Digital Sound Module

DSM-4020

User Manual

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The Media Pro® 4000 system in not intended for direct control in safety critical applications. It should be used in conjunction with a Programmable Logic Controller where safety is an issue.

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Contents

Preface

Welcome to the Media Pro® DSM-4020User's Operational Manual. Highlighted in this manual are the component features, installation, configuration, software operation, programming reference, examples of typical applications, and technical support information.

This document is provided so users of the Media Pro® 4000 can gain an understanding of the system design and implementation techniques. It is assumed the reader has a basic knowledge of typical show elements and their control requirements. In addition, a basic understanding of programming concepts will help the user understand Anitech System's powerful English based Media Pro® Control Language (MPCL).

For specific information about other Media Pro® 4000 products, please refer to the applicable user manual or on-line help system.

Related Publications

The following documents contain additional information concerning ASI Media Pro® 4000 products. To obtain a copy of any of the documents listed below, contact ASI or visit our website.

Document	Description
ABM – 4010	Allen Bradley Remote Input/Output Module (RIO)
AOM – 4010	Analog Output Module - 16 Channel
APC – 4020	Animation Programming Console
ASM – 4030/4020	Analog Servo Module - 8 Channel / 4 Channel with Compliance
DSM – 4020	Digital Sound Module with PCMCIA socket
HMR – 4000	Horizontal Module Rack - 5 Slot
ICM – 4020	Intelligent Control Module
IMC – 4020/4010	Integrated Module Controller
IOM – 4020	Input/Output Module - 16 Bit (24vdc)
LCM – 4020	Lighting Control Module (DMX 512)
SEM – 4020	Serial Expansion Module - 8 Channel (RS-232)
TCM – 4020	Time Code Module (SMPTE)
VMR – 4000	Vertical Module Rack - 18 Slot

System Requirements

➢ IBM PC compatible computer running Windows 95 / 98 environment with 1 serial port at 19.2Kbps.

➢ The PC should be at least Pentium 90 MHz, with a minimum of 15 Mbytes of Ram.

➢ The recommended minimum system is Pentium 133MHz or faster with 32M hard drive and a serial port at 115.2Kbps.

➢ An EPP 1284-1994 compatible parallel port is required for animation and is recommended for all other operations, but not required. Downloads for Animation and DSM sound files are much faster over the EPP parallel port.

➢ Approximately 6 Mbytes of disk space are required for the MP4000 software. In addition, we recommend a minimum of 30 Mbytes storage for each show's application files. This size will vary depending on the show configuration and the size of the sound and animation files that may be required.

Getting Started

The Media Pro® 4000 Software is provided on a set of floppy disks. To install the files, follow these directions:

☐ Place disk 1 into the floppy drive. Open the Explorer and browse **FLOPPY [A:]**

☐ Double click on **SETUP… .EXE**

☐ Follow the on-screen installation instructions.

☐ The default directory **C:\MP4000** will be created and placed on the desktop.

☐ To enter the program, browse the directory and double click **MP4000.EXE**

☐ Current versions of the MP4000 software place an icon on the desktop, earlier versions (1998) do not.

Operating Environment

All Media Pro® Products are manufactured to the highest standards. With proper care and maintenance, they should provide many years of trouble-free service.

To ensure that your equipment has the longest life possible, it should be placed in an area with good ventilation and low humidity, out of direct sunlight and away from heat sources or lamps. Never expose equipment to moisture of any sort. Always maintain a dust, dirt and smoke free environment.

Always remember that high temperature is the enemy of all electronic equipment.

Environmental Conditions:

Recommended Operating:	10° to 32° C (40° - 90° F)
Storage Temperature:	-40° to 60° C (-4° - 140° F)
Relative Humidity:	0 to 95% (Without Condensation)

Warranty

Anitech Systems warrants this product to be free of manufacturing defects for 1 year from the date of purchase. At Anitech System's discretion, Anitech Systems will repair or replace a module that fails due to manufacturing defects.

The warranty does not cover shipping charges or modules damaged due to improper configuration, misapplication, misuse, abuse, accidents, or shipping damage.

Service Options

Obtain a Return Materials Authorization by contacting Anitech Systems.
The contact information for customer support follows:

E-mail	Mail@Anitech-Systems.com
Web	http://www.Anitech-Systems.com
Telephone	(661)257-2184
Fax	(661)257-2025

Non-Warranty Modules Returned for Repair

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Section 1 – Introduction

This manual is a technical reference for the DSM - 4020 Digital Sound Module. It contains specifications, diagrams and instructions to help with the implementation of systems using this product.

1.1   Module Description

The DSM-4020 is a state of the art DSP powered, 2-channel, solid-state audio reproducer. It offers a wide dynamic range, flat frequency response, and is virtually maintenance free. The millionth play is as crisp and clear as the first.

The DSM-4020 has many unique features. It has 2 exclusive channels of audio, user-defined mix busses, built in programmable ramping, integrated maintenance functions, and the FLASH MEMORY storage technology. The data for the Digital Sound Module is stored in FLASH EPROM. The data is downloaded to the FLASH EPROMs on the Media Pro Network, directly from your Pentium compatible computer through it's serial or parallel communications port. With the DSM-4020 you can now digitize, edit, and program the audio tracks from your own computer.

The DSM-4020 uses a 10 MIPS Digital Signal Processor and a 16 bit PCM Digital to Analog Converter built on a standard Eurocard PC board. The module has 2 random access ports of audio that can reproduce over 34 minutes of voice grade audio, to 1 minute 35 seconds of CD quality audio. Each track is programmable for a unique data format of 16 bit PCM, 8 bit uLaw, or 4 bit ADPCM at an update rate of 44.1 Khz, 32 Khz, 24 Khz, 22.050 Khz, 16 Khz, 11.025 Khz, or 8 Khz with 2, 4, or 8 times over sampling computed by the DSP chip. These options coupled with the memory type used determine the audio quality and length that can be stored on a DSM-4020 module. This combination brings high performance CD quality audio reproduction capability with built in intelligence and ease of use previously unavailable.

The DSM-4020 has many unique features that save systems cost by eliminating unnecessary external equipment. The audio MIX BUS enables the system to mix multiple audio sources to one output without the need for an Audio Mixer or Summing Amplifier. By incorporating an audio RAMP feature that provides programmable audio level and ramp rate, expensive external VCA equipment can be eliminated. The built-in Maintenance mode provides a setup feature that generates 100Hz, 1Khz, 10Khz, and Pink noise audio tones before show data is ready for the board. This can greatly simplify the EQ process and calibration of electronic crossovers of the audio system.

Playback time per Megabyte in minutes and seconds				
Frequency Response	4Khz	5.5 Khz	16 Khz	22 Khz
PCM	01:05	00:47	00:16	00:11
uLaw	02:11	01:35	00:32	00:23
ADPCM	04:22	03:10	01:05	00:47

1.2   DSM Timing

(Minutes)	PCMCIA MB>	1	2	4	8	12	60	110	220	520
	Actual Bytes>	1,048,576	2,097,152	4,194,304	8,388,608	12,582,912	62,914,560	115,343,360	230,686,720	545,259,520
PCM Sample Rate (K)	Freq Response (K)	(Min.)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)
44.100	22	0.19	0.39	0.79	1.58	2.37	11.88	21.79	43.59	103.03
32.000	16	0.27	0.54	1.09	2.18	3.27	16.38	30.03	60.07	141.99
24.000	12	0.36	0.72	1.45	2.91	4.36	21.84	40.04	80.09	189.32
22.050	11	0.39	0.79	1.58	3.17	4.75	23.77	43.59	87.18	206.06
16.000	8	0.54	1.09	2.18	4.36	6.55	32.76	60.07	120.14	283.98
11.025	5	0.79	1.58	3.17	6.34	9.51	47.55	87.18	174.36	412.13
8.000	4	1.09	2.18	4.36	8.73	13.10	65.53	120.14	240.29	567.97
uLaw Sample Rate (K)	Freq Response (K)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)
44.100	22	0.39	0.79	1.58	3.17	4.75	23.77	43.59	87.18	206.06
32.000	16	0.54	1.09	2.18	4.36	6.55	32.76	60.07	120.14	283.98
24.000	12	0.72	1.45	2.91	5.82	8.73	43.69	80.09	160.19	378.65
22.050	11	0.79	1.58	3.17	6.34	9.51	47.55	87.18	174.36	412.13
16.000	8	1.09	2.18	4.36	8.73	13.10	65.53	120.14	240.29	567.97
11.025	5	1.58	3.17	6.34	12.68	19.02	95.10	174.36	348.73	824.27
8.000	4	2.18	4.36	8.73	17.47	26.21	131.07	240.29	480.59	1135.95
ADPCM Sample Rate (K)	Freq Response (K)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)	(Min)
44.100	22	0.79	1.58	3.17	6.34	9.51	47.55	87.18	174.36	412.13
32.000	16	1.09	2.18	4.36	8.73	13.10	65.53	120.14	240.29	567.97
24.000	12	1.45	2.91	5.82	11.65	17.47	87.38	160.19	320.39	757.30
22.050	11	1.58	3.17	6.34	12.68	19.02	95.10	174.36	348.73	824.27
16.000	8	2.18	4.36	8.73	17.47	26.21	131.07	240.29	480.59	1135.95
11.025	5	3.17	6.34	12.68	25.36	38.04	190.21	348.73	697.46	1648.55
8.000	4	4.36	8.73	17.47	34.95	52.42	262.14	480.59	961.19	2271.91

CD Quality PCM, 44.1k:				Telephone Quality ADPCM, 8k:			
1MB		**11**	**Seconds**	*1MB*		**4.36**	**Minutes**
	64MB	**12.68**	**Minutes**		**64MB**	**4.66**	**Hours**
	220MB	**43.59**	**Minutes**		**220MB**	**16.01**	**Hours**
	520MB	**1.71**	**Hours**		**520MB**	**37.86**	**Hours**

Introduction

Figure 1-1. Media Pro® 4000 Digital Sound Module
DSM-4020

Port Ø Stop

Port Ø Audio Level Adjustment

Track 1 Indicator

Start Track 1 Push-button

Track 2 indicator

Start Track 2 Push-button

Port Ø Ramp Indicator

Port Ø Ramp Control

1/8" Stereo Jack (Monitor Both Ports)

Port 1 Stop Push-button

Port 1 Audio Level Adjustment

Track 1 Indicator

Start Track 1 Push-button

Track 2 Indicator

Start Track 2 Push-button

Port 1 Ramp Indicator

Port 1 Ramp Control

Green LED Communications Indicator

48 pin DIN field Connector (audio & Control Inputs & Outputs

User-Defined Jumpers

96 pin DIN Backplane Connector

Red LED Programming and Maintenance Force Indicator

1.3   Purpose and Intended Use

The DSM-4020 provides Digital Sound Expansion for the Media Pro® 4000 system. The module can be downloaded with audio data recorded on a PC using many available audio recording utilities. In addition, PCM, ADPCM and uLaw encoding/decoding schemes are supported. Once downloaded, these sounds can be triggered from cues or real time animation as required by the application. There are no quantity restrictions for the DSM-4020. This module is supported by the DSM4000 and MP4000 Software utilities.

Introduction

1.4   Specifications

✓   Able to store up to 64 Megabytes of audio with PCMCIA Flash Memory installed

✓   Able to store up to 520 Megabytes of audio with PCMCIA ATA Drive installed

✓   Storing 11 seconds per MB of CD quality 44.1k PCM, to 4 minutes per MB of voice quality 8k ADPCM

✓   Sample rates of 8k, 11.025k, 16k, 22.050k, 24k, 32k, & 44.1k are supported

✓   Audio can be stored on the DSM in PCM 1:1, uLaw 2:1, & ADPCM 4:1 formats

✓   DSM-4010 - Supports 16 bit PCM Mono and WAV, audio source files

✓   DSM-4020 – Supports 16-bit PCM Mono, WAV, and Stereo audio source files.

✓   2 ports on each DSM

✓   Each port controls 2 tracks

✓   Each track can have up to 32 segments (pieces of audio)

✓   Each segment has its own level setting (for balancing the sound levels on the track)

✓   Each segment can be assigned to the left, both, or right audio output

✓   Both the left and right audio outputs have:

   ➢   2 steering relays each

   ➢   1 mixing output, and 7 mix inputs

   ➢   ramp control

✓   Both the left and right audio outputs can play audio asynchronously if Flash Memory is used

✓   Supports phase locking for multi-track audio

✓   Supports cascading for long playing audio

✓   Can be triggered by 24VDC input, cue commands, or real time-animation

✓   Built in maintenance modes to assist equalizing; 100 Hz, 1KHz, 10KHz, Pink Noise

✓   Front panel track triggers, ramp switches, indicators and 1/8" headphone jack

✓   Bandwidth 20Hz – 20KHz (sample rate dependent)

✓   Harmonic Distortion < .5% THD & N

✓   Dynamic Range 96db

✓   Output Level 6.0 vac P-P @ 600 ohms

If any tracks have MUTE option selected, 24VDC must be supplied to the E/S Bus on the backplane in order to hear the audio.

PCMCIA Flash Memory or ATA Drive must be installed on the board to download audio.

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Section 2 – Preparation for Use

This section describes the board layout, jumper configurations, and switch setting selections.   These user-defined configurations need to be set before the DSM will operate correctly.

2.1   Unpacking and Inspection

Inspect the shipping carton immediately upon receipt for evidence of mishandling during transit. If the shipping carton is severely damaged or water-stained, request that the carrier's agent be present when the carton is opened. If the carrier's agent is not present when the carton is opened and the contents are damaged, keep the carton and packaging materials for the agent's inspection.

It is suggested that all salvageable shipping cartons and packing material be retained for future use in the event the product must be shipped.

2.2   Installation Considerations

Choose which connector to use (see section 3.2 Keying and Connector Information for more information.) If any tracks have MUTE option selected, 24 VDC must be supplied to the E/S Bus on the backplane in order to hear the audio (see Module Rack Data sheets for more information).

PCMCIA Flash Memory or ATA Drive must be installed on the board to download audio.

2.3   User-Configurable Jumpers and Options
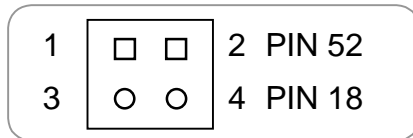
Figure 2 – 1. **DSM-4020**
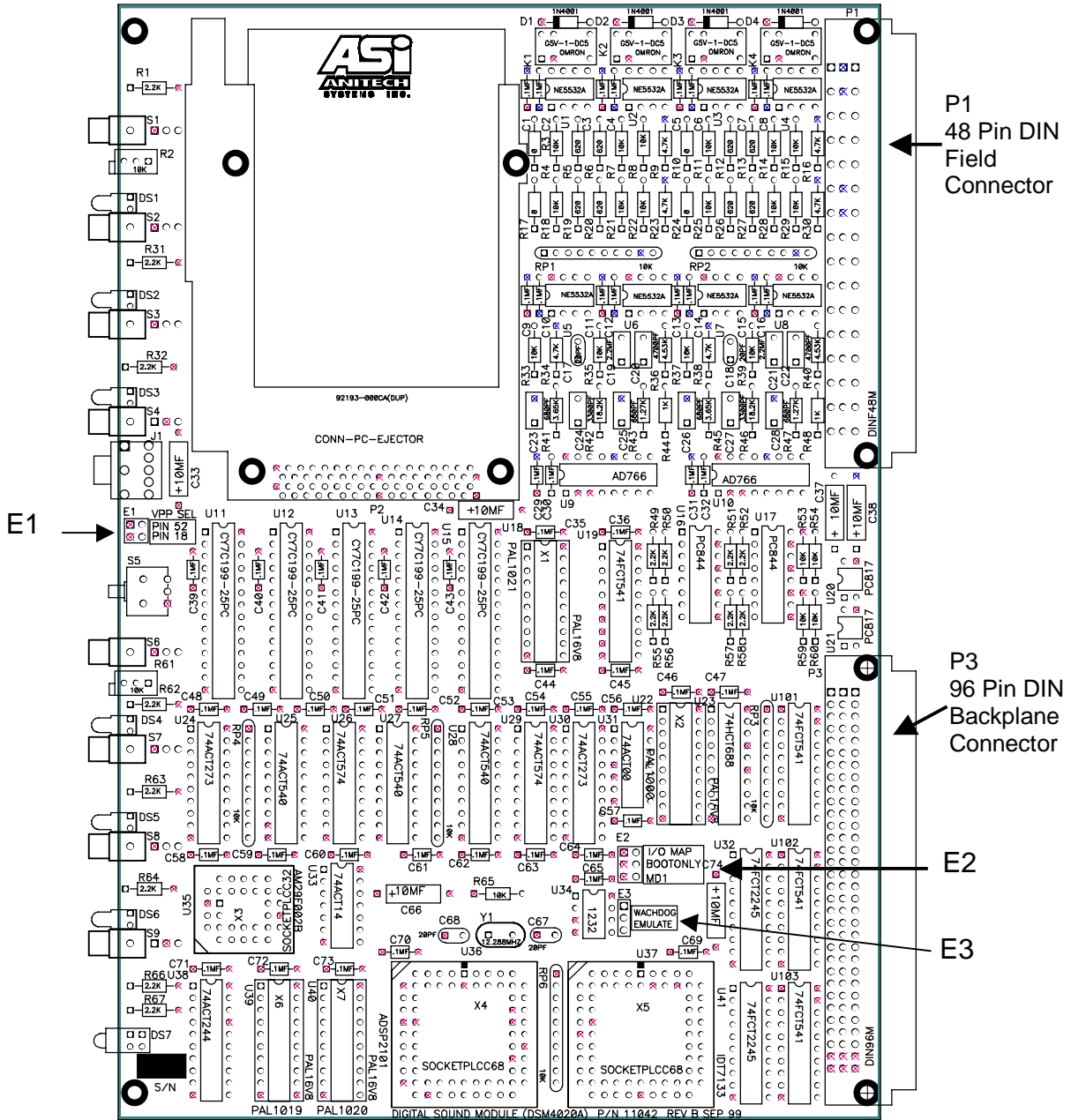
2.3.1 Jumper Settings and Options

The following information applies to user-configurable jumpers and options:

E1

VPP Select (PCMCIA boards)

```
1  □ □ | 2  PIN 52
3  ○ ○ | 4  PIN 18
```

Shunt one of the following:
PIN 52   Shunt across pins 1 – 2.
PIN 18   Shunt across pins 3 – 4.
(Factory Configured to have no pins jumpered.)

E2

I/O Map – Boot Only – MD1

```
I/O MAP      1 □ □ 2
BOOT ONLY 3   ○ ○  4
MD1          5 ○ ○ 6
```
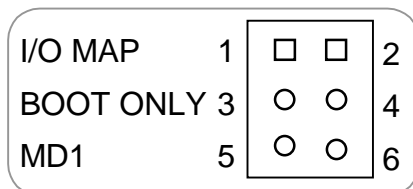
For normal operation:
I/o Map   pins 1 – 2, open, no shunt
Boot Only   pins 3 – 4, open, no shunt.
MD1   pins 5 – 6, open, no shunt.
(Factory Configured)

E3

Watchdog

```
1 □  WATCHDOG
2 ○
3 ○  EMULATOR
```
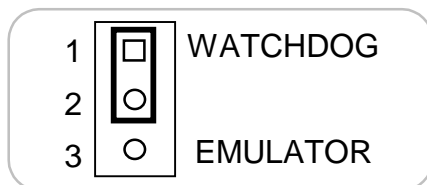
For normal operation, put a shunt over pins 1 – 2.
(Factory Configured).

.

3 Section 3 – Installation

This section details connection information with wiring diagrams for typical installations. It also includes backplane connector pinout and support tool descriptions.

3.1 Typical Installation Example

To install the DSM-4020, power down the system and refer to the following diagrams for typical installation examples:

Figure 3.1a. **DSM Audio Output**

Figure 3.1b. **DSM Mixing**

FIRST DSM, LEFT MIXIN 2   b6

FIRST DSM, LEFT MIXIN 1   d6

SECOND DSM, LEFT MIXOUT   d10

THIRD DSM, LEFT MIXOUT   d10
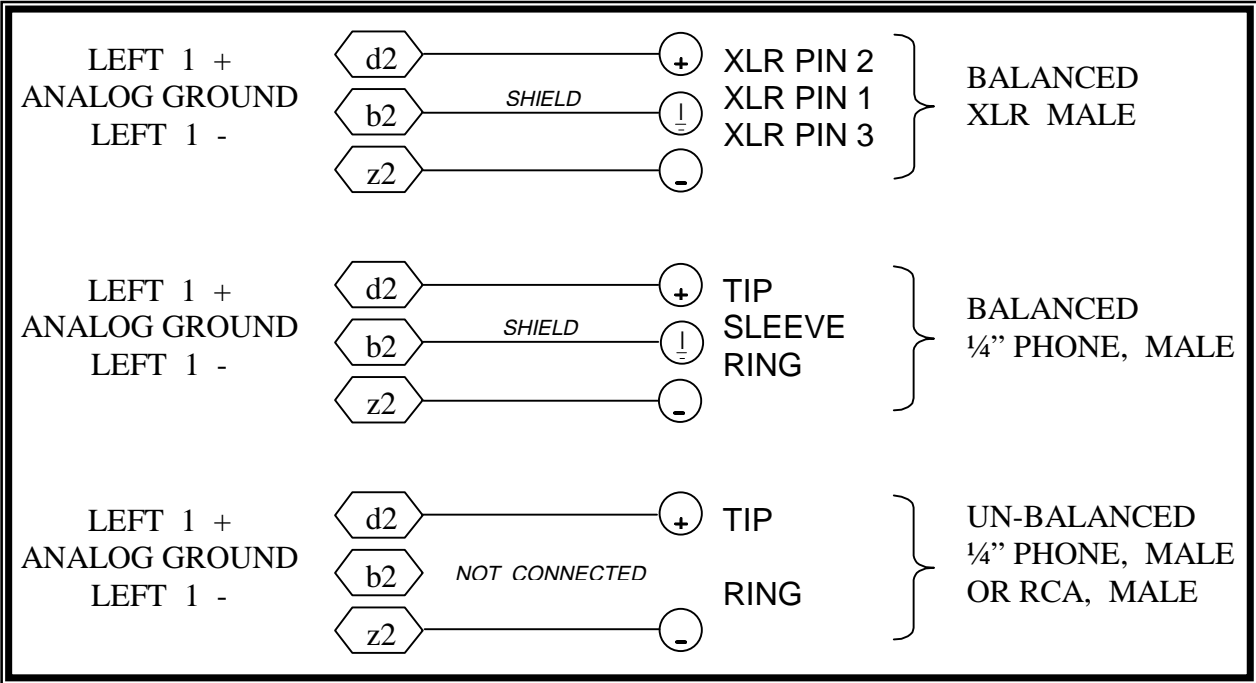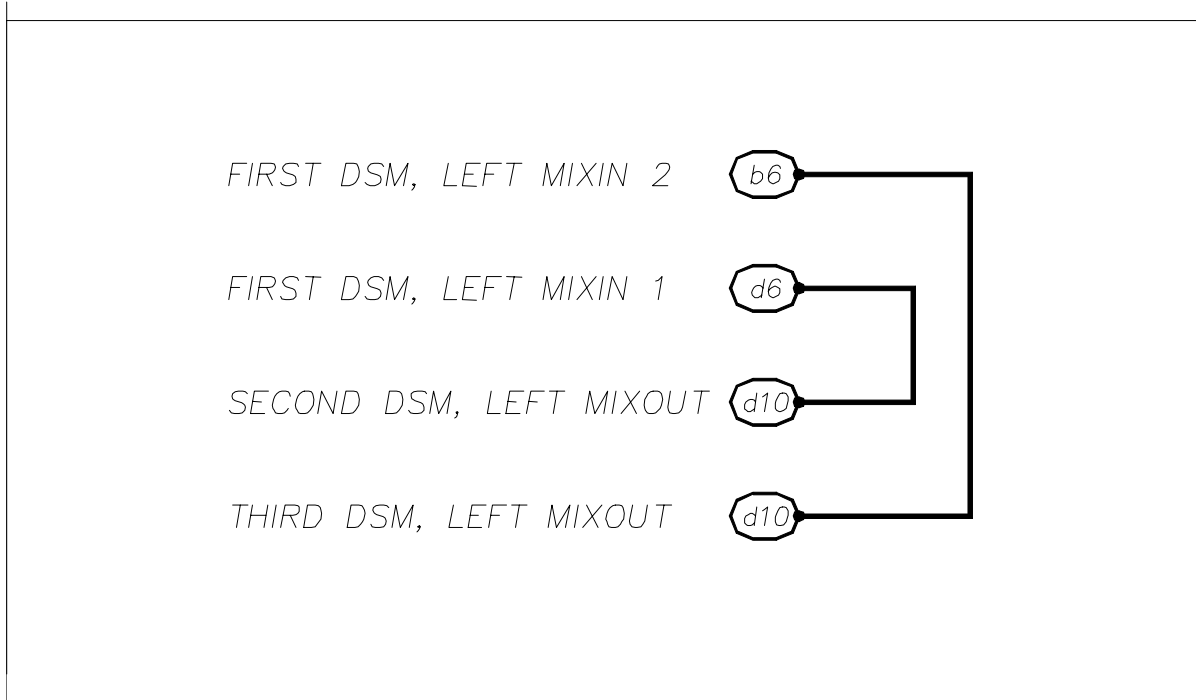
Figure 3.1c**. DSM Chain for Long Play and Multi-track**

FIRST DSM, TALLYOUT   d30

SECOND DSM, TALLYIN   z30

SECOND DSM, TALLYOUT   d30

THIRD DSM, TALLYIN   z30
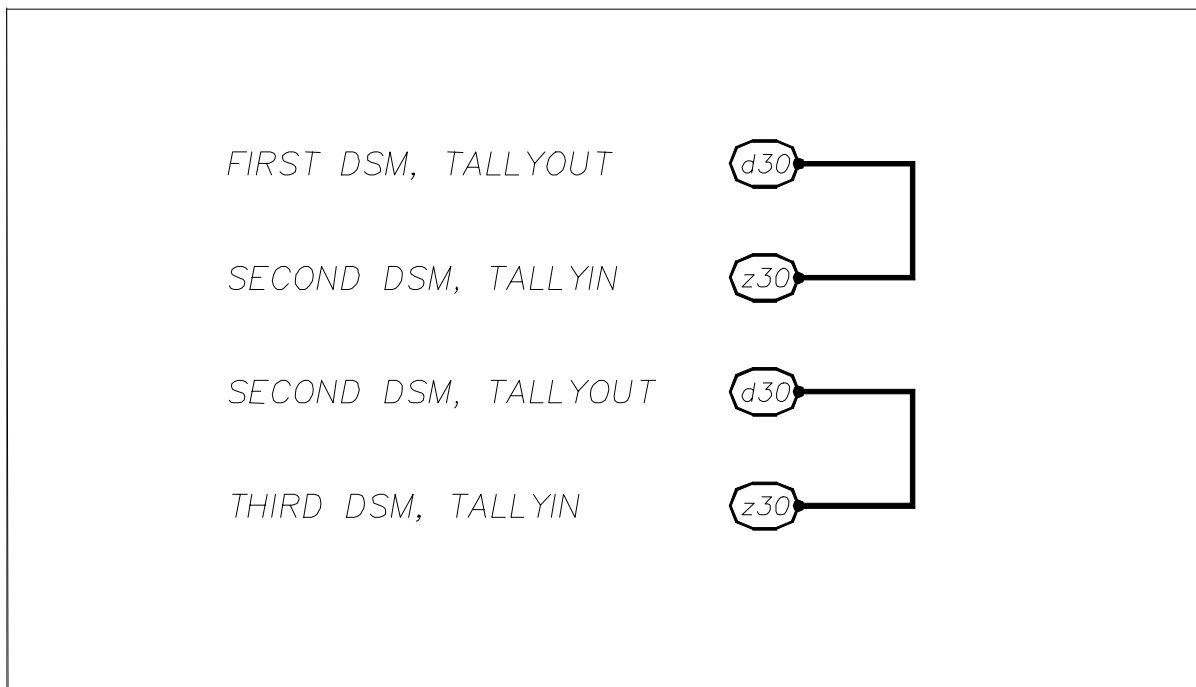
Figure 3.1d. **Multi-Track Synchronization**

FIRST DSM, CLOCKIN   b32

SECOND DSM, CLOCKIN   z32

SECOND DSM, CLOCKIN   b32

THIRD DSM, CLOCKOUT   d32

Figure 3.1e. **24vdc Input Control**

LEFT, STOP   d22
LEFT, START 1   z22
LEFT, START 2   z24
LEFT, RAMP   d24
RIGHT, STOP   d26
RIGHT, START 1   z26
RIGHT, START 2   z28
RIGHT, RAMP   d28

24 VDC POWER SUPPLY

+

−

REFERENCE LEFT STOP/START 1   b22
REFERENCE LEFT RAMP/START 2   b24
REFERENCE RIGHT STOP/START 1   b26
REFERENCE RIGHT RAMP/START 2   b28

Installation

3.2   Keying and Connector Information

The DSM key pin(s) should be inserted at the intersection between column b & z, between rows 2 & 4 (see figure 3-2a on the following page for keying information).
Note: if the key pin(s) are installed in the female field connector, the DSM's male connector must have holes drilled at the appropriate places for the connectors to mate (see figure 3.2b on the following page for pinout information).
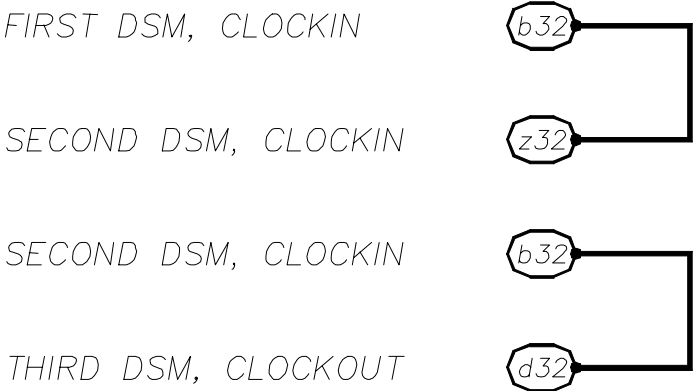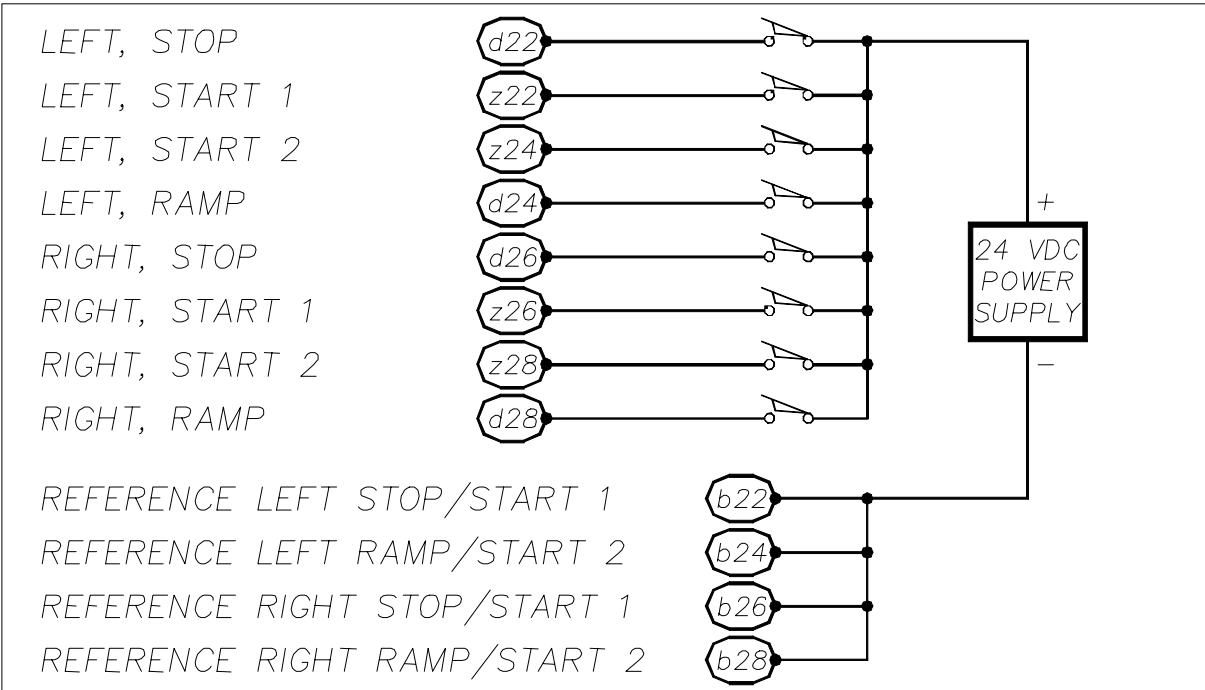
Figure 3.2a**. DSM-4020 Keying**

Rear View, Looking at DSM-4020 Male Contacts				Front View, Looking at Field Connector Female Contacts			
The Key is located at the intersection between column b & z, & between row 2 & 4.				The Key is located at the intersection between column b & z, & between row 2 & 4.			
d	b		z	z	b		d
	○	○			○	○	
|	2	|	|	|		|	2	|
	○	●			●	○	
|	4	|	|	|		|	4	|
	○	○			○	○	
|	6	|	|	|		|	6	|
	○	○			○	○	
|	8	|	|	|		|	8	|
	○	○			○	○	
|	10	|	|	|		|	10	|
	○	○			○	○	
|	12	|	|	|		|	12	|
	○	○			○	○	
|	14	|	|	|		|	14	|
	○	○			○	○	
|	16	|	|	|		|	16	|
	○	○			○	○	
|	18	|	|	|		|	18	|
	○	○			○	○	
|	20	|	|	|		|	20	|
	○	○			○	○	
|	22	|	|	|		|	22	|
	○	○			○	○	
|	24	|	|	|		|	24	|
	○	○			○	○	
|	26	|	|	|		|	26	|
	○	○			○	○	
|	28	|	|	|		|	28	|
	○	○			○	○	
|	30	|	|	|		|	30	|
	○	○			○	○	
|	32	|	|	|		|	32	|
Legend:	|	=	Contact	Legend:	|	=	Contact
	●	=	Key Hole Location		●	=	Key Pin Location
	○	=	unused position		○	=	unused position

Figure 3-2b. **DSM-4020 Pinout Information, P1 Field Connector**

DinF48 Female	d	b	z
2	L ch 1 out (+ Audio)	Analog Ground	L ch 1 out (- Audio)
4	L ch 2 out (+ Audio)	Analog Ground	L ch 2 out (-Audio)
6	L ch mix in 1	L ch mix in 2	L ch mix in 3
8	L ch mix in 4	L ch mix in 5	L ch mix in 6
10	L ch mix out	L ch mix out	L ch mix in 7
12	R ch 1 out (+ Audio)	Analog Ground	R ch 1 out (-Audio)
14	R ch 2 out (+ Audio)	Analog Ground	R ch 2 out (- Audio)
16	R ch mix in 1	R ch mix in 2	R ch mix in 3
18	R ch mix in 4	R ch mix in 5	R ch mix in 6
20	R ch mix out	R ch mix out	R ch mix in 7
22	L Stop in (+ 24 VDC)	L Stop/Start 1 in (24 com)	L Start 1 in (+24 VDC)
24	L Ramp in (+ 24 VDC)	L Ramp/Start 2 in (24 com)	L Start 2 in (+ 24 VDC)
26	R Stop in (+ 24 VDC)	R Stop/Start 1 in (24 com)	R Start 1 in (+24 VDC)
28	R Ramp in (+24 VDC)	R Ramp/Start 2 in (24 com)	R Start 2 in (+24 VDC)
30	Tally out	Tally in	Tally in
32	Clock out	Clock in	Clock in

Rear view, looking at DSM-4020 Male Contacts.

Installation

3.3   Support Tools and Part Numbers

The following connectors or equivalents may be used:

Part	Number
Din48F connector (Z-Rail mount) (Solder Tail)	Harting 09-06-248-6823
Din48F connector (Z-Rail mount) (Wire Wrap)	Harting 09-06-248-6821
Din48F connector (Z-Rail mount) (Crimp Pins required)	Harting 09-06-248-3201
(50) crimp pins (for above connector) 26-20 AWG	Harting 09-06-000-8481
(50) crimp pins (for above connector) 20-16 AWG	Harting 09-06-000-8482
Crimping tool for 26-20 AWG pins	Harting 09-99-000-0076
Crimping tool for 20-16 AWG pins	Harting 09-99-000-0077
Pin Locator (for above crimping tools)	Harting 09-99-000-0086
Crimp Pin Insertion Tool	Harting 09-99-000-0088
Crimp Pin Removal Tool	Harting 09-99-000-0087
*(2) M2.5X6 Screws	*Schroff 21100-146
Code Pin (metal key post)	Harting 09-06-000-9950
Code Pin Insertion Tool	Harting 09-99-000-0103

*These come in bags of 100. Only 2 screws are needed per DSM.

3.3.1   Field Connector Kit

A kit for the field connector is available from Anitech Systems which may be purchased separately. Refer to the Product Price List and/or contact ASI to order the item.

DIN-F48C – Contains the following items:

Qty	Description	Part Number
1	Din 48F Pin Connector	Harting 09-06-248-3201
50	Crimp Pins	Harting 09-06-000-8481
3	Mounting Screws	Schroff 21100-146

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Section 4 – Module Operation

This section describes the operating modes of the module. It includes fault conditions, indicators, and troubleshooting information.

4.1   Normal Operations and Fault Conditions

Figure 4.1 Normal Operations and Fault Conditions

	Indication	Description		Probable Cause	Recommended Action
	OFF	Left Start 1	Normal Condition	Left track 1 is not Playing	
	OFF	Left Start 2	Normal Condition	Left track 2 is not Playing	
	OFF	Left Ramp	Normal Condition	Left Ramp is Ramped DN	
	ON Solid	Left Start 1	Normal Condition	Left track 1 is Playing	
	ON Solid	Left Start 2	Normal Condition	Left track 2 is Playing	
	ON Solid	Left Ramp	Normal Condition	Left Ramp is Ramped UP	
	OFF	Right Start 1	Normal Condition	Right track 1 is not Playing	
	OFF	Right Start 2	Normal Condition	Right track 2 is not Playing	
	OFF	Right Ramp	Normal Condition	Right Ramp is Ramped DN	
	ON Solid	Right Start 1	Normal Condition	Right track 1 is Playing	
	ON Solid	Right Start 2	Normal Condition	Right track 2 is Playing	
	ON Solid	Right Ramp	Normal Condition	Right Ramp is Ramped UP	
→	Blinking	Both Ramp LEDs	Maintenance Mode	Maintenance Test tone mode.	If necessary return to Play mode.
→	Blinking Slow	COM {Communications, Green}	Normal Condition	The DSM is communicating with the ICM.	
→	Blinking Fast	COM {Communications, Green}	Normal Condition	The DSM is Receiving Animation Data from the ICM.	
	OFF	PGM {Programming}	Normal Condition	The DSM is not in Program Mode.	
	ON Solid	PGM {Programming}	Programming	The DSM is in Program Mode.	If necessary return to Play mode.
→	Blinking	PGM {Programming}	Maintenance Forces Active	The DSM has Maintenance forces Active.	If necessary remove Maintenance forces.
	OFF	COM {Communications, Green}	No Communications	The ICM is NOT communicating with the DSM.	1) Make certain that the DSM is fully seated in its slot.
	or				2) Make certain that the Module Rack is Powered, and Turned on
	ON Solid	COM {Communications, Green}			3) Make certain ICM is running, & no downloads, are happening.

4.2 Troubleshooting

The following table (continued on the next page) identifies troubleshooting problems and solutions for the DSM-4020.

Problem	Solution
Module will not mate with the field connector.	1. Check the orientation of the field connector. Make sure that pin 1 is at the top. 2. Check the field connector for proper mounting and position on the rear z-rails. 3. Check the keying of both connectors. Make sure you do not connect the DSM to a connector wired for other peripherals (damage may occur). 4. Check for bent pins on the male connector, or plugged sockets on the female connector.
If none of the tracks will play:	1. Make certain that the Module Rack is powered on. 2. Make certain that the DSM is running, the COM LED should be blinking. 3. Make certain you are in play mode (see 4.1 Normal and Fault Conditions). 4. If the track LEDs are lighting, see section 4.2 Troubleshooting: no audio can be heard. 5. Inspect the DSM track configuration. Make certain the segments have a destination. output selected. 6. Inspect the DSM module. If the track is configured for multi-track, make certain the clock and tally signs are correctly wired and that the other multi-track modules are present, programmed, wired correctly and operational.

Problem	Solution
If none of the tracks will play (continued):	7. Inspect the DSM module. Check to see that there are Flash installed, the flash is installed correctly and that the Flash is the same size & type. 8. Inspect the DSM module. Check all jumper settings (see 2.3 User Settable Jumpers and Options). 9. After programming, verify the card to make certain that it is programmed correctly. 10. Make certain that no cues or animation are telling the track to stop. 11. Put the module in maintenance mode. Play the test tones (see 4.3 Maintenance, for more information). 12. If the track plays when listening to the front panel headphone jack and pushing the front panel buttons, but not cues, or animation, check the ICM's configuration for the DSM (see the Media Pro 4000 Software Programming Manual for more information). 13. Put the module in another slot that is not being controlled and test it there with headphones in the front panel jack.

Module Operation

Problem	Solution
No audio can be heard, but the track playing LEDs are lighting:	1. Listen to the track at the headphone jack on the front panel. 2. If the track plays when listening to the front panel, headphone jack and pushing the front panel buttons, but no audio comes out the rear outputs, make certain that the segments have the correct destination output selected (see the Media Pro 4000 Software Programming Manual for more information). 3. Inspect the DSM track configuration. Make certain that if the ramp or mute are programmed, the ramp is on and the 24 VDC E/S bus is on (see VMR-4000 & HMR-4000 Manuals for more information). 4. Make certain that no cues or animation are telling the track to Stop, Mute, Ramp Down or set the level to a low volume, etc. 5. Check the field connector wiring (see 3.1 Typical Installation Example and 3.2 Keying and Connector Information for more information). 6. Put the module in maintenance mode and play the test tones (see 4.3 Maintenance for more information).

4.3 Maintenance

The DSM can be placed into (or taken out of) maintenance mode to generate test tones by hand:

1. Press and hold the left (top) STOP button.
2. While continuing to hold the STOP button, push and release the left (top) START 1 button.
3. Push and release the left (top) START 2 button.
4. Release the left (top) STOP button.
5. Press and hold the right (bottom) STOP button.
6. While continuing to hold the STOP button, push and release the right (bottom) START 1 button.
7. Push and release the right (bottom) START 2 button.
8. Release the right (bottom) STOP button.

If this procedure is followed correctly, both of the ramp lights should now be blinking.

The DSM can be placed into maintenance mode to generate test tones by Software Control. In the DSM on-line dialog, click on the test button (see the Media Pro 4000 Software Programming Manual for more information).

Module Operation

While in the maintenance mode:

1. Select which output to put the test tone on.
   ❏ If left (top) START 1 button is pushed, the tone will be available at the left 1 out on the field connector.
   ❏ If left (top) START 2 button is pushed, the tone will be available at the left 2 out on the field connector.
   ❏ If right (bottom) START1 button is pushed, the tone will be available at the right 1 out on the field connector.
   ❏ If right bottom) START 2 button is pushed, the tone will be available at the right 2 out on the field connector.
   ❏ When an output is selected, the associated START LED will be lit SOLID.

2. Select which tone to play.
   ❏ If left (top) START 1 button is pushed, the 100Hz tone will be played.
   ❏ If left (top) START 2 button is pushed, the 1Khz tone will be played.
   ❏ If right (bottom) START 2 button is pushed, the Pink Noise will be played.
   ❏ When the tone is selected (and playing), the outputs associated START LED will blink.

3. Press the stop button associated with the sold state LED to stop the tone.

4. Repeat the process of placing into (or taking out of) maintenance mode to return to play mode from maintenance mode.

5 Section 5 – Programming

This section describes the programming considerations of the module. It includes details of programmable functions and software configurations. In addition, the sound files may be tested before and after being downloaded to the module.

5.1 Module Programmable Functions

Each track can be assigned audio segments and play back options in the DSM utility and each port on the module can be assigned aliases and logical channels in the SW configuration (see the Media Pro 4000 Software Programming Manual for more information).

5.2 Software Configuration

The DSM must be properly configured and downloaded by the DSM utility software for proper operation.

DSM configuration is entered on the following menus in the Media Pro® 4000 software.

Highlight the DSM and the Module Firmware information is displayed it the Device Information pane.

Double-click on the DSM from the MP4000 Opening Menu and the DSM configuration tab menus appear.

Programming
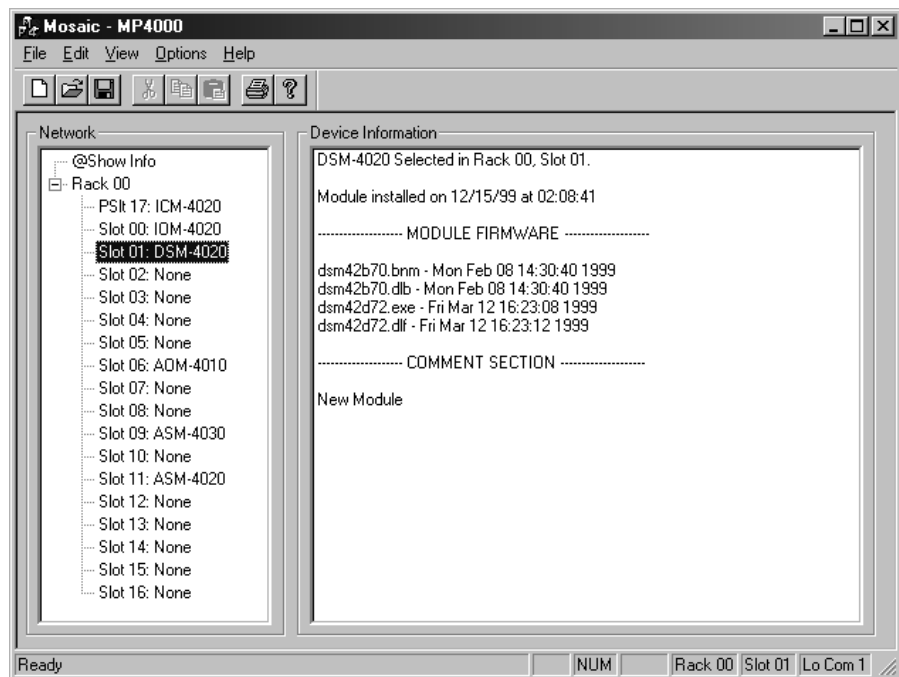
5.2.1 Port, Track, and Audio File Designation –

The DSM has six tab menus to enter the configuration information. Each port has two tracks. Port 0 are the Left tracks and Port 1 are the Right tracks.

This tab menu is for Port 0, Track 1 (left track 1).

Use the slider bar to position the desired segment numbers in the Audio File window pane. There are 32 segments per track.
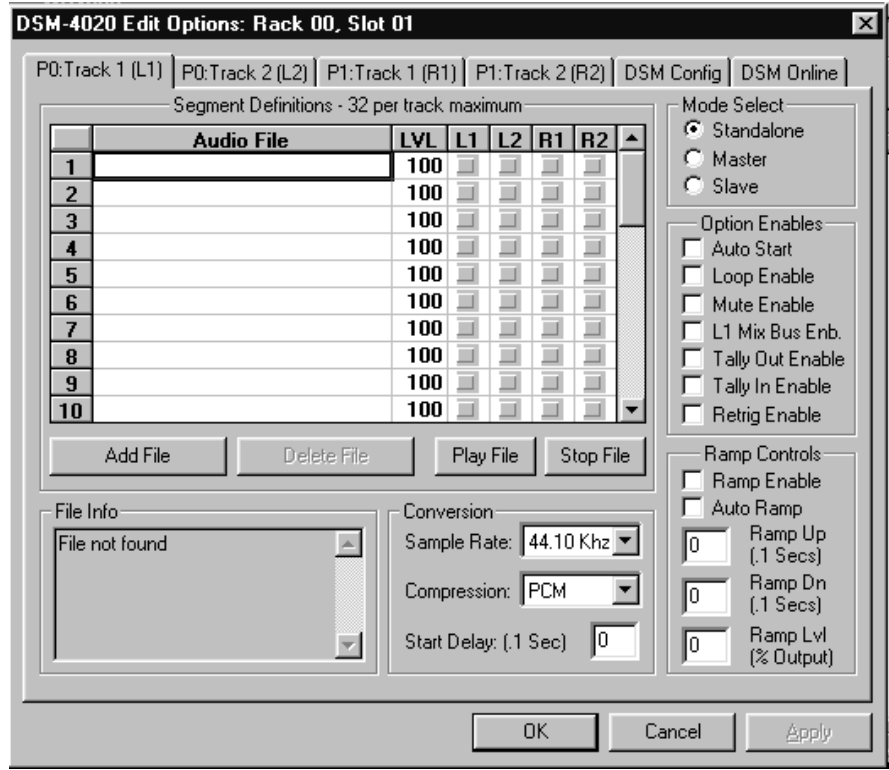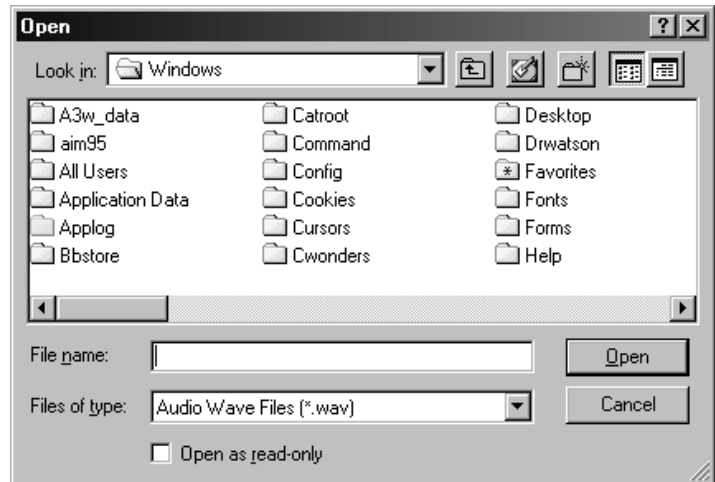
Add File –

Pressing the Add File button brings up a pop-up menu for selecting the path / filename of the audio file.

Either type in the path / filename or browse through the system folder until the file is located.

Select the file name and press Open. The file name will appear on the segment line.

When a file is added to the Port Menu, it needs to have a destination relay assigned. If one has not been assigned, then a warning message appears:

Press the OK button and then place a check mark under the appropriate column for the destination next to the file name.
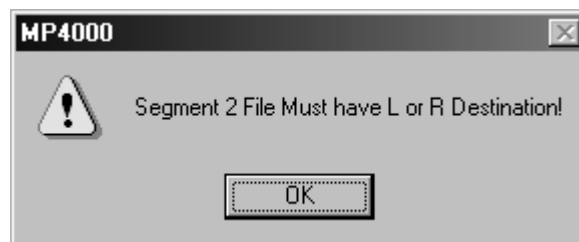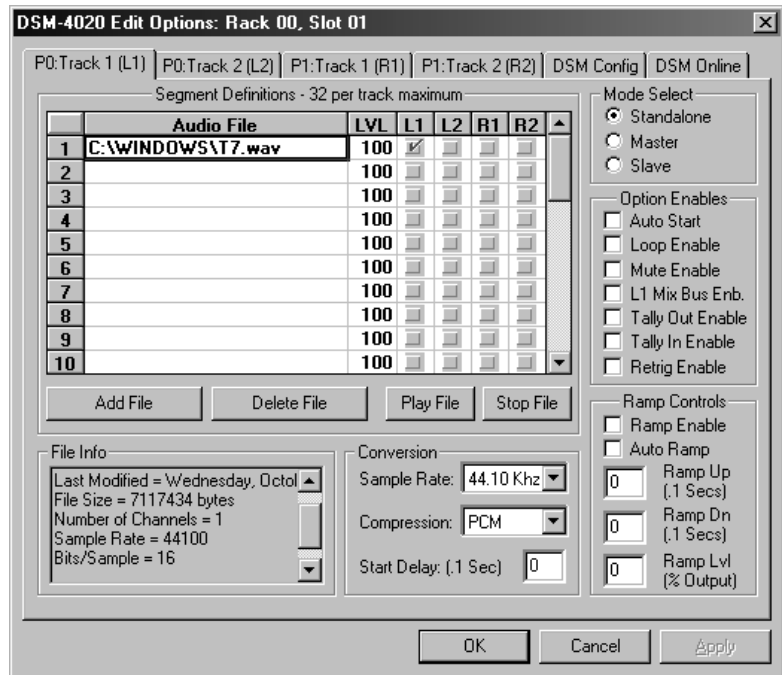
This tab is for Port 0, Track 1 (left track 1).

Press the Apply button for the newly entered parameters to be added to the segment list.

After an Audio file has been added to segment list, the file information will be displayed in the File Info pane:

✓ the Path / filename
✓ the last modified date
✓ the file size (in bytes)
✓ the number of channels
✓ the sample rate
✓ the bits per sample.

Use the scroll bar to position the information needed in the pane.

This tab is for Port 0, Track 2 (left track 2).

Enter the information for the right tracks in the same manner as the left tracks.
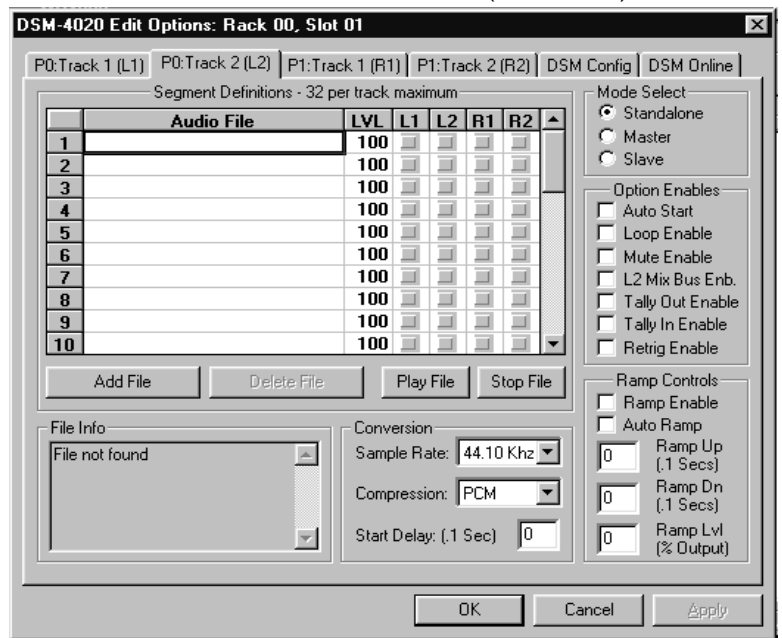
Play File –

Pressing the Play File button plays the file from the computer. This is a quick and convenient way to verify that the correct file has been added to the segment list.

Stop File –

Pressing the Stop File button will cause the file to stop playing.

Delete File –

Pressing Delete File will remove the *highlighted* Audio filename from the segment list.

Programming

5.2.2 Track and Segment Controls-

The following sections of the Menu are Track controls for ALL segments on this menu with one exception, the Mix Bus Enables, which are described below.

Mode Select – Place a mark next to the desired selection.

❖ Standalone
  ➢ Used to provide sound tracks by itself, and not linked up to other DSM modules.
  ➢ This is the default selection.

❖ Master
  ➢ Used to link to other DSM's (ie: Multi-Track Phase Locking).
  ➢ When a mark is placed by this selection, it is the controlling or master module in a Multi-Track set up.

❖ Slave
  ➢ Used to link to other DSM's (ie: Multi-Track Phase Locking).
  ➢ When a mark is place by this selection, it is the secondary or slave module in a Multi-track set up.

Option Enables – Place a mark next to the desired selection.

❖ Auto Start
  ➢ Allows the track to be started automatically on power up.

❖ Loop Enable
  ➢ Allows the track to be looped commands from the cue.

❖ Mute Enable
  ➢ Allows the track to be muted by command from the cue.

❖ L1 Mix Bus Enb
  ➢ This parameter will affect the output relay for the Left 1 Mux.
    ▪ Each menu has a similar selection and it is numbered correspondingly to the menu [example: L2 Mix Bus Enb on Port 0: Track 2(L2) tab menu].
  ➢ When a mark is place next to this parameter, it causes the output relay to be open all the time, even when no segment is playing. This allows an input from another source to go through this relay.

NOTE: refer to section **5-5** (Multi-Track Phase Locking Configuration) for detailed example for use of Tally Out and Tally In. There are specific wiring connections necessary for proper operation of the Tally Out and Tally In option enables.

❖ Tally Out Enable
➢ Allows modules to Tally the signal to the next DSM for audio segments that are too big to fit on one DSM.
➢ A mark placed next to this parameter sends a Tally signal to the next DSM when the segment has finished playing, so there is a seamless stream of audio signal.

❖ Tally In Enable -
➢ Allows the DSM to start playing when it receives a Tally Out signal from the previous DSM.
▪ This gives the DSM a seamless stream of audio signal for files that are too large for one DSM.

❖ Retrig Enable
➢ When a mark is placed next to this parameter, it causes the Start button to begin playing the track from the beginning.
▪ If there is no mark, the start button will have no affect on the track when it is pressed while the track is playing.

Ramp Controls –
❖ Ramp Enable
➢ Place a mark next to this selection to allow the segments on this port / track to be controlled by ramp commands and the ramp switch on the front panel.

❖ Auto Ramp
➢ Place a mark next to this selection to enable the segments to be faded in and faded out automatically.

❖ Ramp Up
➢ Specify the length of time to ramp up to the defined level.
▪ Time units must be .1 sec or longer.

❖ Ramp Dn
➢ Specify the length of time to ramp down to the defined level.
▪ Time units must be .1 sec or longer.

❖ Ramp Lvl
➢ Specify the level of volume to set the file by in a percentage format.

Programming

Conversion –
- ❖ Sample Rate
  - ➢ The sample rate of the Wave file.
    - ▪ Select the rate from the scroll down menu:
      - • 44.10 Khz
      - • 32.00 Khz
      - • 24.00 Khz
      - • 22.05 Khz
      - • 16.00 Khz
      - • 11.02 Khz
      - • 8.00 Khz
- ❖ Compression
  - ➢ The type of compression format of the Wave file.
    - ▪ Select the format from the scroll down menu.
      - • PCM
      - • ADPCM
      - • ULAW

- ❖ Start Delay [.1 sec]
  - ➢ The length of time to delay the playing of the segment(s).
    - ▪ Enter the length on time in time units.

5.2.3 Port Configuration –

Type the channel address next to the Port, as needed. This is the channel that communicates with the ICM. For shows that have animation, the channel assignment will commonly be above 512.

Enter the Alias name, if used.

Programming
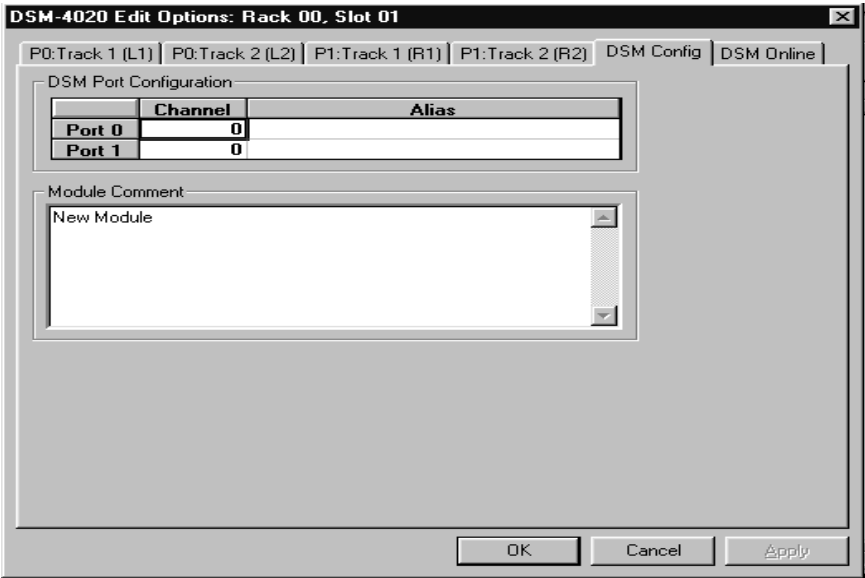
5.2.4 DSM Online

The Online tab menu allows downloading of the sound files as well as testing and playing the sound files.

Compile –

Note: It is necessary to compile before a download in order to have new files downloaded.

Compile the program *after* sound files have been added to the Port menus.

Highlight and click on the Compile button, a message appears:
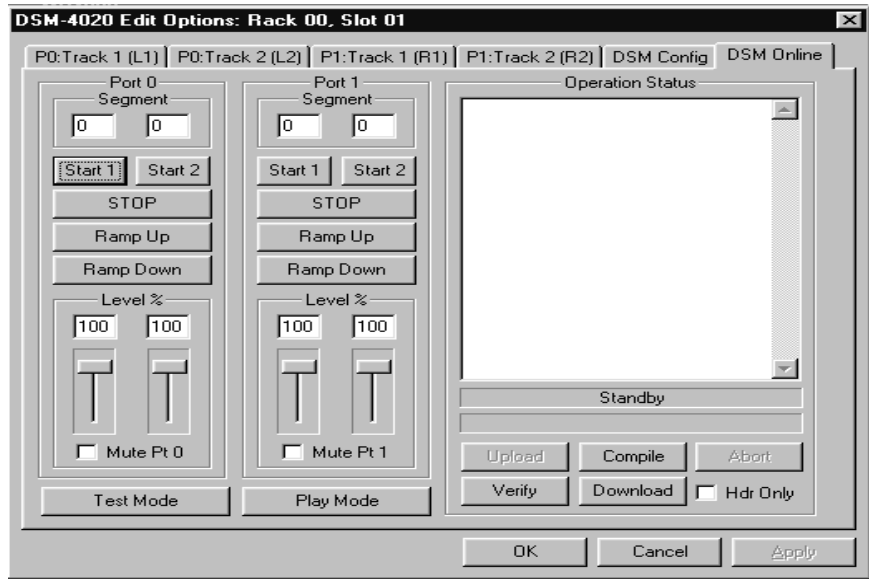
Press Yes to continue the compile operation. A No response will abort the operation.

Download –

After the DSM files have been compiled successfully, the information needs to be downloaded to the Module.

The size of sound files that can be downloaded will vary, depending on the size of the PCMCIA card installed on the DSM.

If there is not a Flash Memory card installed, a message will appear in the Operation Status pane:

File size exceeds Flash!

The message for the example diagram shows that there is no Flash installed on the DSM, and there is not enough storage capacity for the file to be downloaded.

The size of the sound file is displayed in records (two records = 1024 bytes).

Verify –

It is recommended to perform a Verify after the download.

Programming

5.2.5 Testing the Sound files –

A sound file that has been downloaded to the DSM module may be tested either from the front panel switches or from the software.
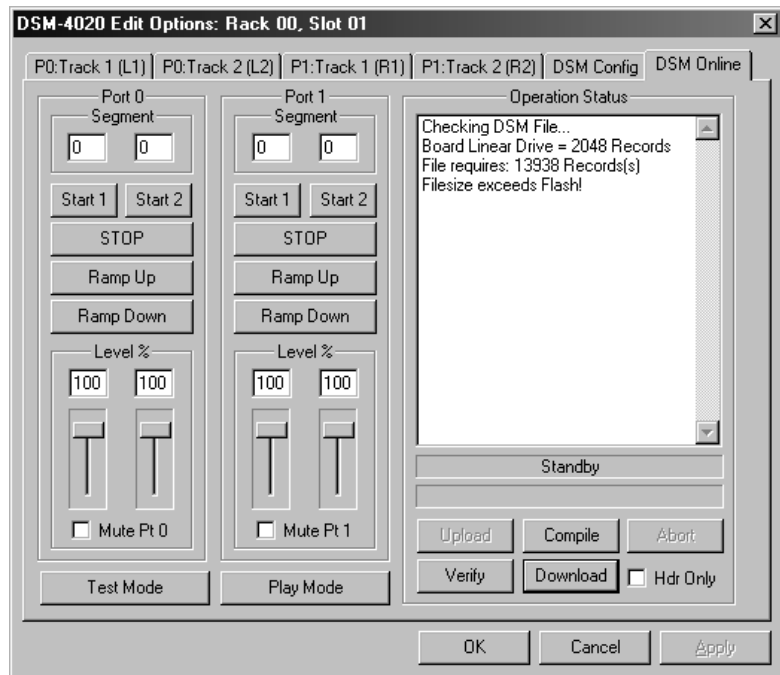
Directly from the Front Panel Switches – (Please refer to figure 1-1 for the location of the front panel switches).

❖ Position the Ramp switch to Auto or On, as desired.

❖ Press the Start button for the desired port and track on the front panel of the DSM.
 ➢ The first segment or the next segment will play.
   ▪

❖ Each time the Start switch is pressed, it sequences to the next segment on the track in the order listed on the track menu.
 ➢ When it reaches the last segment, it will play the first segment on that track.

❖ Press the Stop button to discontinue playing the track.

Test from the software menu –

❖ Type in the Segment number in the appropriate window of the desired track.
 ➢ Refer to the Port Menu for the segment number.
 ➢ Press the Play Mode button.

❖ Select to Ramp Up or Ramp Down and set the appropriate level slider for the ramp.

❖ Press Start under the window to begin playing the sound file.

❖ Press Stop button to discontinue playing the sound file.

❖ Every time the Play button is pressed, the same segment will play, until the segment file number is changed in the segment window.
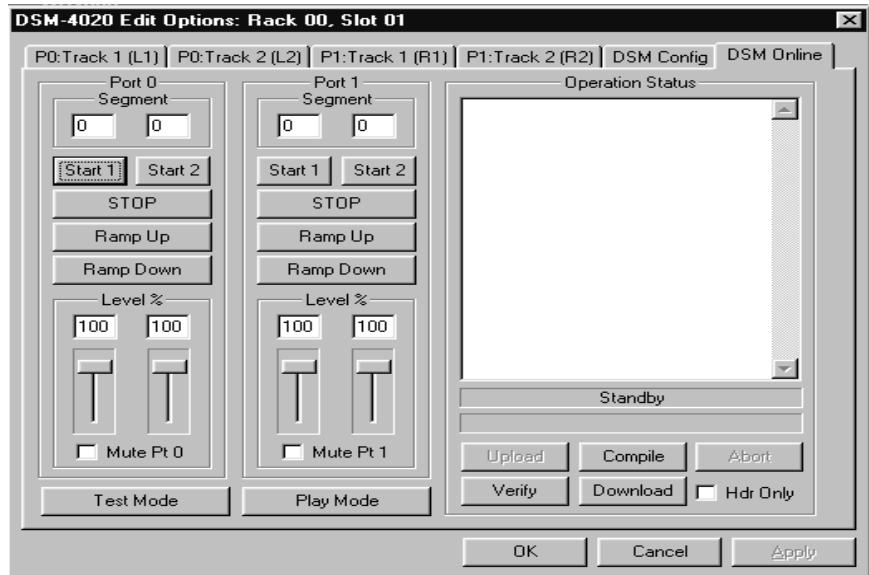
5.3 Supported Command Formats

Verb	RSP	Token 1	Parameter 1	Token 2	Param 2	Token 3	Param 3
Stop	@r0,0,0						
Stop	'Alias'						
Play	@r0,0,1	Track	1	Segment	0		
Play	@r0,0,1	Track	1	Segment	1		
Play	'Alias'	Track	2	Segment	32		
Set	@r0,0,0	Ramp	0				
Set	@r0,0,1	Ramp	1				
Set	@r0,0,0	Audio	0				
Set	@r0,0,1	Audio	1				
Play	'Alias'	Track	1	Segment	0		
Set	'Alias'	Track	1	Segment	1	Level	0
Set	'Alias'	Track	2	Segment	32	Level	100

Programming

5.3.1   Loading Board Status

The following figures describe the bit layout of the Board Status and the Port Status bytes on the DSM-4020. Use the <u>Load</u> command to read the Status Information from a cue:

Load @vVVV With @rR,S Status 0 Byte 0-1;

Figure 5-3a. Board Status 0, Board Status Bits

| Byte 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Hardware Problem

Delayed 5v Input

Constant Bus Input

E-Stop Bus Input

Running Download Code

Board was Reset

Some Port Status has Changed

Board Status has Changed

| Byte 1 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Tally Out

Tally In

Program Mode

Maintenance Mode

Board Command Error

No Parameters in Flash

No Configuration in Flash

No Download Code
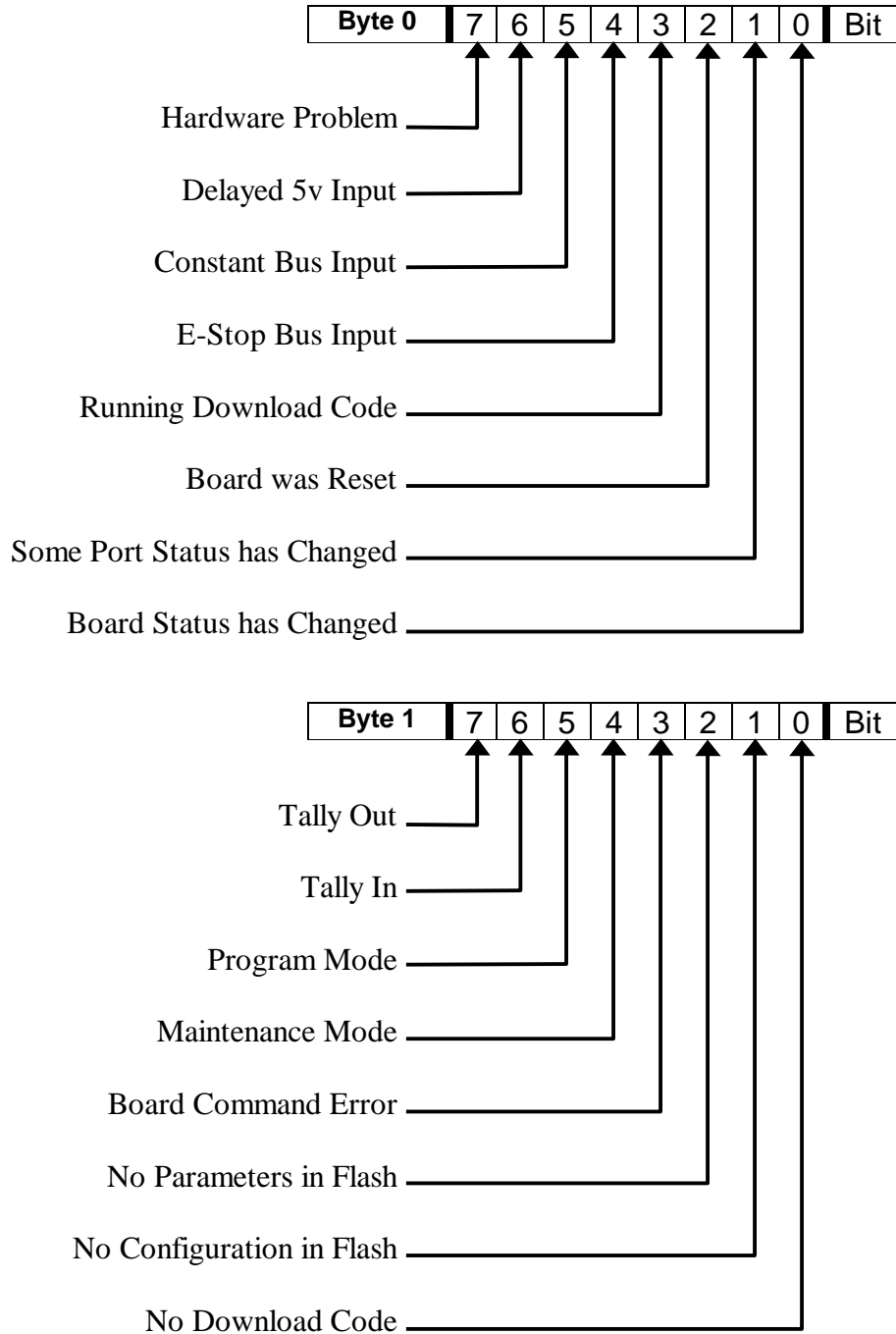
Board Status 1, Boot Firmware Version Number

Load @vVVV With @rR,S Status 1 Byte 0-1;

Byte 0	7	6	5	4	3	2	1	LSB	Bit
Byte 1	MSB	6	5	4	3	2	1	0	Bit

Board Status 2, Download Firmware Version Number

Load @vVVV With @rR,S Status 2 Byte 0-1;

Byte 0	7	6	5	4	3	2	1	LSB	Bit
Byte 1	MSB	6	5	4	3	2	1	0	Bit

Board Status 3, Board Memory Capacity (512 byte records)

Load @vVVV With @rR,S Status 3 Byte 0-3;

Byte 0	7	6	5	4	3	2	1	LSB	Bit
Byte 1	7	6	5	4	3	2	1	0	Bit
Byte 2	7	6	5	4	3	2	1	0	Bit
Byte 3	MSB	6	5	4	3	2	1	0	Bit

Board Status 4, Board Chip Size (bytes)

Load @vVVV With @rR,S Status 4 Byte 0-1;

Byte 0	7	6	5	4	3	2	1	LSB	Bit
Byte 1	MSB	6	5	4	3	2	1	0	Bit

Example:
To load variable 123 with the Download Version of the DSM in rack 0, slot 16

Load @v123 With @r0,16 Status 2 Byte 0-1;

The variable 123 (@v123) will be filled with a value representing the version number of the downloaded firmware.

Figure 5-3b. Port Status 0, Port Status Bits

| Byte 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Port Command Error — 7
Output Active — 6
Ramp On — 5
Set Disabled — 4
Animation Disabled — 3
Port Muted — 2
Port Not Configured — 1
Port Status has Changed — 0

| Byte 1 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Bit |

Stereo — 7
Slave — 6
Master — 5
Mix Bus Enable — 4
Track 2 Playing — 3
Track 1 Playing — 2
Output L2 Open — 1
Output L1 Open — 0
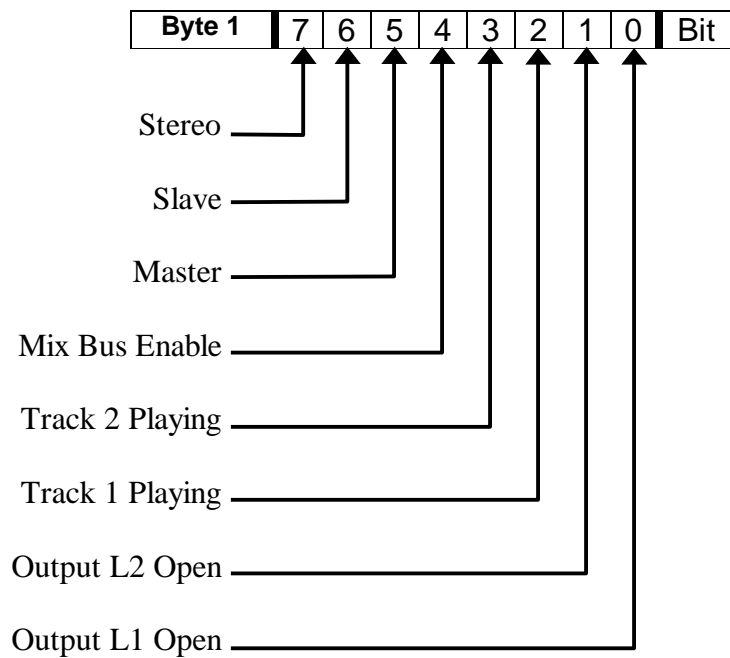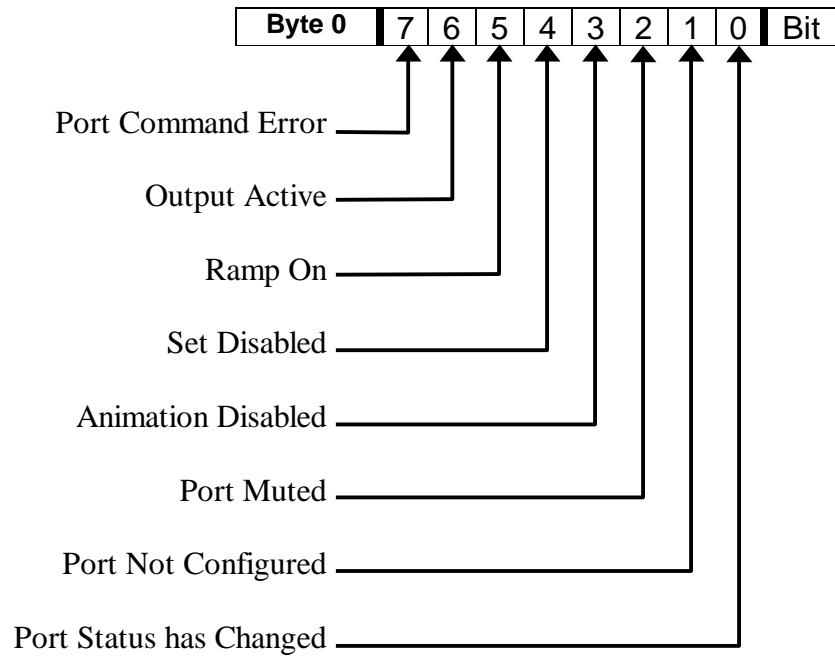
Port Status1, Track 1 Segment Number

Load @vVVV With @rR,S Status 2 Byte 0-0;

Byte 0	MSB	6	5	4	3	2	1	LSB	Bit
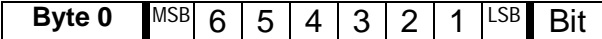
Port Status 2, Track 2 Segment Number

Load @vVVV With @rR,S Status 2 Byte 0-0;

Byte 0	MSB	6	5	4	3	2	1	LSB	Bit
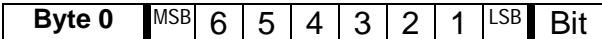
Example:
Load variable 123 with the Track 1 Segment Number of the DSM in rack0, slot 16, port 0

Load @v123 With @r0,16,0 Status 1 Byte 0-0;

The variable 123 (@v123) will be filled with the current segment selected for Port 0, Track 1.

Programming

5.4   Application Example

➢ Play @ RØ, Ø, Ø Track 1 Segment 0; Play next segment
➢ Play @ RØ, Ø, Ø Track 1 Segment 1;
➢ Play 'Sound' Track 1 Segment 1;
➢ Set 'Sound' Audio 0; Audio output off
➢ Set 'Sound' Audio 1; Audio output on
➢ Set 'Sound' Track 1 Segment 1 Level 100; Audio Level 100%
➢ Set 'Sound' Ramp 0; Ramp Down
➢ Set 'Sound' Ramp 1; Ramp Up
➢ Stop 'Sound';

5.5 Multi-Track Phase Locking Configuration

Restrictions in this example are for the sake of simplicity in describing how to configure Multi-Track Phase Locking. The DSM is not limited by the configuration being described here. It is possible for the DSM to work in other module positioning, configuration, and wiring.

❖ DSM Module Positioning
  ➢ The Master module should be to the left of the Slaves.
  ➢ The Slaves should be to the right of the Master.
    ▪ For instance: The Master could be in slot 10 of the rack, and the slave could be in slots 11 & 12.

❖ DSM Software Configuration
  ➢ Only 1 port per module can be configured as Master.
    ▪ This is due to physical wiring constraints, there is only one Tally Out / Tally In on each module.
  ➢ Only 1 port per module can be configure a Slave.
    ▪ This is due to physical wiring constraints, there is only one Tally Out / Tally In on each module.
  ➢ Only 1 Segment can be on the Master and Slave tracks.
  ➢ The Segment on the Master should be of equal or longer length than any of the Slaves.
  ➢ No other Segments can be played while the Multi-Phase is playing.
  ➢ Mode selection –
    ▪ For the Master: Change to Master (on the screen menu for the appropriate track).
    ▪ For the Slave: Change to Slave (on the screen menu for the appropriate track).
  ➢ Tally Out: Can be set for the last Slave.
    ▪ It *must* be Off for all other Slaves and the Master.
  ➢ Tally In: Must be set for all Slaves.
    ▪ Can be set for the Master.
  ➢ Retrig should not be set.

❖ DSM Field Wiring Clock
  ➢ The last Slave must have Clock-Out Jumpered from it's Clock-Out to it's Clock-In.
    ▪ On P1 Field Connector, pins d32 - b32.
  ➢ Chain the Clock-In from the last Slave – previous Slave.
    ▪ On the P1 Field Connectors, last Slave pin z32 – previous Slave pin b32.
  ➢ Continue chaining the Clock-In from the right to the left for all remaining DSMs including the Master.
    ▪ On the P1 Field Connector, right DSM z32 – left DSM b32.

EXAMPLE: Based on the above example description, these pins should be wired together.

Slot 10	Slot 11	Slot 12
Master	Slave	Slave
b32	z32 – b32	z32 – b32 – d32

Programming

❖ DSM Field Wiring Tally
  ➢ The Master Tally-Out must be jumpered to the Tally-In of the Slave to its right (on the P1 Connector, Master d30 – Slave z30).
  ➢ Continue jumpering the Tally-Out from the left to the right for all remaining DSMs (Left Slave d30 – Right Slave z30).

EXAMPLE: Based on the above description, these pins should be wired together.

Slot 10	Slot 11	Slot 12
Master	Slave	Slave
d30	z30 – d30	z30

❖ Multi-Track Operation
  ➢ The Master DSM should be the only DSM given the play command.
  ➢ The Slave DSMs will be prepared to play by the Tally signals from the master to the first Slave, and then to the next Slave, and so on.
  ➢ Each DSM will pass the tally signal tot he DSM when it is prepared to play.
  ➢ When the last Slave is prepared to play, it will send out the clock signal that all other DSMs will synchronize to via the Clock-Out of the last Slave, and the Clock-In to Clock-In chain jumpers.
  ➢ Every time the last DSM outputs a clock signal, all DSMs output a sample of audio.
  ➢ The Master DSM should be the only DSM given the Stop command.
  ➢ All Slaves will stop as the tally is dropped by the Master, and passed from Slave to Slave via the Tally-Out and Tally-In jumpers.

6 Section 6 - Appendix

The following pages contain technical briefs relating to this module. There are additional technical briefs on the ASI website and new briefs are added on an on-going basis. Please visit the website for updated information –

http://www.Anitech-Systems.com

Updated manuals are placed on the Web periodically. Please check to see if a more recent revision is available on the website. Revision numbers are located in the footer of the manual pages.

Also, a glossary of terms is in this section, for terms used by ASI as well as terms used in the Show Control Industry.

6.1 Saving Files from a Web Page without Displaying -

This is useful for retrieving a non-formatted page that is not intended for viewing:

From Internet Explorer® Browser

1 - Saving files from a Web page.
    A) To save a file without opening it:
        1) **Right**-click on the link for the item you want, a pop-up menu appears,
            (a) Select, then Left-click **Save Target As**
            (b) Enter the desired folder and filenames and select **Save**

From Netscape® Communicator Browser

1 - Saving files without displaying them.
    A) To save a file without viewing it:
        1) **Right**-click on the file's link to display a pop-up menu,
            (a) Select, then Left-click **Save Link As**
            (b) Enter the desired folder and filename and select **Save**

6.2   PCMCIA Devices for use with DSM-4020 and LCM-4020

The following list describes the PCMCIA devices that have been evaluated for use in the DSM and LCM modules. Anitech Systems can not insure the performance of unevaluated devices. Specifications regarding the use of PCMCIA devices are subject to change at any time.

1-   PCMCIA Storage

    A)   Many PCMCIA ATA Drives may work with the DSM-4020 & LCM-4020.

    B)   Many PCMCIA Linear Flash may work with the DSM-4020.

    C)   Other Storage with Adapters
        1)   Some Compact Flash adapters will not work.
        2)   Most Cardbus adapters will not work.

    D)   Only 5 volt DC Powered
        1)   Remember, it is very important to take the PCMCIA device's current requirements
               into consideration.
            (a)   Linear or ATA Flash {typ 30-150ma} (NOT PCMCIA HARD DRIVES!).
            (b)   ATA HARD DRIVE {typ 0.5-1.5A}.

    E)   ATA Flash Drives and ATA Hard Drives

        1)   ATA Hard Drives (rotating physical media) {not Flash}.
            (a)   Many ATA Hard Drives are to slow.
             (1)   DSM-4020 Stereo @ 44.1K & (2) Simultaneously Mono @ 44.1K require
                     more throughput than available from ATA Hard Drives to work properly.

        2)   Media Pro® modules are compatible with 16 bit "Microsoft" type DOS File
               Allocation Tables (DOS FAT 16).
            (a)   Typically drives smaller than 16MB will use 12 bit DOS FAT, or can not be made
                   to use 16 bit DOS FAT.
                   NOTE: DOS FAT 12 should be avoided due to compatibility problems.

            (b)   Some drives larger than 850MB will use 32 bit DOS FAT, or can not be made to
                   use 16 bit DOS FAT.
                   NOTE: DOS FAT 32 should be avoided due to compatibility problems.

            (c)   Typically drives larger than 4GB will require 32 bit DOS FAT, and can not be
                   made to use 16 bit DOS FAT.
                   NOTE: DOS FAT 32 should be avoided due to compatibility problems.

        3)   Make certain that the ATA device is properly partitioned and freshly formatted before
               use.
            (a)   Format is recommended before each time file(s) are copied to the ATA device in
                   a PCMCIA slot of a PC.

      (b)   Make certain that the PCMCIA device is Write Enabled (NOT Write Protected).

      (c)   See also the Brief - "PCMCIA Partition and Format" in section 6 for formatting and partitioning description.

   F)   Linear Flash (DSM-4020 only)

     1)   If the Module is not programmed with the correct information for each specific Linear Flash chip, the Linear Flash will not work properly.

      (a)   Every Flash chip has unique manufacturer and individual chip identification bytes (there are hundreds of unique chips).

         (1)   The DSM firmware supports several of the most popular Flash IDs.

         (2)   The LCM does not support Linear Flash.

      (b)   For each unique set of ID Bytes the Flash chips require:

         (1)   Different sequencing of input pins

         (2)   Different commands for erasing

         (3)   Different programming algorithms

         (4)   Different timing to program

2-   PCMCIA ATA devices evaluated (for DSM-4020 only)

   A)   M-Systems, ATA Flash Memory, PCCATA32, 32MB Flash Disk, Type 1.

   B)   SanDisk, ATA Flash Memory, SDP3B, 64MB Flash Disk, Type 2.

   C)   SanDisk, ATA Flash Memory, SDP3B, 220MB Flash Disk, Type 2.

   D)   SanDisk, ATA Flash Memory, SDP3C, D2, 10MB Flash Disk, Type 2.

     1)   This device only supports DOS FAT 12 & should be avoided due to compatibility problems.

3-   PCMCIA ATA devices evaluated (for LCM-4020 only)

   A)   SanDisk, ATA Flash Memory, SDP3B, 64MB Flash Disk, Type 2.

   B)   SanDisk, ATA Flash Memory, SDP3B, 220MB Flash Disk, Type 2.

4-   Additional PCMCIA ATA devices that may be compatible with above evaluated devices (DSM or LCM).

   A)   SanDisk, ATA Flash Memory, SDP3B, 110MB Flash Disk, Type 2.

   B)   M-Systems, ATA Flash Memory, PCCATA32, 32MB Flash Disk, Type 1.

   C)   Calluna, ATA Hard Drive, CT520RM, 520MB Hard Drive, Type 3.

   D)   Integral, ATA Hard Drive, Viper 170E, 170MB Hard Drive, Type 3.

   E)   Maxtor, ATA Hard Drive, MXL-171, 171MB Hard Drive, Type 3.

5-   PCMCIA Linear devices evaluated (for DSM-4020 only)

   A)   AMD, Linear Flash Memory, AmC001CFLKA, 1MB, C Series, Type 1.

   B)   AMD, Linear Flash Memory, AmC008DFLKA, 8MB, D Series, Type 1.

   C)   EDI, Linear Flash Memory, EDI7P008FLD2400C15, 8MB, Type 1.

   D)   Intel, Linear Flash Memory, iMC024FLSG, 24MB, 200 Series, Type 1.

E)   PreTec, Linear Flash Memory, FAD004P, 4MB, Type 1.
F)   PreTec, Linear Flash Memory, FAD008P, 8MB, Type 1.

6-   Additional PCMCIA Linear devices (for DSM-4020 only) that may be compatible with above evaluated devices.

A)   Intel, Linear Flash Memory, iMC008FLSG, 8MB, 200 Series, Type 1.
B)   Intel, Linear Flash Memory, iMC016FLSG, 16MB, 200 Series, Type 1.
C)   Intel, Linear Flash Memory, iMC032FLSG, 32MB, 200 Series, Type 1.
D)   Intel, Linear Flash Memory, iMC048FLSG, 48MB, 200 Series, Type 1.
E)   Intel, Linear Flash Memory, iMC064FLSG, 64MB, 200 Series, Type 1.

7-   For additional information, refer to:

A)   PCMCIA Partition and Format Brief, section 6.
B)   LCM-4020 Manual
C)   DSM-4020 Manual

6.3   PCMCIA Device Partitioning and Formatting

There is more than one way to partition and format a PCMCIA ATA device. Only one example is given here.   Partitioning and formatting should be performed by personnel technically competent with PC/Windows. Incorrect actions can result in a complete loss of data on the PC's Hard Drives and/or result in a completely inoperable PC.

☑ The PC must have a properly configured, and operating PCMCIA Socket.
☑ The Socket *must* be Supported in the Windows Device Manager.

❖ Preparing to Partition or Format
  ➢ Insert a PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk into a PCMCIA socket on the PC.
  ➢ In Windows 95/98 click on Start Menu, Settings, Control Panel, System, Device Manager, Disk Drives, Generic IDE Disk Type 80.
  ➢ Note original settings before making any changes.
  ➢ Settings Tab
  ➢ Int 13 unit will need to be selected in order to partition the device with FDISK.
  ➢ Removable should also be selected.
  ➢ General Tab, check the Device Status, should say "This device is working properly".
  ➢ Windows may require restarting after making changes before the changes are in effect.

❖ Partitioning
  ➢ In Windows 95/98 click on Start Menu, Run on the open line type: **FDISK** ; click OK.
  ➢ If asked "do you wish to enable large disk support", select **No**.
  ➢ Pick option "**5**. Change current fixed disk drive".
  ➢ Select the disk that corresponds to your PCMCIA device.

   ▪ ! DO NOT SELECT DISK 1, DRIVE C !

  ➢ At the top of the window it will show which fixed disk is currently selected.
   ▪ ! If **"Current fixed disk drive: 1"** is displayed, Hit the ESC key to exit FDISK and consult PC/Windows technically competent personnel !
   ▪ **! Proceeding any further will likely result in permanently wiping out all data the hard drive and making your PC completely unusable** !
  ➢ Select option "**4**. Display partition information"
   ▪ If there is an existing partition listed, it will have to be removed in order to create a new partition.
   ▪ An existing partition might look like:

Partition	Type	Mbytes	System	Usage
D: 1	PRI DOS	210	FAT16	100%

- ➢ If an existing partition exists: Select option "**3**. Delete partition or Logical Drive".
  - ▪ Choose the correct option based on the previously displayed partition information.
    - • "1. Delete primary DOS Partition"
    - • "2. Delete Extended DOS Partition"
    - • "3. Delete Logical DOS Drives in the extended DOS Partition"
    - • "4. Delete Non-DOS Partition"
  - ▪ If there were Logical DOS drives in an extended DOS partition, they will need to be deleted before the Extended DOS partition can be removed.

- ➢ If there are no existing partitions:
  - ▪ Select option "1. Create DOS partition or Logical Drive".
    - • Select option "1. Create Primary DOS partition".
      - ♦ When asked "Do you wish to use the maximum available size for a primary DOS partition", select **Yes**.
- ➢ After the partition is created, Hit the **ESC** key to continue.
- ➢ Hit the ESC key to Exit FDISK.
- ➢ A Message will probably appear:

"You MUST restart your system for your changes to take effect.
Any Drives you have created or changed must be formatted AFTER you restart.
Shut down Windows before restarting."

- ➢ Hit the ESC key to Exit FDISK.
- ➢ In Windows 95/98 click on Start Menu, Shut Down
- ➢ Shut Down the Computer, Yes

Congratulations, you have either successfully partitioned the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk in your PCMCIA socket, or wiped out all data on a hard drive.

Formatting

➢ In Windows 95/98 click on Start Menu, Programs, MS-DOS Prompt.
➢ At the DOS prompt type: **Format x /q**
  ▪ The /q stands for Quick Format.
  ▪ Where **X** is the Drive letter assigned to your PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk.
  ▪ **! DO NOT FORMAT DRIVE C !**
➢ If you can not figure out the drive letter for the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk.
  ▪ Hit the ESC key to clear the command line.
  ▪ Type EXIT on the command line and hit return, to exit to windows.
  ▪ ! Consult PC/Windows technically competent personnel !
  ▪ **! Proceeding any further will likely result in permanently wiping out all data the hard drive and making your PC completely unusable** !
➢ A Message will probably appear:
➢ "WARNING, ALL DATA ON DISK DRIVE X: WILL be LOST!
➢ Proceed with Format (Y/N)"
➢ If the drive letter is C: Hit **N**o.
❖ Type EXIT on the command line and hit return, to exit to windows.
  ➢ ! Consult PC/Windows technically competent personnel !
    ▪ ! Proceeding any further will likely result in permanently wiping out all data the hard drive and making your PC completely unusable !
  ➢ If the drive letter **is** the drive letter of the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk: Hit **Y**es.
    ▪ If a Message appears "Invalid existing format. This disk cannot be QuickFormatted. Proceed with unconditional Format (Y/N)?"
      • Select **Y**es

❖ A Message will be displayed while the drive is formatted
  ➢ "Formatting ###.##M, ###% percent completed."
  ➢ When Prompted for a Volume Label, Hit Enter Only.
  ➢ Type **EXIT** on the command line and hit return, to exit to windows.
  ➢ In Windows 95/98 click on Start Menu, Shut Down, Shut Down the Computer, Yes

Congratulations, you have either successfully formatted the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk in your PCMCIA socket, or wiped all data on a hard drive.

The PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk should now be ready for use.

6.4 Power Specification for Continuous *Normal* Operation

The power usage and requirements for Media Pro® modules are depicted in the following table. It is important that **_both_** of the following considerations are evaluated for proper system configuration:

- ✓ The power usage of the modules does not exceed any *individual* maximum current and wattage.
- ✓ The sum of the modules do not exceed the supply *overall* maximum wattage.

DSM-4020, PCB 11042-B

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
DC	Min	Typical	Max	Min	Typical	Max
+ 5	0.350	0.500	0.650	1.75	2.50	3.3
+ 12	0.100	0.120	0.140	1.20	1.44	1.7
- 12	0.100	0.120	0.140	1.20	1.44	1.7
+ 24	0.010	0.015	0.030	0.24	0.36	0.7
				4.4	5.7	7.

## 6.5 Downloading New Version of Firmware to a Module

There may be circumstances where the firmware version of a module may need to be upgraded in the field. The information in this section will describe the process of downloading a new version of firmware from the Anitech Systems website and installing it into the module.

Verify Current Version –

- ✓ Open the MP4000 software.
- ✓ Click on the desired module.
- ✓ Module firmware versions are displayed in the Device Information section of the screen.

Download Firmware Code From Website –

- ❖ Visit the Anitech Systems website (www.anitech-systems.com).
  - ➢ Click on the Support link.
  - ➢ Scroll to the correct module type.
  - ➢ Highlight and select the Firmware column.
    - ▪ Select the correct module version.
      - • Select the appropriate sub-file, this is dependant on the module revision level. (Refer to File Name Conventions in the Media Pro® 4000 manual, section 5.2.1, for a detailed explanation of firmware file names.)
      - • When the file is selected, it needs to be saved to the disk. Since browsers vary, refer to the brief, "Saving Files from a WebPage without Displaying " in Section 6.1 of this manual.
        - ♦ Enter the Directory and Filename information on the pop-up Menu and press the Save button. The file will be saved to the disk.
- ❖ Also, carefully read the most recent ReadMeMP.txt. It is found on the website at the following address:
    http://anitech-systems.com/MP4000/manual/briefs/ReadMeMP.txt
  - ➢ Exit the Website.
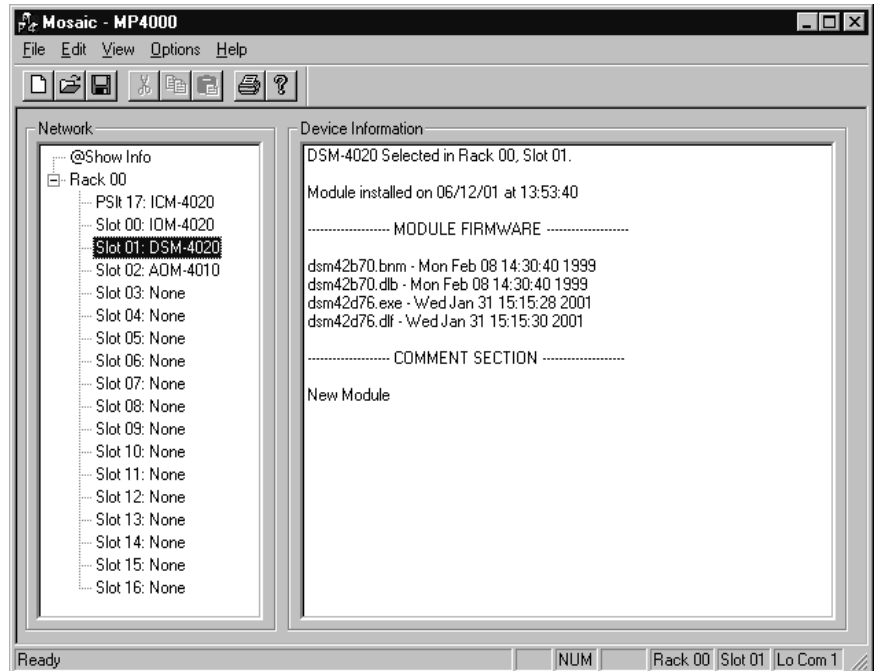
Return to the MP4000 Software –

➢ **Note:** Before attempting to download the firmware to a module, place the switch on the ICM front panel to the **Test** position. This will enable the rack to download faster and with minimal interference. Placing the switch in the test position affects the racks as described below:

▪ Rack 0 (master) – Allows the Rack to concentrate on the download information. Quits the cues and animation from running and stops the broadcast over the MP Net.

▪ Other Racks (slaves) – Still receives the information, but ignores it while the download is being performed.

▪ **NOTE:** When downloading to a slave rack over the MPNet, turn the Rack 0 ICM switch to the Test position in order to minimize interference and enable a successful download.

❖ Open the MP4000 software and select the Showfile.

❖ Highlight the module desired and left click. The module's information is displayed in the Device Information section.

➢ Select OPTIONS from the Menu bar across the top of the MP4000 Menu screen.

▪ From the scroll down menu, highlight and select **MP4000 FIRMWARE**. The Download menu appears.

• In the Download Controls section of the menu, press the **Select File** button. A menu pops up for the selection of the file. Find the directory and filename, then double-click to select and open it.

Anitech Systems, Inc.   Revision - **Error! Reference source not found**.
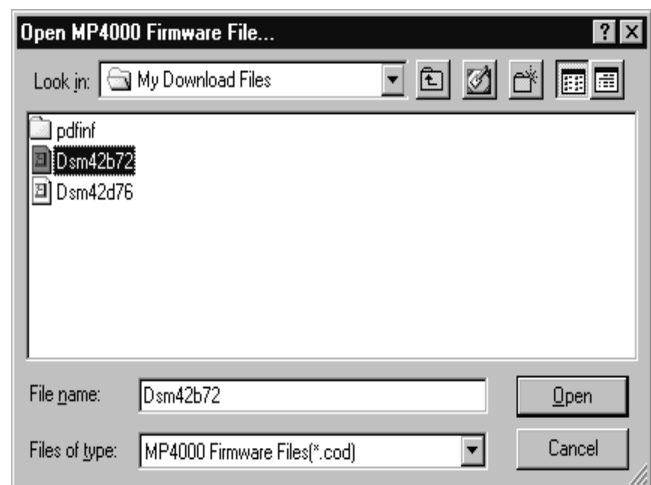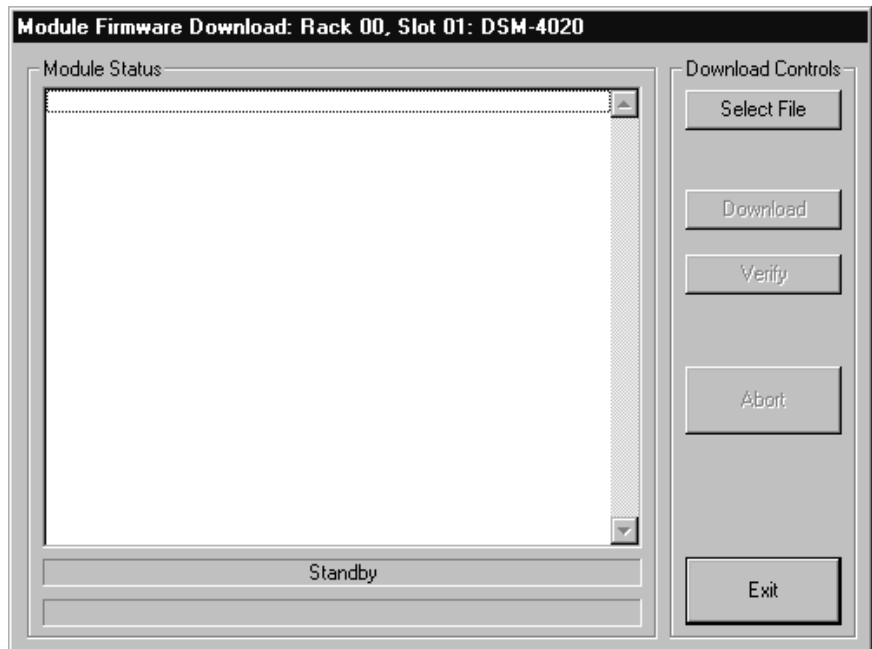
Install the firmware Code in the Module –

❖ The download screen reappears and displays the firmware information in the Module Status section of the screen.

❖ Be Certain to Read the Description & Comment sections of the firmware information for considerations and restrictions of use.

❖ Refer to the ReadMeMP file found on the Website.

❖ Press the Download button to proceed, or Exit to abort the operation.

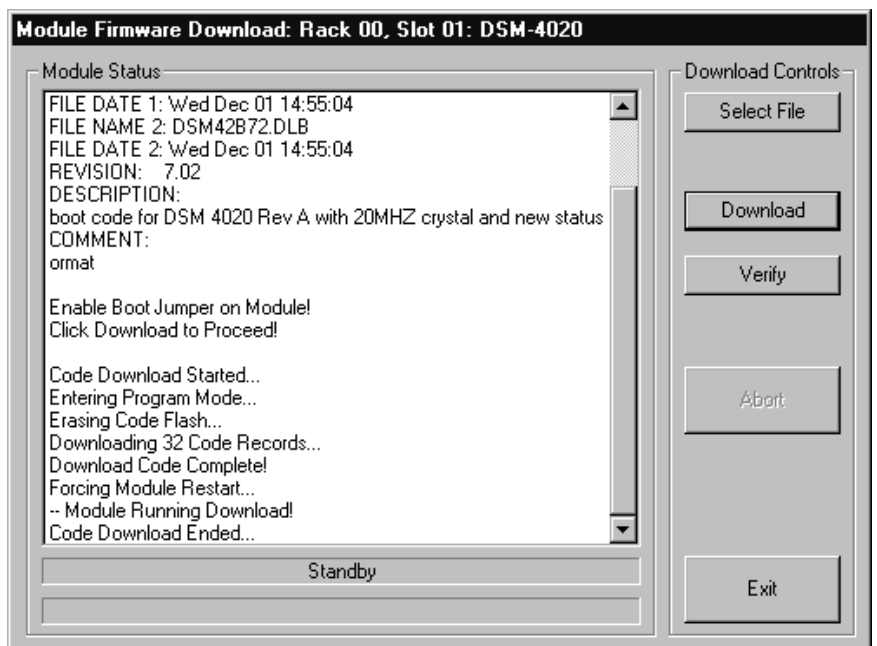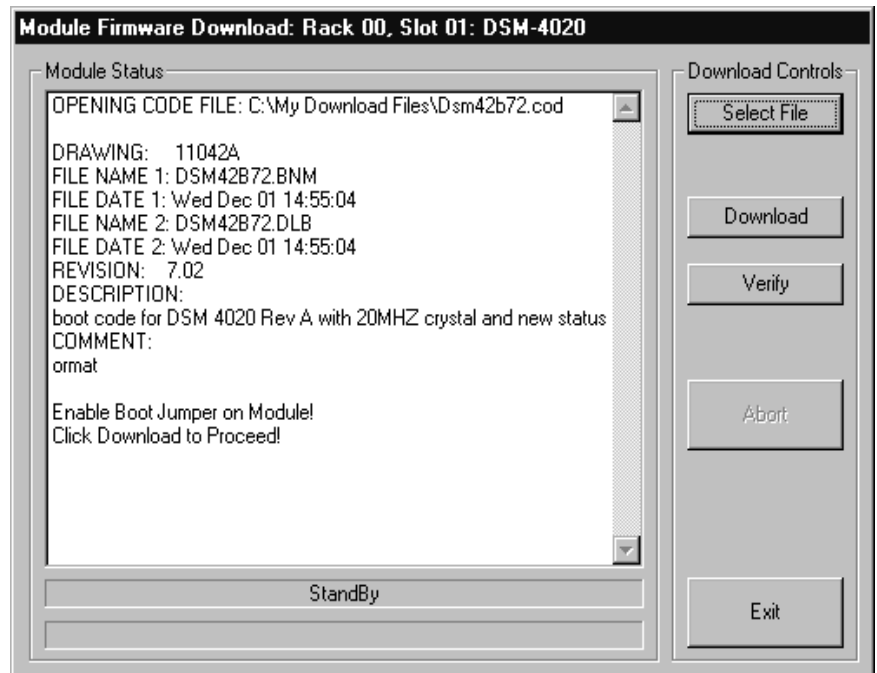> ➢ Once the Download has started, messages appear on the screen to detail the process that is taking place. When it is finished, **Code Download Ended** message is displayed.

❖ It is recommended to run a verify after the download on modules that have the option available. Press the **Verify** button and watch for the **Code Verify Ended** Message.

> ➢ If another download is necessary, then press the Select File button and repeat the download process for the next file needed.
>
> ➢ Press the **Exit** button to end the download process.

The new versions of the firmware will be displayed in the Device Information Pane of the MP4000 menu.

Module Firmware Download: Rack 00, Slot 01: DSM-4020

Module Status

```
OPENING CODE FILE: C:\My Download Files\Dsm42b72.cod

DRAWING:    11042A
FILE NAME 1: DSM42B72.BNM
FILE DATE 1: Wed Dec 01 14:55:04
FILE NAME 2: DSM42B72.DLB
FILE DATE 2: Wed Dec 01 14:55:04
REVISION:    7.02
DESCRIPTION:
boot code for DSM 4020 Rev A with 20MHZ crystal and new status
COMMENT:
ormat

Enable Boot Jumper on Module!
Click Download to Proceed!
```

Download Controls

- Select File
- Download
- Verify
- Abort
- Exit

StandBy

Module Firmware Download: Rack 00, Slot 01: DSM-4020

Module Status

```
FILE DATE 1: Wed Dec 01 14:55:04
FILE NAME 2: DSM42B72.DLB
FILE DATE 2: Wed Dec 01 14:55:04
REVISION:    7.02
DESCRIPTION:
boot code for DSM 4020 Rev A with 20MHZ crystal and new status
COMMENT:
ormat

Enable Boot Jumper on Module!
Click Download to Proceed!

Code Download Started...
Entering Program Mode...
Erasing Code Flash...
Downloading 32 Code Records...
Download Code Complete!
Forcing Module Restart...
-- Module Running Download!
Code Download Ended...
```

Download Controls

- Select File
- Download
- Verify
- Abort
- Exit

Standby

Glossary

ALIAS	English representation contained within single quotes that references an object.
.ani	Extension used for Animation files.
ASCII	A numeric code used by computers to represent characters.
BIT	A single logical or physical resource that can be either ON (true, 1) or OFF (false, 0).
COMMENT	Text following a semicolon on an event line within a cue, it is used to annotate the cue.
COMPLIANCE	Additional feedback applied according to the equations in the firmware and parameters supplied by the user that tends to reduce the output signal.
CONST	Constant.
CONTACT CLOSURE	Completes a circuit. A voltage is applied to a reference pin of a bit's connector. When the switch is closed, the voltage is returned on another wire to the same bit, completing the circuit. When the switch is closed, the I/O pin gets voltage.
CUE	A list of up to 512 EVENTS containing verb, object, token, and variable items.
db	Decibel. Measurement of sound levels.
E/S	Emergency Stop
EVENT	A single line of verb, object, token and parameter items contained in a CUE.
FET	Field Effect Transistor - an electronically controlled switch.
FLASH	Fast, electrically erasable, and programmable in the circuit non-volatile memory devices.
FW	Firmware. The program code that is loaded into an Eprom or other programmable devices.
HMR	Horizontal Module Rack.
HW	Hardware.

ICM	Intelligent Controller Module.
I/O	Input/Output.
IOM	Input/Output Module.
JMP	Push-on jumper, shunt - a small (approximately ¼" x 1/8" thick) piece of plastic with a metal insert. The jumper is set by pushing it down over a pair of pins.
KEY	A piece of hardware that keeps a module from being plugged into a slot that is wired and keyed for a different kind of module.
LABEL	A name, followed by a colon on a line of a CUE, used for a forward or backward jump.
LED	Light Emitting Diode (indicator, light, lamp)
MIDI	Musical Instrument Digital Interface. File format developed to make sound files common on all computer formats.
MPCL	Media Pro® Control Language. Common programming language used to write the cues used in the Media Pro® family of modules.
OBJECT	Term used to reference a resource within the Media Pro® system.
OFF	False, 0, Open.
ON	True, 1, Closed.
PARAMETER	The item that follows a token. The list of parameters is in section 3 of the MP4000 User's Operation Manual.
PCM	Pulse Code Modulation. The most common format for the waveform audio file.
PLC	Programmable Logic Controller.
PORT	A resource on a module in case of the DSM. There are 2 ports.
P-P	Peak to Peak.
RACK	A card cage containing Media Pro® 4000 Modules.
RESOURCE	A controllable device connected to or contained within the Media Pro® 4000 system.

RIFF	**R**esource **I**nterchange **F**ile **F**ormat. A multimedia file format, containing chunks of audio and video data.
RMS	Root Mean Squared.
SLOT	A physical location in a RACK that contains a Media Pro® Module.
SMPTE	Refers to the **S**ociety of **M**otion **P**icture & **T**elevision **E**ngineers, and the standard for timing signals set by this group.
STRING	A collection of alphanumeric characters contained in double quotes, used with the DISPLAY command.
SW	Software. The program and utility code used by the computer to run the system.
THD & N	Total harmonic distortion and noise.
TOKEN	Reserved words for modifiers of the VERBs used in a cue event. The list of TOKENs is in section 3 of the MP4000 User's Operation Manual.
TYPE	The kind of OBJECT being referred to in a direct addressing statement. The list of TYPEs is in section 3.
VAC	Volts Alternating Current.
VARIABLE	A 32-bit value that can contain a number used in a cue line. A variable may be assigned an ALIAS. There may be a maximum of 512 variables per cue.
VDC	Volts Direct Current.
VERB	Reserved words for the actions used in a CUE EVENT. The list of VERBs is in section 3 of the MP4000 User's Operation Manual.
VMR	Vertical Module Rack.
.wav	Extension used for WAVE files, contains sound data. Developed by Microsoft to play sound files on the Windows computers with audio capability.
Z-RAILS	Two Z-shaped rails on the back of the rack, adjacent and parallel to the space for the I/O connectors on the Modules when the modules are inserted. The field connectors attach to the Z-rails.