

ADA-8XR Multi-channel A/D D/A Converter

Firmware Reference



Firmware Reference Revision History

Rev	Date	Author	Comments
1.00	4 th December 2004	Andy Hudson & Ian Dennis	Initial release, for 2.00 firmware

Support Contacts

Prism Media Products Limited
William James House
Cowley Road
Cambridge CB4 0WX
UK

Prism Media Products Inc
21 Pine Street
Rockaway
NJ 07866
USA

Telephone: +44 1223 424988
Fax: +44 1223 425023

Telephone: +1 973 983 9577
Fax: +1 973 983 9588

Email: tech.support@prismsound.com
Web: <http://www.prismsound.com>

Or contact your local Prism Sound distributor as detailed on the website.

Trademark Acknowledgements

Digidesign, Pro Tools, Pro Tools 24|MIX, 888|24 I/O, Pro Tools|HD, 192 I/O, 96 I/O, SYNC I/O and DigiLink are trademarks of Digidesign, a division of Avid Technology Inc.
Direct Stream Digital, DSD, MAC-DSD, SuperMAC and the DSD logo are trademarks of Sony Corporation.
Super Audio CD, SACD and the SACD logo are joint trademarks of Sony Corporation and Philips Electronics N.V.

All trademarks acknowledged

© 2001-2004 Prism Media Products Limited. All rights reserved.
This manual may not be reproduced in whole or part, in any medium, without the written permission of Prism Media Products Limited.

In accordance with our policy of continual development, features and specifications are subject to change without notice.

Contents

1	Introduction	4
2	Menu System Overview	4
2.1	Menu Types	4
2.1.1	Single Selection	4
2.1.2	Multiple Selection	5
2.1.3	Per-Channel Selection	5
2.1.4	Branch	6
2.1.5	Special	6
2.2	Menu Navigation	6
3	Level Screen	8
3.1	Warning Screen	9
4	Path Setup menu groups	10
4.1	Sync menu group	10
4.1.1	Sync Source	10
4.1.2	Sample Rate	10
4.2	Source menu group	11
4.2.1	Source Port	11
4.2.2	Input Channels	12
4.2.3	Module Dependent Input Option menus	12
4.3	Decode menu group	13
4.3.1	MR-X Decode	13
4.3.2	DRE Decode	13
4.4	Process menu group	14
4.4.1	Process	14
4.5	Encode menu group	14
4.5.1	Output Wordlength	14
4.5.2	Output Noise-Shaper	15
4.5.3	MR-X Encode	15
4.5.4	DRE Encode	16
4.6	Destination menu group	17
4.6.1	Destination Port	17
4.6.2	Module Dependent Output Option menus	17
5	Monitor Setup menu group	18
5.1.1	Monitor Mode	18
5.1.2	Monitor Channel Mix	19
5.1.3	Analogue Monitor Line-up Level	20
5.1.4	Headphone Range	20
5.1.5	Monitor Volume Control Enable	20
5.1.6	Monitor Line Output Cut	20
6	Meter Setup menu group	21
6.1.1	Meter Alerts	21
6.1.2	Meter Overloads	22
7	Module Interrogation menu group	22
7.1.1	Module Interrogation	22
8	Preferences menus and menu groups	23
8.1	Ref Sync I/O menu group	23
8.1.1	AES Sync Output	23
8.1.2	Wordclock Sync Output	23
8.1.3	AES Sync Input	24
8.2	Input Selection Mode menu	24
8.2.1	Input Selection Mode	24
8.3	Module Dependent Preferences menus	24
8.3.1	Module Dependent Preferences	24
8.4	Display Options menu group	25

8.4.1	Menu Timeout.....	25
8.4.2	LED Brightness, LCD Brightness, LCD Contrast.....	25
8.5	Store Options menu group.....	25
8.5.1	Load Analogue I/O Gains	25
8.5.2	Load Monitor Setup.....	26
8.5.3	Unlock Stores.....	26
8.5.4	Reload Factory Stores	26
9	Store System	27
9.1	Using the Store System	27
9.1.1	Previewing Stores	28
9.1.2	Accessing Stores	28
9.2	Which parameters are saved with a Store?	29
9.3	Module fitment and Stores	29
9.4	Factory Default Stores	30
9.4.1	'AD/DA 24b 44k1'	30
9.4.2	'AD/DA 24b 48k'	30
9.4.3	'AD/DA 24b 88k2'	31
9.4.4	'AD/DA 24b 96k'	31
9.4.5	'AD/DA 24b 176k4'	31
9.4.6	'AD/DA 24b 192k'	31
9.4.7	'AD/DA 24b 96k 2w'	31
9.4.8	'AD/DA 24b 192k 2w'	32
9.4.9	'AD/DA 16b 44k1'	32
9.4.10	'AD/DA 16b 48k'	32
9.4.11	'D-D dithr 16flat'	32
9.4.12	'D-D dithr 16SNS2'	32

1 Introduction

The Firmware Reference describes the operation of the ADA-8XR's Menu and Store systems. It is specific to a particular version of the ADA-8XR firmware (as detailed on the first page) and should therefore be updated at the same time as any major firmware upgrade.

If a major firmware upgrade is performed by a Prism Sound representative, a revised Firmware Reference will be delivered at the same time. If you have downloaded a firmware upgrade from the website, you can also download the updated Firmware Reference document from there (<http://www.prismsound.com>).

General operation is covered in the Operation Manual, with details and specifications of I/O Modules being provided in the Module Reference.

2 Menu System Overview

This section describes how to navigate the ADA-8XR's Menu System. Many of the ADA-8XR's menus behave in similar ways, and these are said to conform to a common menu 'type'. The subsections below show operation examples of the various menu types.

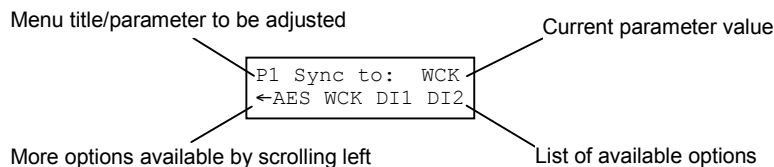
Detailed descriptions of the individual menus are contained in the following sections.

A navigation chart of the entire Menu System is at the end of this section, on page 2.7.

2.1 Menu Types

Most of the ADA-8XR's menus fall into one of the standard menu 'types', whose operation is described below.

2.1.1 Single Selection

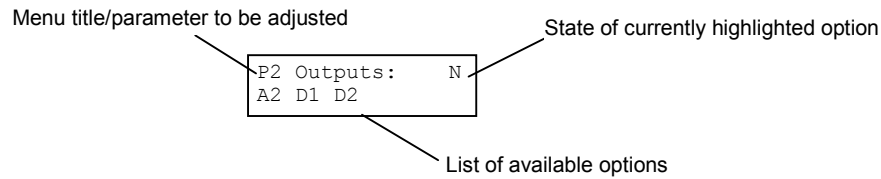


Single Selection menus allow the user to select one value from a list of options. New selections replace old selections. The Path 1 Sync Source menu is shown above as an example.

The menu title (often in some abbreviated form) is shown on the left-hand side of the top line. The current value of the parameter in question (in this case, the sample rate) is shown on the right-hand side of the top line. The bottom line shows the list of options for the relevant parameter (in this case, they are the various sample rates available). If the list of options will not fit on the bottom line, a portion of the list is shown, terminated with an arrow pointing off-screen to indicate the availability of more options.

The user may scroll through the list of options with the 'Select/Change' keys. The currently highlighted option flashes and is accepted as the new parameter value when the 'Enter/Accept' key is pressed. Just scrolling through the available options does not affect the current parameter value, which is shown on the top line.

2.1.2 Multiple Selection

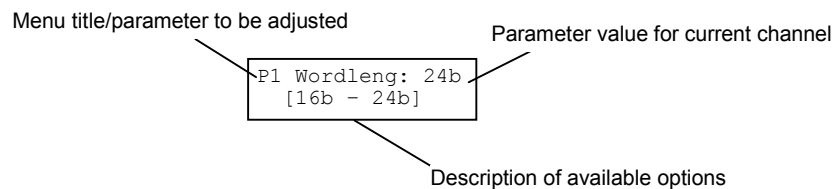


A Multiple Selection menu allows the user to select several options from a list. Normally, any combination of the available options may be chosen—each option may be selected as Yes or No. The Path 2 Destination Port menu is shown above as an example.

The menu title (often in some abbreviated form) is shown on the left-hand side of the top line. The state of the currently highlighted option is shown in the top right-hand corner as 'Y' or 'N'. The bottom line shows a list of options for the relevant parameter (in this case, a list of I/O slots that are fitted with Output Modules). If the list of options will not fit on the bottom line, a portion of the list is shown, terminated with an arrow pointing off-screen to indicate the availability of more options.

The user may scroll through the list of options with the 'Select/Change' keys. The currently highlighted option flashes. Pressing 'Enter/Accept' toggles the state of the highlighted option between Yes and No ('Y'/'N'). Just scrolling through the available options does not affect the current parameter value.

2.1.3 Per-Channel Selection



Per-Channel Selection menus allow the user to independently select an option for each channel in a Path or Port from the same list. As the name suggests, the options are chosen on a 'per-channel' basis rather than for the whole Path or Port. The Path 2 Output Wordlength menu is shown above as an example.

The menu title (often in some abbreviated form) is shown on the left-hand side of the top line. The value for the parameter in question for the currently selected channel (in this case, the wordlength) is shown on the right-hand side of the top line. Some description of the options available is shown on the bottom line (in this case, a legend indicating the wordlength options).

Per-Channel Selection menus use the Channel Select keys and LEDs (on the Meter Panel) to select and indicate the channel for which the parameter is being adjusted. The LED for the selected channel flashes. Pressing one of the other Channel Select keys deselects the old channel and selects the new one.

The user may adjust the parameter value for the selected channel with the 'Select/Change' keys. Any alterations have immediate effect - it is not necessary to press the 'Enter/Accept' key to invoke the change.

The 'All' button can be used to group all eight channels together so they can be adjusted as if they were one. When All is selected, all eight Channel Select LEDs flash and the individual Channel Select buttons are ignored. It is important to remember that if each of the eight channels does not have the same value assigned to it; pressing the 'All' button immediately returns all those values to a default which is specific to that menu. Pressing the 'All' button while All is already selected returns the channel selection to what it was before All was chosen.

2.1.4 Branch

Branch menus serve only as gateways to other sections of the menu system - they control no operating parameters. A short description of the menu section to which the Branch menu grants access is displayed on the top line of the screen. The user may either skip over the Branch menu with the 'Menu' Up/Down keys or enter the relevant menu section by pressing 'Enter/Accept'.

Once inside the section accessed by a Branch menu, the user may navigate normally using the 'Menu' Up/Down keys. Pressing the 'Menu' Up key from the first menu within the section causes a return to the Branch menu.

2.1.5 Special

Some menus do not fit into the four types described above. Operation of Special menus is described in the individual menu sections.

2.2 *Menu Navigation*

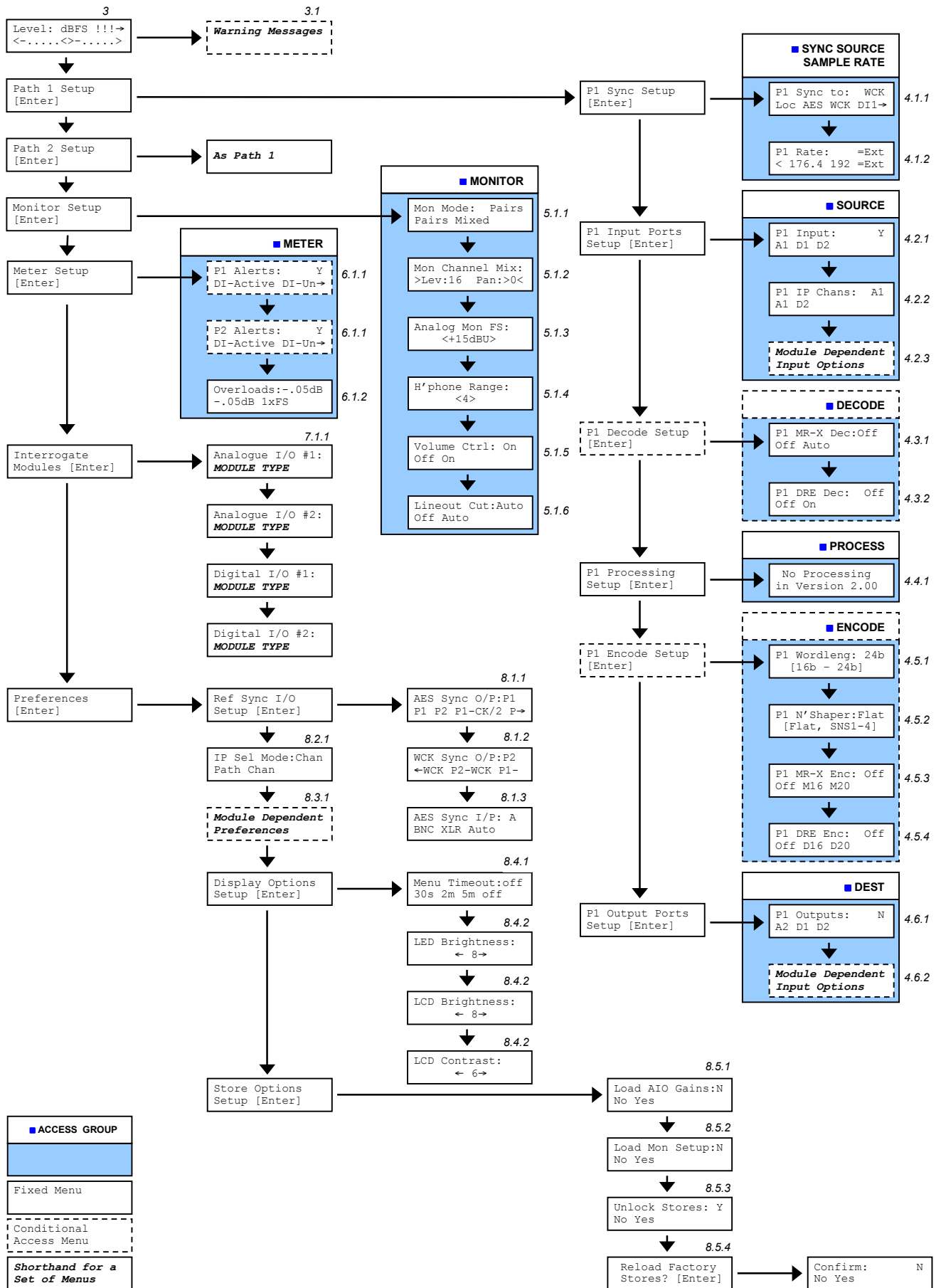
The menu system may be navigated in two ways: the user can either traverse the structure in the figure using the 'Menu' Up/Down keys or the blue Access buttons distributed around the front Panel can be used to allow fast access to the most commonly used menus.

Every menu can be accessed using the 'Up/Down' keys and 'Enter/Accept' in Branch menus, however, owing to the large size of the menu structure, this would be a tedious process if it were the only way of reaching commonly used menus.

The navigation chart on the following page shows the set of menus associated with each blue Access button. Pressing an Access button immediately calls up the last menu accessed with that button. Further presses of the same button display successive menus in that Access Group, returning to the first menu in the group when the end is reached. This method allows the most frequently used menus to be accessed with a single button press.

All the Access Groups are dependent on the Path to which each panel is set (as shown by the two 'Path' LEDs on the Monitor, Mimic and Meter Panels). For example, if the Mimic Panel is showing Path 1, the Source Access Button only reveals the Source menus for Path 1. If the Mimic Panel were switched to display Path 2 with the 'Path' button for that Panel, further presses of the Source Access button would reveal the Source menus for Path 2.

Some menus are conditionally available, that is, they can only be reached if certain criteria are met. For example, the Decode Access Group for each Path is only accessible (using the navigation keys OR the Access button) if at least one Digital I/O Module is selected as an input to that Path. While such menus are unavailable, the Up/Down keys and the Access buttons simply skip over them.



3 Level Screen

```
Level:*dBFS !!!->  
<-30.02<>-29.97>
```

The Level Screen is a Special menu. No operating parameters are set using the Level Screen, though it displays status information and links to any warning messages that may be currently asserted.

The Level Screen is the default screen display - when the ADA-8XR is powered-up or brought out of Standby, the Level Screen is displayed. After loading a Store, or when the menu timer expires (the timeout period is set with the Menu Timeout menu in Preferences), the display returns to the Level Screen.

The top line of the Level Screen normally reads: 'Level: dBFS'. If the currently metered Path (as indicated by the two 'Path' LEDs in the Meter Panel) is in Peak-Hold mode (set with the 'Hold' button in the Meter Panel), 'HOLD' is shown in place of 'dBFS'.

If either Path's PLL is not in ultra-high precision mode (i.e. its sync-source is not within 0.15% of one of the standard sample rates) an asterisk (*) is shown between 'Level:' and 'dBFS'. The ADA-8XR's ability to reject jitter from its sync source is reduced when not in ultra-high precision mode, so it is recommended that all sync sources be within 0.15% of a standard rate unless absolutely necessary. Note that the ADA-8XR waits 10s after any new lock before entering ultra-high precision mode. This speeds up the acquisition of lock.

If there are any current warning messages, three scrolling exclamation marks ('!!!->') are shown in the top right-hand corner of the display. Pressing the right-hand 'Select/Change' key accesses the Warning Screen where each current warning message is flashed in turn on the bottom line of the display.

The bottom line of the Level Screen shows the level of the two-channel Monitor mix for the metered Path in dBFS (Note: this is not necessarily the same Path as that actually feeding the two-channel Monitor). If the two-channel Monitor is in Mix mode (set by the Monitor Mode menu), the levels displayed are the actual left and right channel Monitor output levels and are affected by the 'Mono' and 'Swap' buttons in the Monitor Panel. When the two-channel Monitor is in Pairs mode, the levels displayed are the levels of the pair of channels selected from the metered Path and are not affected by the 'Mono' and 'Swap' buttons in the Monitor Panel.

Levels below -80dBFS are not shown on the Level Screen; in this case the numerical readout is replaced by '.....'.

3.1 Warning Screen

```
Warnings:←[back]
*P1 BAD SYNC
```

The Warning Screen shows a list of all current warning conditions, which can be scrolled through using the 'Up/Down' keys. Pressing the left-hand 'Select/Change' key returns to the Level Screen.

The following messages can be displayed on the Warning Screen:

- 'P1 BAD SYNC' - Path 1 cannot lock to its selected sync-source,
- 'P2 BAD SYNC',
- 'IP CONFLICT' - the same Input Module has been selected on both Paths,
- 'OP CONFLICT' - the same Output Module has been selected on both Paths,
- 'UNCALIBRATED' - the unit has become uncalibrated,
- 'P1 SNS UNAVAIL' - noise shaping is not available on Path 1,
- 'P2 SNS UNAVAIL',
- 'P1 DI FS ERROR' - Path 1 is running at a different sample rate to its digital inputs,
- 'P2 DI FS ERROR',
- 'FS UNAVILABLE' – An extended (4x) sample rate has been selected but is not available.

4 Path Setup menu groups

Two Path Setup menus are available from the top level of the Menu System, one for Path 1 and one for Path 2. Within each, a number of menu groups are available as described below.

4.1 Sync menu group

The Sync group menus are detailed below. These can be reached using the blue Access button in the 'Sync Source / Sample Rate' box of the Mimic Panel, as well as by normal navigation.

4.1.1 Sync Source

```
P1 Sync to: WCK
Loc AES WCK DI1→
```

The Sync Source menu is a Single-Selection menu. The user may choose from the following synchronization sources for each Path:

- Local crystal oscillator ('Loc'),
- AES11 input from either XLR or BNC ('AES'),
- Wordclock input from BNC ('WCK'),
- Digital input slot 1 ('DI1'),
- Digital input slot 2 ('DI2'),

The above options are always available for selection regardless of whether the relevant inputs are actually connected. If no valid sync-source is connected to the selected input, the local crystal is automatically substituted until a valid sync is detected.

A solidly lit LED in the Sync Source box of the Mimic Panel shows the sync source currently in use. The selected sync-source, if different from the one in current use (e.g. if the local crystal is being used by default) is shown by a flashing LED in the Sync Source box. A warning is asserted in this condition.

4.1.2 Sample Rate

```
P1 Rate:      =Ext
← 176.4 192 =Ext
```

The Sample Rate menu is a Single-Selection menu. The user may choose from the following sample-rate options for each Path:

- 32kHz ('32'),
- 44.1kHz ('44.1'),
- 48kHz ('48'),
- 88.2kHz ('88.2'),
- 96kHz ('96'),
- 176.4kHz ('176.4'),
- 192kHz ('192'),
- same as external reference ('=Ext').

Choice of sample rate for a Path is independent of the frame rate of the sync source - the ADA-8XR can generate any of the standard rates from the sync source, provided that the frame rate of the sync source is any one of the standard rates. For example, an ADA-8XR Path might be synchronized to a 48kHz Wordclock or AES11 signal but have its sample rate set to 96kHz; in this case the Path runs at exactly twice the frame rate of the sync source. It is also possible to run a Path at 44.1kHz from a 48kHz sync (or vice-versa); in this case the Path would run at exactly 44100/48000 of the sync frame rate.

In most situations, the user will want the Path(s) to run at the same rate as the sync source, whatever rate that may be. In such cases, '=Ext' should be selected. When a Path sample rate is set to '=Ext', changes in the frame rate of the sync source are automatically reflected in the Path sample rate. For example, a rack of ADA-8XRs synchronized to a house Wordclock at 44.1kHz may all be automatically switched to run at 48kHz simply by changing the rate of the house Wordclock, provided that the Path sample rates are set to '=Ext'.

An anomaly could exist if the sync source is the local crystal and the sample rate is set to '=Ext'; in this case the Path runs at 48kHz.

The ADA-8XR has two synchronization modes of differing jitter-rejection capability and sample rate lock range. Whenever the sync source has a frame rate within 0.15% of one of the standard rates listed above, the Path operates in ultra-high precision mode where the best conversion quality can be provided owing to superior jitter rejection. Each ADA-8XR Path is capable of operating outside ultra-high precision mode when the sample rate is set to '=Ext'. In this setting, a Path can lock to a source with a frame rate up to 6.0% away from one of the standard rates. The wider lock range comes at the expense of the extreme jitter rejection of ultra-high precision mode. Ultra-high precision mode is still available when the sample rate is set to '=Ext' - the ADA-8XR automatically uses it if the sync frame rate is within 0.15% of a standard. The ADA-8XR can seamlessly switch in and out of ultra-high precision mode while the Path is in use without disrupting the audio integrity. It is strongly recommended that ultra-high precision mode be used whenever possible to take advantage of the high quality of conversion it affords i.e. synchronize to within 0.15% of a standard rate whenever possible. A Path always operates in ultra-high precision mode when the sample rate is explicitly set, i.e. it is not set to '=Ext'. Note that the ADA-8XR waits 10s after any new lock before entering ultra-high precision mode. This speeds up the acquisition of lock.

A solidly lit LED on the Sample Rate box of the Mimic Panel indicates the chosen sample rate. If '=Ext' is chosen the LED indicating the actual rate of the external sync source is also lit.

4.2 Source menu group

The Source group menus are detailed below. These can be reached using the blue Access button in the 'Source' box of the Mimic Panel, as well as by normal navigation.

4.2.1 Source Port

P1 Input:	Y
A1 D1 D2	

The Source Port menu is a Multiple Selection menu, although its selection rules depend on the Input Selection Mode menu in Preferences (see section 8.2.1). This menu selects which Input Module(s) the relevant Path will use.

If Input Selection Mode is 'Path', only one Input Module may be selected at a time (the last selected Module replaces any previously selected) and all the input channels from the selected Module form the inputs for the Path.

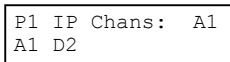
If Input Selection Mode is 'Channel', the user may select more than one Input Module from the Source Port menu. In this mode, all the selected Input Modules are reserved for use by the Path. Each of the Path's eight input channels may be selected from the corresponding inputs of all the chosen Input Modules. The Input Module used to provide each channel is chosen in the Input Channels menu, described below.

For example, if the user wishes the inputs to Path one to be a mixture of analogue channels from slot A1 and digital channels from D2, 'A1' and 'D2' should be selected in the Source Port menu. Each channel can then be assigned to either 'A1' or 'D2' in the Input Channels menu. The displayed options are a list of Module slots that are fitted with boards capable of providing an input, so the selection list is always a subset of: 'A1', 'A2', 'D1', 'D2'.

If no Input Module is selected, the Path is deactivated and the various parameters indicated on the front panel for that Path are invalid (e.g. sample rate, input wordlength).

Solidly lit LEDs in the Source box of the Mimic Panel indicate the chosen Input Modules. If the selected Module is unavailable because it is already in use by the other Path, the relevant LED flashes, a warning is asserted and both Paths are muted.

4.2.2 Input Channels



The Input Channels menu is only available if the ADA-8XR has its Input Select Mode set to 'Channel' in the Input Select Mode menu in Preferences (see section 8.2.1).

The Input Channels menu is a Per-Channel Selection menu. The user may choose which of the Input Modules reserved for that Path provide the input for each of the Path's eight channels. The options available for all channels are the Modules chosen in the Source Port menu (see above) for the same Path. For example, if the user reserved the Modules in analogue slot one and digital slot two for use by a Path, the options 'A1', 'D2' appear in the Input Channels menu. Each channel may be selected as input from either analogue slot one or digital slot two.

4.2.3 Module Dependent Input Option menus

Most types of I/O Module have certain parameters that are specific to that Module type, for example, line-up level for an Analogue Input Module or one-wire/two-wire operation (Split96) on some Digital Input Modules.

Menus for setting these parameters for a Path's selected Input Module(s) are made available in the Path's Source menu group. Only those menus appropriate to the Modules selected in the Source Port menu for that Path are accessible. For example, if the only input port selected is the A/D Module in analogue slot one, only the A/D-Module-related menus are available.

Details of the menus for each Module type are to be found in the I/O Module Reference.

4.3 Decode menu group

The Decode group menus are detailed below. These can be reached using the blue Access button in the 'Decode' box of the Mimic Panel, as well as by normal navigation.

4.3.1 MR-X Decode

P1 MR-X Dec:Off Off Auto

The MR-X Decode menu is a Single Selection menu. The user may choose whether or not to attempt to decode a MR-X encoded signal at the Path's digital input port. For details of Prism Sound's MR-X word-mapping system for recording extended-wordlength and/or high-sampling-rate audio onto short-wordlength media, see the Technical Background section of the Operation Manual.

The decoder may be set 'Off' or 'Auto'. In Auto mode the ADA-8XR will detect when the incoming audio data is MR-X encoded and apply the decoding algorithm. When MR-X encoded data is successfully being decoded, the MR-X LED in the Decode box of the Mimic Panel for that Path is solidly lit. If MR-X decode is set to 'Auto' and the incoming audio data is not MR-X encoded, the MR-X LED for that Path flashes and the audio data is passed unchanged.

Selection of MR-X decoding overrides DRE decoding (see below), i.e. DRE decoding will not take place on a Path that has MR-X Decode set to 'Auto'.

The MR-X Decode menu, like the rest of the Decode Access group, is only accessible when at least one digital board is selected as an input to the Path.

4.3.2 DRE Decode

P1 DRE Dec: Off Off On

The DRE Decode menu is a Single Selection menu. The user may choose whether or not to apply the DRE decoding algorithm to the incoming audio data. For details of Prism Sound's Dynamic Range Enhancement system, see the Technical Background section of the Operation Manual.

The decoder may be set 'Off' or 'On'. There is no way for the ADA-8XR to determine whether the incoming audio data is DRE encoded or not, so DRE decoding takes place whenever DRE Decode for that Path is set to 'On'. **For this reason, it is important that DRE decoding is not accidentally selected when the source data is not DRE-encoded, otherwise serious distortion will occur.**

The DRE LED in the Decode box of the Mimic Panel for that Path reflects the state of the menu option. DRE decoding operates on all eight channels simultaneously.

DRE decoding is overridden by MR-X decoding (see above), i.e. DRE decoding will not take place when MR-X Decode is set to 'Auto'.

The DRE Decode menu, like the rest of the Decode Access group, is only accessible when at least one digital board is selected as an input to that Path.

Note that the DRE Decode menu setting is disregarded in '4x' sample rate modes (176.4kHz and 192kHz) wherein DRE decoding is always disabled.

4.4 Process menu group

This menu group is reserved for the Processing Suite, a range of additional signal processing and mixing functions which will be available in the future, and will require an additional DSP Module to be fitted in the ADA-8XR. No 'processing' facilities are available in firmware version 1.22.

Entering the Process group either by normal navigation or from the blue Access button in the 'Process' box of the Mimic Panel causes the following message to be displayed:

4.4.1 Process

No Processing
In Version 1.22

4.5 Encode menu group

The Encode group menus are detailed below. These can be reached using the blue Access button in the 'Encode' box of the Mimic Panel, as well as by normal navigation.

4.5.1 Output Wordlength

P1 Wordleng: 24b
[16b - 24b]

The Output Wordlength menu is a Per-Channel Selection menu. The user may choose the wordlength for each of a Path's eight output channels. The chosen wordlengths only affect digital outputs—analogue outputs always use all the available bits. Each channel may be independently set to 16-bit, 20-bit or 24-bit digital output. The audio data is dithered or noise-shaped appropriately for each channel.

If the input of any individual channel is digital and the input wordlength is less than or equal to the chosen output wordlength, an 'auto-dither-defeat' algorithm causes the audio data to be passed unmodified. This also applies during prolonged periods of zero-data input.

The wordlength LEDs ('16b', '20b', '24b') on the Encode Panel provide some indication of the output wordlength settings. Each of the three LEDs illuminate if any of that Path's eight channels is set to that wordlength. For example, if any of the output channels are set to 16-bits, the '16b' LED will be lit. Since each channel can be assigned a different wordlength, more than one of these LEDs may be lit simultaneously.

The selected output wordlength is overridden by DRE encoding. That is, if DRE encoding is selected, the per-channel wordlength setting is ignored and all eight outputs will have their wordlength set by the DRE encoder.

The Output Wordlength menu, like the rest of the ENCODE access group, is only accessible when at least one digital board is selected as an output to that Path.

Note that the Output Wordlength menu setting is disregarded in '4x' sample rate modes (176.4kHz and 192kHz) wherein the output wordlength is fixed at 24 bits.

4.5.2 Output Noise-Shaper

```
P1 N' Shaper: Flat
[Flat, SNS1-4]
```

The Output Noise-Shaper menu is a Per-Channel Selection menu. The user may choose which dither or noise-shaping scheme is used on each of the Path's eight output channels. The chosen noise-shaper curves only affect digital outputs - analogue outputs always use all the available bits. For details of Prism Sound's SNS noise-shaping system for wordlength reduction, see the Technical Background section of the Operation Manual.

Each output may be independently set to 'Flat' (unshaped noise floor) or one of the four SNS noise-shaper curves (SNS1-4). Noise shaping only occurs when a reduction in wordlength is being performed. If the input of any individual channel is digital and the input wordlength is less than or equal to the chosen output wordlength (selected for each channel in the Output Wordlength menu), an 'auto-dither-defeat' algorithm causes the audio data to be passed unmodified. This also applies during prolonged periods of zero-data input.

Output noise shaping is overridden by DRE encoding. That is, if DRE encoding is selected, the per-channel noise shaper setting is ignored and the DRE encoder sets the output wordlength.

The 'Flat' and 'SNS' LEDs in the Encode box of the Mimic Panel provide some indication of the noise-shaper settings. The 'Flat' LED illuminates if one or more channels has flat dither selected. The 'SNS' LED illuminates if one or more channels have one of the four SNS curves selected. Since some channels can have flat dither selected whilst others have an SNS curve selected, both LEDs may be lit simultaneously.

If the DRE encoder is overriding SNS noise shaping, the SNS LED flashes and a warning is generated.

The Output Noise-Shaper menu, like the rest of the Encode Access group, is only accessible when at least one digital board is selected as an output to that Path.

Note that the Output Noise-Shaper menu setting is disregarded in '4x' sample rate modes (176.4kHz and 192kHz) wherein the output wordlength is fixed at 24 bits.

4.5.3 MR-X Encode

```
P1 MR-X Enc: Off
Off M16 M20
```

The MR-X Encode menu is a Single Selection menu. The user may choose whether Prism Sound MR-X word-mapping is applied to the Path's digital outputs (MR-X encoding does not affect any analogue outputs). For details of Prism Sound's MR-X word-mapping system for recording extended-wordlength and/or high-sampling-rate audio onto short-wordlength media, see the Technical Background section of the Operation Manual.

Three options are available: 'Off', 'M16' and 'M20'.

When 'Off' is selected, no MR-X encoding is performed on any of that Path's outputs.

'M16' selects MR-X encoding for 16-bit media. The encoding algorithm takes note of the output wordlength settings for the Path. For correct operation of the MR-X encoder, the output wordlength must be the same for all channels on that Path. If the output wordlength is set to 16-bit, no MR-X encoding is performed. When output wordlength is 20-bit, the MR-X encoder performs 20-16-bit mapping, whereby the first six channels of that Path are mapped across eight, 16-bit digital outputs. If the output wordlength is set to 24-bit, the MR-X encoder performs 24-16-bit mapping, whereby the first four channels of that Path are mapped across eight, 16-bit digital outputs. When 'M16' is selected, the 'MR-X' LED in the Encode box on the Mimic Panel is lit.

'M20' only operates when output wordlength is 24-bit. 24-20-bit mapping is performed - the first six channels for that Path are mapped across eight, 20-bit digital outputs. When 'M20' is selected, both the 'MR-X' and the '[20b]' LEDs in the Encode box are lit.

The MR-X Encode menu, like the rest of the Encode Access group, is only accessible when at least one digital board is selected as an output to that Path.

4.5.4 DRE Encode

P1 DRE Enc: Off
Off D16 D20

The DRE Encode menu is a Single Selection menu. The user may chose whether Prism Sound DRE encoding is to be applied to the Path's digital outputs (DRE encoding does not affect any analogue outputs). For details of Prism Sound's DRE (Dynamic Range Enhancement) process for recording high dynamic range audio onto short-wordlength media, see the Technical Background section of the Operation Manual.

DRE encoding always operates on all eight channels of a Path and overrides the selection of output wordlength or noise shaping. If any of the channels has one of the SNS noise shaper curves selected, the 'SNS' LED in the Encode box on the Mimic Panel flashes and a warning is generated.

Three options are available: 'Off', 'D16' and 'D20'.

When 'Off' is selected, no DRE encoding is performed on any of that Path's outputs.

'D16' selects DRE encoding for 16-bit media. The encoder processes the eight channels to form 16-bit digital outputs. The 'DRE' LED in the Encode box for that Path illuminates to indicate this mode.

'D20' selects DRE encoding for 20-bit media. The encoder processes the eight channels to form 20-bit digital outputs. Both the 'DRE' and the '[20b]' LEDs in the Encode box on the Mimic Panel for that Path are lit in this mode.

The DRE Encode menu, like the rest of the Encode Access group, is only accessible when at least one digital board is selected as an output to that Path.

Note that the DRE Encode menu setting is disregarded in '4x' sample rate modes (176.4kHz and 192kHz) wherein DRE encoding is always disabled.

4.6 Destination menu group

The Destination group menus are detailed below. These can be reached using the blue Access button in the 'Dest' box of the Mimic Panel, as well as by normal navigation.

4.6.1 Destination Port

P1 Outputs:	N
A2 D1 D2	

The Destination Port menu is a Multiple Selection Menu. This menu selects which Modules carry the output of the relevant Path.

Every slot fitted with an I/O Module capable of output is presented as an option, so the displayed options are always a subset of: 'A1', 'A2', 'D1', 'D2'. Any or all (or even none) of the available slots may be selected, with the restriction that there may only be one Analogue Output Module in use per Path. For example, a Path may have its eight output channels available on two different Digital Output Modules (which may generate different digital formats e.g. AES3, T-DIF, Workstation) AND an Analogue Output Module at the same time.

If no Output Module is selected, the Path is still active in every other sense - the eight channels can still be viewed on the meters or output through the two-channel Monitor. The selected Output Module slots are shown as solidly lit LEDs in the Dest box of the Mimic Panel for that Path. If a Module is unavailable because it is in use by the other Path, the relevant LED flashes, a warning is generated and both Paths are muted.

4.6.2 Module Dependent Output Option menus

Most types of I/O Module have certain parameters that are specific to that Module type, for example, line-up level for an analogue output board or channel status for some digital output boards.

Menus for setting these parameters for the chosen Output Modules are made available in the Destination group. Only those menus appropriate to the Modules selected in the Destination Port menu for that Path are accessible. For example, if the only output port selected is the D/A Module in analogue slot two, only the D/A Module menus will be available.

Details of the menus for each Module type are to be found in the I/O Module Reference.

5 Monitor Setup menu group

The Monitor Setup group menus are detailed below. These can be reached using the blue Access button in the Monitor Panel, as well as by normal navigation.

The two-channel Monitor output is available in both analogue and digital formats on the ADA-8XR's Utility Panel (note that the digital monitor output channel status is always set to Professional format in firmware revision 1.22).

The structure of the two-channel Monitor is shown in the diagram in the following section. For more information, refer to the Operation Manual.

5.1.1 Monitor Mode

```

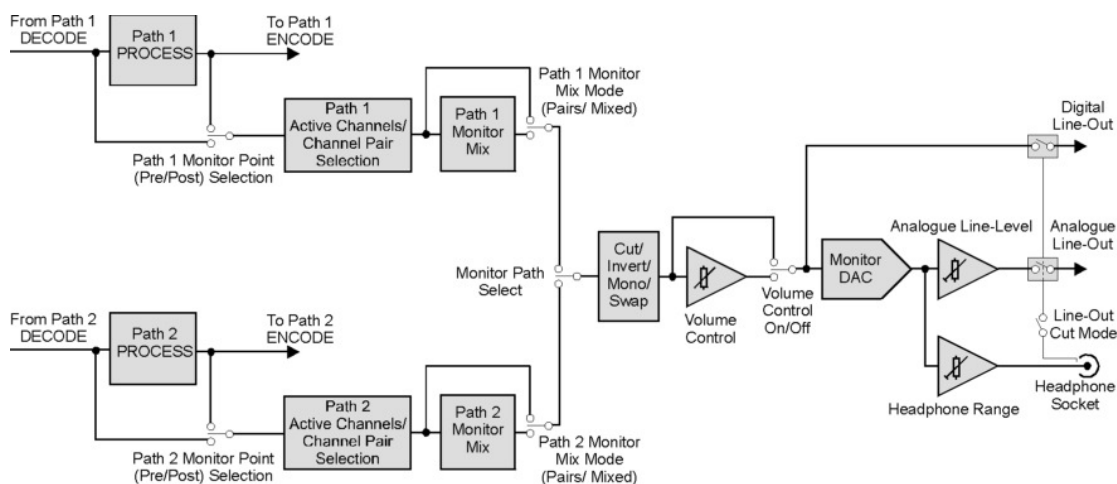
Mon Mode: Pairs
          Pairs Mixed
    
```

The Monitor Mode menu is a Single Selection menu. The user may choose how the Monitor's two output channels are derived from the eight channels of the monitored Path (the monitored Path is indicated by the two 'Path' LEDs on the Monitor Panel).

Two options are available: 'Pairs' and 'Mixed'.

In 'Pairs' mode, one pair of adjacent channels on the monitored Path is fed directly to the Monitor, where it is available at the headphone socket, the analogue monitor output and the digital monitor output. The first channel of the pair (the odd-numbered channel) forms the left monitor output while the second channel forms the right output. The Channel Select buttons are used to select the pair of channels to be monitored while the Channel Select LEDs in the Meter Panel indicate the selection.

In 'Mixed' mode, the user can build a mix of any or all of the eight channels on a Path. By using the Monitor Channel Mix menu, each channel of a Path can be assigned a level and a pan setting. The Channel Select buttons can be used to activate/deactivate the individual channels in-place in the mix. The Channel Select LEDs reflect the selected channels.



There are two important points to make about the use of the Channel Select buttons/LEDs for Monitor channel selection.

First, various menus (e.g. all Per-Channel Select menus and some Special menus, including the Monitor Channel Mix menu) make special use on these buttons and LEDs. When one of these menus is displayed, the Channel Select buttons cannot be used to select the Monitor channels and the selected channels are not displayed. In all other menus, including the Level Screen, the Channel Select buttons/LEDs are used for Monitor channel selection.

Second, the Monitor Path operated on by the Channel Select buttons is the Path selected on the Meter Panel. This may not be the same Path that is currently being monitored. For example, if Path 1 is being monitored (as indicated by the two 'Path' LEDs in the Monitor Panel) and the Meter Panel displays Path 2, the Channel Select buttons adjust the selected channels for Path 2 and so do not cause any changes to the Path being monitored. If the Monitor were then switched over to Path 2 with the 'Path' button in the Monitor Panel, the new settings for Path 2 would be evident on the Monitor output.

5.1.2 Monitor Channel Mix

```
Mon Channel Mix:
>Lev:16 Pan:>0<
```

The Monitor Channel Mix menu is a Special menu, though its selection rules are very similar to Per-Channel Selection menus. The user may set up a simple stereo mix of the eight channels of a Path that can be output through the two-channel Monitor system. For more information on the Monitor system, see the previous section and the Operation Manual.

Each channel has a level and pan setting that takes effect when the Monitor is in 'Mixed' mode. The 'Enter/Accept' key switches between Level and Pan adjustment, as indicated by the flashing arrow next to 'Lev:' or 'Pan:'. Otherwise, the Monitor Channel Mix menu behaves as if it were a Per-Channel Select menu. The channel to be adjusted is chosen with the Channel Select buttons and indicated by a flashing Channel Select LED and the parameter (level or pan) is adjusted with the left and right 'Select/Change' keys.

The 'All' button allows the level or pan of all eight channels to be adjusted together. When 'All' is selected, all eight Channel Select LEDs flash. The menu can be returned to single channel adjustment by pressing 'All' once again. If the relevant parameter (level OR pan) has the same setting for all eight channels, setting 'All' makes no changes, it simply allows all channels to be adjusted together. If however, the relevant parameter has different settings across the eight channels, setting 'All' returns that parameter value for all the channels to its default ('16' for level, '>0<' - centre for pan).

There are thirty-two level settings: zero corresponds to complete cut and thirty-one corresponds to unity gain, the default is sixteen. The control follows an approximate fader law. The ratio between adjacent level settings increases steadily from -1.0dB between settings 30 and 31, to ~-2.4dB between settings 2 and 3, before tailing off more steeply towards total attenuation at setting zero.

There are thirty-three pan settings: 1-16-left, 1-16-right and zero, where 16 is fully panned and zero is centred (default). All settings have a constant angular separation and deliver constant power distributed across the two output channels.

The mix settings for each Path are independent, so switching the Monitor Path (with the 'Path' button in the Monitor Panel) also switches the mix settings to those of the new Path. The Meter Path (set with the 'Path' button in the Meter Panel) determines which Path mix is adjusted by the Monitor Channel Mix menu. Since the currently monitored Path need not be the same as the metered Path, the mix of one Path can be adjusted while monitoring the other.

5.1.3 Analogue Monitor Line-up Level

```
Analog Mon FS:  
<+15dBu>
```

The Analogue Monitor Line-up Level menu is a Special menu. The user may adjust the full-scale range of the analogue monitor outputs with the 'Select/Change' keys. There are four settings: '+15dBu', '+18dBu', '+21dBu' and '+24dBu'. The new setting takes effect as soon as a 'Select/Change' key is pressed. This control is supplementary to the Monitor volume control, if enabled.

5.1.4 Headphone Range

```
H'phone Range:  
<4>
```

The Headphone Range menu is a Special menu. The user may select one of four gain settings (1-4, 4 being the loudest) for the headphone output using the 'Select/Change' keys. The new setting takes effect as soon as a 'Select/Change' key is pressed. This control is supplementary to the Monitor volume control, if enabled.

5.1.5 Monitor Volume Control Enable

```
Volume Ctrl: On  
Off On
```

The Monitor Volume Control Enable menu is a Single Selection menu. The Two-Channel Monitor volume control is switched 'Off' or 'On'. When 'On' is selected, the volume control (the two 'Volume' keys in the Monitor Panel) affects the headphone output and both the analogue and digital monitor outputs. When 'Off' is selected, the volume control operates on just the headphone output and only when Lineout Cut is set to 'Auto' in the Lineout Cut menu.

5.1.6 Monitor Line Output Cut

```
Lineout Cut:Auto  
Off Auto
```

The Monitor Lineout Cut menu is a Single Selection menu. The user chooses whether the Monitor line outputs (analogue and digital) mute when a jack is inserted into the headphone socket. When 'Off' is selected, the line outputs are active regardless of the presence of headphones. When 'Auto' is selected, the line outputs are muted whenever a jack is present in the headphone socket.

6 Meter Setup menu group

The Meter Setup group menus are detailed below. These can be reached using the blue Access button in the Meter Panel, as well as by normal navigation.

6.1.1 Meter Alerts

Pl Alerts:	Y
DI-Active	DI-Un→

There are two Meter Alerts menus, one for each Path. They are Multiple Selection menus, which allow the user to select various conditions under which the 'Alert' LEDs below the bargraphs on the Meter Panel will light. There are three 'assertion criteria' of which any, all or none may be selected:

- 'DI-Active',
- 'DI-Unlock',
- 'AI-Overkill'.

When more than one criterion is chosen, any true criterion forces the LED to light, untrue criteria have no effect. If all criteria are 'untrue', the LED is turned off.

'DI-Active' causes the 'Alert' LEDs for all locked digital input channels to illuminate. The 'Alert' LEDs for unlocked digital input channels flash while those for analogue input channels are unaffected.

'DI-Unlock' causes the 'Alert' LEDs for unlocked digital input channels to light solidly. Locked digital input channels and analogue input channels are unaffected. 'DI-Unlock' has no effect when 'DI-Active' is also selected.

'AI-Overkill' affects only those analogue input channels for which Prism Sound Overkillers (progressive limiters) have been enabled. When the Overkiller is actually limiting, the 'Alert' LED for that channel illuminates. For more information about Overkillers, see the Technical Background section of the Operation Manual.

Since there are two Meter Alert menus, one for each Path, the two Paths can have different Alert criteria. Both of these menus are always accessible with the 'Menu' navigation keys. When using the Meter Access button however, only the Meter Alert menu corresponding to the currently metered Path (as indicated by the two 'Path' LEDs in the Meter Panel) is available.

6.1.2 Meter Overloads

```
Overloads:-.05dB  
-.05dB 1xFS
```

The Meter Overloads menu is a Single Selection menu. The user selects the threshold for the meter Overload LEDs (marked 'OVL' on the ADA-8XR front panel). There are two choices: '-0.05dB' and '1xFS'.

Selection of '-0.05dB' causes the 'OVL' LEDs to illuminate for each channel whose level peaks within 0.05dB of full scale. When '1xFS' is selected, the 'OVL' LEDs only illuminate for channels whose level peaks at the full-scale value (0x7FFF).

The 'OVL' LEDs have a longer persistence than the other bargraph LEDs—an overload condition causes that channel's 'OVL' LED to illuminate for about two seconds after the last overload occurred.

7 Module Interrogation menu group

The Module Interrogation menus display information about the I/O Modules that have been detected by the firmware in the various I/O Module slots in the rear of the ADA-8XR.

7.1.1 Module Interrogation

```
Analogue I/O #1:  
400: DAC line
```

Each Module Interrogation menu is simply a status display – it does not allow any options or parameters to be set.

There are four Module Interrogation menus, one for each I/O Module slot; each shows the slot type (analogue or digital) and number (1 or 2) in the top line, and the code number and description of the detected I/O Module in the bottom line. If a particular slot is empty, the corresponding menu reads 'NO MODULE'.

These menus are the easiest way of determining which I/O Modules are fitted to the ADA-8XR without looking at the rear of the unit. They are also a useful diagnostic if problems are encountered after fitting a new I/O Module.

8 Preferences menus and menu groups

The Preferences area contains a variety of miscellaneous menus and menu groups.

8.1 Ref Sync I/O menu group

The Ref Sync I/O menu group controls the operating modes of the Ref Sync I/O connectors on the ADA-8XR Utility Module.

8.1.1 AES Sync Output

```
AES Sync O/P:P1
P1 P2 P1-CK/2 P→
```

The AES Sync Output menu is a Single Selection menu. The user may choose the source of the ADA-8XR's AES11 sync output. There are four options:

- 'P1' (Path 1),
- 'P2' (Path 2),
- 'P1-CK/2' (Path 1, half speed),
- 'P2-CK/2' (Path 2, half speed).

The AES11 sync output may be synchronous to either Path and it can also run at half the speed of either Path. The half-speed options are useful in systems that use two-wire (Split96) AES3 interfaces at high sample rates (e.g. 96kHz).

8.1.2 Wordclock Sync Output

```
WCK Sync O/P:P2
←WCK P2-WCK P→
```

The Wordclock Sync Output menu is a Single Selection menu. The user may choose the source of the ADA-8XR's Wordclock sync output. There are six options:

- 'P1-WCK' (Path 1),
- 'P2-WCK' (Path 2),
- 'P1-SCK' (Path 1, 256fs),
- 'P2-SCK' (Path 2, 256fs),
- 'P1-WCK/2' (Path 1, half speed),
- 'P2-WCK/2' (Path 2, half speed),
- 'P1-WCK/4' (Path 1, quarter speed),
- 'P2-WCK/4' (Path 2, quarter speed).

The Wordclock sync output may be synchronous to either Path. It can run at the rate of the Path (fs), 256 times the rate of the Path (256fs), half the rate of the Path (fs/2), or a quarter the rate of the Path (fs/4).

The 256fs options are 'Superclock' modes, which are required for synchronizing some types of workstation I/O interfaces (e.g. Pro Tools|24 MIX); the half-speed options are useful in systems that use two-wire (Split96) AES3 interfaces at high sample rates (88.2kHz, 96kHz, 176.4kHz or 192kHz); quarter speed Wordclock output is useful for use with systems which transact only a 'base rate' clock (e.g. Pro Tools|HD).

8.1.3 AES Sync Input

```
AES Sync I/P: A
BNC XLR Auto
```

The AES Sync Input menu is a Single Selection menu. The user may choose which Utility Module connector is used for the AES11 sync input. There are three options: 'BNC', 'XLR' and 'Auto'. If 'BNC' or 'XLR' is selected, the ADA-8XR uses that connector to receive an AES11 sync signal. If 'Auto' is selected, the ADA-8XR alternately tests both connectors until it finds a valid AES11 signal.

AES Sync Input should only be set to 'BNC' or 'XLR' if the user wishes to switch between two AES11 sync signals, one on each connector. 'Auto' should be used for all other situations.

8.2 Input Selection Mode menu

8.2.1 Input Selection Mode

```
IP Sel Mode:Chan
Path Chan
```

The Input Selection Mode menu is a Single Selection menu. The user may choose how the Input Ports to a Path are assigned. There are two options: 'Path' and 'Channel'.

When 'Path' is selected, only one Module may be selected (in the Source Port menu, see section 4.2.1) to provide the input to a Path - any previous selections are superseded by the latest. All the Path's channels are fed from a single Input Module.

When 'Channel' is selected, the user may choose more than one Input Module in the Source Port menu. The Input Channels menu (see section 4.2.2) can then be used to choose which of the selected Modules feeds each of the Path's eight channels.

Selecting 'Path' when multiple Input Modules are selected on either Path causes all but the first (out of A1, A2, D1, D2) to be removed from that Path.

8.3 Module Dependent Preferences menus

8.3.1 Module Dependent Preferences

Some types of I/O Module have certain parameters that are specific to that Module type, yet do not belong with the Input or Output Module dependent menus in the Path Setup menu groups (see sections 4.2.3 and 4.6.2). For example, 'Remote Control Enable' might be a user-settable option for a Workstation Interface Module.

Menus for setting these parameters for any such available Modules appear in the Preferences section. Details of the menus for each Module type are to be found in the I/O Module Reference.

8.4 Display Options menu group

This menu group controls various preference parameters of the ADA-8XR front panel.

8.4.1 Menu Timeout

```
Menu Timeout:Off
30s 2m 5m Off
```

The Menu Timeout menu is a Single Selection menu. The user may choose the time taken for the menu system to automatically return to the Level Screen after the last menu operation.

Options are '30s', '2m', '5m' and 'Off'.

If 'Off' is selected, the menu system stays on any selected menu until another is selected by normal navigation or the action of a blue Access button.

8.4.2 LED Brightness, LCD Brightness, LCD Contrast

```
LED Brightness:
← 8 →
```

These three special menus allow adjustment of a the named parameters with the 'Select/Change' keys. The parameters vary over the range 0 (minimum) to 15 (maximum) and are updated immediately as the 'Select/Change' key is pressed.

8.5 Store Options menu group

This menu group controls various preference parameters of the ADA-8XR Store System, including re-initialization of the Factory Stores.

8.5.1 Load Analogue I/O Gains

```
Load AIO Gains:N
No Yes
```

The Load Analogue I/O Gains menu is a Single Selection menu. The user may choose whether analogue line-up levels and trims are recalled when a Store is loaded.

When 'No' is selected, The ADA-8XR will keep it's current analogue I/O gains and ignore the gain settings that are saved with the Store. When 'Yes' is selected, the current gain settings are replaced with those of the Store.

The 'No' setting is useful, for example, where an ADA-8XR has been lined up to connected equipment, and it is desired to load a Store made with different line-up, or a Factory Store. On the other hand, if Stores have been made to reflect line-up with different connected equipment, 'Yes' should be selected.

8.5.2 Load Monitor Setup

```
Load Mon Setup:N  
No Yes
```

The Monitor Setup menu is a Single Selection menu. The user may choose whether certain parameters used by the two-channel Monitor are recalled when a Store is loaded. When 'No' is selected, the ADA-8XR will keep its current Monitor setup and ignores the Monitor setup saved in the Store. When 'Yes' is selected, the Monitor settings are always replaced with those of the Store.

The parameters that make up the Monitor mix (level, pan, mix mode and the list of active channels) are not affected by the Load Monitor Setup option - these parameters are always recalled when a Store is loaded. The others: Monitor Path, Monitor point, volume, line-up level, mix mode, cut mode etc. are affected by this option.

8.5.3 Unlock Stores

```
Unlock Stores: Y  
No Yes
```

The Unlock Stores menu is a Single Selection menu. The user may choose whether the Stores are unlocked (writeable) or locked (write-protected).

When the Stores are locked, no Store may be saved or cleared, thus protecting the contents. To allow Stores to be saved and cleared, this option should be set to 'Yes'.

8.5.4 Reload Factory Stores

```
Reload Factory  
Stores? [Enter]
```

When Reload Factory Stores is invoked, a number of the ADA-8XR's Stores are filled with 'standard' configurations covering common applications. The type and number of stored configurations depend on which I/O Modules are fitted to the ADA-8XR at the time. For example an ADA-8XR containing only analogue and Pro Tools I/O Modules will only be loaded with Pro-Tools-specific Stores, whereas a unit with analogue and general-purpose Digital I/O Modules fitted will be loaded with a wide variety of general-purpose Stores.

The number of over-written Stores may be as few as three or as many as fifteen. The over-writing always starts with Store location 1.1 (the first location in Bank one) and only those locations required by the Factory Stores are over-written. Any existing Stores, be they user-created or Factory Stores, in locations not required by the reloaded Factory Stores are unaffected by the reload operation.

After requesting 'Reload Factory Stores', a confirmation menu is presented.

When a firmware upgrade is performed, existing Stores are not altered even if the upgrade includes the availability of new Factory Stores; nor are existing Stores affected by a change to the fitted I/O Modules. To make any new Factory Stores available, or to load those Stores appropriate to a new selection of I/O Modules, Reload Factory Stores MUST be invoked.

Note that the Factory Stores are no different from user-created Stores - they can be cleared, altered, re-saved or moved in exactly the same way. The only distinction is that the ADA-8XR keeps a back-up copy of all the Factory Stores for use when Reload Factory Stores occurs.

9 Store System

The ADA-8XR can store up to twenty-four configurations (total system states) that can be loaded, modified, re-named and saved with just a few key presses. The Stores are organised into four Banks of six locations each and are accessed with the six 'Configuration/Stores' buttons, the 'Bank' button and the menu navigation keys.

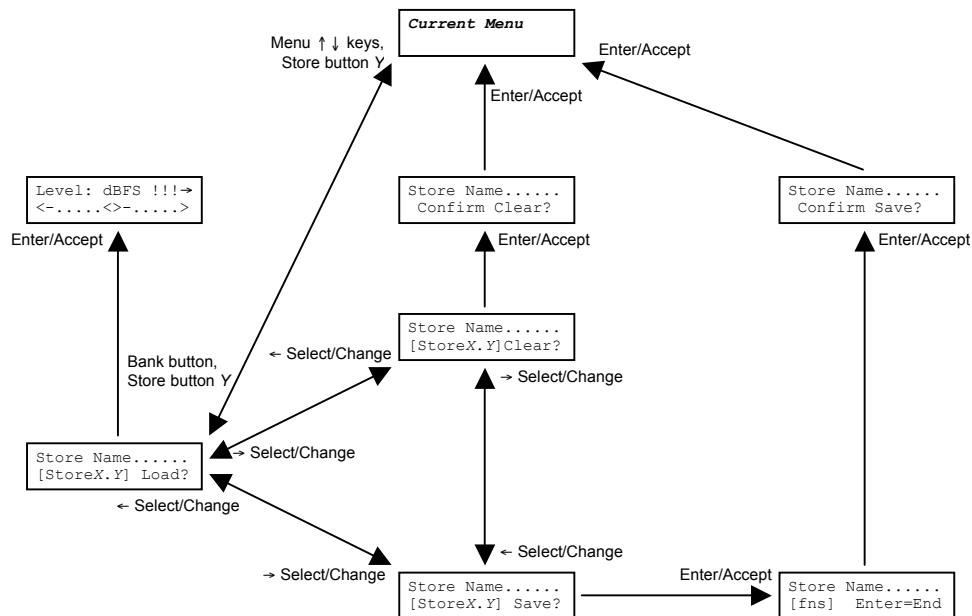
When a Store is saved, the ADA-8XR takes a snapshot of a set of parameters that define the current configuration of the unit and records them in a non-volatile memory with a user specified name and a record of the hardware configuration (which I/O Modules are fitted etc.).

Stores can be created, named and saved or cleared without disrupting the audio Paths while the unit is in use. Loading a Store causes the ADA-8XR's existing configuration to be discarded and replaced with the stored configuration; both Paths are re-initialised, causing them to momentarily mute and re-synchronize.

Some parameters are optionally persistent, i.e. they can be made to survive the loading of a Store but the load operation always re-initialises both audio Paths.

9.1 Using the Store System

The Store System user interface exists independently of the menu system, although it uses the same display and navigation keys. The Store System user interface is shown in the figure below.



9.1.1 Previewing Stores

Pressing one of the six Store buttons or the 'Bank' button in the Menu Panel, below the LCD screen, invokes the Store System. The screen then 'previews' the nominated Store, displaying its name (or '[Empty Store]') on the top line, and its location on the bottom line.

If the 'Bank' button was used to enter Preview, the last accessed Store location is previewed. If one of the six Store buttons was used, the Store of that number in the current Bank is previewed. Further presses of 'Bank' or of different Store buttons cause the nominated Store to be previewed.

Pressing the 'Configuration/Stores' button of the Store that is being previewed exits the Store system and returns the screen to the last used menu, as does pressing either of the 'Menu' navigation keys. The blue Access buttons still work when a Store is being previewed - they too return the display to the menu system.

9.1.2 Accessing Stores

Once the desired Store is previewed, one of three operations may be performed:

- Load (the Store's contents are recalled),
- Save (the current ADA-8XR configuration is written to the Store).
- Clear (the Store is erased),

One of the options 'Load', 'Save' or 'Clear' is displayed in the bottom right-hand corner of the screen during previewing. This is normally 'Load' for full Stores and 'Save' for empty Stores. The user can select the required option with the 'Select/Change' keys. If the selected location is empty, 'Load' and 'Clear' are unavailable and the top line reads '[Empty Store]'. If the stores are locked (write protected) from the Unlock Stores menu, options 'Save' and 'Clear' are unavailable. None of the three options are available for empty locations when the stores are locked. See section 8.5.3 for details of the Unlock Stores menu.

The selected option is then invoked by pressing the 'Enter/Accept' key.

Invoking 'Load' causes the selected configuration to be recalled and the display to return to the Level Screen.

'Clear' requires an extra confirmation step before the operation is completed.

Choosing 'Save' invokes the Store name editor so that the Store can be named, or renamed. When naming a Store location, the 'Select/Change' keys move the flashing cursor to the name character to be altered while the 'Menu' keys alter the selected character. The following table shows the available character set and its order:

→	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
@		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[¥]	^
_	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	{	|	}	

When the Store name editor is invoked, the name of the Store is the same as the last name applied to that location. If that Store location was previously empty, a default name of the form 'Bank X, Store Y' is used. An exception to this rule occurs when saving in an empty Store, immediately after recalling a different Store, without making any changes to the loaded configuration. In this case the new Store name in the editor is that of the recalled Store. This feature facilitates moving Stores from one location to another without having to go through the naming process.

The edited name may be cleared or returned to a default of the form 'Bank X, Store Y' using one of the special functions. These are each invoked by moving the cursor until the bottom left hand corner of the display changes from '[fns]' to 'Deflt' or 'Clear' then selecting them with either of the 'Menu' keys. Pressing 'Enter/Accept' terminates the store name editor and proceeds to the final confirmation step. Until the operation is confirmed, the user may exit the Store system at any time without making any permanent changes to the Stores or their names.

9.2 Which parameters are saved with a Store?

When a Store is saved, the ADA-8XR takes a snapshot of a set of parameters that define the current configuration of the unit and records them. Some parameters, however, are not recalled from Stores, and others are recalled optionally.

The parameters which are never recalled from a Store are:

- LED brightness,
- LCD back-light brightness,
- LCD contrast,
- Menu timeout,
- Load analogue gains (Y/N),
- Load monitor setup (Y/N),
- Unlock stores (Y/N).

Parameters which are optionally recalled (that is, the user may select whether or not they are recalled when the rest of the Store is loaded) are:

- Analogue I/O gains,
- Monitor setup.

The Load Analogue Gains and the Load Monitor Setup menus in the Store Options section in the Preferences menu group (see sections 8.5.1 and 8.5.2) respectively control whether these parameters are recalled with a Store. One exception to the optional recall of the Monitor setup is the Monitor mix - all parameters that form the Monitor mix, namely the gain and pan settings, the mix mode and the list of active channels are always recalled when a Store is loaded.

9.3 Module fitment and Stores

When a Store is saved, a record of the ADA-8XR's I/O Module fitment is kept along with the stored parameters. This record is required to cope with the possibility that the I/O Module arrangement may be different when the Store is recalled.

When a Store is recalled, the ADA-8XR compares the current I/O Module fitment with the fitment when the Store was saved. If the I/O Module fitment is different, the ADA-8XR attempts to intelligently interpret the stored state in order to provide the closest configuration to that described in the Store with the available I/O Modules. This system copes with changes such as swapping one type of digital I/O Module for another, or even swapping Modules to different slots (e.g. swapping the positions of and A/D and D/A Modules).

However, it is quite possible to change the I/O Module fitment so that it is not possible to closely represent the stored state with the available I/O Modules. In this case, the ADA-8XR will still do the best it can with the available I/O Modules but the user should be careful to check how the ADA-8XR has re-implemented a Store if the I/O Module fitment has changed.

9.4 Factory Default Stores

New ADA-8XRs are shipped with a set of pre-programmed Stores aimed at providing a set of useful configurations appropriate to the I/O Modules fitted when the unit left the factory. These Factory Stores are treated the same as user-created Stores by the Store System in that they can be loaded, cleared, modified, renamed, saved or moved. The number and type of Factory Stores will depend on which I/O Modules are fitted, but they will normally occupy banks one to three - some I/O configurations have only three Factory Stores, others have as many as fifteen.

The user may choose to reload the Factory Default Stores at any time with the 'Reload Factory Stores' menu in the Store Options section of Preferences (see section 8.5.4). When this process is invoked, the ADA-8XR inspects its I/O Module fitment and loads the most appropriate set of Factory Defaults, filling some of the Store locations (starting from Bank one, Store one). **The user should be aware that any existing stores in locations used by the new set of Factory Default Stores will be overwritten.** Reloading the Factory Stores does not alter the active configuration of the ADA-8XR, and will not disrupt either audio Path.

Generally, the selection of Stores made available by the reload operation depends on the I/O Module fitment. In many cases, though, the ADA-8XR is fitted with an A/D Module, a D/A Module and one or more DIO Modules chosen from a number of different formats. The basic set of Stores for such arrangements can be used with most types of DIO Module (except Workstation I/O Modules) with little or no changes. These 'generic' Factory Stores are introduced here, rather than in the individual I/O Module documentation. If this set of twelve Stores is made available by the reload operation, they are always placed in banks one and two.

Some parameters are common to all twelve Stores:

- All analogue line-up levels are set to 0dBFS=+18.0dBu,
- Monitor, Mimic and Meter are all set to Path 1,
- Alert criteria for both Paths are 'DI-Active' and 'AI-Overkill',
- Digital output channel status is set to 'Professional',
- All Overkillers are disabled,
- MR-X and DRE encoding/decoding is disabled.

9.4.1 'AD/DA 24b 44k1 '

24-bit, 44.1kHz A/D and D/A conversion; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 1	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	44.1kHz	Flat	24b	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.2 'AD/DA 24b 48k '

24-bit, 48kHz A/D and D/A conversion; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 2	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	48kHz	Flat	24b	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.3 'AD/DA 24b 88k2'

24-bit, 88.2kHz A/D and D/A conversion; one-wire (high-speed) digital interfaces; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 3	SOURCE	DEST	Sync- Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	88.2kHz	Flat	24b	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.4 'AD/DA 24b 96k'

24-bit, 96kHz A/D and D/A conversion; one-wire (high-speed) digital interfaces; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 5	SOURCE	DEST	Sync- Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	96kHz	Flat	24b	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.5 'AD/DA 24b 176k4'

24-bit, 176.4kHz A/D and D/A conversion; one-wire (high-speed) digital interfaces; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 5	SOURCE	DEST	Sync- Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	176.4kHz	(Flat)	(24b)	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.6 'AD/DA 24b 192k'

24-bit, 192kHz A/D and D/A conversion; one-wire (high-speed) digital interfaces; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 5	SOURCE	DEST	Sync- Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	192kHz	(Flat)	(24b)	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.7 'AD/DA 24b 96k 2w'

24-bit, 96kHz A/D and D/A conversion; two-wire (Split96) digital interfaces; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 6	SOURCE	DEST	Sync- Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1 (+D2)	WCK	96kHz	Flat	24b	Two-wire
Path 2	D1 (+D2)	A2	DI1	=Ext	-	-	-

9.4.8 'AD/DA 24b 192k 2w'

24-bit, 192kHz A/D and D/A conversion; two-wire (Split96) digital interfaces; A/D will sync to WCK if present, otherwise local.

Bank 1, Store 6	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1 (+D2)	WCK	192kHz	(Flat)	(24b)	Two-wire
Path 2	D1 (+D2)	A2	DI1	=Ext	-	-	-

9.4.9 'AD/DA 16b 44k1'

16-bit, 44.1kHz A/D and D/A conversion; A/D will sync to WCK if present, otherwise local.

Bank 2, Store 1	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	44.1kHz	Flat	16b	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.10 'AD/DA 16b 48k'

16-bit, 48kHz A/D and D/A conversion; A/D will sync to WCK if present, otherwise local.

Bank 2, Store 2	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	A1	D1	WCK	48kHz	Flat	16b	One-wire
Path 2	D1	A2	DI1	=Ext	-	-	-

9.4.11 'D-D dithr 16flat'

Digital-to-digital wordlength reduction to 16-bits, using flat TPDF dither.

Bank 2, Store 5	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	D1	D1	DI1	=Ext	Flat	16b	One-wire
Path 2	None	-	-	-	-	-	-

9.4.12 'D-D dithr 16SNS2'

Digital-to-digital wordlength reduction to 16-bits, using Prism Sound SNS2 noise shaping.

Bank 2, Store 6	SOURCE	DEST	Sync-Source	Sample Rate	SNS	Wordlength	Carrier
Path 1	D1	D1	DI1	=Ext	SNS2	16b	One-wire
Path 2	None	-	-	-	-	-	-