.) Attach antenna to the wall using four screws.
   c.) Tilt the antenna fully back on the base, place the antenna base on the four screw heads with the antenna pivot at the top, and pull down approximately 1/4 inch until the base is firmly secured. Note that the XM logo will be upside down when the antenna is properly installed.
   d.) Tilt the antenna away from the wall/base until the signal strength is optimized.

Your antenna comes with 20 feet of cable. If the cable length is not sufficient to locate the antenna where there is a strong XM signal, a 100-foot amplifier cable extension kit (SRA-KIT) should be purchased. Up to two additional amplifiers (SRA-100) can be used for up to 300 total feet of antenna cable, see *Table 2-1*.

5. Power on your sound system and turn the amplifier to a low volume.
6. Power on XM-R3 and press the NUMERIC buttons 0-0-1 or 1-Select on the front panel, to tune to the free preview channel.

If the system is working, you will hear XM programming on channel 001 and can proceed to Step 7. If there is a problem with the antenna connection, the XM-R3 front panel display will read "Check Antenna." If the antenna does not have a clear path to the satellites, the front panel display will read "No Signal". Reposition the antenna until you XM programming.

7. Finish installing the antenna, by tightening four screws on the antenna base once the antenna is positioned.

Displaying Signal Strength

To assist in the installation of the unit, an accurate measure of the received signal strength of both XM satellites and the terrestrial signal may be displayed in bar graph form. To access this display, please follow the instructions below.

1. Press and hold the POWER button to enter SETUP mode.
2. Press the CHANNEL down button to highlight "Signal Strength," and then press the SELECT button. A signal strength screen appears, see *Figure 2-7*.

3.   The signal strength for each source is indicated using a bar graph (a longer bar is better), see *Figure 2-7*. In addition, a one word summary of the signal strength of each of the 3 sources appears to the right of the display. The antenna should be positioned to simultaneously maximize all three signal sources to the best extent possible.

> ***NOTE: Note that non-urban areas may have no terrestrial signal and that both satellites require an unobstructed southern sky view - SAT1 is stationed over the eastern United States, SAT2 is stationed over the western United States.***

```
                    SIGNAL STRENTH

         SAT1: █                    NOSIG
         SAT2: ██████               GOOD
         TER : ██████████           EXCEL


         Press SEL to Return
```
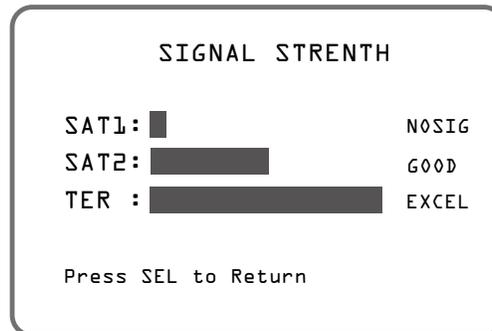
Figure 2-7 Signal Strength Screen

4.   When finished, press the SELECT button to return to the default display.

Activating XM-R3

After completing the *Channel 1 Verification Test*, you must activate your XM-R3 to access all XM channels. To do so, obtain the XM ID numbers (Radio ID numbers) of the unit. There is one ID for each of the three independent radios (hereafter referred to as "radio channels").   Activate your XM Radio service by: (a) going to http://activate.xmradio.com, or (b) calling XM Radio at 1-800-XM-RADIO (1-800-967-2346). A friendly customer care representative will assist you in activating your unit.

> ***NOTE: You can activate one, two or three XM receivers. You do not have to activate all three receivers at the same time. Receivers can be activated when needed by calling XM RADIO.***

Follow the instructions below to obtain the XM ID numbers and activate your XM Radio service. An alternate method, if you are already familiar with operation of the unit, is to tune each of the three modules to channel 0.

> ***NOTE: If the antenna is disconnected or the XM-R3 has no signal reception with the current antenna location, the XM-R3 will not allow the user to access the SETUP Mode. This assures proper antenna installation.***

1. Press and hold the POWER button for four (4) seconds to access the SETUP Mode Menu, see *Figure 2-8*.

```
ELAN XM-R3 SETUP

  ADD OR SKIP
  PARENTAL CONTROL
  XM ID NUMBERS
  SIGNAL STRENGTH
  RETURN
```
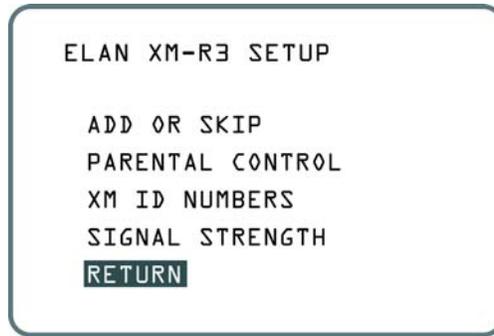
Figure 2-8 SETUP Mode Menu.

2. Press the CHANNEL PRESET down button to scroll to "XM ID NUMBERS," and then press the SELECT button. The XM3 ID NUMBERS screen, appears, see *Figure 2-9*.

   NOTE: It is important to notice that XM Radio IDs do not contain the letters I, O, S or F.

```
       XM ID NUMBERS

   RADIO 1: C6F24DM8
   RADIO 2: CVE540VC
   RADIO 3: 12B5404T

   Press SEL to Return
```
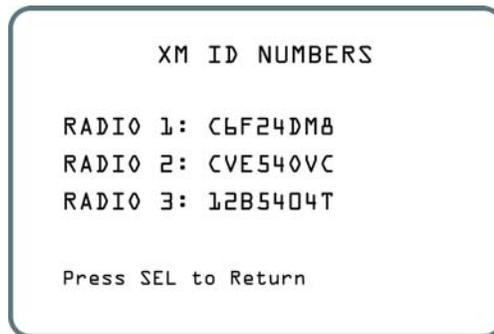
Figure 2-9 XM-R3 ID Numbers Screen

3. Record the 8 character ID numbers for each radio module in the space below.

   Radio 1 ID: _____

   Radio 2 ID: _____

   Radio 3 ID: _____

4. Press the SELECT button twice to return to the default display.
5. Activate your XM Radio service by: (a) going to http://activate.xmradio.com, or (b) calling XM Radio at 1-800-XM-RADIO (1-800-967-2346). A friendly customer care representative will assist you in activating your unit. Customers should have their XM3 ID Number (Radio ID number) ready, the Radio ID number is found by selecting channel 0 on the radio, or from the label attached to the back of the unit.

Connections

Audio Out

Using RCA-type interconnect cables, connect XM1, XM2 and XM3 audio outputs to any three pairs of inputs on an ELAN preamp controller (e.g. System6, System 12, Z•System) or A/V Receiver.

Make sure to connect left channel outputs to left channel inputs and right channel outputs to right channel inputs, see *Figure 2-10*.
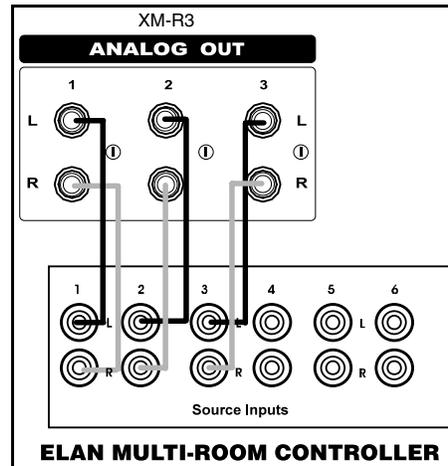
Figure 2-10 XM-R3 to ELAN Controller Connections

Digital Out

Using a fiber optic cable, connect either XM1, XM2 or XM3 digital outputs to any digital inputs on your home theater, A/V receiver or surround sound processor. *Figure 2-11*, shows the fiber optic cable is coming from the XM 1 Radio Modules.
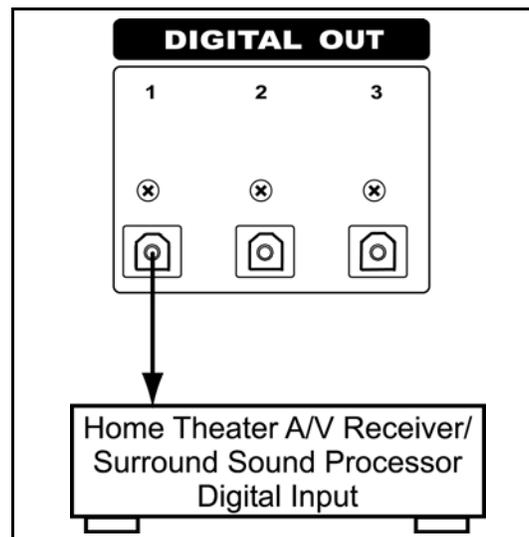
Figure 2-11 XM-R3 Digital Out

IR Connections

The XM-R3 can be controlled via IR using either the 3.5mm ('mini') IR jack on the back panel or the IR SENSOR on the front panel.

> NOTE: There are three discrete sets of IR codes for the XM-R3, one set for XM1, one set for XM2 and another set for XM3. This allows for independent control of all 3 XM-R3 radio modules. From an ELAN multi-room controller, these discrete codes are typically outputted from both the source-specific IR output ports and the IR "ALL" port. When more than one of XM-R3 radio modules are being used, it will be necessary to use the IR "ALL" port (See Figure 2-12 and Figure 2-13). However, if only one of the XM-R3 radio modules is being used, a single source specific IR output port can be utilized to control that one specific module.

Rear Panel "IR" Jack Connections:
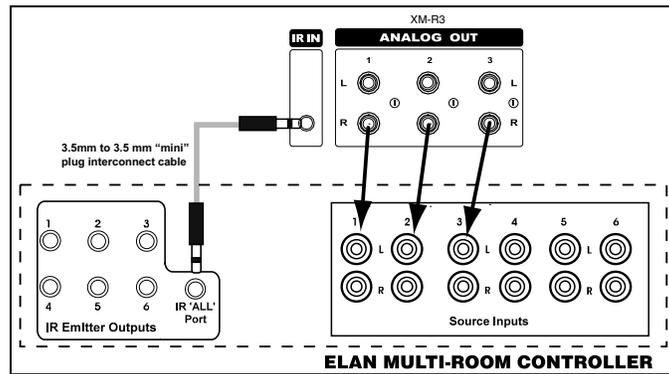
Figure 2-12 Rear Panel "IR ALL Port

Front Panel IR Sensor Connections:
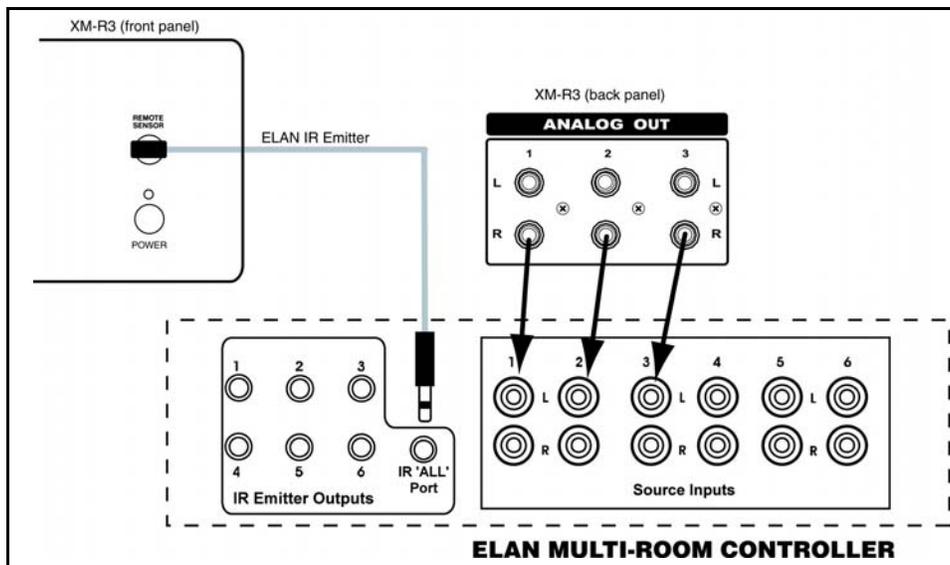
Figure 2-13 Front Panel "IR ALL Port

RS232 Connections

Connecting the XM-R3 Satellite Audio Receiver to ELAN's VIA!2-SS1 System Station or SC4 System Controller pro-vides RS232 serial communications in order to display real-time on-screen feedback of certain XM-R3 functions through the Two-Way Messaging Center. The Two-Way Messaging Center provides a 2-Line, 24 character alpha numeric display on VIA! Touch Panels. *Figure 2-14* shows an example using DB-9 connectors to connect an XM-R3 to an RS232 controller device.
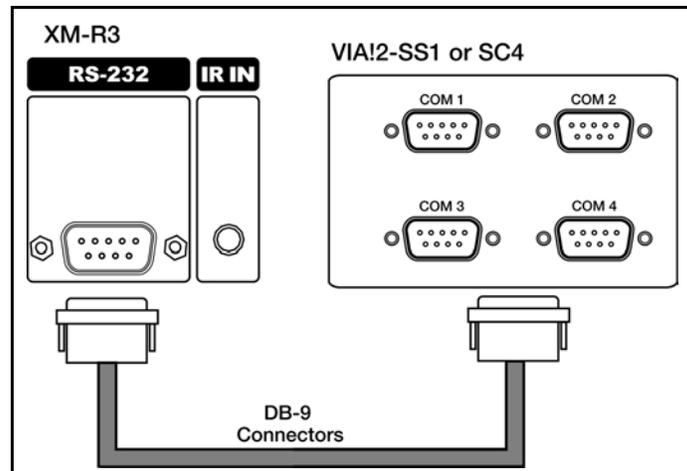
Figure 2-14 Rear Panel RS232 Connection

If connecting the XM-R3 to SS1/SC4 ports 3 or 4 a Null Modem 'gender bender' must be used, see *Figure 2-15*.
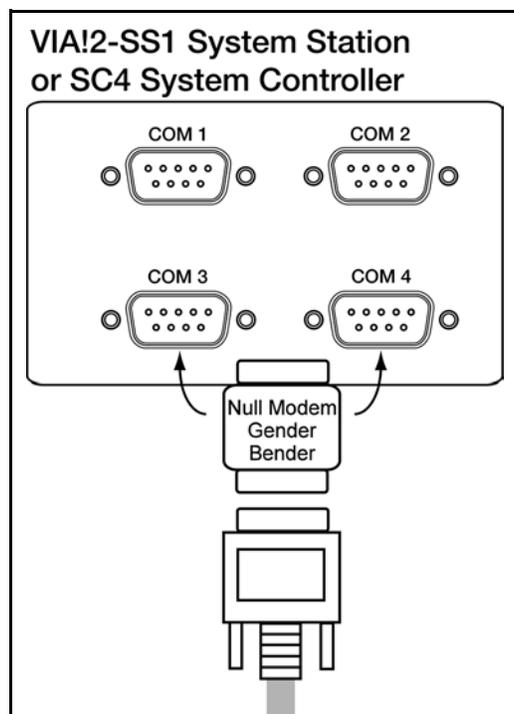
Figure 2-15 Null Modem Connection

CHAPTER 3: Operation

Front Panel Control

Figure 3-1 and *Table 3-1* give a brief description of each control and indicator on the front panel of the XM-R3 Satellite Audio Receiver.
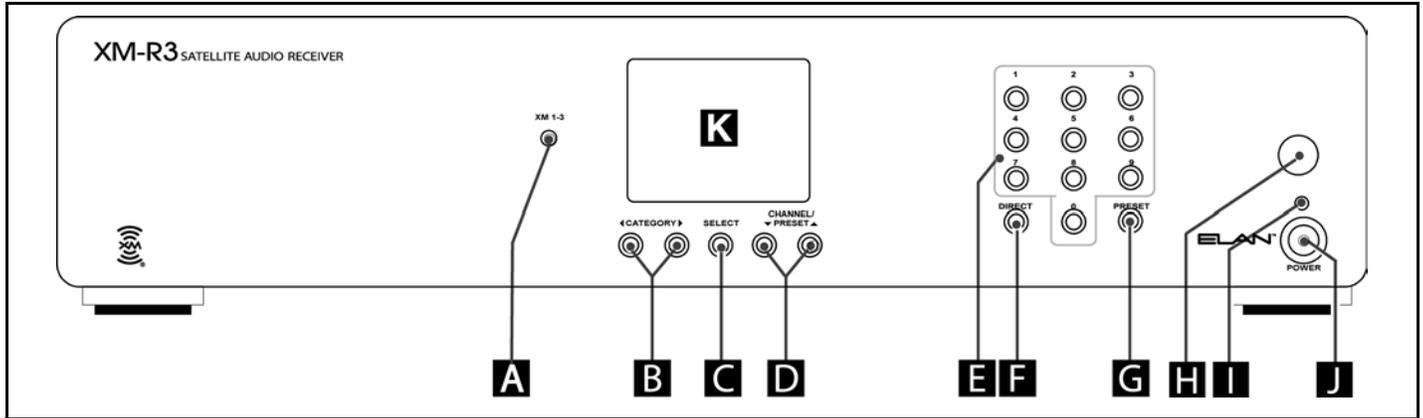
Figure 3-1 XM-R3 Front Panel Controls & Indicators

Table 3-1   Front Panel Controls & Indicators

Callout	Name	Function
A	XM 1-3 Button	Pressing and releasing this button changes control functionality for each of the three radio modules (XM1-3) independently. Radio modules are chosen in a circular list from XM1 to XM2 to XM3, then back to XM1.
B	CATEGORY Previous/Next Buttons	Tunes the active receiver module to specific audio categories such as "Rock", "Country", "Hits", "Decades", "Jazz", "News" and more. Highlights the current Category and Channel. Pressing again increments /decrements the radio module that is highlighted.
C	SELECT Button	Use this button to verify or confirm an intended operation or function. With the Main Screen displayed, this button will confirm an intended operation or function.
D	CHANNEL /PRESET Up/Down Buttons	In the Direct Mode select the next channel up or down when used. In Preset Mode, selects the next up or down preset stations that have been stored in the XM-R3 memory. In the Category Mode, selects the next up or down channel in the active category.
E	0-9 Numeric Buttons	These buttons are used for direct access of channels for the receiver (XM1-3) that is currently active. In Preset Mode, the numeric buttons on the remote control or front panel can be used to directly access preset stations that have been stored in the XM-R3 memory.

Table 3-1   Front Panel Controls & Indicators

Callout	Name	Function
F	DIRECT Button	Pressing this button places the XM-R3 into Direct mode (default mode), allowing the user to use the 0-9 numbered buttons to directly access a channel or the Up/Down buttons to increment or decrement the channels for the selected radio (XM1-3). Pressing this button again places the unit in to Category Mode (CAT), allowing the user to use the Up/Down buttons to increment or decrement the channels within the active Category.
G	PRESET Button	There are two operation functions for this button. Pressing and releasing this button places the unit into Preset Mode. Pressing and holding this button for 1-3 seconds puts the device in Preset Memory Mode. When in Preset Memory Mode the active radio stream display will begin to blink. This function begins the sequence to assign a Preset number to the current channel. Pressing any one of the numeric buttons (0-9), completes assigning the Preset.
H	REMOTE SENSOR	Receives IR information from infrared emitters and the remote control.
I	Power Indicator	This blue LED is lit when the unit is energized by pressing the POWER button on the XM-R3 unit or by pressing the POWER "ON" button on the hand-held remote control.
J	POWER button switch	Pressing this button alternately turns the XM-R3 ON and OFF. Pressing and holding this button for 4 seconds displays the XM-R3 Setup Menu.
K	LCD Display	Displays Channel, Category, Artist and Song Title information for each module. Displays configuration screens when in the Setup Mode.

Hand-Held Remote Control

The *Figure 3-2* and *Table 3-2* give a brief description of each control and indicator on the front panel of the XM-R3 Satellite Audio Receiver.
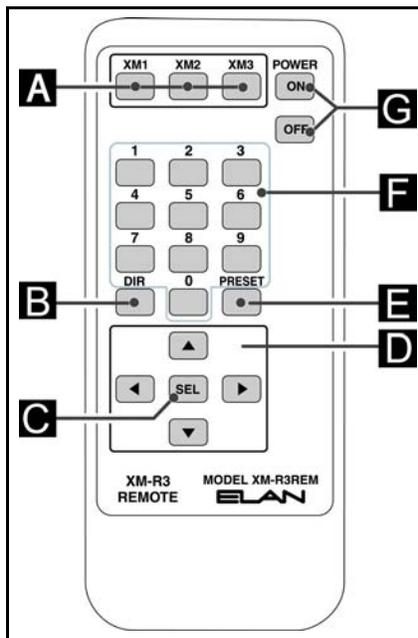
Figure 3-2 Hand-Held Remote Controls & Indicators

Table 3-2   Hand-Held Remote Controls & Indicators

Callout	Name Function	Description
A	XM 1-3 RECEIVER SELECT	Discrete button commands when pressed button changes control functionality for each of the three receiver modules (XM1-3) independently.
B	DIRECT Button	Places the XM-R3 into Direct mode, allowing the user to use the 0-9 numbered buttons to directly access a channel or the Up/Down buttons to increment or decrement the channels for the selected receiver (XM1-3). Pressing this button again place the unit in to Category Mode (CAT), allowing the user to use the Up/Down buttons to increment or decrement the channels through the active Category.
C	SELECT Button	Use this button to verify or confirm an intended operation or function. With the Main Screen displayed, this button will confirm an intended operation or function.
D	◀ ▶ ▲▼ Buttons	Pressing the ◀ or ▶ buttons tune the active receiver module to specific audio categories such as "Rock", "Country", "Hits", "Decades", "Jazz", "News" and more. Highlights the current Category and Channel. Pressing again increments or decrements the receiver module that is highlighted. The ▲ or ▼ buttons select the next channel up or down when used in the Direct Mode. In Preset Mode, selects the next up or down preset channels that have been stored in the XM-R3 memory. In the Category Mode, selects the next up or down channel in the active category.
E	PRESET Button	There are two operation functions for this button. Pressing and releasing this button places the unit into Preset Mode. Pressing and holding this button for 1-3 seconds puts the device in Preset Memory Mode. When in Preset Memory Mode the active radio stream display will begin to blink. This function begins the sequence to assign a Preset number to the current channel. Pressing any one of the numeric buttons (0-9), completes assigning the Preset.
F	0-9 Numeric Buttons	These buttons are used for direct access of channels for the receiver (XM1-3) that is currently active. In Preset Mode, the numeric buttons on the remote control or front panel can be used to directly access preset stations that have been stored in the XM-R3 memory.
G	Power ON / OFF buttons	Discrete button commands pressing the ON Button turns the XM-R3 on. Pressing the OFF Button turns the XM-R3 off. Pressing and holding the OFF Button for 4 seconds displays the XM-R3 Setup Menu.

Front Panel Operation

The XM-R3 provides intuitive control of its various functions via the front panel buttons and the hand-held remote control, IR, and the RS232 port for local and remote operation. The XM-R3 is essentially three completely independent XM satellite tuners (modules), each of which can be tuned independently so that different XM stations can play in different rooms.

Within each module you can:

- Change channels and programming categories

- Enter in a channel number to tune to it directly

- Set and tune to preset channels - 10 for each module

The SETUP menu is also used to block specific channels, as well as add and skip channels. Instructions for all these features are provided in this chapter.

Powering On The XM-R3

With the unit and antenna properly installed, and the unit activated, press and release the POWER button to turn on the unit. The XM-R3 and ELAN logos will appear for 2 seconds, followed by the default display. (If the SETUP menu appears, you held the POWER button too long. Press the SELECT button to return to the default display.)

Changing Radio Modules

The XM1-3 button is used to select the radio module for which you want to change categories or channels. Press the XM1-3 button to cycle through the three modules in sequence. For example a highlighted receiver module (Module 1) is shown on the default display, *Figure 3-3*.

The receiver modules corresponding to audio Outputs 1, 2, and 3 are numbered from top to bottom. As shown in *Figure 3-3*, Module 1 is at the top of the display, Module 2 in the middle, and Module 3 at the bottom.

Changing Categories

The audio channels of the XM service are conveniently organized into categories such as Hits, Rock, News, Sports, etc. The category of each module is displayed in the title box of each module. Press the CATEGORY previous/next buttons to tune to a different category, and then press the SELECT button to confirm the category selection. If the SELECT button is not pressed the active radio module will return the previously assigned station.

> *NOTE: The Category name, Channel name, Artist name, and Song Title information in the display changes to reflect the new category.*

Changing Tuning Mode

XM-R3 supports three modes of channel tuning: Direct (default), Category and Preset. When the unit is in Direct mode you can scroll through and select any channel in the entire XM lineup regardless of what category the channel belongs to. Direct mode is the default mode at power up. When you switch to Category mode, the unit scrolls only through the channels in the currently selected category. This is particularly useful when, for example, you just want to listen to and scroll through news channels only. Preset mode is entered by selecting the PRESET button.

To switch between the two tuning modes, press the DIRECT button. By default the unit is in Direct mode. When you press the DIRECT button the unit changes to Category mode. You can tell you're in Category mode because the abbreviation "CAT" is added to line 2 of the front panel display, as shown in *Figure 3-3*. Press DIRECT again to return to Direct mode.

Changing Channels

You can change programming channels in either Direct, Preset or Category mode using any of the following:

- Channel Up/Down to scroll through channels
- Numbered buttons to tune directly to a specific channel
- Preset button to tune to a preset channel

Use the CHANNEL Up/Down buttons to scroll through the channels within a module and/or category. Simply scroll to the channel you desire, and then press the SELECT button to confirm the channel selection. You will notice that the Channel Name, Artist Name, and Song Title information in the display change to reflect the new channel.

You can also tune to a specific channel directly simply by pressing in its channel number using the NUMERIC buttons.

- When you enter a three-digit channel number, such as 1-5-5, the XM-R3 automatically changes to that channel.
- When you enter a two-digit channel number, such as 1-8, you must then press the SELECT button for the channel change to take effect. (If you enter the channel number as 0-1-8, the XM-R3 will make the change automatically.)

When preset channels have been set, you can access those presets simply by pressing the PRESET button, along with an appropriate numeric button. For example, if preset 0 were set to Rock, preset 1 to Hits, and preset 2 to News, you could jump to the News channel quickly by pressing "PRESET-2."

Setting and Recalling Presets

Each module can have 10 channel presets (numbered 0 to 9). To assign a preset for the selected module, first tune to a desired audio channel. Press and hold the PRESET button for 1 to 3 seconds, followed by a numeric button. For example, if you want to set channel 44 to preset 9, press and hold the PRESET button for 1-3 seconds, then press the numeric button "9." Note that the title bar display changes to "PRESET" to let you know that XM-R3 is ready to assign a preset channel.

To recall a stored preset, press (but don't hold) the PRESET button and then the desired numeric button (0-9).

Configuring Options

The XM-R3 SETUP Mode Menu allows you to configure XM-R3 options (blocking, skipping, and adding channels) and obtain the unit's XM ID numbers for activation.

Default Display

The default display, *Figure 3-3*, provides information about the channel each module is currently tuned to, including category name, channel number, channel name, artist name, preset number and song title.
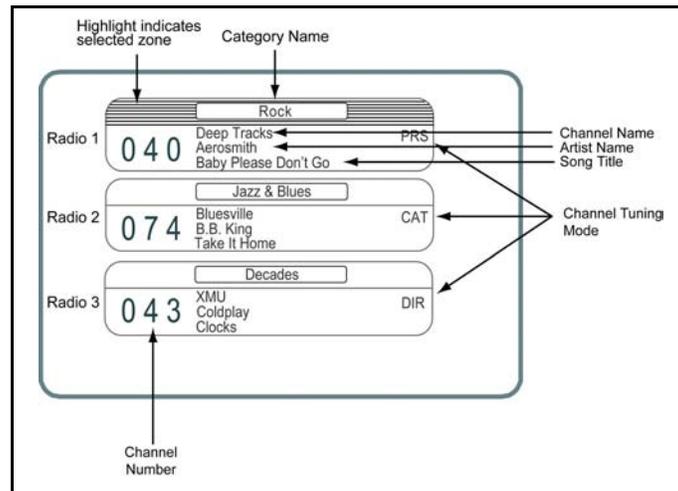

Figure 3-3 Default Display

Entering SETUP Mode Menu

To enter the SETUP mode, press and hold the POWER button for four seconds. The Setup Mode Menu appears, see *Figure 3-4*.

> **NOTE: In SETUP, the CHANNEL Up/Down buttons are used to scroll though the menu options and the SELECT button is used to confirm selections.**

```
ELAN XM-R3 SETUP

  ADD OR SKIP
  PARENTAL CONTROL
  XM ID NUMBERS
  SIGNAL STRENGTH
  RETURN
```

Figure 3-4 SETUP Mode Menu.

Skipping Channels

In the course of using the XM-R3 you may find there are specific channels you prefer not to listen to and would rather skip over. Using the XM-R3's SKIP feature, you can program the unit to skip over these channels when scrolling using the CHANNEL Up/Down buttons or remote control, see *Figure 3-5*.

> *NOTE: You can still access the "skipped" channels using the direct tune method.*

To configure a channel to be skipped when scrolling:

1. Press and hold the POWER button to enter SETUP mode.

```
        ADD and SKIP
           ZONE 1

  70    Real Jazz        SKPd
Press SEL to Return
UP/DN to select Channel
LF/RT to change Status
Zone to change Zone
```
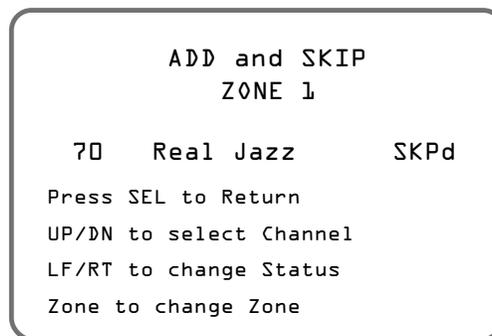
Figure 3-5 Skipped Channels

2.   Press the CHANNEL down button to highlight "ADD OR SKIP" and then press the SELECT button, see *Figure 3-3*.
    •   Use the CHANNEL up/down buttons to scroll to the channel you want to skip (or add back a currently skipped channel).
    •   Use the CATEGORY left/right buttons to toggle the status between skipped "SKPd" or not skipped "NRML".

3.   Add and Skip as many channels as you prefer. When finished, press the SELECT button to return to the default display.

Parental Control

Using the Parental Control feature, you can block specific channels so that can be accessed only with a pass code that you define. Parents find this feature useful to prevent their from children accessing specific content.

To block a channel:

1. Press and hold the POWER button to enter SETUP Menu Mode.

2.   Press the CHANNEL down button to highlight "PARENTAL CONTROL," and then press the SELECT button. The ENTER PASSWORD screen appears, see *Figure 3-6*.

```
        ENTER PASSWORD

             XXXX


     Press SEL to Accept
            PRESET to Exit
```
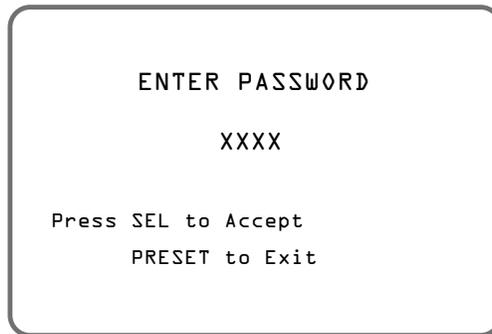
Figure 3-6 Enter Password Screen

"XXXX" will appear for the password. The default password is 1111. You must set a password (if this is the first time at this menu) or enter a previously set password to proceed. Be careful to use a familiar number. Write this number down for future reference, **Pass code**: _____, see *Figure 3-6*.

3.   Enter 4 digits with the numeric buttons or remote, and then press SELECT. The Parental Control menu displays, *Figure 3-7*. To exit this menu without setting or entering the password and return to the previous menu, press the PRESET button.

```
       PARENTAL CONTROL

    CHANGE PASSWORD
    BLOCK CHANNELS
    RETURN
```
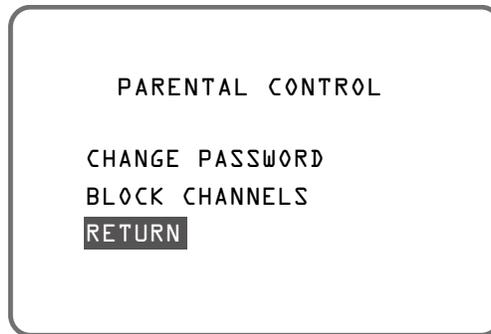
Figure 3-7 Parental Control Menu

4.   Scroll to highlight "BLOCK CHANNELS", and then press the SELECT button. A menu similar to that shown below in *Figure 3-8* appears.

```
      PARENTAL CONTROL
           ZONE 1

   70   Real Jazz      BLKd
  Press SEL to Return
  UP/DN to select Channel
  LF/RT to change Status
  Zone to change Zone
```
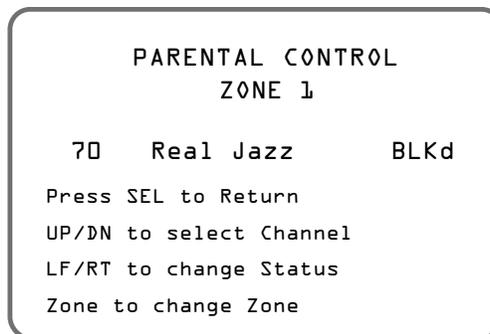
Figure 3-8 Blocked Channel Screen

•   Use the CHANNEL Up/Down buttons to scroll to the channel you want to block.

- Use the CATEGORY Left/Right buttons to toggle the status between blocked "BLKd" or unblocked "NRML".

5. Block (or unblock) as many channels as you choose. When finished, press the SELECT button to return to the default display.

Displaying XM ID Numbers

After initial activation it is unlikely that you will need to access the XM ID numbers again. If you do, please follow the instructions below.

1. Press and hold the POWER button to enter SETUP mode.
2. Press the CHANNEL down button to highlight "XM ID NUMBERS," and then press the SELECT button, see *Figure 3-9*.

```
        XM ID NUMBERS

   RADIO 1: C6F24DM8
   RADIO 2: CVE540VC
   RADIO 3: 12B5404T


   Press SEL to Return
```

Figure 3-9 XM-R3 ID Numbers Menu

3. Press the SELECT button twice to return to the default display.

Displaying Signal Strength

To assist in the installation of the unit, an accurate measure of the received signal strength of both XM satellites and the terrestrial signal may be displayed in bar graph form. To access this display, please follow the instructions below.

1. Press and hold the POWER button to enter SETUP mode.
2. Press the CHANNEL down button to highlight "Signal Strength," and then press the SELECT button. A signal strength screen appears, see *Figure 3-10*.
3. The signal strength for each source is indicated using a bar graph (a longer bar is better), see *Figure 3-10*. In addition, a one word summary of the signal strength of each of the 3 sources appears to the right of the display. The antenna should be positioned to simultaneously maximize all three signal sources to the best extent possible.

NOTE: Note that non-urban areas may have no terrestrial signal and that both satellites require an unobstructed southern sky view - SAT1 is stationed over the eastern United States, SAT2 is stationed over the western United States.

```
        SIGNAL STRENTH

   SAT1: ▮                 NOSIG
   SAT2: ▬▬▬▬             GOOD
   TER : ▬▬▬▬▬▬           EXCEL

   Press SEL to Return
```
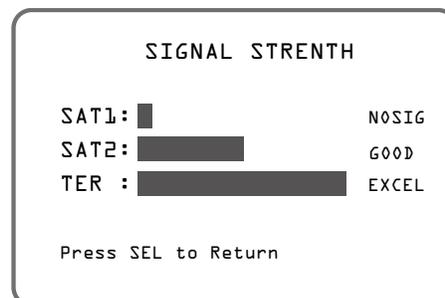
Figure 3-10 Signal Strength Screen

4. When finished, press the SELECT button twice to return to the default display.

ELAN System Control of the XM-R3

The XM-R3 Satellite Audio Receiver can be controlled using ELAN keypads and/or VIA!® Touch Panels. Refer to the following sections of this manual for detailed information on the operation of the XM-R3 using these interfaces.

Controlling the XM-R3 Using VIA!® Touch Panels

First, you will need to know if your XM-R3 is being controlled via IR signals or RS232 serial communications. This can easily be determined by seeing if there is a 2-way 'Message Center' displayed on your VIA! Touch Panels, see *Figure 3-11*.

Figure 3-11 Typical VIA RS232 Screen

If you do not see the Message Center, the XM-R3 is being controlled with IR signals and you can refer to the section entitled *IR Control*.

NOTE: VIA! Touch Panels can be configured in many ways. The layouts shown herein are the factory-default control screens. Your ELAN installer/programmer may have added, deleted or moved any number of buttons depending on your needs and/or input. Also note that the motif that is shown ('Trek') is just one of many styles available and your VIA! Touch Panels may look quite different than the ones depicted here.

RS232 Serial Control

As explained at the beginning of this section, VIA! Touch Panels can be configured in many ways. The XM-R3 can also be controlled by a two-way RS232 serial controller such as ELAN's VIA!2-SS1 System Station or SC4 System Controller. One major advantage to RS232 serial communications is the ability to display real-time on-screen feedback of many XM-R3 functions, using the Two-Way Messaging Center, see *Figure 3-12*. The Two-Way Messaging Center provides a 2-Line, 24 character alpha numeric display.
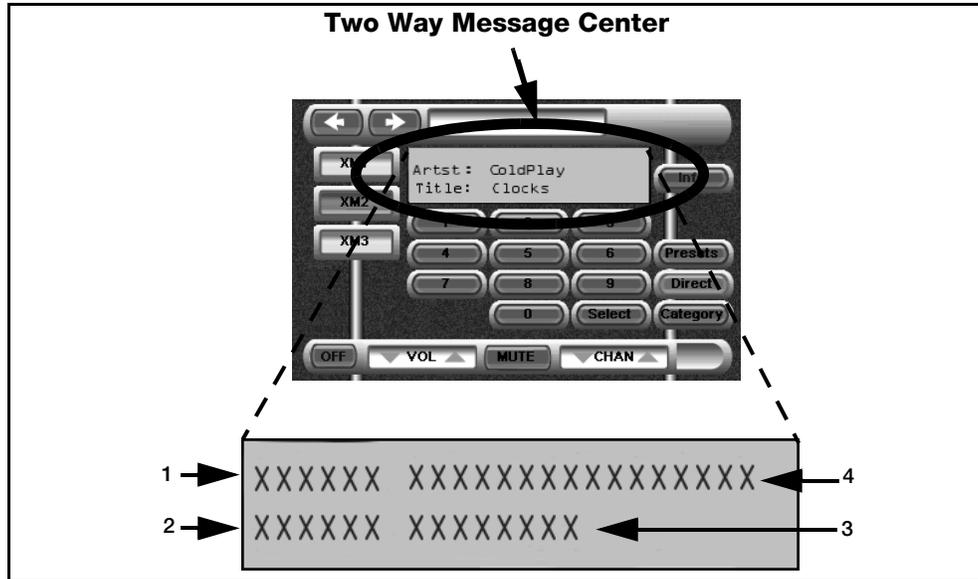
Figure 3-12 Two-Way Message Center

Table 3-3   Two-Way Messaging Center Layout

Item #	Display Text
1	6-character alpha-numeric display, shows the selected channel number or artist label, for example channel 46 is displayed "CH046:" or "Artst:"depending on which Two-Way Message Center Screen is being displayed by pressing or tapping the "Info" Button.
2	6-character text display, shows either "Title:" or "Ctgry:" depending on which Two-Way Message Center Screen is being displayed; Artist/Title or Channel Name/Category.
3	Displays up to 8 characters for the Category or up to 16 characters for the current Track Title, depending on which Two-Way Message Center Screen is being displayed; Artist/Title or Channel Name/Category.
4	Displays up to 16 characters of the current Artist or Channel Name, depending on which Two-Way Message Center Screen is being displayed.

See VIA!TOOLS Help file for instructions on how to load the pre-written two-way RS232 drivers for an ELAN VIA!2-SS1 System Station or SC4 System Controller.

These example screens show the factory-default layouts with the 'Trek'motif. For examples of the RS232 XM Pages, see *Figure 3-13*.
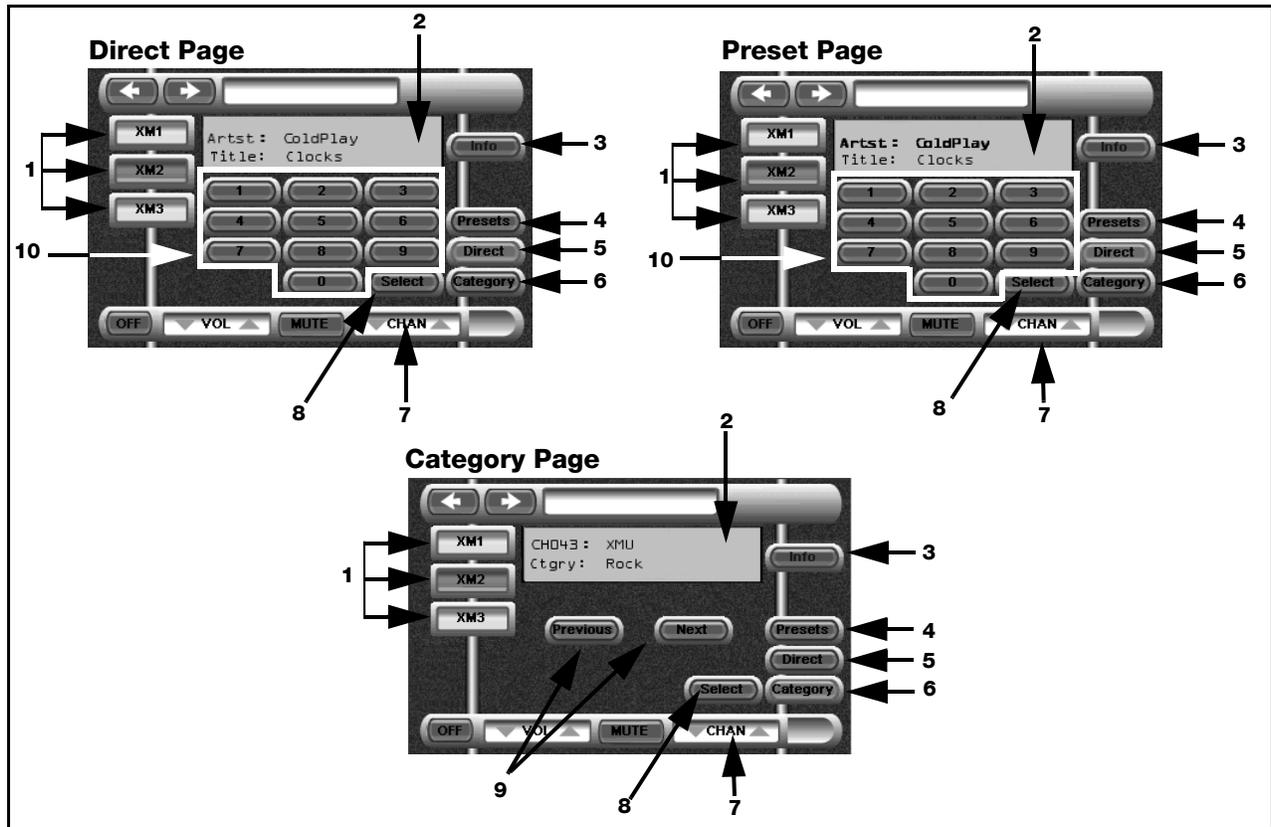
Figure 3-13 RS232 XM-R3 Pages

The following serial control features in *Table 3-4* are available from the RS232 XM-R3 Pages:

Table 3-4   Controls for RS232 XM-R3 Pages

Item #	Button	Function
1	XM 1-3 RECEIVER SELECT Buttons	Discrete buttons, changes control functionality for each of the three XM streams (XM1-3) independently.
2	Two-Way Messaging Center	Provides real-time on-screen feedback of all XM-R3 functions, when using RS232 Serial Control.
3	Info	Toggles the 2-Way Messaging Window between Artist/Song Title and Channel/Category.
4	Presets	Pressing and releasing this button places the unit into Preset Mode and changes the VIA Touch Panel screen to the Presets Page. Use the numeric buttons to directly access the 10 previously assigned preset channels. Use the ▲ CHAN ▼ buttons to move up or down through the 10 preset channels.
5	Direct	Places the XM-R3 into Direct mode, allowing the user to use the 0-9 numbered buttons to directly access a channel or the Up/Down.
6	Category	Pressing this button displays the unit in to Category Screen, allowing the user to use the Up/Down buttons to increment or decrement the channels through the active Category.

Table 3-4   Controls for RS232 XM-R3 Pages

Item #	Button	Function
7	▲ CHAN ▼	Use the Channel Up / Down buttons to select the next channel up or next channel down when the in the Direct Mode, or the next favorite when in the Preset mode. In the Category Mode, selects the next up or down channel in the currently active category.
8	SELECT Button	Use this button to verify or confirm an intended operation or function. With the Direct or Category Page displayed, this button will confirm an intended operation or function.
9	Next/Previous Buttons	Pressing the Next or Previous buttons tune the active receiver module to next or previous audio category such as "Rock", "Country", "Hits", "Decades", "Jazz", "News" and more. Available only on the Category Page.
10	0-9 Numeric Buttons	These buttons are used for direct access of channels for the radio (XM1-3) that is currently active when in Direct or Category Mode. To enter a channel number enter all three digits: for example, to select channel 42, enter 0-4-2 or 4-2 followed by the Select button to complete the action. On the Presets Page these buttons are used to select or assign the 10 preset stations (0-9).

Pre-Configured Templates

Pre-configured VIA!Tools templates for XM 1, XM 2 and XM 3 with serial commands already loaded under each button are automatically imported. Each template has three pages, a Direct page for direct access and mode control, a Presets page that allows you to select up to 10 preset channels and a Category page that allows you to choose channels within a specific category.

The buttons are factory defaulted with the following serial commands: *Preset* (places the XM-R3 into Preset mode), *Direct* (places the XM-R3 into Direct mode) and Category (places the XM-R3 into Category mode). These sequences can be easily modified with VIATOOLS setup software. Two-way serial control of the XM-R3 provides the end user with real-time on-screen feedback of all XM-R3 functions from a VIA! Touch Panel.

IR Control

The IR XM Screen, see *Figure 3-14*.
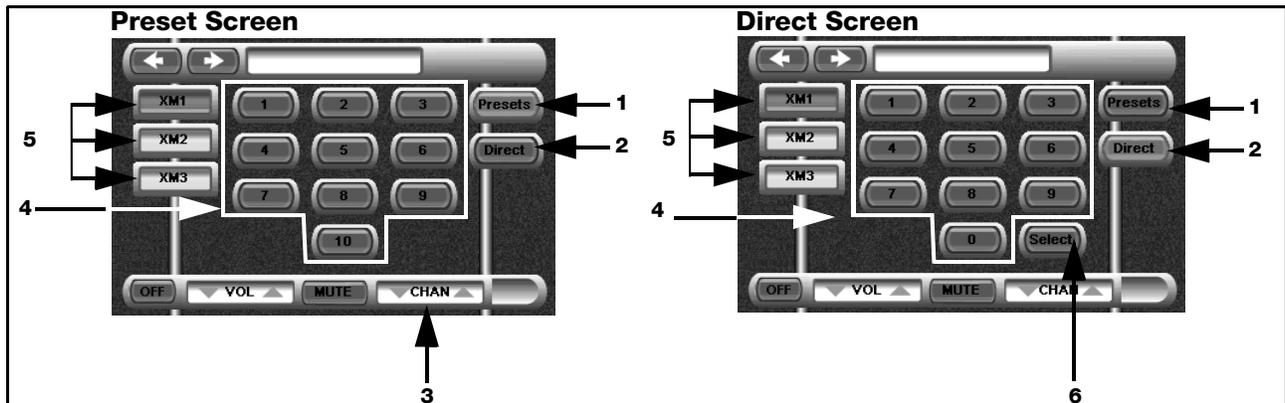
Figure 3-14 IR XM-R3 Screens

The following IR control features in _Table 3-5_ are typical from the IR XM-R3 Screens:

Table 3-5   IR XM-R3 Screen Controls

Callout	Button	Function
1	Presets	Pressing and releasing this button places the unit into Preset Mode and changes the VIA Touch Panel screen to the Presets Page. Use the Numeric buttons to directly access the 10 previously assigned preset channels. Use the ▲ CHAN ▼ buttons to move up or down through the 10 favorite channels.
2	Direct	Pressing this button places the XM-R3 into Direct mode and changes the VIA! Touch Panel display to the Direct page. Use the 0-9 numeric buttons to directly access a channel. Use the ▲ CHAN ▼ buttons to move up or down through the channels for the active receiver module.
3	▲ CHAN ▼	Use the Channel Up / Down buttons to select the next channel up or next channel down when the in the Direct Mode, or the next preset favorite with in the Preset mode.
4	0-9 Numeric Buttons	Used for direct access of channels for the receiver (XM1-3) that is currently active. In Preset Mode, the numeric buttons are used to directly access preset stations that have been stored in the XM-R3 memory.
5	XM 1-3 RECEIVER SELECT Buttons	Discrete buttons, change control functionality for each of the three receiver modules, (XM1-3) independently.
6	Select	Use this button to verify or confirm an intended operation or function, or to complete the function for entering a channel number.

ELAN System Control of the XM-R3 Using ELAN Keypads

The XM-R3 can also be controlled from ELAN keypads. Unlike VIA! Touch Panels, there are no messages displayed on a keypad to inform you of the status of the XM-R3. Therefore, it is important to keep keypad control as simple and user friendly as possible. A basic keypad template that allows for selection of XM-R3 presets is available for your installer to download to ELAN keypads. _Figure 3-15_ shows some typical ELAN keypads.

ELAN Z100/150 Keypads   **ELAN Z250 Keypad**

Figure 3-15 ELAN Keypads

Table 3-6 lists the preset IR commands for the ELAN Z Keypads.

Table 3-6   Keypad Functions

XM-R3 IR	Z100/150	Z200/250
Preset - Channel Up/Down	Control ▲/▼	Control ◄◄/►►I
Preset - Numeric Select	0-9	0-9

RS232 Protocol

This section describes the commands needed to access various functions of the XM-R3 Satellite Audio Receiver via its rear RS232 serial port. The communications channel is in RS-232 format.

Interface:

A DB9 DSUB connector is used for connection.
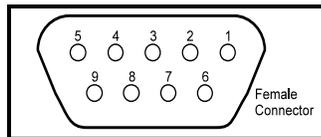
Female Connector
Pin2: Transmission Output (TX)
Pin3: Reception Input (RX)
Pin5: GND

Figure 3-16 DB9 DSUB Connector

Serial Commands

Table 3-7 provides the XM-R3 port settings.

Table 3-7   Port Settings

Baud Rate	9600
Stop Bits	1
Parity	None
Byte Size	8

Commands

All commands supported via the RS232 port are either global or explicitly specify the module of the receiver to be controlled. The format of these commands is, for example, *CUz, for "Channel Up" where "z" is the radio module the controller is incrementing. Note that the front IR receiver and hardwired IR commands also support the concept of "current radio module" commands.

Each command string sent to the receiver must start with an {*}(hex 2A) and be terminated with a carriage return {cr}(hex 0D). The sender may also optionally send a line feed {lf}(hex 0A) after the carriage return. A line feed is not required, and if sent will be ignored - parsing of command strings sent to the receiver terminates when a carriage return is received.

A circular buffer 256 bytes deep is used to buffer the commands received until they can be processed. A terminating {cr} must end each command, even if multiple commands are sent back to back. For example, to do a Channel Up followed by Select, send CU1{cr}SL1{cr}. Any spaces (20 hex) or nulls (00 hex) sent will simply not be stored in the buffer and will have no adverse effect. The buffer is intended to allow back to back commands, or inputs from users in different zones at the same time. It is still possible to overflow the buffer if, for example, a user pounds on the Channel Up button 100 times, not waiting for the channel up action to occur after each button push.

Each response string sent will start with an {*} and terminate with a {cr}{lf}. Commas {,} are used to delimit separate fields in long strings. In addition the following nomenclature is used.

z	=	(radio module number) valid values are 1,2,3
ccc	=	(channel number) valid values are 001 - 223 (must have leading zeros)
pppp	=	(password) valid values are 0000 - 9999 (must have leading zeros)

NOTE: In most cases of a syntax error in the command sent, there will be no response.

Table 3-8   Global Command Group

Command Syntax	Name	Description	Return
*MU1	Mute On	mutes audio outputs on all radio modules	command echo
*MU0	Mute Off	enables audio outputs on all radio modules	command echo
*PR	Power	***PR0{cr}** Turns the unit off, stopping programming in all 3 radio modules ***PR1{cr}** Turns the unit on, providing programming in authorized radio modules. ***PR{cr}** Queries the current powered state of the receiver	***PR0{cr} {lf}** if unit is off ***PR1{cr} {lf}** if unit is on
*PW	Password	Changes the current password**.** If ***PW,pppp,wwww,wwww{cr}** is sent, where pppp is the old 4 digit password and wwww is the new 4 digit password, the password will be change to wwww. The new password is sent twice for verification.	***PW1{cr} {lf}** New password accepted ***PW0{cr} {lf}** failed (old password is incorrect

*SV	Signal Value	This command will return *SV,n{cr} {lf} where n is one a digit signal strength received by the unit, in the range of 0 to 3.
		    0 - No Signal
		    1 - Poor Signal
		    2 - Good Signal, and
		    3 - Excellent Signal.	

Table 3-8   Global Command Group

*UN1	Unsolicited Data ON	Enables the return of unsolicted data.	
*UN0	Unsolicited Data OFF	Disables the return of unsolicted data.	
*UNz	Unsolicited Data	This data will be returned whenever a song changes or a channel is changed only after the "Unsolicited Data ON" command (*UN1) is executed. Channel name, artist name, and song title fields will contains error messages when an error occurs.	UNz,ccc,category,channel name,artist name,song title{cr} {lf}

Table 3-9   Radio Module Specific Commands

Command Syntax	Name	Description	Returned
*CHz	Direct Tune Channel Number - Query Set	This command sets or queries the current channel number for each radio module. The number following the *CH is the radio module (i.e. CH1 queries or sets the channel on radio module 1). *CHz sent without a parameter will query the current channel number for the requested radio module. Valid parameters for z are 1,2,3. valid parameter for ccc are 001 - 247. (Numbers up to 255 may be valid in the future as XM adds channels.)*CHz{cr} Queries the current channel number on radio module z. If *CHz,ccc{cr} is sent, the receiver will change to that channel for the requested zone and return the above string syntax. If the channel number sent (ccc) is not valid, the response will be *CHz,0{cr} {lf}.	*CHz,ccc,catagory,channel name,artist name,song title{cr} {lf}
*CDz	Channel Down (decrement)	This command decrements the channel for the radio module specified. For instance, *CD1 will decrement the audio channel for Radio Module 1. If the z specifier is not sent it will decrement the currently active radio module. In this way, channels may be changed by a remote controller that does not keep track of the current channel the receiver is set to. Note that this command does not tune to the decremented channel it only returns the following information. If in Preset Mode: *PSz,n,ccc,catagory,channel name,artist name,song title{cr}{lf}. Example: *CU1,007,Pop,Totally 70's,Earth, Wind and Fire,Can't Hide Love{cr} The above string will be returned after the selected channel remains stable for one second. Nothing will be returned with rapid decrements.	*CDz,ccc,catagory,channel name,artist name,song title{cr} {lf}

Table 3-9   Radio Module Specific Commands

Command Syntax	Name	Description	Returned
*CUz	Channel Up (increment)	This command increments the channel for the radio module specified. For instance, *CU1 will increment the audio channel for Radio Module 1. If the z specifier is not sent it will increment the currently active radio module. In this way, channels may be changed by a remote controller that does not keep track of the current channel the receiver is set to. Note that this command does not tune to the incremented channel it only returns the following information. Example: *CU1,007,Pop,Totally 70's,Earth, Wind and Fire,Can't Hide Love{cr} If in Preset Mode: *PSz,n,ccc,catagory,channel name,artist name,song title{cr} {lf} The above string will be returned after the selected channel remains stable for one second. Nothing will be returned with rapid decrements. Use the *SLz command to tune to the channel. The *SLz command must be received within 4 seconds of the last *CUz command to force a direct tune.	*CUz,ccc,catagory,channel name,artist name,song title{cr} {lf}
*CGDz	Category Down (decrement)	This command decrements the category for the radio module specified. For instance, CGD1 will decrement the audio category for Radio Module 1. If the z specifier is not sent it will decrement the currently active radio module. In this way, category may be changed by a remote controller that does not keep track of the current category the receiver is set to. Note that the current category type can be determined using the QZz command. Example: *CGD1,007,Pop,Totally 70's,Earth, Wind and Fire,Can't Hide Love {cr} {lf} The above string will be returned after the selected category remains stable for one second. Nothing will be returned with rapid decrements. The Channel number returned is the first channel in the category found by decrementing.	*CGDz,ccc,catagory,channel name,artist name,song title{cr} {lf}

Table 3-9   Radio Module Specific Commands

Command Syntax	Name	Description	Returned
*CGUz	Category Up (increment)	This command increments the category for the radio module specified. For instance, CGU1 will increment the audio category for Radio Module 1. If the z specifier is not sent it will increment the currently active radio module. In this way, category may be changed by a remote controller that does not keep track of the current category the receiver is set to. Note that the current category type can be determined using the QZz command. Example: *CGU1,007,Pop,Totally 70's,Earth, Wind and Fire,Can't Hide Love{cr} {lf} The above string will be returned after the selected category remains stable for one second. Nothing will be returned with rapid increments. The Channel number returned is the first channel in the category found by incrementing.	*CGUz,ccc,cat-agory,channel name,artist name,song title{cr}{lf}
*PPz	Preset program	This command stores a preset for the selected zone. If *PPz,n{cr} is sent, where n is the preset number 0 - 9, the channel currently tuned to in the selected zone will be stored as Preset number n .	*PPz,1{cr}{lf} if successful.
*PSz	Preset select	This command selects or stores a preset for the selected radio module. If *PSz,n{cr} is sent, where n is the preset number 0 - 9, the channel in the selected radio module will be changed to the stored channel in preset n.	*PSz,n,ccc,cat-agory,channel name,artist name,song title{cr}{lf}) *PSz,0{cr}{lf} if unable to tune to the channel.
*QZz	Query Radio Module Information	This command dumps all pertinent information about the specified radio module including Channel Name, Category Name, Artist Name, Song or Program Title. This information may be used for display on a remote control panel. QZz,ccc,nnn{cr} where z is radio module number, nnn is number of ascending channels to get data from, starting with ccc channel. nnn must less than or equal to 20. If a number greater than 20 is entered, it will be truncated to 20.	QZz,ccc,(channel name),(category name),(artist name),(song title),ccc+1,(channel name),(cataegory name),(artist name),(song title),ccc+2,.....{cr}{lf}
*SKz	Skip Channel	This command removes the specified channel number from the universe of channels allowed when using Up/Down commands. Note that unlike parental blocked channels skipped channels may still be tuned to directly by their channel number. The number following the SK is the radio module (i.e. SK1 skips the channel on Radio Module 1). Valid parameters for z are 1,2,3. If SKz,ccc{cr} is sent, the receiver will skip channel ccc for the requested radio module z.	*SKz,1{cr} {lf} if skip is successful *SKz,0{cr} {lf} channel number is invalid (> 255)

Table 3-9   Radio Module Specific Commands

Command Syntax	Name	Description	Returned
*USz	Unskip Channel	This command adds the specified channel number to the universe of channels allowed when using Up/Down commands. Parental blocked channels cannot be added. The number following the *US is the radio module (i.e. *US1 unskips the specified channel on Radio Module 1). Valid parameters for z are 1,2,3. If *USz,ccc{cr} is sent, the receiver will unskip channel ccc for the requested radio module x.	*USz,1{cr}{lf} if unskip is successful *USz,0{cr}{lf} if channel number is invalid (>255)
*LKz	Lock Channel	This command locks out the specified channel number from the universe of channels allowed when using Up/Down commands or direct tune commands. This command requires a 4 digit password that is previously programmed via the front panel or the *PW command. The number following the *LK is the radio module (i.e. *LK1 locks the channel on Radio Module 1). Valid parameters for z are 1,2,3. pppp is the 4 digit password. If *LKz,ccc,pppp{cr} is sent, the receiver will lock channel ccc for the requested radio module z if the password pppp is correct.	*LKz,1{cr}{lf} if lock is successful *LKz,0{cr}{lf} if password is incorrect
*ULz	Unlock Channel	This command unlocks the specified channel number from the universe of channels allowed when using Up/Down commands or direct tune commands. This command requires a 4 digit password that is previously programmed via the front panel or the *PW command. The number following the *UL is the radio module (i.e. *UL1 unlocks the channel on Radio Module 1). Valid parameters for z are 1,2,3. pppp is the 4 digit password. If *ULz,ccc,pppp{cr} is sent, the receiver will unlock channel ccc for the requested radio module z if the password pppp is correct.	*ULz,1{cr}{lf} if unlock is successful *ULz,0{cr}{lf} if password is incorrect
*SLz	Select Command	This command is the equivalent of the select button on the front panel. It can be sent after a *CD, *CU, *CGD and *CGU command to cause the receiver to direct tune to the last channel sent by these commands. This command must be sent within 4 seconds of the previous listed commands or it will be ignored.	
*XIDz	Serial Identification Number Query	This command is used to query the 8 digit identification number of each programming radio module. The number following the ID is the radio module (i.e. *XID1 queries Radio Module 1).	*XIDz,nnnnnnnn{cr}{lf}
*Zz	Zone Select Command	If *Z1{cr}{lf} is sent Radio 1 will become the currently active radio. This command changes the currently active radio.	command echo
*MZ1	Zone 1 Mute ON Command	Mutes Audio Output on Radio 1.	command echo
*MZ2	Zone 2 Mute ON Command	Mutes Audio Output on Radio 2.	command echo
*MZ3	Zone 3 Mute On Command	Mutes Audio Output on Radio 3.	command echo
*UM1	Zone 1 UNMute Command	Enables Audio Output on Radio 1.	command echo

Table 3-9   Radio Module Specific Commands

Command Syntax	Name	Description	Returned
*UM2	Zone 2 UNMute Command	Enables Audio Output on Radio Module 2.	command echo
*UM3	Zone 3 UNMute Command	Enables Audio Output on Radio Module 3.	command echo

Table 3-10   Mode Commands

Name	Description	Returned
*DIRz	Sets Radio Module z to DIRECT Mode	command echo
*PREz	Sets Radio Module z to PRESET Mode	command echo
*CATz	Sets Radio Module z to CATEGORY Mode	command echo
*UMDz	Unsolicted notification of DIRECT Mode. This message sent if unsolicted messages turned on (*UN1) to indicate Radio Module z has been placed in DIRECT Mode.	
*UMPz	Unsolicted notification of PRESET Mode. This message sent if unsolicted messages turned on (*UN1) to indicate Radio Module z has been placed in PRESET Mode.	
*UMCz	Unsolicted notification of CATEGORY Mode. This message sent if unsolicted messages turned on (*UN1) to indicate Radio Module z has been placed in CATEGORY Mode.	
NOTE: It is recommended that remote panels always set the mode before issuing any commands that have different functionality in different modes such as channel up or down.		

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