McIntosh Control Interface

By: Rob Kikta (www.linkedin.com/in/robkikta)

Introduction

This application note integrates several published sources along with some additional content in order to provide a single comprehensive overview of interfacing to the RS-232 control interface of McIntosh audio equipment.

This application note provides a general overview of the McIntosh RS-232 control interface and is provided "as is." The author assumes no responsibility for any typographical, technical, content or other inaccuracies in this document. The author of this document does not represent McIntosh Labs in any way.

Equipment that support the Control Interface include a connector on the back panel.

Figure 1 MA5200 Rear Panel (from MA5200 Owner's Manual)

Physical

The control interface is implemented using 3-wire RS232. In the context of RS232, the McIntosh equipment acts as the DCE (data circuit-terminating equipment). The connector used is a standard 3.5mm (1/8 inch) stereo headphone connector wired as shown in Figure 2. The pins are further described in Table 1.

Table 1 McIntosh Control Interface Pin Descriptions

Title	3mm Connector	DB9 Connector	Description
Data In	Tip	2	Data **FROM** McIntosh equipment
Data Out	Ring	3	Data **TO** McIntosh equipment
Ground	Sleeve	5	Ground

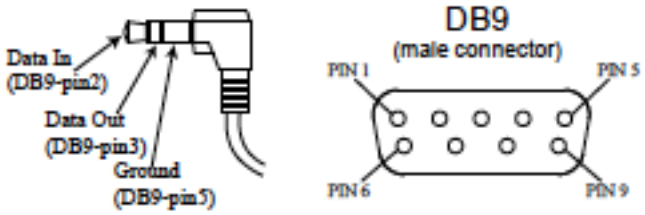

Figure 2 McIntosh Control Interface Pinout (from MA5200 Owner's Manual)

The RS232 specification defines the voltage levels corresponding to logical one and zero levels. Valid signals are either in the range of +3 to +15 volts or the range -3 to -15 volts with respect to ground. As depicted in Figure 3, the measured values are well within the specification at +/- 7 volts.

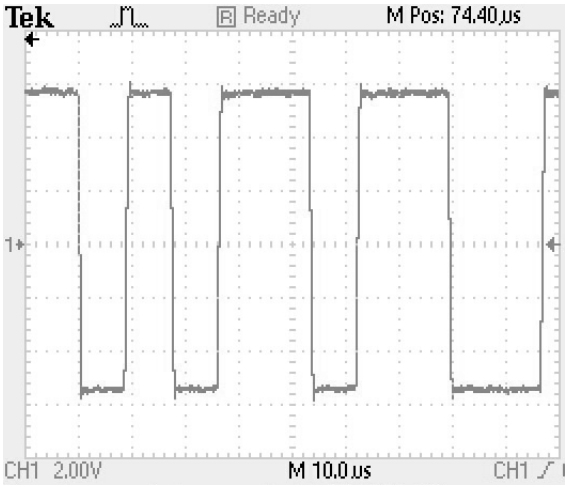

Figure 3 McIntosh Control Interface Voltage Levels

The control interface can operate at multiple speeds but defaults to 115,200 bits per second (bps). The data is formatted as described in Table 3.

Table 2 Control Interface Data Values

Parameter	Value
Data bits	8
Stop bits	1
Parity	None

Command Set

The list of supported commands is dependent upon the specific piece of unit. The commands and parameters supported by a specific unit can be obtained using the HLP command described Table 3.

The commands are sent / received using the ASCII character set. Every command must start with an open parenthesis (“(“, 0x28) and end with a close parenthesis (“)”, 0x29). Carriage returns and line feeds are not necessary and are not used to parse the commands, but should be included for readability. Responses from McIntosh equipment are terminated by carriage return (0x0D) and line feed (0x0A).

The command format is:

(Command [Zone] [Parameter1] [Parameter 2] [Parameter n])

For example the command:

(INP Z1 3)

Will set the input select to CD1.

A full list of commands is provided in Table 3.

Table 3 Commands

Message	Command	Zone	Parameters	Example	Description
Help	HLP	N/A	None	(HLP)	Display list of commands supported by specific unit
RS232 Control	CTL	N/A	0 – Off 1 – On	(CTL 1)	Enables / Disables RS232 interface
Power On	PON	Z1	None		Power on unit. If the unit is in Standby, send power on twice with 100ms delay between commands.
Power Off	POF	Z1	None		Power off unit
System Off	SY0	N/A	None		Power off system
Volume Up	VUP	Z1	None	(VUP Z1)	Volume up one step

Message	Command	Zone	Parameters	Example	Description
Volume Up	VUP	Z1	Step size (1 – 9)	(VUP Z1 5)	Volume up specified step size
Volume Down	VDN	Z1	None	(VDN Z1)	Volume down one step
Volume Down	VDN	Z1	Step size (1 – 9)	(VDN Z1 5)	Volume down specified step size
Volume Set	VST	Z1	Level (0 – 100)	(VST Z1 30)	Set volume to specified level
Output 1	OP1	Z1	0 – On 1 – Off	(OP1 Z1 1)	Turn output 1 on/off
Output 2	OP2	Z1	0 – On 1 – Off	(OP2 Z1 1)	Turn output 2 on/off
Mute	MUT	Z1	0 – Unmuted 1 – Muted	(MUT Z1 1)	Mute or unmute unit

Message	Command	Zone	Parameters	Example	Description
Input Up	INU	Z1	None	(INU Z1)	Increment input select
Input Down	IND	Z1	None	(IND Z1)	Decrement input select
Input Select	INP	Z1	1 – MC 2 – MM 3 – CD1 4 – CD2 5 - DVD 6 – AUX 7 - Server 8 – D2A 9 – Tuner	(INP Z1 3)	Input select

Message	Command	Zone	Parameters	Example	Description
Trim Up	TRU	Z1	0 – Off 1 – Balance 2 – Bass 3 – Treble 4 – Level 5 – Output 6 – Bypass 7 – Mono 8 – Phono 9 – Display 10 – Info 11 – Meter 12 – Tuner 13 – Radio Text 14 – Tuner Mode	(TRU Z1 0)	Increment selected trim value

Message	Command	Zone	Parameters	Example	Description
Trim Down	TRD	Z1	Same as TRU	(TRD Z1 0)	Decrement selected trim value
USB Audio	TPC	Z1	0 – Play 1 – Stop 2 – Pause 3 – Next 4 – Back 5 – Reverse 6 – Forward	(TPC Z1 0)	Send control commend to USB source unit. The parameters are as reported by McIntosh, but don't seem to match use on Apple computer
IR Converter	CNV	N/A	0 – Off 1 – On	(CNV 1)	CNV
RS232 to IR	KEY	Z1	IR Hex Code	(KEY Z1 5F)	Send hex value to IR port
System Query	QRY	N/A	None	(QRY)	See Table 4

Table 4 Reply Messages

Message	Command	Zone	Parameters	Example	Description
IR to RS232	IRC	Z1	IR Hex Code	(IRC Z1 10)	Report value of command received on IR interface
Volume Status	VST	Z1	Volume Level (0 – 100)	(VST Z1 30)	Report volume level
Mute Status	MUT	Z1	0 – Unmuted 1 – Muted	(MUT Z1 1)	Report mute status
Input Selected	INP	Z1	2 – MM 3 – CD1 4 – CD2 6 – AUX 8 – D2A 9 – Tuner	(INP Z1 3)	Report selected Input

Message	Command	Zone	Parameters	Example	Description
Trim Status	TRS	Z1	**Parameter1** – Selected Trim 0 – Off 1 – Balance 4 – Level 5 – Output 7 – Mono 9 – Display 10 – Info 11 – Meter **Parameter2** – Trim Value	(TRS Z1 1 +10)	Value of specified trim parameter

Table 5 Error Messages

Message	Command	Example	Description
Command Error	ERR 1	(ERR 1)	Unrecognized command
Zone Error	ERR 2	(ERR 2)	Use only Z1
Parameter Error	ERR 3	(ERR 3)	Format or value in error
Request Blocked Error	ERR 4	(ERR 4)	Trim or Setup Mode is active
Zone Off Error	ERR 5	(ERR 5)	Requested Zone must first be on
Input Error	ERR 6	(ERR 6)	Wrong input selected for request