

AUDIO REQUEST

Communication Protocol Guide

Version 1.9.0

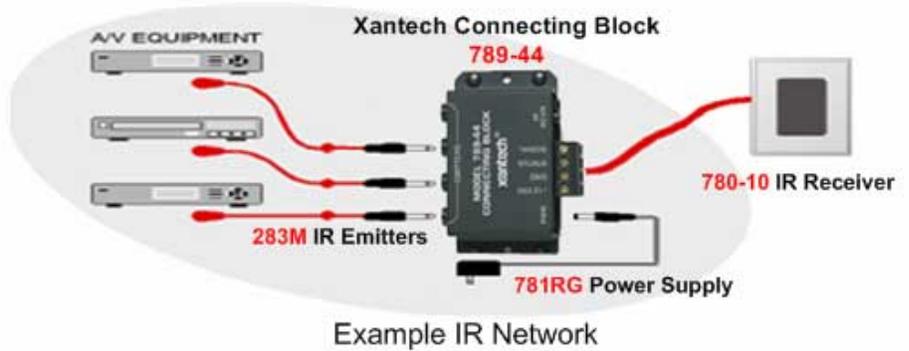
IR, RS-232, and Ethernet Interface Guide



CONTROL WITH IR (Infra-red)



Attach IR emitter to IR window on the front of the unit for controlling an IR network system.



IR Sensor
Detects infra-red signals from the remote control.



Examples



IR In
Connects to an External IR Emitter.

Different types of IR Receivers



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REVISION HISTORY

Revision Number	Changes
1.7.11	Updated for 1.7.11, updated graphics
1.7.5	Updated for 1.7.5 (genre commands)
1.8.1	Updated for 1.8.1
1.9.0	Complete redesign Added new 1.9.0 commands

INTRODUCTION

This document describes how to communicate with the AudioReQuest via IR, Serial, or Ethernet. For Serial and Ethernet, we will also explain how data feedback is formatted. Serial and Ethernet protocol is identical in terms of commands sent to the ReQuest and feedback received from the ReQuest, however an Ethernet connection must be initialized (see **Initializing Ethernet** below). For the purpose of simplicity, Serial and Ethernet communication will be referred to as Serial in this document.

Conventions Used

- 1) Throughout this document, we will use the lowercase 'H' (*h*) notation when we wish to denote a Hexadecimal number. Multi-Byte strings will be written as "XX*h*, YY*h*, ...".

Examples:

- The Hex number 39 will be written as 39*h*, which is 57 in ASCII, or the number 9
- The Hex string 4AC5 will be written as 4A*h*, C5*h*.

- 2) Some Multi-Byte feedback strings, such as Elapsed Time, are sent as Least Significant Byte First, or LSBF. This will be noted in the document as **LSBF**, and should be calculated as in the following example.

Example: If the Total Time is sent as 04010000, the actual number of seconds would be calculated as follows:

$$(04 \times 1) + (01 \times 256) + (0 \times 256^2) + (0 \times 256^3) = (4 \times 1) + (1 \times 256) = 260 \text{ sec}$$

$$260 \text{ sec} = 4 : 20$$

- 3) **ReQuest**, **ARQ**, and **AudioReQuest** will be used synonymously to describe any model of AudioReQuest Pro or Zone unit (ARQ1, ARQ2, Nitro, Fusion, Tera, or Triton).

PART 1: IR CONTROL

There are 2 ways to control the AudioReQuest via IR. The simplest method is to use a handheld remote aimed at the IR receiver on the front of the unit. For more advanced installations, there is a 1/8th inch mini jack on the rear of the unit for integration with IR based control systems (ARQ2 and higher **ONLY**). No matter which method you choose, this portion of the document will describe the commands available.

Rear IR Pinout

ARQ3 (Nitro, Fusion, Tera, and Triton) ONLY:

You **MUST** connect a powered connecting block, such as a Xantech 789-44, to the rear IR jack. It is important to make sure you are using Model **781RG** for the 12V power supply.

ARQ2 ONLY:

Some earlier ARQ2 units had a different pinout than what is used now. If you have an ARQ2 model, there should be a sticker on the rear of the unit that will say one of the following:

- **2 conductor Xantech Connecting Block**
- **3 cond. IR Dinkylink Receiver ONLY**

If your ARQ2 does not have a sticker, try a 3 conductor style first. This will ensure that you do not cause any damage to the AudioReQuest.

The pinouts are as follows:

	2 Conductor Pinout	3 Conductor Pinout
Tip	Signal	Signal
Ring	Ground	Ground
Sleeve	<i>Not Connected</i>	+12V

Two Kinds of IR Remotes

ReQuest Multimedia now has two different IR Remotes that are supported. The newest addition to the IR family is the QuickPlay™ remote. The QuickPlay remote is simpler to use than our previous solution, and offers quick access to many commonly used features. This remote has 24 one-button commands and 20 two-button advanced commands, for a total of 44 commands. Visit <http://www.request.com/Support/Manuals.html> to download a quick sheet on all the commands.



Our original remote is a full featured 64 button remote control that allows access to every IR command available through either 1 or 2 button key combinations. For everyday use, this remote is more cumbersome than the QuickPlay remote. However, if you are creating an IR library for a control system, this remote is required.



Learning IR Codes into Other Systems

For any advanced commands (2 button key combinations), the proper method for teaching the system the ReQuest IR codes is as follows:

1. Aim the ARQ Remote **AWAY** from the learner
2. Press **AND HOLD** the **Alt** or **Shift** button (depending on command)
3. Aim the ARQ Remote **AT** the learner
4. Press the second button
5. Release **BOTH** buttons

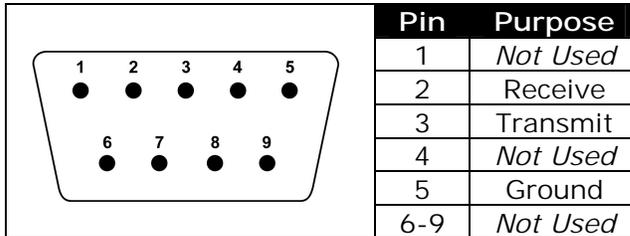
List of Advanced IR Commands

Action	Description	Alt/Shift	2 nd Button
Clear Now Playing	Stops the music and clears the Now Playing queue	ALT	NOW PLAYING
Continuous ON	Activates Continuous Mode	SHIFT	STOP
Delete from Playlist	Removes the selected song from the Playlist. Does not delete the song from the system. Does not prompt for confirmation	ALT	U
Deselect	Deselects all selected songs	ALT ALT	S SELECT
Direct Playlist 1-10	Plays Playlist number 1-10	SHIFT	1,2,3,...,0
Discrete Navigator	Go to Navigator page	ALT	1
Discrete Player	Go to Player page	ALT	2
Eject	Open the CD tray	ALT	X
Fast Forward	Skip ahead 5 seconds	SHIFT	FORWARD
FREEDB Reset	Resets CD information for FREEDB lookup	ALT	R
Go to Bottom of list	Navigates to the bottom of the current list	ALT	DOWN
Go to Current Album	Navigates to the Currently Playing Song's Album	ALT	5
Go to Current Artist	Navigates to the Currently Playing Song's Artist	ALT	4
Go to Current Genre	Navigates to the Currently Playing Song's Genre	ALT	V
Go to Current Playlist	Navigates to the Currently Playing Song's Playlist	ALT	W
Go to Current Song	Navigates to the Currently Playing Song in All Songs	ALT	3
Go to Top of List	Navigates to the top of the current list	ALT	UP
Line-In Play	Lets you listen to what is connected to LINE-IN	SHIFT	CD
Line-In Record	Starts a recording of what is connected to LINE-IN	SHIFT	RECORD
Next Album	Plays the next Album	ALT	ALBUM
Next Artist	Plays the next Artist	ALT	ARTIST
Next Genre	Plays the songs in the next Genre	ALT	I
Next Playlist	Playlist the next Playlist	SHIFT	JUMP-DOWN
Next Song	Plays the Next Song	SHIFT	NEXT
Pause OFF	Unpause music playback	ALT	PAUSE
Pause ON	Pause music playback	SHIFT	PAUSE
Play	Resumes playback from a paused or stopped state	ALT	ENTER
Play Now	Plays the list or songs selected on Navigator	SHIFT	NOW PLAYING
Play Now-no flip	Same as above, but leaves the ARQ on the Navigator page	ALT	K
Power OFF	Discrete Power OFF	ALT	Q
Power ON	Discrete Power ON	ALT	P
Previous Album	Plays the previous Album	SHIFT	ALBUM
Previous Artist	Plays the previous Artist	SHIFT	ARTIST
Previous Genre	Plays the songs in the previous Genre	ALT	H
Previous Playlist	Plays the previous Playlist	SHIFT	JUMP-UP
Previous Song	Plays the previous Song	SHIFT	PREVIOUS
Random IN	Enters Random mode	ALT	JUMP-DOWN
Repeat OFF	Turns repeat OFF	ALT	REPEAT
Repeat ON	Turns repeat ON	SHIFT	REPEAT
Restart TV Out	Forces a re-initialization of the TV Out card	ALT	T
Rewind	Skips back 5 seconds	SHIFT	REWIND
Search	Begin/Restart an extended search	ALT	A
Show Genres	Displays the Genres on the system	ALT	G
Show Playlists	Displays the Playlists on the system	ALT	F
Show Selected Songs	Displays the Selected Songs on the System	SHIFT	SELECT
Shuffle OFF	Turns shuffle OFF	ALT	SHUFFLE
Shuffle ON	Turns shuffle ON	SHIFT	SHUFFLE

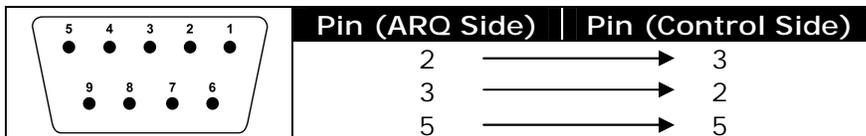
PART 2: SERIAL/ETHERNET PROTOCOL

This section describes how to communicate with the AudioReQuest via Ethernet or Serial. Ethernet and Serial protocols are identical in terms of sending commands and receiving feedback, however an Ethernet connection must be initialized (see **Initializing Ethernet** below). For simplicity, we will refer to Ethernet and Serial communication as Serial, though it can be used for Ethernet as well.

Rear Serial Port Pinout



Serial Cable Pinout



COM Settings

The **rear serial port** is used for integrating the AudioReQuest with a control system. Connection to the **rear serial port** requires a **NULL MODEM** serial cable. The **front serial port** is used **ONLY** for configuring certain settings on the AudioReQuest, such as the IP Address. You **CANNOT** use the **front serial port** to control the ARQ.

Rear Serial Port	
Parameter	Value
Baud	9600
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None

Front Serial Port	
Parameter	Value
Baud	1200
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None

Initializing Ethernet

Unlike Serial communication, an Ethernet connection to the ARQ is not "always on", and the AudioReQuest is not always prepared to receive commands from the control system. To initialize an Ethernet connection to the ARQ, the first string you send to the ARQ **MUST** be as follows:

5Fh, A0h

After sending this string, the AudioReQuest will accept all incoming strings exactly as it would through a serial connection. If you do not send this string, the AudioReQuest will immediately sever the connection once it receives any other command.

Sending Commands

Commands are sent to the ReQuest in strings of Hexadecimal (or Hex) numbers. Depending on the command, these strings are anywhere from 1 byte to 3 or more bytes.

Basic Serial Port Codes

Command	Hex String	Description
Back Space	30h, 3Fh	Deletes the last character entered in text entry
Cancel	30h, 13h	Exit from any menu or from Visuals
Continuous Toggle	30h, AFh	Toggles Continuous playback mode ON/OFF
Copy	30h, 66h	Copies any Selected Songs to the current location
Delete	30h, 65h	Deletes the current selection
Delete from Playlist	30h, B1h	Removes the current selection from the Playlist
Edit	30h, 7Dh	Edits the current selection
Edit Genre	30h, 6Dh	Edits the Genre of the current selection
Enter/Pause	30h, 19h	Acts as Enter in edits or on the Navigator page Acts as Play/Pause toggle on the Player page
Enter – No Flip	30h, 8Dh	Same as Enter/Pause, but will not flip the ARQ to the Player page if issuing command on a song
Forward/Right	30h, 16h	Acts as Move Right on the Navigator page Acts as Fast Forward on the Player page
Go to Albums	30h, 21h	Displays the list of Albums
Go to All Songs	30h, 1Fh	Displays All Songs
Go to Artists	30h, 20h	Displays the list of Artists
Go to CD	30h, 1Eh	Displays the contents of a CD in the CD tray
Go to Genres	30h, 6Ah	Displays the Genre list
Go to Now Playing	30h, 22h	Displays the songs in the Now Playing queue
Go to Playlists	30h, 69h	Displays the Playlists on the system
Go to Selected Songs	30h, A6h	Displays the list of selected songs
Info	30h, 5Eh	Displays information about the current selection
Intro Toggle	30h, 5Fh	Toggles Intro Mode (plays first 7 seconds of any song)
Jump Down	30h, 1Dh	Acts as Page Down on the Navigator page Acts as Random Mode ON on the Player page
Jump Down X	46h, XXh	Same as Jump Down, except jumps X lines at a time (01h – 08h). Useful for having different numbers of lines on different touch panels.
Jump Up	30h, 1Ch	Acts as Page Up on the Navigator page Acts as Random Mode OFF on the player page
Jump Up X	45h, XXh	Same as Jump Up, except jumps X lines at a time (01h – 08h). Useful for having different numbers of lines on different touch panels.
Letter "a"	30h, 23h	Lowercase 'a'
Letter "A"	30h, 41h	Uppercase 'A'
Letter "b"	30h, 24h	Lowercase 'b'
Letter "B"	30h, 42h	Uppercase 'B'
Letter "c"	30h, 25h	Lowercase 'c'
Letter "C"	30h, 43h	Uppercase 'C'
Letter "d"	30h, 26h	Lowercase 'd'
Letter "D"	30h, 44h	Uppercase 'D'

Letter "e"	30h, 27h	Lowercase 'e'
Letter "E"	30h, 45h	Uppercase 'E'
Letter "f"	30h, 28h	Lowercase 'f'
Letter "F"	30h, 46h	Uppercase 'F'
Letter "g"	30h, 29h	Lowercase 'g'
Letter "G"	30h, 47h	Uppercase 'G'
Letter "h"	30h, 2Ah	Lowercase 'h'
Letter "H"	30h, 48h	Uppercase 'H'
Letter "i"	30h, 2Bh	Lowercase 'i'
Letter "I"	30h, 49h	Uppercase 'I'
Letter "j"	30h, 2Ch	Lowercase 'j'
Letter "J"	30h, 4Ah	Uppercase 'J'
Letter "k"	30h, 2Dh	Lowercase 'k'
Letter "K"	30h, 4Bh	Uppercase 'K'
Letter "l"	30h, 2Eh	Lowercase 'l'
Letter "L"	30h, 4Ch	Uppercase 'L'
Letter "m"	30h, 2Fh	Lowercase 'm'
Letter "M"	30h, 4Dh	Uppercase 'M'
Letter "n"	30h, 30h	Lowercase 'n'
Letter "N"	30h, 4Eh	Uppercase 'N'
Letter "o"	30h, 31h	Lowercase 'o'
Letter "O"	30h, 4Fh	Uppercase 'O'
Letter "p"	30h, 32h	Lowercase 'p'
Letter "P"	30h, 50h	Uppercase 'P'
Letter "q"	30h, 33h	Lowercase 'q'
Letter "Q"	30h, 51h	Uppercase 'Q'
Letter "r"	30h, 34h	Lowercase 'r'
Letter "R"	30h, 52h	Uppercase 'R'
Letter "s"	30h, 35h	Lowercase 's'
Letter "S"	30h, 53h	Uppercase 'S'
Letter "t"	30h, 36h	Lowercase 't'
Letter "T"	30h, 54h	Uppercase 'T'
Letter "u"	30h, 37h	Lowercase 'u'
Letter "U"	30h, 55h	Uppercase 'U'
Letter "v"	30h, 38h	Lowercase 'v'
Letter "V"	30h, 56h	Uppercase 'V'
Letter "w"	30h, 39h	Lowercase 'w'
Letter "W"	30h, 57h	Uppercase 'W'
Letter "x"	30h, 3Ah	Lowercase 'x'
Letter "X"	30h, 58h	Uppercase 'X'
Letter "y"	30h, 3Bh	Lowercase 'y'
Letter "Y"	30h, 59h	Uppercase 'Y'
Letter "z"	30h, 3Eh	Lowercase 'z'
Letter "Z"	30h, 5Ah	Uppercase 'Z'
Menu	30h, 02h	Enters the Main Menu
Mode	30h, 01h	Toggles between Player and Navigator pages
Move to Bottom	30h, B4h	Navigates to the bottom of the current list
Move to Top	30h, B3h	Navigates to the top of the current list
Next/Down	30h, 17h	Acts as Cursor Down on the Navigator page Acts as Next Song on the Player page

Number '0'	30h, 0Dh	Number '0'
Number '1'	30h, 04h	Number '1'
Number '2'	30h, 05h	Number '2'
Number '3'	30h, 06h	Number '3'
Number '4'	30h, 07h	Number '4'
Number '5'	30h, 08h	Number '5'
Number '6'	30h, 09h	Number '6'
Number '7'	30h, 0Ah	Number '7'
Number '8'	30h, 0Bh	Number '8'
Number '9'	30h, 0Ch	Number '9'
Pause Toggle	30h, 0Fh	Toggles Pause ON and OFF
Play Now	30h, AEh	Plays the current selection immediately. Flips the ARQ to the Player page
Play Now-NoFlip	30h, 6Eh	Plays the current selection immediately. Leaves the ARQ on the Navigator page
Power Toggle	30h, 03h	Toggles Soft Power ON and OFF
Previous/Up	30h, 15h	Acts as Cursor Up on the Navigator page Acts as Previous Song on the Player page
Queue	30h, 68h	Adds the current selection to the end of the Now Playing queue
Record	30h, 10h	Rips the CD in the CD Tray onto the hard drive
Record – No Edit	30h, 90h	Begins ripping the CD in the CD tray without prompting user for information
Repeat Toggle	30h, 12h	Toggles Repeat On and OFF
Repeat/Continuous Toggle	30h, B0h	Cycles between Repeat, Continuous, and OFF
Rewind/Left	30h, 18h	Acts as Move Left on the Navigator page Acts as Rewind on the Player page
Search	30h, 64h	Enters extended search mode
Select Toggle	30h, 14h	Selects/Deselects the currently highlighted item
Shuffle Toggle	30h, 11h	Toggles Shuffle ON and OFF
Space	30h, 3Dh	Enters a Space in text entry
Stop	30h, 0Eh	Stops music from playing
Symbol " " "	30h, 75h	Symbol " " "
Symbol " ! "	30h, 79h	Symbol " ! "
Symbol " # "	30h, 6Ah	Symbol " # "
Symbol " \$ "	30h, 6Bh	Symbol " \$ "
Symbol " & "	30h, 78h	Symbol " & "
Symbol " ("	30h, 6Eh	Symbol " ("
Symbol ") "	30h, 6Fh	Symbol ") "
Symbol " * "	30h, 6Ch	Symbol " * "
Symbol " , "	30h, 7Bh	Symbol " , "
Symbol " . "	30h, 7Ch	Symbol " . "
Symbol " / "	30h, 6Dh	Symbol " / "
Symbol " : "	30h, 74h	Symbol " : "
Symbol " ? "	30h, 7Ah	Symbol " ? "
Symbol " @ "	30h, 69h	Symbol " @ "
Symbol " _ "	30h, 70h	Symbol " _ "
Symbol " ~ "	30h, 73h	Symbol " ~ "
Symbol " - "	30h, 71h	Symbol " - "

Symbol " + "	30h, 72h	Symbol " + "
Symbol " = "	30h, 77h	Symbol " = "
Symbol " ' "	30h, 76h	Symbol " ' "
Themes	30h, 5Ch	Changes the look of the GUI display
Visuals	30h, 5Bh	Enters Visuals mode
Volume Down	30h, 1Bh	Lowers the volume of the Analog output
Volume Up	30h, 1Ah	Raises the volume of the Analog output

Discrete Serial Port Codes

Command	Hex String	Description
Auto Rip Off	30h, 93h	Turns off Auto Ripping mode
Auto Rip On	30h, 92h	Turns on Auto Ripping mode
Clear Now Playing	30h, A0h	Empties the Now Playing queue
Continuous ON	30h, 3Ch	Turns on Continuous playback mode
Create Empty Playlist	30h, A7h	Creates an empty Playlist. Prompts for a name.
Create Now Playing Playlist	30h, A8h	Creates a Playlist from the songs in the Now Playing queue
Create Selected Songs Playlist	30h, A9h	Creates a Playlist of the songs in the Selected Songs list. Prompts for a name
Deselect	30h, 76h	Deselects any selected songs
Direct Playlist Access – Flip	42h, Nh	Plays songs in the N^{th} Playlist, where N is any Hex number from 01h to FFh (total of 255 playlists). ARQ flips to Player page
Direct Playlist Access – No Flip	43h, Nh	Plays songs in the N^{th} Playlist, where N is any Hex number from 01h to FFh (total of 255 playlists). ARQ stays on current page (Player or Navigator)
Eject	30h, 8Bh	Opens/Closes the CD Drawer
Fast Forward	30h, 88h	Skips ahead 5 seconds on the current song
FreeDB Reset	30h, 75h	Resets pending CD lookups
Go to Current Album	30h, BAh	Navigates to the Currently Playing Song's Album
Go to Current Artist	30h, B9h	Navigates to the Currently Playing Song's Artist
Go to Current Genre	30h, 79h	Navigates to the Currently Playing Song's Genre
Go to Current Playlist	30h, 7Ah	Navigates to the Currently Playing Song's Playlist
Go to Current Song	30h, B8h	Navigates to the Currently Playing Song in All Songs
Go to Navigator	30h, 8Eh	Flips the ARQ to the Navigator page
Go to Player	30h, 8Fh	Flips the ARQ to the Player page
Line-In Play	30h, B5h	Lets you listen to what is connected to Line-In
Line-In Record	30h, B6h	Starts a recording of what is connected to Line-In (requires you enter a name and begin the recording)
Next Album	30h, ACh	Plays songs on the next Album, alphabetically
Next Artist	30h, AAh	Plays songs by the next Artist, alphabetically
Next Genre	30h, 6Ch	Plays songs in the next Genre, alphabetically
Next Playlist	30h, 9Eh	Plays songs in the next Playlist, numerically
Next Song	30h, 89h	Plays the Next song in the play queue
Pause-OFF	30h, 81h	Un-pauses music playback
Pause-ON	30h, 84h	Pauses music playback
Play	30h, 8Ch	Starts music playing if music is stopped or paused
Play/Pause Toggle	30h, B2h	Toggles between Play and Pause. Discrete because it works on the Navigator page also

Play Playlist 1	30h, 94h	Plays songs in the first Playlist on the system
Play Playlist 2	30h, 95h	Plays songs in the second Playlist on the system
...
Play Playlist 10	30h, 9Dh	Plays songs in the tenth Playlist on the system
Power-OFF	30h, 74h	Soft Powers OFF the ARQ
Power-ON	30h, 73h	Powers ON the ARQ from a Soft Power OFF state
Previous Album	30h, ADh	Plays songs on the previous Album, alphabetically
Previous Artist	30h, ABh	Plays songs by the previous Artist, alphabetically
Previous Genre	30h, 6Bh	Plays songs in the previous Genre, alphabetically
Previous Playlist	30h, 9Fh	Plays songs in the previous Playlist, numerically
Previous Song	30h, 87h	Plays the Previous song in the play queue
Random-IN	30h, 80h	Turns on Random play mode
Random-OUT	30h, 7Fh	Turns off Random play mode
Repeat/Continuous OFF	30h, 83h	Turns off Repeat and Continuous modes
Repeat-ON	30h, 86h	Turns on Repeat
Rewind	30h, 8Ah	Skips back 5 seconds on the current song
Shuffle-OFF	30h, 82h	Turns off Shuffle
Shuffle-ON	30h, 85h	Turns on Shuffle (reorders the current play queue)
Start-TVout	30h, 77h	Re-initializes the Composite and S-Video outputs

Other Advanced Serial Port Codes

Command	Hex String	Description
LCD/GUI Data Request	3Fh	Request for updated Player info (used when Constant Player Feedback is not turned ON)
Jump to Line X – Flip	5Dh, XXh	Moves the cursor to line XX and issues an "Enter" command on that line. If that line contains a song, the ARQ will flip to the Player page.
Jump to Line X – No Flip	3Eh, XXh	Moves the cursor to line XX and issues an "Enter" command on that line. Does NOT flip the ARQ to the Player page.
Move to Line X	3Dh, XXh	Moves the cursor to line XX, but does NOT issue an "Enter" command
Ethernet Ping Request	47h	Request a ping response for TCP/IP connections. Used to determine if ARQ is still online.
Reboot	30h, B7h	Reboots the AudioReQuest
Refresh	48h	Requests all current LCD/GUI/Status information be sent from the ARQ
Set Volume Level	49h, XXh	Sets the volume level of the Analog audio output to the value of XX. Values of XX may be: <ul style="list-style-type: none"> • Between 00h and 64h (0-100 in ASCII) • FFh (mute) • FEh (unmute)
Seek	44h, time	Seeks to a certain time in the current song. See below for an example.
Path Request	4Ah, XXh	Requests a Song path, Song ID, or AlbumARQ™ path be sent from the ARQ. The value of XX determines which path will be sent. <ul style="list-style-type: none"> 01h – Player Current Song image – large 02h – Player Current Song image – small 03h – Player Current Song path 04h – Navigator image – large 05h – Navigator image – small 06h – Navigator path 07h – Player Current Song ID 08h – Player Next Song ID 09h – Player Next Song image – large 0Ah – Player Next Song image – small 0Bh – Player Next Song path
Queue by Song ID	4Bh, IDh	Adds to the Now playing queue the song with Song ID equal to ID . See next page for more info.
Queue by Song Path	4Dh, LLh, path	Adds to the Now Playing Queue the song with Song Path equal to path . See next page for more info.

Seek Example:

Let's assume the current song is 2:30 long, or 150 seconds. To seek to the middle of the song (1:15 or 75 seconds), you would do the following.

$$\text{BYTE 1} = \frac{75}{255} = 0, \text{ or } 00h$$

$$\text{BYTE 2} = 75 \text{ MOD } 255 = 75, \text{ or } B4h$$

Therefore, you would send **44h, 00h, B4h**

Queue by Song ID:

The format of this command is as follows

Command Header 1 Byte (4Bh)	ID Byte 1	ID Byte 2	ID Byte 3	ID Byte 4
---	-----------	-----------	-----------	-----------

Song IDs start at 1001 and should be formatted as **LSBF**. The Song IDs can be found by doing an export of the music database from the WebServer. The following example shows how to format the Song ID correctly.

Example: Let's assume that the song ID is 1001 (the lowest possible number). The bytes should be calculated as follows:

$$\text{Byte 4} = \frac{1001}{256^3} = 0 \quad (\text{remainder dropped})$$

$$\text{Byte 3} = \frac{1001 - (\text{Byte4} \times 256^3)}{256^2} = 0 \quad (\text{remainder dropped})$$

$$\text{Byte 2} = \frac{1001 - (\text{Byte4} \times 256^3) - (\text{Byte3} \times 256^2)}{256} = 3 \quad \text{which equals } 03h \quad (\text{remainder dropped})$$

$$\text{Byte 1} = 1001 - (\text{Byte4} \times 256^3) - (\text{Byte3} \times 256^2) - (\text{Byte2} \times 256) = 233 \quad \text{which equals } E9h$$

Therefore, the string you would send to the ReQuest would be as follows:

4Bh, E9h, 03h, 00h, 00h

Queue by Song Path:

The format of this command is as follows

Command Header 1 Byte (4Dh)	Path Length 1 Byte	Path 255 Bytes Max
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The path should **ALWAYS** start with "/MP3", as that is the root directory for all files on the AudioReQuest. The paths can be found by doing an export of the music database from the WebServer.

Example: Let's say we want to play "Two Step" by Dave Matthews Band. The path to this file is "/MP3/6C45AFD354BE/dave_matthews_band/crash/two_step.mp3". This path is 51 characters long, which is **33h**. The following command will queue this song:

4Dh, 33h, /MP3/6C45AFD354BE/dave_matthews_band/crash/two_step.mp3

Requesting Feedback

Before the AudioReQuest will send feedback data, you must send a command to the ReQuest that initializes data feedback. All commands are formatted as follows:

Command Header 1 Byte (33h)	Command 1-2 Bytes
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The **Command Header** is always **33h**.

It is recommended that the initialization string you choose to use be sent to the ReQuest any time the ReQuest is selected from the sources page. This ensures that if the previous connection was lost, it is regained and all data is refreshed.

The following commands may be sent to the ReQuest to initialize feedback (**bold** lines are typical and recommended):

Command	Hex String	Symbol/Letter equivalent	Description
Feedback OFF	6Eh	n	Turns off Data Feedback
LCD ON	6Ch	l	ONLY LCD Data should be sent
GUI ON	67h	g	ONLY GUI Data should be sent
LCD & GUI ON	62h	b	BOTH LCD and GUI Data should be sent
Compressed	63h	c	Data should be sent in compressed format with FFh, FAh as a delimiter. This command should be sent before the 'g', 'l', or 'b'
Uncompressed	75h	u	Data should be sent in uncompressed format (no delimiters)
Elapsed Time ON	2Bh, 74h	+t	Elapsed time should be sent during playback
Elapsed Time OFF	2Dh, 74h	-t	Elapsed time should NOT be sent during playback
Compressed LCD ON	4Ch, 63h	Lc	LCD Data should be sent in compressed format (same as sending 'c', then 'l'). Data sent could be up to 80 characters.
Compressed LCD ON	4Ch, 66h	Lf	Same as 'Lc', except that no more than 20 characters will be sent for each line
LCD OFF	4Ch, 30h	L0	Turns OFF LCD Data feedback
Compressed GUI ON	47h, 63h	Gc	GUI Data should be sent in compressed format (same as sending 'c', then 'g')
Uncompressed GUI ON	47h, 72h	Gr	GUI Data should be sent in uncompressed format
GUI OFF	47h, 30h	G0	Turns OFF GUI Data feedback
Constant Player Data ON	6Dh, 2Bh	m+	Turns ON constant player feedback so you get player data on any page
Constant Player Data OFF	6Dh, 2Dh	m-	Turns OFF constant player feedback
Status Messages ON	73h, 2Bh	s+	Enables Status messages
Status Messages OFF	73h, 2Dh	s-	Disables Status messages

Example: This command will turn on Compressed GUI data, Elapsed Time, Constant Player Feedback, and Status messages

Hex Version	Text Version
33h, 47h, 63h, 33h, 2Bh, 74h, 33h, 6Dh, 2Bh, 33h, 73h, 2B	3Gc3+t3m+3s+

Receiving Feedback

The typical format for feedback data is compressed (either LCD or GUI). Uncompressed Data is **NOT** recommended. When the AudioReQuest sends compressed data, the first byte is **ALWAYS** one of the following data types:

Data Type		
Hex Value	ASCII Value	Description
31h	49	LCD Data
32h	50	GUI Data (most common)
36h	54	Status Message
37h	55	Cover Art/Stream Path
38h	56	Timed Dialog Message
39h	57	Player Song has changed
3Ah	58	Navigator Selection has changed
47h	71	Ethernet Ping response

Breakdown of Each Data Type

1) LCD Data (31h):

Data Type	Unused	Cursor Position (X)	Cursor Position (Y)	Line Number	Data	Footer
31h	1 Byte	1 Byte	1 Byte	1 Byte	32 Bytes Max	2 Bytes (FFh, FAh)

2) GUI Data (32h):

Data Type	Screen Type	Data Header	Data	Footer
32h	1 Byte	1 Byte	32 Bytes Max	2 Bytes (FFh, FAh)

Screen Types (Only sent when Data Type = 32h):

Hex Value	ASCII Value	Description
11h	17	Player Data is being sent
12h	18	Navigator Data is being sent

Data Headers (Only sent when Data Type = 32h):

**The Data Header depends on the Screen Type

When Screen Type is 11h (Player Data):

Data Header			Length of the following Data (Bytes)
Hex Value	ASCII Value	Description	
01h	1	Playlist Name	32 max
02h	2	Shuffle State 0 = Shuffle OFF 1 = Shuffle ON	1
03h	3	Repeat/Continuous State 0 = OFF 1 = Repeat ON 2 = Continuous ON	1
04h	4	Intro State 0 = Intro OFF 1 = Intro ON	1
05h	5	Player State 1 = Stopped 2 = Playing 3 = Paused	1

06h	6	Elapsed Time	4 (LSBF)
07h	7	Total Time	4 (LSBF)
08h	8	Current Song Selected 0 = Song NOT Selected 1 = Song IS Selected	1
0Ah	10	Next Song Selected 0 = Song NOT Selected 1 = Song IS Selected	1
0Bh	11	Next Song Title	32 max
0Ch	12	Current Song Title	32 max
0Dh	13	Current Artist Name	32 max
0Eh	14	Current Album Name	32 max
0Fh	15	Current Genre	32 max
10h	16	Current Track Number	4 (LSBF)
12h	18	Total Tracks	4 (LSBF)
13h	19	Next Track Artist	32 max
14h	20	Next Track Album	32 max
15h	21	Next Track Genre	32 max

When Screen Type is 12h (Navigator Data):

Data Header			Length of the following Data (Bytes)
Hex Value	ASCII Value	Description	
01h	1	Cursor Position (1 bit for each of the 8 lines)	2
02h	2	Window Title	32 max
03h	3	Up Arrow (Byte 1) 0 = no lines above line 1 1 = more lines above line 1 Down Arrow (Byte 2) 0 = no lines below line 8 1 = more lines below line 8	2 Total 1 for UP 1 for DOWN
06h	6	Line 1	32 max
07h	7	Line 2	32 max
08h	8	Line 3	32 max
09h	9	Line 4	32 max
0Ah	10	Line 5	32 max
0Bh	11	Line 6	32 max
0Ch	12	Line 7	32 max
0Dh	13	Line 8	32 max
0Eh	14	Selected Artist	32 max
0Fh	15	Selected Album	32 max
10h	16	Selected Genre	32 max
11h	17	Selected Playlist	32 max
12h	18	Num Items in List	4 (LSBF)
13h	19	Total Time	4 (LSBF)

3) Status Message (36h):

Data Type 36h	State 2 Bytes	NetSync 1 Byte	SW Update 1 Byte	Search 1 Byte	Screen Saver 1 Byte	Vol Level 1 Byte	Footer 2 Bytes (FFh, FAh)
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State

The 2 bytes for the state value are **LSBF**. Valid states are as follows:

Value*	Mode	Description
100	Navigator	The ARQ is on the Navigator page.
101	Power	The ARQ is Soft Powered OFF.
102	Edit	The ARQ is on the Edit screen.
103	Info	The ARQ is on the Info screen.
105	Day/Time	The ARQ is on the Edit Day/Time page.
106	Line In Rec	The ARQ is recording from LINE-IN.
107	Line In Info	The ARQ is on the edit screen for LINE-IN.
108	Edit (listbox)	The ARQ is on an edit page with a list of choices, such as EDIT GENRE.
240/241	Player	The ARQ is on the Player page.
303	Non-Timed Dialog	There is a message being displayed on the ARQ that will not go away until Enter or Cancel is pressed.
400	Menu	The ARQ is on the Menu page.
500/502	Encoder	The ARQ is encoding music.
501	Encoder Edit	The ARQ is on the edit page prior to encoding.
503	Genre Lookup	The ARQ is looking up genres for your music.
504	Transcode	The ARQ is converting WAV to FLAC.
600	Visuals	The ARQ is in Visuals Mode.
700	Unusable State	The ARQ is installing a software update and the unit is unusable.
701	Unusable State	The ARQ has booted into Safe Mode due to a HW or SW failure. Call Tech Support for further assistance.

NetSync

If this Byte contains a value of 1, the AudioReQuest is NetSyncing to its master. This will only be the case on an ARQ Zone or a Pro configured as a Zone.

SW Update

If this Byte contains a value of 1, the AudioReQuest is downloading a Software Update

Search

If this Byte contains a value of 1, the AudioReQuest is in Extended Search mode, allowing you to enter multiple characters to narrow your search.

Screen Saver

If this Byte contains a value of 1, the AudioReQuest is in Screen Saver mode.

Vol Level

This Byte contains the Volume Level of the Analog Audio output on the ARQ. The valid range of values is 0-100 (or 00h – 64h). If the level returned is FFh, then the volume is muted. There is essentially no difference between a value of 00h and a value of FFh. 00h will be sent when the volume is *turned down* all the way, whereas a value of FFh will be returned when the MUTE command is sent.

NOTE: This value is NOT valid for either of the Digital outputs, which are always at MAX.

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4) Cover Art/Stream Path (37h):

Data Type 37h	Path Type 1 Bytes	Path Data 255 Bytes Max	Footer 2 Bytes (FFh, FAh)
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The Cover Art or Stream paths are **ONLY** sent when they are requested. Refer to the **Other Advanced Serial Port Codes** section on page 10 for further information.

Path Types

Hex Value	ASCII Value	Description
01h	1	Player AlbumArt™ path, large picture
02h	2	Player AlbumArt™ path, small picture
03h	3	Player Stream path*
04h	4	Navigator AlbumArt™ path, large picture
05h	5	Navigator AlbumArt™ path, small picture
06h	6	Navigator Song Stream path*
07h	7	Currently playing Song ID**
08h	8	Next Song ID**
09h	9	Next Song AlbumArt™ path, large picture
0Ah	10	Next Song AlbumArt™ path, small picture
0Bh	11	Next Song Stream path*

* -----Path to music files, used for streaming audio.

** -----The Song ID can be found by exporting the catalog information from the WebServer

5) Timed Dialog Message (38h):

Data Type 38h	Dialog Title 32 Bytes Max	Delimiter 00h	Dialog Message 256 Bytes Max	Delimiter 00h	Display Time 4 Bytes (LSBF)	Footer 2 Bytes (FFh, FAh)
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6) Player Song has changed (39h):

Data Type 39h	Footer 2 Bytes (FFh, FAh)
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This data is sent whenever the currently playing song on the AudioReQuest changes. This will happen whenever one of the following occurs:

- The current song ends and the next song in the queue begins
- The user selects a new song to play

This is useful for knowing when to request a new AlbumArt™ or Stream path.

7) Navigator Selection has changed (3Ah):

Data Type 3Ah	Footer 2 Bytes (FFh, FAh)
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This data is sent whenever the currently highlighted item on the Navigator page (Song, Artist, Album, etc) changes.

This is useful for knowing when to request a new AlbumArt™ or Stream path.

8) Ethernet Ping Response (47h):

Data Type	Footer
47h	2 Bytes (FFh, FAh)

This data is sent in response to an Ethernet Ping Request (see **Other Advanced Serial Port Codes** on page 10 for more information).

NOTE: An Ethernet Ping Response will **ONLY** be sent to TCP/IP connections. Serial connections will not get a response.