
HD SERIES LOCAL CONTROL CARD USER MANUAL**CONTENTS**

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- 1 INTRODUCTION** This document provides details of functions supported by the software written for the 2412, 2413 and 2414 HD series local control cards contained in EPROM numbers SP20, SP55 and SP90. For detailed description of the hardware see the appropriate hardware handbook. For convenience, the control cards will be referred to as 2414 throughout this document unless otherwise stated as the control functions are identical.
- 2 OTHER ASSOCIATED DOCUMENTATION** The following documents are referred to in this document.
- SW-P-02** - General Switcher Protocol.
 - SW-P-03** - Simple Switcher Protocol.
- The above documents are available on request.
- 3 CONTROL FACILITIES** This section provides details of the control facilities that the software provides.
- 3.1 Power Up** The HD series 2414 control card has two power up sequences, **NORMAL** power up and **SYSTEM RECONFIGURE** power up. The system reconfigure power up sequence allows for control of partially equipped switchers without having to install dummy modules for the unequipped part of the router.
- 3.1.1 Normal Power Up** This power up sequence occurs when the system RECONFIGURE button (SW2) is not pressed and applies when either the 2414 control card is powered up from cold or the RESET button (SW1) is pressed.
- In this mode the RAM based configuration table is used to work out the size of router being controlled. The RAM based inhibit table is then adjusted to indicate allowed crosspoints.
- 3.1.2 System Reconfigure Power Up** This sequence is provided to enable the 2414 local control card to be informed of the layout of the switcher that it controls.
- This power up sequence is instigated by pressing the RESET button (SW1) whilst the system RECONFIGURE button (SW2) is pushed and held in. The system RECONFIGURE button must remain pressed until the 2414 is running properly i.e. LEDs 0 & 2 are alternately lit with LEDs 1 & 3.
- In this mode all module positions are checked for a module being present and the RAM based configuration table adjusted accordingly. The 2414 control card then continues to power up in the same manner as in **NORMAL** power up mode but using the adjusted RAM configuration table to describe the actual hardware configuration.

3.2 Crosspoint Update on Power Up

A selectable crosspoint update facility is provided so that on power up either no crosspoints are set or all crosspoints are set according to the crosspoint tally tables. When the no crosspoint set mode of operation is selected crosspoint tallies will get updated when crosspoint set commands are received but the actual crosspoints will not get set until the **START UPDATE** command is received from the router controller. This facility is only available if the **GENERAL SWITCHER PROTOCOL** is selected, (see **SW-P-02**) and the matrix being controlled is not an **RS422 machine control router (6511/6521)** or a **Serial digital video router (6621/6622/6623/6624)** or a **MADI router (5613)**.

3.3 Switcher Control

Control of the HD series switchers is only available via two serial control ports. Each serial port can be set up as either RS232 or RS485 ports (link selectable). The electrical characteristics of each port is also link selectable, see **SECTION 4.1**.

Two switcher communication protocols are provided which are the **SIMPLE SWITCHER PROTOCOL**, see **SW-P-03**, and the **GENERAL SWITCHER PROTOCOL**, see **SW-P-02**. The required switcher protocol again is link selectable.

The simple switcher protocol provides just normal setting and reading of crosspoints where as the general switcher protocol provides switcher module status information and salvo switching functions as well.

NOTE

Salvo switching functions as defined in the General Switcher Protocol, **SW-P-02**, are not supported by EPROM SP20.

3.4 Fault Checking

A fault checking routine is provided to check the system for faulty or missing modules against the RAM configuration table. This check routine is called every other time round the main loop of the program and checks eight module positions each time.

If a faulty/missing module is detected the 2414 goes into fault mode, the error LEDs are setup, see **SECTION 5 LED DIAGNOSTICS**, and the switcher goes into update mode, trying to reset the crosspoints. After all errors have been cleared the error LEDs are turned off and the switcher remains in update mode for about another second.

Also provided for serial digital video routers is a mechanism for getting the status of the source and destination locks. This is only available when General Switcher Protocol is selected but is not supported by EPROM SP20.

3.5 Monitor Row Control

For each level of the router a monitor row is provided. This monitor row allows all outputs of a level of switcher to be monitored.

Control of the monitor row(s) is only available when using the **GENERAL SWITCHER protocol (see SW-P-02)**. Eight special destination numbers have been allocated for controlling the monitor row(s). These are 896 - 903 inclusive with 896 being the monitor row for the first level. Source 255 is allocated as an OFF source. This is because on the HD AUDIO routers there is one monitor output row per control card but on the HD VIDEO routers there is only one monitor row output per router. The OFF source is used so that only one control card is updating the monitor row output at any time.

3.6 LED Diagnostics

A group of 16 LEDs are provided for diagnostic information to indicate that the 2414 is active, serial ports are active, crosspoints are being set, which switcher protocol is selected and whether there are any faulty or missing modules in the system.

For more detailed information about the LEDs see **SECTION 5 LED DIAGNOSTICS**.

4. CONFIGURATION LINKS

This section gives details of how to set up the various configuration links on the control card. The links allow set up of baud rates, data bits etc for each of the serial ports, selection of serial communication protocol, selection of RS232/RS485, picture/field rate switching, line number on which picture is switched and baud rate clock select.

The following table gives a brief synopsis of the link configuration on the 2412 local control card.

JUMPER NO	FUNCTION
PL 4	1 MHz/2 MHz Processor clock speed select. See section 4.2.2.1
PL 5	Serial Port A RS485/RS232 select. See section 4.1.3
PL 6	Serial Port B RS485/RS232 select. See section 4.1.3
PL 7	Baud rate set select. See sections 4.1.1, 4.1.2 and 4.2.4
PL 8 & PL12	Switcher Protocol select. See section 4.2.1.2 and SW-P-02 & SW-P-03
PL 9	Crosspoint Update enable/disable on power up select. (Only applies when GENERAL SWITCHER PROTOCOL is selected.) See section 4.2.1.3
PL10	TALLY ERROR response enable/disable select. (Only applies when GENERAL SWITCHER PROTOCOL is selected.) See section 4.2.1.4
PL11	Reference Input enable/disable select. See section 4.2.1.5
PL13	Stereo Set select enable used to make stereo routes from one set command. See Section 4.2.1.6
PL14	Not used at present.
PL15 - PL22	Serial Port B baud rate,data bits,parity etc configuration. See Section 4.1.2
PL23 - PL30	Serial Port A baud rate,data bits, parity etc configuration. See Section 4.1.1
PL31 - PL34	Line number on which video switchers switch crosspoints. See Section 4.2.2.3
PL35	Field/Picture crosspoint switch rate. See section 4.2.2.2

A more detailed description of the link settings is given in the following sections.

4.1 Serial Port Configuration

4.1.1 Port A

PL27 to PL30 are used to set the baud rate for port A. The following table defines the link settings for defining the baud rate of serial port A. PL7 is used to determine which baud rate set is applicable. (See SECTION 4.1.4.)

LINK NO / MODULE LEGEND				BAUD RATE	
PL30 H	PL29 G	PL28 F	PL27 E	BAUD RATE PL 7 = 1	CLOCK SEL PL 7 = 0
0	0	0	0	75	50
0	0	0	1	110	110
0	0	1	0	134.5	134.5
0	0	1	1	150	200
0	1	0	0	300	300
0	1	0	1	600	600
0	1	1	0	1200	1200
0	1	1	1	2000	1050
1	0	0	0	2400	2400
1	0	0	1	4800	4800
1	0	1	0	1800	7200
1	0	1	1	9600	9600
1	1	0	0	19200	38400

PL23 to PL26 define the handshake control, stop bits and parity for port A.

LINK NUMBER	LINK FUNCTION	LINK POSITION	
		1	0
PL23	CTS/RTS control	ENABLED	DISABLED
PL24	No of STOP bits	2	1
PL25	PARITY TYPE	EVEN	ODD
PL26	PARITY USE	ENABLED	NONE

NOTE : There are always 8 DATA BITS.

4.1.2 Port B

PL19 to PL22 are used to set the baud rate for port B. The following table defines the link settings for defining the baud rate for serial port B. PL7 is used to determine which baud rate set is applicable. (See SECTION 4.1.4.)

LINK NO / MODULE LEGEND				BAUD RATE	
PL22 H	PL21 G	PL20 F	PL19 E	BAUD RATE PL 7 = 1	CLOCK SEL PL 7 = 0
0	0	0	0	75	50
0	0	0	1	110	110
0	0	1	0	134.5	134.5
0	0	1	1	150	200
0	1	0	0	300	300
0	1	0	1	600	600
0	1	1	0	1200	1200
0	1	1	1	2000	1050
1	0	0	0	2400	2400
1	0	0	1	4800	4800
1	0	1	0	1800	7200
1	0	1	1	9600	9600
1	1	0	0	19200	38400

PL15 to PL18 define the handshake control, stop bits and parity for port B.

LINK NUMBER	LINK FUNCTION	LINK POSITION	
		1	0
PL15	CTS/RTS control	ENABLED	DISABLED
PL16	No of STOP bits	2	1
PL17	PARITY TYPE	EVEN	ODD
PL18	PARITY USE	ENABLED	NONE

NOTE : There are always 8 DATA BITS.

4.1.3 RS485/RS232 Select The serial ports may operate as RS485 or RS232 ports. Links PL5 is used to select RS485 or RS232 on port A and PL6 is used to select RS485 or RS232 on port B. The link positions are defined by the legending on the 2414 control card.

N.B. The RS485/RS232 select links are not under software control.

4.1.4 Baud Rate Set Select The 2681 DUART provides two sets of baud rates which may be used to configure the port baud rates. However once a set is chosen, then this set is applied to both ports.

The link used to select the baud rate sets is **PL7**. See **Section 4.1.1** and **Section 4.1.2** for details.

4.2 Miscellaneous Configuration Links

This section provides details of how to configure links PL7 - PL14 and details of other links which are not under software control.

4.2.1 Software Configurable Links (PL7 - PL14)

The following defines the usage of links PL7 - PL14.

In all cases in this section 0 = 0 volts, 1 = 5 volts.

4.2.1.1 PL17 - Baud Rate Set Select

This link selects the baud rate sets as defined in **SECTIONS 4.1.1** and **4.1.2**.

4.2.1.2 PL8 & PL12 Protocol Select

These two links select the communication protocol used for communicating with the 2414 control card via the serial ports.

PL12	PL8	FUNCTION
1	X	General Switcher Protocol on Port A and Simple Switcher Protocol on Port B.
0	1	General Switcher Protocol on both ports.
0	0	Simple Switcher Protocol on both ports.

For details of the **General Switcher Protocol** see **SW-P-02** and details of the **Simple Switcher Protocol** see **SW-P-03**.

**4.2.1.3 PL9 - Crosspoint Update
Enable/Disable Select**

This link selects whether crosspoints are updated or not on power up and thereafter. This link's position is only applicable when the General Switcher Protocol is selected and the router being controlled is not an RS422 machine control router, a serial digital video router or a MADI router.

PL9 = 1 - Crosspoint Update DISABLED.
0 - Crosspoint Update ENABLED.

If the Simple Switcher Protocol is selected crosspoint update is ENABLED.

**4.2.1.4 PL10 - Tally Error
Response Enable/disable
Select**

This link selects whether a TALLY ERROR response is generated when an out of range destination is INTERROGATED. If the tally error response is disabled no TALLY message is generated when an out of range destination is INTERROGATED. Source 1023 is used to indicate that the destination is out of range in the TALLY response message. This link's position is only applicable when the General Switcher Protocol is selected.

PL10 = 1 - TALLY Error response ENABLED.
0 - TALLY Error response DISABLED.

**4.2.1.5 PL11 - Reference Input
Enable/disable Select**

This link selects whether the reference input is used to set the crosspoints. If the reference input is disabled then crosspoints are set immediately whilst if the reference input is enabled and the reference SYNC pulses are detected then the crosspoints will be set on the next field or picture SYNC pulse.

PL11 = 1 - Reference Input ENABLED.
0 - Reference Input DISABLED.

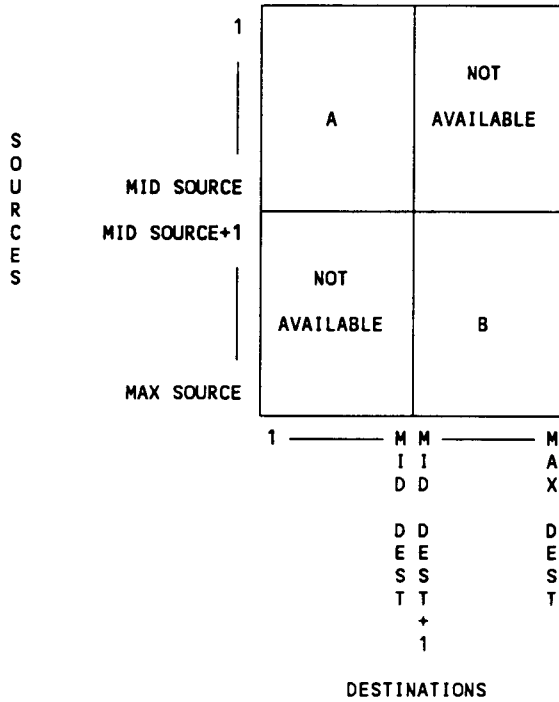
**4.2.1.6 PL13 - Stereo Set
Select Enable**

This link sets whether a STEREO pair of crosspoints is set from just receiving the Left channel crosspoint set command.

This link is intended for use on analogue audio routers or MADI type routers allowing the device controlling the router to send just the left channel crosspoint set command and then the right channel crosspoint is set as well.

PL13 = 1 - Stereo Set Select ENABLED.
0 - Stereo Set Select DISABLED.

A router is logically configured as in diagram below.



KEY

MAX SOURCE = Maximum wired source (not equipped)

MID SOURCE = Maximum wired source / 2

MAX DEST = Maximum wired destination

MID DEST = Maximum wired destination / 2

A = LEFT channel sources/destinations

B = RIGHT channel sources/destinations

When **PL13=1** and a crosspoint set command is received for block A then the corresponding block B crosspoint will also be set. If **PL13=1** and a crosspoint set command is received for block B only the block B crosspoint will be set.

When **PL13=0** only single crosspoints are set from each crosspoint set command and all sources can be set to all destinations if the crosspoints are equipped.

4.2.1.7 PL14

This link is not used at present.

4.2.2 Hardware Configurable Links

4.2.2.1 PL4 - Processor clock speed select

This link selects the processor clock speed. Under normal circumstances the clock speed will be 2 MHz. The 1 MHz clock speed will normally only be used when using an emulator to try out new software or fix bugs. The link setting is defined by the legending on the 2414 control card.

4.2.2.2 PL35 - Field/Picture Rate

This link determines if the crosspoints are switched at field or picture rate when the 2414 control card is controlling a VIDEO switcher. The link setting is defined by the legending on the 2414 control card.

4.2.2.3 PL31-PL34 - Line Switch

These four links define the line number that the picture switches on when the 2414 is controlling a video switcher.

The following table defines the available configurations.

LINE NO	LINK (PL) NO			
	34	33	32	31
16	0	0	0	0
15	0	0	0	1
14	0	0	1	0
13	0	0	1	1
12	0	1	0	0
11	0	1	0	1
10	0	1	1	0
09	0	1	1	1
08	1	0	0	0
07	1	0	0	1
06	1	0	1	0
05	1	0	1	1
04	1	1	0	0
03	1	1	0	1
02	1	1	1	0
01	1	1	1	1

NOTE : 0 = 0 Volts, 1 = 5 VOLTS.

5 LED DIAGNOSTICS

The following table defines the diagnostic usage of LEDs D0 - D15.

LED NO	DIAGNOSTIC
0 - 3	Indicates 2414 is running (LEDs 0 & 2 flash alternately with LEDs 1 & 3).
4	Serial port A active (flashes to indicate port active)
5	Serial port B active (flashes to indicate port active)
6	Indicates which switcher serial communication protocol is selected. (ON = GENERAL switcher protocol both ports, OFF = SIMPLE switcher protocol both ports, FLASHING = GENERAL switcher protocol on port A & SIMPLE switcher protocol on port B.)
7	Crosspoint set active (on when crosspoint being set)
8 - 13	Indicates first faulty input/crosspoint/output module when error(s) are detected. (6 bit binary number with binary 1 indicating the first module.)
14	Not used at present.
15	Error detect. This LED is on when a faulty/missing input/crosspoint/output module is detected.

A **DEFAULT/FACTORY
JUMPER SETTINGS**

This section defines the factory set jumper settings. The jumper settings assume that the local control card is connected to a Pro-Bel controller.

The following table define the factory set jumper settings.

JUMPER	SETTING	FUNCTION
PL4	2 MHz	Set Processor at full speed
PL5	RS485	Select RS485 for port A
PL6	RS485	Select RS485 for port B
PL7	0	Select BAUD RATE set 1
PL8	1	Select GENERAL SWITCHER PROTOCOL on both ports
PL9	0	Enable crosspoint update
PL10	1	Enable tally ERROR response
PL11	1	Enable reference input
PL12	0	Select GENERAL SWITCHER PROTOCOL on both ports
PL13	0	Stereo Set Select Disabled.
PL14	X	Not used.
PL15	0	RTS/CTS Control Port B disabled
PL16	0	Number of STOP BITS Port B = 1
PL17	1	PARITY TYPE Port B = EVEN
PL18	1	PARITY USE Port B = YES
PL19	0	} Baud Rate Port B = 38.4K Baud
PL20	0	
PL21	1	
PL22	1	
PL23	0	RTS/CTS Control Port A disabled
PL24	0	Number of STOP BITS Port A = 1
PL25	1	PARITY TYPE Port A = EVEN
PL26	1	PARITY USE Port A = YES
PL27	0	} Baud Rate Port A = 38.4K Baud
PL28	0	
PL29	1	
PL30	1	
PL31	1	} Switch crosspoints LINE 6 - DIGITAL VIDEO 9 - ANALOGUE VIDEO
PL32	1	
PL33	1	
PL34	0	} Switch crosspoints at FIELD rate.
PL35	FIELD	

**B RS422 MACHINE
CONTROL
ROUTERS**

Due to the way in which the PARKING of a destination operates on these routers, i.e. to park a destination the current source routed is added to the park source (64 on 6511/6521), there are situations where the current source routed is unknown e.g. when changing the 2414 control card without swapping the non volatile RAM chip, thus causing the router to operate in correctly. To get round this problem it will be necessary to do a **SYSTEM RECONFIGURE POWER UP**, see **Section 3.1.2** and then power down the router and then switch back on again.

C MADI CONFIGURATIONS

This appendix provides details about the various MADI (**M**ulti-**c**hannel **A**udio **D**igital **I**nterface) configurations contained in the 2414 software. MADI configurations are only available in EPROMS SP55/6 upwards and SP90/1 upwards.

1 INTRODUCTION

1.1 MADI Routers

The MADI router frame (type 5613) contains slots for 4 2414 control cards, each 2414 controlling 2 5603 MADI crosspoint cards. Each MADI crosspoint card has 8 MADI inputs + CASCADE input and 1 MADI output with each MADI containing 56 audio channels, each adjacent pair i.e. 1 & 2, 3 & 4, 5 & 6 etc representing stereo pairs. Thus a 5603 MADI crosspoint card has 448 + 56 (if cascade input used as normal inputs) inputs and 56 outputs.

The module layout of the frame (looking from the front) is shown in figure 1 below.

```

2 5 5 2 5 5 2 5 5 2 5 5
4 6 6 4 6 6 2 6 6 2 6 6
1 0 0 1 0 0 1 0 0 1 0 0
4 3 3 4 3 3 4 3 3 4 3 3
# # # # # # # # # # # #
1 1 2 2 1 2 3 1 2 4 1 2
    
```

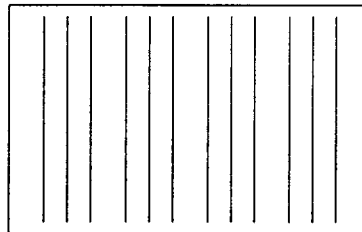


Figure 1 - 5613 Module Layout (front view)

The 2414 software provides 4 MADI router configurations:

- 504 x 112 Non Mapped,
- 504 x 112 Mapped,
- 952 x 56 Non Mapped,
- 952 x 56 Mapped.

Each configuration is selected using 8 way DIL switch associated with the particular 2414 located on the motherboard in the MADI router frame. The switches set the card ID of each 5603 card (3 switches for each 5603) and the 2414 operating mode. The configurations are described in later sections.

1.2 MAD I Multiplexer/ Demultiplexer

A MAD I multiplexer/demultiplexer frame (type 6505) is provided. Each 6505 frame provides 28 AES inputs multiplexed on to one MAD I out via 5606/5609 modules and a one MAD I in demultiplexed to 32 or 8 AES outputs via 5608 (32 AES outputs) or 5605 (8 AES outputs) modules.

The 6505 frame has a fixed input mapping i.e. for the 56 channels of the MAD I:

AES input 1 left channel is encoded onto channel 1,
AES input 1 right channel is encoded onto channel 2,
AES input 2 left channel is encoded onto channel 3,
AES input 2 right channel is encoded onto channel 4,
etc.

The 6505 frame can have a fixed output mapping or a configurable output mapping selected by a jumper on the rear of the 6505 frame.

For each channel of the MAD I, the fixed output mapping is as follows:

channel 1 is demultiplexed onto AES output 1 left channel,
channel 2 is demultiplexed onto AES output 1 right channel,
channel 3 is demultiplexed onto AES output 2 left channel,
channel 4 is demultiplexed onto AES output 2 right channel,
etc.

NOTE if a 5608 is used AES outputs 29-32 are not used in the fixed output mapping mode.

When the configurable output mapping is used a 2414 is used to control the output mapping as though it was a router with any channel in the MAD I able to be routed to any left or right channel AES output thus effectively forming a 56x64 (if using 5608) or a 56x16 (if using 5605) router. The 2414 software provides two software configurations for each MAD I demultiplexer type module:

56x64 Non Mapped, (5608)
56x64 Mapped, (5608)
56x16 Non Mapped, (5605)
56x16 Mapped. (5605)

The configuration used is set by jumpers located on the rear of the 6505 frame. Each configuration is described in later sections.

2 MADI ROUTER CONFIGURATIONS

Each of the following descriptions describe how to configure a single 2414. To expand outputs (in blocks of 56) but use the same inputs another 2414 is to be used with the same switch settings with the same physical inputs connected to each of the MADI inputs on each 5603.

2.1 504x112 Non Mapped

The 8 DIL switches associated with the 2414 must be set as follows:

1	2	3	4	5	6	7	8
ON	OFF	ON	ON	OFF	OFF	OFF	OFF

Referring to Figure 1 for each 2414/5603 block 5603#1 represents outputs 1-56 (AES outputs 1-28) and 5603#2 represents outputs 57-112 (AES outputs 29-56).

In this configuration all inputs and outputs are treated as they are physically mapped out as far as the communication protocol is concerned, i.e. the physical input and output numbers are used in communication protocol commands.

This configuration allows the CASCADE MADI input to be used as an extra set of 56 inputs.

In this configuration the Stereo Set Select enable jumper (PL13) is ignored, two crosspoint set commands have to be sent to set a stereo route.

2.2 504x112 Mapped

The 8 DIL switches associated with the 2414 must be set as follows:

1	2	3	4	5	6	7	8
ON	OFF	ON	ON	OFF	OFF	ON	OFF

Referring to Figure 1 for each 2414/5603 block 5603#1 represents outputs 1-56 (AES outputs 1-28) and 5603#2 represents outputs 57-112 (AES outputs 29-56).

In this configuration all inputs and outputs are physically in the same place as section 2.1 but are logically addressed as a contiguous block of inputs/outputs for the left channel inputs/outputs followed by a contiguous block of inputs/outputs for the right channel inputs/outputs as far as the communication protocol is concerned,

- i.e. inputs 001-252 = Left channel inputs,
- inputs 253-504 = Right channel inputs,
- outputs 001-056 = Left channel outputs,
- outputs 057-112 = Right channel outputs.

This configuration allows the CASCADE MADI input to be used as an extra set of 56 inputs.

In this configuration the Stereo Set Select enable jumper (PL13=1) can be used to make a stereo route from one logical left channel crosspoint set command otherwise the logical left and right crosspoint set commands have to be sent to set a stereo route.

This mode is preferred for use on Pro-Bel SYSTEM controllers (e.g. SYSTEM3) as it only needs to use one RS422 port per 2414. The non mapped configuration may need to use both of the RS422 ports of the 2414 to set stereo routes.

2.3 952x56 Non Mapped

The 8 DIL switches associated with the 2414 must be set as follows:

1	2	3	4	5	6	7	8
ON	OFF	ON	OFF	ON	ON	OFF	ON

This configuration uses the CASCADE MAD I input to enable expansion of the inputs. Referring to Figure 1 for each 2414/5603 block 5603#1 represents inputs 1-504 (AES inputs 1-252), outputs 1-56 (AES outputs 1-28) and 5603#2 represents inputs 505-952 (AES inputs 253-476), outputs 57-112 (AES outputs 29-56). The MAD I output of 5603#1 is connected to the CASCADE MAD I input of 5603#2.

In this configuration all inputs and outputs are treated as they are physically mapped out as far as the communication protocol is concerned, i.e. the physical input and output numbers are used in communication protocol commands.

This configuration only allows the CASCADE MAD I input of 5603#1 to be used as an extra set of 56 inputs.

In this configuration the Stereo Set Select enable jumper (PL13) is ignored, two crosspoint set commands have to be sent to set a stereo route.

2.4 952x56 Mapped

The 8 DIL switches associated with the 2414 must be set as follows:

1	2	3	4	5	6	7	8
ON	OFF	ON	OFF	ON	ON	ON	ON

This configuration uses the CASCADE MAD I input to enable expansion of the inputs. Referring to Figure 1 for each 2414/5603 block 5603#1 represents inputs 1-504 (AES inputs 1-252), outputs 1-56 (AES outputs 1-28) and 5603#2 represents inputs 505-952 (AES inputs 253-476), outputs 57-112 (AES outputs 29-56). The MAD I output of 5603#1 is connected to the CASCADE MAD I input of 5603#2.

In this configuration all inputs and outputs are physically in the same place as section 2.3 but are logically addressed as a contiguous block of inputs/outputs for the left channel inputs/outputs followed by a contiguous block of inputs/outputs for the right channel inputs/outputs as far as the communication protocol is concerned,

- i.e. inputs 001-476 = Left channel inputs,
- inputs 477-952 = Right channel inputs,
- outputs 001-028 = Left channel outputs,
- outputs 029-056 = Right channel outputs.

This configuration only allows the CASCADE MADI input of 5603#1 to be used as an extra set of 56 inputs.

In this configuration the Stereo Set Select enable jumper (PL13=1) can be used to make a stereo route from one logical left channel crosspoint set command otherwise the logical left and right crosspoint set commands have to be sent to set a stereo route.

This mode is preferred for use on Pro-Bel SYSTEM controllers (e.g. SYSTEM3) as it only needs to use one RS422 port per 2414. The non mapped configuration may need to use both of the RS422 ports of the 2414 to set stereo routes.

**3 MADI
 DEMULTIPLEXER
 CONFIGURATIONS**

Each of the following descriptions describe how to configure a 2414 to control a MADI demultiplexer module (5608 or 5605).

**3.1 5608 (56x64)
 Non Mapped**

The jumpers on the back of the 6505 frame must be set as follows:

- PL6 = PROC
- PL8 = 1
- PL9 = 1
- PL10 = 0

In this configuration all inputs and outputs are treated as they are physically mapped out as far as the communication protocol is concerned, i.e. the physical input and output numbers are used in communication protocol commands.

In this configuration the Stereo Set Select enable jumper (PL13) is ignored, two crosspoint set commands have to be sent to set a stereo route.

3.2 5608 (56x64) Mapped

The jumpers on the back of the 6505 frame must be set as follows:

PL6 = PROC
PL8 = 0
PL9 = 1
PL10 = 0

In this configuration all inputs and outputs are physically in the same place as section 3.1 but are logically addressed as a contiguous block of inputs/outputs for the left channel inputs/outputs followed by a contiguous block of inputs/outputs for the right channel inputs/outputs as far as the communication protocol is concerned,

i.e. inputs 001-028 = Left channel inputs,
inputs 029-056 = Right channel inputs,
outputs 001-032 = Left channel outputs,
outputs 033-064 = Right channel outputs.

In this configuration the Stereo Set Select enable jumper (PL13=1) can be used to make a stereo route from one logical left channel crosspoint set command otherwise the logical left and right crosspoint set commands have to be sent to set a stereo route.

This mode is preferred for use on Pro-Bel SYSTEM controllers (e.g. SYSTEM3) as it only needs to use one RS422 port per 2414. The non mapped configuration may need to use both of the RS422 ports of the 2414 to set stereo routes.

3.3 5605 (56x16) Non Mapped

The jumpers on the back of the 6505 frame must be set as follows:

PL6 = PROC
PL8 = 1
PL9 = 0
PL10 = 0

In this configuration all inputs and outputs are treated as they are physically mapped out as far as the communication protocol is concerned, i.e. the physical input and output numbers are used in communication protocol commands.

In this configuration the Stereo Set Select enable jumper (PL13) is ignored, two crosspoint set commands have to be sent to set a stereo route.

3.4 5605 (56x16) Mapped

The jumpers on the back of the 6506 frame must be set as follows:

PL6 = PROC
PL8 = 0
PL9 = 0
PL10 = 0

In this configuration all inputs and outputs are physically in the same place as section 3.3 but are logically addressed as a contiguous block of inputs/outputs for the left channel inputs/outputs followed by a contiguous block of inputs/outputs for the right channel inputs/outputs as far as the communication protocol is concerned,

i.e. inputs 001-028 = Left channel inputs,
 inputs 029-056 = Right channel inputs,
 outputs 001-008 = Left channel outputs,
 outputs 009-016 = Right channel outputs.

In this configuration the Stereo Set Select enable jumper (PL13=1) can be used to make a stereo route from one logical left channel crosspoint set command otherwise the logical left and right crosspoint set commands have to be sent to set a stereo route.

This mode is preferred for use on Pro-Bel SYSTEM controllers (e.g. SYSTEM3) as it only needs to use one RS422 port per 2414. The non mapped configuration may need to use both of the RS422 ports of the 2414 to set stereo routes.