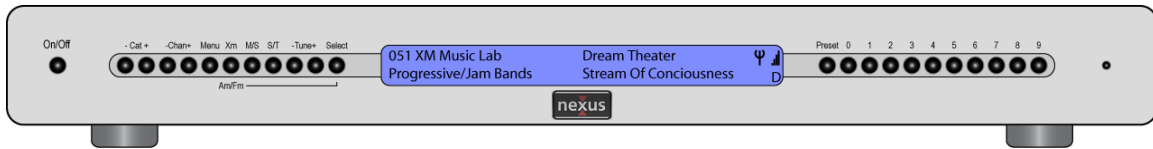


INSTALLATION INSTRUCTIONS

T-2 DUAL XM-AM/FM TUNER



IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the 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.



13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



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 product.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

To completely disconnect this equipment from the AC mains, disconnect the power supply cord plug from the AC receptacle.

The mains plug of the power supply cord shall remain readily operable.

INTRODUCING XM SATELLITE RADIO

There's a world beyond AM and FM. XM Satellite Radio. 100 channels of music, news, sports, comedy, talk, and entertainment. Coast-to-coast coverage. Digital quality sound. With many commercial-free music channels. Questions? Visit www.xmradio.com.

How to Subscribe

Listeners can subscribe by visiting XM on the Web at www.xmradio.com or by calling XM's Listener Care at 1-800-XM-RADIO (1-800-967-2346). Customers should have their Radio ID ready; the Radio ID can be found by selecting channel 0 on the radio.

A Warning Against Reverse Engineering:

Technology. It is prohibited to copy, decompile, disassemble, reverse engineer, or manipulate any technology incorporated in receivers compatible with the XM Satellite Radio system. Furthermore, the AMBE (R) voice compression software included in this product is protected by intellectual property rights including patent rights, copyrights, and trade secrets of Digital Voice Systems, Inc. The user of this or any other software contained in an XM Radio is explicitly prohibited from attempting to copy, decompile, reverse engineer, or disassemble the object code, or in any other way convert the object code into human-readable form. The software is licensed solely for use within this product.

NEXUS AUDIO SYSTEMS

T-2 INSTALLATION INSTRUCTIONS

INTRODUCTION

Welcome to Nexus Audio Systems and congratulations on your purchase of the T-2 Dual XM-AM/FM Tuner. The T-2 features independent XM and AM/FM tuners that allow simultaneous tuning of an XM and an AM or FM station. The dual tuners have discrete outputs so the two stations can be distributed to different listening areas using a multi-zone preamp matrix or other switching device.

Each Tuner has its own dedicated IR input allowing selective control of the different tuners. These dedicated inputs provide dedicated control of the individual XM and AM/FM Tuner up/down functions and selection of 10 preset XM and 10 AM or FM stations.

The front panel controls allow selection of XM Categories and Channels and presets. For AM/FM, Channel, seek/manual tune and AM/FM band selection controls are provided.

Preset station setup is as simple as tuning a station and setting the preset. Up to 20 XM and 10 AM/FM stations are allowed.

The easy to read blue backlit LCD Front Panel Display shows XM metadata for channel, category, artist and track along with satellite signal strength. AM/FM information shows preset, station frequency, stereo/mono, and seek or manual tune modes.

The rear panel features XM, FM and AM antenna terminals, IR and RS232 control inputs for tuner control from whole-house systems, and the proprietary Nexlink that provides an instant control connection the Nexus C-6 Controller via the cable provided.

PRODUCT OVERVIEW

- Dual XM-AM/FM Tuners
- Discrete stereo audio line level outputs for each tuner
- Discrete IR control of each tuner
- XM Category Search
- Tuner Seek
- 20 preset stations for XM and 10 preset stations for the AM/FM Tuners
- LCD display shows XM metadata and AM/FM station information
- Nexus Nexlink connection control from Nexus C-6 Controller

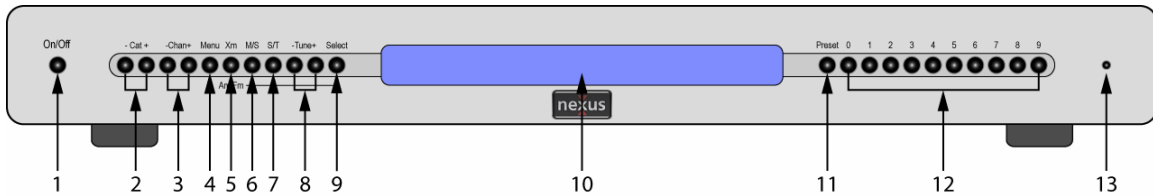


Figure 1. T-2 Front Panel Features

T-2 FRONT PANEL FEATURES

1. **Power On/Off Switch** – Press to turn T-2 ON/OFF.
2. **CAT-/+ Buttons** - In XM Mode, press to search different categories.
3. **CHAN -/+ Buttons** – In XM Mode, press Chan – to tune the previous channel. In XM Mode, press Chan + to tune the next channel.
4. **Menu Button** – Press in any mode to open T-2 Menu. Menu features NexLink Setup and Radio ID.
5. **XM-AM/FM Display Mode Button** – Press at any time to toggle the T-2 Display between XM metadata and AM/FM Station information.
6. **M/S Button** – Press in FM Mode to toggle between Stereo and Mono tuning and output. The mono setting can be useful in improving reception for weak FM stations.
7. **S/T Button** – Press to toggle between Seek and Tune. Seek mode will automatically scan for the next station up or down with a tunable signal when Tune -/+ is pressed. Tune mode will increase/decrease tuner frequency one increment when Tune -/+ is pressed.
8. **Tune -/+ Button** – In XM Mode, with a channel tuned press to preview other XM channels without changing the currently selected channel. To select the previewed channel, press the Select Button. In AM/FM Mode, press to change tuner frequency up/down. When S/T Button is set to Seek, a press of the Tune -/+ Buttons will cause the tuner to automatically scan for the next tunable station. When the S/T Button is set to Tune, a press of the Tune -/+ Buttons will increase/decrease tuner frequency one increment.
9. **Select Button** – In XM Mode, press to select a channel previewed with the Tune -/+ Buttons. In AM/FM Mode press to toggle between AM and FM bands.
10. **Tuner Display** – Blue backlit LCD displays tuner status for XM-AM/FM Modes, Menus and Radio ID. See Section T-2 Display for additional information.
11. **Preset Button** – In XM Mode, press to select 'A' or 'B' bank of presets, then press and hold one of the Numeric buttons to store the currently tuned channel to a preset location. Select 'D' for direct tuning with a three digit entry of the Numeric Buttons followed by a press of the Select Button. 'A', 'B' and 'D' status is displayed in the lower right corner of the Tuner Display. In AM/FM modes, this button is not used. XM can have 20 and AM/FM can have 10 preset stations.
12. **Numeric Buttons** – Press to recall stored preset stations. XM Stations will be recalled in the XM Mode, 'A' or 'B' banks as selected with the Preset Button, AM/FM Stations will be recalled in AM/FM Mode. In XM Mode, in 'D' preset mode as set with the Preset Button, enter a three digit number for direct tuning.
13. **IR Sensor** – Infrared eye 'sees' the IR commands from a Nexus R-1 Remote or other properly programmed controller for remote control of the T-2.

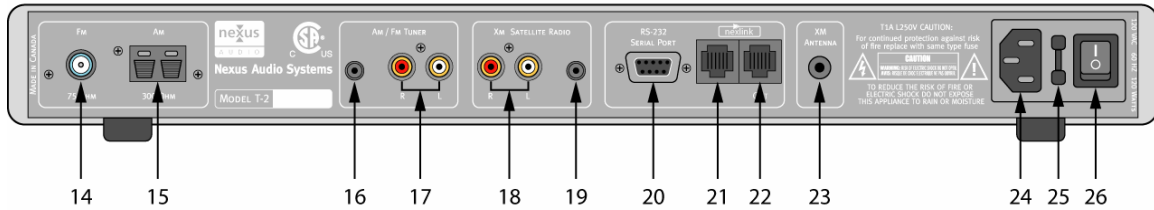


Figure 2. T-2 Rear Panel Features

T-2 REAR PANEL FEATURES

14. **FM Antenna Terminal** – One female F-type terminal for connecting an appropriate 75ohm FM Antenna.
15. **AM Antenna Terminal** – One two wire spring clip allows connection of an AM Loop Antenna.
16. **AM/FM Tuner IR Control Input** – One 3.5mm mini jack connects to the output of an IR control system for dedicated control of the T-2 AM/FM Tuner. Polarity: Tip = signal; sleeve = ground.
17. **AM/FM Tuner Audio Output** – Two RCA-type jacks output L & R channels line level audio from the AM/FM tuner for connection to a stereo preamp, whole-house matrix switcher, Nexus C-6 Controller or other device.
18. **XM Tuner Audio Output** – Two RCA-type jacks output L & R channels line level audio from the XM tuner for connection to a stereo preamp, whole-house matrix switcher, Nexus C-6 Controller or other device.
19. **XM Tuner IR Control Input** – One 3.5mm mini jack connects to the output of an IR control system for dedicated control of the T-2 XM Tuner. Polarity: Tip = signal; sleeve = ground.
20. **RS-232 Serial Port** – One DB9 connector provides two-way RS-232 communication with like featured control systems. Pinout: Pin 2 = Tx; Pin 3 = Rx; Pin 5 = ground.
21. **NexLink IN** – One RJ45 jack connects to the Feature Bus or NexLink jack on a Nexus C-6 Controller for system control of Nexus brand components.
22. **NexLink OUT** – One RJ45 jack connects to the NexLink jack on Nexus brand components for system control of Nexus brand components.
23. **XM Antenna** – One mini pin jack connects to the included XM indoor antenna.
24. **AC Power** – Standard IEC 3-conductor line cord receptacle.
25. **AC Fuse** – T 1A L250V
26. **Main Power Switch** – Turns AC power to the T-2 ON/OFF.

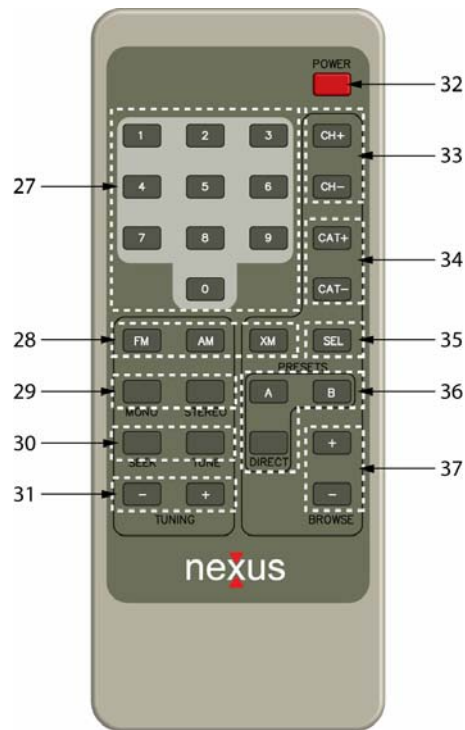


Figure 3. T-2 Remote Control Features

T-2 REMOTE CONTROL FEATURES

27. **Numeric Buttons** - Press to recall stored preset stations. XM Stations will be recalled in the XM Mode, 'A' or 'B' banks as selected with the Preset Button, AM/FM Stations will be recalled in AM/FM Mode. In XM Mode, in 'D' preset mode as set with the Preset Button, enter a three digit number for direct tuning.
28. **XM-AM/FM Display Mode Button** – Press at any time to toggle the T-2 Display between XM metadata and AM/FM Station information. Pressing these buttons will change the display, and sometimes the band. For example if the display is showing XM, pressing AM will switch the display to the AM/FM Tuner, and then switch the band to AM. If the AM/FM Tuner was already on AM, then no band switching takes place.
29. **Mono and Stereo Buttons** – Press in FM Mode to toggle between Stereo and Mono tuning and output. The mono setting can be useful in improving reception for weak FM stations.
30. **Seek and Tune Buttons** – Press to toggle between Seek and Tune. Seek mode will automatically scan for the next station up or down with a tunable signal when Tune +/- is pressed. Tune mode will increase/decrease tuner frequency one increment when Tune +/- is pressed.
31. **Tune +/- Button** – In XM Mode, with a channel tuned press to preview other XM channels without changing the currently selected channel. To select the previewed channel, press the Select Button. In AM/FM Mode, press to change tuner frequency up/down. When S/T Button is set to Seek, a press of the Tune +/- Buttons will cause the tuner to automatically scan for the next tunable station. When the S/T Button is set to Tune, a press of the Tune +/- Buttons will increase/decrease tuner frequency one increment.
32. **Power On/Off Switch** – Press to turn T-2 ON/OFF.
33. **CHAN +/- Buttons** – In XM Mode, press Chan – to tune the previous channel. In XM Mode, press Chan + to tune the next channel.
34. **CAT +/- Buttons** - In XM Mode, press to search different categories.

35. **Select Button** – In XM Mode, press to select a channel previewed with the Tune +/- Buttons. In AM/FM Mode press to toggle between AM and FM bands.
36. **A, B and Direct Buttons** – In XM Mode, press to select 'A' or 'B' bank of presets, then press and hold one of the Numeric buttons to store the currently tuned channel to a preset location. Select 'D' for direct tuning with a three digit entry of the Numeric Buttons followed by a press of the Select Button. 'A', 'B' and 'D' status is displayed in the lower right corner of the Tuner Display. In AM/FM modes, this button is not used. XM can have 20 and AM/FM can have 10 preset stations.
37. **Browse** – In XM Mode, with a channel tuned, press to preview other XM channels without changing the currently selected channel. To select the previewed channel, press the SEL Button.

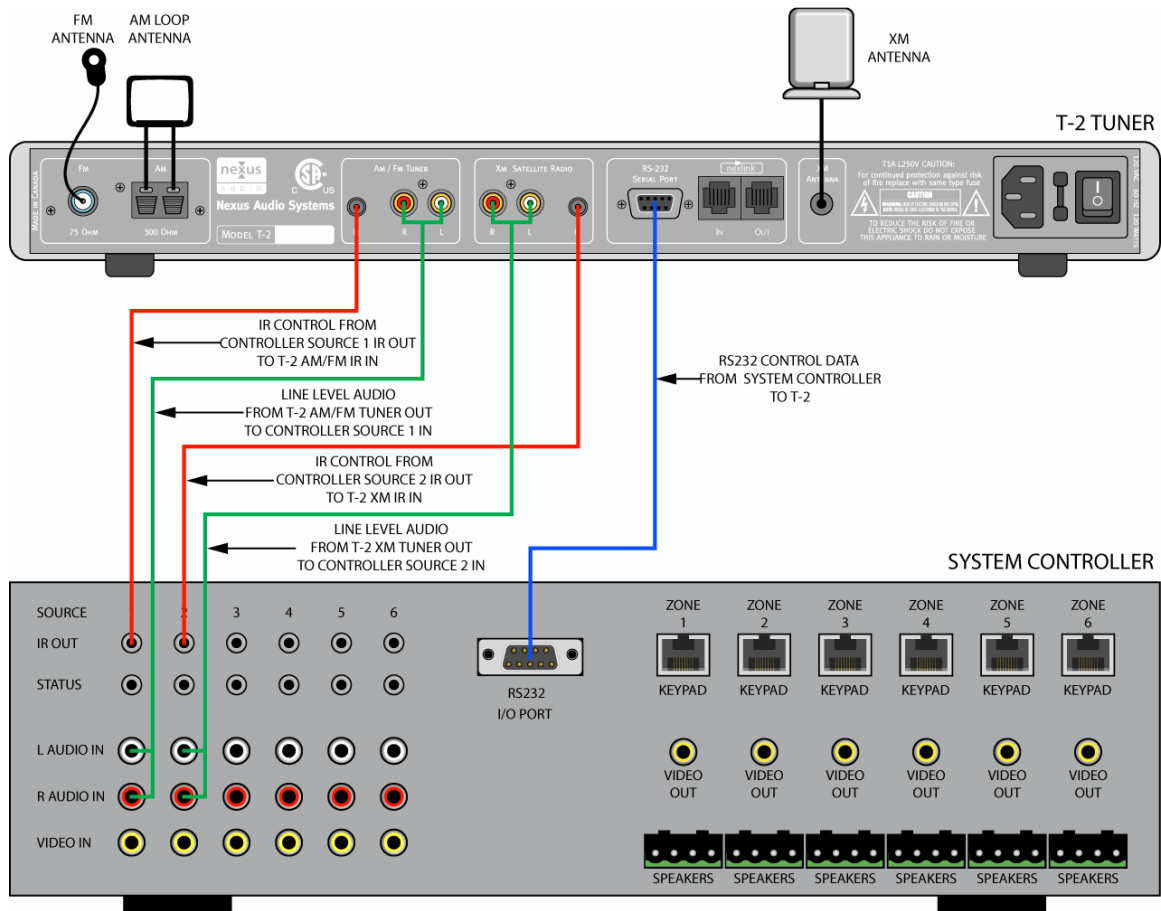


Figure 4. Typical System Connections

CONNECTIONS

Typical System

This section provides instruction to connecting a T-2 to a typical whole-house A/V distribution and control system. If using a Nexus Audio C-6 Controller, see the section: CONNECTIONS/Nexus C-6, following. Connections for the Nexus Audio T-2 are fairly simple, basic connections that should only take a few minutes. Antenna placement is always critical in setting up a tuner, so some extra attention should be paid to those steps.

AM/FM Tuner Audio

- Using a quality stereo RCA to RCA cable with gold connectors, connect the T-2 AM/FM Tuner L&R line level audio OUT to the L&R line level audio IN on a whole-house A/V Controller (Source 1 Figure X) or other audio preamp/controller.

IR Control

If using RS232 for control, the IR connections are not required.

- Using a 3.5mm mini to mini plug cable, connect the appropriate IR OUT of the whole house A/V Controller to the T-2 AM/FM Tuner IR Jack. Polarity: Tip=Signal; Sleeve=Ground.

NOTE 1: This is an optional connection depending upon system configuration. If connecting the T-2 to a preamp or controller that does not have IR Outputs, use the T-2 Remote to control the tuner directly or 'teach' the T-2 Remote IR commands to an integrated IR Remote.

NOTE 2: Most IR 'emitter' outputs are 3.5mm mini jacks with a polarity of Tip=Signal; Sleeve=Ground. Confirm this configuration on the IR control system being used and terminate connections appropriately. DO NOT USE A HIGH OUTPUT IR BLASTER connection to this input as it may damage the T-2 IR Control Section.

RS232

See Section: RS232 Protocol.

AM Loop Antenna

1. Use the included AM Loop antenna. Connect to the AM 300 ohm Antenna two-position spring clip terminal. Polarity is not critical. Position as needed for best reception.

FM Antenna

1. Use the included 75 ohm antenna. Connect to the FM 75 ohm F-type antenna terminal. Position as need for best reception and secure with a small nail or tack through the plastic hanger at the end of the antenna.

NOTE: Other types of 75 ohm antennas can be used if necessary in areas with poor reception.

XM Tuner

Audio

1. Using a quality stereo RCA to RCA cable with gold connectors, connect the T-2 XM Tuner L&R line level audio OUT to the L&R line level audio IN on a whole-house A/V Controller (Source 2 Figure X) or other audio preamp/controller.

IR Control

If using RS232 for control, the IR connections are not required.

1. Using a 3.5mm mini to mini plug cable, connect the appropriate IR OUT of the whole house A/V Controller to the T-2 XM Tuner IR Jack. Polarity: Tip=Signal; Sleeve=Ground.

NOTE 1: This is an optional connection depending upon system configuration. If connecting the T-2 to a preamp or controller that does not have IR Outputs, use the T-2 Remote to control the tuner directly or 'teach' the T-2 Remote IR commands to an integrated IR Remote.

NOTE 2: Most IR 'emitter' outputs are 3.5mm mini jacks with a polarity of Tip=Signal; Sleeve=Ground. Confirm this configuration on the IR control system being used and terminate connections appropriately. DO NOT USE A HIGH OUTPUT IR BLASTER connection to this input as it may damage the T-2 IR Control Section.

RS232

See Section: RS232 Protocol.

XM Antenna

1. Use the included XM antenna. Connect to the XM Antenna Terminal.
2. Adjust the XM antenna for signal strength. Typically, the antenna should be mounted with an unobstructed southeast facing. Some directional adjustment may be needed to attain optimum signal strength. The signal strength indicator, in the upper right corner of the Tuner Display will show four bars when the antenna is in the proper position.
3. To test the XM Tuner prior to activation, tune to Channel 1 (XM Preview). If the Preview Channel plays, the antenna is positioned correctly and the tuner is ready for activation.

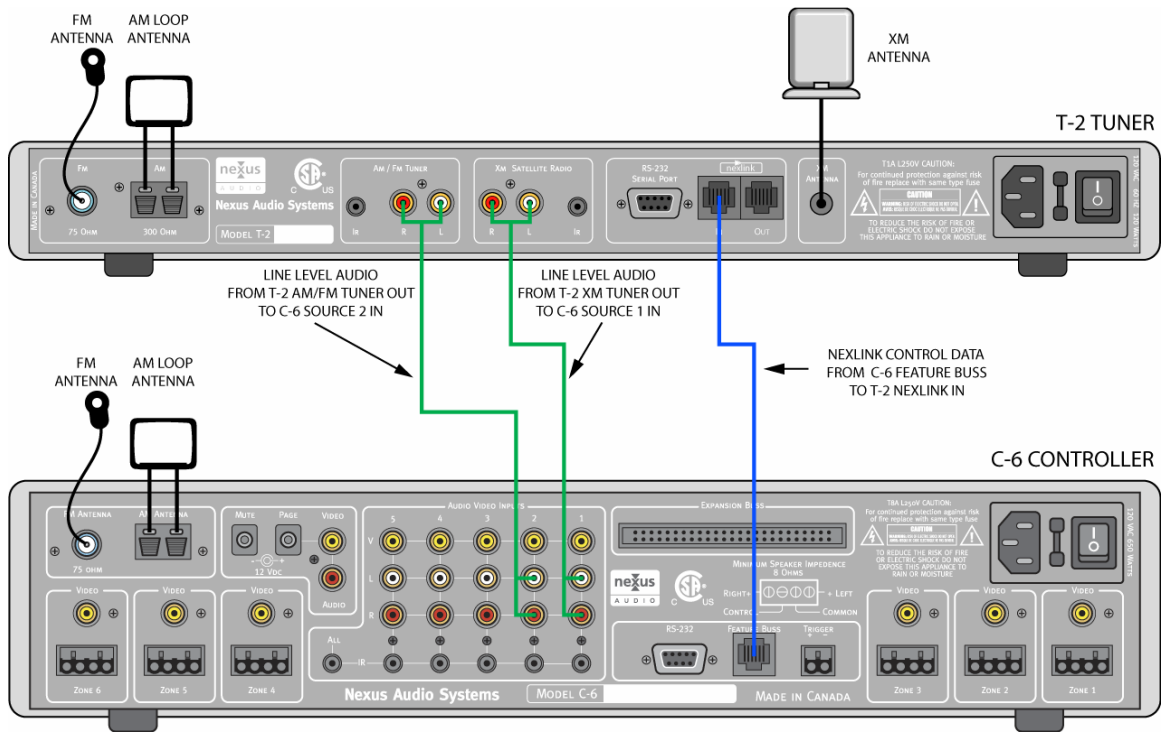


Figure 5. Typical T-2, C-6 System Connections

C-6 System Connections

XM Tuner Audio

Using a quality stereo RCA to RCA cable with gold connectors, connect the T-2 XM Tuner L&R line level audio OUT to the Source 1 L&R line level audio IN on a C-6 Controller. (Figure X)

IR Control

If using NexLink or RS232 for control, IR connections are not required.

NexLink

Using the included NexLink cable, connect the NexLink IN on the T-2 to the Feature Buss Terminal on the C-6. This will provide complete control of the T-2 Tuner from the C-6 Controller when using the K-8 and K-22 Keypads or T-2 Remote.

RS232

See Section: RS232 Protocol.

XM Antenna

1. Use the included XM antenna. Connect to the XM Antenna Terminal.
2. Adjust the XM antenna for signal strength. Typically, the antenna should be mounted with an unobstructed southeast facing. Some directional adjustment may be needed to attain optimum signal strength. The signal strength indicator, in the upper right corner of the Tuner Display will show four bars when the antenna is in the proper position.
3. To test the XM Tuner prior to activation, tune to Channel 1 (XM Preview). If the Preview Channel plays, the antenna is positioned correctly and the tuner is ready for activation.

AM/FM Tuner

Audio

Using a quality stereo RCA to RCA cable with gold connectors, connect the T-2 AM/FM Tuner L&R line level audio OUT to the Source 2 L&R line level audio IN on a C-6 Controller. (Figure X)

IR Control

If using NexLink or RS232 for control, IR connections are not required.

NexLink

Using the included NexLink cable, connect the NexLink IN on the T-2 to the Feature Buss Terminal on the C-6. This will provide complete control of the T-2 Tuner from the C-6 Controller when using the K-8 and K-22 Keypads or T-2 Remote.

RS232

See Section: RS232 Protocol.

Antennas

When using a T-2 Tuner with a C-6 Controller, connecting AM and FM antennas to both units is required for AM/FM reception on both devices.

AM Loop Antenna

1. Use the included AM Loop antenna. Connect to the AM 300 ohm Antenna two-position spring clip terminal. Polarity is not critical. Position as needed for best reception.

FM Antenna

1. Use the included 75 ohm antenna. Connect to the FM 75 ohm F-type antenna terminal. Position as need for best reception and secure with a small nail or tack through the plastic hanger at the end of the antenna.

NOTE: Other types of 75 ohm antennas can be used if necessary in areas with poor reception.

TUNER DISPLAY MODES

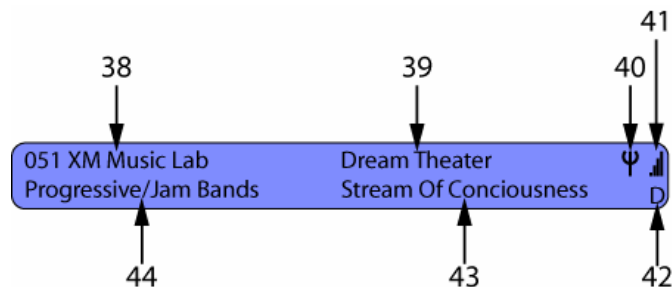


Figure 6. Tuner Display XM Mode

XM Display Features

38. **Channel** – Displays the XM Channel number and Channel Name of the currently tuned channel.
39. **Artist** – Displays the Artist Name for the currently playing track.
40. **XM Antenna Confirm** – Indicates connection of XM Antenna.
41. **Signal Strength** – Displays the strength of signal being received from the XM Satellite. If four bars are not showing at any time reposition the antenna to improve signal strength.
42. **Preset Status Indicator** – 'A' and 'B' indicate Preset Banks 'A' and 'B'. 'D' indicates XM Direct Tune Mode.
43. **Song Title** – Displays the Song Name of the currently playing Track.

44. **Genre** – Displays the genre or type of music or program, (classical, jazz, rock, comedy, talk, traffic, etc) for the currently selected channel. Channels can be selected by genre (rock channels, jazz channels, comedy channels etc) by first selecting a genre.

FM Display Features

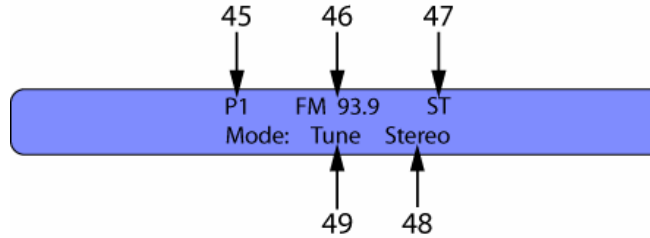


Figure 7. Tuner Display FM Mode

45. **Preset Number** – Preset Channel number, programmed and selected using the Numeric Buttons.
46. **Tuner Band and Channel Frequency** – Indicates band selected (AM/FM) and channel frequency.
47. **Stereo/Mono Indicator** – ‘ST’ indicates a tuned stereo FM channel. There is no display in this field when a mono station is tuned.
48. **Stereo/Mono Tuning Mode Indicator** – Displays the status of the M/S (stereo/mono) button.
49. **Seek/Tune Mode Indicator** – Displays the status of the S/T button. Seek mode will automatically scan for the next station up or down with a tunable signal when Tune +/- is pressed. Tune mode will increase/decrease tuner frequency one increment when Tune +/- is pressed.

AM Display Features

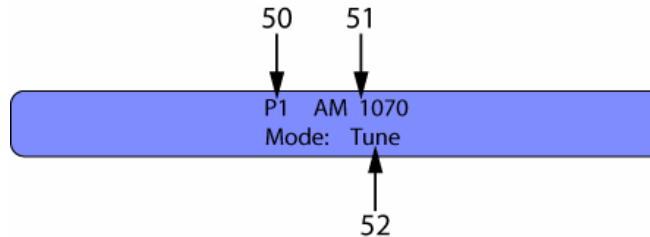


Figure 8. Tuner Display AM Mode

50. **Preset Number** – Preset Channel number, programmed and selected using the Numeric Buttons.
51. **Tuner Band and Channel Frequency** – Indicates band selected (AM/FM) and channel frequency.
52. **Seek/Tune Mode Indicator** – Displays the status of the S/T button. Seek mode will automatically scan for the next station up or down with a tunable signal when Tune +/- is pressed. Tune mode will increase/decrease tuner frequency one increment when Tune +/- is pressed.

TUNER CONFIGURATION

XM Satellite Radio Activation

The XM Tuner requires subscription service from XM Satellite Radio to be able to receive program. To activate an XM Satellite Radio Subscription, call 1.800.XM-RADIO (1.800.967.2346) or visit www.xmradio.com and have Radio ID ready. To find Radio ID:

1. Press the XM-AM/FM Display Mode Button so XM Display is selected.
 2. Press the Chan +/- Buttons to tune Channel 000. The Radio ID will appear on the Display.
 3. Press Chan + to tune Channel 001 (XM Preview) until subscription service is activated.
- or:
1. Press the Menu Button.
 2. Press Numeric Button '2'. The Radio ID will appear on the Display.
 3. Press any Numeric Button to return to operational mode.
 4. Press Chan +/- to tune Channel 001 (XM Preview) until subscription service is activated.

XM Antenna Adjustment

Be sure to attach and position the included XM antenna for optimum reception prior to tuning channels or storing Presets.

1. Use the included XM antenna. Connect to the XM Antenna Terminal.
2. Adjust the XM antenna for signal strength. Typically, the antenna should be mounted with an unobstructed southeast facing. Some directional adjustment may be needed to attain optimum signal strength. The signal strength indicator, in the upper right corner of the Tuner Display will show four bars when the antenna is in the proper position.
3. To test the XM Tuner prior to activation, tune to Channel 1 (XM Preview). If the Preview Channel plays, the antenna is positioned correctly and the tuner is ready for activation.

Tuning XM Channels

Press the XM-AM/FM Button to select the XM Display Mode when Controlling the XM Tuner. Changing the display will not affect either the XM or AM/FM Tuner outputs.

1. Press the CAT +/- Buttons to select XM Categories (genres) such as Rock, Country, Jazz & Blues, Classical, News, Sports, Comedy etc. Category Name will be displayed in the lower left corner of the Tuner Display.
2. Press the CHAN +/- Buttons to change XM Channels. As channels are selected, the Channel Number and Name will be displayed in the upper left corner of the Tuner Display. The Category Name will change in the Tuner Display as channels in different Categories are selected. The Channel Number and Name will also be displayed in the K-8 and K-22 Keypad Displays.
3. Press the TUNE +/- Buttons to preview XM Channels on the Tuner Display. As channels are selected, the Channel Number and Name will be displayed in the upper left corner of the Tuner Display. The Category Name will change in the Tuner Display as channels in different Categories are selected. Press the Select Button to select the displayed channel. The Channel Number and Name will be displayed in the K-8 and K-22 Keypad Displays. If a category was previously selected using CAT+/-, the "CAT" will be displayed in the lower left, and previewing using TUNE +/- will then stay within the selected category. CAT mode will cancel itself after a few seconds.

Programming XM Preset Channels

Press the XM-AM/FM Button to select the XM Display Mode when Controlling the XM Tuner. Changing the display will not affect either the XM or AM/FM Tuner outputs.

1. Tune XM channel as described in Tuning XM Channels, above.
2. Press the Preset Button to select 'A' or 'B' bank of presets. 'A' and 'B' status is displayed in the lower right corner of the Tuner Display.
3. Press and hold one of the Numeric buttons to store the currently tuned channel to a preset location. XM can have 20 preset channels, 10 in bank A and 10 in bank B.

Tuning AM/FM Channels and Programming AM/FM Presets

There are ten AM/FM Tuner Preset memory locations. They can be any combination of AM and FM stations. If connected to a Nexus C-6 Controller, the stored band and frequency presets will appear on K-8 and K-22 Keypad LCDs when the T-2 AM/FM Tuner is selected and the NexLink IN Port on the T-2 is connected to the Feature Buss Terminal on the C-6. To store AM/FM Tuner Presets:

1. Press the XM-AM/FM Button followed by the Select Button, if necessary, to change the AM/FM Display Mode to the appropriate Band. Changing the display will not affect the XM Tuner output.
2. Press the MONO/STEREO Button to select mode on the Tuner Display.
3. Press the SEEK/TUNE Button to select TUNE mode on the Tuner Display.
4. Press the TUNE UP/DOWN Buttons to select tuner frequency e.g. FM 94.7.
5. Press and hold TUNER PRESET 0 for 3 seconds or until P0 appears in the upper left corner of the Tuner Display.
6. Repeat steps 1-5 for Tuner Presets 1-9.

RS232 PROTOCOL

The T-2 Tuner has an RS-232 port that allows control of the Tuner from a variety of controllers including Whole-House A/V Distribution and Home Automation Systems, or any just about any hard-wired device capable of outputting RS232 commands.

The T-2 Serial Port allows control of all tuner functions including: Power ON/OFF, XM-AM/FM Band selection, Preset selection, Stereo/Mono Modes and Direct Numeric Tuning. XM metadata can also be accessed via the RS232 port.

The Serial Port on the T-2 uses a female DB9 connector wired in a DTE configuration. Tx (transmit) = pin 2, Rx (receive) = pin 3, Ground = pin 5. Communication settings are 9600 baud, 8 bits, no parity, no handshake.

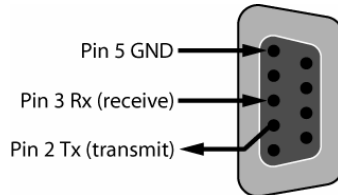


Figure 14. RS-232 Port Pin Out

Baud Rate	Parity	Data Bits	Stop Bits	Flow Control
9600	None	8 bits		None

Each command must be terminated with a carriage return: <cr>. If an invalid command is sent, the T-2 will respond with **ERR**. If a valid command is sent, the T-2 will respond with information. Every response from the T-2 is terminated with CR.

Command	Syntax	Parameters	Description
Turn Radio ON	PW1<cr>	N/A	Similar to pushing the power button on the remote Front Panel or Remote.
Turn Radio OFF	PW0<cr>	N/A	Similar to pushing the power button on the remote Front Panel or Remote.
Query Radio Power Status	PW?<cr>	PW0=off; PW1=on	Use for if/then power management.
XM Channel Up	CH+<cr>	No reply, unless monitor is turned on, then reply is: (example) "CH? 046 Top Tracks Rock Doors 20 th Century Fox<cr>	Similar to pushing CH+ Button on Front Panel or Remote.
XM Channel Down	CH-<cr>	No reply, unless monitor is turned on, then reply is: (example) "CH? 045 XM Cafe Rock Louque Cry Cry<cr>	Similar to pushing CH- Button on Front Panel or Remote.
Query XM Channel	CH?<cr>	Reply is: (example) "CH? 045 XM Cafe Rock Louque Cry Cry<cr>	Use to identify channel, and retrieve XM metadata.
Direct Select XM Channel	CHxxx<cr>	xxx=Channel. valid range: 001-247	Similar to pressing a numeric buttons on the Front Panel or Remote.
Query Current XM Channel SID (Station ID)	SID?<cr>	Reply is: (example) SID045	Identifies permanent XM Station ID for currently selected station.
Direct Select XM Channel by SID (Station ID)	SIDxxx<cr>	xxx=SID. valid range: 001-247	Tune XM Channels by permanent SID. Channel numbers may change. SID does not. For elaborate control systems this method will eliminate unnecessary re-programming of channel numbers.
Turn on XM Channel Monitoring	MON1<cr>	Reply is: (example) "CH? 045 XM Cafe Rock Louque Cry Cry<cr>	Allows reporting of XM metadata via the serial port. A new string is sent out every time the song or channel changes.
Turn off XM Channel Monitoring	MON0 <cr>	Reply is: MON0<cr>	Turn off reporting of XM metadata.
Query XM Channel Monitor Mode	MON?	MON0<cr> = monitor off MON1<cr> = monitor on	Use to determine XM monitor mode.
Query XM Radio Serial Number	ID?<cr>	Reply is: (example) MT3LT21RV<cr>	Query radio ID via serial port. Required for subscription activation.
Recall XM Preset From Bank A	PRAx<cr>	x=0-9. Reply is: (example) "CH? 046 Top Tracks Rock Doors 20 th Century Fox<cr>	Similar to pushing a Preset Button on the Front Panel or Remote. Recalls a preset from XM bank A
Recall XM Preset From Bank B	PRBx<cr>	x=0-9. Reply is: (example) "CH? 046 Top Tracks Rock Doors 20 th Century Fox<cr>	Similar to pushing a Preset Button on the Front Panel or Remote. Recalls an XM preset from bank B

Command	Syntax	Parameters	Description
Save XM preset to Bank A	PSAx<cr>	x=0-9	Save current XM station into Bank A location x
Save XM preset to Bank B	PSBx<cr>	x=0-9	Save current XM station into Bank B location x
Query FM/AM Tuner Frequency	FREQ?<cr>	Reply is: FM95.7<cr> or AM1010<cr>	Reports the current AM/FM frequency via the serial port.
Select FM Band	FMB<cr>	No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing the Select Button on the Front Panel in AM/FM Mode, or pushing the FM Button on the Remote
Select AM Band	AMB<cr>	No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing the Select Button on the Front Panel in AM/FM Mode, or pushing the AM Button on the Remote.
Set FM Stereo	FMS<cr>	No reply.	Similar to pushing the M/S Button on the Front Panel or Stereo Button on the Remote.
Set FM Mono	FMM<cr>	No reply.	Similar to pushing the M/S Button on the Front Panel or Mono Button on the Remote.
Direct Tune FM	FMFxxx<cr>	No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing the numeric Buttons on the Front Panel or Remote in Direct Mode.
Direct Tune AM	AMFxxx<cr>	No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing the numeric Buttons on the Front Panel or Remote in Direct Mode.
Recall FM/AM Preset	PSRx<cr>	X=0-9. No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing the Numeric Buttons on Front Panel or Remote in Preset Mode.
Save FM/AM Preset	PSSx<cr>	x=0-9. No Reply.	Similar to saving a Preset with Front Panel or Remote Buttons.
Seek Up FM/AM	SEEK+<cr>	No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing Tune Up in Seek Mode. Tuner stops at next tunable station.
Seek Up FM/AM	SEEK-<cr>	No reply, unless channel monitor is on, then it will reply with the radio frequency.	Similar to pushing Tune Down in Seek Mode. Tuner stops at next tunable station.

TUNER OPERATION

The following section describes basic tuner operation using the T-2 Front Panel and T-2 Remote Control Buttons. Control may vary given system application, type of controller used and the setup of the controller if other than the T-2 Remote.

FRONT PANEL	REMOTE
On/Off	
Press the ON/OFF Button.	Press the Power Button.
Select Band	
Press XM-AM/FM Button.	Press XM, FM or AM button
Press Select Button in AM/FM Mode to select Band.	
Select XM Category	
In XM Mode, press the Cat +/- Button.	Press CAT+ or CAT- button
Select XM Channel	
In XM Mode, press the Chan +/- Button. Press Tune +/- Buttons.	In XM mode, Press CH+ or CH-, or press browse _/- then SEL
Select FM Channel	
In FM Mode, press the Tune +/- Buttons.	In FM mode, press CH+ or CH-
In FM Mode, press Preset Buttons.	In FM mode, press a number button
In FM Mode, press S/T (Seek/Tune) Seek will scan dial up or down to next tunable station when the Tune+/- Buttons are pressed. Tune will manually change frequency up/down when the Tune +/- Buttons are pressed.	In FM Mode, press SEEK or TUNE. Seek will scan dial up or down to next tunable station when the CH+/- Buttons are pressed. Tune will manually change frequency up/down when the CH+/- Buttons are pressed.
Press M/S Button for Stereo/Mono Modes. Use mono to help tune weak FM channels.	Press Stereo or Mono Button for Stereo/Mono Modes. Use mono to help tune weak FM channels.
Select AM Channel	
In AM Mode, press the Tune +/- Buttons.	In AM Mode, press the CH+/- Buttons.
In AM Mode, press Preset Buttons.	In AM Mode, press Preset (number) Buttons.
In AM Mode, press S/T (Seek/Tune) Seek will scan dial up or down to next tunable station when the Tune+/- Buttons are pressed. Tune will manually change frequency up/down when the Tune +/- Buttons are pressed.	In AM Mode, press Seek or Tune. Seek will scan dial up or down to next tunable station when the CH+/- Buttons are pressed. Tune will manually change frequency up/down when the CH+/- Buttons are pressed.
Set AM/FM Presets	
Tune AM/FM Channel as described above. Press and hold Preset Button 0-9 for five seconds or until P(0-9) appears on the display next to the channel frequency to set up to 10 Preset Channels.	Tune AM/FM Channels as described above. Press and hold Preset Button 0-9 for five seconds or until P(0-9) appears on the display next to the channel frequency to set up to 10 Preset Channels.

XM ERROR MESSAGES

Error Message	Condition	Solution
CHECK ANTENNA	Problem with antenna connection	a)Check antenna connection b)Check antenna cable for shorts
UPDATING	User encryption code has changed and is being updated	Wait for encryption code to finish updating
NOSIGNAL	Signal is too weak to tune in	Confirm that antenna has not moved or is being obstructed from 'line of sight' to satellite
LOADING	Audio and or text information are being loaded for selected channel	Wait until program information has been received
OFF AIR	Selected channel is not currently broadcasting	Tune to another channel
--- or CHANNEL ---	Channel SID is no longer available	Tuner will switch automatically to Channel 1, or to the previous channel after 2 seconds
---	Metadata not available for Artist Name/Feature, or Song/Program title	No action required

TROUBLESHOOTING

PROBLEM	SOLUTION
Power	
Tuner will not Power up	a) T-2 must be plugged into an AC outlet. b) Power cord must be plugged into C-6 Controller
Tuner	
Poor reception	a) Are antennas connected? b) Reposition antennas to improve reception.
No stations in presets	Stations must be stored in Presets. See Instructions sections: Tuning AM/FM Channels and Programming AM/FM Presets and Programming XM Preset Channels.
Audio	
No Audio From Tuner	a) Is tuner ON? b) Is tuner line audio out connected to appropriate source input on Controller? c) Is a proper channel tuned?
Infrared Control	
T-2 does not respond to IR Commands	a) XM IR Control IN and AM/FM IR Control IN must be connected to appropriate, separate IR outputs on System Controller. b) Is emitter attached to the IR eye of the T-2 and connected to an appropriate IR out on System Controller? c) Confirm IR commands are properly programmed for the T-2 in the IR control device?
No IR output on C-6 In Expanded Systems (When using X-1 and X-2 Expansion Controllers)	a) Check connection of 52 pin expansion cable. b) Are Keypads properly connected? Check polarity.
RS-232 Control	
T-2 does not Respond to RS-232 Commands from control device	a) Is control device ON? b) Is T-2 ON? b) Is control device connected with a DB9 Serial cable? (NOT NULL) c) Is control device properly configured to send/receive? d) Are ASCII text commands properly entered in control device? e) See Instructions section RS-232.

SPECIFICATIONS

XM Section

Satellite RF Sensitivity	-92.2 dBm
Tuning Range	2332.5 to 2345.0 MHz
Dynamic Range	95 dB
Audio Frequency Range	20Hz to 20 kHz

FM Section

Frequency Range:	87.5-108Mhz.
IHF Sensitivity:	20dBu (19Khz LPF On THD = 3%)
IF Rejection:	60db
Image Rejection:	30db
Usable Sensitivity:	25db (S/N = 20db)
Selectivity:	60db
Signal to Noise:	60db
Stereo Separation:	25db

AM Section

Frequency Range	530-1710Khz.
IF Rejection:	45db
Image Rejection:	30db
Sensitivity:	61 db
Selectivity:	18db (+/- 10Khz)
Signal to Noise:	43db

IR

IR Modulation Frequency:	38K
Keypad IR Sensor Range:	30'
IR Control Inputs	2, 3.5mm mini jacks

General

RS-232:	DB9F Terminal, 9600 Baud, Asynchronous, 8 Bits, No Parity, No Handshake
NexLink Connections:	2 RJ45 Jacks
Power Requirements:	120VAC
Power Consumption:	120 Watts
Dimensions: (including feet and connectors)	17"W x 1 3/4"H x 14"D

WARRANTY

Limited Warranty (North America)

Nexus Audio Systems Inc. (Nexus Audio) Warrant the product designated herein to be free of manufacturing defects in material and workmanship, subject to the conditions set forth below for a period of 5 years from the date of purchase by the original registered purchaser.

Conditions

1. This Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the Owners Manual, abused or misused, damaged by accident or neglect in being transported.
2. This Warranty is void if the product is altered or otherwise repaired or tampered with by anyone other than Nexus Audio Systems Inc. or an authorized Nexus Audio Systems Inc. repair professional or center, as designated by Nexus Audio.
3. A returned product is to be delivered to Nexus Audio with a Nexus Audio assigned Return Authorization Number. In addition, the returned product is to be accompanied by a written description of the defect and proof of purchase.
4. Nexus Audio Systems Inc reserves the right to modify the design and specifications of any product at anytime, without obligation to advise the purchaser of previously manufactured products and to change the prices of any product without notice to any person.
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1. This Warranty is valid for specified Nexus Audio product and the assigned serial number for the duration specified in this certificate.
2. This certificate does not extend to any incidental or consequential costs or damages to the purchaser.
3. This Warranty shall provide the original purchaser with specific legal rights, which may vary from State to State in the United States and Province to Province in Canada.
4. This Warranty is a Limited Warranty as defined by the Federal Trade Commission (Magnuson-Moss Warranty Act) in the United States and as defined by Industry Canada (Competition Act) in Canada.

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T-2 Quick Start Guide

Wiring.

Using the diagram below as a reference, connect the T-2 to the C6:

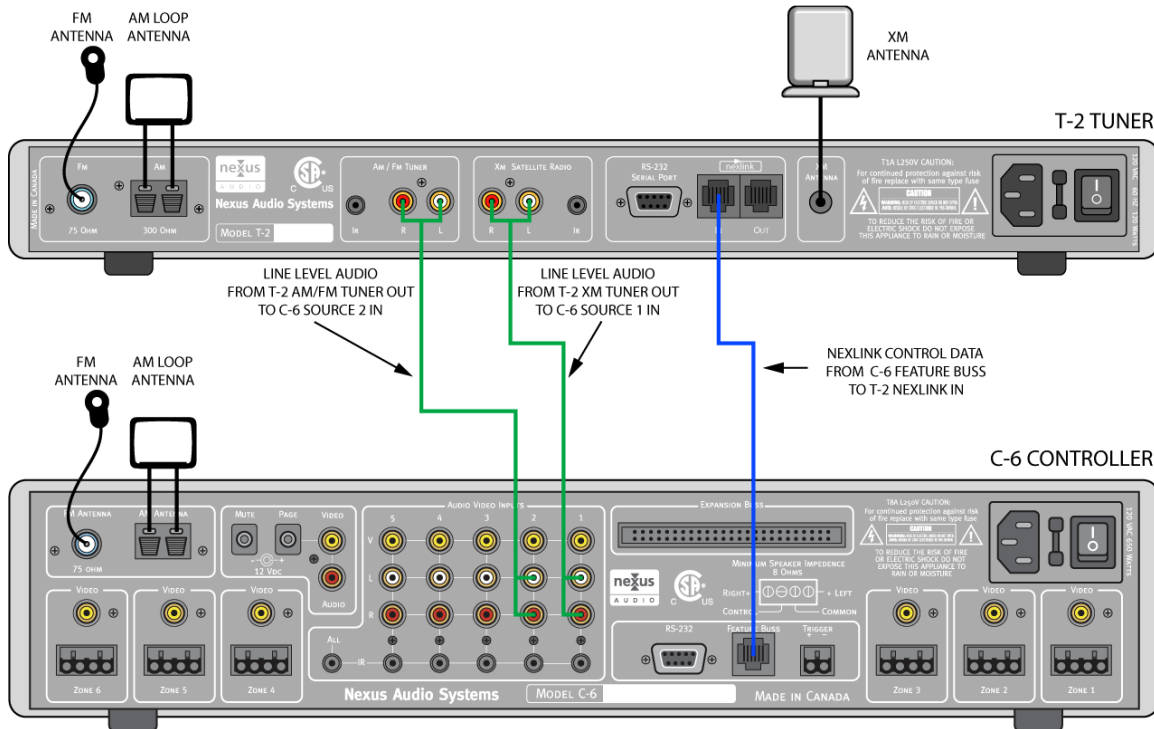
Connect an RCA cable from the T-2 XM audio output to input 1 on the C6.

Optionally, connect an RCA cable from the T2 FM/AM audio output to input 2 on the C6.

If using the FM/AM portion of the T-2, connect an FM and AM antenna to the T-2

Connect the supplied RJ-25 cable from the C6 nexlink out jack (may be called Feature Bus) to the nexlink in connector on the T-2

Connect an XM antenna to the T-2. This antenna should be placed in a south facing window for proper operation of the T-2



C6 Menu Setup.

On the C6, press menu, scroll down to Satellite radio, and press enter. The following screen is displayed:

Radio	XM	FM/AM
Input	[-]	,-

Make sure the square brackets are surrounding the first dash under XM as shown above. On the C6, press the up arrow ▲ so that the dash becomes a 1, indicating the XM output of the T-2 is connected to input1 on the C6.

Press the right arrow on the C6 until the brackets are surrounding the first dash under FM/AM as shown below:

Radio	XM	FM/AM
Input	1,-	[-]

continued.....

On the C6, press the up arrow ▲ twice so that the dash becomes a 2, indicating the FM/AM output of the T-2 is connected to input2 on the C6. If you do not wish to use the FM/AM portion of the T-2, leave this area blank (a dash -).

The screen now looks as shown below:

Radio Input	XM 1,-	FM/AM [2]-
----------------	-----------	---------------

Press the enter key to save your changes. The C6 is now set up.

T-2 Menu Setup.

On the T-2, press the menu button, and then press numeric button 1 for nexlink setup. The following screen is displayed:

T2 output	XM	FM/AM
C6 input (0=none)	[0]	0

Press numeric button 1 to tell the T-2 that its XM output is attached to the C6 input1. The number 1 will be displayed under XM, and the brackets will move to the FM/AM setting shown below:

T2 output	XM	FM/AM
C6 input (0=none)	1	[0]

Press numeric button 2 to tell the T-2 that its FM/AM output is attached to the C6 input2. The number 2 will be displayed under FM/AM. The top line of the display will display "settings saved" briefly, and then the radio will return to the main XM display. See below:

Settings Saved		
C6 input (0=none)	1	[2]

If you do not wish to use the FM/AM portion of the T-2, press numeric button zero for the second entry.

The T-2 is now set up to be used with the C6.

Controlling the T-2 with the C-6

Using the K8, the keys used to control the T2 when listening to XM radio are Play, Next, <<, and >>.

There are three modes of operation for the K8 and K22 which are selected using the "Next" button. The initial mode is "Mode = Bank A" as shown on the screen to the right.

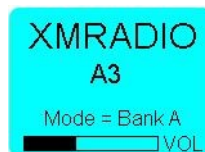
In this mode, pressing << or >> will allow you to scroll through the presets for bank A. The screen will show A1... A2... A3... etc when pressing >> repeatedly. When the desired preset is reached, pressing Play will select it. Similarly, if the Mode is "Bank B" then you will be able to scroll through the presets for bank B with << and >>, then select the preset with the Play button.

The third mode of operation is "Mode = Direct". In this mode, pressing << or >> simply tunes to the next available XM station.

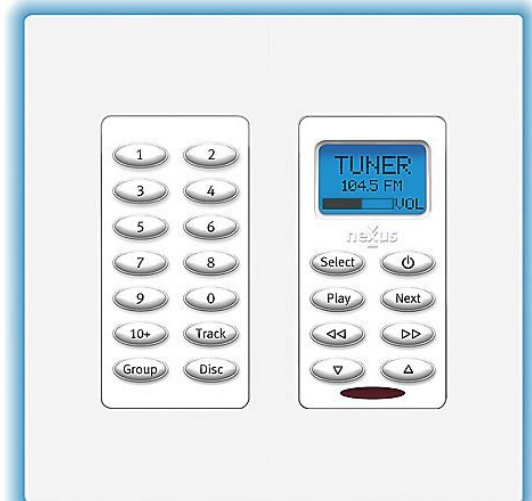
Normally, the keypad display shows the station name, but if you press "Play" by itself, the display will switch to show you the Artist and song name for a few seconds.

If you are using the K22, you have additional functionality with the numeric keys. Using the numeric keys, you can directly access a preset from bank A or bank B (depending on mode), or, if in direct mode you can directly enter a 3 digit channel number.

If you are listening to the AM/FM tuner which is built into the T2, you can use the << and >> keys to tune the next or previous stored AM or FM preset on the T2.



K8



K22